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The Potential Impacts of Working from Home on Post COVID-19 Municipal Wage Tax Revenues in Ohio.

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Introduction.

Every nation evolves its own complex system to collect taxes to finance government operations. No two systems are exactly alike. Each is embedded in a unique blend of historical, cultural, economic, and political factors at the national, sub-national, and local levels. All adjust themselves continuously to changes that occur in their internal and external environments.

The COVID-19 pandemic has been a major disruptive external shock to the *status quo* of every tax system throughout the world. Most systems responded to the crisis with short-term measures designed to reduce uncertainty and to maintain as much flow of tax revenues as possible. Yet the COVID-19 pandemic is changing many of the long-established patterns of cultural, economic, and political behaviors on which tax systems are based. Some behavioral changes may be transitory. Yet many will persist, at least in some fashion. Persistent changes could invalidate important assumptions about behavior that have been used to create and manage each specific tax system. Working from home is one behavior that has important consequences for some tax systems. This paper examines one example.

Municipalities in the State of Ohio (i.e. cities and villages) have been generating large portions of their revenue by taxing the wages of residents and the wages of non-residents who work within their borders since the 1940s[2]. In 2018, approximately $5.6 billion in municipal wage taxes were collected by 642 cities and villages in Ohio.

Ohio Governor Mike DeWine imposed stay-at-home orders in the Spring of 2020 as an emergency policy to minimize spread of the COVID-19 virus. Only essential businesses were

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[2] The first city wage tax was enacted by the City of Toledo in 1946. See, Donald J. Newman, "Municipal Income Taxation in Ohio: Some Proposals," 22 Case W. Rsrv. L. Rev. 308 (1971). Ohio did not enact an income tax for state revenue until 1971, which became effective in 1972.

permitted to keep their workplaces open for employees. Hundreds of thousands of employees suddenly tried working from home whenever possible. Overall employment levels, however, dropped catastrophically. The unexpected shock threatened to become a major disruption in municipal wage tax receipts. Revenue would fall due to lower employment, but also because hundreds of thousands of workers suddenly changed where they were working. To cope, the state legislature imposed a temporary freeze on the pre-pandemic municipal wage tax system. The freeze allowed cities and villages to continue keeping wage taxes from those who began working from home during 2020 based on each employee's work location prior to the shutdown. Subsequent legislation removed that freeze starting with tax year 2021.

Throughout 2021 many businesses continued to allow large proportions of their employees to work from home since the pandemic continued to surge. This may result in a wave of tax-filings from home workers seeking net tax refunds for tax year 2021 based on different tax rates where they reside and where they worked previously. Data on how many taxpayers are seeking net refunds is not yet available. In the meantime, most cities and villages are using emergency intergovernmental grants made possible by the Federal government's American Rescue Plan Act of 2021 (ARPA) to cope with this short-term uncertainty in wage tax revenues for tax year 2021.

Moving forward it seems certain that many workers will continue to work from home. Workers and businesses have learned that this type of behavior can be mutually beneficial. Yet the degree of long-term growth in working from home is not yet known. Large-scale growth could create substantial disruptions in Ohio's complex municipal wage tax collection system. Some municipalities could net more revenue. Others could realize substantial revenue reductions. The complex matrix of varying tax rates, the differing ability of workers to work from home, and the differing willingness of employers to allow employees to work from home, all combine to obscure the likely effect on the amount of wage taxes received by each city or village.

This paper reports the results of a tax revenue model we developed to provide estimates of the scale and scope of short-term (tax year 2021) and longer-term municipal revenue changes that could occur in Ohio. Estimates are based on different scenarios of how popular working from home remains among employees and businesses once the COVID-19 pandemic recedes and Ohio's labor market settles into a new, post-pandemic pattern.

2. Overview of the Municipal Wage Tax System in Ohio.

Local municipalities -- cities and villages -- in the State of Ohio rely heavily on revenue from locally assessed wage taxes to fund essential public services such as police, fire, public works, and recreation.[3] Townships in Ohio are not permitted to assess wage taxes. In 2018, approximately $5.6 billion in municipal wage taxes were collected by 642 cities and villages in

[3] Municipal income taxes in Ohio are governed by Ohio Revised Code (ORC), Title 7, Chapter 718.

Ohio.[4] Heavy dependence on municipal wage tax revenue is unusual for local units of general government in the U.S. In 2017, for example, the Urban-Brookings Tax Policy Center estimates that wage taxes accounted for only two percent of local government general revenues in the U.S.[5]

The State of Ohio does not mandate specific tax rates for cities and villages, but it does require each municipality to apply its tax rate with uniformity.[6] Consequently, each city and village has evolved its own tax rate. The state has also enacted a series of special provisions over the years that have allowed cities and villages to offer credits to residents who work outside their boundaries, to prohibit taxation of income from intangibles (in 1987), to allow (in 1993) and later prohibit (in 2000) sharing wage tax revenue with school districts, and to permit the exemption of income from stock options. Municipalities have also been permitted to grant tax credits to companies for job creation as part of local economic development incentives.[7] Consequently, Ohio's municipal wage tax system is a complex matrix of varying rates and different local policies. Residents who live and work within the same municipality are not subject to double taxation. Rural townships in Ohio are not permitted to assess wage taxes.[8]

Employers are required to withhold municipal wage taxes from their employees' paychecks and remit those taxes to municipalities, but only for the principal municipality where each employee works.[9] Employers are not required to withhold municipal wage taxes for municipalities where employees reside (although some choose to do this). Residents who work outside the boundaries of their residential cities or villages, therefore, are required to estimate their annual tax liability to their residential municipality and make quarterly payments directly if their employers do not withhold directly.

Although some cities and villages manage their own wage tax administration (from registration to litigation), two governmental agencies in Ohio offer wage tax administrative services to municipalities. The largest is the Regional Income Tax Agency (RITA), which is governed by the Regional Council of Governments (RCOG). RITA administers local wage taxes for about half of

[4] Annual Report, Fiscal Year 2020, Ohio Department of Taxation.
[5] Urban-Brookings Tax Policy Center, "State and Local Finance Initiative Data Query System."
[6] After a decade of widespread adoption of wage taxes by Ohio's municipalities, the State legislature enacted the Uniform Municipal Income Tax Law in 1957.
[7] See Ohio Revised Code (ORC), Title 7, Chapter 718, sections 718.15, 718.151, and 718.16.
[8] Tiebout's classic article about local government finance provides a good framework for understanding the dynamics among city and village tax systems in Ohio. See Tiebout, Charles M. "A pure theory of local expenditures." *Journal of political economy* 64, no. 5(1956): 416-424. Also see Howell-Moroney, Michael. "The Tiebout hypothesis 50 years later: Lessons and lingering challenges for metropolitan governance in the 21st century." *Public Administration Review* 68, no. 192008): 97-109.
[9] The only codified exception to this rule is for employees who work in a specific municipality fewer than 20 days a year.

Ohio's cities and villages. A second agency, the City of Cleveland's Central Collection Agency (CCA), administers wage taxes for about fifty municipalities in addition to Cleveland.[10]

The sudden outbreak of the COVID19 pandemic created an unprecedented shock to all tax systems. Ohio Governor Mike DeWine imposed stay-at-home orders in the Spring of 2020. Employment levels dropped catastrophically since only businesses defined as "essential" were allowed to keep their workplaces open. Soon after, the state legislature imposed a temporary freeze on the pre-pandemic wage tax system to provide some stability for local governments. The freeze allowed cities and villages to continue keeping wage taxes (from those who were still working) during 2020 based on each worker's principal work location prior to the shutdown. Subsequent legislation removed that freeze and reinstated the ability of employees to adjust their local wage tax liability for tax year 2021 when they file their personal tax forms for that year.

Moving forward, employers will continue to be required to withhold wage taxes from employees and make payments to cities and villages based solely on each worker's principal work location. Employees will be responsible for adjusting their tax liabilities when they file their annual municipal tax returns. It is unclear how many tax filers will seek adjustments. The incentive to do so varies because wage tax rates and credits to residents vary across cities and villages.

3. Working from Home.

The physical separation of where a person resides from where a person works for wages is one of the principal behaviors that characterize modern social relationships in industrial societies. The great majority of laws and regulations that govern the social relationships of work assume that work occurs in locations where employers own (or rent) the workplace and all the tools, equipment, materials, and supplies that are associated with work activities. This standard social relationship covers the great majority of jobs in all for-profit, nonprofit, and government sectors whether goods-producing or service-producing. Assumptions about this standard social relationship are ubiquitous throughout American culture. For example, these assumptions have been designed into land use patterns, zoning regulations, transportation infrastructure, and most other aspects of the built environment of our cities, suburbs, and rural areas for more than a century. Those patterns also underscore the political economy of municipal governments of all sizes to manage their tax bases and to provide the "package" of municipal services needed to satisfy residents and local employers.[11]

[10] For background on the administration of municipal wage taxes, see John W. Cook, "Effects, Problems, and Solutions of Central Collection of Municipal Income Taxes," 19 Case W. Rsrv. L. Rev. 900 (1968).

[11] See Tiebout (1956) and Howell-Moroney (2008).

Until recently, working from home was limited largely to senior executives and specialized professionals who enjoy higher occupational status. Working from home, if only on occasion, was one way to express the greater autonomy these workers have over their own working conditions. The invention of personal computers, fax machines, home printers, etc. over the last four decades reinforced the gradual growth of this behavior. The more recent growth of the internet and widely distributed high-speed connectivity have extended the capacity to work from home to a much broader range of less prestigious occupations.

Yet even though the capacity to work from home has increased, companies and workers have been slow to adopt this form of work. One study using Bureau of Labor Statistics (BLS) data from 2003-2007 defined working from home to include as little as one minute of paid time per week. Using that minimal measure, the study found that fewer than ten percent of all employees in the U.S. reported working even one minute at home in a typical week in those years. Half (52%) of those who did report working from home in the 2003-2007 period, reported working at home less than one hour in a typical week.[12]

A more recent study using BLS data from 2017 and 2018 estimated that as many as 45% of the entire U.S. workforce had the capacity to work from home in the years just before the pandemic. Yet less than ten percent of the U.S. workforce reported working from home even one day a week.[13] The slow adoption of working from home is evident even among the highest prestige employees in management, business, and financial occupations. The more recent BLS study estimated that 87% of these employees had the capacity to work from home prior to the pandemic. Yet fewer than 30% of them reported working at home as much as one day each week in 2017 and 2018.

The unexpected COVID-19 pandemic in March 2020 and the unprecedented orders to shutdown workplaces changed everything. Millions of businesses and workers suddenly faced the choice between working from home or not working at all. Total employment dropped an unprecedented 16 percent between February and April of 2020, and the measured rate of unemployment increased by 11 percent.[14] The capacity of many workers to work from home became tested for the first time.

The ability to work from home, of course, varies widely by occupation. Table One shows estimates by occupation calculated by Dey, et. al. (2020) using data from the BLS's American Time Use Survey (ATUS). Some work cannot be done at home, such as construction, extraction, installation, maintenance, repair, transportation, material handling, and production. Other

[12] Allard, M.D., and Lacey, J. "Work-at-home patterns by occupation" *Issues in Labor Statistics,* U.S. Department of Labor, Bureau of Labor Statistics, Summary 09-02, March 2009.
[13] Dey, M., Frazis, H., Loewenstein, M.A., and Sun, J. (hereafter Dey, et al.) "Ability to work from home: evidence from two surveys and implications for the labor market in the COVID-19 pandemic" *Monthly Labor Review,* U.S. Department of Labor, Bureau of Labor Statistics, June 2020.
[14] U.S. Department of Labor, Bureau of Labor Statistics.

work requires extensive interaction with customers, such as retail sales, or with patients, such as health care and other direct services.

Table One: Estimated Ability to Work from Home, by Occupation

Occupations	Ability to Work From Home (%)
Management, business and financial occupations	86.6
Professional and related occupations	64.4
Service occupations	7.9
Sales and related occupations	31.9
Office and administrative support occupations	59.2
Farming, fishing, and forestry occupations	0
Construction and extraction occupations	0
Installation, maintenance, and repair occupations	1.0
Produciton occupations	0.4
Transportation and material moving occupations	0.3

Source: ATUS data. See Dey, et. al. (2020)

Occupation defines an employee's ability to work from home more so than industry. All industries contain a wide variety of occupations. Consequently, the average capacity of employees in each industry depends on that industry's distribution of occupations within its workforce. Table Two shows the estimated capacity of employees to work from home by industry, again calculated by Day, et. al. (2020) using data from 2017 and 2018. These estimates range from a high of almost 78% for financial activities companies to a low of 13% for leisure and hospitality companies.

Table Two: Estimated Ability to Work from Home, by Industry

Occupations	Ability to Work From Home (%)
Agriculture, forestry, fishing, and hunting	8.3
Mining, quarrying, and oil and gas extraction	55.9
Construction	17.3
Manufacturing	36.4
Wholesale and retail trade	26.9
Transportation and utilities	25.4
Information	71.2
Financial activities	77.9
Professional and business services	69.9
Education and health services	48.9
Leisure and hospitality	13.0
Other services	31.0
Public administration	65.2

Source: ATUS data. See Dey, et. al. (2020)

4. Estimating Municipal Wage Tax Base and Wage Tax Revenues According to Where Employees Work and Where they Reside for Municipalities in Ohio.

To create a model that can estimate net municipal wage tax revenues under different scenarios of working from home, we developed a method to estimate the total wage tax base for each municipality before the pandemic, and then segment that wage tax base into different categories based on where workers reside and where they work. Each city or village's wage tax base includes all employed workers in three broad categories. Category A includes employed residents who work outside their home municipality's boundaries. Category B includes employed residents who work inside their home municipality's borders. Category C includes all non-residents who work within each municipality's borders.

Those in Category A pay different levels of wage taxes to the municipalities where they work. Their wage tax liability to their home municipality, therefore, may vary according to how much they pay elsewhere and to their home municipality's tax credit and credit factor policies for the payments they made where they work. Those differences need to be included in the model. The wage tax liability for those in Category B and Category C is easier to estimate. Those workers pay the municipality's approved wage tax rate. The net wage tax base for each municipality, therefore, is the sum of the wage tax base that can be estimated for all employed people in all three categories.

As described above, Ohio's municipal wage tax rates are a complex matrix. State law allows Ohio's 642 cities and villages to assess different wage tax rates, but each city or village must use the same rate to tax the income of residents and the income of non-residents who work at locations within their borders. State law, however, also allows municipalities to offer different

types of tax credits, so net tax rates may vary. For example, many cities and villages offer tax credits to residents who are employed outside of their borders and who pay wage taxes to the municipalities where they work. Credit rates are complicated further by some municipalities that require credit rates to be adjusted further by credit factor percentages. The net effect of some tax credits can result in some residents owing no wage tax to their home city or village. Others provide only partial credit. State law also allows municipalities to offer wage tax credits when companies locate jobs within their borders as part of an economic development incentive package.

There is no single source of data for Ohio's municipal wage tax matrix. Ohio's Department of Taxation maintains a dataset of all municipal wage tax rates, but tax credits are not included. The Auditor for the City of Columbus maintains a dataset that includes most of the tax rates and tax credits offered by municipalities to their own residents who work outside their borders. Yet no agency maintains a publicly available listing of the net effects of tax agreements that are included in economic development incentive packages. To create a matrix of net wage tax rates for all possible municipality-to-municipality, live-work combinations across Ohio's 642 municipalities, therefore, the authors compiled data covering local income tax rates, credit rates, and credit factors from multiple sources: primarily from the Auditor for the City of Columbus, RITA, CCA, individual location websites, and the Ohio Department of Taxation. No attempt was made to estimate the effects of economic development packages.[15]

Once the matrix of tax rates was assembled, the next step was to develop a method to estimate the wage tax base prior to the pandemic for each of Ohio's 642 cities and villages. The geographic unit of analysis for each municipality is a mix of Census-designated geographies: places and county subdivisions. Places were used to get the proper geography for some villages and cities not included in the subdivision file, or that are split across county boundaries in the subdivision file. Subdivisions were used to identify places outside of the places file, such as townships and some villages / cities. Priority was given to the place geography. Any Census block without a place attached to it in the LODES crosswalk file (more on LODES below) is assigned to its county subdivision. An adjustment was made to the crosswalk file for Ohio's two different Oakwood villages (in Paudling County and Cuyahoga County) to prevent misidentification.

With geographies defined properly, the next step was to estimate the number of residents and non-resident workers in each municipality by industry. The data used to estimate employed workers by industry, and then divide them according to where those workers are employed, and where they reside is the 2018 Census LODES dataset.[16] The LODES data used represents

[15] The authors recommend that municipal officials adjust the estimates in this paper for their city or village's wage tax receipts when they know that their overall wage tax receipts are heavily affected by special provisions embedded in economic development agreements.

[16] U.S. Census Bureau, LEHD Origin-Destination Employment Statistics (LODES) Dataset Structure Format Version 7.5. LODES data for 2019 were not yet available at the time of the analysis.

Census block-level counts of all employed people who earn income that is recorded on IRS Forms W-2 or 1099. The LODES data are not generated by a survey. Rather, they are generated from full-count administrative records. The LODES data for each Census block come in three files: RAC (data on employed workers whose home address falls within the census block); WAC (data on employed persons whose principal place of work falls within the census block), and O-D (an origin-destination data matrix on all employed persons in the WAC/RAC files that identifies the home-block/work-block connections). For this analysis, all data were collapsed to the county subdivisions (primarily) or Census designated places (when those places are taxing entities and not already in the subdivision file) and consolidated across county boundaries. Census blocks that do not fall into an Ohio subdivision or place or classified as "out of state" or "other Ohio."

From the O-D files the count of non-resident employed workers and resident employed workers were calculated for every city and village. The O-D files don't provide job counts at detailed industrial level data. Industrial level employment data for each geography was joined from the WAC and RAC files to create an integrated table that contained city-to-city-level, within-city-level, and city-industrial-level data.

With this master table the count of outside workers within each city-city relationship was spread using the relative proportion of jobs per industry for the "home" city (h_geocode in the O-D and RAC files). Any industry that was missing from the "home" or "work" city or village was dropped and excluded from the relative proportion. (For example, if there were no agriculture workers in one or both municipalities, it made no sense to estimate agricultural commuters in those places.)

Mean wage data for each industry was taken from 2019 Occupational Employment and Wage Statistics (OES) for Ohio created by the U.S. Department of Labor's Bureau of Labor Statistics. OES data track wages by occupation and estimate mean wages by industry to reflect the degree to which the occupational distribution of employment in each industry varies by State. Mean wage data for each industry was then multiplied by the number of employed people in each industry in each of the three categories of workers whose wages are taxed by each of the 642 cities and villages: employed residents who work outside their home municipality, employed residents who work within their home municipality, and non-residents who work within each municipality.

For employed residents who work outside their home municipality the net home municipal tax rate was calculated using the following rules. When the product of the work location tax rate and the home credit factor is less than or equal to the home credit rate, then the product of the work tax rate and the home credit factor is subtracted from the home tax rate. When the product of the work location tax rate and the home credit factor is greater than the home credit rate, then the home credit rate is subtracted from the home tax rate. When the home

tax rate, home credit rate, or home credit factor is zero or blank, then the home tax rate is used.

Employed residents who work within their home municipality and non-residents who work within the municipality are added together. This avoids double counting those who live and work in the same municipality. Their wages are estimated using Ohio industry averages and their net tax rate is equal to the municipality's uniform wage tax rate. As discussed above, no adjustments are made to reflect specialized economic development tax credits that may exist for some municipalities.

5. Estimating Short-Term Impacts of Working from Home During the Pandemic Shutdown on Municipal Wage Taxes in Ohio in 2021.

As discussed above, the sudden imposition of stay-at-home orders during March 2020 led to a loss of almost 16% of all employment in the U.S. between April and June of that year. Although that was an unprecedented scale of job loss, it is remarkable that 84% of jobs were able to continue. This is accounted for in large part by the high percent of jobs that employees could continue to do from home, even though so few companies and so few employees had done so before the crisis.

The rapid shift of work from workplaces to homes was a major disruption that had many consequences. But for this paper, we focus on how that unexpected change disrupted the flow of wage tax revenues to Ohio's municipalities. The immediate effects in tax year 2020 were driven largely by short-term job losses since Ohio's legislature passed emergency legislation that allowed municipalities to keep wage taxes that were withheld from employees based on where they worked before the pandemic. But that policy ended at the beginning of 2021. Consequently, when employees begin filing municipal tax forms for 2021, they will be permitted to adjust their wage tax liabilities depending on where they worked if they worked at home.

It is not clear, however, how many taxpayers will file forms to adjust their 2021 wage tax liabilities. From an administrative perspective, the process is complex and potentially risky. State law allows employers to continue withholding taxes and remitting them to municipalities based on pre-pandemic work locations. Consequently, taxpayers who worked at home instead of their previous location need to file forms where they previously worked to request a refund if they fell into Category C before the pandemic. While working at home, however, they shifted into Category B. In most cases that gives them a new tax liability to their home municipality that they may not have had before if their home municipality previously awarded them tax credits for wage taxes paid elsewhere. Furthermore, that new tax liability would not be offset by any employer withholding. When they file 2021 tax forms the difference in their previous tax liability and their adjusted tax liability may still be worth pursuing. But in practical terms, many taxpayers may need to pay their new tax liability to their home municipality before they

are able to receive any refunds from taxes that were withheld by their employer(s) based on where they worked previously. In other words, many taxpayers could end up better off, but they need to float the difference in cash while their tax forms are processed.

Yet despite the administrative complexity, many employees may still seek to adjust their tax liabilities. Municipalities need to know the scale of revenue changes they could experience. To estimate the scale of potential short-term net changes in municipal tax receipts for each municipality in Ohio during tax year 2021, we started with data from 2019 as the base year. We divided each municipality's tax base by industry into the Categories A, B, and C. We then assumed that all employees who had the capacity to work at home during 2020 and 2021 did switch to working from home. We used estimates for each industry from Day, et. al. (2020). That redistributed each municipality's total 2018 wage tax base into different proportions across Categories A, B, and C. Those new proportions were then used to recalculate estimates for the 2019 municipal wage tax base using the estimates for working at home that occurred during the height of the workplace shut down orders. New estimates for tax receipts were then calculated using the complex matrix of net tax rates described in the previous section. Comparing the new estimates for tax year 2019 with the original estimates for tax year 2019 yielded an estimated maximum "worst case scenario" (or best case if working from home creates a net positive) of how the dramatic shift to working from home could, on net, proportionally alter each municipality's wage tax revenues.

The proportion of that "worse case" or "best case" scenario that occurs in reality for 2021 will depend on two additional parameters. The first is the overall change in employment in Categories A, B, and C in each municipality. Reliable data at the municipal level for employment changes during pandemic-fed 2020 recession and the rapid 2021 economic job rebound are not yet available. The second parameter is the proportion of workers in each segment of Categories A, B, and C who could realize enough net difference to motivate them to seek adjustments on their tax forms, even if they need to finance the short-term cash flow themselves. Reliable data on this parameter is also not yet available.

Consequently, Table Three presents data in the far right column that estimates the maximum refund liability that municipalities could face for tax year 2021 based on three assumptions. First, if 2021 employment levels matched the pre-pandemic 2019 employment levels. Second, if all those who could work at home during 2021 did work at home. And third, if all who worked at home during 2021 seek a full adjustment of their municipal wage tax liabilities.

Table Three: Largest 30 Ohio Municipalities, by Size of Wage Tax Base

Municipality	2019 Wage Tax Revenue	Estimated Maximum Refund Liability if All 2021 Home Workers Pay Wage Tax to Home City While Working At Home (2)
Columbus city, OH	948,106,000	(156,620,099)
Cleveland city, OH	441,753,856	(94,629,978)
Cincinnati city, OH	417,086,000	(101,634,738)
Toledo city, OH	189,434,000	(20,178,229)
Akron city, OH	167,479,460	(24,603,701)
Dayton city, OH	133,573,282	(29,421,589)
Dublin city, OH	91,709,730	(24,852,528)
Canton city, OH	62,602,915	(10,382,632)
Parma city, OH	31,180,091	1,753,061
Westerville city, OH	48,832,792	(14,113,623)
West Chester township (Butler, OH) (3)	-	0
Kettering city, OH	51,507,371	(9,179,118)
Mentor city, OH	45,616,221	(4,839,780)
Fairfield city, OH	30,571,598	(5,652,608)
Jackson township (Stark, OH) (3)	-	0
Gahanna city, OH	23,727,439	(5,599,120)
Westlake city, OH	32,525,899	(7,000,727)
Youngstown city, OH	42,012,940	(8,030,351)
Springfield city, OH	41,046,500	(6,746,724)
Elyria city, OH	33,791,684	(2,925,766)
Blue Ash city, OH	34,494,737	(12,637,003)
Strongsville city, OH	37,780,744	(1,494,999)
Grove City city, OH	26,443,162	(4,178,558)
Beavercreek city, OH (3)	-	0
Cuyahoga Falls city, OH	23,788,787	499,213
Findlay city, OH	24,096,233	(4,399,353)
Solon city, OH	43,226,393	(8,694,287)
Hamilton city, OH	28,672,605	(2,131,724)
Newark city, OH	24,146,929	(3,788,194)
Hilliard city, OH	29,833,908	(4,958,737)
Total of Largest 30	3,105,041,276	(566,441,891)

Notes:

(1) Assumes that Post-pandemic pattern of working from home adjusts to 20% of work time.

(2) Assumes that all who can work at home do work at home from January-June 2021. Half of the work time for those workers remains at home between July-Dec 2021.

(3) No income tax.

6. Estimating Longer-Term Impacts of Working from Home After the Pandemic on Municipal Wage Taxes in Ohio, Year 2022 and Beyond.

The model used to estimate the short-term effects of working from home during the pandemic on wage tax revenues in tax year 2021 can be used to examine the potential consequences of permanent growth in working from home after the pandemic recedes. Major shocks to any system are short-term events. But once a shock occurs, few systems ever return to their pre-

shock condition. System shocks tend to alter the course of any system's evolution in new directions. The pandemic-driven workplace shutdowns of 2020 and the volatile labor market experiences of 2020 and 2021 likely set in motion many long-term changes in the social, political, and economic context in which social relationships and policies related to work, including wage tax policies, are made in Ohio as well as throughout the world. But policy changes do not happen overnight, and people do not change their place of residence quickly in response to changes in their place of work, at least not within the same general regional commuting shed. In addition, companies do not change the location of their workplaces quickly. Consequently, if we assume that most municipalities will retain their current wage tax policies for at least the next several years, most employees will retain their home addresses, and most companies will maintain their principal workplaces, even if they have more employees working from home, we can estimate the likely effects of more working from home on municipal wage tax receipts.

The most important parameter that we do not know, however, is how many companies and employees will continue the current experiment with widespread working from home once the pandemic recedes. The model includes the estimates from Day, et. al. (2020) about how many employees in different industries have the capacity to work at home. The model's estimates for 2021 assumed that all those who could work from home were doing so, since the incentive to work from home had never been so great. Therefore, the model allows us to develop reasonable estimates for different scenarios for 2022 and subsequent years by varying the proportion of employees who take advantage of their capabilities to work from home. Table Six presents the estimates for three different scenarios.

The first scenario assumes that 20% of each industry's workforce that has the capacity to work from home continues to work from home on a permanent basis. That scenario could emerge in different ways. The most straightforward would be if 20% of the number of employees in that category keep working from home 100% of their work time. But the overall 20% scenario could also include a wide range of different circumstances. For example, if all employees who could work from home did that one day a week on average, the overall result would still be 20%. The second scenario uses the same bundle of possibilities, but it achieves an overall result of 50% of time spent working from home. The third scenario provides the maximum estimate of 100% take up in working from home. Table Four presents the net percentage change in wage tax revenues from the three scenarios, and it translates the 20% scenario into dollar estimates.

Table Four: Largest 30 Municipalies by Size of Income Tax Base					
					Potential Long-Term Change
Municipality	20% Scenario	50% Scenario	100% Scenario	2019 Wage Tax Revenue	Estimated Long-term Annual Change in Wage Tax - 20% Scenario (1)
Columbus city, OH	-4.41%	-11.01%	-22.03%	948,106,000	(41,765,360)
Cleveland city, OH	-5.71%	-14.28%	-28.56%	441,753,856	(25,234,661)
Cincinnati city, OH	-6.50%	-16.25%	-32.49%	417,086,000	(27,102,597)
Toledo city, OH	-2.84%	-7.10%	-14.20%	189,434,000	(5,380,861)
Akron city, OH	-3.92%	-9.79%	-19.59%	167,479,460	(6,560,987)
Dayton city, OH	-5.87%	-14.68%	-29.37%	133,573,282	(7,845,757)
Dublin city, OH	-7.23%	-18.07%	-36.13%	91,709,730	(6,627,341)
Canton city, OH	-4.42%	-11.06%	-22.11%	62,602,915	(2,768,702)
Parma city, OH	1.50%	3.75%	7.50%	31,180,091	467,483
Westerville city, OH	-7.71%	-19.27%	-38.54%	48,832,792	(3,763,633)
West Chester township (Butler, OH) (3)	NA	NA	NA	-	-
Kettering city, OH	-4.75%	-11.88%	-23.76%	51,507,371	(2,447,765)
Mentor city, OH	-2.83%	-7.07%	-14.15%	45,616,221	(1,290,608)
Fairfield city, OH	-4.93%	-12.33%	-24.65%	30,571,598	(1,507,362)
Jackson township (Stark, OH) (3)	NA	NA	NA	-	-
Gahanna city, OH	-6.29%	-15.73%	-31.46%	23,727,439	(1,493,099)
Westlake city, OH	-5.74%	-14.35%	-28.70%	32,525,899	(1,866,860)
Youngstown city, OH	-5.10%	-12.74%	-25.49%	42,012,940	(2,141,427)
Springfield city, OH	-4.38%	-10.96%	-21.92%	41,046,500	(1,799,126)
Elyria city, OH	-2.31%	-5.77%	-11.54%	33,791,684	(780,204)
Blue Ash city, OH	-9.77%	-24.42%	-48.85%	34,494,737	(3,369,867)
Strongsville city, OH	-1.06%	-2.64%	-5.28%	37,780,744	(398,666)
Grove City city, OH	-4.21%	-10.53%	-21.07%	26,443,162	(1,114,282)
Beavercreek city, OH (3)	NA	NA	NA	-	-
Cuyahoga Falls city, OH	0.56%	1.40%	2.80%	23,788,787	133,124
Findlay city, OH	-4.87%	-12.17%	-24.34%	24,096,233	(1,173,161)
Solon city, OH	-5.36%	-13.41%	-26.82%	43,226,393	(2,318,476)
Hamilton city, OH	-1.98%	-4.96%	-9.91%	28,672,605	(568,460)
Newark city, OH	-4.18%	-10.46%	-20.92%	24,146,929	(1,010,185)
Hilliard city, OH	-4.43%	-11.08%	-22.16%	29,833,908	(1,322,330)
Total of Largest 30				3,105,041,276	(151,051,171)
Notes:					
(1) Assumes that Post-pandemic pattern of working from home adjusts to 20% of work time.					
(2) Assumes that all who can work at home do work at home from January-June 2021. Half of the work time for those workers remains at home between July-Dec 2021.					
(3) No income tax.					

7. Discussion and Summary.

Ohio's municipalities -- cities and villages -- are unusually dependent on wage tax revenues to fund the delivery of core services to residents and businesses within their boundaries. The unexpected COVID-19 pandemic has caused two major disruptions to the normal flow of wage tax revenues to these units of local government. The first disruption was the initial drop in employment caused by the emergency stay-at-home orders. This lost source of revenue is beginning to recover as overall employment levels rebound.

Yet the second cause of lost revenue has more serious long-term consequences for Ohio's current system of local governmental finance. Municipalities tax wages that are earned by their own residents and wages that are earned by non-residents who work within their borders. There is strong evidence that the pandemic has caused a major long-term increase in the number of Ohio workers in many different industries who will work from home on a permanent basis, either full-time or partially. The net effect of increased working from home changes the wage tax base for municipalities.

The municipalities that are most likely to lose large amounts of wage tax revenue are those that contain major job centers that attract large numbers of inbound commuters who live in other municipalities. This includes big cities with traditional downtowns and suburban municipalities with large office parks and industrial parks. Data in Table Four estimate that Ohio's three largest cities -- Columbus, Cleveland, and Cincinnati, -- could lose about $94 million in annual wage tax revenue if 20 percent of those workers who were working from home during the height of the pandemic continued to work from home on a permanent basis once overall employment levels return to pre-pandemic levels. That amount would increase to about $235 million annually if approximately half of those workers continued working from home permanently. Those estimates represent a range of 5.2% to 13% of the wage tax revenues received by those three cities in 2019, just prior to the pandemic.

Although the range of potential income losses may seem manageable at first on an annual basis, the accumulated effects of this scale of tax revenue loss will compound from year to year. The consequences will become more apparent each year, especially since the current influx of ARPA funds from the Federal government will fade quickly.

In addition, if the pandemic has indeed accelerated the long-term shift toward more and more working from home, the current revenue system for municipalities in Ohio may create new and unintended incentives for companies and workers to begin shifting activities away from incorporated cities and villages and into townships. Townships in Ohio are not permitted to enact wage taxes on income earned by either residents or non-residents. Ohio's municipal tax system is a complex set of interconnected policies. It is difficult to predict how behaviors will adapt to unexpected, large-scale change.