

Appendix: “A Roadmap for Strategic Enforcement: Complaints and Compliance with San Francisco’s Minimum Wage”

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Notes on Estimates of Minimum Wage Violations

The actual number of minimum wage violations is unknown. Employer-provided data is not reliable, and state agency data on complaint- and agency-initiated investigations are unrepresentative of the actual violation rate. Minimum wage violations must therefore be estimated using survey data.

Most useful is the Current Population Survey’s Merged Outgoing Rotation Groups (CPS-MORG) data, which the Wage and Hour Division of the U.S. Department of Labor uses to identify “priority industries” for investigations and which remains the top choice of every social scientist who has sought to develop national or industry-specific estimates of Fair Labor Standards Act (FLSA) noncompliance since the 1970s.¹

The CPS-MORG data has many advantages: it is gathered via extensive interviews with around 60,000 households per month; it is representative at the state and national levels, unlike other survey data, such as the Survey of Income and Program Participation (SIPP); and its individual-level responses permit us to estimate earnings and minimum wage violations relatively easily. The biggest downside is measurement error, as with any survey.

Methodology

The methodological approach employed here is fully consistent with previous research.² A few key methodological points to keep in mind:

First, for hourly wages, we use the Center for Economic and Policy Research’s (CEPR) “wage4” variable, which includes overtime, tips, and commissions (OTC) for both hourly and nonhourly workers.³ Wage estimates are, therefore, conservative over-estimates that effectively downward-bias the estimated minimum wage violation rates. This is preferable to the alternative, however, which excludes OTC for hourly workers, while including it for nonhourly workers (for whom different sources of wages are not distinguished). Accordingly, efforts to estimate and subtract OTC from nonhourly workers adds unknown quantities of additional measurement error to this key variable, and is not recommended.⁴ As a crosscheck, we also generated estimates using the National Bureau of Economic Research’s favored “wage3” variable, noting that the estimated violation rates are virtually identical.

Minimum wage violations are measured on whether an individual's estimated hourly wage was or was not lower than the applicable legal minimum. As such, the applicable minimum wage ordinance (by month) is used to calculate violations.

Rather than limit the pool of workers to "low-wage" workers as in Galvin (2016), we use all covered, non-exempt workers here for the sake of precision and ease of interpretation. Reported estimates thus reflect the overall violation rate in the entire workforce.

Although the FLSA and many states exempt a number of categories of workers from the minimum wage, 99.96 percent of workers in California are covered by the minimum wage. Exemptions are "very limited and most cannot be identified in the CPS data."⁵ We exempt door-to-door salespeople, consistent with Cooper and Kroeger (2017), and keep all other workers in the dataset. To correct for measurement error, we also follow the Eastern Research Group (2014), Galvin (2016), and Cooper and Kroeger (2017) and exclude all observations of workers not specifying hourly/nonhourly status, observations of nonhourly workers with weekly earnings less than \$10, and all observations of workers with hourly wages less than \$1. To generate a sufficient sample size, we combine the years 2005-2018. Industries with fewer than 1,000 average annual employees according to the Quarterly Census of Employment and Wages are excluded from the analysis.

Finally, a note on measurement error in the CPS data. There is reason to believe that measurement error in the CPS may downward-bias, or reduce, the estimates of minimum wage violations.⁶ First, for example, despite going to great lengths to reach them, both Hispanics (Latinos) and undocumented immigrants are underrepresented in the CPS.⁷ Because workers in these groups are at higher risk of experiencing minimum wage violations, the estimates of violations reported here should be considered conservative estimates.⁸ Second, in Bollinger's study of measurement error in the CPS, he finds a "high overreporting of income for low-income men" driven by "about 10% of the reporters who grossly overreport their income," thus potentially biasing estimates downward even further.⁹ Third, CPS data have a shortage of low-wage workers and an excess of high-wage workers relative to comparable survey data like SIPP; one effect of this imbalance could be to underestimate minimum wage violations.¹⁰ Roemer does find that the CPS reaches more "underground" workers than other large-scale surveys and is less biased than alternatives.¹¹ But given the high rates of violation discovered in the Bernhardt et al. 2009 innovative survey of hard-to-reach workers in the "informal" labor market—much higher than the estimates presented here—there is reason to suspect that these findings underestimate the prevalence of minimum wage violations across the board.¹² These considerations notwithstanding, the fact that measurement error surely exists recommends using caution when working with the point estimates reported.

Industries and Occupations

To better illustrate how violations by industry and occupation overlap, the below table outlines the subsectors that fall within high violation industries, and the high risk occupations employed at the highest levels and/or concentration in those subsectors.¹³

Industry	Subsectors & Highly Represented Occupations
Private households (NAICS 814)	Personal care and service occupations (NAICS 812100) <ul style="list-style-type: none"> - Child care workers 39-9011 - Personal and home care aides 39-9021
	Building and grounds cleaning and maintenance occupations (NAICS 37-0000) <ul style="list-style-type: none"> - Maids and housekeeping cleaners 37-2012
Food services and drinking places (NAICS 722)	Restaurant Industry (NAICS 7225) <ul style="list-style-type: none"> - Combined food prep and serving workers, including fast food (35-3021) - Dishwashers (35-902) - Bakers (51-3011) - Counter attendants, cafeteria, food concession, and coffee shop (35-3022) - Dining room and cafeteria attendants and bartender helpers (35-9011) - Cashiers (41-2010) - Waiters and waitresses (35-3031) - Bartenders (35-3011) - Food preparation workers (35-2021) - 1st-line supervisors/managers food prep and serving workers (35-1012) - Chefs and head cooks (35-1011) - Cooks (35-2010)
	Drinking places (NAICS 7224) <ul style="list-style-type: none"> - Waiters and waitresses (35-3031) - Bartenders (35-3011) - Cooks (35-2010)
	Special food services industry (NAICS 7223) <ul style="list-style-type: none"> - Food preparation workers (35-2021) - Chefs and head cooks (35-1011) - Cooks (35-2010)
Personal and laundry services (NAICS 812)	Personal care services industry (NAICS 8121) <ul style="list-style-type: none"> - Miscellaneous personal appearance workers (39-5090) - Hairdressers, hairstylists, and cosmetologists (39-5012)
	Death care services industry (NAICS 8122) <ul style="list-style-type: none"> - Grounds maintenance workers (37-3010)
Social assistance (NAICS 6241 – 6244)	Child day care services industry (NAICS 6244) <ul style="list-style-type: none"> - Childcare workers (39-9011) - Cooks (35-2010) - Postsecondary teachers (25-1000)
	Individual and family services industry (NAICS 6241) <ul style="list-style-type: none"> - Personal and home care aides (39-9021) - Nursing, psychiatric, and home health aides (31-1010)
Food manufacturing (NAICS 3111 – 3119)	Bakeries and tortilla manufacturing industry (NAICS 3118) <ul style="list-style-type: none"> - Bakers (51-3011)
Accommodation (NAICS 7211, 7212, 7213)	Travel accommodation industry (NAICS 7211) <ul style="list-style-type: none"> - Maids and housekeeping cleaners (37-2012) - Dining room and cafeteria attendants and bartender helpers (35-9011) - Waiters and waitresses (35-3031) - Janitors and building cleaners (37-201X) - Chefs and head cooks (35-1011)

	<ul style="list-style-type: none"> - Cooks (35-2010) 	
	<p>Room and boarding houses (NAICS 7213)</p> <ul style="list-style-type: none"> - Janitors and building cleaners (37-201X) 	
	<p>Parks and recreational camps (NAICS 7212)</p> <ul style="list-style-type: none"> - Grounds maintenance workers (37-3010) 	
Administrative and support services (NAICS 561)	<p>Services to buildings and dwellings industry (NAICS 5617)</p> <ul style="list-style-type: none"> - Maids and housekeeping cleaners (37-2012) - Janitors and building cleaners (37-201X) - Grounds maintenance workers (37-3010) 	
	<p>Employment services industry (NAICS 5613)</p> <ul style="list-style-type: none"> - Packers and packagers, hand (53-7064) - File Clerks (43-4071) - Nursing, psychiatric, and home health aides (31-1010) - Miscellaneous assemblers and fabricators (51-2090) - Laborers and freight, stock, and material movers, hand (53-7062) - Customer service representatives (43-4051) 	
	<p>Business support services (NAICS 5614)</p> <ul style="list-style-type: none"> - Medical assistants and other healthcare support occupations (31-909X) - Customer service representatives (43-4051) 	
	<p>Facilities support services (NAICS 5612)</p> <ul style="list-style-type: none"> - Janitors and building cleaners (37-201X) 	
	<p>Investigation and security services industry (NAICS 5616)</p> <ul style="list-style-type: none"> - Security guards and gaming surveillance officers (33-9030) 	
		<p>Other amusement and recreation industries (NAICS 7139)</p> <ul style="list-style-type: none"> - Childcare workers (39-9011) - Recreation and fitness workers (39-9030) - Grounds maintenance workers (37-3010)
Arts, entertainment, and recreation (NAICS 711, 712, 713)		
Retail trade (NAICS 44-45)	<p>Food and beverage stores (NAICS 4451 and 4452)</p> <ul style="list-style-type: none"> - Bakers (51-3011) - Cashiers (41-2010) - Packers and packagers, hand (53-7064) - Food preparation workers (35-2021) - First-line supervisors/managers of retail sales workers (41-1011) - Stock clerks and order fillers (43-5081) 	
	<p>General merchandise stores (NAICS 452)</p> <ul style="list-style-type: none"> - Cashiers (41-2010) - Retail salespersons (41-2031) - Laborers and freight, stock, and material movers, hand (53-7062) - First-line supervisors/managers of retail sales workers (41-1011) - Stock clerks and order fillers (43-5081) 	
	<p>Gasoline stations (4471)</p> <ul style="list-style-type: none"> - Cashiers (41-2010) - First-line supervisors/managers of retail sales workers (41-1011) 	
	<p>Health and personal care stores (NAICS 4461)</p> <ul style="list-style-type: none"> - Cashiers (41-2010) - Medical assistants and other healthcare support occupations (31-909X) 	
	<p>Beer, wine, and liquor stores industry (NAICS 4453)</p> <ul style="list-style-type: none"> - Cashiers (41-2010) 	
	<p>Clothing stores (NAICS 4481)</p> <ul style="list-style-type: none"> - Retail salespersons (41-2031) - First-line supervisors/managers of retail sales workers (41-1011) 	
	<p>Building material and supplies dealers (NAICS 4441)</p> <ul style="list-style-type: none"> - Retail salespersons (41-2031) - First-line supervisors/managers of retail sales workers (41-1011) 	

	<ul style="list-style-type: none"> - Stock clerks and order fillers (43-5081) 	
	Sporting goods, hobby, and musical instrument stores (NAICS 4511) <ul style="list-style-type: none"> - Retail salespersons (41-2031) 	
	Shoe stores (NAICS 4482) <ul style="list-style-type: none"> - Retail salespersons (41-2031) 	
	Jewelry, luggage and leather goods stores (NAICS 4483) <ul style="list-style-type: none"> - Retail salespersons (41-2031) 	
	Book stores (NAICS 4512) <ul style="list-style-type: none"> - Retail salespersons (41-2031) 	
Membership associations and organizations (NAICS 8131, 8132, 8133, 8134, 8139)	Civic and social organizations (NAICS 8134) <ul style="list-style-type: none"> - Childcare workers (39-9011) - Recreation and fitness workers (39-9030) 	
	Religious organizations (NAICS 8131) <ul style="list-style-type: none"> - Clergy (21-2011) 	
Real estate (NAICS 531)	<ul style="list-style-type: none"> - Property, real estate, and community association managers (11-9141) - Real estate brokers and sales agents (41-9020) - Bookkeeping, accounting, and auditing clerks (43-3031) 	
Transportation and warehousing (NAICS 48-49)	Warehousing and storage (NAICS 4931) <ul style="list-style-type: none"> - Packers and packagers, hand (53-7064) - Laborers and freight, stock, and material movers, hand (53-7062) - Stock clerks and order fillers (43-5081) 	
	Other support activities for transportation (NAICS 4889) <ul style="list-style-type: none"> - Packers and packagers, hand (53-7064) 	
	Taxi and limousine service industry (NAICS 4853) <ul style="list-style-type: none"> - Taxi drivers and chauffeurs (53-3041) 	
	Other transit and ground passenger transportation industry (NAICS 4859) <ul style="list-style-type: none"> - Taxi drivers and chauffeurs (53-3041) 	
	Truck transportation (NAICS 484) <ul style="list-style-type: none"> - Laborers and freight, stock, and material movers, hand (53-7062) 	
Health care services, except hospitals (NAICS 6211, 6212, 6213, 6214, 6215, 6216, 6219, 6231, 6232, 6233)	Nursing care facilities (NAICS 6231) <ul style="list-style-type: none"> - Maids and housekeeping cleaners (37-2012) - Recreation and fitness workers (39-9030) - Nursing, psychiatric, and home health aides (31-1010) - Cooks (35-2010) 	
	Home healthcare services industry (NAICS 6216) <ul style="list-style-type: none"> - Personal and home care aides (39-9021) - Nursing, psychiatric, and home health aides (31-1010) 	
	Residential intellectual and development disability, mental health and substance abuse facilities industry (NAICS 6232) <ul style="list-style-type: none"> - Personal and home care aides (39-9021) 	
	Continuing care retirement communities and assisted living facilities for the elderly industry (NAICS 6233) <ul style="list-style-type: none"> - Personal and home care aides (39-9021) - Nursing, psychiatric, and home health aides (31-1010) - Cooks (35-2010) 	
	Offices of physicians (NAICS 6211) <ul style="list-style-type: none"> - File Clerks (43-4071) - Medical assistants and other healthcare support occupations (31-909X) 	
	Offices of dentists (NAICS 6212) <ul style="list-style-type: none"> - Medical assistants and other healthcare support occupations (31-909X) 	
	Medical and diagnostic laboratories (NAICS 6215) <ul style="list-style-type: none"> - Medical assistants and other healthcare support occupations (31-909X) 	
Insurance (NAICS 524)	Agencies, brokerages, and other insurance related activities (NAICS 5242) <ul style="list-style-type: none"> - Customer service representatives (43-4051) 	

Educational services (NAICS 61)	Colleges, universities, and professional schools industry (NAICS 6113) - Postsecondary teachers (25-1000)
Public administration (NAICS 92)	NA
Construction (NAICS 23)	Nonresidential building construction industry (NAICS 2362) - 1st-line supervisors/managers construction & extraction workers (47-1011)
	Residential building construction (NAICS 2361) - 1st-line supervisors/managers construction & extraction workers (47-1011)
	Foundation, structure, and building exterior contractors (NAICS 2381) - 1st-line supervisors/managers construction & extraction workers (47-1011)
	Other specialty trade contractors (NAICS 2389) - 1st-line supervisors/managers construction & extraction workers (47-1011)
Hospitals (NAICS 622)	General medical and surgical hospitals (NAICS 6221) - Maids and housekeeping cleaners (37-2012) - Medical assistants and other healthcare support occupations (31-909X) - Nursing, psychiatric, and home health aides (31-1010) - Cooks (35-2010)
	Psychiatric and substance abuse hospitals (NAICS 6222) - Nursing, psychiatric, and home health aides (31-1010)
Finance (NAICS 521, 522, 523, 525)	Credit intermediation and related activities (NAICS 5221 and 5223) - Customer service representatives (43-4051) - Bookkeeping, accounting, and auditing clerks (43-3031)
Professional and technical services (NAICS 54)	Other professional, scientific and technical services (NAICS 5419) - Medical assistants and other healthcare support occupations (31-909X)
	Accounting, tax preparation, bookkeeping, and payroll services industry (NAICS 5412) - Bookkeeping, accounting, and auditing clerks (43-3031)

About the Authors

Daniel Galvin is a CIWO Fellow working on Strategic Enforcement initiatives. He holds a Ph.D. from Yale University and is currently an Associate Professor of Political Science and Faculty Fellow at the Institute for Policy Research at Northwestern University. His research examines the relationship between labor and employment policies, labor market outcomes, changing forms of worker organization, and the politics of workers' rights. Daniel has published empirical analyses of minimum wage noncompliance at the state level, including a study demonstrating that stronger state enforcement capacities and the introduction of higher penalties for noncompliance – especially treble damages – significantly reduce the incidence of wage theft. He has also constructed new data on the proliferation of state-level employment policies over the last half-century and analyzed the role labor unions and other worker groups have played in their enactment. His current book project, supported by the Russell Sage Foundation, examines the development of alt-labor groups and the changing politics of workers' rights. Daniel's other work focuses on political institutions, political organizations, and public policy in the United States. He was awarded the Emerging Scholar Award from the American Political Science Association's Political Organizations and Parties section, the E. LeRoy Hall Award for Excellence in Teaching, the R. Barry Farrell

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¹ Ashenfelter and Smith 1979; Ehrenberg and Schumann 1982; Sellekaerts and Welch 1984; Trejo 1991, 1993; Fry and Lowell 1997; Weil and Pyles 2005; U.S. Department of Labor 2014; Galvin 2016; Kroeger 2017.; Ashenfelter and Smith 1979; Ehrenberg and Schumann 1982; Sellekaerts and Welch 1984; Trejo 1991, 1993; Fry and Lowell 1997; Weil and Pyles 2005; U.S. Department of Labor 2014; ERG 2014; Galvin 2016; Cooper and Kroeger 2017.

² In particular, Galvin 2016; U.S. Department of Labor 2014; Cooper and Kroeger 2017.

³ <http://ceprdata.org/cps-uniform-data-extracts/cps-outgoing-rotation-group/>.

See also Cooper and Kroeger's 2017 preference for this method of estimating wages.

⁴ U.S. Department of Labor 2014.

⁵ Cooper and Kroeger 2017.

⁶ For an excellent discussion of the advantages and limitations of using the CPS data to estimate minimum wage violations given the existence of measurement error and other issues, see U.S. Department of Labor 2014, Appendix B.

⁷ McKay 1992. As Bernhardt et al. 2009 write: "standard surveying techniques—phone interviews or census-style door-to-door interviews—rarely are able to fully capture the population that we are most interested in: low- wage workers who may be hard to identify from official databases, who may be vulnerable because of their immigration status, or who are reluctant to take part in a survey because they fear retaliation from their employers. Trust is also an issue when asking for the details about a worker's job, the wages they receive, whether they are paid off the books or not, and their personal background" (56).

⁸ McKay 1992; Bernhardt et al. 2009; U.S. Department of Labor 2014.

⁹ Bollinger 1998.

¹⁰ Roemer 2002; U.S. Department of Labor 2014.

¹¹ Roemer 2002.

¹² Bernhardt et al. 2009.

¹³ The data used to create this table is from the U.S. Bureau of Labor Statistics.

<https://www.bls.gov/oes/current/oes119141.htm>.