

Safety Net Snags:

THE EFFECT OF PAYROLL FRAUD ON MINNESOTA WORKERS AND
TAXPAYERS



NorthStar

POLICY ACTION



ABOUT THE AUTHOR

Aaron Rosenthal is the Research Director for North Star Policy Action. He holds a Ph.D. in Political Science from the University of Minnesota. He has published a book and several articles on public policy and inequality, with his writing appearing in outlets ranging from *The Washington Post* to *MinnPost*.



ABOUT NORTH STAR POLICY ACTION

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Executive Summary

The employer-employee relationship is foundational in the United States. Labor protections, such as minimum wage and overtime pay, begin with being recognized as an employee. The existence of many of our social safety net programs, including Unemployment Insurance and Workers' Compensation, comes from employer and employee contributions. Unfortunately, that foundation is under threat. Rather than hiring people as employees, deceptive employers are exploiting our system by misclassifying their workers as independent contractors.

To understand how this misclassification works, consider a recent example in which individuals were being hired by staffing agencies to work as dishwashers in restaurants. Rather than being hired as an employee of the restaurant, however, these individuals were told they were independent contractors. Imagine their surprise at finding out from the staffing agency that they were now understood as owning a dishwasher business that operated independently within the restaurant.¹ As a result, rather than being protected by federal, state, and local labor laws, the people hired by the staffing agency had to function as business owners, including all the paperwork and tax liabilities that come from owning a business.

When this type of payroll fraud occurs, everyone loses. Workers miss out on crucial benefits and worker protections. Employers who play by the rules are placed at a competitive disadvantage, as those engaging in fraud can undercut them. And taxpayers must cover the costs of social safety net programs that fail to receive legally required benefits due to this fraud.

Adding to the concerning nature of misclassification is the fact that we don't know its extent. One recent study of Minnesota's construction industry estimated that 23% of workers were misclassified, costing each worker roughly \$30,000 annually, along with the state losing out on \$136 million in tax revenue.² While helpful, this analysis leaves an open question about the scale and cost of misclassification outside of construction.

¹ Tamara Chuang, "Gig workers are employees, Denver auditor says as city seeks more than \$1 million in penalties," *The Colorado Sun*, January 23, 2024, <https://coloradosun.com/2024/01/23/denver-auditor-gig-workers-wage-theft>.

² Nathan Goodell and Frank Manzo, "The costs of wage theft and payroll fraud in the construction industries of Wisconsin, Minnesota, and Illinois: Impacts on Workers and Taxpayers," *Illinois Economic Policy Institute and Midwest Economic Policy Institute*, January 14, 2021, <https://midwestepi.files.wordpress.com/2020/10/mepi-ilepi-costs-of-payroll-fraud-in-wi-mn-il-final.pdf>.

To help answer this question, we ran an analysis to estimate the proportion of workers experiencing payroll fraud in Minnesota in 2019, along with estimates of how much money was lost to crucial state programs due to that fraud and how much workers themselves lost in compensation.³ We find:

- ◆ **Approximately 316,000 private-sector workers experienced payroll fraud in 2019**, representing 9.4% of all private-sector workers in Minnesota.
- ◆ **These Minnesota workers lost between \$2.9 and \$6.2 billion due to payroll fraud**, including lost compensation in the form of paid leave, overtime pay, health insurance, and retirement benefits.
- ◆ **Payroll fraud cost the Minnesota state government an estimated \$506 million to \$1.3 billion in tax revenue.** This total includes \$276 million to \$836 million in unrealized state income tax collections, \$176 million to \$353 million in Workers' Compensation premiums, and \$54 million to \$108 million in state Unemployment Insurance contributions.
- ◆ **We estimate the total public revenue impact of payroll fraud in Minnesota to be between \$1.04 and \$2.1 billion.** This greater financial penalty reflects payroll fraud's impact on other legally required benefits, including money lost in federal Social Security and Medicare contributions. If we assume this level of payroll fraud exists today and adjust it for inflation to put it in real 2024 dollars, the losses rise to an estimated \$1.3 to \$2.6 billion.

Notably, the methodology underlying these estimates utilizes conservative assumptions, meaning our analysis almost assuredly underestimates the amount and cost of payroll fraud in Minnesota. A more comprehensive and accurate estimate of payroll fraud in Minnesota will ultimately require greater data analysis from state agencies. Even if we accept our likely underestimation as correct, the analysis shows that payroll fraud is widespread in Minnesota, devastates North Star State workers, and punches significant holes in the state's social safety net.

³ We focus on 2019 because it was the most recent year for which all necessary data was available that was not significantly affected by the COVID-19 pandemic. Data was also available for 2020, but we were concerned the estimates would not be valid due to the pandemic's impact that year.

Estimating the Number of Workers Experiencing Payroll Fraud

Scholars have utilized several methodologies for estimating the number of workers experiencing payroll fraud. These analyses have focused almost exclusively on the construction industry, recognizing that construction is an area where payroll fraud is prevalent.⁴ The target of our analysis differs, as we are interested in identifying payroll fraud across all industries within Minnesota. As such, many of our methods mirror steps utilized in other analyses, while some of our methods differ.

Generally, identifying payroll fraud starts by estimating the number of self-employed workers (SE). This starting point begins with the understanding that individuals classified as wage-and-salary employees (i.e., W-2 employees) are not treated as independent contractors and therefore are not subject to payroll fraud. To estimate the number of self-employed workers, we subtract the number of wage-and-salary employees (WSE) from the total number of employees (TE).

Equation 1: $SE = TE - WSE$

Past analyses carrying out this function have utilized household surveys, such as the American Community Survey (ACS), to inform their estimate of the total number of employees (TE). While common, studies have

also suggested that this method may create errors insofar as evidence suggests that the ACS undercounts the total number of jobs⁵ and may specifically suffer in its ability to capture self-employment accurately.⁶

To calculate total employment (TE), we rely instead on the total full-time and part-time employment numbers provided by the Bureau of Economic Analysis (BEA).⁷ Based on data from the Bureau of Labor Statistics (BLS) and the Internal Revenue Service (IRS), this source avoids the issues that stem from any household survey's reliance on self-reporting. According to the BEA, Minnesota had approximately 3.4 million total private-sector, full and part-time employees in 2019.⁸

To estimate the number of wage-and-salary employees (WSE), we again turn to the BEA. However, we now focus on their data measuring full- and part-time wage-and-salary employment by industry (i.e., W-2 employees). The BEA data indicates that the state had roughly 2.6 million full- and part-time private-sector wage-and-salary employees in 2019.

4 See for example: Russell Ormiston, Dale Belman, and Mark Erlich, "An empirical methodology to estimate the incidence and costs of payroll fraud in the construction industry," Institute for Construction Employment Research, January 2020, <https://iceres.org/wp-content/uploads/2020/06/ICERES-Methodology-for-Wage-and-Tax-Fraud.pdf>. Laura Valle-Gutierrez, Russ Ormiston, Dale L. Belman, and Jody Calemine, "Up to 2.1 million US construction workers are illegally misclassified or paid off the books," The Century Foundation, November 12, 2023, <https://tcf.org/content/report/up-to-2-1-million-u-s-construction-workers-are-illegally-misclassified-or-paid-off-the-books/>.

5 Robert Warren, "2020 American Community Survey: Use with caution, an analysis of the undercount in the 2020 ACS data used to derive estimates of the undocumented population," *Journal on Migration and Human Security*, Volume 10, Number 2, 2022, Pages 134-45, <https://doi.org/10.1177/23315024221102327>.

6 Katherine G. Abraham, John C. Haltiwanger, Claire Hou, Kristin Sandusky, and James R. Spletzer, "Reconciling survey and administrative measures of self-employment," *Journal of Labor Economics*, Volume 39, Number 4, October 2021, Pages 825-60, <https://doi.org/10.1086/712187>.

7 Throughout this entire analysis, the data we receive refers to jobs, not individuals. This is a potentially important distinction, insofar as one individual might have multiple jobs and therefore file multiple W-2s or 1099s, leading to a form of double counting for that individual. To the extent that this takes place, it should boost the number of legitimate jobs we are capturing in our analysis, meaning it will drive down estimates of payroll fraud and create a more conservative estimate of the problem.

8 U.S. Bureau of Economic Analysis, "SAEMP25N Total full-time and part-time employment by NAICS industry" (accessed Monday, March 4, 2024), <https://www.bea.gov/itable>. Our analysis excludes public sector employees. In support of this choice, the BEA's statistics show that there is no self-employment within the Public Administration industry.

Plugging these numbers into Equation 1 reveals an estimated 740,000 self-employed private-sector workers in Minnesota. This estimate is broken down by all private-sector industries in Table 1 below.

With this calculation run, we must now identify who among the self-employed (SE) is correctly classified as self-employed (CSE) and which workers are instead suffering from

payroll fraud (WPF), either because they are paid off-the-books in cash or misclassified as independent contractors (i.e., should be classified as wage-and-salary employees). Subtracting the correctly classified self-employed (CSE) from the total number of self-employed (SE) provides us with an estimate of the workers suffering from payroll fraud (WPF).

Table 1. Self-Employment in Minnesota, 2019

Industry	Total Employment (TE)	Wage-and-Salary Employment (WSE)	Self-Employment (SE), TE - WSE
Agriculture, Forestry, Fishing and Hunting	91,586	25,306	66,280
Mining, Quarrying, and Oil and Gas Extraction	8,522	5,821	2,701
Utilities	12,801	12,054	747
Construction	185,156	130,375	54,781
Manufacturing	338,900	324,471	14,429
Wholesale Trade	138,008	128,902	9,106
Retail Trade	354,771	295,382	59,389
Transportation and Warehousing	152,547	97,695	54,852
Information	54,829	46,906	7,923
Finance and Insurance	220,384	155,545	64,839
Real Estate and Rental and Leasing	142,496	36,680	105,816
Professional, scientific, and technical services	240,317	161,020	79,297
Management of companies and enterprises	93,296	89,244	4,052
Administrative and support and waste management and remediation services	171,938	135,791	36,147
Educational services	93,134	72,964	20,170
Health care and social assistance	517,479	477,773	39,706
Arts, entertainment, and recreation	94,194	48,427	45,767
Accommodation and food services	243,298	229,254	14,044
Other services (except Public Administration)	197,813	139,961	57,852
All private sector	3,351,469	2,613,571	737,898

Equation 2: $WPF = SE - CSE$

To carry out Equation 2, we rely on the US Census Bureau’s Nonemployment Statistics series (NES).⁹ The “NES Establishments” statistic from this data series provides the number of U.S. businesses with no paid employees by industry. Given that this statistic represents businesses where only the business owner is being paid, we treat the “NES Establishments” statistic as approximating the number of self-employed individuals who reported earnings to tax agencies. As this group reports self-employed earnings, we identify them as Minnesota’s correctly classified self-employed population (CSE). According to the NES, nearly 420,000 self-employed contractors reported earnings in Minnesota in 2019.¹⁰

Drawing on equation 2, subtracting this number of self-employed workers who reported earnings (CSE) from the total number of self-employed workers (SE) identifies all self-employed workers who did NOT report any earnings to tax agencies. Given that these individuals appear to be self-employed but did not report any

earnings from this self-employment, we classify them as workers suffering from payroll fraud (WPF). This analysis indicates that nearly 316,000 Minnesota workers suffered from payroll fraud in 2019. The results of this analysis for each industry can be found in Table 2.

Taking these 316,000 workers as a share of total private-sector employment in Minnesota reveals that approximately 9.4 percent of all private-sector workers in Minnesota suffered from payroll fraud in 2019.

Notably, we employ a conservative method for identifying workers suffering from payroll fraud in Minnesota. For example, our method misses workers who may have been misclassified as independent contractors but still reported their earnings to tax agencies as a self-employed person. Moreover, it misses individuals who were paid “off-the-books”, meaning they did not file any tax return, causing our analysis procedure to miss them entirely.¹¹ As such, the 9.4 percent estimate should be seen as a conservative estimate of the amount of payroll fraud in Minnesota.

⁹ Some concerns have been raised in previous analyses about the use of NES data to estimate payroll fraud (see for example, Ormiston et al. 2020, footnote 40 where the authors note that one individual may file a return for multiple businesses, leading to the double counting of correctly classified self-employed individuals and thus an undercount of workers experiencing payroll fraud). To the extent that this critique impacts our results, it should only create an even more conservative estimate of payroll fraud, once again suggesting that our estimates provide a lower bound.

¹⁰ US Census Bureau, 2019 County Business Patterns and Nonemployer Statistics Combined Report. “Minnesota.” (accessed Monday, March 4, 2024), <https://www.census.gov/data/tables/2019/econ/nonemployer-statistics/2019-combined-report.html>.

¹¹ Previous analysis in Massachusetts suggests that roughly 30% of all independent contractors in the state’s residential construction industry may fall into the paid “off-the-books” category. It is not clear if this statistic would extrapolate out to other industries, but it is suggestive of how large the undercount in our analysis might be. See Tom Juravich, Russell Ormiston, and Dale Belman, “The social and economic costs of illegal misclassification, wage theft, and tax fraud in residential construction in Massachusetts,” Institute for Construction Economic Research, June 2021, <https://faircontracting.org/wp-content/uploads/2022/03/Juravich-Ormiston-and-Belman-Wage-Theft-6-28-21.pdf>.

Table 2. Workers Suffering from Payroll Fraud in Minnesota, 2019

Industry	Self-Employment (SE)	Correctly Classified as Self-Employed (CSE)	Workers Suffering from Payroll Fraud (WPF), SE - CSE
Agriculture, Forestry, Fishing and Hunting	66,280	5,398	60,882
Mining, Quarrying, and Oil and Gas Extraction	2,701	162	2,539
Utilities	747	220	527
Construction	54,781	40,099	14,682
Manufacturing	14,429	7,143	7,286
Wholesale Trade	9,106	6,043	3,063
Retail Trade	59,389	38,792	20,597
Transportation and Warehousing	54,852	44,987	9,865
Information	7,923	5,500	2,423
Finance and Insurance	64,839	12,466	52,373
Real Estate and Rental and Leasing	105,816	46,061	59,755
Professional, scientific, and technical services	79,297	63,193	16,104
Management of companies and enterprises	NA*	NA*	NA*
Administrative and support and waste management and remediation services	36,147	29,488	6,659
Educational services	20,170	16,240	3,930
Health care and social assistance	39,706	28,769	10,937
Arts, entertainment, and recreation	45,767	32,730	13,037
Accommodation and food services	14,044	5,353	8,691
Other services (except Public Administration)	57,852	35,436	22,416
All private sector	733,846	418,080	315,766

**The NES does not include an estimate for NES establishments within the “Management of companies and enterprises” industry. As such, we do not include this industry in our analysis. This choice creates a more conservative estimate of payroll fraud in Minnesota to the extent that we miss any payroll fraud within the management industry.*

Estimating Tax Revenue Lost

Similar to identifying workers suffering from payroll fraud, different methodologies have been used to estimate tax revenue lost due to this fraud.¹² In this analysis, we draw on the methodology utilized by the Illinois Economic Policy Institute (ILEPI) in their 2021 analysis of payroll fraud.¹³ While the ILEPI report focuses on fraud within the construction industry, it is particularly useful for our purposes because none of the assumptions about lost revenue in their methodology rely on assumptions specific to that industry. It is therefore possible to apply this methodology to our statewide focus.

Our aim here is to identify lost tax revenue in four areas. These include:

- ◆ Lost income tax collections
- ◆ Lost Workers' Compensation (WC) premiums
- ◆ Lost state Unemployment Insurance (UI) contributions
- ◆ Lost legally required benefits

This last category of lost legally required benefits includes revenue deducted from workers' paychecks to cover state and federal government programs. As such, it combines the aforementioned state programs (WC and UI) with federal programs (i.e., Social Security, Medicare, and the federal portion of UI) to provide a more comprehensive sense of the public revenue lost due to payroll fraud.

INCOME TAX LOST

To identify the revenue lost for these programs, we start by estimating the average annual wages for wage-and-salary workers in Minnesota. This estimate provides a sense of how much income tax is lost due to payroll fraud while also giving us a basis for estimating how much revenue is lost in social insurance program contributions.

To explain this estimation process, consider the example of workers in the educational services industry. Using data from the BEA, we find that the total private-sector wages in that industry in 2019 were roughly \$2.5 billion.¹⁴ When divided by the total number of private-sector wage-and-salary employees in that industry shown in Table 1 (72,964), we can estimate that the average annual wage per educational services employee was \$35,098.

This wage amount can then be used to identify the income tax lost due to payroll fraud. First, the effective state income tax rate for a single individual making \$35,098 in Minnesota is 3.24%, meaning educational service wage-and-salary employees contribute \$1,137 annually in state income taxes, on average.¹⁵

Given that our method for identifying workers suffering from payroll fraud was based on finding individuals who did not report earnings to tax agencies, we assume that this group paid no income taxes. Thus, if we assume that workers suffering from payroll fraud receive the same annual average wage as wage-and-salary workers (\$35,098),

¹² For example, see: Dale Belman and Aaron Sojourner, "Illegal worker misclassification: Payroll fraud in the District's construction industry," Office of the Attorney General for the District of Columbia, September 2019, <https://oag.dc.gov/sites/default/files/2019-09/OAG-Illegal-Worker-Misclassification-Report.pdf>.

John Schmitt, Heidi Shierholz, Margaret Poydock, and Samantha Sanders, "The economic costs of worker misclassification," Economic Policy Institute, January 25, 2023, <https://www.epi.org/publication/cost-of-misclassification/>.

¹³ Goodell and Manzo, 2021.

¹⁴ U.S. Bureau of Economic Analysis, "SAINC7N Wages and salaries by NAICS industry" (accessed Monday, March 4, 2024).

¹⁵ Following ILEPI's methodology, effective state income tax rates are derived from SmartAsset's Income Tax Calculator, found at <https://smartasset.com/taxes/income-taxes>.

we can assume that the state loses \$1,137 in income taxes per misclassified worker within the educational services industry.

However, it is possible that workers suffering from payroll fraud are paid substantially less than their wage-and-salary counterparts, as exploitation of these workers is common. To explore this possibility, we create a second estimate that assumes workers suffering from payroll fraud make half as much as W-2 employees in the same industry. In the case of educational service workers, this creates an estimated annual wage of \$17,549 and an effective state income tax rate of 1.14%, meaning the state would lose \$200 per educational service worker suffering from payroll fraud.¹⁶

¹⁶ The assumption of workers suffering from payroll fraud making as much as W-2 employees mirrors ILEPI's treatment of construction workers who are paid off-the-books in cash. As we discuss, while this equivalence is possible, it is also conceivable that wages for workers experiencing payroll fraud could be lower than what wage-and-salary employees receive, particularly because the exploitation of these workers often includes low pay. With that said, a third possibility is that wages for workers experiencing payroll fraud could be higher, as the people employing them can get away with not contributing to social insurance programs or other benefits (e.g., health insurance), allowing them to put more of their compensation into wages. If that is the case, the actual income tax revenue lost would be greater than our upper bound estimates.

Utilizing these assumptions, we apply the per-worker amount of income tax (\$200/\$1,137) to the total number of workers suffering from payroll fraud within educational services (3,930), resulting in our estimating that the state loses between \$786,000 and \$4.5 million in income taxes due to payroll fraud within the educational services industry.

The table below provides these same totals for each industry in Minnesota, showing that the state lost out on an estimated \$276 to \$854 million in income tax contributions in 2019. Notably, if we assume this same level of payroll fraud exists today and update the estimates to adjust for inflation, it suggests that the state will lose between \$340 million and \$1.05 billion in income tax revenue in 2024.¹⁷

¹⁷ This inflation adjustment relies on the 23% inflation rate provided by the CPI from 2019 to 2023. This inflation rate was taken from the Inflation Calculator provided by the Federal Reserve Bank of Minneapolis: <https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator>.

Table 3. State Income Tax Lost Due to Payroll Fraud in Minnesota, 2019

Industry	Wages Estimates	Effective State Income Tax Rate	State Income Tax Lost Per Worker	Workers Suffering from Payroll Fraud (WPF)	Total state income tax lost (thousands of \$)
Agriculture, Forestry, Fishing and Hunting	\$17,927 - \$35,855	1.22% - 3.3%	\$219 - \$1,183	60,882	\$13,316 - \$72,036
Mining, Quarrying, and Oil and Gas Extraction	\$46,225 - \$92,450	3.82% - 5.31%	\$1,766 - \$4,909	2,539	\$4,483 - \$12,464
Utilities	\$58,704 - \$117,408	4.46% - 5.67%	\$2,618 - \$6,657	527	\$1,380 - \$3,508
Construction	\$34,863 - \$69,725	3.23% - 4.83%	\$1,126 - \$3,368	14,682	\$16,533 - \$49,445
Manufacturing	\$34,043 - \$68,086	3.18% - 4.78%	\$1,083 - \$3,255	7,286	\$7,888 - \$23,712
Wholesale Trade	\$42,532 - \$85,064	3.61% - 5.18%	\$1,535 - \$4,406	3,063	\$4,703 - \$13,497

Retail Trade	\$15,750 - \$31,500	0.65% - 3%	\$102 - 945	20,597	\$2,109 - \$19,464
Transportation and Warehousing	\$28,128 - \$56,255	2.72% - 4.35%	\$765 - \$2,447	9,865	\$7,547 - \$24,141
Information	\$41,955 - \$83,909	3.59% - 5.16%	\$1,506 - \$4,330	2,423	\$3,649 - \$10,491
Finance and Insurance	\$53,685 - \$107,369	4.24% - 5.52%	\$2,276 - \$5,927	52,373	\$119,213 - \$310,403
Real Estate and Rental and Leasing	\$27,363 - \$54,727	2.65% - 4.29%	\$725 - \$2,348	59,755	\$43,330 - \$140,292
Professional, scientific, and technical services	\$48,847 - \$97,694	3.98% - 5.39%	\$1,944 - \$5,266	16,104	\$31,308 - \$84,799
Administrative and support and waste management and remediation services	\$21,320 - \$42,641	1.88% - 3.62%	\$401 - \$1,544	6,659	\$2,669 - \$10,279
Educational services	\$17,549 - \$35,098	1.14% - 3.24%	\$200 - \$1,137	3,930	\$786 - \$4,469
Health care and social assistance	\$26,760 - \$53,520	2.59% - 4.23%	\$693 - \$2,264	10,937	\$7,580 - \$24,760
Arts, entertainment, and recreation	\$19,737 - \$39,474	1.6% - 3.48%	\$316 - \$1,374	13,037	\$4,117 - \$17,909
Accommodation and food services	\$11,748 - \$23,495	0% - 2.2%	\$0 - \$517	8,691	\$0 - \$4,492
Other services (except Public Administration)	\$18,651 - \$37,302	1.38% - 3.37%	\$257 - \$1,257	22,416	\$5,770 - \$28,179
All private sector	\$78,084,330 - \$156,168,660			315,766	\$276,381 - \$854,340

REVENUE LOST TO SOCIAL INSURANCE PROGRAMS

Extrapolating from annual wages to revenue lost to social insurance programs requires identifying how much of each worker's compensation is devoted to these programs. Here, we rely on the BLS's "Employer Costs for Employee Compensation" report (ECEC).¹⁸

This report breaks down the compensation provided to workers by employers on an industry-by-industry basis, indicating how much the employer gives in wages and benefits. Notably, this benefit compensation is further broken down into categories like retirement and legally required benefits, including how much an employer devotes to Social Security, Medicare, federal UI, state UI, and WC.

¹⁸ Bureau of Labor Statistics, "Employer Costs for Employee Compensation – September 2019," Table 4 "Employer Costs for Employee Compensation for private industry workers by occupational and industry group," Page 8, https://www.bls.gov/news.release/archives/ecec_12182019.pdf.

An example of how this breaks down for workers in the educational services industry is provided in the “Percentage of Compensation” column in Table 4 below.

The calculations for the “Dollar Amount of Compensation” column above begin with the two annual wage estimates for educational service workers (one equal to the average wage for W-2 employees and one estimated at half that amount). With the ECEC identifying educational service wages comprising 71.2% of these workers’ total compensation, we can calculate that employers provide a grand total of \$24,665 to \$49,330 when these wages are added to the 28.8% of compensation offered in other employer benefits.¹⁹

Included among these benefits are 7.2% of compensation provided in legally required benefits (\$1,778/\$3,556 per worker), 0.4% in state UI (\$92/\$185 per worker), and 1.2% in WC (\$300/ \$600 per worker).

Given that no earnings were reported for the 3,930 educational workers suffering from payroll fraud, it is safe to assume that all of these contributions were lost for each worker. As a result, each of these per-worker totals can be multiplied by 3,930, creating the industry total price tags of \$7 to \$14 million lost in legally required benefits, \$363,000 to \$725,000 lost in state UI contributions, and \$1.2 to \$2.4 million lost in WC premiums.²⁰

¹⁹ Following the ILEPI report’s methodology, we calculate the percentage of compensation by taking the average of the industry-specific compensation and the West North Central region’s overall compensation statistics (i.e., Minnesota’s Census division). For example, the share of the education industry’s compensation devoted to legally required benefits for private industry workers was 6.7%, while it was 7.8% for the West North Central region, resulting in the 7.2% average used here.

²⁰ The ECEC report does not provide industry-specific shares of compensation for each program (e.g., Workers’ Compensation). To create these, we relied on the share that each program comprised of the legally required benefits for all private industry workers (see Table 1- Employer Costs for Employee Compensation by Ownership). For example, Workers’ Compensation made up roughly 16.9% of legally required benefits according to that table, so we assume this share of legally required benefits transfers across each industry, explaining how we derive the 1.2% share for Workers’ Compensation for educational service workers from the 7.2% share given to legally required benefits within this industry (i.e., 1.2% = 16.9% of 7.2%).

Table 4. Lost Programmatic Revenue Due to Educational Services Workers Suffering from Payroll Fraud in Minnesota, 2019

	Percentage of Compensation	Dollar Amount of Compensation	Total Lost Across All Payroll Fraud
Wages	71.2%	\$17,594 – \$35,098	
Total Compensation	100%	\$24,665 – \$49,330	
Legally Required Benefits	7.2%	\$1,778 – \$3,556	\$6,988,428 – \$13,976,855
State Unemployment Insurance	0.4%	\$92 – \$185	\$362,699 – \$725,399
Workers’ Compensation	1.2%	\$300 – \$600	\$1,179,647 – \$2,359,293

The table below displays these same programmatic totals for each industry.²¹ Taken together, these indicate that Minnesota lost \$54 to \$108 million in state UI contributions, along with \$176 to \$353 million in WC premiums. Added to the \$276 to \$836 million lost in state income taxes, Minnesota lost an estimated \$506 million to \$1.3 billion in revenue due to payroll fraud in 2019.

Moreover, when the money lost to state UI and WC is added to employer contributions for other federal programs, such as Social Security and Medicare, the total tax revenue lost to legally required benefits rises to between \$1.04 and \$2.1 billion. Again, if this estimate is updated to adjust for inflation, the totals rise to between \$1.3 and \$2.6 billion in real 2024 dollars.

²¹ We do not provide the programmatic compensation breakdown for each industry here, but these calculations are available from the authors by request.

Table 5. Lost Programmatic Revenue due to Payroll Fraud in Minnesota, 2019

Industry	Legally Required Benefits (thousands of \$)	State Unemployment Insurance (thousands of \$)	Workers' Compensation (thousands of \$)
Agriculture, Forestry, Fishing and Hunting	\$149,002 - \$298,005	\$7,733 - \$15,467	\$25,152 - \$50,303
Mining, Quarrying, and Oil and Gas Extraction	\$14,053 - \$28,107	\$720 - \$1,459	\$2,372 - \$4,744
Utilities	\$3,553 - \$7,106	\$184 - \$369	\$600 - \$1,200
Construction	\$65,996 - \$131,993	\$3,425 - \$6,850	\$11,140 - \$22,280
Manufacturing	\$28,438 - \$56,876	\$1,476 - \$2,952	\$4,800 - \$9,601
Wholesale Trade	\$16,199 - \$32,397	\$841 - \$1,681	\$2,734 - \$5,469
Retail Trade	\$36,599 - \$73,198	\$1,899 - \$3,799	\$6,178 - \$12,356
Transportation and Warehousing	\$34,502 - \$69,004	\$1,791 - \$3,581	\$5,824 - \$11,648
Information	\$10,439 - \$20,878	\$542 - \$1,084	\$1,762 - \$3,524
Finance and Insurance	\$282,090 - \$564,179	\$14,640 - \$29,281	\$47,617 - \$95,234
Real Estate and Rental and Leasing	\$182,766 - \$365,532	\$9,485 - \$18,971	\$30,851 - \$61,702
Professional, scientific, and technical services	\$79,936 - \$159,872	\$4,149 - \$8,297	\$13,493 - \$26,986
Administrative and support and waste management and remediation services	\$16,516 - \$33,032	\$857 - \$1,714	\$2,788 - \$5,576
Educational services	\$6,988 - \$13,977	\$363 - \$725	\$1,180 - \$2,359
Health care and social assistance	\$31,155 - \$62,311	\$1,617 - \$3,234	\$5,259 - \$10,518
Arts, entertainment, and recreation	\$28,161 - \$56,321	\$1,462 - \$2,923	\$4,754 - \$9,507
Accommodation and food services	\$12,012 - \$24,023	\$623 - \$1,247	\$2,028 - \$4,055
Other services (except Public Administration)	\$46,390 - \$92,780	\$2,408 - \$4,815	\$7,831 - \$15,661
All private sector	\$1,044,795 - \$2,089,591	\$54,225 - \$108,450	\$176,361 - \$352,723

Estimating the Impact on Workers

When payroll fraud occurs, it is not just taxpayers who are hurt through lost revenue, but also the workers who experience this fraud. Workers suffering from payroll fraud lose access to the many forms of compensation that employees generally receive above and beyond their wages. These additional forms of compensation include supplemental pay (often pay for overtime), paid leave, insurance (primarily health insurance), and retirement benefits.

Following a similar methodology to one developed by the Economic Policy Institute (EPI),²² we can use these additional forms of compensation to identify how much workers lost due to payroll fraud by industry in Minnesota in 2019. Once again, we begin with the educational services industry to exemplify how this methodology works.

We start with the same average annual wage for W-2 employees in educational services calculated in the previous section (\$35,098). We also utilize the estimates for compensation derived from the 2019 ECEC report, indicating that wages comprised an average of 71.2% of total compensation for workers in the educational services industry.²³ Additional value to the worker was provided in the form of paid leave (7.4% of total compensation), supplemental pay (1.6%), insurance (8.3%), and retirement and savings (4.3%).

Applying these percentages to the \$35,098 average wage allows us to calculate the average dollar amount received by educational service W-2 employees for each form of compensation, as seen in the second column of Table 6. Factoring these additional benefits in, W-2 employees in educational services received \$45,767.55 in total value from their job.

²² Heidi Shierholz, John Schmitt, and Margaret Poydock, “EPI comments on DOL’s proposed rulemaking on employee or independent contractor classifications under the Fair Labor Standards Act,” Economic Policy Institute, December 13, 2022, <https://www.epi.org/publication/epi-comments-on-dols-proposed-rulemaking-on-employee-or-independent-contractor-classification-under-the-fair-labor-standards-act/>.

²³ Bureau of Labor Statistics, “Employer Costs for Employee Compensation – September 2019,” Table 4 “Employer Costs for Employee Compensation for private industry workers by occupational and industry group,” Page 8, https://www.bls.gov/news.release/archives/ecec_12182019.pdf. See note 14 for the way we combine industry and geography compensation figures to derive our estimates.

Table 6. Lost Worker Compensation in Educational Services Due to Payroll Fraud in Minnesota, 2019

	W-2 Employee	Worker Experiencing Payroll Fraud, Low Wage Estimate	Worker Experiencing Payroll Fraud, High Wage Estimate
Wages (71.2%)	\$35,098	\$35,098	\$41,328
Paid leave (7.4%)	\$3,656		
Supplemental pay (1.6%)	\$783		
Insurance (8.3%)	\$4,091		
Retirement and savings (4.3%)	\$2,139		
Total value of job to worker	\$45,768	\$35,098	\$41,328
Total value lost due to payroll fraud- Dollars Lost (% Lost)		\$10,669 (23.3%)	\$4,439 (9.7%)

Following EPI’s methodology, we can then derive two estimates for the value lost to workers experiencing payroll fraud. In the first estimate, we assume that these workers receive an identical wage to W-2 employees. With these workers failing to receive the additional benefits of paid leave, supplemental pay, insurance, and retirement and savings, their total compensation remains at \$35,098.20, more than \$10,000 (23.3%) less than their industry colleagues who are treated as W-2 employees.

In the second estimate, we assume that workers experiencing payroll fraud are paid better than W-2 employees, with employers covering the cost of health insurance and retirement benefits. While providing a larger total value, workers experiencing payroll fraud still lose more than \$4,400 (9.7%) in total compensation under this more conservative estimate due to losses in areas like supplemental pay and paid leave.

Table 7 provides the results when this methodology is applied to all industries in Minnesota in 2019. Notably, the value lost varies considerably based on the industry’s average wage and the industry’s level of compensation beyond wages. Where workers experiencing payroll fraud in the well-compensated and more generous utilities industry lose between 12.3% and 31.4% (\$21,118 and \$53,861) of their total compensation, those in the less well-paying and less generous accommodation and food services industry see estimated losses between 9.2% and 20.6% (\$2,715 and \$6,100).

The final column in Table 7 multiplies these per worker losses by the total number of workers experiencing payroll fraud, as provided in Table 3. Adding these totals together reveals Minnesota workers lost an estimated \$2.9 to \$6.2 billion in total job value due to payroll fraud in 2019. An adjustment for inflation reveals that this same level of payroll fraud today would lead to workers losing between \$3.6 and \$7.7 billion.

Table 7. Lost Worker Compensation due to Payroll Fraud in Minnesota, 2019

Industry	Total Value Lost per Worker (Low Wage Estimate)			Total Value Lost per Worker (High Wage Estimate)		
	Dollars Lost	% Lost	Industry Total Lost (thousands of \$)	Dollars Lost	% Lost	Industry Total Lost (thousands of \$)
Agriculture, Forestry, Fishing and Hunting	\$11,708	24.6%	\$712,802	\$4,491	9.4%	\$273,442
Mining, Quarrying, and Oil and Gas Extraction	\$32,139	25.8%	\$81,600	\$14,227	11.4%	\$36,123
Utilities	\$53,861	31.4%	\$28,385	\$21,118	12.3%	\$11,129
Construction	\$21,510	23.6%	\$315,804	\$8,768	9.6%	\$128,729
Manufacturing	\$25,110	26.9%	\$182,949	\$11,583	12.4%	\$84,390
Wholesale Trade	\$31,515	27.0%	\$96,531	\$12,911	11.1%	\$39,547
Retail Trade	\$8,621	21.5%	\$177,571	\$3,905	9.7%	\$80,432
Transportation and Warehousing	\$20,842	27.0%	\$205,605	\$8,539	11.1%	\$84,234
Information	\$30,582	26.7%	\$74,100	\$15,305	13.4%	\$37,083

Finance and Insurance	\$40,834	27.6%	\$2,139	\$21,041	14.2%	\$1,102,004
Real Estate and Rental and Leasing	\$16,531	23.2%	\$987,807	\$7,683	10.8%	\$459,091
Professional, scientific, and technical services	\$29,974	23.5%	\$482,700	\$15,498	12.1%	\$249,575
Administrative and support and waste management and remediation services	\$11,278	20.9%	\$75,097	\$5,342	9.9%	\$35,572
Educational services	\$10,669	23.3%	\$41,931	\$4,439	9.7%	\$17,447
Health care and social assistance	\$17,340	24.5%	\$189,646	\$8,066	11.4%	\$88,222
Arts, entertainment, and recreation	\$12,265	23.7%	\$159,894	\$5,746	11.1%	\$74,908
Accommodation and food services	\$6,101	20.6%	\$53,021	\$2,715	9.2%	\$23,599
Other services (except Public Administration)	\$10,787	22.4%	\$241,802	\$4,617	9.6%	\$103,493
All private sector			\$6,245,854			\$2,929,021

NET VALUE LOST TO WORKERS

A final aspect of this analysis is to consider additional costs that may occur to workers experiencing payroll fraud. A central aspect of our analysis up to this point has been that workers experiencing payroll fraud do not pay any income tax, but as discussed earlier, that is almost assuredly not true of all workers in this category. Some workers who should be treated as employees but instead are misclassified as independent contractors likely still pay taxes based on the income they receive.

Notably, such workers face a considerable penalty for their misclassification. Where W-2 employees must only cover the employee's share of taxes for Medicare and Social

Security, independent contractors are forced to double their contribution to cover both their share of tax and their employer's share. As a result, rather than paying 7.65% of their income to cover taxes for Medicare and Social Security, these misclassified workers must devote 15.3% of their pay.²⁴

Moreover, as covered in EPI's methodology, these misclassified workers must also cover the clerical costs associated with their independent contractor status, including invoicing, bookkeeping, and small business tax filings. Factoring these additional costs into the analysis reveals a more comprehensive set of losses facing misclassified workers.²⁵

²⁴ Medicare and Social Security contributions are based on taxing the amount a worker receives in income (wages + paid leave + supplemental pay) minus any contributions to business-related expenses that could be written off from this income (in this case, paperwork costs for independent contractors).

²⁵ See note 4 in Shierholz, Schmitt, and Poydock, 2022 for a detailed explanation of the methodology behind the clerical cost estimate. In short, it includes the cost for bookkeeping software, tax filing software, and labor costs for administrative time put in by the misclassified worker.

Table 8 reveals these net losses using the educational services industry example. The first row begins with the total value estimates derived in Table 6, while the remaining rows cover the paperwork costs facing misclassified independent contractors and

the share of a worker’s pay that is contributed to Social Security and Medicare. Factoring these additional costs in shows that the net value of a job for a misclassified worker in educational services is reduced by 20.1% to 32.2%.

Table 8. Lost Net Value for Misclassified Educational Services Workers in Minnesota, 2019

	W-2 Employee	Misclassified Worker, Low Wage Estimate	Misclassified Worker, High Wage Estimate
Total value of job	\$45,767.55	\$35,098.20	\$41,328.21
[Minus] Paperwork Costs		\$898.09	\$1,014.90
[Minus] Worker contribution to Social Security and Medicare	\$3,024.62	\$5,232.62	\$6,167.94
Net Value of Job	\$42,742.93	\$28,967.49	\$34,145.37
Total Lost due to Misclassification		\$13,775.44 (32.2%)	\$8,597.56 (20.1%)

These same costs are factored in for each industry in Table 9, revealing that misclassification costs for workers range from 19.8% (Accommodation and Food Services) to 39.4% (Utilities). We do not provide a total dollar value lost here

across the whole state, recognizing that we do not have an estimate of how many workers experience this specific form of misclassification given that our analysis in Table 2 captures workers who did not file taxes.

Table 9. Lost Net Value for Misclassified Workers in Minnesota, 2019

Industry	Net Value Lost per Worker (Low Wage Estimate)		Net Value Lost per Worker (High Wage Estimate)	
	Dollars Lost	% Lost	Dollars Lost	% Lost
Agriculture, Forestry, Fishing and Hunting	\$14,880	33.5%	\$8,882	20.0%
Mining, Quarrying, and Oil and Gas Extraction	\$39,794	34.2%	\$24,908	21.4%
Utilities	\$63,295	39.4%	\$36,082	22.5%
Construction	\$27,483	32.2%	\$16,894	19.8%
Manufacturing	\$30,717	35.3%	\$19,474	22.4%
Wholesale Trade	\$38,589	35.4%	\$23,127	21.2%
Retail Trade	\$11,436	30.6%	\$7,516	20.1%
Transportation and Warehousing	\$25,589	35.5%	\$15,363	21.3%
Information	\$37,366	35.0%	\$24,669	23.1%
Finance and Insurance	\$49,347	35.7%	\$32,897	23.8%
Real Estate and Rental and Leasing	\$21,202	31.9%	\$13,848	20.8%
Professional, scientific, and technical services	\$38,017	31.9%	\$25,985	21.8%
Administrative and support and waste management and remediation services	\$15,011	29.9%	\$10,078	20.1%
Educational services	\$13,775	32.2%	\$8,598	20.1%
Health care and social assistance	\$21,870	33.1%	\$14,163	21.4%
Arts, entertainment, and recreation	\$15,675	32.5%	\$10,257	21.2%
Accommodation and food services	\$8,267	30.0%	\$5,453	19.8%
Other services (except Public Administration)	\$14,083	31.4%	\$8,955	20.0%

Comparison to Official State Numbers

The preceding analysis relied on federal government statistics from both the BEA and the NES. To check the robustness of that analysis, we requested corresponding records from Minnesota’s Department of Revenue (DOR). In response, the DOR provided the total number of wage-and-salary tax returns (W-2s) they received in 2019, along with the total compensation associated with those returns. They similarly provided this information for self-employed tax returns for non-employment compensation (1099-NECs).

Similar to the BEA and NES records, these DOR records provide us with crucial information, with the number of W-2s received serving as an estimate of the number of wage-and-salary employees in the state, while the 1099-NECs give us an estimate of the number of correctly classified self-employed workers. Moreover, the compensation statistics give us an estimate of the average salaries for Minnesota workers, allowing us to again derive estimates of tax revenue lost due to payroll fraud.

Before moving into this analysis, there are a couple of important caveats. Mirroring the BEA and NES statistics, several assumptions remain when utilizing the DOR records. For example, the DOR records still miss any individuals who experience payroll fraud by being paid “off-the-books” because there are no tax records for these individuals. In addition, we are still assuming that all people who did file taxes are correctly classified, while it is likely the case that many individuals who are misclassified still file taxes under an incorrect category. As a result of these two assumptions, using the DOR numbers means we are still almost assuredly undercounting the amount of payroll fraud.

In addition, the DOR numbers are only provided at the economy-wide level, rather than being broken down by industry as was the case for the federal statistics previously utilized. This removes some of the precision of the analysis but still allows for statewide estimates to be created.

Finally, to fully carry out the analysis using the DOR numbers, we must draw on some BEA statistics because there is no estimate from the DOR of total employment, and therefore no way to generate an estimate of total self-employment that captures individuals who fail to file their taxes. From this perspective, it is not the case that the estimates produced using the DOR numbers are more accurate or superior to the previous analysis, but they do provide another reference point and a further robustness check for our original analysis.

NUMBER OF IMPACTED WORKERS

Table 10 provides a comparison of the records provided by DOR (left column) and the corresponding estimates produced earlier through our original analysis utilizing federal statistics (NSPA- right column). To start, DOR reported receiving over 3.4 million W-2 tax returns,²⁶ indicating nearly 400,000 more wage-and-salary employees than the estimate we derived from the BEA (3 million).²⁷ To utilize this number for our

²⁶ We believe that the discrepancy between the DOR’s reported W-2 total and the BEA’s wage-and-salary employment estimate comes from a difference in data sources. The BEA relies on data from the Quarterly Census of Employment and Wages (QCEW), which itself takes data from state Unemployment Insurance (UI) numbers. Notably, some individuals who receive W-2s are not covered under UI. For example, individuals who have not worked the minimum number of hours to qualify for UI coverage would file a W-2 with the DOR but not be captured by the QCEW or BEA. For this reason, the DOR is likely to receive more W-2s than would be collected under the BEA’s system of relying on UI data.

²⁷ Note that we indicate a total of 3 million wage-and-salary employees here, while Table 1 listed 2.6 million. The difference here stems from Table 1 excluding the 431,000 public sector workers in Minnesota in 2019. As the DOR numbers did not exclude this population, we provide the BEA estimate of total employment in Table 10 which also includes the public sector.

analysis, recall our equation for estimating self-employment (SE) involved taking the difference between total employment (TE) and wage-and-salary employment (WSE).

Unfortunately, as mentioned above, the DOR does not have an estimate of total employment, making it impossible to utilize this data to generate an estimate of total self-employment. To deal with this limitation, we once again rely on the BEA’s estimate for total self-employment of 733,846.

With this total self-employment estimate in hand, we then turn to identifying how many of these individuals are correctly classified and how many are suffering from payroll fraud using the following equation:

$$\text{Equation 2: WPF} = \text{SE} - \text{CSE}$$

As seen in Table 10, the DOR reported receiving 396,370 1099-NEC filings.²⁸ Given that these individuals filed self-employment taxes, we treat this as the number of correctly classified self-employed individuals in the state. Notably, the 396,370 reported number is slightly smaller than the correctly classified self-employment estimate we derived from

²⁸ In their data report to us, the DOR indicated they received 326,913 1099s that included Social Security Numbers (SSNs) and 69,457 1099s without SSNs, creating our total correctly classified self-employment estimate of 396,370. They also indicated that they had 86,605 filings from people who provided both W-2s and 1099s. For the purposes of this analysis, we categorize those 86,605 people as correctly classified self-employed to create a more conservative estimate, though they just as easily could have been counted only as W-2 workers, which would have increased the amount of payroll fraud found in this analysis.

the NES of 418,080, though they are quite similar.

The final row in Table 10 lists the result of inserting these different estimates into Equation 2. Using the DOR numbers means subtracting the 396,370 correctly classified self-employed individuals from the total self-employment estimate of 733,846. The result is an estimated 337,376 workers suffering from payroll fraud in Minnesota, according to the DOR data.

From this perspective, our original analysis based on federal data found a slightly smaller degree of payroll fraud in Minnesota, though the difference is relatively modest (21,710 people or 6.9%). This slight difference from our initial estimate of payroll fraud provides further confidence in our analysis.

TAX REVENUE LOST

To derive estimates of tax revenue lost, we must begin by estimating the average salaries of workers experiencing payroll fraud, as this provides us with the amount of money that these workers would pay in state income tax if they were correctly classified.

In our original analysis, we assumed that workers suffering from payroll fraud received either the same wage as their W-2 colleagues or half of that wage total. Where our original analysis created these estimates at the industry level, if we utilize this same assumption at an economy-wide level using

Table 10. Total Workers Suffering from Payroll Fraud, DOR v. NSPA

	DOR	NSPA
Total Wage-and-Salary Tax Returns (WSE)	3,447,030	3,044,911
Total Self-Employment (SE), TE - WSE	733,846	733,846
Total Correctly Classified Self-Employed Returns (CSE)	396,370	418,080
Workers Suffering from Payroll Fraud (WPF), SE - CSE	337,476	315,766

the BEA data, it creates estimates of workers suffering from payroll fraud receiving an upper bound of \$59,753 or a lower bound of \$29,876.²⁹

The DOR numbers allow for this estimated annual average salary to be created differently. Here, we can divide the total number of 1099-NEC returns (396,370) by the total compensation reported on these returns (\$17,712,656,199).³⁰ The result is an average estimated self-employed annual wage of \$44,687. We can then assume that workers suffering from payroll fraud would receive this same average salary, meaning the DOR numbers suggest that workers suffering from payroll fraud received compensation that is between the upper and lower bound estimates used in our original analysis.³¹

If we apply the effective state tax rate for \$44,687 (3.73% or \$1,667 lost per worker) and multiply it by the total number of impacted workers (337,476), it suggests that the total income tax revenue lost to the state would be roughly \$563 million. Notably, this estimate falls between the upper bound estimate derived in our original analysis (\$854 million) and the lower bound estimate (\$176 million) but is a bit closer to the upper bound.

REVENUE LOST TO SOCIAL INSURANCE PROGRAMS

Turning to revenue lost to social insurance programs, our original estimates again differ due to the different wage amounts for self-employed workers derived from the DOR statistics. If workers suffering from payroll fraud are being paid \$44,687 instead of the \$29,876 or \$59,753 we originally estimated, then the amount that they would have theoretically paid into social insurance programs had they been classified as W-2 employees also falls between these estimates. For example, a worker who is paid \$59,753 would contribute roughly \$1,111 in Workers' Compensation premiums, while one being paid \$44,687 would contribute \$831.

²⁹ The upper bound average salary estimate (\$59,753) is calculated by dividing the state's total private-sector industry wages (\$156 billion) by the state's total number of private-sector wage-and-salary employees (2,613,571). The lower bound estimate (\$29,876) is then derived by dividing this upper bound estimate in half.

³⁰ Once again, this compensation total reflects all 1099s (those filed with and without SSNs).

³¹ This is not a perfect comparison to our original analysis, as our earlier estimates concerned the pay for workers experiencing payroll fraud, while the DOR numbers reference pay for the correctly classified self-employed.

Table 11. Tax Revenue Lost Due to Payroll Fraud According to DOR Statistics

	DOR
Total Correctly Classified Self-Employed Returns (1099-NEC)	396,370
Total Correctly Classified Self-Employed Compensation (1099-NEC) (thousands of \$)	\$17,712,566
Estimated Annual Average Salary for Self-Employed Workers	\$44,867
Effective State Income Tax Rate	3.73%
Tax Revenue Lost Per Worker	\$1,667
Total Workers Suffering from Payroll Fraud (WPF)	337,476
Total Tax Revenue Lost (thousands of \$)	\$562,513

Table 12 carries out this same analysis for each social insurance program, looking at the amount lost per worker based on these different levels of compensation. To start, we utilize the ECEC compensation statistics for all workers in the West North Central region, which indicate that wages comprise 69.9% of total compensation on average. If we assume that the wages received by workers suffering from payroll fraud are \$44,687, total compensation for that worker if they were correctly classified would then be \$63,930. By comparison, an assumed wage of \$59,753 suggests a total compensation of \$85,484, as seen in the right column.

From here, the ECEC statistics are again used, in this case to obtain the percentages of total compensation that go to legally required benefits (7.9%), State UI (0.4%), and Workers' Compensation (1.3%). Taking these percentages from the total compensation

estimate derived from the DOR number suggests that the state loses \$256 in UI per misclassified worker, along with \$831 in lost in Workers' Compensation premiums. Again, these estimates fall between the estimates we originally derived as seen by comparing the DOR and NSPA columns in Table 12.

When multiplying these per worker totals by the 337,476 estimated workers suffering from payroll fraud according the DOR numbers, the estimated total revenue lost to the State's Unemployment insurance comes to \$96 million (between the \$54 to \$108 million in our original analysis), the total lost in Workers' Compensation premiums comes to \$280 million (between our original \$176 to \$353 million estimates), and the total lost in all legally required benefits comes to \$1.7 billion (between our original \$1.04 to \$2.1 billion estimates).

Table 12. Money Lost to Social Insurance Programs Per Worker, DOR v. NSPA

	% of Compensation	DOR	NSPA
Total Compensation	100	\$63,930	\$42,742 - \$85,484
Wages	69.9	\$53,861	\$29,876 - \$59,753
Legally Required Benefits	7.9	\$5,050	\$3,377 - \$6,753
State UI	0.4	\$256	\$171 - \$342
Workers' Compensation	1.3	\$831	\$556 - \$1,111

Conclusion

The findings above indicate widespread payroll fraud in Minnesota, leading to significant revenue declines for crucial social insurance programs and tremendous losses in compensation to working Minnesotans. While alarming, there are important limitations to consider within this analysis. As payroll fraud is illegal and hidden, it is a difficult concept to estimate. There is no objective data demonstrating how much payroll fraud actually exists.

Instead, we engage in an estimation of payroll fraud. This practice requires using data sources that are approximations of important measures and making several assumptions about those approximations. In doing so, there are sure to be gaps between the concepts we want to capture and the methods we are using to estimate them. In these gaps, we endeavor to use conservative methods to ensure our findings provide a lower bound of the problem. Ultimately, a more accurate estimate of payroll fraud in Minnesota necessitates greater data analysis from state agencies.



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