Appendix to "A Fracturing Wage Floor? Below-Minimum Wages in the 21st Century"

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Methodology

When estimating the incidence of minimum-wage violations, we implement specific methodological choices in our analysis that reflect the legal exemptions established by the Fair Labor Standards Act (FLSA) or the applicable state. To identify such exemptions in our data, we apply the following.

- We assign an effective minimum wage of $4.25 per hour to all workers under 20 years of age, a conservative approach because this reduced youth rate legally applies only during the initial 90-day employment period. If the state minimum wage for workers under 20 years old is higher than the federal youth minimum wage, we apply this state youth minimum wage.
- We exclude exempted occupations listed in the FLSA or the applicable state-level regulation, another conservative decision given that exemptions for these occupations often apply to a specific subset within the occupation or require approval from the US Department of Labor. See endnotes 6 and 7 in the main paper for the list of exempted occupations.
- For tipped employees, our methodology incorporates tip-inclusive earnings, consistent with methodology in Cooper and Kroeger (2017) for calculating such earnings.
- Regarding section 14(c) of the FLSA that applies to workers with disabilities who receive a certificate from the US Department of Labor, we exclude all individuals who report working in community rehabilitation programs because nearly all section 14(c) disabled subminimum-wage workers are employed in these programs. Estimates from the US Government Accountability Office (2001, 2023) indicate that around 84 to 93 percent of section 14(c) disabled workers are employed in these programs.
- To exclude non-wage-and-salary workers, we exclude self-employed workers, workers who do not report paid-by-the-hour status, and unpaid family members. The Current Population Survey (CPS) defines wage-and-salary workers as those who receive wages, salaries, commissions, tips, or payment in kind from a private-sector employer or from a local, state, or federal government agency or entity. Accordingly, the CPS lists taxi drivers as an occupation among wage-and-salary workers. In theory, this should capture only drivers who work as employees of companies, meaning that they receive base pay from their employer and possibly tips from riders. Rideshare drivers should not be included because under the law they are independent contractors who receive payment from riders rather than from an employer. In our sample, we choose to include taxi drivers who self-identify as wage-and-salary workers and do not include taxi drivers who self-identify as self-employed. We acknowledge the possibility that some rideshare drivers may mistakenly self-identify as wage-and-salary drivers in the survey data.
- Consistent with labor law, we use the applicable minimum wage, defined as the higher of the state and federal minimum wage, except for federal government employees, who are subject to only the federal minimum (US Office of Personnel Management, 2019).

We construct historical monthly minimum wage rates using three complementary sources. Our primary data source is the historical state and sub-state minimum wage monthly-level dataset compiled by Vaghul and Zipperer (2016). We validate these figures against the Federal Reserve Economic Data (FRED) federal and state minimum wage annual dataset. Then, we cross-check these sources with historical minimum wage records from state governments to identify exact start and end dates for minimum wage changes. To identify state and federal minimum wage exemptions, we use the Bloomberg Law minimum wage dataset (2025). To account for measurement error, we generally follow Cooper and Kroeger (2017) and Galvin et al. (2024); thus we do the following.

- Exclude hourly workers who report making less than $1 per hour and nonhourly workers who report making less than $10 per week.
- Top-code workers who report working more than 99 hours per week as working 99 hours per week. Hours worked per week are needed to measure average weekly underpayments.
- Classify as "below minimum" if a worker reports a wage at least $0.20 (in 2025 dollars) below the applicable minimum wage. For earlier years, the $0.20 buffer is inflation adjusted to reflect real 2025 dollars.

These methodological choices produce a lower-bound estimate of violation incidence.

To ensure that our estimates are reflective of the workforce, we use the earnings survey weights provided by the CPS.

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