Cleveland Tax Benchmarking Analysis

Prepared by EY Quantitative Economics & Statistics (QUEST) for the Greater Cleveland Partnership

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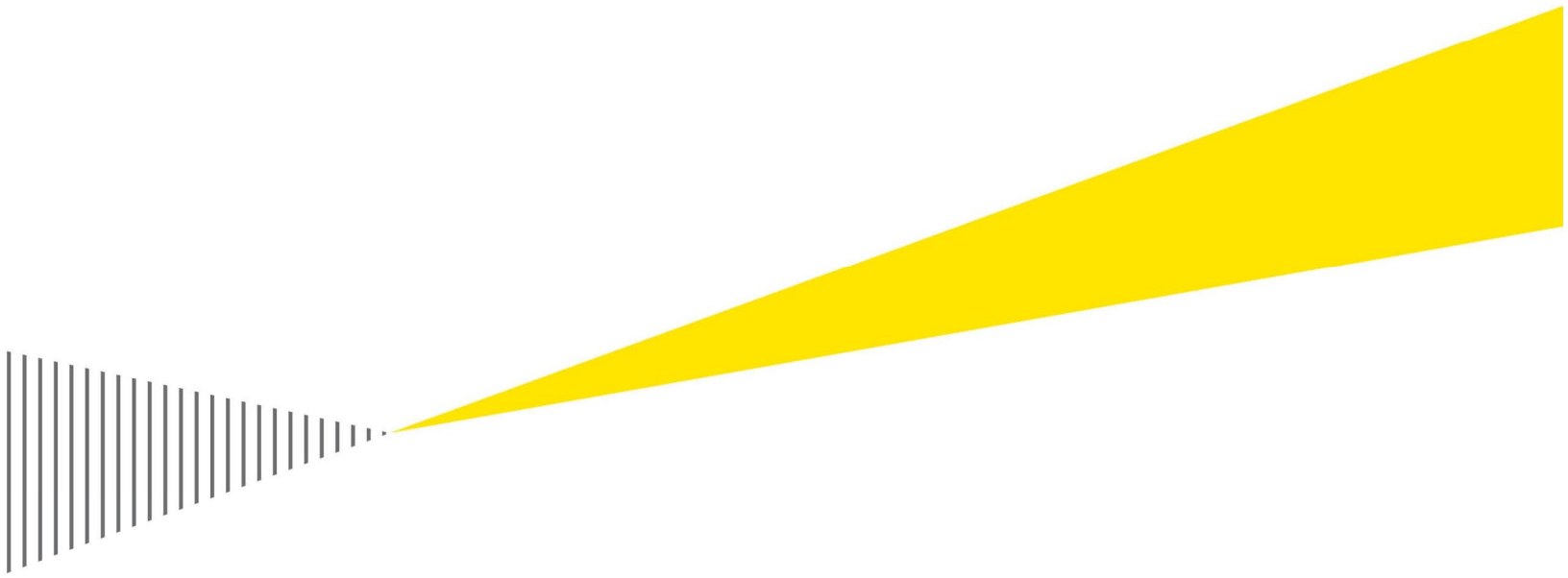

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Contents

Executive summary

EY was commissioned by the Greater Cleveland Partnership to analyze Cleveland's tax climate as compared with other benchmark cities.

Cleveland's tax structure is characterized by local tax burdens that are generally higher than other regional cities with comparable economies. However, these higher local tax burdens are, in some cases, offset by a generally competitive state tax system. For corporations, Ohio's state tax system provides a generally competitive tax environment due to its substitution of a low-rate gross receipts tax for a traditional tax on apportioned corporate net income. For pass-through businesses, Cleveland's overall tax burden is marginally higher than benchmark cities examined in this analysis which include Columbus, Cincinnati, Pittsburgh, Detroit, Buffalo, Indianapolis, Milwaukee, Nashville, Saint Louis, and Kansas City. For households, Cleveland's combined state and local tax system imposes an overall tax burden that is higher than the benchmark-city average for most types of households, characterized by relatively high local tax collections and competitive state taxes.

Overall level of tax collections. When measured in terms of aggregate tax collections, the level of tax burden in Cleveland is higher than benchmark cities. Specifically:

- **Cleveland's state and local tax collections are higher than benchmark cities.** On a per capita basis, Cleveland's tax collections ($5,426) are 13% higher than the average of the benchmark cities included in the analysis ($4,794).
- **State taxes are competitive, but local taxes are not.** At the state level, Ohio's taxes are relatively competitive with peer states, with per capita taxes of $2,469, or 7% lower than the $2,646 benchmark city average per capita tax burden. In contrast, Cleveland's local taxes averaging $2,958 per capita are 38% higher than the $2,148 average per capita tax collections in the benchmark cities.
- **Local property and local income tax account for most of the Cleveland's higher tax burden.** On a per capita basis, Cleveland's taxes are $809 higher than the benchmark cities, of which approximately 93% is driven by differences in local property and local income taxes.
- **Cleveland's taxes are increasing more rapidly than peer cities.** From FY2015-FY2017, Cleveland's city taxes increased 24%, as compared with 6% in the peer cities. This increase was largely due to an increase in the individual income tax rate from 2.0% to 2.5%. Additionally, county taxes in Cuyahoga County increased 6.5% compared to peer cities' county tax increase of 3.1%.

Tax burden for small (pass-through) businesses. Cleveland's business taxes are 6% higher than the taxes imposed by benchmark cities for small businesses organized as pass-through entities who are not subject to corporate tax in most states.

- **Ohio's Commercial Activity Tax imposes an additional burden for pass-through businesses compared with most states.** Non-corporate entities are subject to the tax in Ohio, while in the benchmark states, non-corporate entities do not incur significant amounts of state business entity tax.

- **Ohio's state individual income tax provides a benefit for small businesses which is diminished by higher local taxes.** While Ohio's individual income tax deduction for the first $250,000 of business provides a benefit, this advantage is diminished by Cleveland's local income tax rate which is 1.1 percentage points higher (78%) than the benchmark average.

Tax burden for corporate businesses. For corporate investors contemplating a new or expanded business location, Cleveland presents a relatively competitive tax climate, primarily driven by competitive state-level business entity taxes.

- **For corporations, Cleveland's state and local business tax burden is below the benchmark city average for 4 of 8 industries analyzed.** Using a discounted cash flow modeling approach for eight industries, Cleveland's overall business tax burden is estimated to be 7.9% as compared with 8.3% for the benchmark cities.

- **Cleveland's state-level business taxes for corporations are among the lowest in the benchmark cities for corporations.** The Ohio Commercial Activity Tax (CAT) provides the lowest business entity tax for corporations among the states included in the analysis. At a 0.26% rate on gross receipts, the CAT is roughly equivalent to a 2.6% corporate net income tax for companies with a 10% profit margin – as compared with an average corporate tax rate of 6.8% for the other states included in the benchmark set. While the state sales tax burden is close to average, the overall state tax burden on business remains competitive for every industry. Overall, these factors contribute to an average total state and local burden for Cleveland businesses organized as corporations that is lower the benchmark city average.

Household tax burden. Cleveland's household tax burden exceeds the burden imposed by benchmark cities for seven of the nine household types included in the analysis. However, these burdens vary significantly with the characteristics of the household.

- **Cleveland's tax burden for households owning homes is higher than the benchmark city average.** Due to Cleveland's relatively high property tax rate, the tax burden for home owners in Cleveland averages 15% more than benchmark cities.

- **Retiree households in Cleveland with pension income face significantly higher taxes than benchmark cities.** Ohio taxes pension income under the state individual income tax, in contrast to most states in the set of benchmark cities. Given the lower incomes but higher asset values (including homes) of retired households, Cleveland's higher property tax rates contribute to higher tax burdens for retired households as compared with benchmark cities. For a married household earning $50,000 of pension

income and owning a home, Cleveland's combined state and local tax rate is 55% higher than the benchmark city average.

- **Cleveland households with business income benefit from Ohio's pass-through income deduction.** Because Ohio exempts the first $250,000 of pass-through business income, households with such income typically face lower overall tax burdens in Cleveland as compared with the benchmark cities. For a married household earning $200,000 of business income, owning a home and car, with two children, Cleveland's overall state and local tax burden is 12% lower than the benchmark city average.

1. Introduction and overview

EY was commissioned by the Greater Cleveland Partnership to analyze Cleveland's tax climate as compared with other benchmark cities.

This report presents the findings of that analysis in four sections. In the first section of the report, the background for the selection of the benchmark cities is presented and the cities are compared in terms of basic economic metrics.

The second section of the analysis compares aggregate tax collection data across the cities for various types of taxes, on a per capita basis. The objective of this second section is to provide a broad overview of the level of aggregate tax burden, without differentiating between business and household taxpayers or sub-categories of business or household types. While this type of analysis provides a broad view of the level of tax in each jurisdiction, it does not provide insight into the tax system characteristics that result in differences in tax burden across the cities or types of tax.

The third and fourth sections provide these additional insights. The third section of the report describes the relative competitiveness of Cleveland's tax system for representative firms across various sectors, using a financial modeling approach to show the impact of state and local taxes on investor rates of return on a new investment, similar to the approach a sophisticated business would use when deciding where to locate a new facility. The fourth section provides a similar representative taxpayer modeling approach for households, to show the variation in tax burden across household types as well as the key policy factors that influence the result.

1.1 Selecting benchmarking jurisdictions

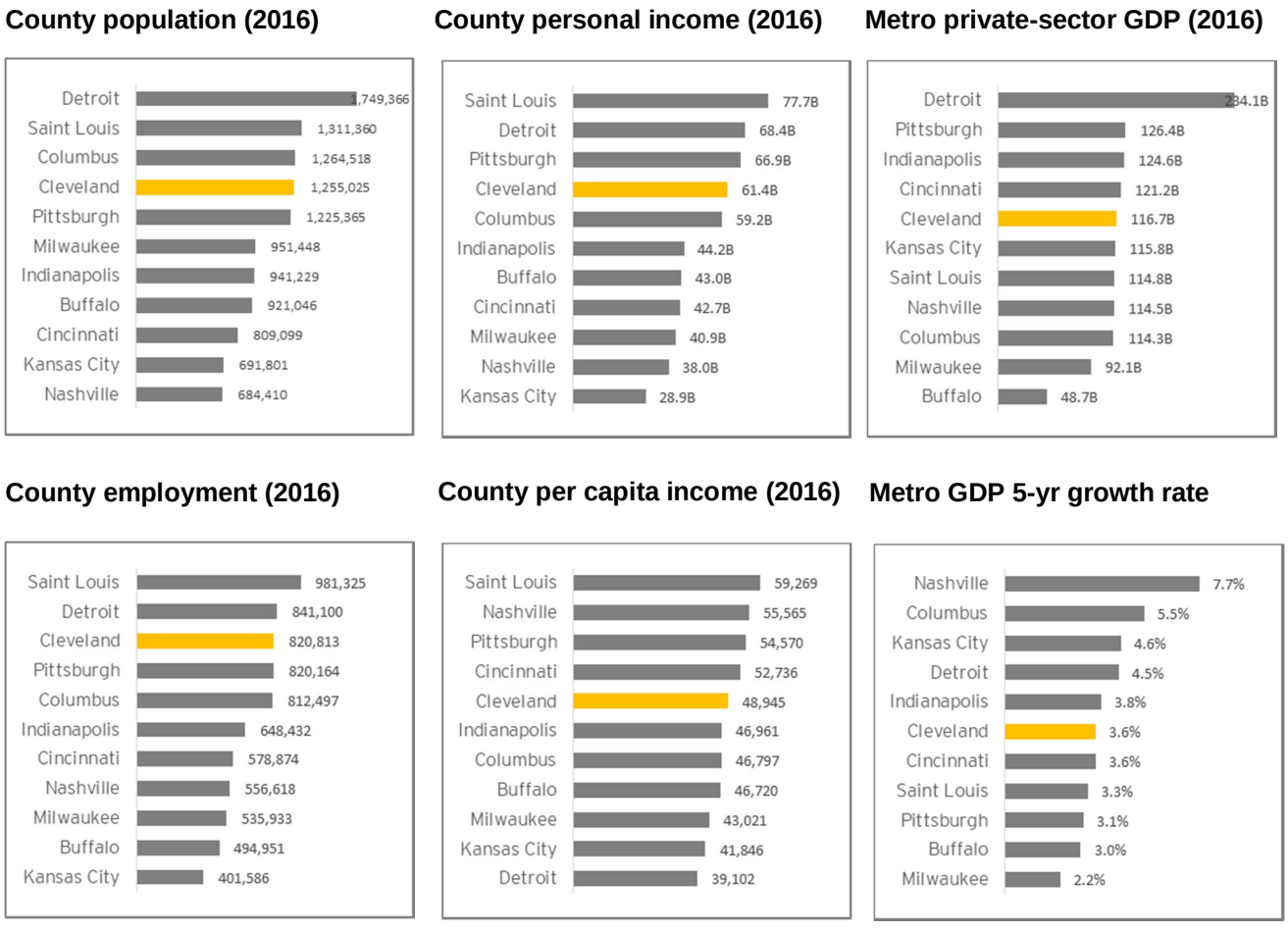
The first step in the benchmarking analysis is the selection of comparable jurisdictions with which to compare Cleveland's tax climate. To select benchmark cities, several factors were considered. Benchmark cities were considered based on several factors including:

- **Geography** – cities that are proximate to Cleveland are preferred due to these cities being more likely to compete with Cleveland for new business investment and employment as well as more likely to attract relocating residents. The majority of the cities selected are within 250 miles of Cleveland with the farthest city being Kanas City at 800 miles from Cleveland.
- **Population and employment** – Cleveland is among the largest cities in the group of benchmark cities as measured by population and employment. Note that these metrics are measured for the county geographic areas for the largest county in the metro area of each city. E.g. population and employment for Cleveland are measured for the Cuyahoga county area and compared against similar largest county-area measures for other cities.
- **Private-sector GDP personal income** – These metrics describe the scale of the economy and prosperity in each city. Private-sector GDP reflects the value of products and services produced by businesses in each city while personal income reflects the earnings of local residents from employment as well as investments. Cleveland is among

the middle tier of cities in terms of aggregate private-sector GDP and personal income, indicating that in terms of the scale of the economies in each metro area, the benchmark set represents a reasonable set of cities with which to compare Cleveland. Measured on a per capita basis, Cleveland's level of personal income is also in the middle tier of the benchmark cities, indicating that Cleveland residents have approximately the same level of prosperity as their counterparts in each of the other cities included in the analysis, which is an important consideration given the regressivity of most state and local tax systems which impose a greater tax burden relative to income for lower income residents.

- **GDP growth rate** – The growth rate of GDP is a broad measure of the changing competitiveness of each city. High GDP growth rates, such as that of Nashville (8.0%) or Columbus (5.5%) suggest that businesses in these cities are expanding rapidly and relocating businesses are favoring these cities as a place to do business. Low GDP growth rates, such as Milwaukee (2.6%) or Buffalo (3.0%) may suggest these cities have unfavorable business conditions or a low quality of life.

Figure 1. Metrics used to select benchmark cities



Cleveland's tax profile

2.1 Current tax types and rates

Cleveland's tax system includes a relatively typical mix of major taxes by tax type, which are presented in Table 1 and compared with the other cities. Both state and local taxes are presented and compared throughout this analysis due to state-to-state differences in the way governments are structured, services are provided, and taxes are collected. For instance, one of the large differences between states is the state vs local responsibility for education funding, which impacts the level of taxes levied at the state vs local levels of government such that in states with strong state funding for local educational expenditures, local taxes will often be lower than in other states. These differences across states suggest that comparing state and local taxes together is the most appropriate approach to identify significant differences in the level of taxation.

State individual income taxes - At the state level, Ohio's individual income taxes are levied using a progressive rate schedule with a top marginal tax rate on a broad measures of income that is 4th lowest among the peer set. Of the peer set, only four states use a flat income tax rate. Among those states with a progressive tax rate schedule, Ohio is more progressive than Missouri, but less progressive than New York. Ohio's top marginal tax rate of 4.997% applies at $213,350 of income. Ohio's federal individual income tax starting point (adjusted gross income) is commonly used across many states, and is the typical starting point in the peer states. Two noteworthy exceptions are Tennessee, which taxes only interest and dividend income, and Pennsylvania, which taxes a typical range of income categories (including investment and earned wage income) but does not start its income tax calculation with a federal tax return concept.

State business entity taxes – All peer states except Ohio rely on a traditional corporate income tax to tax business entities. The majority of these states (except Missouri and Tennessee) determine corporate income subject to tax in the state using single sales-factor apportionment, which sets the share of a taxpayer's nationwide income subject to tax in a state equal to the share of the taxpayer's nationwide sales that occurred in the state. Tennessee and Missouri, by comparison, use a three-factor apportionment approach which sets the share of income subject to tax in a state equal to the weighted average of the company's payroll, property, and sales in the state. In both Tennessee and Missouri, companies double-weight the sales factor. Additionally, in Missouri, certain taxpayers have the option to use single sales-factor apportionment. Ohio, by contrast, relies on the Commercial Activity Tax (CAT), a gross receipts tax which is levied at 0.26% of gross receipts apportioned on a destination sales basis – similar to the single sales-factor apportionment approach used in many states' corporate income taxes.

The CAT is an important feature of Ohio's business tax structure. While it is not entirely unique in the United States, it is uncommon – with only Texas, Washington State, and Nevada imposing gross receipts or modified gross income taxes. Typical criticisms of the CAT and gross receipts taxes include that they result in tax pyramiding and that the tax does not consider the taxpayer's ability to pay. Tax pyramiding results from tax being imposed on business input transactions that occur as a good moves through multiple stages of production, with tax being imposed on each transaction. Another common criticism of the CAT and other gross receipts tax is that since they

are based on gross receipts, they do not vary with the taxpayer's ability to pay, commonly measured by net income. As a result, gross receipts taxes may impose very significant effective tax rates on net income for low-margin businesses (and infinite tax rates on profit for loss-making companies).

Table 1. Comparison of key tax characteristics of Cleveland and comparison cities

State Level		NY	OH	OH	OH	MI	IN	MO	WI	TN	PA	MO
Individual Income Tax	Top Rate	8.820%	4.997%	4.997%	4.997%	4.250%	3.230%	6.000%	7.650%	4.000%	3.070%	5.900%
	Rate structure	Progressive	Progressive	Progressive	Progressive	Flat Rate	Flat Rate	Progressive	Progressive	Flat Rate	Flat rate	Progressive
	Income starting point	AGI	AGI	AGI	AGI	AGI	AGI	AGI	AGI	On interest & dividends only	State does not employ a federal starting point	AGI
Business Entity Tax	Top Rate	6.500%	0.260%	0.260%	0.260%	6.000%	5.750%	6.250%	7.900%	6.500%	9.990%	6.250%
	Apportionment	Single sales factor formula.	Sales	Sales	Sales	Single sales factor formula.	Single sales factor formula.	Single-factor formula*	Single sales factor formula.	3-factor formula.	Single sales factor formula.	3-factor formula or single-factor formula.
Sales Tax	Top Rate	4.000%	5.750%	5.750%	5.750%	6.000%	7.000%	4.225%	5.000%	7.000%	6.000%	4.225%
	% of services subject to SUT	36%	49%	49%	49%	15%	20%	14%	47%	43%	38%	14%
Franchise Tax	Top Rate	0.00%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
City Level		Buffalo	Cincinnati	Cleveland	Columbus	Detroit	Indianapolis	Kansas City	Milwaukee	Nashville	Pittsburgh	Saint Louis
Individual Income Tax	Top Rate	0.00%	2.10%	2.50%	2.50%	2.40%	2.02%	1.00%	0.00%	0.00%	3.00%	1.00%
	Tax Base	NA	Income	Income	Income	Income	Income	Income	NA	NA	Income	Income
Sales Tax	Avg. Rate within County	4.75%	1.25%	2.25%	1.75%	0%	0%	3.72%	0.60%	2.25%	1.00%	4.61%
Property Tax	Real Commercial ETR	1.80%	3.27%	3.55%	2.87%	4.34%	2.46%	2.75%	2.73%	1.26%	2.29%	2.27%
	Real Residential ETR	1.73%	2.47%	2.84%	2.09%	3.44%	1.36%	1.49%	2.73%	0.79%	2.01%	1.60%
	Is industrial personal property taxable?	No	No	No	No	No	Yes	No	Yes	Yes	No	No
	Is intangible pers. property taxable?	NA	No	No	No	No	No	No	No	Yes	Yes	No

Local income tax. Cleveland's local individual income tax is the second-highest in the peer set, although eight of the eleven cities in the analysis levy such a tax. Cleveland is also not unique in levying both a municipal income tax that includes business and wage income. Of the benchmark cities, 7 of the 10 benchmark cities levy such a tax.

Sales tax. Ohio's 5.75% state sales tax is levied at rate that is relatively close to the 5.4% average state sales tax rate among the peer set. At the local level, Cleveland's 2.25% local sales tax rate is 4th highest in the peer set, with two jurisdictions having no local sales tax. While Cleveland's state and local sales tax rate is roughly in-line with the peer set (8% combined state and local rate compared to 7.5% peer set), Ohio's 86 services subject to tax is well above the 61 average number of services subject to sales tax across all US states.

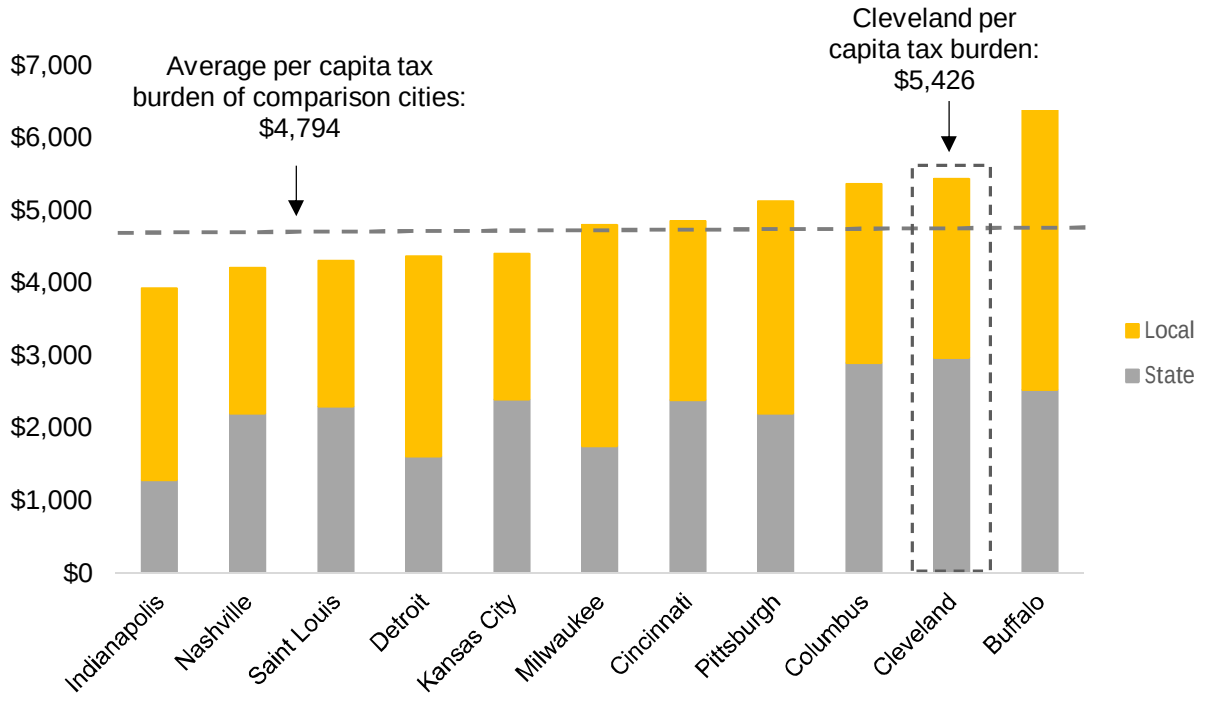
Property tax. Cleveland's effective tax rate on real commercial and industrial property of 3.55% is the second highest, only after Detroit (4.34%). Personal property is exempt from the property tax in Ohio, as well as in Missouri, New York, and Pennsylvania. Industrial personal property is additionally exempt in Michigan.

2.2 Cleveland tax collections compared with benchmark cities

The state and local tax systems in place in the cities included in this analysis reflect a mix of taxes on income, sales, property, and other tax bases which are incomparable based on statutory rates given the diversity of the items subject to tax and the other tax system characteristics that influence the level of tax liabilities. This section compares Cleveland to other cities based on the tax revenues that were collected in a recent year, using US Census Bureau data describing tax collections.

Figure 2 shows a comparison of Cleveland's per capita tax burden for all state and local taxes with other cities in the benchmark set. At $5,426 of taxes collected by Cleveland's local and state governments in 2016, per capita taxes in Cleveland are the second highest in the group, second only to Buffalo, and 13% higher than the overall benchmark average.

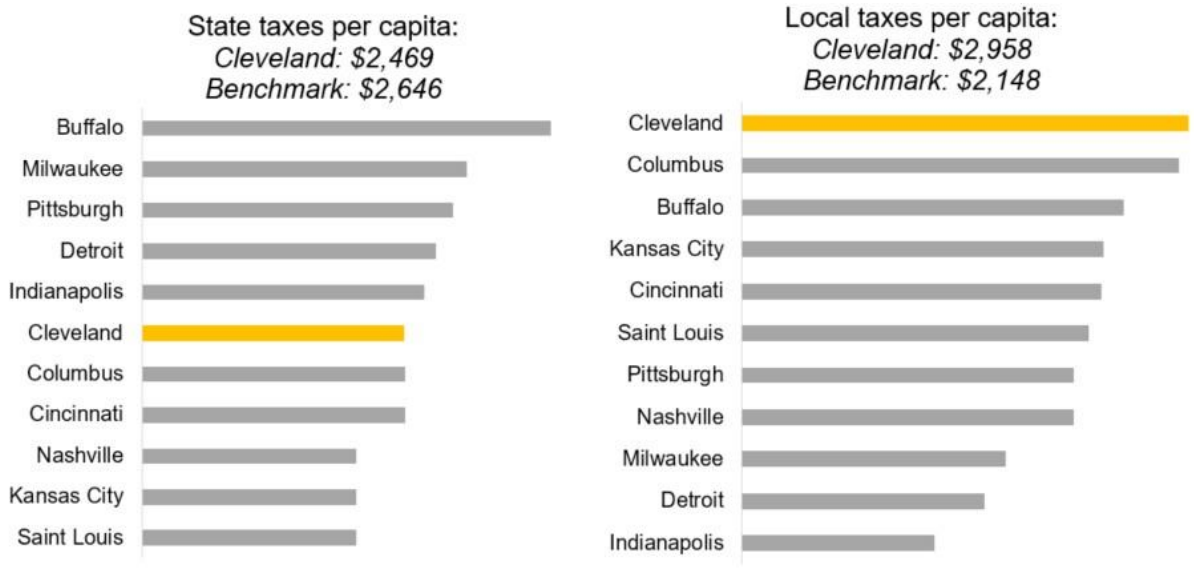
Figure 2. Per Capita State and Local Tax Burden by City, FY2016



Source: EY analysis of Census State and Local Finance Survey data

As shown in Figure 3, Cleveland's level of tax burden is largely a result of its local taxes. Measured on a per capita basis statewide, Ohio's state taxes are $2,469 compared with $2,646 in the benchmark cities (for state taxes in the relevant states) – meaning Cleveland is below the benchmark average by nearly 7%. At the local level, Cleveland's taxes are the highest among the benchmark set at $2,958 per capita as compared with $2,148 for the benchmark set.

Figure 3. Comparison of Cleveland State and Local Taxes to Benchmark Cities, FY2016



Source: EY analysis using Census State and Local Finance Survey data

Table 2 illustrates the source of the differential between Cleveland's tax burden and the benchmark average. Cleveland's tax burden is higher across-the-board on a per capita basis as compared with the benchmark cities, but in absolute terms, the property tax and the municipal income tax drive the additional burden – with the property tax burden in Cleveland nearly $350 higher than the benchmark average, and individual income taxes at more than $400 higher.

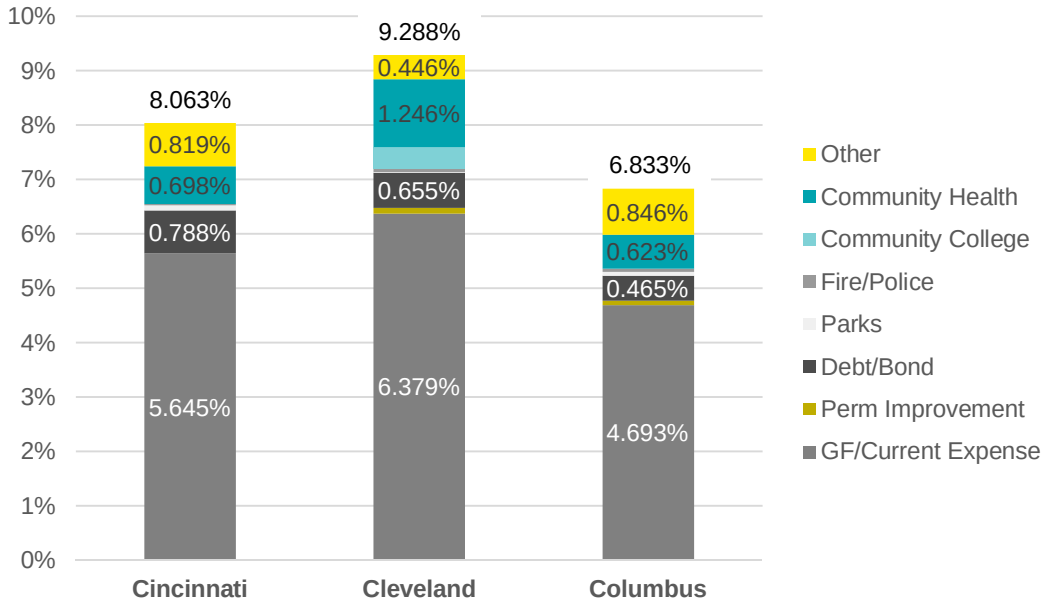
Table 2. Composition of Cleveland's Local Tax Burden Compared to Benchmark Cities' Average, FY2016

	Cleveland	Benchmark Average	Difference
Property	$1,712	$1,364	+$349
Sales	$368	$338	+$30
License	$54	$41	+$13
Individual Income	$668	$265	+$403
Business Income	$50	12	+$38
Other	$105	$129	-$24
Total	**$2,958**	**$2,148**	**+$809**

Source: EY analysis using Census State and Local Finance Survey data. Note: may not sum due to rounding

A significant contributing factor to the higher tax burden in Cleveland is the higher property tax rate. Figure 4 shows a comparison of the property tax millage in Cleveland and the two other Ohio cities included in the benchmark group. Cleveland's millage rate is 36% higher than Columbus and 15% higher than Cincinnati, a difference which is largely driven by the general fund millage, but exacerbated by the higher community health millage.

Figure 4. Comparison of Cleveland and Ohio Benchmark City Property Tax Millages, FY2017



Source: Ohio Department of Taxation, Tax Year 2017 Property Tax Rate Abstract, Effective Class 1 (Residential) Tax Rates

Cleveland's local taxes have increased significantly over the 2015-2017 period. Table 3 below shows the growth in city, county, and state taxes for each of the cities included in the analysis. The city and county tax amounts reflect the growth rate in tax collections from FY2015-FY2017 for the largest municipal government and the major county government in each metro area. The state tax change reflects the overall level of state tax revenue growth for the relevant state.

Cleveland city-level taxes grew 24% over the two-year period from FY2015-FY2017, far exceeding the benchmark average of 5.6%. Most of this growth resulted from an increase in the municipal income tax rate from 2.0% to 2.5% in January of 2017. At the county level, Cuyahoga County's tax collections grew at a rate that was more than double the benchmark average, but still within the range of other counties in the group. The rate of growth in tax collections was higher for the largest county governments in Pittsburgh (6.9%) and Cincinnati (7.3%). At the state level, Ohio's growth in tax revenues is similar although slightly higher than the benchmark average.

Table 3. Growth in City, County, and State Tax Collections for Benchmark Cities, FY2015-FY2017

City	County	State	'15-17 % chg City Tax	'15-17 % chg County Tax	'15-17 % chg State Tax
Columbus	Franklin	OH	8.49%	4.65%	7.10%
Cincinnati	Hamilton	OH	4.28%	7.29%	7.10%
Pittsburgh	Allegheny	PA	6.12%	6.89%	4.83%
Detroit	Wayne	MI	3.60%	-8.16%	6.20%
Buffalo	Erie	NY	1.59%	3.52%	1.83%
Indianapolis	Marion	IN	6.42%	N/A	3.75%
Milwaukee	Milwaukee	WI	6.83%	2.71%	6.55%
Nashville	Davidson	TN	8.51%	N/A	9.42%
Saint Louis	St. Louis	MO	5.24%	2.85%	4.51%
Kansas City	Jackson	MO	5.10%	5.13%	4.51%
Cleveland	Cuyahoga	OH	24.43%	6.46%	7.10%
Benchmark cities average*			5.62%	3.11%	5.58%

Source: EY review of consolidated 2015 and 2017 annual financial reports (CAFR) from largest county and city government in each metro area, as well as CAFRs for relevant states.

2.3 Comparison of Cleveland metro area tax levels

As shown in the prior section, Cleveland's local taxes (as proxied by taxes collected by all local units of government in Cuyahoga County) are above the benchmark average, while state taxes in Ohio are generally competitive with benchmark cities. This section compares local taxes within the Cleveland metropolitan area, defined as the five county region which includes Cuyahoga, Geauga, Lake, Lorain, and Medina.

Table 4 below shows the level of local taxes levied per capita by units of government in each of the five Cleveland-area counties. For each county noted, the amount reflects the per capita tax levied by the county, school, city and town, and special units of government in the county area.

On a per-capita basis, Cuyahoga's tax collections are higher than the 4-county average for every tax type. In dollar terms, the most significant differences arise from higher-than-average property, sales, and income taxes levied in Cuyahoga County as compared with surrounding counties. It is worth noting that when measured on a per-capita basis, the tax burdens in "bedroom communities" is artificially lower than in central business districts (CBD) because CBDs have lower population. Such is the case in the Cleveland area, where Cuyahoga County has 1.5 residents per employee, while the surrounding counties have 2.3 residents per employee. When measured on a per-capita basis, Cuyahoga's tax burden is 64% higher than the surrounding counties, but when measured on a per-employee basis, the tax burden is 12% higher.

Table 4. Comparison of local tax burden for Cleveland metro counties, FY2016 (per capita tax amounts shown in table)

	Lake	Medina	Lorain	Geauga	4-county average	Cuyahoga	Difference: Cuyahoga vs 4-county
Property tax	$1,473	$1,457	$1,112	$1,411	$1,363	$1,715	+$351
Sales tax	$158	$140	$94	$155	$137	$369	+$232
License taxes	$25	$16	$72	$15	$32	$54	+$22
Individual Income	$313	$250	$324	$87	$243	$669	+$425
Business Income	$17	$7	$12	$9	$11	$50	+$39
Other taxes	$53	$17	$9	$3	$20	$105	+$66
Total local taxes	**$2,039**	**$1,887**	**$1,623**	**$1,679**	**$1,807**	**$2,961**	**+$1154**

2. Business tax competitiveness analysis

When comparing the attractiveness of state and local tax systems to businesses making investments in new or expanded facilities, much of the focus of legislators and the public centers on statutory tax rates. These tax rates are often used in interstate comparisons to illustrate purported differences in the level of corporate income, sales, and property taxes by comparing the statutory rates and other tax features rather than the total tax burden. Businesses contemplating a new investment, however, are concerned with the actual tax liability that results from an investment in a given location, not simply statutory tax features which are difficult to compare and combine into an overall estimate of tax burden.

This analysis provides a city-by-city comparison of the tax liabilities that new investments in selected industries would incur, taking into consideration state and local statutory tax provisions and the financial and economic characteristics of the new investments. The resulting specific industry tax burdens are aggregated to provide an overall measure of the business tax competitiveness of each state. The results reflect the type of analysis undertaken by businesses when evaluating investments decisions to reveal the impact of state and local business tax systems on capital investment, the cornerstone of state economic development.

The methodology used in this section provides an overall index measuring the state and local taxes that new business investments face in each state. Unique features of the study include:

- The financial characteristics of new investments in each industry are held constant across the states. This allows isolation of the tax burden differences to the specific features of each state and local business tax system.
- The financial characteristics of the selected industries provide the level of financial detail needed to estimate the size of state and local business tax bases in each state. This includes detailed information on business purchases taxable under the sales tax, property taxes on real and personal property, gross receipts taxes, and the sourcing and apportionment of corporate income and excise tax bases.
- The financial characteristics of the selected “representative” firms automatically weight the importance of each state and local tax in determining the overall competitiveness index.

The weights assigned to each tax type (property tax, corporate income tax and sales tax on inputs, for example) recognize differences in the state and local tax mix across industries.

- The tax burdens for representative investments in selected industries are aggregated to derive a weighted average competitiveness index for each state. The weights assigned to each industry's result when averaging to a single overall result are based on the relative importance of each type of capital investment in the mix of recent mobile capital investments in the U.S. In other words, the result for facilities that accounted for a larger share of recent investment are given more weight in the overall average than the result for facilities that generated a smaller share of the total investment. This approach provides an objective way of weighting the different industry tax burdens to derive an overall business tax competitiveness index for each state.
- The use of actual data on capital investments that businesses are undertaking nationwide provides important information about how competitive current state and local business tax systems for mobile capital investments.

Business tax burden estimation approach

The business tax competitiveness analysis presents a comparison of the state and local business taxes that would be incurred by a company making an investment in a new facility or expansion of an existing facility. This approach compares marginal taxes on new capital investment, rather than the average level of taxes paid by all businesses in the state. While both measures of tax (average and marginal) are of interest to policymakers, marginal tax rates on new investment have the greatest impact on a state's economic development because these are the taxes that affect business investment decisions.[1]

To estimate these marginal taxes on new investment, the analysis uses the EY business tax competitiveness model (BTCM) to estimate the effective state and local taxes imposed on investment in each state. The following is a brief overview of the steps used in developing the BTCM and estimating the taxes paid by the expanding businesses.

- The first step of the analysis is the construction of financial profiles for each of the five facility types analyzed. The financial profiles are based on IRS Statistics of Income data and other data that include information on assets, liabilities, receipts, deductions, and net income. The financial profile is then projected for 30-years so that differences in the timing of certain taxes can be incorporated into the analysis.

- The analysis includes estimates of the major state and local taxes, including corporate income and alternative business income taxes, sales tax, property tax, and net worth taxes. For the types of facilities included in the analysis, these taxes represent the overwhelming majority of

[1] Studies that use this approach and provide a more detailed description of the benefits of the hypothetical firm methodology include: Papke, James, and Leslie Papke. "Measuring Differential State-local Tax Liabilities and Their Implications for Business Investment Location." National Tax Journal, (1986): 357-366 and Fisher, Peter S and Alan H Peters. "Measuring tax and incentive competition: What is the best yardstick?" Regional Studies (1997); 31:751-764.

total tax liability and provide a good indicator of the level of total state and local tax burden on a new investment.

- For each tax, the most significant tax system features are incorporated. For corporate and business income taxes, the model incorporates tax rates, base definitions (net income or alternate tax base), apportionment formula weights, and sourcing of sales. For the sales tax, state and local sales rates are incorporated along with variations in the tax base for operating inputs and capital investment. The property tax considers tax rates on five major classes of real and personal property, to reflect both the level of the statutory tax rate as well as the breadth of the tax base.

- Taxes are estimated by year, considering changes in rates and other key tax system features scheduled to occur through 2022 under current law.

- Based on the taxes estimated for each year of the 30-year period, the before and after-tax rate of return is estimated for each of the facility types. The effective tax rate is then calculated based on the estimated change in the rate of return. For example, if the rate of return falls from 15% to 13%, a 2 percentage point decrease, this translates into a 13.3% effective tax rate (the 2 percentage point decrease divided by the original 15% rate of return). The interpretation of this effective tax rate measure is that it represents the percentage change in the rate of return on the investment in a new facility due to state and local taxes.

While the estimates provide results that can be used to evaluate the competitiveness of each state's business tax system for the selected facility types included in the analysis, the study has several important limitations that should be understood when using the results:

- The analysis presented in this section examines C-corporations, which are the typical legal form of companies making large investments in new facilities. However, companies are increasingly organized as pass-through entities, such as limited liability companies and partnerships, which will incur individual income taxes. For companies organized as pass-through entities, individual income tax will be a significant factor in determining the overall state and local tax burden. We show the differences in total state and local ETR in section 3.4 if the companies are organized as a partnership.

- Other industry-specific taxes are not included in the analysis and can be significant for certain taxpayers. Insurance premium tax, severance tax, utility gross receipts tax, and other excise taxes are not included in the analysis but would influence investment decisions for businesses operating in certain industries.

- The study examines the general tax system as it would apply to most businesses and accordingly does not consider statutory credits or negotiated incentives that relate to job creation, investment, or research activities. In some cases, these credits and incentives may significantly impact tax burdens, but are not generally available to a wide range of taxpayers and are therefore not included in the analysis.

- Non-tax costs are typically the most significant variable business cost and are not considered in this analysis. For example, labor costs account for approximately 30% of total U.S. gross

economic output making it the most significant operating cost for most industries. Other operating costs such as utilities and freight costs to major suppliers can also influence location decisions. While this analysis identifies only state and local tax cost differences across cities, non-tax cost differentials may cause a high tax location to be a more desirable investment location than a low tax location. At the margin, however, taxes influence investment locations.

3.1 Selected industries

The analysis focuses on industries and types of facilities that have a choice in location, and would therefore be the most sensitive to differences in state and local tax burdens. In general, the following criteria were considered in selecting the industries included in the analysis.

- Industries should be economically mobile, with location choices indicating that they are more sensitive to differences in the level of tax burden
- Typically focused on exported goods and services, rather than serving local populations or markets
- Contributors to economic development (indicated by growth of the sector and regional significance of the sector in terms of employment or GDP)
- Non-regulated industries, with tax burdens that would generally be more representative of broader sectors

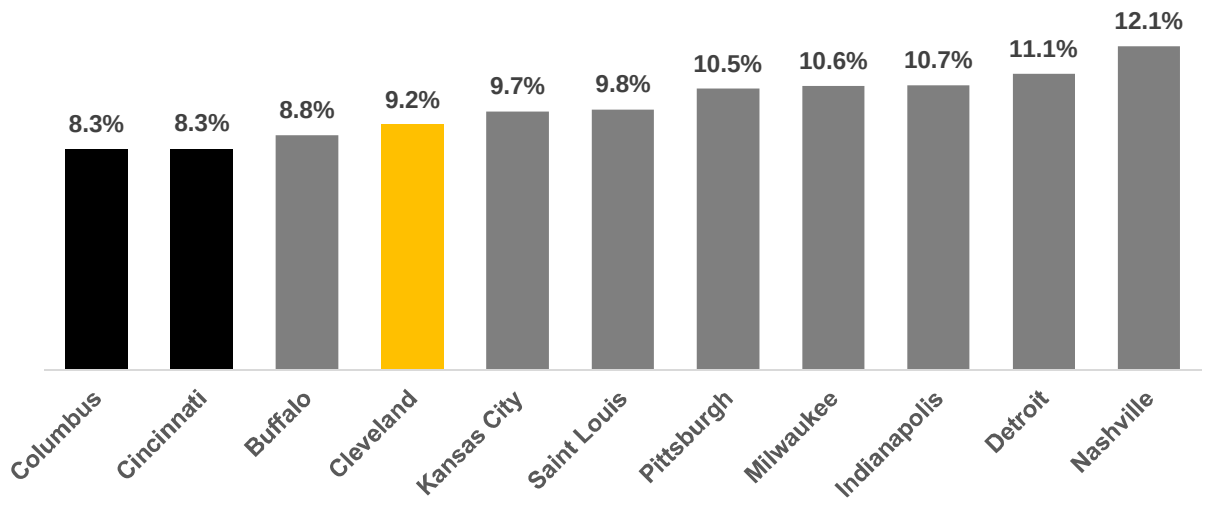
Based on these considerations the following industries were chosen for evaluation:

1. Headquarters (NAICS 55),
2. Medical devices (NAICS 3391)
3. Logistics (NAICS 49)
4. Unregulated financial services (NAICS 52399); (not subject to bank tax)
5. Polymers chemicals (NAICS 3251)
6. Food processing (NAICS 311)
7. Machinery manufacturing (333)
8. Software (51121)

3.2 Business tax competitiveness results for corporations

Figures 5-8 below present estimates of the average tax burden for all industries included in the analysis. As shown in Figure 5, for the industries included in the analysis, Cleveland's overall state and local business tax burden is generally competitive with the benchmark cities. Cleveland's average effective tax rate including all state and local taxes on income, business inputs, property, and net worth is 9.2% compared to 10.0% on average across the benchmark cities.

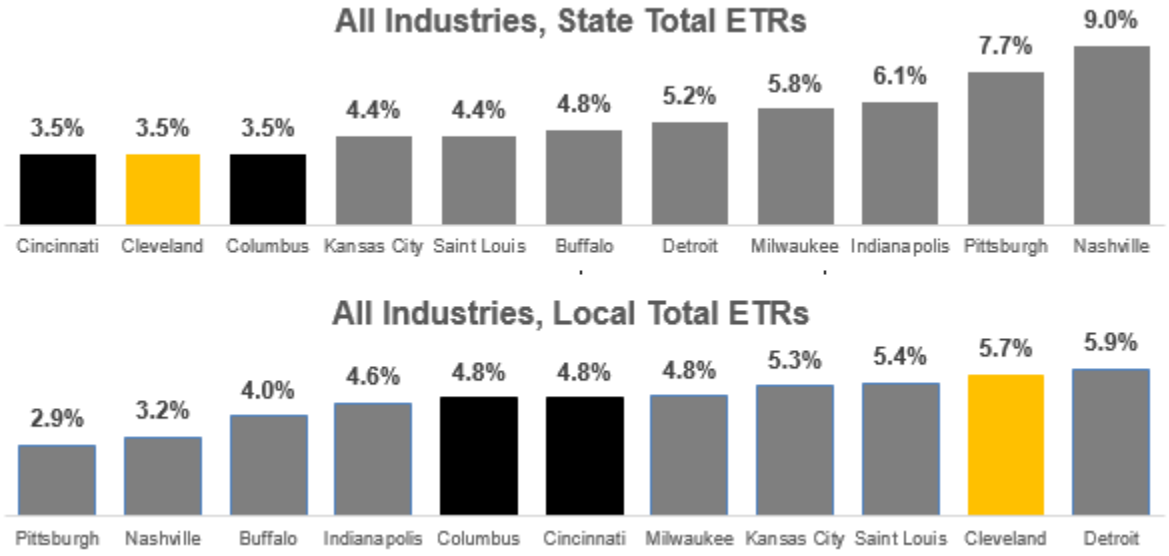
Figure 5. Total State and Local Total Effective Tax Rate on Business



Source: EY analysis using Business Tax Competiveness Model

Most of Cleveland's advantage is a result of state-level tax competitiveness. Figure 6 shows that Ohio's state-level business taxes are significantly lower the benchmark average for C-corporations of the types included in the analysis.

Figure 6. State and Local Total ETRs by Location

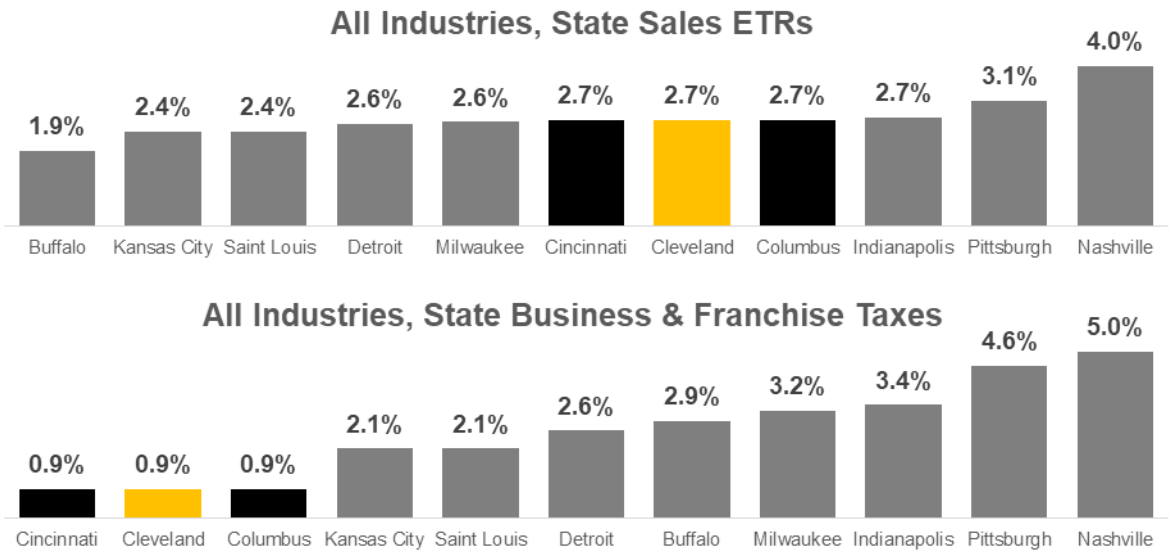


Source: EY analysis

As shown in Figure 7, Ohio's sales tax on business capital and operating inputs is at the benchmark average at 2.65% in Ohio compared with 2.69% for the benchmark set. Ohio's 5.75% state sales tax rate is only slightly higher than the 5.6% average sales tax rate in the other benchmark states. However, in addition to the minor deviation in the state rate, Ohio also has a broader state sales tax base, which includes certain data processing and other technology services, as well as business services that include security and printing. Overall, Ohio taxes an estimated 13.8% of operating inputs for our representative businesses, compared to 12.9% in the benchmark states.

Ohio's business tax, the Commercial Activity Tax, presents an advantage for corporations, as compared with the traditional corporate net income tax levied in every other benchmark state. For example, the CAT's 0.26% rate on gross receipts would impose an approximately 2.6% effective tax rate on net income for a simple business earning a 10% net income profit margin on sales as compared with the average 6.5% state net income tax rate imposed on corporations in the benchmark states. Ohio's Commercial Activity Tax is also based on destination sales with market-based sourcing, an apportionment approach which does not penalize in-state investment or payroll. Most other states in the benchmark set use a similar sales-based income apportionment approach, with the exception of Tennessee which includes payroll and property in its apportionment calculation for most businesses.

Figure 7. State-level Business Tax Comparisons



Source: EY analysis

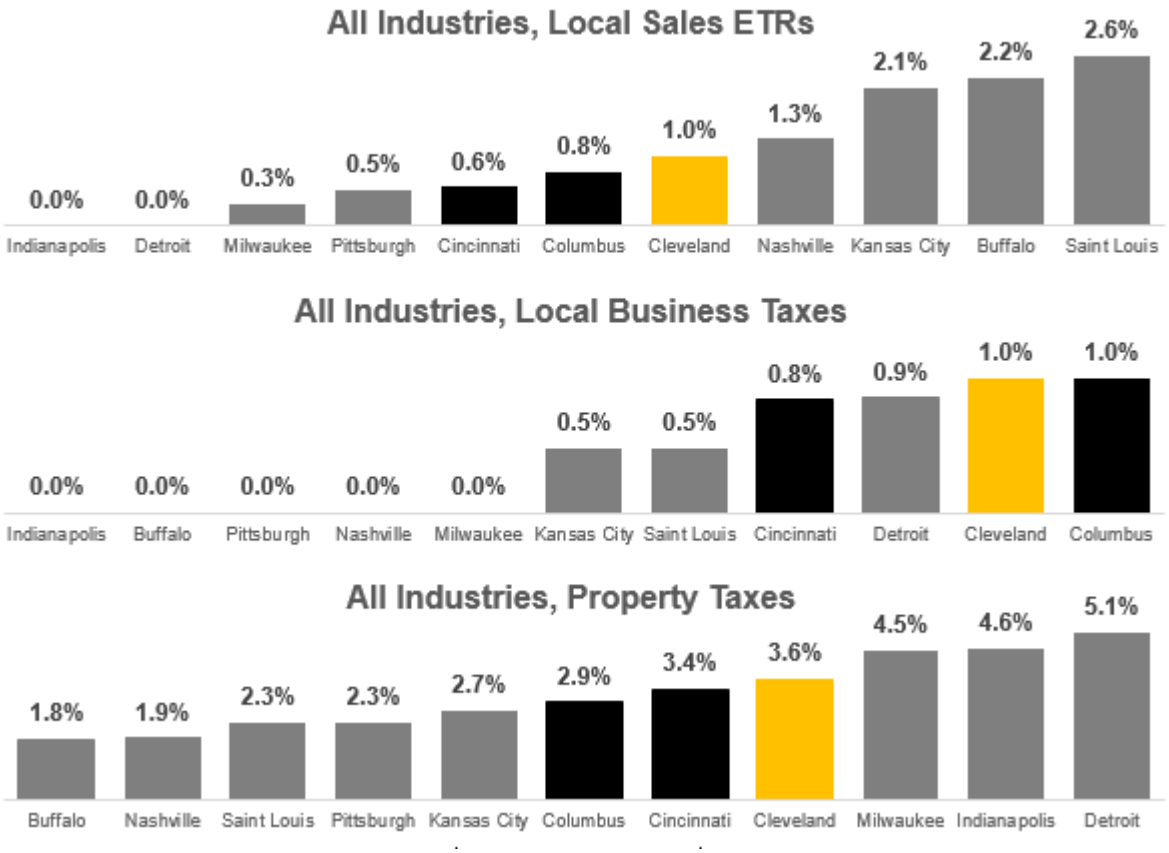
As shown in Figure 8, Cleveland's local taxes are less competitive than its state-level taxes. Among Cleveland's local taxes, the local sales tax is the most typical as compared with the benchmark set. The local sales tax is higher than the benchmark average (2.25% in Cleveland as compared with 1.99% in the benchmark set, including two cities that do not levy a local sales tax). However, as noted earlier, Ohio's sales tax base is somewhat broader than the benchmark

states, and since the state and local sales taxes rely on the same tax base definitions, Cleveland's local sales tax base is somewhat broader than the benchmark set.

Cleveland's local property tax is higher than the benchmark average, but lower in terms of overall burden than four of the comparison cities. While Cleveland's 3.55% effective property tax rate on real property is higher than the benchmark average of 3.2%, Ohio's lack of a general business tangible personal property tax provides a benefit which partially mitigates the disadvantage of a higher real property tax rate, particularly to equipment-intensive manufacturing businesses. It is worth noting that the benchmark cities located in Missouri, New York, and Pennsylvania also exempt general business tangible personal property from the local property tax.

Cleveland's primary area of non-competitiveness with respect to local business taxes is the local business income tax. Five benchmark cities have no local corporate income tax, while those with a local business tax impose an average statutory tax rate of just 0.9% compared with 2.5% in Cleveland. Note that the effective tax rate is lower than the statutory tax rate primarily due to the apportionment of income and the assumption that the representative firms have sales both inside and outside of Cleveland.

Figure 8. Local Business Tax Comparison

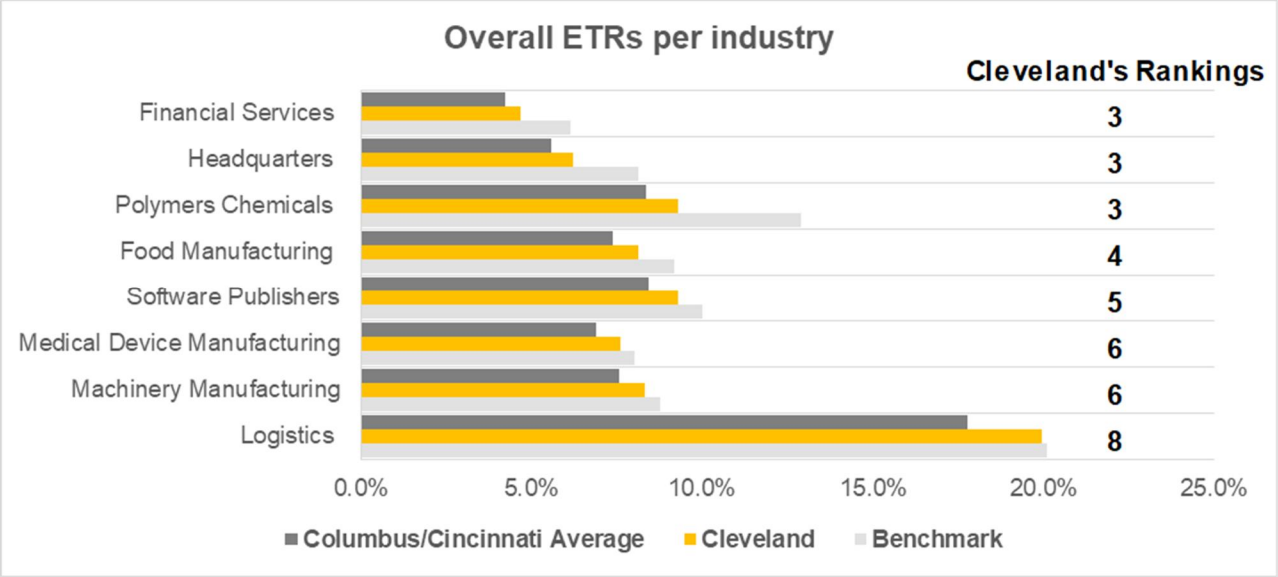


Source: EY analysis

3.3 Results by industry for corporations

Figure 9 below shows the results of the business tax analysis by industry. As shown in the chart, Cleveland ranks between 3 and 8 for all industries but is lower than the benchmark average for all sectors. By contrast, Cleveland has higher taxes for every industry compared with Cincinnati and Columbus.

Figure 9. Overall ETRs by Industry



Source: EY analysis

3.4 Small businesses (pass-through entities)

Figure 10 compares total state and local ETRs across all industries if the companies were organized as pass-through businesses rather than C-corporations, which is common for small and medium-sized businesses. As shown in the figure, the overall ETRs do not change for the Ohio locations. In the results below, business income is not taxed by the state individual income tax since the first $250,000 of business income is exempt in Ohio. Average net income distributions to partners based on national SOI data are well below this threshold, which we have used in this analysis. Thus, businesses organized as pass-through entities pay the CAT but not the income tax, same as a C-corporation. In Cleveland, pass-through entities pay tax on net income, but a credit is provided for this in the local individual income tax for the partner, resulting in the income being taxed once.

For the other locations in our analysis, the total ETRs are lower due to lower effective tax rates on the pass-through business income that is taxed through the individual income tax rather than the corporate tax. The location with the biggest decline in effective tax rate is Nashville. At the state level, business income for C-corporations is taxed but not for limited liability partnerships or limited liability companies, although S-corporation distributions are taxed. This results in a lowering of the overall ETR by an average of 41% if the business is organized as a pass-through

entity rather than a C-corporation in Nashville. Pittsburgh is another location with a large decline in ETR based on how the business is organized. Corporations pay almost 10% on net income in Pennsylvania while individuals pay 3.07% on income. The overall ETR for pass-through entities is 17% lower than for C-corporations in Pittsburgh.

Table 5. Comparison of Total State and Local ETRs due to Organizational Structure,
Overall industry average

City	C-corporation	Pass-through entity	% Difference
Columbus	8.3%	8.3%	0.0%
Cincinnati	8.3%	8.3%	0.0%
Buffalo	8.8%	7.6%	-13.6%
Cleveland	**9.2%**	**9.2%**	**0.0%**
Milwaukee	10.6%	9.0%	-15.3%
Kansas City	9.7%	9.2%	-5.0%
Saint Louis	9.8%	9.3%	-4.9%
Indianapolis	10.7%	9.5%	-11.0%
Pittsburgh	10.5%	8.7%	-17.1%
Detroit	11.1%	9.6%	-13.1%
Nashville	12.1%	7.1%	-41.2%

Source: EY analysis

3. Household tax competitiveness analysis

This section of the report estimates the state and local income, property, and sales tax burdens for different types of households by location.

4.1 Household profiles

Table 6 shows the characteristics of the nine household types that were used in the analysis. Characteristics important for estimating state and local taxes include amount of income, source of income, number of dependents, filing status, and ownership of a home and car. Four of the households do not own their home and are renters. Six of the households in our analysis have dependent children. One of the households receives pension income while the rest of the households have wage, investment, business income, or "mixed" income, which includes some combination of wage, investment, and business income. The following sections discuss the tax burden differences across the locations due to these household characteristics.

Table 6. Characteristics of households used in household tax competitiveness analysis

Income	Filing type	Income type	No. of children	Owns home	Owns car	Housing value	Value of car
$20,000	Single	Wage	0	No	No	$0	$0
$30,000	Head	Wage	2	No	Yes	$0	$7,500
$40,000	Single	Wage	2	No	Yes	$0	$10,500
$50,000	Single	Wage	0	No	Yes	$0	$10,500
$70,000	Married	Mixed	2	Yes	Yes	$175,000	$13,000
$100,000	Married	Mixed	2	Yes	Yes	$250,000	$13,500
$150,000	Married	Mixed	2	Yes	Yes	$375,000	$25,000
$200,000	Married	Business	2	Yes	Yes	$500,000	$25,000
$50,000	Married	Pension	0	Yes	Yes	$185,000	$13,000

4.2 State and local tax household tax burdens

Table 7 shows the estimated state and local property, income, and sales taxes paid by each household type as a percentage of household income (ETR) for Cleveland and the average of the benchmark cities. Cleveland's effective tax rate is higher for most household types than the benchmark average. Figure 11 provides insight into what is driving this result. For households that own a home, Cleveland's high local property taxes (second highest after Detroit) result in an overall higher ETR compared to the benchmark cities. Cleveland is closer to the benchmark average for households that do not own a home, and therefore do not pay property taxes, and have dependents (i.e. children). Ohio's state income tax provides an additional exemption for children as well as a child tax credit, lowering the tax burden for households with dependent children. Pension income is taxed in Ohio, resulting in a much higher ETR for pension households compared to peers. While Michigan taxes certain pension income, for our analysis we have assumed that the household would be exempt from taxation given the years that they retired and the type of pension income.

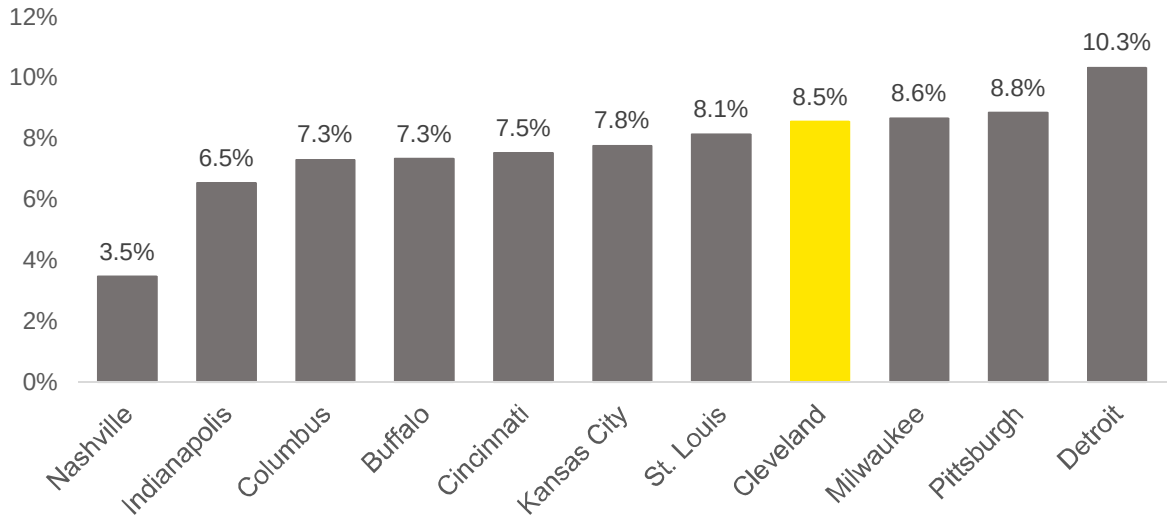
Table 7. Comparison of state and local household tax burden for Cleveland and benchmark cities' average by type of household

Income	HH type	Benchmark ETR	Cleveland ETR	Difference (%pt)	% Difference
$20,000	Single, wage	4.4%	5.6%	+1.2%	+27%
$30,000	Head, wage	4.4%	4.2%	-0.2%	-4%
$40,000	Single, wage	5.2%	5.3%	+0.1%	+3%
$50,000	Single, wage	6.2%	6.5%	+0.4%	+6%
$70,000	Married, mixed	9.9%	11.9%	+2.0%	+20%
$100,000	Married, mixed	9.8%	10.6%	+0.8%	+8%
$150,000	Married, mixed	10.0%	10.6%	+0.6%	+6%
$200,000	Married, business	9.4%	8.3%	-1.1%	-12%
$50,000	Married, pension	8.9%	13.7%	+4.9%	+55%

Source: EY analysis using specific tax parameters for each location

The average ETR across all household types for each location is shown in Figure 10. As shown in the figure below, Cleveland's overall ETR is the fourth highest. Cleveland has the highest overall ETR of the Ohio locations due to the combination of high property and local individual income taxes. Cleveland's property taxes are the highest of the three Ohio locations with an effective tax of 2.84% on the cash value of the home compared to 2.09% in Columbus and 2.47% in Cincinnati. Cleveland's local income tax of 2.5% is the same as Columbus, but higher than Cincinnati's rate of 2.1%.

Figure 10. Average state and local household tax burden in Cleveland and benchmark cities
(State and local taxes as a percentage of household income)



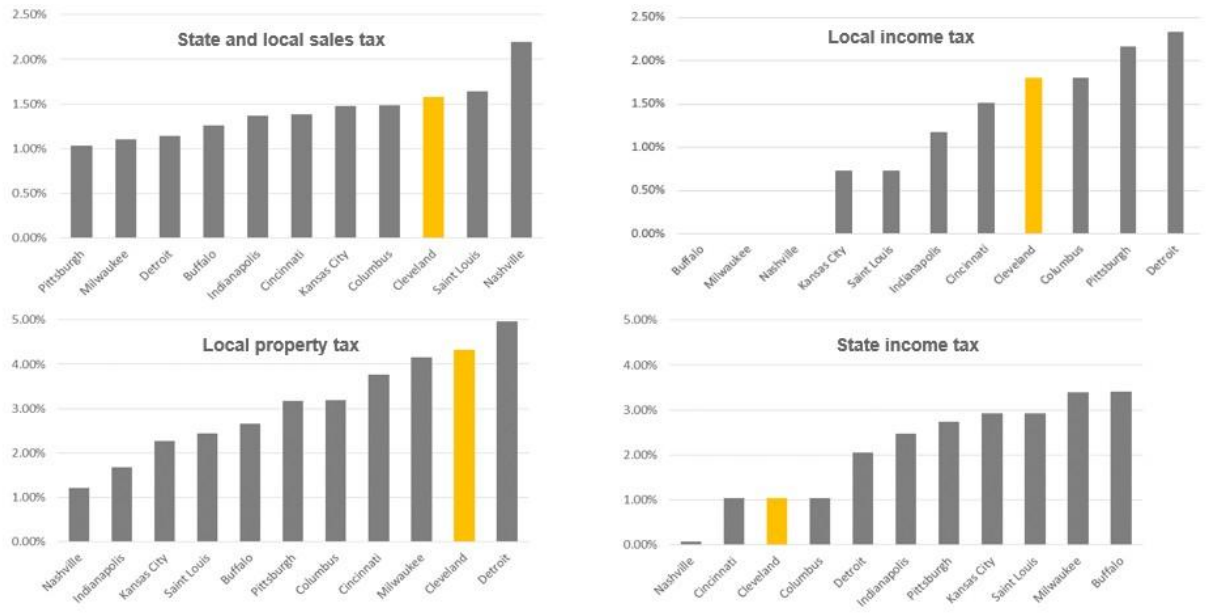
Source: EY analysis

Detroit's high property and local income taxes explain its high total ETR. Detroit has the highest local property tax ETR and a local income tax rate on city residents of 2.4%. Pittsburgh has the second highest ETR explained in part by its 3.0% tax rate on earned income, which is the highest of the benchmark states. Milwaukee's effective tax rate on property is the third highest in our group at 2.73%. Effective state individual income taxes are also among the highest for Milwaukee residents.

Figure 11 compares the average ETR across all households by type of tax for each location. Ohio's state income tax is competitive compared to its peers. The state allows pass-through business income of up to $250,000 to be deducted from adjusted gross income for a married taxpayer. The state also has higher personal exemption and child exemption amounts than most of the other states in the analysis. However, Ohio taxes pension income, while most states do not. Overall, the result is a lower effective tax rate for the state income tax for Ohio cities compared to their peers across all household taxpayer types included in the analysis. This result is in constrast to the local income tax, which is higher in Cleveland than in most of the benchmark cities.

Cleveland's combined state and local sales tax rate of 8.0% is the third highest in our study. Ohio also taxes more personal services than other states in our study. Ohio taxes more categories of personals services (e.g. health clubs, shoe repair, laundry and dry cleaning) than the other benchmark states.[2] Finally, Cleveland's property tax ETR, shown in the figure below as a share of household income across all households, is second hightest at 4.3% following only Detroit where the porperty tax ETR is nearly 5.0%.

Figure 11. Effective tax rates by type of tax for households



Source: EY analysis

[2] See Federation of Tax Administrators, *Services Taxation Survey 2017*.

4. Conclusion

Measured in terms of per capita tax burden, taxes levied by local units of government in Cuyahoga County, including the City of Cleveland, are higher than the other benchmark cities examined in this analysis. This higher burden is partially offset by more competitive state tax rates that apply to businesses and households in Cleveland, as well as other Ohio cities. Examining business taxes, corporations in Cleveland face an overall tax burden that is lower than the tax burden in the average benchmark city included in this analysis, primarily resulting from Ohio's low business entity tax, the CAT. For pass-through entities, Ohio offers benefits at the state level through an exemption of certain pass-through income which improves competitiveness, yet imposes a business entity tax which reduces competitiveness compared with the benchmark cities included in the analysis. For households, Cleveland's combined state and local tax burden is above the average of the benchmark cities included in the analysis, yet below cities such as Milwaulkee, Pittsburgh, and Detroit. Considering the various dimensions used to measure tax burden, the analysis finds that Cleveland's tax burden is higher than benchmark cities for many types of taxpayers primarily resulting from taxes levied by local governments. However, a relatively competitive state tax structure somewhat mitigates this disadvantage.