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Mr. Richard A. Stoff
President and CEO
Ohio Business Roundtable, Inc.
41 South High Street
Columbus, Ohio 43215

Dear Mr. Stoff:

We are pleased to transmit the Ernst & Young LLP analysis, requested by the Ohio Business Roundtable, of the proposed changes in Ohio's oil and gas severance tax included in Governor Kasich's mid-biennium budget review. The analysis includes a description of current law and proposed law Ohio severance tax features, as well as a comparison of major state and local taxes imposed on horizontal wells producing oil and gas in Ohio and seven other production states.

The current and proposed state and local taxes, measured over a thirty-year period of operation of a hypothetical well, include corporate income and franchise taxes, gross receipts taxes, sales taxes on input purchases, property taxes and severance taxes. The level of taxes in each state is summarized as effective tax rates on sales, measured as total state and local taxes on the operation of the well divided by sales from the well. Effective tax rates are also presented for each major tax type by state.

The comparison of Ohio's effective tax rates on sales from the production of the horizontal well under current law and proposed law addresses the question of the impact of the proposed severance tax change on Ohio's competitiveness for new investment in this industry.

If you have any questions related to the analysis please contact Dr. Robert Cline, Director of State and Local Tax Policy Economics.

Very truly yours,

Ernst + Young LLP

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Analysis of Ohio Severance Tax Proposal

Prepared by EY Quantitative Economics and Statistics Practice
for the Ohio Business Roundtable

Summary

The Ohio Business Roundtable engaged Ernst & Young to evaluate the impact on state and local taxes paid on Ohio horizontal oil and gas wells under Governor Kasich's proposed changes to the state severance tax. The evaluation includes a comparison of the combined Ohio state and local taxes on a representative horizontal well before and after the proposed tax change. In addition, EY was asked to compare the proposed severance tax system in Ohio with the severance tax treatment in seven selected states.

Key conclusions from this analysis are:

- The proposal would impose a new severance tax of 2.75% on the gross revenue from the production of oil and natural gas from a horizontal well. Each well would receive an exemption (subtraction from gross receipts) of $8 million over the first three years of production.

- Ohio's current law, combined state and local tax burden on a representative horizontal oil and gas well is 1.5% of sales, the lowest combined effective tax rate on sales (ETR) among the eight states included in the comparison. Ohio's overall ETR for the hypothetical well under current law is 82% below the average rate for the other 7 states.

- The proposed law would increase the state and local effective rate on sales of horizontal wells in Ohio from 1.5% to 3.1%. This higher rate is still the lowest ETR among the comparison states, 63% below the average in the other 7 states.

- Looking at just the severance tax, the proposed Ohio ETR increases from 0.4% to 2.0%. The proposed Ohio severance effective tax rate on sales is second lowest among the included states and 45% below the average in the other states for the horizontal well example.

Proposed change in Ohio severance taxes

The proposal levies a new severance tax on the gross receipts of oil and gas severed from a horizontal well. The tax would be imposed at a rate of 2.75% on the first arm's-length sale from the well. An exemption would be provided in the first three years of a well's production. The exemption provides an annual subtraction from gross receipts of $4 million, $3 million and $1 million, respectively, over the first three years of operation.

The proposed tax replaces the current severance tax on horizontal wells which is based on the volume of production. The current severance tax is imposed on the volume of production: 3 cents per mcf (1,000 cubic feet) for gas and 20 cents per barrel for oil whether recovered from horizontal or vertical wells. The proposal also exempts from the current law volume-based severance tax any gas severed from a non-horizontal well producing less than or equal to 910 mcf of gas in a calendar quarter.

Comparison of state and local tax burdens on a representative well

Overview

EY was asked to compare state and local tax burdens on horizontal wells in Ohio (both under current and proposed law) and seven other states, including Arkansas, Michigan, North Dakota, Oklahoma, Pennsylvania, Texas and West Virginia. The states chosen are states that currently have, or are expected to have in the near future, significant horizontal well drilling activities.[1]

The state and local tax comparison takes a comprehensive look at the combined burden of the major state and local taxes imposed on the representative well in each of the included states. The cost structure, production levels and output prices are held constant across the states to isolate the differences in state and local tax features. From a competitiveness perspective, it is the combined impact of all state and local taxes, not just severance taxes, that determines Ohio's relative tax burden and Ohio's competitiveness for new capital investment in the natural gas drilling industry.

The analysis developed financial statements, both balance sheet and income statements, for a single, representative horizontal well. The same financial profile was used to determine the state and local tax bases for the major taxes imposed on the well operation in each state. The analysis includes severance taxes, corporate income taxes, alternative entity-level business taxes such as the commercial activity tax (CAT) in Ohio, net worth taxes, sales taxes on input purchases by the

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[1] EY completed a study for the BRT in 2012 that evaluated the impacts of an earlier Ohio severance tax proposal. See Ernst & Young, *Analysis of Ohio Severance Tax Provisions of H.B. 487*, May 2012, located at www.ohiobrt.com under "Resources and Analysis." The methodology used in the prior and current study is similar, but the severance tax proposals are substantially different. In addition, the economic profile of the hypothetical well is quite different in the two studies.

well operators, and real and personal property taxes imposed on the assets related to the well.[2] For each state, the state and local tax burdens on the well are expressed as effective tax rates on sales of well output, calculated as the present value of total taxes divided by the present value of total sales from the well.

The horizontal wells in Ohio produce dry gas, natural gas liquids and oil/condensates. The proposal would tax the total value of the horizontal well output, after the subtraction of the exemption in the first three years, at a tax rate of 2.75%. The modeling of effective tax rates in other states recognizes the fact that these different types of outputs may be taxed at different severance tax rates based on either production volume or value.

The following are key assumptions used in modeling the financials and tax bases for the hypothetical well:

- The up-front cost of developing the horizontal well is assumed to be $8 million.
- In the initial year of operation the well produces 730,000 mcf of dry natural gas, 72,000 barrels of natural gas liquids, and 36,500 barrels of oil.[3] The production rate drops significantly in the first few years; after five years of production, the well's output is reduced by 75%. The well operates at reduced levels of production over the next 25 years.
- In estimating the tax base for the well, it is assumed that the market price of natural gas is $3.50 per mcf, the price of natural gas liquids is $41 dollars per barrel, and the price of oil is $86 barrel.[4]
- It is assumed that, under current law, natural gas liquids from horizontal wells are subject to Ohio's severance tax on gas at the rate of 3 cents per mcf.
- In calculating corporate income taxes, the Ohio CAT tax and the Texas margin tax, it is assumed that 50% of the value of sales is assigned instate for purposes of calculating the tax base.

[2] The tax burdens are estimated annually over a 30-year period. Tax liabilities can vary significantly over time given differences in state tax provisions, such as reductions in the proposed tax base in the first three years of production in Ohio. The present discounted value of the annual tax stream is divided by the present discounted value of the gross revenue stream from the well to determine a state's state and local effective tax rate on the horizontal well.

[3] The production profile represents a typical well in the Utica formation. The production quantities are based on actual production information from the Ohio Department of Natural Resources, Division of Oil and Gas, 4th Quarter 2013 oil and gas production by well report. The data was averaged for producing wells that operated for more than 80 days during the quarter. The quarterly production data was converted to an annual estimate and then grown to 2016 levels of operation, assuming growth in output of a typical well as gathering capacity in Ohio increases over time.

[4] The market prices, estimated at 2014 market price levels, are converted to well-head prices in states that impose the severance tax at this point of the production and distribution process. The Ohio proposal imposes the severance tax on the first arm's-length sale of the horizontal well output.

Effective tax rate estimates

Table 1 presents estimates of the effective state and local tax rates (ETRs) on the hypothetical horizontal well in Ohio (under current law and proposed law) and the seven comparison states. The ETRs equal the ratio of state and local taxes to the sales of the well's output (both discounted over the 30-year life of the well).

As shown in Table 1, Ohio's current-law, combined state and local tax burden on the well (1.3% of sales) is the lowest among the eight states included in the comparison. Ohio's overall ETR for the hypothetical well under current law is 85% below the average rate for the other seven states.

The proposed law would increase the total effective tax rate on the well in Ohio from 1.5% to 3.1%, still the lowest ETR among the comparison states. The proposed law state and local tax ETR would be 63% below the seven-state average.

Looking at just the severance tax, the proposed law Ohio ETR on sales is 2.0%, second lowest among the included states. Only Pennsylvania, that imposes a fixed dollar impact fee on the well, has a lower severance tax rate. Under the proposal, the Ohio effective severance tax rate would be almost 45% lower than the seven-state average (3.6%) for the horizontal well example.

Table 1
Effective tax rates on horizontal well producing natural gas, natural gas liquids and oil
(state and local taxes as percent of sales)

State and local taxes	Ohio Current Law	Ohio Proposed Law	Pennsyl-vania	North Dakota	Oklahoma	Michigan	Arkansas	Texas	West Virginia	Other State Average
State taxes										
State sales tax	0.1%	0.1%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.4%	0.4%
State corporate/business tax	0.1%	0.1%	3.5%	2.6%	3.5%	2.1%	3.4%	0.3%	3.4%	2.7%
State franchise tax	0.0%	0.0%	0.1%	0.0%	0.2%	0.0%	0.5%	0.0%	0.0%	0.1%
Severance tax	0.4%	2.0%	0.7%	4.5%	3.3%	5.4%	2.8%	3.9%	4.7%	3.6%
Total state taxes	**0.6%**	**2.3%**	**4.6%**	**7.6%**	**7.3%**	**7.9%**	**7.2%**	**4.7%**	**8.5%**	**6.8%**
Local taxes										
Property tax	0.8%	0.8%	1.6%	0.0%	0.0%	0.1%	0.8%	4.6%	2.8%	1.4%
Local sales tax	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	0.1%	0.1%	0.0%	0.1%
Total local taxes	**0.8%**	**0.8%**	**1.7%**	**0.1%**	**0.3%**	**0.1%**	**0.9%**	**4.8%**	**2.8%**	**1.5%**
Total state and local taxes	**1.5%**	**3.1%**	**6.3%**	**7.6%**	**7.6%**	**8.0%**	**8.1%**	**9.5%**	**11.3%**	**8.3%**

Notes:

1. Ohio proposed law: 2.75% gross receipts tax on value of horizontal well output.
2. Corporate income taxes include the Texas margin tax and the Ohio CAT tax at current law 0.26% rate and 0.30% proposed law rate. It is assumed that the net income from the well is taxed under the C corporation income tax in states with a corporate income tax.
3. Pennsylvania severance tax is the fixed-dollar impact fee that is independent of the level of annual well output.
4. The up-front cost of developing a horizontal well is assumed to be $8 million.
5. The ETRs for the CAT tax in Ohio reflect the statutory tax rates adjusted for the percent of in-state sales.