
**The Social and Economic Costs of Illegal Misclassification, Wage Theft and
Tax Fraud in Residential Construction in Massachusetts**

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APPENDICES

APPENDIX A: ESTIMATING THE NUMBER OF WORKERS AFFECTED BY WAGE AND TAX FRAUD IN THE MASSACHUSETTS CONSTRUCTION INDUSTRY

Introduction

Estimating the number of misclassified independent contractors and off-the-books workers in the construction industry has been a focus of researchers over the last 20 years. But while scholars have used state UI audits as the best *direct* measure of worker misclassification, there are many reasons to suspect that audits underrepresent the rate of illegality. As highlighted in the report, state UI audits do not directly audit labor brokers, are likely to not detect many instances of cash-only payments, and disproportionately exclude small businesses given their ability to evade state auditors. Other government data sources feature similar limitations; after all, contractors and workers often go to great lengths to conceal evidence of illegality from government regulators and data collectors. To make matters worse for researchers, nationally-representative worker surveys—which are the bedrock of most labor market analyses in the United States—do not ask about the legality of workers’ employment situations. Given these data limitations, scholars are unable to assess the extent of worker misclassification using *direct* evidence.¹

To resolve these issues, scholars have developed an *indirect* empirical approach to estimate the incidence of wage and tax fraud; variants of this methodology have been featured in every known study of the topic in the last two decades. The foundation of this approach is a comparison between the aggregated results of worker surveys and that of UI payroll records. In effect, researchers have discovered that the number of workers who self-identify as working in the construction industry on Census surveys (i.e., *total employment*) far exceeds the number of workers employed by tax-paying construction employers as found in UI payroll records (i.e., *legal wage-and-salary employment*). Although this gap also includes some legitimate self-employed contractors, this difference captures a substantial number of misclassified independent contractors and off-the-books workers.

While this perspective has been foundational to numerous public policy papers on the underground construction economy, this view has been validated by work in academic journals. Most prominently, a 2013 article in the prestigious *Journal of Labor Economics* strongly advocated that workers who appear in nationally-representative surveys but fail to appear as employees in tax filings are quite likely to be misclassified independent

¹ In addition to state UI audit studies, the best source of direct evidence of wage and tax fraud has resulted from surveys of workers *on jobsites*. The most prominent studies have been published by the Workers Defense Project, whose on-site surveys revealed rates of worker misclassification—including off-the-books workers—of 38% in Texas and 41% in six Southern Cities (Workers Defense Project, 2009, 2013). While these types of studies offer the most direct evidence of widespread illegality, there are two concerns that undermine on-site surveys as viable options for organizations and researchers interested in assessing illegality. First, one cannot be sure that the samples are representative of the broader industry labor force, meaning that the results may or may not accurately reflect the true rate of illegality in the industry. Second, engaging in surveys featuring a sufficient number of workers typically requires a substantial amount of resources that is prohibitive for some researchers and their affiliated organizations.

contractors or workers engaged in a cash-only employment relationship.² Further, a 2012 article in *Industrial Relations* used the methodology advanced in those public policy papers—the aggregate difference between Census surveys of workers and UI records—as a means of estimating the number of informal laborers by industry.³ In sum, this indirect empirical methodology has been developed and applied by scholars as an appropriate means of estimating the scope of payroll fraud on a regional and national basis.

While a statistical comparison of worker surveys and UI records on the aggregate has emerged as the primary method of projecting payroll fraud in construction, there remains one empirical problem for which there has yet to be consensus. As mentioned above, the gap between *total employment* (i.e., workers self-reporting their industry) and *legal wage-and-salary employment* (i.e., UI records) features both legitimate, tax-paying self-employed workers and those engaged in payroll fraud. But distinguishing between these two groups—on an aggregate basis—has proved difficult. Multiple studies have recommended different ways of delineating rates of illegality in this group; a full review of those approaches is presented in a 2020 study published by the Institute for Construction Economic Research (ICERES) and co-written by two of the authors of the current report.⁴

To resolve this empirical uncertainty, the authors of this study apply—and further refine—the statistical approach advanced in that 2020 ICERES report. While the authors of the current study believe that this methodology is the best available approach of delineating the degree of illegality in the underground economy at this time, it is acknowledged that there is a nontrivial margin of error in these estimates given the problem of disaggregating legal from illegal self-employment in the data and other concerns of using survey data. This is true in all prior studies on this topic and should not be unexpected in the current report; after all, the authors have effectively been tasked with quantifying the extent of something that employers (and many workers) are actively trying to conceal.

Methodology & Results

The first step in this analysis uses the 2019 American Community Survey (ACS) to establish the *total* number of people working in Massachusetts' construction industry. Administered by the Bureau of the Census, the ACS is a foundational tool of economists studying the labor market as it represents the largest annual household survey in the United States; in 2019, the ACS featured survey data from over two million households across the country, including 37,842 in Massachusetts.⁵ While the results taken from any subset of a population is subject

² Abraham, Katharine G., John Haltiwanger, Kristin Sandusky, and James R. Speltzer. 2013. "Exploring Differences in Employment Between Household and Establishment Data," *Journal of Labor Economics*, 31(S1), S129-S172.

³ Bohn, Sarah, and Emily Greene Owens. 2012. "Immigration and Informal Labor," *Industrial Relations*, 51(4), 845-873.

⁴ Ormiston, Russell, Dale Belman, and Mark Erlich. 2020. An Empirical Methodology to Estimate the Incidence and Costs of Payroll Fraud in the Construction Industry. Accessed at: <http://icer.es.org/wp-content/uploads/2020/06/ICERES-Methodology-for-Wage-and-Tax-Fraud.pdf>.

⁵ The Census conducted 2.06 million interviews while contacting 3.54 million households for the 2019 American Community Survey. For year-over-year data on the number of addresses selected and interviews

to sampling error (i.e., meaning the sample is not entirely representative of the population), the sheer volume of respondents in the ACS minimizes these concerns; in sum, the ACS is considered a “gold standard” data source that scholars and economists routinely use to project labor-market trends in the population.

The results of the 2019 ACS offer estimates suggesting that there were 218,644 Massachusetts residents who self-reported to working in the construction industry.⁶ But this is only the starting point of the analysis, as a number of adjustments must be made in order to fully reflect total construction employment in the Commonwealth; these adjustments are presented in Table A1. First, the ACS only queries individuals about their primary job, meaning that this number ignores anyone whose second job is in the construction industry. Fortunately, another “gold standard” labor survey—the Current Population Survey (CPS), a monthly survey administered by the Census and the Bureau of Labor Statistics—does ask respondents about their second job. On a national basis, the CPS suggests that including workers’ second jobs would increase total construction employment by 1.99%; this equates to an additional 4,356 construction jobs in Massachusetts.⁷

Table A1. Estimating Total Construction Employment in Massachusetts, 2019

<i>Massachusetts Residents</i>		
Total Construction Employment (2019 ACS)		218,644
Number of Second Jobs in Construction (estimate)		4,356
<i>Inflow & Outflow of Workers (2019 ACS)</i>		
Residents from Other States Working in MA	16,264	
MA Residents Working in Other States	<u>8,012</u>	
Net Inflow/Outflow of Workers into/out of MA		8,252
<i>Unauthorized Immigrant Underreporting</i>		
MA Immigrant Population (2019 ACS)	1,190,192	
ACS Estimated Undercount (Pew)	2.00%	
% of MA Non-Citizens in Construction (2019 ACS)	<u>6.09%</u>	
Adjustment for Immigrant Undercounting		1,450
Total Construction Employment in Massachusetts		<u>232,702</u>

conducted by the Census, see: <https://www.census.gov/acs/www/methodology/sample-size-and-data-quality/sample-size/index.php>

⁶ The number of Massachusetts residents working in each industry in 2019 can be found here: <https://data.census.gov/cedsci/table?t=Class%20of%20Worker%3AIndustry&g=0400000US25&tid=ACSST1Y2019.S2407&moe=false&hidePreview=true>.

⁷ The full estimate (1.99244%) of second-job holding in construction is drawn from a national perspective given that the sample size of Massachusetts construction workers in the CPS is deemed by the authors to be insufficient as a means of predicting a stable rate of second-job holding in the Commonwealth on a year-to-year basis.

A second adjustment occurs because this study's focus is on the construction industry *in Massachusetts*. The results presented in the American Community Survey are based on workers' state of *residence* and not their state of *employment*. As a result, the initial total of industry employment will include Massachusetts residents working in other states while ignoring out-of-state residents who are working in the Commonwealth. Fortunately, the ACS microdata has information on workers' state of employment, allowing researchers to capture the net flow workers into or out of a state by industry. An analysis of the 2019 ACS microdata revealed that an estimated 16,264 construction workers in Massachusetts are out-of-residents. Meanwhile, the results indicate that there were 8,012 Massachusetts residents who are working in construction jobs in other states. On net, that means that total construction employment in Massachusetts needs to be increased by 8,252 to account for the net inflow of out-of-state residents.

Finally, while the ACS is considered the "gold standard" among labor economists, it is not perfect. The Census does an extensive amount of work trying to ensure that the ACS is nationally representative of the population, including authorized and unauthorized immigrants. However, research by the Pew Research Center has suggested that these surveys have been historically undercounting the number of unauthorized immigrants in a region; their most recent estimates suggest that the immigrant population is 2% to 3% higher after adjusting for this undercount.⁸ Factoring this into the analysis is particularly important in construction given the high degree of immigrant laborers in the sector.⁹ Data from the ACS reveals an initial immigration population estimate of 1,190,192; conservatively projecting a 2% undercount and multiplying by 6.09%—the proportion of foreign-born, non-citizens who work in construction in Massachusetts as offered in the 2019 ACS microdata—this equates to an estimated 1,450 additional construction workers who were previously uncounted in the data.¹⁰

After incorporating all of these adjustments, Table A1 projects that *total construction employment* in Massachusetts amounted to 232,702 jobs in 2019. But as a reminder, not all of these jobs necessarily represented legal employment relationships. To determine how many these were *legal wage-and-salary jobs*, this study incorporates data from employer

⁸ For a full conversation on the undercounting of unauthorized immigrants in the ACS and CPS, see: <https://www.pewresearch.org/hispanic/2018/11/27/unauthorized-immigration-estimate-methodology/>

⁹ According to the research from the Pew Research Center, the construction industry features the second-highest rate of employment of unauthorized immigrant laborers, behind only agriculture. For more, see: <https://www.pewresearch.org/hispanic/2018/11/27/unauthorized-immigrant-workforce-is-smaller-but-with-more-women/>

¹⁰ The 6.09% employment rate comes from the authors' analysis of 2019 ACS microdata and represents the proportion of foreign-born non-citizens living in Massachusetts who work in the construction industry. The 1,450 estimate is derived by multiplying the estimated number of immigrants in the Commonwealth (1,190,192) by the undercount rate (2%) and the proportion of similar residents in construction (6.09%). As a reminder, the 1,450 value is only the amount projected to be *undercounted* and thus represents a fraction of all unauthorized immigrant laborers in Massachusetts' construction sector. Data on the number of immigrants in Massachusetts is found here:

<https://data.census.gov/cedsci/table?q=immigrants&g=0400000US25&tid=ACSDP1Y2019.DP02&hidePreview=true>

payroll records submitted to the Massachusetts Department of Unemployment Assistance (DUA). As part of the required federal oversight of state unemployment insurance (UI) programs, the states provide the U.S. Department of Labor with its UI records; the DOL aggregates payroll records and publishes industry totals by state via its Quarterly Census of Employment and Wages.¹¹ In Massachusetts, this information is also augmented to include public-sector jobs and is published directly by the DUA through the state government’s Labor Market Information portal.¹²

To those ends, the Massachusetts Department of Unemployment Assistance reports that there were 174,489 legal wage-and-salary jobs among Massachusetts construction employers in 2019. But this does not account for all *legal* wage-and-salary jobs in the construction industry, as that total must be augmented by construction jobs provided by temporary staffing agencies.¹³ Data from the Bureau of Labor Statistics reveal that Massachusetts employment agencies had 840 construction workers on their payroll as of May 2019.¹⁴ Adding this to the payroll total, this means that there were an estimated 175,329 legal wage-and-salary jobs in the Massachusetts construction industry in 2019.

As expected, the estimate for *total* construction jobs (232,702) in the Commonwealth far exceeds those on employers’ official payrolls (175,329); in sum, there appear to be 57,373 construction jobs unaccounted for on employers’ payrolls.¹⁵ This differential, however,

¹¹ To examine employer payroll records using the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) program, see the QCEW Data Viewer at: https://data.bls.gov/cew/apps/data_views/data_views.htm

¹² For more, see: <https://lmi.dua.eol.mass.gov/LMI/EmploymentAndWages>.

¹³ This step is necessary because household surveys ask workers to identify the industry in which they make the most money; from the authors’ analysis of worker responses to that question, it is suspected that many temp workers in construction occupations identify themselves as working in the construction industry and not the employment staffing industry.

¹⁴ Data from the BLS does not offer information on the destination industry of workers employed by staffing agencies, so the authors are using the number employed in construction *occupations* as the best proxy for that value. There would seem to be some margin for error around this number (840), as it could be that construction industry employers could be using staffing agencies to help in their front office; this would mean that 840 is too low. On the other hand, those in construction occupations could be working in other industries, meaning that 840 could be too high. Given uncertainties surrounding this issue, the authors decided to stick with 840 as the best approximation. For more on occupational totals within the employment agency industry, see: https://www.bls.gov/oes/current/oes_research_estimates.htm.

¹⁵ Using the difference between worker surveys and payroll records to assess the number of jobs unaccounted for within a specific *industry* relies on the critical assumption that the industry codes (a) are 100% compatible across data sources and (b) are identified and coded correctly on surveys and payroll records. In terms of the former, these concerns are minimized—if not entirely erased—given that “construction” is a distinct industry code in both worker surveys and payroll records, producing a one-to-one connection between the industry code of the ACS (Census=770) and that used in payroll records (NAICS=23). Things are less certain for the second issue, as there is research identifying that it is not uncommon for workers’ occupations to be miscoded on surveys; we presume similar findings may occur for workers’ industries. Similarly, our conversations with DOR representatives in the course of this research revealed that employers’ industry classifications may evolve over time without the companies updating their industry code from their initial time of registration with the state; further, it is possible that construction employers may be strategic in how they classify their industry code on state and federal forms. While these issues are likely to affect the employment estimates in some way, there are no known credible assessments of the net effect in construction. As a result, we assume the net effect

includes *both* legitimate self-employed contractors *and* workers engaged in fraudulent employment relationships. As highlighted earlier, there is no clear consensus in the research on how to best divide these 57,373 jobs into *legal* and *fraudulent* categories. While a number of studies have offered different approaches—the pros and cons of which are presented in the 2020 ICERES study—the overarching concern of many of these previously-explored methods is that substantially undercount the extent of illegal employment in the industry. As a result, this report utilizes the methodology developed in the 2020 ICERES report: the use of estimated income underreporting rates by self-employed construction workers as published in reports by the Internal Revenue Service and in academic journal articles featuring IRS-sponsored research.

The authors of the 2020 ICERES study contended that income underreporting rates represent the best *available* proxy for the degree of illegality among self-employed construction workers. While that study provides more background and justification, the logic is that worker misclassification and off-the-books arrangements are, for the most part, efforts on the part of employers to conceal payments to workers and evade taxes due to the government. To be clear, the decision to report—or not report—income on tax returns is the responsibility of the worker. But employers who rely on cash-only payments—without tax documentation—effectively open the door for income underreporting.

The methodology developed in the 2020 ICERES study purports that between 38.6% and 64.0% of the gap between *total employment* and *legal wage-and-salary employment* represents the number of jobs affected by payroll fraud. These proposed minimum and maximum rates were established following the authors' analyses of IRS-sponsored research on income underreporting, and were validated against the limited *direct* evidence of payroll fraud available to researchers (e.g., UI audit studies).¹⁶ Applying these thresholds to the 57,373 jobs identified in this study, this suggests that there were between 22,146 and 36,719

is zero and that the data utilized in this study are accurate, a presumption bolstered by the fact that the data sets are extracted from two government agencies—the Census Bureau and the Bureau of Labor Statistics—that represent the gold standard for large-scale data collection in the United States.

¹⁶ While the 2020 ICERES study offers considerable more detail, the minimum rate was established by the authors' analysis of a 2016 article in the academic journal *Public Budgeting & Finance* that found that self-employed construction workers substantially underreported their income on tax forms when compared to their answers on national surveys; the article also showed that a substantial amount of self-employment income by construction workers was incorrectly submitted to the IRS as wage-and-salary income, further highlight potential payroll fraud in the sector. Meanwhile, the maximum rate was established via a 2016 IRS study demonstrating that 64% of self-employment—across the entire economy—was not reported on tax forms. To be clear, the 2020 ICERES study also identified possible rates between these two extremes and also explored rates less than 38.6%, however these were discarded after it was shown that the results were inconsistent with the *known* data points on payroll fraud from state UI audits and public policy papers that surveyed small numbers of workers. For more, see: Ormiston, Russell, Dale Belman, and Mark Erlich. 2020. "An Empirical Methodology to Estimate the Incidence and Costs of Payroll Fraud in the Construction Industry."; Alm, James, and Brian Erard. 2016. "Using Public Information to Estimate Self-Employment Earnings of Informal Suppliers," *Public Budgeting & Finance*, 36(1), 22-46; Internal Revenue Service. 2016. "Federal Tax Compliance Research: Tax Gap Estimates for Tax Years 2008-2010." IRS Publication 1415.

construction jobs in Massachusetts that were structured fraudulently in 2019, either through the misclassification of independent contractors or via cash-only work arrangements.¹⁷

Validating the Results

When compared to total employment in Massachusetts' construction industry in 2019, these results indicate that between 9.5% and 15.8% of the construction workforce in Massachusetts is affected by wage and tax fraud. These results are consistent with other data points on worker misclassification, and may actually be conservative. First, industry-wide results are comparable to studies using similar empirical methodologies in other states, including New Jersey (16%), California (16%) and Tennessee (11%-21%); they are also consistent with the national estimates (12.4%-20.5%) offered in the 2020 ICERES study.¹⁸ Second, the ACS indicates that 17.4% of construction workers in the Commonwealth are "self-employed and not incorporated"; this group is likely to predominantly include misclassified independent contractors and off-the-books workers.

Another way to consider the viability of these estimates is to consider that while there were 57,373 construction jobs unaccounted for in Massachusetts, state data reflects that there were 21,389 construction employers in the Commonwealth in 2019. If the principal of each company is considered to be *legally* self-employed, then 35,984 jobs remain unaccounted for; this value is nearly identical to the maximum number expressed above. Given that the industry also has a number of legitimate self-employed tradespeople and sole proprietors, the established range—22,146 to 36,719 workers affected by wage and tax fraud—seems consistent with expectations.

A fourth set of data points on payroll fraud comes from surveys of workers *on construction sites*; these studies are often conducted in areas known to be rife with payroll fraud and their methodologies typically suffer from concerns about sample size and the representativeness of the sample of workers surveyed. Their results are nevertheless stunning. In a series of studies undertaken in Texas and in six Southern cities in the last 15 years, rates of illegality in workers' employment relationships ranged between 32% and 41%.¹⁹ More recently, a

¹⁷ The use of 38.6% as a minimum threshold of income underreporting is supported by data on 1099-MISC filings in Massachusetts that is discussed in Appendix B; in sum, data from the Massachusetts Department of Revenue reflects that 32% of non-employee compensation listed on 1099-MISC forms in the state's construction industry is never reported by workers on income tax returns filed with the DOR. Given that off-the-books payments are likely to exhibit much worse rates of income tax reporting, the use of 38.6% would seem to be consistent with the concept of a baseline minimum income underreporting rate across all workers in the state's construction sector.

¹⁸ For more, see: Cooke, Oliver, Deborah Figart, and John Froonjian. 2016. "The Underground Construction Economy in New Jersey"; Liu, Yvonne Yen, Daniel Flaming, and Patrick Burns. 2014. "Sinking Underground: The Growing Informal Economy in California Construction"; Canak, William, and Randall Adams. 2010. "Misclassified Construction Employees in Tennessee."

¹⁹ While rates in Massachusetts are estimated to be lower than the national average, this is consistent with limited survey data showing that payroll fraud is especially rampant in the Southern part of the United States. For more, see: Workers Defense Project. 2013. "Building a Better Texas: Construction Conditions in the Lone Star State"; Workers Defense Project. 2009. "Building Austin, Building Injustice"; Theodore, Nik, Bethany

forthcoming study to be published by the Catholic Labor Network surveyed 79 workers at 24 commercial construction sites in Washington, D.C., and discovered nearly half (47%) were a part of the underground construction economy.²⁰ Taken together, the triangulation of these data points suggests that estimated rates of worker misclassification between 9.5% and 15.8% in Massachusetts may not only be reasonable, but may in fact be conservative.

As a final means of validating the results in this section, results of DUA audits in the main part of this study identified between 11,593 and 13,496 workers misclassified among Massachusetts construction firms in 2017-19. While these results are lower than offered by the indirect method (22,146 to 36,719 workers), this is not unexpected for reasons outlined in the main part of this report.²¹ First, DUA audits do not include labor brokers, contractors without employees, and any other employers who are not in the DUA database. Second, DUA audits are disproportionately completed among the industry's largest employers. As highlighted in the main text, small employers are more difficult to locate and often do whatever possible to evade DUA auditors—likely in efforts to conceal illegality—meaning that the DUA estimates above are likely undercounting the number of workers affected by payroll fraud. Finally, conversations with DUA representatives note that identifying misclassified independent contractors is typically substantially easier than detecting off-the-books employment, meaning that an unknown number of workers engaged in cash-only jobs are likely to go undetected in the audit process. Considering that some researchers have suggested that off-the-books employment is far more expansive than the number of misclassified independent contractors using 1099-MISCs—a conclusion that has been echoed by the authors' many conversations with industry stakeholders in Massachusetts and across the country—it is not surprising that there is a substantial gap between the total number of workers identified by the DUA and the results of the indirect method.²²

Before concluding, this study has been primarily focused on wage and tax fraud amongst blue-collar tradespeople. However, it is important to acknowledge that the estimated rates of 9.5% and 15.8% are established as a proportion of *all* employment in the construction industry.²³ But sector employment is comprised of *both* blue-collar tradespeople and white-collar office staff (e.g., salespeople, clericals, engineers). While it is undoubted that payroll fraud occurs with both sets of employees, it is likely that illegality is far more prevalent in

Boggess, Jackie Cornejo, and Emily Timm. 2017. "Build a Better South: Construction Working Conditions in the Southern U.S."

²⁰ For more, see; Sinai, Clayton and Ernesto Galeas. *Forthcoming*. "The Underground Economy and Wage Theft in Washington, D.C.'s Commercial Construction Sector." Catholic Labor Network.

²¹ The data that comprise the foundation of the indirect statistical method—the worker surveys from the American Community Survey (Census) and UI payroll records from the Massachusetts Department of Labor—are both based on worker employment at a specific moment in time. Meanwhile, UI audits may examine employment records over a longer time horizon, especially if there is evidence of misclassification. Especially given that some employment relationships in the construction industry are short-term, it is likely that the UI audits are identifying more cases than would be recognized in the ACS/BEA analysis.

²² As an example of a study offering a statistical case that off-the-books employment is far more extensive than the number of misclassified independent contractors, see: Liu, Yvonne Yen, Daniel Flaming, and Patrick Burns. 2014. "Sinking Underground: The Growing Informal Economy in California Construction." <https://economicrt.org/publication/sinking-underground>.

²³ This assumes that 95% of workers affected by payroll fraud in the construction industry are tradespeople.

the employment of blue-collar workers. As such, these industry-wide rates are likely to appear to undercount the prevalence of fraud among tradespeople.

Given the lack of data comparing blue-collar vs. white-collar payroll fraud in the construction sector, this study proposes two empirical steps to develop a rough estimate of the proportion of payroll fraud among tradespeople. First, the Bureau of Labor Statistics suggests that 25.75% of construction employment in Massachusetts in 2019 came from non-production occupations (i.e., non-tradespeople).²⁴ Applying this rate to the BEA estimate of *total employment* (175,329), this implies that there were 45,141 legal wage-and-salary white-collar employees in the sector; for calculating a blue-collar rate of illegality, these jobs are removed from consideration (both the numerator and denominator). Second, in the absence of data to guide the process, the authors assume that 95% of the difference between total employment and legal wage-and-salary employment is comprised of blue-collar tradespeople (i.e., 19 off-the-books tradespeople for every one off-the-books white-collar staff member). Putting this all together, the resulting rate of wage and tax fraud for blue-collar workers in the construction industry would rise to an estimated 11.3% to 18.8%.²⁵

Discussion

The authors advocate that the empirical approach described above is the best *available* methodology to indirectly estimate the incidence of payroll fraud in the construction industry. But this method is far from perfect. Even the 2020 ICERES study that first developed this approach deemed it a “blunt instrument.” None of this is unexpected; after all, it is reminded that the task at hand was to estimate the scope of underground activity for which direct evidence is expressly hidden by both employers and employees. As a result, any study that attempts to estimate payroll fraud using only publicly-available data will feature a considerable margin of error. This report is no different.

All that said, there are a number of methodological reasons that imply that the estimated rates of payroll fraud produced by this indirect method are likely *undercounting* the true degree of illegality in the industry. The authors of this report acknowledge these issues, however do not make any further adjustments to the projections. This is primarily because the authors appreciate the gravity of the conclusions offered in this study—widespread illegality—and seek to adhere to conservative assumptions and projections in the face of statistical uncertainty and without direct evidence.

²⁴ For the occupational breakdown of the Massachusetts construction industry, see the Occupational Employment Statistics series of the BLS at: https://www.bls.gov/oes/2019/may/oes_research_estimates.htm.

²⁵ To demonstrate how the authors reached this number, start with *total employment* (232,702) and *legal wage-and-salary employment* (175,329) and subtract off the estimated number of legal white-collar jobs (45,141) from both numbers. That still leaves the same 57,373 difference identified earlier in the paper; applying the minimum and maximum rates of illegality, this leaves estimates of 22,146 and 36,719 workers affected by payroll fraud. Multiplying both numbers by the assumption that 95% of affected workers are tradespeople, this would result in estimates of 21,039 to 34,883 of blue-collar workers affected by payroll fraud in the industry. Dividing these numbers by the estimated number of all blue-collar workers in the sector—for the minimum rate, the calculation would be $(21039) / (232702 - 45141 - 0.05 * 21039)$ —results in rates of payroll fraud for tradespeople that are 11.3% and 18.8%.

Of the three primary methodological reasons to suspect that this study is underestimating the degree of illegality in the industry, two were originally identified in the 2020 ICERES report while an additional factor has been brought to light since the publication of that study. Of the previously-identified reasons, it should be acknowledged that income underreporting rates are better measures of the *volume* of illegality rather than the number of workers involved. In fact, the authors of this study cannot rule out that *all* 57,373 jobs unaccounted for in the payroll records are affected by, or are the product of, wage and tax fraud, with the aggregate underreporting rates across all workers set at 38.6% to 64.0%. But not all levels of payroll fraud are the equivalent; for instance, a legally-employed carpenter who doesn't report to the IRS the \$900 in cash earnings resulting from fixing a neighbor's roof on a random summer weekend is technically engaging in fraud. But that should arguably be counted differently than someone whose primary employment involves cash-only payments and requires weekly trips to a check-cashing operation. As a result, the authors are comfortable with the use of aggregate rates to establish estimates of the relative proportion (or volume) of illegality in the sector.

A second concern is that while income underreporting rates may offer the best estimates of illegality, it is reminded that simply paying one's taxes does not necessarily mean that a person is working in a legal employment relationship. A worker who is misclassified as an independent contractor may do all the right things in filing their taxes and tacking on their 1099-MISC forms to their tax returns, but that does not make their situation legal. As such, the use of income underreporting rates may undercount the degree of illegality by assuming that all earnings reported to the IRS are acquired in a legitimate and entirely legal employment relationship.

Finally, a 2019 academic paper by Katherine Abraham (University of Maryland) and Ashley Amaya strongly suggests that this study's estimates of *total employment* in the Massachusetts construction industry are undercounting the number of people who are actually working.²⁶ In particular, Abraham and Amaya demonstrate that many respondents to large national surveys like the American Community Survey—the foundation of the analysis in this report—fail to report a substantial amount of informal work that they do for pay. Not all of this is nefarious; for instance, a stay-at-home Dad may forget to report the four hours a week that he drives for Uber when answering the survey. The amount of informal work overlooked by survey respondents is substantial; in a 2019 study, Abraham and Ashley Amaya demonstrate that these surveys miss 21.9% of informal jobs (and 13.0% of informal work lasting more than four hours per week).

"Informal" labor is what many scholars call short-term job opportunities not covered by formal wage-and-salary employment structures; this typically includes off-the-books construction employment. As such, if the ACS does not capture all informal construction employment—as Abraham and Amaya's work suggests—then this would imply that this approach taken in this study is undercounting *total employment* in the industry. As a result,

²⁶ For more, see: Abraham, Katherine, and Ashley Amaya. 2019. "Probing for Informal Work Activity," *Journal of Official Statistics*, 35(3), 487-508.

this would mean that the study is subsequently undercounting the number of workers unaccounted for in payroll records and, as such, underestimating the number of people working in cash-only arrangements in the Massachusetts construction industry. This perspective was further confirmed after Abraham reviewed and publicly commented on the ICERES study when it was presented at the 2021 Labor and Employment Relations Association (LERA) Conference.²⁷

The authors of the current study acknowledge that the use of the ACS may lead to undercounting informal labor and, as a result, the number of workers affected by payroll fraud. However, the desire to maintain conservative assumptions and estimates compel the authors of the current study to not adjust its methodology. The reason for this is that while Abraham and Amaya's work show that 21.9% of informal jobs are not reported on national surveys, this is an economy-wide number and no industry-specific figures are available. The authors of the current study suspect that rates of undercounting informal work are considerably higher among, say, Uber drivers and babysitters than they are for carpenters. As a result, applying any economy-wide estimate is likely to overrepresent the number of construction jobs unreported by respondents on the ACS. As a result, the authors have decided to forego this adjustment lest it produce overly inflated projections of *construction* employment and, as a result, payroll fraud.

²⁷ This perspective was documented in a PowerPoint delivered to the authors of the current report.

**APPENDIX B:
ANALYSIS OF 1099-MISC RECORDS FROM CONSTRUCTION INDUSTRY AS FILED WITH
THE MASSACHUSETTS DEPARTMENT OF REVENUE**

Introduction

Independent contracting has long been a central part of the construction industry, however many companies purposely misclassify their employees as “independent contractors” as a means of evading the legal responsibilities as an employer. Regardless of whether a worker is legally or illegally deemed an independent contractor, the hiring firm is responsible for submitting 1099-MISC forms to the Internal Revenue Service for each worker paid \$600 or more; unfortunately, federal IRS data was inaccessible for this study. However, some firms also submit their 1099-MISC forms to the Massachusetts Department of Revenue, and state DOR representatives agreed to share aggregate data on an industry-by-industry basis with the authors.

Having access to 1099-MISC records is a breakthrough for scholars interested in studying payroll fraud; to the authors’ knowledge, this is the first known study to have such information. But this comes with a substantial caveat. The Massachusetts DOR does not have an enforcement mechanism to require that employers file 1099-MISC forms with the Commonwealth, and many firms choose to bypass the state agency entirely. While the DOR can access all records via their interface with the IRS, the state agency can only share publicly what it directly collects from employers. As such, the DOR could only share a fraction of *all* 1099-MISC records from the state’s construction industry as most records are sent exclusively to the IRS and not the Massachusetts Department of Revenue.

While the authors are incredibly grateful for the collaboration offered by DOR officials, the incomplete nature of the 1099-MISC records provided to the authors severely limits its usefulness. In particular, the authors are hesitant to reach any definitive conclusions from the data given that these records account for a fraction of the total; from the authors’ conversations with DOR officials, the totals provided account for considerably less than half of the all 1099-MISC filings with the IRS. Further, it is acknowledged that reporting rates to the DOR are likely to vary strongly across subsector of the construction industry; for example, it is possible that the records provided to us reflect 45% of 1099-MISC files in one sector and just 15% of the same files in another sector. However, since this is the first known study to have access to *any* 1099-MISC records in the construction industry, the authors found it important to present the data even if they caution against making any definitive conclusions about what the results may reflect.

Table B1. The Number of 1099-MISCs Filed by Construction Employers to the Massachusetts Department of Revenue, 2016-2019 (Number of Payees)

NAICS	Industry	2016	2017	2018	2019	2016-19 Total
<i>NAICS Two-Digit Total</i>						
23XXXX	All Construction Total	5,886	5,152	6,495	7,939	25,472
<i>NAICS Three-Digit Totals</i>						
236XXX	Construction of Buildings	2,360	1,906	2,477	2,748	9,491
237XXX	Heavy and Civil Engineering Const.	352	330	355	362	1,399
238XXX	Specialty Trade Contractors	3,166	2,896	3,637	4,796	14,495
23XXXX	Construction, Undefined	8	20	26	33	87
<i>NAICS Four/Five-Digit Totals</i>						
236XXX	Construction of Buildings					
2361XX	Residential Building Construction	2,117	1,679	2,182	2,500	8,478
2362XX	Nonresidential Building Construction	243	227	295	248	1,013
237XXX	Heavy and Civil Engineering Const.					
2371XX	Utility System Construction	90	76	77	91	334
2372XX	Land Subdivision	58	56	68	49	231
2373XX	Highway, Street and Bridge Const.	113	98	95	143	449
2379XX	Other Heavy and Civil Engin. Const.	91	100	115	79	385
238XXX	Specialty Trade Contractors					
238100	Foundation and Structure, Undefined	189	181	278	243	891
238110	Poured Concrete Foundation	5	15	12	7	39
238130	Framing Contractors	21	12	23	19	75
238140	Masonry Contractors	16	14	31	26	87
238160	Roofing Contractors	71	63	45	60	239
238170	Siding Contractors	1	7	15	17	40
238190	Other Foundation and Structure	10	9	10	9	38
238210	Electrical Contractors	268	233	272	1,607	2,380
238220	Plumbing, Heating and AC Contractors	153	185	203	232	773
238290	Other Building Equipment Contract.	47	37	132	111	327
238300	Building Finishing, Undefined	622	660	674	668	2,624
238310	Drywall and Insulation Contractors	53	25	46	31	155
238320	Painting and Wall Covering Contract.	120	158	182	231	691
238330	Flooring Contractors	85	114	143	116	458
238340	Tile and Terrazzo Contractors	4	2	14	12	32
238350	Finish Carpentry Contractors	102	87	120	120	429
238390	Other Building Finishing Contractors	31	31	28	80	170
238900	Other Specialty Trades, Undefined	1,211	908	1,280	1,092	4,491
238910	Site Preparation Contractors	14	11	10	16	51
238990	Other Specialty Trades Contractors	143	144	119	99	505
23XXXX	Construction, Undefined	8	20	26	33	87

Note: Totals include both Massachusetts residents and non-residents. There were three or less 1099-MISC filed for Structural Steel and Precast Concrete Contractors (NAICS=238120), Glass and Glazing Contractors (NAICS=238150) and Building Equipment Contractors, Undefined (NAICS=238200). Due to statistical and disclosure concerns, the authors included them in the Other Specialty Trades, Undefined (NAICS=238900). Also, one firm was identified as NAICS=238321 (i.e., Residential Painting), however the authors included that with the more general Painting and Wall Covering Contractors (NAICS=238320) category due to disclosure reasons.

Table B2. Sum of Total Nonemployee Compensation, 1099-MISCs Filed by Construction Employers to the Massachusetts Department of Revenue, 2016-2019 (in \$ million)

NAICS	Industry	2016	2017	2018	2019	2016-19 Total
<i>NAICS Two-Digit Totals</i>						
23XXXX	All Construction Total	\$118.30	\$114.75	\$131.99	\$148.12	\$513.16
<i>NAICS Three-Digit Totals</i>						
236XXX	Construction of Buildings	\$49.33	\$42.64	\$51.78	\$65.10	\$208.85
237XXX	Heavy and Civil Engineering Const.	\$11.41	\$16.32	\$10.92	\$9.72	\$48.37
238XXX	Specialty Trade Contractors	\$57.50	\$55.19	\$68.54	\$72.57	\$253.81
23XXXX	Construction, Undefined	*	*	*	\$0.74	\$2.14
<i>NAICS Four/Five-Digit Totals</i>						
236XXX	Construction of Buildings					
2361XX	Residential Building Construction	\$43.30	\$37.26	\$43.90	\$55.81	\$180.27
2362XX	Nonresidential Building Construction	\$6.03	\$5.38	\$7.88	\$9.29	\$28.57
237XXX	Heavy and Civil Engineering Const.					
2371XX	Utility System Construction	\$3.78	\$5.47	\$5.32	\$4.83	\$19.41
2372XX	Land Subdivision	\$1.26	\$0.88	\$1.06	\$0.62	\$3.83
2373XX	Highway, Street and Bridge Const.	\$4.07	\$6.87	\$1.89	\$2.41	\$15.24
2379XX	Other Heavy and Civil Engin. Const.	\$2.28	\$3.11	\$2.66	\$1.84	\$9.89
238XXX	Specialty Trade Contractors					
238100	Foundation and Structure, Undefined	\$3.95	\$4.16	\$5.70	\$3.63	\$17.44
238110	Poured Concrete Foundation	*	*	*	*	\$0.28
238130	Framing Contractors	*	*	*	*	\$1.24
238140	Masonry Contractors	*	*	\$0.30	*	\$1.03
238160	Roofing Contractors	\$0.65	\$1.37	\$0.62	\$1.21	\$3.85
238170	Siding Contractors	*	*	*	*	\$0.67
238190	Other Foundation and Structure	*	*	*	*	\$0.38
238210	Electrical Contractors	\$3.74	\$3.49	\$5.56	\$9.45	\$22.25
238220	Plumbing, Heating and AC Contractors	\$1.51	\$2.35	\$2.94	\$3.44	\$10.22
238290	Other Building Equipment Contract.	\$0.61	\$0.53	\$1.79	\$2.78	\$5.70
238300	Building Finishing, Undefined	\$13.42	\$15.95	\$15.19	\$12.77	\$57.33
238310	Drywall and Insulation Contractors	\$1.12	*	\$1.23	\$0.68	\$3.79
238320	Painting and Wall Covering Contract.	\$2.43	\$2.66	\$3.02	\$4.18	\$12.29
238330	Flooring Contractors	\$1.33	\$2.43	\$2.52	\$2.56	\$8.83
238340	Tile and Terrazzo Contractors	*	*	*	*	\$0.49
238350	Finish Carpentry Contractors	\$1.69	\$1.44	\$1.96	\$2.15	\$7.25
238390	Other Building Finishing Contractors	\$0.34	\$0.41	*	\$1.29	\$2.37
238900	Other Specialty Trades, Undefined	\$23.96	\$16.78	\$24.49	\$25.46	\$90.69
238910	Site Preparation Contractors	*	*	*	*	\$0.58
238990	Other Specialty Trades Contractors	\$1.74	\$2.00	\$1.81	\$1.56	\$7.10
23XXXX	Construction, Undefined	*	*	*	\$0.74	\$2.14

Note: * indicates that there were 30 or fewer 1099-MISC forms in this industry; because of that, the authors have chosen not to present these totals due to concerns that individuals may be identified. There were three or less 1099-MISC filed for Structural Steel and Precast Concrete Contractors (NAICS=238120), Glass and Glazing Contractors (NAICS=238150) and Building Equipment Contractors, Undefined (NAICS=238200). Due to statistical and disclosure concerns, the authors included them in the Other Specialty Trades, Undefined (NAICS=238900).

Table B3. Sum of Total Nonemployee Compensation, 1099-MISCs Filed by Construction Employers to the Massachusetts Department of Revenue, 2016-2019 (in \$ million)

NAICS	Industry	Average # of Payers (2016-19)	Number of 1099s per Payer	Average \$ of 1099
<i>NAICS Two-Digit Totals</i>				
23XXXX	All Construction Total	1,589	4.0	\$20,146
<i>NAICS Three-Digit Totals</i>				
236XXX	Construction of Buildings	566	4.2	\$22,005
237XXX	Heavy and Civil Engineering Const.	82	4.3	\$34,575
238XXX	Specialty Trade Contractors	934	3.9	\$17,374
23XXXX	Construction, Undefined	8	2.7	\$24,593
<i>NAICS Four/Five-Digit Totals</i>				
236XXX	Construction of Buildings			
2361XX	Residential Building Construction	493	4.3	\$21,263
2362XX	Nonresidential Building Construction	73	3.5	\$28,208
237XXX	Heavy and Civil Engineering Const.			
2371XX	Utility System Construction	9	9.0	\$58,105
2372XX	Land Subdivision	20	3.0	\$16,576
2373XX	Highway, Street and Bridge Const.	25	4.4	\$33,942
2379XX	Other Heavy and Civil Engin. Const.	28	3.5	\$25,699
238XXX	Specialty Trade Contractors			
238100	Foundation and Structure, Undefined	50	4.5	\$19,579
238110	Poured Concrete Foundation	4	2.4	\$7,071
238130	Framing Contractors	6	3.0	\$16,559
238140	Masonry Contractors	10	2.3	\$11,894
238160	Roofing Contractors	14	4.2	\$16,119
238170	Siding Contractors	3	3.3	\$16,631
238190	Other Foundation and Structure	4	2.4	\$9,888
238210	Electrical Contractors	119	5.0	\$9,347
238220	Plumbing, Heating and AC Contractors	85	2.3	\$13,238
238290	Other Building Equipment Contract.	16	5.1	\$17,443
238300	Building Finishing, Undefined	139	4.7	\$21,849
238310	Drywall and Insulation Contractors	12	3.2	\$24,456
238320	Painting and Wall Covering Contract.	38	4.6	\$17,785
238330	Flooring Contractors	31	3.7	\$19,287
238340	Tile and Terrazzo Contractors	3	3.2	\$15,336
238350	Finish Carpentry Contractors	41	2.6	\$16,910
238390	Other Building Finishing Contractors	12	3.6	\$13,963
238900	Other Specialty Trades, Undefined	296	3.8	\$20,192
238910	Site Preparation Contractors	4	3.0	\$11,406
238990	Other Specialty Trades Contractors	49	2.6	\$14,063
23XXXX	Construction, Undefined	8	2.7	\$24,593

Note: There were three or less 1099-MISC filed for Structural Steel and Precast Concrete Contractors (NAICS=238120), Glass and Glazing Contractors (NAICS=238150) and Building Equipment Contractors, Undefined (NAICS=238200). Due to statistical and disclosure concerns, the authors included them in the Other Specialty Trades, Undefined (NAICS=238900).

Table B4. Data on 1099-MISCs Not Filed by Massachusetts Payees on Income Tax Returns, Construction Industry, Massachusetts Department of Revenue, 2016-2019 (in \$ million)

NAICS	Industry	% Payees are MA Resident	% MA Payees Nonfiler w/DOR	Total \$ via 1099s to MA Payees Not Filed w/DOR (2016-19) (in \$ mill.)	% of 1099 Dollars to MA Payees Not Filed w/DOR
<i>NAICS Two-Digit Totals</i>					
23XXXX	All Construction Total	96%	33%	\$165.93	32%
<i>NAICS Three-Digit Totals</i>					
236XXX	Construction of Buildings	97%	32%	\$60.08	29%
237XXX	Heavy and Civil Engineering Const.	91%	23%	\$7.79	16%
238XXX	Specialty Trade Contractors	96%	35%	\$97.26	38%
23XXXX	Construction, Undefined	95%	30%	\$0.80	37%
<i>NAICS Four/Five-Digit Totals</i>					
236XXX	Construction of Buildings				
2361XX	Residential Building Construction	97%	33%	\$54.37	30%
2362XX	Nonresidential Building Construction	95%	28%	\$5.71	20%
237XXX	Heavy and Civil Engineering Const.				
2371XX	Utility System Construction	98%	17%	\$2.70	14%
2372XX	Land Subdivision	97%	23%	\$0.30	8%
2373XX	Highway, Street and Bridge Const.	91%	27%	\$2.50	16%
2379XX	Other Heavy and Civil Engin. Const.	82%	24%	\$2.30	23%
238XXX	Specialty Trade Contractors				
238100	Foundation and Structure, Undefined	97%	42%	\$7.48	43%
238110	Poured Concrete Foundation	100%	33%	\$0.05	18%
238130	Framing Contractors	99%	47%	\$0.67	54%
238140	Masonry Contractors	94%	27%	\$0.27	26%
238160	Roofing Contractors	98%	43%	\$1.67	43%
238170	Siding Contractors	100%	43%	\$0.19	29%
238190	Other Foundation and Structure	97%	35%	\$0.09	25%
238210	Electrical Contractors	97%	13%	\$5.07	23%
238220	Plumbing, Heating and AC Contractors	95%	30%	\$2.35	23%
238290	Other Building Equipment Contract.	98%	30%	\$2.03	36%
238300	Building Finishing, Undefined	99%	47%	\$27.16	47%
238310	Drywall and Insulation Contractors	88%	36%	\$0.93	24%
238320	Painting and Wall Covering Contract.	99%	46%	\$5.85	48%
238330	Flooring Contractors	97%	58%	\$6.26	71%
238340	Tile and Terrazzo Contractors	100%	63%	\$0.26	53%
238350	Finish Carpentry Contractors	96%	31%	\$2.26	31%
238390	Other Building Finishing Contractors	89%	36%	\$0.95	40%
238900	Other Specialty Trades, Undefined	92%	34%	\$29.13	33%
238910	Site Preparation Contractors	98%	32%	\$0.13	23%
238990	Other Specialty Trades Contractors	95%	31%	\$4.44	48%
23XXXX	Construction, Undefined	95%	30%	\$0.80	37%

Notes: There are many reasons why a person may not file with the Massachusetts DOR. This includes legitimate reasons. For example, 46% the 1099-MISCs from the state construction industry that were not filed on workers' individual income tax were for less than \$8,000; in other words, they reflected an amount less than the minimum required of Massachusetts residents to file their income taxes. DOR representatives also noted that a nontrivial amount of nonfiling is due to businesses mistakenly using 1099-MISC as a payee and mislabeling their ID type.

**APPENDIX C:
ANALYSIS OF CONSTRUCTION BUSINESS TAX FILINGS FROM THE MASSACHUSETTS
DEPARTMENT OF REVENUE**

The tables that follow are drawn from industry-by-industry totals from three types of businesses and the respective tax forms, as submitted to the Massachusetts Department of Revenue for the 2019 tax year: sole proprietorships (Form 1), partnerships (Form 3) and corporations (Form 355). These tables provide the number of business who filed in 2019, along with the aggregate value of gross receipts by business type by industry. Data on gross receipts for industry categories featuring 30 or fewer businesses are not presented by the authors due to concerns that the data may make individual firms identifiable.

Table C1. Number of Income Tax Returns, by Business Type and Industry, Construction, Massachusetts Department of Revenue, 2019

NAICS	Industry	Form 1: # of Sole Proprietor	Form 3: # of Partners.	Form 355: # of Corporate	% Sole Proprietor
<i>NAICS Two-Digit Totals</i>					
23XXXX	All Construction Total	59,293	3,990	25,045	67%
<i>NAICS Three-Digit Totals</i>					
236XXX	Construction of Buildings	14,554	2,073	7,944	59%
237XXX	Heavy and Civil Engineering Const.	568	360	1,398	24%
238XXX	Specialty Trade Contractors	42,971	1,490	15,542	72%
23XXXX	Construction, Undefined	1,200	67	161	84%
<i>NAICS Four/Five-Digit Totals</i>					
236XXX	Construction of Buildings				
2361XX	Residential Building Construction	13,149	1,774	6,470	61%
2362XX	Nonresidential Building Construction	1,374	298	1,472	44%
237XXX	Heavy and Civil Engineering Const.				
2371XX	Utility System Construction	120	108	171	30%
2372XX	Land Subdivision	92	142	255	19%
2373XX	Highway, Street and Bridge Const.	102	42	363	20%
2379XX	Other Heavy and Civil Engin. Const.	254	68	609	27%
238XXX	Specialty Trade Contractors				
238100	Foundation and Structure, Undefined	64	80	1,141	5%
238110	Poured Concrete Foundation	231	10	73	74%
238120	Structural Steel and Precast Concrete	79	1	32	71%
238130	Framing Contractors	1,565	2	24	98%
238140	Masonry Contractors	1,441	5	74	95%
238150	Glass and Glazing Contractors	120	3	19	85%
238160	Roofing Contractors	831	15	139	84%
238170	Siding Contractors	463	2	17	96%
238190	Other Foundation and Structure	439	2	27	94%
238210	Electrical Contractors	4,319	158	1,870	68%
238220	Plumbing, Heating and AC Contractors	3,994	145	2,183	63%
238290	Other Building Equipment Contract.	351	61	356	46%
238300	Building Finishing, Undefined	194	254	2,960	6%
238310	Drywall and Insulation Contractors	1,079	27	188	83%
238320	Painting and Wall Covering Contract.	7,296	18	252	96%
238330	Flooring Contractors	1,986	19	232	89%
238340	Tile and Terrazzo Contractors	597	5	46	90%
238350	Finish Carpentry Contractors	5895	6	119	98%
238390	Other Building Finishing Contractors	1,352	9	65	95%
238900	Other Specialty Trades, Undefined	146	627	5,464	2%
238910	Site Preparation Contractors	511	9	57	89%
238990	Other Specialty Trades Contractors	9,981	32	199	98%

Table C2. Aggregate Gross Receipts on Income Tax Returns, by Business Type and Industry, Construction, Massachusetts Department of Revenue, 2019 (\$ in millions)

NAICS	Industry	Form 1: Sole Proprietor	Form 3: Partners.	Form 355: Corporate	% Sole Proprietor
<i>NAICS Two-Digit Totals</i>					
23XXXX	All Construction Total	\$7,257.8	\$45,574.9	\$195,274.8	3%
<i>NAICS Three-Digit Totals</i>					
236XXX	Construction of Buildings	\$2,541.9	\$23,017.2	\$79,071.5	2%
237XXX	Heavy and Civil Engineering Const.	\$143.9	\$5,228.2	\$35,709.0	<1%
238XXX	Specialty Trade Contractors	\$4,414.8	\$13,510.3	\$78,742.9	5%
23XXXX	Construction, Undefined	\$157.2	\$3,819.2	\$1,751.4	3%
<i>NAICS Four/Five-Digit Totals</i>					
236XXX	Construction of Buildings				
2361XX	Residential Building Construction	\$2,243.2	\$4,959.6	\$5,393.4	18%
2362XX	Nonresidential Building Construction	\$298.0	\$18,057.5	\$73,678.1	<1%
237XXX	Heavy and Civil Engineering Const.				
2371XX	Utility System Construction	\$21.4	\$615.8	\$2,912.0	1%
2372XX	Land Subdivision	\$34.6	\$56.7	\$455.1	6%
2373XX	Highway, Street and Bridge Const.	\$23.5	\$2,732.9	\$4,814.8	<1%
2379XX	Other Heavy and Civil Engin. Const.	\$64.4	\$1,822.9	\$27,527.1	<1%
238XXX	Specialty Trade Contractors				
238100	Foundation and Structure, Undefined	\$4.1	\$205.1	\$4,837.8	<1%
238110	Poured Concrete Foundation	\$45.5	*	\$200.0	10%-30%
238120	Structural Steel and Precast Concrete	\$12.1	*	\$208.0	0%-20%
238130	Framing Contractors	\$134.5	*	*	70%-90%
238140	Masonry Contractors	\$151.6	*	\$41.8	70%-90%
238150	Glass and Glazing Contractors	\$17.9	*	*	10%-30%
238160	Roofing Contractors	\$120.0	*	\$537.9	10%-30%
238170	Siding Contractors	\$43.9	*	*	70%-90%
238190	Other Foundation and Structure	\$85.5	*	*	20%-40%
238210	Electrical Contractors	\$520.9	\$2,091.6	\$17,837.1	3%
238220	Plumbing, Heating and AC Contractors	\$605.1	\$2,088.2	\$8,834.3	5%
238290	Other Building Equipment Contract.	\$34.0	\$647.1	\$3,829.0	1%
238300	Building Finishing, Undefined	\$12.8	\$697.8	\$3,612.0	<1%
238310	Drywall and Insulation Contractors	\$120.0	*	\$2,330.0	0%-20%
238320	Painting and Wall Covering Contract.	\$424.1	*	\$68.8	70%-90%
238330	Flooring Contractors	\$180.8	*	\$443.3	20%-30%
238340	Tile and Terrazzo Contractors	\$48.8	*	\$16.3	70%-90%
238350	Finish Carpentry Contractors	\$498.2	*	\$72.8	70%-90%
238390	Other Building Finishing Contractors	\$152.1	*	\$171.0	40%-60%
238900	Other Specialty Trades, Undefined	\$8.8	\$6,172.1	\$34,517.6	<1%
238910	Site Preparation Contractors	\$96.2	*	\$70.7	50%-70%
238990	Other Specialty Trades Contractors	\$1,090.4	\$278.2	\$710.7	52%

Note: For cells with 30 or fewer firms, the authors have chosen not to disclose the gross receipts given concerns that individual firms may be identifiable.

APPENDIX D: ESTIMATING THE ECONOMIC COSTS OF WORKER MISCLASSIFICATION IN THE MASSACHUSETTS CONSTRUCTION INDUSTRY

Introduction

It is well understood among industry stakeholders and research scholars that worker misclassification largely occurs in the construction industry due to employers' self-interest in evading legally-required tax contributions and other necessary expenses of legal employment. These actions are known to result in severe costs on workers and broader society. Most directly, this form of wage and tax fraud defunds critical social programs, robs workers of their legal rights to benefits and shifts much of employers' tax burden onto the backs of workers and taxpayers at large. Indirectly, these illegal actions put downward pressure on wages for workers in the legitimate corners of the construction industry. Further, wage and tax fraud is well recognized as severely disadvantaging honest, law-abiding contractors in the bidding for new projects, driving many out of business and further quickening the "race to the bottom" when it comes to employment practices in the construction sector.

While these issues are well known to industry stakeholders and academics alike, *quantifying* the effects of worker misclassification encounters a familiar and challenging problem: data availability. While Appendix A was designed to estimate the incidence of worker misclassification in the Massachusetts construction industry, assessing the economic costs requires one to know how much money is exchanging hands illegally. The underground nature of this activity makes the development of a *definitive* answer to this question a practical impossibility. But there are available means of estimating the economic costs of wage and tax fraud in the construction industry. To those ends, this study relies on a variant of the methodology co-developed by one of the authors of this report (Dale Belman) and published in a 2019 paper commissioned by the Attorney General for the District of Columbia, whose office was similarly interested in assessing the costs of wage and tax fraud in the construction industry in their jurisdiction.²⁸ This empirical approach was further refined in the 2020 ICERES study, and serves as the basis for the current report's projections on the economic costs in Massachusetts' construction industry.

Per-Worker Costs of Wage and Tax Fraud

The general framework for assessing the state-level economic costs of wage and tax fraud as advanced by these prior studies is to (a) establish the economic cost of fraud for a single worker and then (b) multiply this per-worker cost by the number of workers involved. While the number of workers affected was established in Appendix A (22,146 and 36,719), developing the per-worker cost of payroll fraud in Massachusetts' construction industry requires a number of assumptions. The use of assumptions—both in the number of workers affected and their per-worker costs—knowingly introduces a nontrivial margin of error into

²⁸ Belman, Dale, and Aaron Sojourner. 2019. "Economic Analysis of Incentives to Fraudulently Misclassify Employees in District of Columbia Construction," Office of the Attorney General for the District of Columbia.

the cost projections, but these are necessary given that researchers do not have direct evidence of the full extent of worker misclassification nor the amount of money that changes hands in the underground economy.

In generating the per-worker cost of wage and tax fraud, the starting assumption is that workers affected would, if paid legally, earn incomes equivalent to the 10th percentile of legal wage-and-salary employees in construction occupations in the Commonwealth.²⁹ Drawn from a survey of legal construction employers in the state, this equates to annual earnings of \$35,200.³⁰ Using the 10th percentile of legal earnings is a conservative assumption, however there are a multitude of reasons supporting this starting point. First and foremost, it is recognized that construction workers most often affected by wage and tax fraud are in lower-skill, lower-paying jobs. Second, an analysis of the American Community Survey reveals that this number nearly matches the 25th percentile of earnings (\$35,000) of *all* construction-industry workers in Massachusetts in 2019, a number that includes misclassified independent contractors and off-the-books workers. Further, among construction workers in the four most affected trades identified in the main report—painters, carpenters, laborers, and roofers—this value (\$35,200) is between the 35th and 40th percentile of earnings in Massachusetts according to the ACS. Finally, this value approximates the median earnings (\$35,000) of non-incorporated self-employed construction workers in the Commonwealth in 2019.³¹

While there are numerous aligning data points suggestive of \$35,200 as the appropriate number, it is reminded that the actual earnings of these workers is an empirical black box. Further, given that payroll fraud occurs in *all* corners of the construction industry—including high-skill, high-pay jobs—the authors assess payroll fraud with a second assumption: that workers affected by payroll fraud would earn annual earnings equivalent to the 25th percentile of legal wage-and-salary workers in construction occupations. According to the Bureau of Labor Statistics, that equates to \$44,960.³²

In order to build the per-worker cost of wage and tax fraud—a necessary precursor to generating the aggregate economic costs—this study adheres closely to the method advanced by Dale Belman (Michigan State University) and Aaron Sojourner (University of

²⁹ The move to *occupation* rather than *industry* is because it is assumed that a vast majority of workers affected by payroll fraud are tradespeople; as a result, using earnings levels of construction occupations removes the influence of construction-industry architects, engineers, salespeople, and other white-collar workers who are likely less representative of the market from which these workers are drawn.

³⁰ Data for occupational earnings for 2019 can be found at: https://www.bls.gov/oes/current/oes_ma.htm.

³¹ The analysis of DUA records reflects that the gross payroll of workers affected by misclassification as discovered via audit averaged far less than \$35,200. While the data does not allow for additional analysis, the short-term nature of informal employment relationships in the construction industry means that it is likely that these payments were for only part-year work, thereby not precluding multiple employment opportunities in a given year.

³² Prior studies have featured only the 25th percentile as the starting point of earnings. However, Massachusetts features the third-highest earnings (\$44,960) in the United States—behind only Alaska and Hawaii—at the 25th percentile for workers in construction occupations according to the BLS. As a result of the authors' concerns that this higher rate may not be entirely representative of conditions for workers in lower-wage trades, the decision was made to rely on the more conservative 10th percentile as a starting point.

Minnesota) in their report for the Attorney General for the District of Columbia, an empirical approach further refined in the 2020 ICERES report on payroll report. This includes the application of construction-industry data from the Employer Costs for Employee Compensation (ECEC) program administered by the Bureau of Labor Statistics; these reports offer the national average per-hour rates for all types of employees' pay and benefits in the construction sector.³³ This work is complemented with Massachusetts-specific tax and contributions schedules where possible, including insight offered by the Department of Unemployment Assistance (average UI contribution rates in construction) and the Workers' Compensation Rating and Inspection Bureau of Massachusetts (average workers' compensation insurance rates among construction employers).

Table D1. A Comparison of Per-Worker Labor Costs for Legal Employers and Those Engaging in Payroll Fraud in Massachusetts, 2019 (Assuming Legal Earnings = \$35,200)

	Legal Employer	Conservative Estimate	Moderate Estimate
<i>Value to Worker</i>			
Regular Pay	\$34,329.61	\$34,329.61	\$34,329.61
Overtime and Premium Pay	\$870.39	\$0.00	\$0.00
Fringe Benefits / Wage Premium	\$5,599.27	\$5,599.27	\$0.00
<i>Subtotal (1)</i>	\$40,799.27	\$39,928.88	\$34,329.61
LESS: Social Security & Medicare (EE share) (2)	\$2,692.80	\$6,109.12	\$5,252.43
Total – Net Value to Worker	\$38,106.47	\$33,819.76	\$29,077.18
<i>Employer Contributions to Social Programs</i>			
Social Security & Medicare (ER share)	\$2,692.80	\$0.00	\$0.00
Unemployment Insurance	\$1,105.50	\$0.00	\$0.00
Workers Compensation	\$1,669.18	\$0.00	\$0.00
Total – ER Contributions to Social Programs (3)	\$5,467.48	\$0.00	\$0.00
<i>Totals</i>			
Total Net Value to Worker (1-2)	\$38,106.47	\$33,819.76	\$29,077.18
Total Value to Social Insurance (2+3)	\$8,160.28	\$6,109.12	\$5,252.43
Total Labor Costs (1+3)	\$46,266.75	\$39,928.88	\$34,329.61
<i>Differences from Legal Employer</i>			
Total Labor Cost Differential from Legal		\$6,337.88	\$11,937.15
Percent Higher for Legal Employer		15.9%	34.8%

Notes: The worker is responsible for both the employee and employer's share of Social Security and Medicare when working off-the-books or as an independent contractor. Workers who receive a wage premium—such as the cash value of fringe benefits in the second column—must pay the tax on the premium; in contrast, the fringe benefits (e.g., health insurance) provided by the legal employer in the first column are not subject to tax.

Following Belman and Sojourner's blueprint, this study starts by decomposing the pay of a worker in Massachusetts, earning \$35,200 per year. But this value undercounts the sum that legal employers would have to pay to employ the worker, as this fails to capture legally-required tax contributions and optional fringe benefits. To those ends, the first column of Table D1 presents estimates of each category of employer costs so that a more complete

³³ This study relies on ECEC rates for the construction industry as published in September 2019, available at: <https://www.bls.gov/web/ecec/ececqrtn.pdf>.

understanding of the economic costs of payroll fraud can be estimated. These categories include:

- *Regular vs. Overtime and Premium Pay:* One of the defining characteristics of legal employment is that employees are entitled to overtime wage rates (i.e., time-and-a-half) if they exceed 40 hours of work in a given week; in contrast, higher rates for overtime are not required for workers misclassified as independent contractors. Further, regular employees are often granted a premium for working on holidays. The starting point of \$35,200 however, does not differentiate between regular, overtime and premium pay.³⁴ Fortunately, calculations derived from the ECEC reflect that 2.47% of construction workers' income, on average, is derived from the overtime and premium rates on a national basis (e.g., the "half" in "time-and-a-half").³⁵ Applying this to the worker in question, this means that \$34,329.61 was earned via regular rates with an additional \$870.39 earned from overtime and premium pay.³⁶
- *Social Security and Medicare:* To be conservative, this study assumes that workers' \$35,200 represents gross annual pay. The employee will then have 7.65% deducted for Social Security and Medicare, a contribution otherwise known as the Federal Insurance Contribution Act (FICA) tax; this amounts to \$2,692.80 being taken out of employees' paychecks. The employer will also be required to pay an additional \$2,692.80 to cover its share of Social Security and Medicare without it showing up on the employee's pay stub.
- *Workers' Compensation:* While this rate may differ across trades and individual firms, data provided by WCRIBMA reflects that the average cost of workers' compensation insurance for construction employers in Massachusetts in 2019 was \$4.742 for every \$100 of the employer's payroll.³⁷ For the hypothetical worker in question, this equates to \$1,669.18 in workers' compensation insurance policy costs.
- *Unemployment Insurance:* Legal employment in Massachusetts requires that employers contribute to the state's UI fund; the required payment is based on a certain percentage of an employee's first \$15,000 earned via the firm. While the amount that employers must pay varies by industry, trade and firm, a representative of the Department of Unemployment Assistance confirmed with the authors that the

³⁴ This study assumes that workers' total of \$35,200 includes all tax-eligible income payments that find their way on workers' paychecks, including wages and salaries, paid leave, and supplemental pay.

³⁵ This number is estimated by adding up all tax-eligible income payments made to workers; from the ECEC, this would include the categories of wages and salaries, paid leave, supplemental pay. That sum for September 2019 was \$31.14 per hour. Of that, \$0.77 per hour was deemed to be from overtime and premium pay. Dividing \$0.77 by \$31.14 yields 2.47%.

³⁶ This calculation assumes that workers affected by payroll fraud are on the job for the same number of weeks and weekly hours as regular employees. While data on this is unclear—since This was investigated in the 2020 ICERES study, which concluded th. For more, see Ormiston, Russell, Dale Belman and Mark Erlich. 2020. "An Empirical Methodology to Estimate the Incidence and Costs of Payroll Fraud in the Construction Industry."

³⁷ For more, see:

https://www.wcribma.org/mass/IndustryInformation/RateFiling/2020/WCRIBMA_Filing/Filing_2020.pdf.

average rate for Massachusetts construction employers was 7.37% in 2019. For the worker in question, this means that a typical employer would be required to pay \$1,105.50 in UI contributions.³⁸

- *Tax-Exempt Benefit Costs:* Workers' responses on the American Community Survey do not offer insight into the dollar value associated with employer-provided, tax-exempt fringe benefit costs, which include things like health insurance and pension funding. However, calculations from the ECEC suggest that, on average, construction employers spend \$17.15 on these fringe benefits for every \$100 paid to the worker on a national basis. While this may be true for the average worker, benefit packages are likely to be much smaller for those workers paid an entry-level wage. As such, this study analyzes differences in the incidence of employer-sponsored health insurance in the ACS to suggest that a more appropriate fringe benefit rate for these workers should be \$15.91 for every \$100 paid to the worker.³⁹ Multiplying this rate by \$35,200, this implies that employers would spend \$5,599.27 in insurance and pension benefits for this worker.⁴⁰

Aggregating all wages, benefits, taxes and required social contributions, this employee would cost a legally-operating construction employer in Massachusetts a total of \$46,266.75. Of those funds, workers would receive \$38,106.47 in after-tax earnings and fringe benefits. The remaining \$8,160.28 would be diverted to Social Security, Medicare, workers' compensation and unemployment insurance programs.

The fundamental question from here is: how much would this worker cost an employer if they were classified as an independent contractor or hired in a cash-only arrangement? This question is a bit more complicated than meets the eye. Economic theory would suggest that, in order to entice workers to forego the legally-earned benefits bestowed upon a legal employee, employers would have to pay workers extra per hour in cash; this amounts to what economists call a "wage premium." Conversations with industry stakeholders suggests that this sometimes does happen. But certainly not always. Other times, employers are able

³⁸ This calculation assumes that workers remain with their respective employer throughout the year and that all of their earnings are paid fraudulently (either via 1099-MISC documentation or by cash payment). These assumptions are suspected to undercount the amount lost by the UI system. Given high levels of worker turnover in the construction industry, it is likely that many workers would be employed by multiple employers in a given year. In that case, each employer would have to contribute to the state UI fund up to the first \$15,000 earned by the worker for that company. Nevertheless, in the absence of other data, the authors adhere to the assumption of a single employer in order to provide conservative estimates of UI shortfalls.

³⁹ The rate of \$17.15 is deflated by comparing the average rate of employer-sponsored health insurance across the entire industry (61.75%) against the rate for those who earn between \$30,000 and \$40,000 (57.28%); empirically, the calculation is $17.15 \times 0.5728 / 0.6175 = 15.91$. To be fair, using the industry-average ratio of \$17.15 to calculate the fringe benefit packages of lower-income workers would also have offered validity: the smaller benefit packages would be a product of working with a smaller base income. But this study was compelled to deflate the rate of fringe benefits at the lower-income range to account for the lack of union employers in this income range and for the sake of generating conservative empirical estimates.

⁴⁰ This study ignores potential mandatory health insurance costs such as the opt-out of the Affordable Care Act. A vast majority of construction firms do not employ the 50+ employees that would make it legally obligated to comply with the law.

to exploit their monopsony power in the labor market—they have the jobs that workers desperately need—and attract and hire enough workers without paying such a premium.

The wage premium paid to workers agreeing to operate in an illegal employment relationship likely differs from employer to employer and from worker to worker. For many employers and workers, there may be no such wage premium at all. Others may see a reasonable sum added to their earnings to incentivize them to work off-the-books. Unfortunately, there are no known data on this presumed value. So for the sake of offering an initial, conservative estimate of the costs of payroll fraud in the construction industry, this study follows the lead of Belman and Sojourner’s approach in their 2019 study in first assuming that workers who are employed fraudulently do earn a sizeable premium: the cash value of legal employees’ fringe benefits. This would leave the employer to save on labor costs via the (a) denial of overtime and premium pay, (b) avoiding required workers’ compensation and unemployment insurance contributions, and (c) shifting its FICA burden to employees.

Given this conservative assumption, comparing the first two columns of Table D1 projects the amount and distribution of employers’ per-worker labor costs when the firm is operating legally versus when they acting fraudulently but offering workers this sizeable wage premium. The results suggest that a construction employer that is operating legally in Massachusetts must spend \$6,337.88 more on a per-worker basis than one that is operating fraudulently. Put another way, per-worker labor costs for the law-abiding firm are 15.9% higher than the one acting illegally.⁴¹

Much of this differential in labor costs is attributable to the elimination of firms’ required contributions to social insurance programs. A substantial portion of this is a shifting of the “employer share” of the Social Security and Medicare tax burden from employers and onto the backs workers. But of perhaps the most interest to state legislators may be that payroll fraud also defunds the state’s unemployment insurance fund (\$1,105.50 lost per worker). In addition, there is a substantial amount of workers’ compensation insurance premiums uncollected (\$1,669.18 per worker). These values are the same regardless of whether a wage premium is paid or not.

Beyond shortfalls to state and federal programs, it is notable in the second column of Table D1 that workers also lose a substantial amount even with the assumed wage premium. Including \$870.39 in lost overtime and premium pay and now having to pay the employer’s share of the FICA tax burden—which is larger because taxes must be paid on the wage premium whereas fringe benefits are tax-exempt—workers’ net compensation declines by \$4,286.71 when working for an employer engaging in worker misclassification. In sum, even under the

⁴¹ With a \$35,200 assumption, this study estimates that the per-worker labor costs for legal employers is 15.9% higher than firms who operate fraudulently and pay a wage premium to workers who operate as misclassified independent contractors or who work in a cash-only relationship. This is calculated using the earnings of workers in these illegal employment relationships as the denominator. This is not the same as the percent of cash savings using the legal employers’ labor costs as the basis of analysis; using that as the denominator, the estimated differential is 13.7%.

best situation for the worker—the presence of a substantial wage premium—both workers and taxpayers are substantially worse off.

The assumption that these workers receive a substantial wage premium for operating outside a legal employment structure does offer a conservative estimate of per-worker cost savings attributable to payroll fraud. But while a large wage premium may occur in some parts of the industry, our conversations with industry stakeholders suggests that workers more often receive little to no such premium. To those ends, the third column in Table D1 offers a less conservative assumption that workers receive no wage premium for engaging in an illegal employment structure, instead receiving only cash in the form of regular pay. Under this set of circumstances, a construction employer that is operating legally and offers fringe benefits in Massachusetts must spend \$11,937.15 more on a per-worker basis than a contractor operating fraudulently. This equates to 34.8% higher per-worker labor costs for the law-abiding firms that offer benefits when compared to illegal firms that do not.⁴² Given the lack of wage premium, workers in Massachusetts' construction industry bear the brunt of this arrangement, with their net compensation being \$9,029.29 less than that of a legal employee (including higher Social Security and Medicare tax liability). To be clear, however, not all of this differential represents illegality: the evasion of required social insurance contributions is illegal, but the refusal to pay fringe benefits or a wage premium is not.

Table D1 highlights the respective sources of these cost savings for fraudulent employers and how this leads to reduced net compensation for workers and funding for social programs in Massachusetts. For employers, avoiding legally required contributions to social insurance programs makes up a considerable portion (\$5,467.48) of the cost differential, leading to substantial shortfalls in the Massachusetts unemployment insurance and workers' compensation insurance programs, as well as Social Security and Medicare on a federal level. Further, the denial of overtime and premium pay shaves off an additional \$870.39 on a per-worker basis. In sum, the results of Table D1 suggest that payroll fraud allows construction employers to illegally reduce labor costs by \$6,337.88 when hiring a worker at a rate equal to the 10th percentile (\$35,200) of construction occupations in the legitimate labor market. These savings can expand to over \$10,000 if also including the cost savings accrued by not offering fringe benefits to employees (which is not illegal).

Aggregate Costs of Wage and Tax Fraud

The results of Table D1 offer the authors' best estimates of the minimum and maximum per-worker labor cost differential between legal employers and those who misclassify equivalent workers as independent contractors or hire workers using cash-only payments in Massachusetts. To estimate the aggregate cost of wage and tax fraud in the state's construction industry, this study multiplies the per-worker cost differential by the number of workers directly affected by payroll fraud. As a starting point, the authors apply the lower-bound number of workers involved in Massachusetts (22,146) and continue to assume that

⁴² When using the labor costs of legal firms as the denominator (instead of those of the fraudulent employers), the cost difference without wage premiums is estimated to be 25.8%. These numbers straddle the industry's long-held 30% rule of thumb when it comes to estimating the cost savings attributable to payroll fraud.

affected workers would earn the equivalent of the 10th percentile of legal wage-and-salary employees holding construction occupations in the Commonwealth.

Table D2 presents the projected aggregate annual labor costs of these 22,146 construction workers in Massachusetts on the basis of their employment relationship. The first column presents the aggregate costs of these workers being employed legally. The second and third columns estimate the same totals but under the assumption that workers are employed fraudulently; the second column is conservative and assumes there is a wage premium equal to the cash value of fringe benefits while the third column assumes no wage premium. The results of Table D2 suggest that these 22,146 workers would have cost Massachusetts construction employers \$1.02 billion if employed legally (and employees were offered insurance and pension benefits). In comparison, employers engaged in fraud paid just \$884.3 million in labor costs if paying a wage premium equivalent to the value of fringe benefits, and just \$760.3 million if not offering any wage premium. Ignoring the loss of fringe benefits (which are not legally required of employers), these results demonstrate that by not paying overtime (\$19.3 million) and evading required taxes and social contributions (\$121.1 million), construction employers in Massachusetts illegally shaved an estimated \$140.4 million off their labor costs in 2019.

Of the \$140.4 million pocketed by contractors and developers (through lower project costs), it is important to highlight losses to critical social programs. First, payroll fraud in the Massachusetts construction industry is projected to result in a \$24.5 million shortfall in the state's unemployment insurance fund under these assumptions. Second, these actions also led to \$37.0 million in lost workers' compensation insurance premiums. Finally, a substantial portion of employers' savings was due to its offloading of its obligations to Social Security and Medicare onto the backs of workers; this amounts to \$59.6 million in tax obligations transferred from employers to workers. This is because, under these circumstances, workers would technically be considered "self-employed" and thus responsible for both the employee's and employer's share of Social Security and Medicare. This increased tax responsibility comprises a large part of why workers' net value declines so drastically due to payroll fraud.

While the results offered in Table D2 represent the direct costs associated with payroll fraud in Massachusetts' construction industry, there are also indirect economic costs. In particular, employers' lack of tax withholding and failure to provide employment documentation open the door to workers to not report or underreport their income to the Internal Revenue Service and the Massachusetts Department of Revenue. It is telling that, in a 2016 report, the IRS noted that only 1% of W-2 earnings were misreported on tax forms; in contrast, the agency assessed that 64% of nonfarm proprietor income—which is subject to "little to no information reporting"—is underreported on tax forms.⁴³ As such, while the decision to fully report earnings is the responsibility of workers, the lack of employer documentation effectively opens the door for widespread income tax shortfalls.

⁴³ For more, see: Internal Revenue Service. 2016. "Federal Tax Compliance Research: Tax Gap Estimates for Tax Years 2008-2010." IRS Publication 1415.

Table D2. Estimated Aggregate Labor Costs for Legal Employers and Those Engaging in Payroll Fraud, Massachusetts, 2019 (\$ in millions) (Assuming Legal Worker Earnings = \$35,200)

	Legal Employer	Conservative Estimate	Moderate Estimate
<i>Illegal Employment</i>			
Number of Workers	22,146	22,146	22,146
<i>Value to Worker</i>			
Regular Pay	\$760.3	\$760.3	\$760.3
Overtime and Premium Pay	\$19.3	\$0.0	\$0.0
Fringe Benefits / Wage Premium	\$124.0	\$124.0	\$0.0
<i>Subtotal (1)</i>	\$903.5	\$884.3	\$760.3
LESS: Social Security & Medicare (EE share) (2)	\$59.6	\$135.3	\$116.3
Total – Net Value to Worker	\$843.9	\$749.0	\$643.9
<i>Employer Contributions to Social Insurance</i>			
Social Security & Medicare (ER share)	\$59.6	\$0.0	\$0.0
Unemployment Insurance	\$24.5	\$0.0	\$0.0
Workers Compensation	\$37.0	\$0.0	\$0.0
Total – ER Contributions to Social Insurance (3)	\$121.1	\$0.0	\$0.0
<i>Totals</i>			
Total Net Value to Worker (1-2)	\$843.9	\$749.0	\$643.9
Total Value to Social Insurance (2+3)	\$180.7	\$135.3	\$116.3
Total Labor Costs (1+3)	\$1,024.6	\$884.3	\$760.3
<i>Differences from Legal Employer</i>			
Total Labor Cost Differential from Legal		\$140.4	\$264.4
Percent Higher for Legal Employer		15.9%	34.8%

Notes: The worker is responsible for both the employee and employer's share of Social Security and Medicare when working off-the-books or as an independent contractor. Workers who receive a wage premium—such as the cash value of fringe benefits in the second column—must pay the tax on the premium; in contrast, the fringe benefits (e.g., health insurance) provided by the legal employer in the first column are not subject to tax.

The projections in Table D3 offer a range of the potential tax loss attributable to worker nonpayment and underpayment that is made possible by the lack of employment documentation provided by the employer. To be conservative, this study uses the entire range of potential income underreporting rates among self-employed construction workers that could be gleaned from the 2016 study in *Public Budgeting and Finance* and from IRS reports: 23.3% to 64.0%.⁴⁴ This leads to a predictably wide range of potential outcomes for state and federal revenue, but the authors are compelled to adhere to this range in the absence of confirmatory data otherwise. The results of Table D3 demonstrate that Social

⁴⁴ The lowest rate (23.3%) in this expanded range was not included in the calculation of the incidence of payroll fraud because it produced estimates of the number of workers affected that were so low as to be contradicted by a preponderance of other studies on the issue. That said, the authors include these lower rates here in the absence of confirmatory data otherwise on income underreporting. For more discussion of how these rates were generated, see: Ormiston, Russell, Dale Belman and Mark Erlich. 2020. “An Empirical Methodology to Estimate the Incidence and Costs of Payroll Fraud in the Construction Industry”; Alm, James, and Brian Erard. 2016. “Using Public Information to Estimate Self-Employment Earnings of Informal Suppliers,” *Public Budgeting & Finance*, 36(1), 22-46.

Security and Medicare experience the most substantial expected shortfalls due to payroll fraud in the Massachusetts construction industry. Using the \$35,200 income assumption for each of the 22,146 affected workers employed by Massachusetts construction employers, it is projected that these programs experience losses between \$27.1 million and \$86.6 million.

The bottom two rows of Table D3 also present the projected shortfalls in federal and state income taxes—using 2019 tax schedules—as a result of income underreporting made possible by the lack of employer documentation.⁴⁵ Generating exact estimates, however, is practically impossible with publicly-available data given that researchers do not know which specific workers are affected by payroll fraud. As such, the authors must make some assumptions about the characteristics of these workers. First, since marital status dictates workers’ standard deduction and tax rates, this study assumes that workers engaged in payroll fraud have one child and are married at the same proportion (56.83%) as all construction workers in the authors’ analysis of the American Community Survey. In the absence of clear data on spousal income, this study assumes that all workers take the standard deduction and have no other household income. This latter assumption is *extremely* conservative, and suggests that the estimated resulting income tax revenue losses approximate *lower-bound* projections.⁴⁶ With these caveats in mind, the results suggest that payroll fraud in Massachusetts’ construction industry led to federal income losses between \$8.4 million and \$31.7 million in 2019.

Table D3. Minimum and Maximum Estimated Tax Loss in Payroll Fraud, Massachusetts, 2019 (in \$ millions) (Assuming Legal Worker Earnings = \$35,200)

	Minimum	Maximum
<i>Illegal Employment</i>		
Number of Workers (Total)	22,146	22,146
Number of Massachusetts Residents (Est.)	20,554	20,554
<i>Tax Revenue Shortfalls</i>		
Social Security & Medicare	\$27.1	\$86.6
Federal Income Tax (2019 tax schedule)	\$8.4	\$31.7
State Income Tax (2019 tax schedule)	\$6.7	\$18.4

Note: Social Security, Medicare and federal income tax projections based on the estimated total number of affected workers among Massachusetts employers. State income tax projections based on the estimated number of Massachusetts residents employed by those firms. Data from American Community Survey suggests that 92.81% of Massachusetts construction workers live in the state.

Estimating the corresponding loss in Massachusetts tax revenue is complicated by the fact that some of the estimated 22,146 workers affected by payroll fraud while working for Massachusetts construction employers do not live in the state and would not be responsible

⁴⁵ Per-worker tax estimates derived from looking at breakdowns from the Tax Foundation: <https://taxfoundation.org/2019-tax-brackets> and <https://taxfoundation.org/state-individual-income-tax-rates-and-brackets-for-2020/>.

⁴⁶ One counterbalance to the conservative nature of estimated federal income tax losses is that this study does not consider potential earned income tax credit (EITC) benefits.

for Massachusetts income tax. To estimate the proportion of affected workers who are state residents, this study used data from the 2019 American Community Survey that suggests that 92.81% of construction workers employed by Massachusetts firms also live in the state. As a result, this proportion is multiplied by the number of workers affected; the results suggest 20,554 of these workers reside in Massachusetts and thus are subject to the state's income tax.⁴⁷ Using the same income and demographic assumptions above and using the 2019 state income tax schedule, Table D3 suggests that payroll fraud resulted in an estimated \$6.7 million to \$18.4 million shortfall in Massachusetts income tax. As a reminder, however, these estimates are lower-bound projections of income tax losses due to the conservative nature of the assumptions applied.

The first three tables of Appendix D explored payroll fraud under the most conservative set of assumptions: 22,146 workers affected and assumed earnings (\$35,200) equivalent to the 10th percentile of wage-and-salary income for those in legal construction occupations. But it is reminded that this represents only one potential set of assumptions regarding the number of workers affected and their presumed earnings if they had been employed legally. To those ends, Table D4 presents the estimated aggregate costs of payroll fraud under four different scenarios based on the number of workers affected (22,146 or 36,719) and the assumed average earnings of these workers had they been employed legally: the 10th percentile (\$35,200) or 25th percentile (\$44,960) of wage-and-salary tradespeople in Massachusetts.

The projections offered by these four scenarios tell a similar story, even if the dollar values change in each column of Table D4. First and foremost, the direct effects of payroll fraud are substantial no matter the case, with illegal actions of employers—not paying overtime and evading taxes and legally-required contributions—amounting to totals between \$140.4 million and \$286.0 million. The state unemployment insurance program is projected to have lost between \$24.5 million and \$40.6 million in 2019 due to payroll fraud in construction, while there were between \$37.0 million and \$78.3 million in uncollected workers' compensation insurance premiums. Employers also rid themselves of substantial Social Security and Medicare obligations, amounting to \$59.6 million to \$126.3 million under the varying assumptions outlined in Table D4.

And this is all on top of indirect effects of payroll fraud, as the lack of employer documentation effectively makes possible widespread income underreporting to the IRS and the Massachusetts Department of Revenue. While tax estimates knowingly feature a wide margin of error, the results of Table D4 suggest that payroll fraud in Massachusetts is costing the state budget between \$6.7 million and \$41.3 million depending on which set of assumptions is applied. At the federal level, presumed income underreporting among Massachusetts construction workers affected by payroll fraud leads to federal income tax shortfalls of \$8.4 million to \$82.7 million depending on the chosen assumptions;

⁴⁷ This assumes that workers affected by payroll fraud follow the same residence and commuting patterns as regular employees. While it could be argued that workers affected by payroll fraud may be more likely to be local—thus suggesting that the number of in-state workers used in this study could be an underestimate—the absence of any data on this issue compels the authors to rely on the overall industry average for all workers.

correspondingly, Social Security and Medicare exhibit losses of \$27.1 million to \$183.4 million depending on the chosen assumptions.

Table D4. Estimated Aggregate Labor Costs for Legal Employers and Those Engaging in Payroll Fraud, Massachusetts, 2019 (in \$ millions)

	Conservative (22,146 workers)		Moderate (36,719 workers)	
<i>Earnings (10th vs. 25th Percentile)</i>				
Assumed Legal Worker Earnings	\$35,200	\$44,960	\$35,200	\$44,960
<i>Total Labor Costs</i>				
If Workers Hired Legally	\$1,024.6	\$1,301.9	\$1,698.9	\$2,158.7
If Workers Hired Fraudulently	Min \$760.3 Max \$884.3	Min \$971.1 Max \$1,129.4	Min \$1,260.5 Max \$1,466.1	Min \$1,610.1 Max \$1,872.7
<i>Direct Effects of Payroll Fraud</i>				
Overtime and Premium Pay Not Received	\$19.3	\$24.6	\$32.0	\$40.8
Unemployment Insurance Fund Shortfall	\$24.5	\$24.5	\$40.6	\$40.6
Workers Compensation Fund Shortfall	\$37.0	\$47.2	\$61.3	\$78.3
Employer Share FICA onto Workers	\$59.6	\$76.2	\$98.9	\$126.3
<i>Effect of Worker Income Underreporting</i>				
Social Security & Medicare Shortfall	Min \$27.1 Max \$86.6	Min \$34.6 Max \$110.6	Min \$44.9 Max \$143.6	Min \$57.4 Max \$183.4
Federal Income Tax Shortfall	Min \$8.4 Max \$31.7	Min \$13.7 Max \$49.9	Min \$13.9 Max \$52.5	Min \$22.8 Max \$82.7
State Income Tax Shortfall	Min \$6.7 Max \$18.4	Min \$9.1 Max \$24.9	Min \$11.1 Max \$30.5	Min \$15.0 Max \$41.3

Notes: The worker is responsible for both the employee and employer's share of Social Security and Medicare when working off-the-books or as an independent contractor. Workers who receive a wage premium—such as the cash value of fringe benefits in the second column—must pay the tax on the premium; in contrast, the fringe benefits (e.g., health insurance) provided by the legal employer in the first column are not subject to tax.

Discussion

Appendix D has provided the authors' preferred methodology for estimating the economic costs of wage and tax fraud in Massachusetts' construction industry. This approach leads to cost projections suggesting that payroll fraud among Massachusetts construction employers was estimated to *directly* cost workers and taxpayers a minimum of \$140.4 million in 2019, and potentially reaching values over \$250 million. Put another way, this is effectively a public subsidy for law-breaking construction employers, general contractors, developers, construction owners, and anyone else who profits from an economic structure that is based on flagrant, pervasive and systematic violation of state and federal labor law and, in most cases, the suppression of workers' rights.

While this empirical approach is the authors' best attempt at projecting the costs of wage and tax fraud in the Massachusetts construction industry, it is reminded that this study is attempting to estimate the volume of money exchanging hands in the underground economy. To those ends, a "true" count is practically impossible: both employers and workers have incentives to systematically conceal payments and their involvement in fraudulent activities.

As such, the authors have had to rely on assumptions about the number of workers affected, their incomes, and other work and tax circumstances. The use of assumptions knowingly introduces a nontrivial margin of error into the cost projections, however the lack of direct evidence on many instances of wage and tax fraud leave the authors no choice but to estimate the costs of misclassification in this indirect way.

Despite considerable concerns over the margin of error in the cost estimates using this approach, the authors have reasons to believe that the direct costs of payroll fraud advanced in this study are not only reasonable, but may understate the costs. Beyond the argument that this study is likely undercounting the number of workers affected by payroll fraud (see *Discussion* in Appendix A), there are two primary direct costs that this study do not incorporate into its projections in order to maintain the most conservative assumptions in the absence of any data. First, legal employers must adhere to regulations imposed by the Occupational Safety and Health Administration. While this may be in the best interest of workers, it nevertheless imposes a substantial cost on legal employers that is often evaded by contractors operating fraudulently. However, since there is no known credible estimate for the cost that safe and responsible contracting imposes on legally-operating employers, it is not included in this analysis.

A second means by which fraudulent employers reduce labor cost that is not captured in the methodology is direct wage theft, or the explicit non-payment of wages promised by an employer. There are anecdotal reports of rampant wage theft among off-the-books workers in the construction industry, especially among the most vulnerable workers (e.g., undocumented laborers); as an example, see Part 1 of this study as well as the 2015 report of Western Massachusetts written by Tom Juravich, Essie Ablavsky and Jake Williams.⁴⁸ However, while anecdotal reports are plentiful, there are no known estimates for its extent in the national or state construction industry. For the sake of generating conservative estimates, the results in this study assumed there was no wage theft among fraudulent workers. This is an egregiously conservative assumption. But if this report instead assumed that 1% of wages from fraudulent employers were not paid to workers (a rough approximation derived from the Workers Defense Project studies in Texas), the cost impact would be enormous.⁴⁹ For example, an assumption of 1% wage theft paired with a \$35,200 average worker income and 22,146 workers—the most conservative set of assumptions offered in this study—would suggest that wage theft would cost affected workers, on the aggregate, approximately \$7 to \$8 million. Under the most aggressive worker and income assumptions applied in this paper, the cost of wage theft expands to \$14-\$16 million. This has enormous ripple effects throughout Massachusetts, harming workers, their families, social programs needed to support them, taxpayers, and law-abiding contractors who are forced to compete against these unscrupulous, cost-shaving employers for the same projects.

⁴⁸ For more, see; Juravich, Tom, Essie Ablavsky, and Jake Williams. 2015. “The Epidemic of Wage Theft in Residential Construction in Massachusetts,” UMass-Amherst Working Paper Series.

⁴⁹ For more, see: Workers Defense Project. 2013. “Building a Better Texas: Construction Conditions in the Lone Star State”; Workers Defense Project. 2009. “Building Austin, Building Injustice”.

Finally, the authors contend that the cost estimates developed in this study undercount the full costs of payroll fraud due to its focus on its *direct* effects on Massachusetts workers and taxpayers. But there are innumerable indirect effects that degrade Massachusetts communities that are not fully captured in this study. For instance, construction workers who are not eligible for UI and workers' compensation insurance benefits may have to rely on other state-funded government programs for support during difficult times. Further, payroll fraud puts downward pressure on wages among workers employed by legitimate, law-abiding contractors who may struggle to win project bids when competing against firms who can reduce their labor costs by nearly 30% by operating illegally. State tax revenues from businesses would also be expected to decline as law-abiding (and tax-paying) firms are gradually replaced by dishonest employers (and labor brokers) who are less likely to fully report their income to the Department of Revenue. While these are important societal outcomes that result from payroll fraud, data limitations make conclusions drawn from any such analyses—if even possible—to be tenuous at best and are thus not a part of this study.

Finally, while this report offers an estimate of the dollar value of fringe benefits foregone by workers in the underground construction economy, it is reminded that the failure to offer employer-sponsored health insurance and pension benefits is entirely legal and does not, by itself, constitute payroll fraud. But the erosion of working conditions in the construction industry that results from the presence of these unethical actors will necessarily lead to a “race to the bottom” in the Massachusetts construction industry. While some subsectors may be more insulated than others on the basis of skill, licensing requirements, or other factors, the presence of these bad actors can only further exacerbate the decline in health care coverage of Massachusetts workers, leading to more reliance on public sources of funding.