ANALYSIS OF REVENUE PROPOSALS

FY 2017-18 EXECUTIVE BUDGET

Independent Fiscal Office

APRIL 2017

About the Independent Fiscal Office

The Independent Fiscal Office (IFO) provides revenue projections for use in the state budget process along with impartial and timely analysis of fiscal, economic and budgetary issues to assist Commonwealth residents and the General Assembly in their evaluation of policy decisions. In that capacity, the IFO does not support or oppose any policy it analyzes, and will disclose the methodologies, data sources and assumptions used in published reports and estimates.

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INDEPENDENT FISCAL OFFICE

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April 5, 2017

This document provides an analysis of the tax proposals included in the *2017-18 Executive Budget* released in February 2017. The Independent Fiscal Office (IFO) publishes this report to fulfill its statutory duties as provided under Section 604-B (a)(4) of the Administrative Code of 1929. The statute requires that the IFO "provide an analysis, including economic impact, of all tax and revenue proposals submitted by the Governor or the Office of the Budget."

This analysis uses various data sources to derive estimates of the revenue proposals included in the budget. All data sources and methodologies used to derive those estimates are noted in the relevant sections of this document. The IFO would like to thank the various organizations that provided input to this analysis.

Questions or comments regarding the contents of this analysis are welcome and can be submitted to contact@ifo.state.pa.us.

Sincerely,

MATTHEW J. KNITTEL
Director

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Table of Contents

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Introduction

This report provides revenue estimates for the tax proposals contained in the *2017-18 Executive Budget* released in February 2017. The Independent Fiscal Office (IFO) publishes this report to fulfill its statutory duties as provided under Section 604-B (a)(4) of the Administrative Code of 1929. The statute requires that the IFO "provide an analysis, including economic impact, of all tax and revenue proposals submitted by the Governor or the Office of the Budget."

The report contains three sections. The first section analyzes the various tax proposals included in the *2017-18 Executive Budget* and the corresponding impact on General Fund tax revenues over a five-year period. The specific proposals include brief descriptions of the data sources and methodologies used to derive the revenue estimates. Certain proposals also provide interstate comparisons or a discussion of tax incidence under proposed tax law.

The second section analyzes the proposal to increase the state minimum wage from $7.25 to $12.00 per hour. It discusses potential employment effects, income effects and implications for General Fund revenues.

The third section discusses the proposal to expand lottery sales to the internet. It also provides an interstate comparison of per capita lottery sales to provide context for the potential future expansion of the Pennsylvania Lottery.

At the time of publication, technical language was not available to inform the revenue estimates of the proposals included in the budget. The explanations and descriptions contained in this report are based on descriptions from the *2017-18 Executive Budget* and presentations made by executive branch officials. The analysis assumes that none of the proposals impact the current fiscal year, and most become effective July 1, 2017.

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Tax and Revenue Proposals

The *2017-18 Executive Budget* proposes changes to corporate net income, sales and use, and insurance premiums taxes. It also proposes a new tax levy on the severance of natural gas and reductions in funds available for certain tax credits. By FY 2021-22, the analysis projects that the proposals would increase General Fund tax revenues by $1.40 billion (excludes reduction in tax credits). New revenues peak in FY 2018-19, but then decline slightly as the corporate net income tax rate reduction is phased in. The revenue impact from the tax credit reduction and minimum wage increase are not shown in the table, and estimates may be found in the relevant sections.

Table 1.1
General Fund Revenue Impact Summary

	Fiscal Years				
	17-18	18-19	19-20	20-21	21-22
Corporate Net Income Tax	$18	$178	$63	-$241	-$521
Severance Tax	349	712	755	931	1,152
Insurance Premiums Tax	142	164	172	182	191
Sales and Use Tax	435	500	526	554	573
Total	**944**	**1,554**	**1,516**	**1,426**	**1,395**

Note: figures in dollar millions.

Corporate Net Income Tax

The administration's proposal:

1) alters the cap on net operating loss deductions (NOLDs) from the greater of $5 million or 30 percent of taxable income to a cap of 30 percent of taxable income, effective for tax years beginning in 2018 and thereafter;
2) reduces the corporate net income tax (CNIT) rate from 9.99 percent to 8.99 percent for tax years beginning in 2019; 7.99 percent for tax years beginning in 2020; 6.99 percent for tax years beginning in 2021; and 6.49 percent for tax years beginning in 2022 and thereafter; and

3) requires corporations that are members of a unitary business group to apportion their income via a combined annual report for tax purposes, a filing method commonly known as combined reporting, effective for tax years that begin in 2019 and thereafter.[1]

In conjunction with the implementation of combined reporting, the cap for NOLDs will be changed to the sum of 30 percent of taxable income for net operating losses carried forward from tax years beginning before 2019 (used first) and 100 percent of taxable income for losses carried forward from tax years beginning after 2018 (i.e., losses reported by the new unitary group).

Methodology

The three CNIT proposals were analyzed in the following order: NOLD cap reduction, rate reduction and combined reporting. The impact of the NOLD cap reduction was calculated first to determine the new tax base after certain deductions have been disallowed. Then, the phase-in of the rate reduction was applied to the adjusted tax base. Once the rate reduction was applied, the combined reporting proposal was added. The stacking order does not affect the total net impact of the three proposals, but it does change the relative magnitudes of the second and third proposal.

NOLD Cap Reduction The estimate uses a simulation of the proposed NOLD cap of 30 percent of taxable income based on tax return data from 2013. The disallowance of deductions due to the more restrictive cap increases CNIT revenues. The revenue impact was computed by applying the current tax rate (9.99 percent) to the amount of NOLDs disallowed due to the more restrictive cap.

Rate Reduction The estimate applies the proposed rate reduction to the IFO's most recent CNIT baseline projection, adjusted for the impact of the NOLD cap. The estimate includes a behavioral impact that partially offsets the revenue loss due to the lower rate because corporations have less incentive to use tax planning techniques to reduce Pennsylvania corporate tax liability if tax rates are reduced. In addition, when fully phased in, the 35 percent reduction in the tax rate would likely be sufficient to have a positive impact on firms' location decisions.

Combined Reporting The estimate references an IFO report (2013) which used research from states that have implemented combined reporting during the previous decade to

[1] A unitary business is a single economic enterprise that is made up either of separate parts of a single business entity or of a commonly controlled group of business entities that are sufficiently interdependent, integrated and interrelated through their activities so as to provide a synergy and mutual benefit that produces a sharing or exchange of value among them and a significant flow of value to the separate parts. Source: "Allocation and Apportionment Regulations" Multistate Tax Commission (MTC) http://www.mtc.gov/uploadedFiles/Multistate_Tax_Commission/Uniformity/Uniformity_Projects/A_-_Z/AllocaitonandApportionmentReg.pdf.

examine the revenue impact from that filing method.[2] The report found that combined reporting could increase revenues by roughly 9 to 13 percent. A parameter at the upper end of that range was used by the IFO to estimate the previous combined reporting proposal included in the *2015-16 Executive Budget*. At that time, the IFO assumed that Pennsylvania's unique corporate tax structure would cause the impact from combined reporting to be stronger than the typical impact estimated or realized by other states. Specifically, Pennsylvania's high statutory tax rate, separate entity filing method, restrictive cap on NOLDs and lack of a throwback/throwout rule suggested an impact from combined reporting that would fall on the upper end of the aforementioned range.

Recent research, certain changes to the proposal and other Pennsylvania-specific factors now suggest a revenue impact on the lower end of that range.[3] Specifically, two factors suggest a smaller relative impact from combined reporting:

- The proposal from two years ago included a restrictive NOLD cap on prospective losses of the unitary group (greater of $3 million or 12.5 percent of taxable income). The current proposal does not include any cap on prospective NOLs of the unitary group that are carried forward.
- The combined reporting proposal is estimated after the phase in of the lower corporate tax rate. The high Pennsylvania statutory tax rate relative to other states is an important factor that motivates revenue gains from combined reporting. By FY 2021-22, the tax rate will have declined by more than three percentage points under the administration's proposal. In general, combined reporting should be less effective (i.e., a smaller relative base expansion) at lower tax rates because firms have less incentive to engage in tax planning to reduce CNIT liabilities.

The combined reporting estimate also reflects timing issues related to state or taxpayer challenges under the new reporting regime. It is not unusual for states or taxpayers to challenge the inclusion or exclusion of entities that comprise the unitary group. The resolution of that general issue could take several years. Finally, it is noted that full implementation of the new reporting regime by a state tax authority will require several years and additional staff for audit and enforcement purposes. The estimate assumes that additional resources would be made available for that purpose.

Revenue Impact

Table 1.2 displays the estimated net revenue impact of the CNIT proposals over the next five fiscal years. The only proposal to impact CNIT revenues in the next two fiscal years is the NOLD cap reduction, which increases revenues by $18 million in FY 2017-18 and

[2] See "Corporate Tax Base Erosion: Analysis of Policy Options," Independent Fiscal Office (March 2013) http://www.ifo.state.pa.us./Releases.cfm.

[3] For a summary of recent estimates regarding the impact of combined reporting, see "A Study of Practices Relating to and the Potential Impact of Combined Reporting," Office of Fiscal Management Analysis, Indiana Legislative Services Agency (October 2016) https://iga.in.gov/static-documents/6/b/7/8/6b78b5a3/exhibit_1410.pdf. The report finds that most states that have recently enacted combined reporting assumed a revenue gain of roughly 5 to 10 percent.

$178 million in FY 2018-19. By the end of the five-year window, the net impact of the three proposals reduces revenues due to the significant rate reduction.

Table 1.2
Corporate Net Income Tax Revenues

	Fiscal Years				
	17-18	18-19	19-20	20-21	21-22
NOLD Threshold	$18	$178	$149	$128	$117
Rate Reduction	0	0	-394	-609	-883
Combined Reporting	0	0	308	240	245
Total	**18**	**178**	**63**	**-241**	**-521**

Note: figures in dollar millions.

Interstate Comparison

Table 1.3 provides an interstate comparison of the corporate net income tax. The table includes (1) the tax rate, or range of tax rates, (2) the applicable reporting method, (3) the number of years that a corporation can carry forward/back net operating losses and (4) the applicable cap on NOLDs.

Forty-four states currently levy a CNIT, with the highest statutory rate (12.00 percent) levied by Iowa and the second highest levied by Pennsylvania (9.99 percent). Fourteen states use a graduated rate structure, while 30 levy a single, flat rate. As of 2016, 24 states and the District of Columbia require combined reporting for businesses that meet unitary group standards. The most recent states to enact combined reporting were Rhode Island (2015) and Connecticut (2016). The remaining 20 states that levy a CNIT require separate reporting. Eight of the states that require separate reporting have processes in place where (1) the taxpayer can elect to use a different filing method (e.g., consolidated) or (2) the state tax authority can require a taxpayer to file a combined return based on audit results.[4] Four states enforce a cap on the amount of NOLDs that can be claimed (Connecticut, Louisiana, New Hampshire and Pennsylvania) and four states enforce a cap on the amount net operating losses that can be carried back (Delaware, Hawaii, Utah and West Virginia). Among states that impose a NOLD cap, Pennsylvania is the only one that imposes both a dollar amount and a percent of taxable income cap.

[4] Consolidated reporting is not the same as combined reporting. The unitary requirements that must be met for mandatory combined reporting do not extend to consolidated reporting. Consolidated reporting allows related affiliates/firms to combine tax reports into one filing, similar to the federal consolidated return, rather than combine income from all states in which the taxpayer may or may not have nexus.

Table 1.3
States With Corporate Net Income Tax

State[1]	Tax Rate[2]	Method[3]	CF/CB[4]	NOL Deduction Cap[4]
Alabama	6.50%	Separate	15/0	None
Alaska	0 - 9.40%	Combined	20/2	None
Arizona	4.90%	Combined	20/0	None
Arkansas	1.00 - 6.50%	Separate	5/0	None
California	8.84%	Combined	20/2	None
Colorado	4.63%	Combined	20/0	None
Connecticut	9.00%	Combined	20/2	50% of taxable income on CFs
Delaware	8.70%	Separate	20/2	$30,000 on CBs
Florida	5.50%	Separate	20/0	None
Georgia	6.00%	Separate	20/2	None
Hawaii	4.40 - 6.40%	Combined	20/2	$100,000 on CBs
Idaho	7.40%	Combined	20/2	None
Illinois	7.75%	Combined	20/2	None
Indiana	6.25%	Multiple[5]	20/0	None
Iowa	6.00 - 12.00%	Separate	20/0	None
Kansas	4.00 - 7.00%	Combined	10/0	None
Kentucky	4.00 - 6.00%	Separate	20/0	None
Louisiana	4.00 - 8.00%	Separate	20/0	72% of taxable income on CFs
Maine	3.50 - 8.93%	Combined	20/0	None
Maryland	8.25%	Separate	20/2	None
Massachusetts	8.00%	Combined	20/0	None
Michigan	6.00%	Combined	10/0	None
Minnesota	9.80%	Combined	15/0	None
Mississippi	3.00 - 5.00%	Multiple[5]	20/2	None
Missouri	6.25%	Separate	20/2	None
Montana	6.75%	Combined	7/3	None
Nebraska	5.58 - 7.81%	Combined	20/0	None
New Hampshire	8.20%	Combined	10/0	$10M on CFs
New Jersey	9.00%	Separate	20/0	None
New Mexico	4.80 - 6.20%	Separate	20/0	None
New York	6.50%	Combined	20/3	None
North Carolina	3.00%	Multiple[5]	15/0	None
North Dakota	1.41 - 4.31%	Combined	20/0	None
Oklahoma	6.00%	Multiple[5]	20/2	None
Oregon	6.60 - 7.60%	Combined	15/0	None
Pennsylvania	**9.99%**	**Separate**	**20/0**	**$5M or 30% of taxable income on CFs**
Rhode Island	7.00%	Combined	5/0	None
South Carolina	5.00%	Multiple[5]	20/0	None
Tennessee	6.50%	Multiple[5]	15/0	None
Utah	5.00%	Combined	15/3	$1M on CBs
Vermont	6.00 - 8.50%	Combined	10/0	None
Virginia	6.00%	Multiple[5]	20/2	None
West Virginia	6.50%	Combined	20/2	$300,000 on CBs
Wisconsin	7.90%	Combined	20/0	None

[1] Nevada, Ohio, South Dakota, Texas, Washington and Wyoming do not levy a corporate net income tax. Ohio, Texas and Washington levy a gross receipts tax on business activities.

[2] Tax Foundation. "State Corporate Income Tax Rates and Brackets for 2017." (February 2017).

[3] Office of Fiscal Management Analysis and Indiana Legislative Services Agency. "Combined-Reporting Study." (October 2016).

[4] CF/CB is Carryforward/Carryback. Data are in years. Source: Tax Foundation. Wolters Kluwer CCH IntelliConnect.

[5] States that generally require separate reporting, but either allow taxpayers to elect another form of reporting, or may require combined reporting based on audits.

Natural Gas Severance Tax

The administration's proposal levies a tax on the severance of unconventional (i.e., shale) natural gas within the Commonwealth. The tax rate is 6.5 percent of the value of natural gas extracted and does not include a deduction for post-production costs incurred such as gathering, processing and transportation costs. The amount paid in unconventional gas well impact fees is applied as a credit against the severance tax. The estimate assumes an effective date of July 1, 2017, with remittances due the 20th day of the fourth month following production; therefore, collections begin in November 2017.

Methodology

The estimate is based on the projected market value of natural gas sold, which is valued using prices from the Dominion South and Leidy trading hubs. A trading hub is a fixed point where pipelines connect and natural gas is bought and sold. The market value, or tax base, is equal to the product of unconventional gas production volume and the spot price at the regional hubs.[5] The analysis projects price and production based on forecasts from Bentek Energy. Projected tax collections equal the product of the 6.5 percent tax rate and the tax base, less the deduction for the impact fee credit. Impact fee revenues are based on the number and age of unconventional gas wells projected to be subject to the fee and the applicable fee schedule under current statute.[6]

The price forecast assumes that natural gas prices increase modestly through FY 2021-22, as more wells are connected to an expanding pipeline network that serves new markets in the northeast, midwest and south. The production forecast assumes only minor gains in 2017 due to (1) low regional prices and (2) a reduction in output from the imposition of the new severance tax, which reduces demand if most of the tax is passed forward to final consumers through higher prices.[7]

Revenue Impact

The top portion of Table 1.4 displays the price and production data used for the estimate. The bottom portion of the table displays the revenue estimates derived from those forecasts and the four-month lag between production and remittance of tax on a fiscal year basis. Projected impact fee revenues that can be applied as a credit against the

[5] In practice, firms would self-report the price received for gas sold during the year. The spot price represents the lowest price a firm would likely receive, and other data sources suggest that received prices would be higher. Firms may trade on international platforms such as the New York Mercantile Exchange, or may enter into two-party agreements with varying time frames and conditions.

[6] The Commonwealth Court recently issued a decision (March 29, 2017) that affects which wells are subject to the impact fee. Snyder Bros. v. Public Utility Commission, No. 1043 C.D. 2015 (Pa.Cmwlth. 2017). That decision is not incorporated in this analysis (Tables 1.4 and 1.5).

[7] The analysis assumes that the new 6.5 percent tax on the market value at the hub reduces production by roughly 5 percent.

proposed severance tax are also shown. For FY 2018-19 (first full fiscal year), the analysis projects $712 million of net tax revenue, growing to $1,152 million by FY 2021-22. It should be noted that revenue projections are sensitive to the price forecast. A 10 percent reduction in the price forecast would reduce projected revenues by roughly the same percentage.

Table 1.4
Natural Gas Production and Price Data (Calendar Years)

	2015	2016	2017	2018	2019	2020	2021	2022
PA Natural Gas Production[1]	4,597	5,092	5,198	5,437	5,863	6,336	6,720	7,098
Growth Rate	12.9%	10.8%	2.1%	4.6%	7.9%	8.1%	6.1%	5.6%
Average Annual Prices[2]								
Henry Hub	$2.70	$2.57	$3.42	$3.43	$3.36	$3.60	$3.88	$3.97
Regional Hub	1.43	1.53	2.44	2.62	2.62	2.88	3.19	3.29
Difference	-1.28	-1.04	-0.97	-0.81	-0.75	-0.72	-0.69	-0.68

Severance Tax Revenues (Fiscal Years)[3]

	17-18	18-19	19-20	20-21	21-22
Tax on Market Value	$574	$952	$1,017	$1,216	$1,425
Less Impact Fee Credit[4]	225	240	262	285	273
Net Severance Tax	349	712	755	931	1,152

[1] Unconventional production. Billions of cubic feet.

[2] Dollars per thousand cubic feet (mcf), converted from $/mmbtu using U.S. and Pennsylvania heat content data. Pennsylvania regional hub price equal to a weighted average of the Dominion South and Leidy trading hubs.

[3] Figures in dollar millions.

[4] Henry Hub price is projected to increase above the $2.99/mmbtu threshold, causing the impact fee schedule to increase. Fee is remitted in April, and is based on well counts and ages from the prior calendar year. Corresponds to year credit is applied.

Effective Tax Rate Comparisons

The analysis computes two types of effective tax rates (ETRs). The ETRs are equal to the ratio of taxes paid to the total market value of gas for (1) a single new well over its productive life (lifetime ETR) and (2) all wells that produced during a calendar year (annual ETR). An ETR is a summary metric that isolates the impact of state-specific exemptions, deductions, rates or credits (lifetime ETR) or reflects the mix of different wells in operation for a given year (annual ETR). For the lifetime ETR, the analysis compares the proposed Pennsylvania severance tax to six other states: Arkansas, Louisiana, Ohio, Oklahoma, Texas and West Virginia. For the annual ETR, the analysis computes values for Pennsylvania for 2011 to 2016. The two ETRs represent different concepts and serve different purposes, which are described in the following subsections.

The ETRs are computed based on the wellhead price because all states that levy a value-based severance tax use the market value at the wellhead as the tax base (which excludes, or does not tax, post-production costs). The proposed Pennsylvania severance tax is unique because it would be levied on the extractor's revenues from sales (i.e., no deduction for post-production costs). Following convention, all ETRs computed in this section (including Pennsylvania) are based on the market value at the wellhead to facilitate consistent interstate comparisons.

Lifetime ETRs The lifetime ETR is the average effective tax rate over all production years for a newly-drilled well.[8] It is equal to the net present value of severance taxes remitted divided by the net present value of the market value of gas extracted.[9] Lifetime ETRs are prospective measures that can be used to compare ETRs for new wells across states. They reflect current production technology and anticipated prices in the future.

For the lifetime ETR computations, the analysis applies the same parameters to each state: (1) the well is drilled in 2017 and begins production on January 1, 2018, (2) it produces 10 billion cubic feet of natural gas over a 30-year lifetime, (3) it has a production profile (decline curve) similar to a recently-drilled Marcellus shale well and (4) natural gas extracted from the well is valued at a blended spot price for Pennsylvania regional hubs.[10] Drilling costs and the tax policies specific to each state, including any special provisions, are used to calculate severance tax revenues for that state.

Table 1.5 shows the statutory tax rates and lifetime ETRs for the proposed Pennsylvania severance tax and the six comparison states. The entry for Pennsylvania includes the total ETR and its components: the current natural gas impact fee and the proposed severance tax. Based on the price assumptions from Table 1.4, the analysis finds that the total lifetime ETR for Pennsylvania is the highest among comparison states: 9.0 percent (before deduction of the impact fee credit). The analysis finds that the impact fee has a lifetime ETR of 1.4 percent. Allowing for the deduction of the current impact fee yields a lifetime ETR of 7.6 percent for the proposed severance tax. That rate is higher than the 6.5 percent statutory rate due to the disallowance of post-production costs, which increases the lifetime ETR by 2.5 percentage points. It should be noted that the computed lifetime ETRs are dependent on a regional hub price that ranges from $2.62 to $3.29 per mcf from calendar year 2018 to 2022. (See Table 1.4.)

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[8] For a more detailed explanation, see "Natural Gas Extraction: An Interstate Tax Comparison," Independent Fiscal Office (March 2014).

[9] The computations use a discount rate of 4.5 percent to calculate net present value.

[10] The analysis uses an updated Marcellus shale decline curve, based on an analysis by Bentek Energy of production data filed with the Pennsylvania Department of Environmental Protection. Compared to the previous decline curve used by the IFO, the new curve contains a larger share of production in the first five production years, and much less in the final 15 years (years 16 to 30). The new production pattern implies lower lifetime ETRs for certain states in the analysis because those states levy lower rates in the early production years.

Table 1.5
Lifetime Effective Tax Rates

State	Statutory Tax Rate	ETR at Wellhead[1]
Arkansas[2]	5.0%	3.6%
Louisiana[3]	13.9 cents/mcf	4.0%
Ohio[4]	2.5 cents/mcf	1.3%
Oklahoma[5]	7.0%	4.6%
Texas[6]	7.5%	3.5%
West Virginia[7]	5.0%	5.0%
Pennsylvania	n.a.	9.0%
Current Impact Fee	n.a.	1.4%
Proposed Severance Tax[8]	6.5%	7.6%

[1] The wellhead price excludes post-production costs, which are assumed to be 0.87 cents/mcf in 2018 and increase with inflation.

[2] Arkansas levies a reduced value-based rate of 1.5 percent for the first three years, and a fourth if the operator's market revenue does not exceed the drilling and completion costs. Arkansas also levies a volume-based administrative fee of 0.9 cents/mcf.

[3] Louisiana levies a volume-based tax that is adjusted based on the level of the Henry Hub price during the previous year. A reduced volume-based tax rate, also determined by the Henry Hub price, applies for the first two years if the operator's market revenue does not exceed the drilling and completion costs. Louisiana also levies a volume-based administrative fee of 0.3 cents/mcf.

[4] Ohio levies a volume-based tax of 2.5 cents/mcf and an administrative fee of 0.5 cents/mcf.

[5] Oklahoma levies a reduced value-based rate of 2.0 percent for the first three years. Oklahoma also levies an excise tax of 0.095 percent and an administrative fee of 0.0015 cents/mcf.

[6] Texas levies a reduced value-based rate for the first ten years or until the cumulative value of the reduction equals half of the drilling and completion costs. Texas also levies a volume-based administrative fee of 1/15 of one cent/mcf.

[7] The former volume-based tax of 4.7 cents/mcf is no longer in effect.

[8] Proposed severance tax uses the price received. Other states allow a deduction for post-production costs, or the price at the wellhead. The proposed tax is modeled at the wellhead to facilitate comparisons.

Annual ETRs The Pennsylvania annual ETR is the average effective tax rate paid for all wells in a single year. The numerator is equal to annual impact fee remittances. The denominator is equal to the volume of gas extracted multiplied by a regional spot price less post-production costs. The annual ETR is essentially a weighted average rate across all wells. While some wells may be in their first year of operation, others could have been active for nearly a decade.

For the Pennsylvania impact fee, annual ETRs were as follows: 2011 (5.7 percent), 2012 (5.1 percent), 2013 (2.7 percent), 2014 (2.4 percent), 2015 (6.9 percent) and 2016 (5.0 percent, for the estimated fee of $174.6 million due in April 2017). The relatively high annual ETRs in 2011 and 2012 are due to low production and modest prices. The annual ETR declined in 2013 and 2014 due to strong production gains and higher prices. For 2015, the annual ETR rose dramatically due to the collapse of natural gas prices.[11] For 2016, the annual ETR declined to 5.0 percent, and it should continue to decline to roughly 2.0 percent based on the price and production forecasts from Table 1.4.

It should be noted that the regional spot prices used for the computations will generally understate the actual prices received by firms, and the annual ETR computations will be somewhat overstated. For example, if the actual price received by firms exceeds the spot price by 10 percent, then the annual ETR would fall by roughly the same percentage. Due to that uncertainty and the sensitivity of hub spot prices to regional conditions, these rates are best used to illustrate historical trends for a particular state, as opposed to comparisons across states.

Lifetime versus Annual ETRs In the long-term, an annual ETR (all wells for a single year) will be higher than a lifetime ETR (a single new well) because (1) some firms remit the impact fee for wells that did not produce, or produced marginal amounts and (2) the annual ETR is overstated for most years because the prices received by natural gas extractors generally exceed real time spot prices reported by regional hubs. These two issues do not impact the lifetime ETR computation.

Despite the difference between the lifetime and annual ETR computations, both rates are appropriate depending on the purpose of the computation. If a policymaker wants to know the average tax rate for all wells subject to the impact fee compared to prior years, then the annual ETR is an appropriate metric. However, if policymakers are interested in the tax burden on a newly-drilled well that reflects the most recent technology and estimated well recovery, then the lifetime ETR is the appropriate metric. That metric is also appropriate for interstate comparisons because it isolates differences in severance tax structures across states by holding all other factors constant that could affect computations across the comparison states (e.g., price and production volume).

[11] The collapse of natural gas prices in 2015 likely caused a significant difference between the spot and received prices, and spot prices could have been much lower than received prices. To the extent that occurred, the annual ETRs would be materially overstated.

Tax Incidence

In response to multiple inquiries from members of the General Assembly, this section presents a brief discussion regarding the implications of the proposed severance tax for Pennsylvania leaseholders and energy consumers. Although producers are liable for the proposed severance tax, others will generally bear the tax burden through lower royalty payments or higher energy prices. Producers will also be affected because output will fall in response to the higher post-tax price. The discussion in this section applies to the longer-term incidence of the proposed tax, once output declines in response to the tax.

For existing natural gas severance taxes, tax incidence studies assume that most of the tax is pushed forward into final prices and borne by natural gas consumers who may reside in other states. For example, the annual Tax Foundation incidence study allocates severance taxes across all states based on a state's consumption of the relevant natural resource.[12] The State of Texas assumes that two-thirds of natural gas severance taxes are exported to non-residents.[13] This analysis follows general convention and assumes that much of the tax is exported through higher prices once output has declined in response to the new tax.

In the *2015-16 Executive Budget*, the administration proposed a severance tax and included specific language that attempted to prevent the pass back of the tax to lease holders through lower royalty payments.[14] The proposal does not currently include such a provision. Based on the lack of statutory language to prevent it, this analysis assumes that some portion of the proposed severance tax would be passed back to leaseholders through lower royalty payments.[15]

In general, there are two ways that firms may pass the tax to leaseholders:

- For current contracts, the tax could be passed back due to the deduction of the tax from the royalty base. In that case, the pass back should not exceed 13.5 percent of the tax, which research finds is the average Pennsylvania royalty rate.[16]

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[12] Malm and Prante, "State-Local Tax Burden Rankings: Methodology," Tax Foundation Working Paper (January 2016).

[13] "Tax Exemptions and Tax Incidence," Texas Comptroller of Public Accounts (March 2015). See also "2017 Minnesota Tax Incidence Study: An Analysis of Minnesota's Household and Business Taxes," Minnesota Department of Revenue (March 2017).

[14] Royalty payments are made to leaseholders on the sale of gas extracted from the property. Some leases allow producers to deduct post-production costs from royalty payments on a pro-rata basis. The pass back of the proposed severance tax would occur if producers include the tax as a post-production cost and deduct it from future royalty payments.

[15] The proposed severance tax is not expected to include language that prohibits the taxpayer from passing the tax burden onto leaseholders. For the impact fee, such language is currently in force at 58 Pa.C.S. § 3502. See also *Kilmer v. Elexco*, 990 A.2d 1147,1157 (Pa. 2010), citing Williams and Meyers, "Manual of Oil and Gas Terms" (2009) for the proposition that "production taxes" may be deducted from royalty payments absent agreement to the contrary.

[16] Brown, Fitzgerald and Weber, "Capturing Rents from Natural Resource Abundance: Private Royalties from U.S. Onshore Oil and Gas Production," Federal Reserve Bank of Kansas City RWP 15-04 (July 2016). For example, if the price producers receive did not change in response to the

- For new contracts, negotiated royalty rates might also decline.

Recent academic research finds that the enactment of the impact fee did reduce royalty rates on new contracts by 1.0 percentage point, roughly a 6 percent reduction in the average Pennsylvania royalty rate at that time.[17] However, when the fee was enacted, firms had to pay the fee retroactively on unconventional wells in operation, and essentially made two years of payments in a single year. The study notes that likely caused cash flow constraints, and limited the ability of firms to enter into new lease agreements. Moreover, the impact fee is a lump sum payment that must be paid regardless of production levels or profits. By contrast, a severance tax is a production tax that depends on market value and is paid on a monthly basis. Therefore, the study provides only general guidance regarding the potential tax incidence on leaseholders from the imposition of a new severance tax.

Ultimately, the amount of tax that can be passed forward to consumers will depend on supply and demand conditions. Research and market conditions suggest that firms could pass much of the tax forward to consumers in higher prices in the long-term. There are two reasons that could occur:

- Consumers are relatively non-responsive or inelastic;[18] and
- Pennsylvania is a dominant supplier for many of the larger destination points for natural gas (e.g., New York, New Jersey and Boston) due to its proximity.

Based on these factors, the analysis assumes that current and new leaseholders would bear 7 percent of the tax through lower royalty payments (current leaseholders) or lower royalty payments and rates (new leaseholders). The figure is an average of the two impacts, and current leaseholders may bear less of the tax burden.[19] The residual amount is assumed to be pushed forward to final consumers. It is possible that some of the tax burden is also borne by firms, and if that occurs, presumably much of that impact would flow out-of-state to non-resident shareholders of multistate corporations through lower dividends and capital gains realizations.

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tax, then the royalty base would fall by the entire tax (since it can be deducted) and the royalty payment to leaseholders would decline by the dollar amount of tax deducted times 13.5 percent. However, if the full amount of the tax was passed forward to consumers, then current leaseholders would be unaffected.

[17] Black, McCoy and Weber, "When Externalities are Taxed: The Effects and Incidence of Pennsylvania's Impact Fee on Shale Gas Wells," USAEE Working Paper No. 16-272 (2016).

[18] Arora, "Estimates of the Price Elasticities of Natural Gas Supply and Demand in the United States," Munich RePEc Archive, MRPA No. 54232 (2014). The study finds a demand elasticity for natural gas that ranges from -0.24 to -0.70 using U.S. data from 1993 through 2013.

[19] For the purpose of the incidence analysis, it is useful to know the base amount of royalty payments that are received by Pennsylvania leaseholders. Tax return data from tax year 2014 suggest that royalty payments exceeded $1.0 billion and a reasonable estimate could range from $1.3 to $1.6 billion.

Table 1.6
Incidence of Proposed Severance Tax

	Share of Incidence		Share of Utility Bills
Total Impact[1]	**100.0%**	**Residential Distribution**[3]	
Lease Holders	7.0	$0 - $24,999	17.0%
All Consumers		$25,000 - $49,999	21.8
Resident	18.9	$50,000 - $74,999	18.3
Non-Resident	74.1	$75,000 - $99,999	13.7
		$100,000 - $249,999	24.0
PA Consumption by Sector[2]		$250,000 +	5.2
Residential	37.8	**Total**	**100.0**
Commercial	27.5		
Industrial and Other	34.7		
Total In-State Consumption	**100.0**		

[1]Pennsylvania consumption data are from U.S. Energy Information Administration, and Pennsylvania production data are from the Pennsylvania Department of Environmental Protection for 2016.

[2] Natural gas used for heating and natural gas used to generate electricity. Natural gas data are for 2016; electricity data are for 2015. Share of electricity is from the U.S. Energy Information Administration, EIA-923 Survey; consumption data are from surveys including EIA-895 and EIA-861.

[3] Weighted average of natural gas heating and natural gas electricity generation. Data are from the U.S. Census Bureau's American Community Survey, PUMS 2015 1-Year Pennsylvania Household file. Data pertain only to residences that have separate natural gas and electricity bills. Rental units are each considered one data point; excludes group housing such as nursing facilities and university dormitories. Share of electricity generated by natural gas is from the U.S. Energy Information Administration, EIA-923 Survey for 2015.

[4] The lowest income bracket could constitute a larger portion than currently shown. The Census data (see note 3) exclude utility bills in which natural gas and electricity are combined into one bill or included in rent. These bills are frequently used for renters in lower income brackets. Also, some residents in the $100,000 - $249,999 income bracket might belong in the $250,000 bracket because the Census data exclude income from capital gains.

The tax burden on consumers is allocated between resident and non-resident consumers by determining the share of natural gas produced in Pennsylvania that is also consumed by state residents or businesses. The computation uses production data from the Pennsylvania Department of Environmental Protection and consumption data from the U.S. Energy Information Administration (EIA). For 2016, those data suggest that state residents and businesses consumed 20.3 percent of total production. Therefore, the analysis assumes that (1 - 0.07) * 0.203 = 18.9 percent of the tax burden is borne by state residents or businesses. (See Table 1.6.) That share would likely be somewhat lower because some industrial gas consumers that export products will also pass a portion of the tax to non-residents.

The middle portion of Table 1.6 allocates the Pennsylvania consumption share to the electric, residential, industrial and commercial sectors, based on EIA data for 2016.[20] The share of in-state natural gas consumption used to generate electricity is 46.2 percent of the total.[21] The residual amount of in-state consumption is for residential heating (20.6 percent), or commercial (13.7 percent) and industrial (19.3 percent) purposes. The final sector shares shown in Table 1.6 are equal to direct gas consumption plus a prorated share of electricity consumption generated by natural gas.

The second column of Table 1.6 displays the share of total natural gas and electric utility bills by income group. Based on data from the U.S. Census Bureau, the data show that Pennsylvania households with incomes under $25,000 comprised 17.0 percent of the total dollar amount of residential natural gas and electric utility bills.[22] The distribution is based on dollar amounts spent on natural gas heat and electricity by each income group, with electricity expenditures reduced to reflect only the share of electricity generated from natural gas (46.2 percent).

Based on a request from a member of the General Assembly, the analysis in this section concludes with an estimate of the impact of the proposed severance tax on gas and electric utility bills. The two computations are as follows:

- For natural gas, data show that roughly 60 percent of the bill is due to fuel costs (other amounts are distribution, administrative and other miscellaneous charges).[23] Other data from the EIA show that 53.8 percent of gas is consumed by residential, commercial or industrial customers, and not electric utilities. The computed impact on the gas bill is equal to 2.0 percent, which is the product of the tax rate, the consumer share not borne by leaseholders, the fuel cost share of the total bill and the non-electric utility share of gas consumption (0.065 * 0.93 * 0.60 * 0.538). The last factor must be included because it eliminates double counting for gas used in the electric bill.
- For electricity, data show that roughly 50 percent of the bill is due to generation costs. Other data from the EIA show that 46.2 percent of natural gas is consumed by electric utilities, and 31.6 percent of all electricity sold is generated using natural gas. The computed impact on the electric bill is equal to 1.0 percent, which is the product of the tax rate, the consumer share not borne by leaseholders, the fuel cost share of the total bill and the share of electricity generated by gas (0.065 * 0.93 * 0.50 * 0.316).

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[20] U.S. Energy Information Administration, various surveys including EIA-895 and EIA-861.
[21] The EIA data also show that 31.6 percent of electricity was generated from natural gas, and projects that percentage will grow as more utilities switch to natural gas.
[22] The lowest income bracket may comprise a larger share than shown. The Census data exclude utility bills in which natural gas and electricity are combined into a single bill or included in rent. Those types of bills are frequently used for renters in lower income brackets. In addition, the Census data also exclude capital gains, therefore some residents in the $100,000-$249,999 income bracket would likely migrate to the highest group if that income were included.
[23] Based on "Rate Comparison Report" Pennsylvania Public Utility Commission (April 2016) and conversations with Commission staff.

It should be noted that the methodology assumes that all consumers of natural gas and electricity (residential, commercial and industrial) would realize a similar increase in their utility bills. That need not occur because (1) some customers are more responsive to price than others (e.g., residential versus industrial customers) and (2) consumers that purchase electricity from a utility that does not use gas might be affected less. Finally, it is noted that Pennsylvania is a major exporter of electricity, and some of the tax burden would also be shifted to non-residents through the sale of that commodity.

Insurance Premiums Tax

Pennsylvania levies a 2.0 percent tax on insurance premiums received from policies sold within the Commonwealth. The administration's proposal expands the tax base to include health insurance companies that are currently exempt. These include non-profit hospital service plans, health management organizations (HMOs), preferred provider organizations (PPOs) and risk-assuming non-licensed insurers (RANLIs). The tax base expansion is proposed to take effect for tax year 2018.[24]

The first category of insurer, the non-profit hospital service plan, was originally developed to reduce the cost of hospital access for low-income individuals.[25] Those firms are still required to maintain non-profit status, although their clientele is now more diverse, and they generally are now licensed to insure a broad range of medical services. An HMO or PPO is an organization that provides coverage through a contracted network of hospitals and medical providers. HMOs use gatekeepers to manage the delivery of healthcare services, while PPOs utilize financial incentives to encourage the use of in-network providers. A RANLI is a PPO that is not a licensed insurer, but is approved by the Department of Insurance to operate in the Commonwealth.

[24] Entities subject to the insurance premiums tax (IPT) are not subject to the corporate net income tax. Managed care plans (e.g., HMOs) that would become subject to the IPT under the proposal also are subject to a managed care assessment under the Human Services Code. This assessment is used to support Medical Assistance expenditures by the Department of Human Services. The department proposes to levy the assessment at $15.07 per member per month for FY 2017-18, an increase from the current rate of $13.48. The entities' responsibility for this assessment would not be affected by the proposed expansion of the IPT.

[25] This category includes companies commonly known as "Blue Cross" or "Blue Shield," among others. For a general overview, see Thomasson, "The Importance of Group Coverage: How Tax Policy Shaped U.S. Health Insurance," NBER Working Paper 7543 (2000), and Rorem, "Enabling Legislation For Non-Profit Hospital Service Plans," Duke University Journal of Law and Contemporary Problems (1939).

Revenue Impact

The Department of Revenue (DOR) projects that the proposal will generate $142 million in FY 2017-18, and increase to $191 million by FY 2021-22. The revenues for the first fiscal year represent only the estimated payments for tax year 2018 (90 percent prepayment), and revenue collections are fully phased-in for subsequent years.

Table 1.7
Insurance Premiums Tax Revenues

	Fiscal Years				
	17-18	18-19	19-20	20-21	21-22
Total	$142	$164	$172	$182	$191

Notes: figures in dollar millions. The first fiscal year consists only of estimated payments for tax year 2018. Subsequent fiscal years include both regular and estimated payments. Revenue estimates are reduced to account for the corporate net income tax that would be foregone by the expansion of the insurance premiums tax.

Source: Pennsylvania Department of Revenue.

The DOR estimate is based on direct premiums written in Pennsylvania for calendar year (CY) 2013 as reported in the Department of Insurance's annual statistical report.[26] The department excluded premiums written for Medicare, Medicaid and federal employee insurance from its computations because those lines of insurance would not be subject to tax. It also made various adjustments to the remaining premiums using information from tax returns, including a deduction for the loss of corporate net income tax for companies that would now be subject to the insurance premiums tax. Their forecast grows the CY 2013 estimate by applying the growth rate for consumer expenditures on medical services from IHS Economics.

The IFO analyzed Department of Insurance data for CY 2015, which was not yet available when DOR performed its analysis, and compared it to CY 2013 data.[27] (See Table 1.8.) Total premiums written by the companies likely to be affected by the proposal increased at an annual rate of 5.6 percent between the two years.[28] However, the premiums written for the lines of insurance assumed to be taxable under the proposal (e.g., group, individual, Medicare supplement, dental and vision) declined at an annual rate of 1.1 percent. The premiums written for the remaining lines of insurance increased at an annual rate of 8.8 percent, driven by strong growth in Medicaid premiums.

[26] "Annual Statistical Report for the Period July 1, 2013 to June 30, 2014," Pennsylvania Department of Insurance (data as of December 31, 2013).
[27] "Annual Statistical Report for the Period July 1, 2013 to June 30, 2014" Pennsylvania Department of Insurance (data as of December 31, 2013) and "Annual Statistical Report for the Period July 1, 2015 to June 30, 2016" (data as of December 31, 2015).
[28] The IFO identified entities likely to be affected by the proposal based on information provided by the Department of Insurance and by queries on the department's website.

Table 1.8
Unadjusted Healthcare Premiums by Line of Insurance and Type of Entity

Insurance Line	Non-profit	HMO/PPO	RANLI	Total
CY 2013				
Group	$2,479	$3,146	$2,523	$8,148
Individual	493	547	41	1,081
Medicare Supplement	436	0	0	436
Vision	18	0	1	19
Dental	157	0	30	187
Total	**3,583**	**3,693**	**2,595**	**9,871**
CY 2015				
Group	$2,067	$2,361	$2,532	$6,960
Individual	748	1,005	267	2,020
Medicare Supplement	392	0	0	392
Vision	52	0	5	57
Dental	178	2	45	225
Total	**3,437**	**3,368**	**2,849**	**9,654**

Note: figures in dollar millions. Includes premiums written by entities identified by the Department of Insurance as being in one of the three categories affected by the proposal. The same entities are included for each year analyzed. Does not include adjustments for (1) premiums that currently are subject to the premiums tax or (2) any corporate net income tax paid by these entities.
Source: "Annual Statistical Report for the Period July 1, 2013 to June 30, 2014" Pennsylvania Department of Insurance (data as of December 31, 2013) and "Annual Statistical Report for the Period July 1, 2015 to June 30, 2016" (data as of December 31, 2015).

Despite the decline between 2013 and 2015 in premiums written for the lines subject to tax, the department's estimate appears to be reasonable, subject to certain qualifications. For example, the IFO does not possess the information to make the adjustments that were incorporated into the DOR estimate based on tax return data. Furthermore, the estimates may be subject to a greater-than-usual degree of uncertainty because the health insurance market may undergo changes in the future, and any potential changes are not reflected in the data used to develop the estimates.

Economic Impact

The entities newly subject to the insurance premiums tax wrote approximately 85 percent of the health premiums in Pennsylvania for CY 2015, according to Department of Insurance data. Among the affected companies, the lines of insurance that are assumed to be taxable (e.g., group, individual, Medicare supplement, dental and vision) constituted nearly 30 percent of the premiums written by these entities.

It can be assumed that (1) companies newly subject to the tax will pass the burden forward to employers or consumers in the form of higher prices and (2) higher prices will induce some employers or consumers to drop insurance coverage or increase deductibles and/or copays.[29] The degree to which companies have the ability to adjust their rates within the Affordable Care Act's regulated marketplace is one uncertainty. There may also be differences in price response between holders of individual and group policies, and between small-group and large-group policies. The impacts of these potential behavioral responses have not been estimated.

The tax base expansion may have an impact on the Children's Health Insurance Program (CHIP). Any premium increases that are passed through will be treated as follows:

- Fully subsidized CHIP policyholders (Free CHIP) would not be affected by any premium increases that are passed through by the companies. Nearly 90 percent of the increase would be covered by federal funds based on the current federal matching percentage.[30] The remainder would be paid by state funds.
- Partially subsidized CHIP policyholders (Low Cost CHIP) would pay a portion of a premium increase that is passed through to their policies. The premiums range from 25 percent to 40 percent of the cost depending on the income of the policyholder. Federal and state funds would pay the remainder.
- Unsubsidized policyholders (At Cost CHIP) would pay the full amount of a premium increase.

Survey data from the U.S. Census Bureau show that Pennsylvania citizens with incomes over $25,000 primarily own private health insurance policies, while residents with incomes under $25,000 are primarily insured by public plans. (See Table 1.9.) The share of residents who own private insurance increases with income, and the impact of the tax base expansion is expected to follow this pattern.

[29] See "Minnesota Tax Incidence Study: An Analysis of Minnesota's Household and Business Taxes," Minnesota Department of Revenue (March 2017) for an explanation of the pass-forward concept.

[30] Legislative action by the U.S. Congress will be required to extend federal funding for CHIP past September 30, 2017.

Table 1.9
Income Distribution of Health Insurance Coverage

	With Health Insurance	Private Health Insurance	Public Health Insurance	No Health Insurance
Under $25,000	90.4%	38.0%	71.3%	9.6%
$25,000 to $49,999	90.5	61.5	50.7	9.5
$50,000 to $74,999	93.3	77.2	31.5	6.7
$75,000 to $99,999	95.3	85.6	22.1	4.7
$100,000 or more	96.8	91.8	13.7	3.2

Notes: Data represent the percentage of Pennsylvania residents who own each type of insurance. Some residents own both private and public insurance.
Source: U.S. Census Bureau, American Community Survey, 2015 1-year estimates (Pennsylvania only).

Interstate Comparison

Compared to all other states, Pennsylvania's 2.0 percent insurance premiums tax rate is the median rate. Seventeen states impose a tax rate lower than 2.0 percent; seventeen impose a higher rate; and twelve impose the same rate as Pennsylvania.[31] It is notable that the tax rates imposed by other states vary widely. The lowest rate is 0.4 percent (Illinois), and the highest is 4.265 percent (Hawaii).

Other states tax non-profit hospital plans as follows:

- Exempt in five states: Kentucky, Maryland, New York, Utah and West Virginia.
- Lower than the default premium tax rate in two states: Colorado (variable rate) and Minnesota (1.0 percent).
- Higher than the default premium tax rate in two states: Alaska (6.0 percent) and Arizona (2.0 percent).

The taxation of HMOs is as follows:

- Exempt in five states: Indiana, Iowa, Maryland, Utah and Virginia.
- Lower than the default premium tax rate in two states: Minnesota (1.0 percent) and New Jersey (2.0 percent).
- Higher than the default premium tax rate in three states: Kansas (3.31 percent), Louisiana (5.5 percent) and Tennessee (6.0 percent).

[31] Some states' policies did not readily lend themselves to this count. California imposes a higher rate than Pennsylvania, but exempts all health insurance from tax until June 30, 2019. Louisiana imposes a variable rate based on the amount of premiums. In Oregon, insurance companies are subject to the corporate income tax at 7.6 percent. In Wisconsin, companies are subject to the corporate income tax or franchise tax based on a variable rate.

Sales and Use Tax

The administration's proposal (1) imposes sales and use tax (SUT) on custom computer programming, design and data processing and (2) eliminates current SUT exemptions for commercial storage (excluding farming and transportation services), purchases of catered food by airlines, helicopters, and helicopter and aircraft parts, repair, maintenance or components. The estimates assume that the share of new SUT revenue transferred to the special funds that support public transportation remains unchanged (5.347 percent) and all provisions are effective July 1, 2017.

The estimates also assume that the new taxes are fully passed forward to final consumers and include the behavioral response of consumers (i.e., fewer purchases due to higher prices), as well as a minor non-compliance response from retailers (i.e., not all firms will levy and remit the tax). For sales of custom computer programming and commercial storage services, most purchasers are likely businesses. The taxation of business-to-business sales results in tax pyramiding.[32] Due to higher costs from the tax, it is also possible that some firms may internalize these services to avoid SUT.

Methodology

Custom Programming The estimate for custom programming uses Pennsylvania data for computer systems design and related services (NAICS 5415) and data processing, hosting, and related services (NAICS 51821) from the 2012 Economic Census. Receipts from the 2012 non-employer statistics file published by the U.S. Census Bureau are also included to account for independent contractors, certain sole proprietors and partnerships and other businesses not included in the Economic Census. The newly taxable portion of total receipts is estimated using the 2012 National Income Product Account (NIPA) product lines for Pennsylvania.

Commercial Storage The estimate for commercial storage uses Pennsylvania data for warehousing and storage (NAICS 493) from the 2012 Economic Census. Receipts from the 2012 non-employer statistics file published by the U.S. Census Bureau are also included to account for independent contractors, certain sole proprietors and partnerships and other businesses not included in the Economic Census. The newly taxable portion of total receipts is estimated using the 2012 NIPA product lines for the United States because Pennsylvania NIPA data are unavailable.

Airline Purchases of Catered Food The IFO utilized the administration's forecast for this line item.

Aircraft Sales, Use and Repair The IFO utilized the parts and repair estimates from its publication *Proposed Sales Tax Exemption: Aircraft Sales, Parts and Maintenance and Repair* (January 2013) and is grown by 10 percent to account for helicopter sales, parts and repair.

[32] Tax pyramiding occurs when the same tax is levied at multiple points of the production cycle, passed forward to the next purchaser and compounded until reaching the final consumer.

Revenue Impact

The proposal increases revenues by $500 million in FY 2018-19 (first full-year impact). The estimates in the table represent net amounts after transfers from the General Fund to the special funds that support public transportation.

Table 1.10
Sales and Use Tax Revenues

	Fiscal Years				
	17-18	18-19	19-20	20-21	21-22
Custom Programming	$349	$402	$423	$445	$459
Commercial Storage	79	90	95	100	105
Airline - Catered Food	1	1	1	1	1
Aircraft - Sales, Use and Repair	6	7	7	8	8
Total	**435**	**500**	**526**	**554**	**573**

Note: figures in dollar millions.

Interstate Comparisons

The taxation of custom software often depends on the method of delivery. For custom software that is delivered on tangible personal property, 11 states and the District of Columbia tax the service and 34 states exempt it (including Pennsylvania). For custom software that is delivered electronically, nine states and the District of Columbia tax the service and 36 states exempt it (including Pennsylvania). For storage space, 13 states tax some aspect of the rental of storage space (including Pennsylvania for personal storage), and 33 states exempt storage. For certain states that exempt storage, specific items are subject to tax, such as clothing, automobile or boat storage.

Tax Credits

The administration's proposal converts existing tax credit incentives into a block grant and reduces the total amount of credits that may be allocated. Credit awards would be targeted to programs determined to have the greatest return in terms of business investment, educational access and community development. The administration projects the reduced tax credit allocation will increase revenues by $100 million in FY 2017-18.

The following 19 tax credits totaling $391 million are impacted by the proposal (dollars in millions):

- Educational Improvement Tax Credit - $125.0
- Educational Opportunity Scholarship Tax Credit - $50.0

- Resource Enhancement and Protection Tax Credit - $10.0
- Research and Development Tax Credit - $55.0
- Tax Credit for New Jobs - $10.1
- Neighborhood Assistance Programs - $18.0
- Film Production Tax Credit - $65.0
- Concert Rehearsal and Tour Tax Credit - $4.0
- Video Game Production Tax Credit- $1.0
- Keystone Innovation Zone - $15.0
- Coal Refuse Energy and Reclamation Tax Credit - $10.0
- Manufacturing Tax Credit - $4.0
- Rural Jobs and Investment Tax Credit - $1.0
- Brewers' Tax Credit - $5.0
- Mobile Telecommunications Broadband Investment Tax Credit - $5.0
- Waterfront Development Tax Credit - $1.5
- Community-Based Services Tax Credit - $3.0
- Historic Preservation Incentive Tax Credit - $3.0
- Computer Data Center Equipment Incentive Program - $5.0

Revenue Impact

The IFO reviewed the carryforward and transfer provisions for each of the tax credits affected by the proposal. Most of the programs referenced allow unused credits to be carried forward for a number of years (generally 3 to 15) or to be sold or assigned to other taxpayers. Due to the carryforward and transfer provisions, tax credits that reduce revenues in the current fiscal year were typically issued several years earlier. While it is possible to reduce credit allocations by an amount necessary to generate $100 million in additional revenue for FY 2017-18, almost all of those reductions would need to be associated with the Educational Improvement Tax Credit and the Educational Opportunity Scholarship Tax Credit. Both of these programs require that the credit be used in the same year that the qualifying contribution is made.

Raising the Minimum Wage

The administration's proposal increases the state minimum wage from the federal minimum of $7.25 to $12.00 per hour. The proposal did not specify whether the minimum wage would increase immediately or over several years.[33] In practice, states have phased-in material increases to the minimum wage over several years, and generally do not increase the minimum by more than one dollar in a single year. The parameters used by the analysis assume that the increase would also be phased-in for Pennsylvania in a similar manner. However, in order to maintain simplicity and reduce the number of computations and tabulations in this section, the analysis depicts the proposal as if the $12.00 wage were fully implemented on January 1, 2018. Without a phase-in, the proposal would cause more labor market disruptions compared to the phased-in approach assumed by the analysis. Essentially, the analysis shows a three-year phase-in in a single year. The analysis is best viewed as providing a general estimate of the potential employment, income and revenue implications that would occur over multiple years, and not all at once.

For 2018, Pennsylvania and 20 other states do not require employers to pay a wage that exceeds the federal minimum of $7.25 per hour. (See Table 2.1 on next page.) By contrast, 12 states and the District of Columbia require employers to pay an hourly wage of $10.00 or more. By 2021, seven states and the District of Columbia will require employers to pay an hourly wage of $12.00 or more under current law.

Currently, all surrounding states have a minimum wage that exceeds Pennsylvania by at least $1.00 per hour for 2018, and two states (New York and Maryland) have a minimum wage that is at least $2.00 higher. If Pennsylvania's minimum wage increases to $12.00 per hour in 2018, it would have the highest minimum wage of any state for that year. Only the District of Columbia and certain cities or metro areas (e.g., New York City and Seattle) would require employers to pay a higher hourly minimum wage.

[33] The proposal also did not specify the treatment of tipped workers who receive a minimum wage of $2.83 per hour, and this analysis assumes they remain unaffected.

Table 2.1
Minimum Wage Rates by State

	2018 Rank	2018	2019	2020	2021
District of Columbia	1	$12.50	$13.25	$14.00	$15.00
Washington[1,2]	2	11.50	12.00	13.50	13.86
California[1]	3	11.00	12.00	13.00	14.00
Massachusetts	3	11.00	11.00	11.00	11.00
Arizona[1]	5	10.50	11.00	12.00	12.32
Vermont[2]	5	10.50	10.76	11.04	11.34
New York[1]	7	10.40	11.10	11.80	12.50
Oregon[1]	8	10.25	10.75	11.25	12.00
Colorado[2]	9	10.20	11.10	12.00	12.32
Connecticut	10	10.10	10.10	10.10	10.10
Hawaii	10	10.10	10.10	10.10	10.10
Alaska[2]	12	10.00	10.25	10.52	10.81
Maine[1,2]	12	10.00	11.00	12.00	12.32
Minnesota[2]	14	9.70	9.94	10.20	10.48
Rhode Island	15	9.60	9.60	9.60	9.60
Maryland[1]	16	9.25	10.10	10.10	10.10
Michigan[2]	16	9.25	9.48	9.73	9.99
Nebraska	18	9.00	9.00	9.00	9.00
South Dakota[2]	19	8.83	9.05	9.29	9.54
West Virginia	20	8.75	8.75	8.75	8.75
New Jersey[2]	21	8.62	8.83	9.06	9.31
Arkansas	22	8.50	8.50	8.50	8.50
Nevada[2]	23	8.42	8.63	8.86	9.10
Montana[2]	24	8.32	8.52	8.75	8.99
Ohio[2]	24	8.32	8.52	8.75	8.99
Florida[2]	26	8.27	8.47	8.70	8.93
Delaware	27	8.25	8.25	8.25	8.25
Illinois[1]	27	8.25	8.25	8.25	8.25
Missouri[1,2]	29	7.86	8.05	8.27	8.49
New Mexico[1]	30	7.50	7.50	7.50	7.50
Pennsylvania	31	7.25	7.25	7.25	7.25
Other States	31	7.25	7.25	7.25	7.25

[1] Has one or more local areas in the state with a different minimum wage than the state minimum.
[2] Many states use a local inflation measure to automatically adjust their minimum wage rate on an annual basis. However, states use different methods to make that computation. For this table, all future inflation adjustments use the U.S. CPI-U from IHS Economics.

Source: Economic Policy Institute. Minimum Wage Tracker.

Workers Directly Affected by a Higher Minimum Wage

This analysis uses data from the Merged Outgoing Rotation Group dataset from the 2016 Current Population Survey (CPS). The CPS provides data on the labor force, employment levels, unemployment rates and various demographic characteristics. The monthly survey includes 60,000 U.S. households and is designed so that state-specific observations can be weighted to yield population totals for individual states.

The CPS asks respondents to report their hourly wage or weekly salary, occupation, number of hours worked per week, age, sex and other demographic information. Many hourly-paid workers report compensation that falls below the federal minimum and most are employees who earn tips, such as food servers and bartenders. Employers may pay less than the federal minimum if a tipped worker earns at least $30 per month in tips or commissions and total compensation yields an hourly wage rate of $7.25 or more. For Pennsylvania, such employees can be paid a wage as low as $2.83 per hour.

For 2016, the CPS dataset for Pennsylvania represents 5.69 million workers: 3.52 million had an hourly wage, and 2.17 million were non-hourly workers.[34] The great majority of workers affected by an increase in the minimum wage are hourly-paid workers. However, the analysis includes certain non-hourly paid workers if their computed hourly wage was less than $12.00 per hour.[35]

For 2016, the data reveal that 63,200 workers reported a wage less than $7.25 per hour and were employed in occupations that received tips.[36] The analysis assumes those workers are not affected by the proposal.

[34] Excludes self-employed individuals and workers who were not paid for their labor.

[35] Following the convention used by the U.S. Congressional Budget Office (CBO), the analysis includes non-hourly paid workers who earn an effective hourly wage that is below the proposed $12.00 minimum wage. For respondents who reported weekly earnings instead of an hourly wage, an effective hourly wage was computed as their reported usual earnings per week divided by their reported usual hours worked per week. See "The Effects of a Minimum Wage Increase on Employment and Family Income," CBO (February 2014).

[36] This figure is lower than a recent report issued by the Pennsylvania Department of Labor and Industry because this analysis assumes that workers who reported a wage of $7.00 to $7.24 per hour misreported their wage and actually received the federal minimum. The approach follows the convention used by the CBO study. The adjustment applied to 13,200 workers, and the great majority were employed in occupations that did not receive tips. The analysis also corrected obvious errors in reported hourly wages, such as wage rates that were less than $1 per hour. For those cases, other reported data or an industry-wide average for the occupation were used to determine an hourly wage rate. See "Analysis of the Pennsylvania Minimum Wage," Pennsylvania Department of Labor and Industry (March 2017).

Table 2.2
Workers Directly Affected by a $12.00 Minimum Wage for 2016

	Employees (000s)			
	Part-Time	Full-Time	Total	Impact
Less than $7.25	35.8	27.4	63.2	unaffected
Exactly $7.25	63.1	26.1	89.2	direct
$7.26 to $9.99	339.5	241.2	580.7	direct
$10.00 - $10.99	187.4	249.8	437.2	direct
$11.00 - $11.99	55.6	179.1	234.7	direct
$12.00 - $13.49	114.4	379.3	493.7	unaffected
$13.50 - $14.99	56.0	264.1	320.1	unaffected
$15.00 or more	336.0	3,135.5	3,471.5	unaffected
Total	**1,187.8**	**4,502.5**	**5,690.3**	
Directly-Affected Workers	**645.6**	**696.2**	**1,341.8**	see note

	Employees (000s)			
	Male	Female	Total	Impact
Less than $7.25	25.5	37.7	63.2	unaffected
Exactly $7.25	42.1	47.1	89.2	direct
$7.26 to $9.99	229.2	351.5	580.7	direct
$10.00 - $10.99	171.9	265.3	437.2	direct
$11.00 - $11.99	97.3	137.4	234.7	direct
$12.00 - $13.49	204.1	289.6	493.7	unaffected
$13.50 - $14.99	139.2	180.9	320.1	unaffected
$15.00 or more	1,948.3	1,523.2	3,471.5	unaffected
Total	**2,857.6**	**2,832.7**	**5,690.3**	
Directly-Affected Workers	**540.5**	**801.3**	**1,341.8**	see note

Note: Directly-affected workers include 141,600 workers that likely received tips but reported an hourly wage between $7.25 and $11.99 per hour. It is possible that some portion of those workers would be unaffected by the proposal.

Source: U.S. Census Bureau, Current Population Survey and Merged Outgoing Rotation Group dataset (2016) compiled by the National Bureau of Economic Research.

The analysis defines "directly-affected" workers as those who earn a wage of $7.25 to $11.99 per hour. For 2016, the analysis finds 1.342 million workers who would have been directly affected by a $12.00 minimum wage and a little less than half (48.1 percent) of those individuals were employed on a part-time basis. (See Table 2.2.) Additionally, of the 1.342 million workers impacted, 5.7 percent (76,700) were government workers, 8.8 percent (118,300) worked for non-profit entities and the remainder (85.5 percent, 1.147 million) worked for private entities.

It should be noted that directly-affected workers include workers employed in occupations that received tips, but also reported an hourly wage that is greater than or equal to $7.25 and less than $12.00. For 2016, there were 141,600 workers in occupations such as bartenders (15,000), food servers (52,000), other servers (7,100), hosts (19,200), taxi drivers (11,200) and hairdressers (5,400). It is possible that many would be unaffected by the proposal if their combined wages plus tips at least equal the new minimum wage. These workers are included in the analysis because employers paid them a wage that meets or exceeds the current federal minimum, despite the fact that most received tips. Moreover, other workers (counter attendants) will receive informal tips that are split among all workers during a shift, and that additional tip income is not included in the analysis. The inclusion of these types of workers reflects a broad definition of directly-affected workers. A narrower definition would exclude them.

Many analyses also discuss workers who might be "potentially affected" by a higher minimum wage. Employers may want to maintain wage differentials between certain workers, and may increase wages for those who currently earn somewhat more than $12.00 per hour. In a recent report, the Congressional Budget Office (CBO) called these impacts "ripple effects." For this analysis, workers who earn up to $13.50 per hour could also be impacted by the proposal. For 2016, the CPS data reveal 493,700 such workers in Pennsylvania who could be potentially affected by the increase in the minimum wage. The CBO report notes that "available research suggests that the average effect on the wages of those workers would be positive."[37] A more recent study from the University of Washington finds that workers up to a few dollars above the minimum wage threshold also received hourly wage gains of two to three percent after the Seattle minimum wage was raised.[38] While it is likely that some workers earning more than $12.00 per hour would be affected, those potential gains are not included in this analysis.[39]

Potential Employment Impact of a Higher Minimum Wage

For the analysis of the revenue proposals in the *2016-17 Executive Budget* (April 2016), the Independent Fiscal Office used parameters from a February 2014 CBO study to determine the impact of a higher minimum wage on employment. Based on an extensive survey of academic research, the CBO study used two parameters to estimate how teen and adult employment levels would respond to a higher minimum wage. For teens, the CBO study used an employment elasticity parameter of -0.45, implying that a 10.0 percent increase in the minimum wage would reduce employment levels for teens directly

[37] "The Effects of a Minimum Wage Increase on Employment and Family Income," CBO (February 2014).
[38] "Report on the Impact of Seattle's Minimum Wage Ordinance on Wages, Workers, Jobs and Establishments Through 2015," The Seattle Minimum Wage Study Team, University of Washington (July 2016).
[39] If all workers earning between $12.00 to $13.49 also received an average hourly wage increase of three percent due to the higher minimum wage, then it would imply an extra $340 million of annual wage income for those workers.

affected by 4.5 percent. For adults, the employment elasticity was considerably lower (-0.15). More recent research finds some consensus for an adult employment elasticity of -0.1, and that result is generally consistent with a University of Washington study that examined the recent increase (2015) in the minimum wage from $9.47 to $11.00 for the city of Seattle.[40]

In general, most results from academic studies are only pertinent for relatively moderate increases in the minimum wage. For example, the University of Washington study examined an effective increase in the minimum wage rate of 16 percent. By contrast, the administration's proposal could effectively increase the average wage paid to workers earning under $9.00 per hour by roughly 50 percent.

This analysis assumes that directly-affected workers who receive a relative wage increase consistent with most academic studies have an employment elasticity similar to those studies (-0.1). Those workers currently earn between $10.00 to $10.99 per hour, and would effectively receive an average hourly increase of 16.6 percent. (See Table 2.3.) For workers who earn less, the employment response parameter must be higher because employers would be more sensitive to the larger percentage increase in their hourly wage. Hence, a higher response parameter is used for those workers. Moreover, lower wage workers are disproportionately composed of teenagers, who have a higher (i.e., more sensitive) employment response parameter.

Table 2.3
Projected Impact of Higher Minimum Wage on Employment

	Average Hourly Wage[1]	Percent Increase	Response Parameter	Number Affected (000s)	Higher Wage (000s)	Employment Reduction (000s)
$7.25 to $8.99	$8.02	49.6%	-0.180	395.7	360.4	-35.3
$9.00 to $9.99	9.32	28.8	-0.140	274.2	263.2	-11.0
$10.00 to $10.99	10.29	16.6	-0.100	437.2	429.9	-7.3
$11.00 to $11.99	11.35	5.7	-0.006	234.7	234.6	-0.1
Total Directly Affected				**1,341.8**	**1,288.1**	**-53.7**

[1] Average hourly wages are based on 2016 CPS data, grown by 0.5 percent per annum to account for wage inflation.

Note: The response parameters in this table assume that the higher minimum wage is phased in over multiple years. If the $12.00 minimum wage is not phased in, then the response parameters would be higher and the projected employment reduction would be higher as well.

[40] Neumark, "The Effects of Minimum Wages on Employment," Federal Reserve Bank of San Francisco Economic Newsletter (December 2015).

Table 2.3 projects the impact on directly-affected workers for calendar year 2018, when the proposal is assumed to become effective. For simplicity, the analysis assumes that the number of directly-affected workers in 2018 does not change from the tabulations in Table 2.2 (2016), but the average wage paid to those workers increases slightly. Table 2.3 displays (1) the average hourly wage across the four groups of directly-affected workers, (2) the percentage increase in the average hourly wage, (3) the employment response parameter (or elasticity) used to compute the impact on employment and (4) the projected employment impact. For workers earning between $10.00 to $10.99 per hour, the analysis projects a 16.6 percent increase in the average wage paid and a reduction in employment opportunities of 7,300. The latter figure is equal to the average wage increase (0.166) times the response parameter (-0.1) times the number of workers affected (437,200).

Under the proposed minimum wage, Table 2.3 projects a reduction in employment opportunities of 53,700 (-4.0 percent), and a higher hourly wage paid to 1.288 million workers who retain employment. Assuming that the higher minimum wage is phased-in, any employment reduction would not occur all at once, and would be realized through the failure to fill vacancies or create lower-wage jobs, the release of employees, and a slower rate of hiring compared to a counterfactual scenario where the minimum wage did not increase. These effects may even occur prior to the effective date. Employment would not immediately fall by the amount in Table 2.3 on the date that the higher minimum wage became effective.

Income Effects for Directly-Affected Workers

Table 2.4 displays the potential income effect from a higher minimum wage given the employment response from Table 2.3. For those making an hourly wage between $7.25 and $8.99, the analysis projects that 360,400 workers would retain employment at a wage rate of $12.00 per hour. The higher wage represents an average wage gain of $3.98 per hour ($12.00 - $8.02). The data show that the typical work week for those workers is 27 hours,[41] and the projected income gain across all workers in that group is $2.0 billion (360,400 * 27 hours per week * 52 weeks * $3.98). However, the analysis also assumes an employment reduction of 35,300 for that group, with an average wage of $8.02 per hour. The reduction implies an income loss of $397 million (35,300 * 27 * 52 * $8.02). The net income change for that group equals the difference, or $1.6 billion.[42]

[41] Assumes that part-time workers work an average of 20 hours per week and full-time workers work an average of 40 hours per week.

[42] Some of these workers would receive unemployment compensation, which would offset their income loss. However, that would only occur in the near-term for certain workers who did not retain employment. In the longer-term, the reduction in employment opportunities would simply reflect less hiring, as opposed to the release of current employees. Moreover, many of those in

Table 2.4 provides similar projections for the other three groups of directly-affected workers. Across all workers, the net wage gain is $3.87 billion.[43] However, employers must withhold the employee's share of payroll taxes (7.65 percent) on the additional wage income, yielding a net income gain of $3.57 billion that may be spent. Most workers would be liable for the state income tax (3.07 percent), while some may also incur federal income tax obligations on the additional income.

Table 2.4
Potential Income Impact from a $12.00 Minimum Wage

	Hourly Wage				
	$7.25-$8.99	$9.00-$9.99	$10.00-$10.99	$11.00-$11.99	Total
Receiving a Higher Wage (000s)	360.4	263.2	429.9	234.6	1,288.1
Typical Workweek (hours)[1]	27	29	31	35	30
Average Hourly Wage Gain	$3.98	$2.68	$1.71	$0.65	$2.39
Annual Income Gain ($ millions)	$2,014	$1,064	$1,185	$278	$4,541
Employment Reduction (000s)	-35.3	-11.0	-7.3	-0.1	-53.7
Typical Workweek (hours)	27	29	31	35	30
Average Wage	$8.02	$9.32	$10.29	$11.35	$9.61
Annual Income Loss ($ millions)	-$397	-$155	-$121	-$2	-$675
Total Income Change ($ millions)	$1,617	$909	$1,064	$276	$3,866
Exclude Employee Payroll Tax	$1,493	$839	$983	$255	$3,570

[1] Assumes that part-time workers work an average of 20 hours per week and full-time workers work an average of 40 hours per week.

Other pertinent findings from the analysis are as follows:

- Roughly three-fifths (31,600) of the employment reduction would be realized by part-time workers.
- Female wage earners comprise roughly 60 percent of workers (769,000) who receive a higher wage and the same proportion of projected income gains. Females also comprise the same share of the projected employment reduction.
- The industries most impacted by the $12.00 minimum wage are retail trade (22.4 percent of directly-affected workers), food services and drinking places (13.2 percent), and healthcare services, except hospitals (10.8 percent).

the lowest wage group who do not retain employment would be teenagers with part-time employment, who do not qualify for unemployment compensation. Hence, the analysis does not include an offset from unemployment compensation.

[43] For 2016, total wage income for all Pennsylvania residents was $317 billion.

Potential Implications for General Fund Revenues

Many studies assume that higher minimum wage costs are pushed forward to final consumers, and a smaller portion reduces business profits.[44] Upon enactment, a higher minimum wage resembles an income transfer to lower-wage workers who retain employment from consumers and business owners who are indirectly affected through higher prices and/or lower profits. Non-residents would also absorb a portion of the higher wage cost, such as tourists who would pay higher prices at restaurants or retail outlets.

In order to quantify the potential implications for General Fund revenues, the analysis should first identify the source of the income transfer to lower-wage workers. The exact sources of the transfer cannot be known for certain, and studies have used various assumptions. Many studies assume that the majority of the transfer is attributable to higher prices (which affects all consumers) and a smaller portion from a reduction in business profits (which affects higher-income residents or even non-resident shareholders). This analysis also assumes that most of the wage increase is passed forward to consumers through higher prices (70 percent), while the residual (30 percent) is attributable to lower profits of pass-through entities (partnerships, S corporations and sole proprietors) and corporations.[45] Initially, this income transfer does not change the real size of the state economy, but alters relative prices and the income flows to workers and business owners.

Having determined the source and size of the income gain to lower-wage workers, the analysis considers the potential revenue implications. Consumer survey data suggest that the transfer would yield higher overall spending levels because lower-income workers have a higher propensity to spend any income they receive compared to higher-income consumers and business owners.[46] This differential in the propensity to spend facilitates the higher spending levels identified by most minimum wage studies. Essentially, the income transfer unlocks savings or retains income within the state that may have otherwise flowed out of the state.

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[44] Studies also assume that the higher wage manifests itself through reductions in non-wage benefits and training, business savings through lower turnover costs, changes in employment composition, improvements in efficiency, and wage compression. See "Why Does the Minimum Wage Have No Discernible Effect on Employment?" Center for Economic and Policy Research (February 2013).

[45] In general, if more of the income transfer is attributable to lower corporate profits, then that outcome implies a potentially larger economic impact. That outcome occurs because the corporate profits multiplier (i.e., the increase in GDP from an incremental $1 of profits) is relatively low as corporations (1) retain earnings, (2) remit significant federal and state income tax and (3) pay dividends to higher-income shareholders who have relatively high propensities to save and many reside in other states.

[46] The U.S. Bureau of Labor Statistics publishes data on the spending habits of consumers in the Consumer Expenditure Survey. See http://www.bls.gov/cex/.

Revenue Implications from Initial Income Transfer

Assuming that the real size of the Pennsylvania economy does not change and focusing solely on the transfer of income to lower-income workers, the following factors would impact General Fund revenues:

- The analysis assumes that five percent of the higher wage cost is exported through tourism or exported goods and services. This represents a transfer from non-residents to residents and implies a $5 million gain ($3.6 billion times 5 percent times 3.07 percent) in PIT revenues.
- For Pennsylvania residents, any income transfer from higher to lower-income consumers and workers would be taxed at the same rate. However, the significant increase in the wage rate implies that some portion of income that qualifies for Tax Forgiveness would no longer qualify. Based on tax return data from 2014, the IFO estimates a $15 million reduction in Tax Forgiveness for 2018 and a commensurate gain in PIT revenues.[47]
- The analysis assumes a small net gain to sales and use tax (SUT) revenues ($5 million) from the general transfer of income to lower-wage workers. Spending patterns for lower-wage workers suggest that a slightly higher share of any additional income could be spent on products subject to state sales tax compared to higher-income residents. Moreover, those workers are more likely to spend a greater share of their income in the state.
- Profits of pass-through entities are taxed at the same rate as wage income. Hence, there is no change in PIT revenues due to a trade-off of lower pass-through profits and higher wage income.
- Corporate profits are taxed at a much higher rate (9.99 percent) than wage income (3.07 percent). However, much of the impact could be mitigated by multi-state corporate apportionment factors (i.e., the lower profits do not directly translate to the taxable base on a one-for-one basis). Due to this factor, the analysis includes a modest reduction from lower corporate profits (due to the tax rate differential) of -$10 million.

The net result is a $15 million increase to revenues, mainly due to lower Tax Forgiveness. That estimate does not grow over time if the Tax Forgiveness thresholds are not increased, and would actually decline by a small amount each year.

[47] The simulation used the 2014 Personal Income Tax micro data file for filers who claimed Tax Forgiveness and reported compensation income.

Revenue Implications from Increased Economic Activity

As noted, the proposal should also increase the real size of the Pennsylvania economy because lower-income wage earners are more likely to spend their entire earnings, and even borrow against those amounts. The analysis assumes that lower-income workers would spend all new income, while those indirectly affected through higher prices or lower profits would spend a smaller share of incremental income. The differential between the two groups motivates extra spending and an expansion of the Pennsylvania economy. The expansion of the state economy implies more consumer spending and personal income subject to sales and income tax. The analysis derives the following General Fund revenue impact: (1) a $10 million increase in PIT revenues and (2) a $15 million increase in SUT revenues.

Overall, the projected impact on General Fund revenues from the income gains to lower-wage workers ($15 million, from prior page) and higher economic activity ($25 million) is $40 million. The latter effect may take several years to fully materialize.

Costs/Savings to State Government

During the recent budget hearings (February 2017), several members of the General Assembly requested that the IFO examine the potential cost and savings implications of a higher minimum wage for the state budget. The text that follows provides a limited discussion of those issues. Many of the estimates rely on projections supplied by the Department of Human Services (DHS), and the IFO was not able to review those projections due to time constraints.

Direct State Costs

As of February 17, 2017 the Commonwealth had 377 full-time equivalent employees making less than $12.00 per hour. Those employees are employed in the Executive Offices (144), Department of Conservation and Natural Resources (105) and Department of Revenue (58). The estimated cost to the Commonwealth to bring these employees up to $12.00 per hour would be $1.5 million per annum in salaries, employer pensions and employer payroll taxes.

Indirect State Costs

In addition to direct costs, there are indirect costs from a higher minimum wage that would impact the Commonwealth. Indirect costs include the following:

- various contracts with private entities (e.g., custodial services);
- Medicaid reimbursement rates to certain healthcare providers;
- child care subsidies provided to child care centers and in-home daycare services;
- wages for personal care workers who supply long-term living services; and

- the state share of pension and Social Security costs for affected school district employees.

Certain contracts with private companies In early 2016, the administration issued Executive Order 2016-02, which raised the minimum wage for all state employees and certain employees who receive direct or indirect compensation from the Commonwealth for services provided from $7.25 to $10.15 per hour.[48] At the request of the General Assembly, the IFO reviewed the administration's estimate of the cost of the order and estimated that the overall cost to the state would be roughly $5.0 million for FY 2016-17, including $3.4 million from various contracted services. It is likely that further increasing the minimum wage for those same workers from $10.15 to $12.00 per hour would increase the costs by roughly $5 million. For workers providing contracted services who currently earn between $10.16 and $11.99, the proposal could increase costs by another $5 to $15 million. It is likely that the costs would be realized over several years as contracts were renewed.

Medicaid contracts and reimbursements The Commonwealth's Medical Assistance (MA) program, also known as Medicaid, provides services to enrolled individuals through contracts with managed care organizations (MCOs) and by reimbursements to MA-enrolled healthcare providers under fee-for-service arrangements. An increase in the minimum wage to $12.00 per hour would increase the costs for MCOs and healthcare providers, thus prompting increases to the rates for MCOs and the reimbursement fee schedule under fee-for-service. This would increase costs for MA services by an unknown amount.

Child care subsidy Child Care Works is the Commonwealth's child care subsidy program administered by the Department of Human Services (DHS). The program has an income limit of 200 percent of the federal poverty level (FPL) and work requirements. Child Care Works subsidizes part of the cost of child care, with the parent or guardian contributing a co-pay based on their income level. The child care provider, typically an organization or an individual, receives a subsidy to care for the child or children. DHS estimates that 40 percent of children enrolled in child care statewide receive subsidies for those services. In Pennsylvania, the median wage for a child care worker is $10.13.[49] An increase in the minimum wage to $12.00 will increase costs for child care organizations, requiring a larger subsidy from DHS to keep subsidized children in child care programs. If the subsidies are not raised, child care organizations may accept fewer subsidized children to offset higher costs. DHS estimates that the proposed increase in

[48] The $10.15 wage rate went into effect on July 1, 2016 for certain employees who receive direct or indirect compensation from the Commonwealth for services provided and increases annually with inflation. On July 1, 2017, the wage will increase to $10.20 per hour. See "Executive Order: 2016-02 – Minimum Wage for Employees of the Commonwealth and of Organizations Receiving State Contracts," (March 2016). https://www.governor.pa.gov/executive_orders/executive-order-2016-02-minimum-wage-for-employees-of-the-commonwealth-and-of-organizations-receiving-state-contracts/ and "The Pennsylvania Bulletin," Doc. No 17-454. (March 2017). http://www.pabulletin.com/secure/data/vol47/47-10/454.html.

[49] DHS. "Increase in the Minimum Wage to $12 on Eligibility/Savings for TANF, SNAP, MA and Child Care," Provided by DHS via e-mail on March 20, 2017.

the minimum wage would increase state costs for this program by $87.8 million per annum in order to provide the same level of services.[50]

Long-Term Living Waiver Programs The Long-Term Living Waiver programs provide nursing home care and community-based services to seniors and persons with disabilities. DHS estimates that individuals in community-based programs receive an average 5.2 hours of personal care per person each day.[51] There are approximately 60,000 individuals who receive these services on the waiver programs in the state. The DHS analysis assumes that median wage for personal care workers in Pennsylvania is $10.28.[52] DHS estimates that the proposed increase in the minimum wage would increase state costs for this program by $96.0 million per annum.[53]

Higher state share of school districts' pension and Social Security costs The state's General Fund reimburses a portion of school districts' pension and Social Security costs. Hence, any increase in district salaries will directly impact General Fund expenses. Unfortunately, while the Pennsylvania Department of Education (PDE) has detailed data on the salaries of professional personnel (teachers, administrators, etc.), it only has summary level data on public school support personnel (instructional aides, school administration support staff, library/media support staff, etc.). For professional personnel, it appears that very few, if any, have hourly wages below $12.00 per hour. While some of the public school support personnel may be earning below $12.00 per hour, it is likely that a relatively small portion earn significantly less than that amount. Therefore, the state share of the increase in pension and Social Security costs for these employees should be modest.

State Savings

A higher minimum wage would also reduce state expenditures because lower-income individuals making a higher income would "graduate" out of various programs designated to assist low-income individuals and their families. These programs are often collectively referred to as safety net programs and include parts of Medical Assistance (MA), Children Health Insurance Program (CHIP) and Child Care Works. In addition, there are other primarily federally funded safety net programs such as Temporary Assistance for Needy Families (TANF), Low-Income Home Energy Assistance Program (LIHEAP) and Supplemental Nutrition Assistance Program (SNAP). These programs would also realize savings, but those amounts are not discussed in the following subsections because the amounts represent federal savings.

Medical Assistance (MA) The Commonwealth administers MA, which provides healthcare for low-income and other eligible adults. Medical services include physical and mental healthcare and substance abuse services. Individuals can qualify for MA

[50] *Ibid.*
[51] *Ibid.*
[52] *Ibid.*
[53] *Ibid.*

based on a financial or needs basis. A large segment of those on MA qualify on a financial basis. In Pennsylvania, those who have incomes up to 138 percent of the FPL are eligible for MA services. Therefore, individuals who earn up to $16,642 a year are eligible for the expanded MA coverage in Pennsylvania. An individual working full-time, earning the current minimum wage would earn $15,080 annually and qualify for MA. If the minimum wage increased to $12.00 per hour, an individual working full-time would earn $24,960 annually and would no longer financially qualify for MA. DHS estimates that an increase in the minimum wage to $12.00 would reduce the number of individuals eligible for MA by 111,600.[54,55] DHS estimates that the reduction in eligible individuals would save the state $231.7 million.[56] These savings appear reasonable given the size and scale of MA services and comprise the bulk of savings for state safety net programs.

Children Health Insurance Program (CHIP) This program provides free or low cost health insurance for all uninsured children who are not eligible for or enrolled in MA. Free CHIP coverage is available for children living in families with incomes less than or equal to 208 percent of the FPL.[57] To qualify for Low Cost coverage, a family's total income must be less than 314 percent of the FPL and not be eligible for Medicaid coverage. A little less than 90 percent of CHIP's total costs are funded by the federal government.

A minimum wage increase to $12.00 would move some children from Free CHIP coverage to the Low Cost coverage. Some families at the Low Cost subsidized level may be moved to the At Cost (unsubsidized) CHIP coverage. While savings are expected from children moving onto the Low Cost or At Cost coverage, some families may reach the income limit for MA and move onto Free CHIP coverage. The federal matching rate for CHIP is higher than the standard MA matching rate, so the state should realize savings that cannot be quantified at this time.

Child Care Works While it is likely that the subsidies for child care would need to increase to allow providers to raise wages in response to the higher minimum wage, increasing the minimum wage would also result in many families no longer qualifying for the subsidies. For a family of three, 200 percent of the FPL would be $40,840. Two adults both working full-time at the current minimum wage would earn $30,160 annually. Under the proposed minimum wage, they would earn a total of $49,920 annually. DHS estimates that there would be 14,242 families that lose eligibility due to the proposed increase in the minimum wage.[58] However, due to waiting lists, it is possible that many families that no longer qualify could be replaced by those on the list.

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[54] *Ibid.*
[55] As of January 2017, there were 2.9 million Pennsylvanians enrolled in MA.
[56] *Supra* note 49.
[57] It excludes those eligible for Medicaid. For children under age 5 the upper limit for Medicaid eligibility is 157 percent of FPL. For children ages 6 through 18, the upper limit for Medicaid eligibility is 133 percent of FPL.
[58] *Supra* note 49.

Costs/Savings to Other Stakeholders

Non-Profit Entities

The 2016 CPS data report that there are approximately 632,800 non-profit employees in Pennsylvania. About one-quarter of non-profit workers were part-time, while three-quarters were full-time workers. There are approximately 118,300 non-profit employees making between $7.25 to $12.00 per hour (19 percent of all non-profit employees) and roughly half are full-time employees and half are part-time employees.

The expected net salary gains for non-profit employees is $331 million under the proposed minimum wage. Along with salary gains, payroll taxes would add $25 million to employer costs. The increase in costs for non-profits may be offset by larger grants, donations or government subsidies, or may result in a reduction in services. Non-profits may also rely more heavily on volunteers instead of paid staff to reduce costs. However, certain non-profits might also see reduced demand for services targeted to low-income individuals and families, such as food pantries.

For-Profit Entities

Similar to employees, employers would need to remit the employer's share of payroll taxes (7.65 percent) on the wage gains of directly-affected workers. Excluding non-profits and governments, the employer's share would total $265 million (based on Table 2.4). Other factors should offset some of those costs. Firms paying a higher wage should experience lower employee turnover and retain workers who are more productive. Moreover, workers may raise their productivity levels in response to the higher wage.

Local Governments Including School Districts

The 2016 CPS data show 22,700 full-time and 15,700 part-time workers employed by local governments (includes school districts and public colleges and universities) who reported earning between $7.25 and $12.00 per hour. If all directly-affected workers retained employment, then the increase in the minimum wage would increase salary costs (excluding employer payroll taxes) to local governments by $107 million. Payroll taxes would further increase employer costs by $8 million. It is unclear how much pension and retirement benefit costs would increase because municipal governments, public colleges and universities have separate retirement plans. A reasonable assumption is that employer costs for pension and retirement benefits could further increase wage costs by 10 to 25 percent.

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Lottery Fund

The administration's proposal includes sales of lottery products through the launch of lottery sales on the internet and on mobile devices, enactment of Interactive Lottery (I-Lottery) and Lottery Fund margin relief.[59] Enhanced revenues related to these initiatives would impact the Lottery Fund.

Revenue Impact

Limited details were available regarding the administration's lottery proposals and specific revenue estimates were not provided for most proposals. To evaluate the potential impact of lottery expansion or enhancement, the IFO reviewed the I-Lottery experience of other states and computed a per capita total lottery sales figure (i.e., the saturation rate) for Pennsylvania and surrounding states. (See Table 3.2.)

The administration's I-Lottery projections appear in Table 3.1 and assume an I-Lottery launch on October 1, 2017. (Estimates for the remaining proposals were not provided.) Based on Michigan's limited experience with interactive lottery (see Table 3.3), the administration's projections appear to be within a reasonable range of outcomes. It should be noted that the analysis does not consider any potential cannibalization of current game sales, particularly Fast Play and instant tickets.

Table 3.1
Lottery Fund Impact

	Fiscal Years				
	17-18	18-19	19-20	20-21	21-22
I-Lottery Total	$19	$31	$37	$45	$43

Note: figures in dollar millions.
Source: The Pennsylvania Lottery Commission.

[59] Margin relief is relief from the Act 201 of 2014 requirement that the lottery return 25 percent in net profits for programs that benefit older Pennsylvanians. The net profit percentage for FY 2015-16 was 27.12 percent, but has been trending downward.

Interstate Comparison

Fifteen comparison states with established lottery systems were identified for the purpose of this analysis and a per capita sales figure was computed for each state.[60] This metric is often used to measure the market saturation of state lottery systems to determine the potential for increased sales within the respective market.

Table 3.2 displays per capita sales and related performance metrics for each state. Total sales exclude Keno and video lottery terminal (VLT) gaming, which are unique to certain states. For the purpose of this comparison, "profit margin" represents the total operating income (excluding Keno and VLTs) reported on each state's financial statement divided by total sales. The profit margin is a function of the mix of lottery games offered in each state, payout rates, mandated minimum returns and efficiency of operations.

An interstate comparison of total lottery sales reveals:

- Pennsylvania recorded the 6th highest profit margin.
- The inclusion of other lottery games and products such as Keno does not alter Pennsylvania's relative ranking in terms of profit margins.
- Massachusetts and Georgia have the highest per capita sales due to the large volume of instant ticket sales and higher payouts.
- Pennsylvania per capita sales ($409) and profit margin (27 percent) are both mid-range.
- New York and New Jersey rank higher in profit margin because they have a lower payout ratio. New York and New Jersey's prizes comprise roughly 60 percent of total sales, whereas Pennsylvania's payout ratio is closer to 64 percent.

[60] The computation only includes residents age 18 or older who can legally purchase lottery products.

Table 3.2
FY 2016 State Lottery Sales and Profits

	Total Sales[1]	Operating Income[1]	Profit Margin	Rank	Per Capita Total Sales[1,2]	Per Capita Rank
Massachusetts	$4,329	$989	18.9%	13	$797	1
Georgia	4,363	1,097	24.1%	11	559	2
New York	7,674	2,365	30.7%	2	493	3
New Jersey	3,290	1,024	31.1%	1	473	4
Pennsylvania	**4,135**	**1,120**	**27.1%**	**6**	**409**	**5**
Connecticut	1,144	323	28.2%	5	405	6
Maryland	1,594	308	16.1%	14	341	7
Michigan	2,480	884	28.5%	4	321	8
Tennessee	1,627	394	24.2%	10	316	9
Virginia	2,007	587	29.3%	3	307	10
North Carolina	2,384	636	26.7%	7	304	11
Ohio	2,693	793	25.9%	8	299	12
Kentucky	984	253	25.7%	9	287	13
Delaware	150	21	13.7%	15	200	14
West Virginia	184	42	22.2%	12	126	15

Note: Unless otherwise noted, figures in dollar millions.
[1] Excludes Keno and VLT gaming revenues.
[2] In actual dollars.
[3] Connecticut and Delaware are 2015 figures.
Source: Comprehensive Annual Financial Reports for various states. Populations data are from the U.S. Census Bureau and include residents age 18 or older.

Many states are also considering the expansion of lottery games to an online, interactive platform commonly referred to as I-Lottery. Demographic trends suggest that the average age of adults who regularly play lottery games is increasing, and an online option would help expand lottery play to a younger market. While many states have considered this option, few have taken action. Michigan launched their interactive lottery platform in 2014, followed by Kentucky in 2016. Some states, such as Massachusetts, are currently in the process of passing legislation to legalize I-Lottery play.

Michigan is the only state with sufficient data to provide an effective interactive lottery comparison, and Table 3.3 compares the three-year Michigan experience with the Pennsylvania projections. Although Michigan has experienced sales growth, higher prize payouts have slightly eroded profit margin. Pennsylvania anticipates lower sales in the first three years of I-Lottery, likely the result of lower prize payouts, which yields a higher profit margin. Michigan's approach emphasizes sales volume and higher payouts, while Pennsylvania relies on higher margins from lower sales to generate roughly the same profit in terms of total dollars. Relative to the personal income and population of each state (Pennsylvania is roughly one-third larger than Michigan), the projections appear reasonable in the short term.

Table 3.3
I-Lottery Comparison

Michigan Actuals	2014: Year 1	2015: Year 2	2016: Year 3
Sales	$4	$146	$385
Less: Prizes	$3	$128	$337
Net Profit	**$1**	**$19**	**$48**
Profit Margin	14%	13%	12%
Personal Income ($ billions)			$446
Population (millions)			7.7
Pennsylvania Projections	**2017: Year 1**	**2018: Year 2**	**2019: Year 3**
Sales	$86	$140	$191
Less: Prizes	$56	$91	$130
Net Profit	**$30**	**$49**	**$61**
Profit Margin	35%	35%	32%
Personal Income ($ billions)			$667
Population (millions)			10.1

Note: figures in dollar millions.

Source: Michigan Comprehensive Financial Annual Report FY 2016. Personal income from the U.S. Bureau of Economic Analysis is for 2016. Population data from the U.S. Census Bureau are for 2016 and only include residents age 18 or older.