Does Increasing Minimum Wage Impact Service Quality?

Hyejin Yim

Department of Agriculture Economics, Purdue University

yim11@purdue.edu

Bhagyashree Katare

Department of Agriculture Economics, Purdue University

bkatare@purdue.edu

Joel Cuffey

Department of Agriculture Economics and Rural Sociology, Auburn University

cuffey@aruburn.edu

Selected Paper prepared for presentation at the 2022 Agricultural & Applied Economics Association Annual Meeting, Anaheim, CA; July 31-August 2

Abstract

This paper examines the impact of the minimum wage on restaurant service quality as measured by restaurant food safety violations. We use a unique dataset derived from restaurant-level food safety inspection reports to study the impact of minimum wage on employee- and employer-associated violations. We find that increase in minimum wages improves restaurant service quality by decreasing the number of food safety violations. Specifically, the increase in minimum wage decreases overall employee-associated violations. However, the increase in minimum wages increases the proportion of severe employer-associated violations.

1. Introduction

How does an increase in minimum wage impact the customer service quality offered by a firm? Existing studies have estimated the impact of increases in the minimum wage on employment (Clemens and Wither 2019), employee wage distribution (Cengiz et al. 2019), and price adjustment by firms (Renkin et al. 2020; Leung 2021). However, considerably less attention has been paid to the effect of minimum wage on the service quality offered by a firm. In this paper, we estimate the impact of minimum wage on restaurant service quality and consumer wellbeing.

A wage increase can potentially influence restaurant service quality through two channels: employee and employer food safety behaviors. The standard of services and goods provided by employees affects consumer wellbeing. For example, the restaurant employees' food safety practices directly affect consumer wellbeing (Centers for Disease Control and Prevention (CDC) 2017). In several cases, it is difficult to measure the differences in quality at the time of service. In these cases, higher wages might improve employee retention (Dube et al. 2016), employee decision-making (Mani et al. 2013), and employee productivity (Shapiro and Stiglitz 1984), thus

improving the service quality. For instance, as a result of wage increases, restaurant employees may pay more attention to their food preparation and food safety practices, resulting in better service quality and consumer wellbeing. Employer response to a wage increase might offset the gain in consumer wellbeing. For example, an increase in employee wages can raise restaurant operating costs, leading to fewer employees (Gopalan et al. 2020; Clemens and Strain 2021) or a reduction in work schedule (Yu et al. 2021). A reduced number of employees can obstruct restaurant food safety practices due to time pressure and short staffing (Clayton et al. 2015). Employee and employer responses to a minimum wage might have competing effects on restaurant service quality. Whether an increase in minimum wage can ultimately improve restaurant service quality and consumer wellbeing remains an open question. Hence, it is important to understand how the gains and losses from employee and employer responses to an increase in minimum wage collectively affect customer service quality and consumer wellbeing.

We use publicly available food safety inspection reports (FSIRs) to answer this question. FSIRs have been extensively used to measure restaurant service quality (Jin and Leslie 2009; Meltzer et al. 2019). From FSIRs, we constructed a unique dataset consisting of 450,000 restaurant food safety inspections from 92,000 restaurants across 58 jurisdictions (counties, cities, or states) between 2010 and 2020. FSIRs contain detailed information on inspection results, including a list of food safety violations. We use restaurant food safety violations as a proxy for restaurant service quality. In the literature, food safety violations are defined as a subset of restaurant service quality most likely affected by restaurant employees' behavior and productivity (Carpenter et al. 2013; Angelo et al. 2017). Apart from employee response, restaurant food safety is also influenced by employers' management decisions, including inconvenient workplace design, equipment, and resources (Green et al. 2005; Pragle et al. 2007; Roberts et al., 2008). We leverage restaurant food

safety violations to examine the impact of minimum wage on employee and employer responses to food safety behavior.

We hypothesize that an increase in minimum wage positively influences employee food safety practices but negatively influences employer decisions on restaurant service quality. To test our hypothesis, we classified food safety violations into two categories, employee-associated and employer-associated violations. The employee-associated violations include cooking, food handling, food storage, and cleaning violations. The employer-associated violations include facility maintenance, workplace design, equipment, and supplies violations.

Our research is closely related to the recent literature studying the impact of minimum wage on low-wage workers' productivity. Coviello et al. (2018) studied the effect of the minimum wage increase on retail salespersons' productivity, and Ku (2022) studied the effect of the minimum wage increase on farmworkers' productivity. Both these studies found an increase in worker productivity as a response to the minimum wage increase. However, these studies examined hourly outcomes, which are easily observable and quantifiable. Unlike the hourly outcomes, service quality provided by low-wage workers is a subjective measure and difficult to quantify. Recent studies have applied public inspection reports to estimate industry service quality as reflected in the number of inspection violations. Ruffini (2021) studied the effect of minimum wage increases on service quality in nursing homes and found a decrease in health violations and an increase in resident health outcomes. In a related study, Giupponi and Machin (2018) found that a minimum wage increase in the United Kingdom increases the number of nursing home inspection violations. Our paper differs from these studies as we are able to disaggregate the change in service quality by employee and employer channels.

Chakrabarti et al. (2021) is the closest to our study. They studied the effect of the Seattle minimum wage increase in 2014 on restaurant food safety violations to show that an increase in minimum wage negatively influences restaurant food safety practices. Our paper differs from Chakrabarti et al. (2021) in three ways. First, we use a broader sample of 54 jurisdictions that have undergone 82 minimum wage changes over a period of 10 years. This allows us to have sufficient variations over time and jurisdictions for identification to make a credible assessment. Second, we disaggregate employee and employer responses to the minimum wage increase. We provide a detailed picture of how minimum wages affect employees and employers differently by identifying violation contributors. Lastly, we examine the dynamic relationship between minimum wage and restaurant food safety violations over time. This allows us to understand how employees and employers gradually adjust their responses to the minimum wage increase.

Our study makes three unique contributions to the literature. First, we investigate the effect of minimum wage increases on a new and novel non-price dimension compared to the previously studied restaurant prices (Allegretto and Reich 2018) and supermarket prices (Renkin et al. 2020; Leung 2021). We study the effect of a minimum wage increase on the non-price dimension: employee food safety behavior, employer management, and consumer wellbeing. Second, this paper contributes to the evidence on compensation and worker productivity. The standard theory of efficiency wage suggests that a higher wage may increase employee productivity as employees are incentivized with higher pay (Shapiro and Stiglitz 1984). Several studies have empirically investigated the effects of financial incentives on individual productivity (Jones et al. 2010; Bandiera et al. 2013; Goodman and Turner 2013; Imberman and Lovenheim 2015). However, there is less information about how minimum wage increase affects service quality provided by the worker and the firm. We examine the impact of minimum wages on service quality provided

by restaurant workers, which has been a focus of minimum wage studies (Luca and Luca 2019). Third, we examine a new policy dimension influencing restaurant food safety. Previous studies have measured the impact of mandatory posting of inspection results on restaurant food safety (Jin and Leslie 2003; Jin and Leslie 2009; Ho 2012; Makofske 2020). Clayton et al. (2015) found that restaurant workers' financial concerns hinder proper food safety practices. This may indicate that higher wages can improve employee food safety practices by reducing financial stress. Despite the importance of restaurant workers' behaviors on food safety (Green and Selman 2005; Roberts et al. 2008; Carpenter et al. 2013; Angelo et al. 2017), little is known about how policies aimed to impact restaurant workers influence restaurant food safety and service quality.

Our results show that an increase in the minimum wage decreases employee and employer-associated restaurant food safety violations. This suggests that an increase in minimum wage improves employee food safety behaviors and restaurant service quality. However, the proportion of severe violations related to employers significantly increases after the minimum wage increases. The proportion of severe violations related to employees significantly decreases, resulting in a competing effect on food safety practices. Severe violations can cause foodborne illnesses, resulting in a high risk to human health and safety (CDC 2018). This finding may suggest a spillover effect on employer responses. The competing relationship in restaurant food safety suggests that employer responses should be taken into consideration when proposing a minimum wage increase policy. Our findings will lead to a better understanding of how the increase in minimum wage affects the productivity and decision-making of people working in restaurants and the health and safety of consumers.

2. Background

The restaurant industry includes all types of facilities that serve food and beverages, such as fast-food restaurants, full-service restaurants, food trucks, coffee shops, food courts, bars, and catering companies. It is a major contributor to the U.S. economy, comprising 4% of its GDP and generating 11 million jobs (Lew 2020). Restaurants have become an integral part of public diet and health as they serve more than one-third of Americans daily (CDC 2018). At the same time, restaurants have been under scrutiny for paying lower wages to their employees. Specifically, restaurants predominantly hire minimum wage workers (BLS, 2021) and 16.7% of these workers live below the poverty level (Shierholz 2014).

Restaurant food safety is associated with consumer wellbeing and public health. Almost 17% of the U.S. population suffers from foodborne illnesses every year and 60% of the foodborne illness outbreaks happen at restaurants (CDC 2019). The most common factors contributing to restaurant foodborne illnesses are inadequate food handling, food preparation practices, and food worker health and hygiene (Angelo et al., 2017). To ensure food safety, local governmental public health or environmental health agencies employ food safety inspectors to conduct restaurant food safety inspections. Inspectors generally monitor violations associated with various food safety practices, including food source, food storage, cooking process, cleanliness, and facility maintenance.

Literature studying restaurant-associated foodborne illness outbreaks emphasized the importance of proper food safety practices from restaurant employees (Clayton et al., 2015; Angelo et al., 2017). Several factors influence restaurant employees' food safety behaviors: time pressure, fear of negative consequences, dedication to the job, and food safety knowledge (Green and

Selman 2005; Clayton et al. 2015). Other than employees' food safety behaviors, factors such as inadequate restaurant resources, limited availability of cleaning supplies, and lack of proper equipment can influence restaurant food safety practices (Pragle et al. 2007). Violations related to these factors are mainly related to employers' neglect and poor management practices.

Local governments and cities implement various policies to reduce the number of food safety violations. Some cities require restaurants to display the inspection report visibly to support restaurant food safety practices. Studies on the mandatory posting policy found mixed results for restaurant food safety. Jin and Leslie (2003) found that the mandatory posting of restaurant inspection results in Los Angeles significantly reduced the number of food safety violations and the rate of foodborne illness. However, Ho (2012) found that mandatory posting policies in San Diego and New York did not significantly reduce restaurant foodborne illness rates. Some cities disclose restaurant food safety inspection results online. Makofske (2020) found a decrease in food safety violations in Louisville, KY, after disclosing restaurant food safety inspection results on the Yelp website. Some cities provide food safety training and education to support appropriate restaurant food safety practices. While food safety training can increase food safety knowledge, restaurant workers can fail to engage in proper food safety practices during work (Clayton et al. 2002; Egan et al. 2007). Previous studies assumed mandatory positing and food safety education as key drivers to enhancing restaurant food safety. While these factors are also important, the study on how financial incentives or wage increases for employees influence restaurant food safety is limited.

For restaurant employees, an increase in the minimum wage might work as a financial incentive as it increases their earnings and family incomes (Allegretto et al. 2018; Cengiz et al. 2019; Dube 2019). Theoretically, higher wages and financial incentives increase worker

productivity (Salop 1979; Weiss 1980; Akerlof 1982; Shapiro and Stiglitz 1984). Therefore, it is likely that an increase in the minimum wage positively influences restaurant employees' attention to food safety.

For restaurant employers, however, an increase in the minimum wage raises the labor and operating cost, resulting in financial burdens. Previous studies found that firms reduce employee benefits packages (Clemens et al.2018) or employee working hours (Yu et al. 2021) to compensate for increases in labor costs due to the minimum wage increase. For the restaurant industry, an increase in the minimum wage leads to restaurants raising menu prices (Aaronson et al. 2008; Allegretto and Reich 2018) or exiting the market (Aaronson et al. 2018; Luca and Luca 2019). To offset the increase in labor cost, restaurant employers might decrease their expenses on food safety products, such as sanitary supplies. Our study complements the literature on restaurant food safety by examining whether an increase in minimum wage affects restaurant food safety.

3. Data

3.1 Minimum Wage Data

We use the minimum wage data compiled from several primary sources and made available by Vaghul and Zipperer (2021). For our main analysis, we use the jurisdiction-by-biyearly minimum wage in the U.S. from 2010 to 2020. The minimum wage for the jurisdiction is the highest city, state, or federal minimum wage applicable to the jurisdiction type within the given time period. For instance, if the minimum wage increase was at a city level, we account for the local minimum wage ordinance at the city level. Likewise, if the minimum wage change was at a state level, we account for the state minimum wage ordinance. We use the federal minimum wage for states that do not have a minimum wage policy.

Several jurisdictions in our dataset increased the minimum wage over the time period of our study. There are four types of minimum wage changes in our data and the study time period: state-level change, city-level change, states that follow indexation, and cities that follow indexation[1]. Specifically, eighteen minimum wage increases happened at the state level. Twenty-nine minimum wage increase ordinances happened at the city level, and thirty-five minimum wage increases through indexation at the state or city level. Twenty-four jurisdictions in our data follow the federal minimum wage ordinance, which did not undergo any change during our study time period. In total, we explore the effect of 82 minimum wage increases. The minimum wage increase varies across time periods and across jurisdictions.

3.2 Food Safety Inspection Reports (FSIRs)

The primary data for restaurant food safety violations is derived from the publicly available Food Safety Inspection Reports (FSIRs). FSIRs contain information about the onsite inspection of food facilities (e.g., school cafeterias, hotels, and restaurants) conducted by local government agencies. The purpose of food safety inspection is to protect public health and maintain a high food safety standard. FSIRs are made available by several local government agencies across the U.S. and provide detailed demographic and inspection information about the inspected facilities. The demographic information includes the facility's name and location. The inspection information includes inspection date, inspection type, type of violations, the severity of violations, and the inspection grade, if available. We use FSIRs for restaurants to construct a unique dataset that includes demographic and inspection information for restaurants from 54 government agencies

[1] Some states and cities annually increase the minimum wage based on inflation to adjust wages to the rising living cost so that minimum wage workers can maintain their purchasing power. As inflation varies by geographical areas, the states and cities follow their local inflation rates for indexing.

(jurisdictions) in 36 states[2]. The data is available from 2010 to 2020, but the year range varies by jurisdiction.

A food facility can undergo several types of inspections, such as routine inspections, follow-up inspections, and educational inspections. Routine inspections are unscheduled inspections conducted randomly by local health agencies at regular frequencies. Follow-up inspections are conducted by health inspectors when the routine inspections result in violations. The educational inspections are conducted by agencies to provide education about food, health, and safety practices to the employees and employers. We use routine inspections for the analysis as they are unscheduled and are conducted randomly throughout the year.

In our data, some restaurants missed inspections for some years in a given sample period. There can be several reasons for missing inspections, such as temporary closure due to renovations or maintenance, permanent closure due to going out of business, starting a business in the middle of the year, etc. We only consider restaurants that appear throughout the entire sample period. This is important as restaurants' entry or exit will not affect our results.

The number of routine inspections per year varies by jurisdiction's inspection policy. Across the jurisdictions, the average frequency of inspection per food facility is twice a year. Thus, we assume jurisdictions conduct routine inspections at least twice a year[3]. The final FSIR sample is at a facility-biyearly level. The minimum wage increase policies mostly happened in January or July of a calendar year. The facility-biyearly level sample allows us to account for the immediate

[2] The final dataset consists of data derived from governmental websites. Some data that was not straightforward to download from governmental websites was obtained from a private organization named Hazal Analytica.

[3] In our dataset, 72% of facilities are inspected twice or more per year. In some jurisdictions, the frequency of inspections varies depending on the method of food preparation. For instance, facilities with complex food processes (e.g., full-service restaurants) are inspected more frequently than other facilities (e.g., limited-service restaurants). Certain jurisdictions more frequently inspect facilities considered high risk based on their previous year's inspection record. The number of routine inspections varies in range from one to four.

minimum wage effects. The balanced sample contains FSIR data before and after the implementation of the minimum wage increase policy.

During a food safety inspection, the inspector monitors violations associated with various food safety practices. Although food safety inspection checklists differ by jurisdiction, 94% of the jurisdictions in the sample follow the Food Code provided by the U.S. Food and Drug Administration (FDA)[4] to categorize restaurant food safety violations. In order to have a consistent categorization of violation codes, we followed the Food Code to re-categorize the inspection results and violations for the remaining 6% agencies. Based on the violation descriptions provided by the Food Code, we are able to classify violations into two categories: employee-associated and employer-associated violations. The employee-associated violations are related to the duties of restaurant workers, including cooking, food handling, food storage, and cleanliness. The employer-associated violations are related to the responsibilities of restaurant employers, such as facility maintenance, workplace design, equipment, and supplies.

We also classified violations by severity based on the list of foodborne illness risk factors identified by the Centers for Diseases Control and Presentation (CDC). The severe violations include improper hand washing, lack of hot water, and improper food temperature violations, which have a higher likelihood of causing foodborne illness. Following Ruffini (2021), we calculated a severity index that integrates the severe violation as follows:

$$S_{ijst} = \frac{V_{ijst} - \overline{V_{js}}}{\sigma_{\overline{v_{js}}}} \quad (1)$$

[4] Out of 54 jurisdictions, three jurisdictions (Los Angeles, San Diego, and New York City) did not adopt the FDA Food Code. More information is available at https://www.fda.gov/food/fda-food-code/adoption-fda-food-code-state-and-territorial-agencies-responsible-oversight-restaurants-and-retail.

where S_{ijst} is the standardized score for severe violations for facility i in jurisdiction j and state s during time t, and V_{ijst} is the total number of severe violations for facility i during time t, $\overline{V_{js}}$ is the average number of severe violations among all restaurant facilities in jurisdiction j and state s, and $\sigma_{\overline{v_{js}}}$ is the corresponding standard deviation.

3.3 Labor Market Data

The main assumption of our study is that a minimum wage increase positively affects the earnings of restaurant workers. In order to study the impact of the minimum wage on the restaurant labor market outcomes, we collected employment and wage-related data for restaurants from the Current Population Survey Outgoing Rotation Group (CPS-ORG) and the Quarterly Workforce Indicators (QWI) for the years 2010 to 2020[5].

The CPS-ORG data is a monthly household survey conducted by the U.S. Bureau of Labor Statistics (BLS). The CPS-ORG data provides participating households' employment status and earnings with detailed demographic and geographic information. The data includes household residential state, race, primary job status, secondary job status, and hourly and weekly earnings. We focus on households with primary employment at drinking or restaurant facilities. We use hourly and weekly earnings to estimate minimum wage impacts on the restaurant labor market.

We also use the Quarterly Workforce Indicators (QWI) data for the years 2010 to 2020 from the U.S. Census Bureau to estimate the effect of minimum wages on employment and earnings in the drinking places and restaurants (NACIS 7224 and NACIS 7225). The QWI provides county-quarterly level measures of employment outcomes, such as quarterly hires, separations, wages, etc.

[5] The CPS-ORG data is available at https://www.nber.org/research/data/current-population-survey-cps-merged-outgoing-rotation-group-earnings-data. The QWI data is available at https://ledextract.ces.census.gov/static/data.html.

We use five outcome variables: earning, employment, stable hire, separation, and turnover. Earning is the average monthly earnings of employees with stable jobs. Employment is the total number of people employed in a corresponding industry at any time during the quarter. Turnover is the rate at which stable jobs begin and end. Separation is the estimated number of workers whose job in the previous quarter continued and ended in the given quarter. Stable hire is the estimated number of employees that started a job that lasted at least one full quarter with a given employer.

3.4 Other Variables

We collected data for local environmental factors such as housing price index, unemployment rate, population, and median income to account for factors that might affect minimum wage policies and food safety violations in a given jurisdiction. We collected monthly county-level housing prices from Zillow Home Value Index (ZHVI), annual county-level unemployment rate variables from the U.S. BLS, annual county-level population counts from the U.S. Census, and annual county-level median income from the American Community Survey (ACS).

We also created jurisdiction level food facility demographic variables, such as percentage of fast-food chain restaurants, percentage of dine-in chain restaurants, percentage of cafe and bakery restaurants, percentage of local restaurants, and percentage of risky restaurants inspected for each jurisdiction. We defined risky restaurants as food facilities inspected more than three times per year. Including these jurisdiction-level time-varying factors absorb the variation in food safety violations that can be due to business cycles or housing price shocks (Renkin et al. 2020). In addition, the unemployment rate and population represent the demand and supply of employees (e.g., employment shortage), which are likely to influence restaurant operations. Controlling the

percentage of risky restaurants is important as risk restaurants are likely to be inspected more frequently than non-risky restaurants.

References

Aaronson, D., French, E., & MacDonald, J. (2008). The minimum wage, restaurant prices, and labor market structure. *Journal of Human Resources*, *43*(3), 688-720.

Aaronson, D., French, E., Sorkin, I., & To, T. (2018). Industry dynamics and the minimum wage: a putty-clay approach. *International Economic Review*, *59*(1), 51-84.

Akerlof, G. A. (1982). Labor contracts as partial gift exchange. *The quarterly journal of economics*, *97*(4), 543-569.

Allegretto, S., Dube, A., Reich, M., & Zipperer, B. (2017). Credible research designs for minimum wage studies: A response to Neumark, Salas, and Wascher. *ILR Review*, *70*(3), 559-592.

Allegretto, S., Godoey, A., Nadler, C., & Reich, M. (2018). The new wave of local minimum wage policies: Evidence from six cities. *CWED Policy Report*.

Allegretto, S., & Reich, M. (2018). Are local minimum wages absorbed by price increases? Estimates from internet-based restaurant menus. *ILR Review*, *71*(1), 35-63.

Angelo, K. M., Nisler, A. L., Hall, A. J., Brown, L. G., & Gould, L. H. (2017). Epidemiology of restaurant-associated foodborne disease outbreaks, United States, 1998–2013. *Epidemiology & Infection*, *145*(3), 523-534.

Bandiera, O., Barankay, I., & Rasul, I. (2013). Team incentives: Evidence from a firm level experiment. *Journal of the European Economic Association*, *11*(5), 1079-1114.

Carpenter, L.R., Green, A.L., Norton, D.M., Frick, R., Tobin-D'Angelo, M., Reimann, D.W., Blade, H., Nicholas, D.C., Egan, J.S., Everstine, K. and Brown, L.G., 2013. Food worker experiences with and beliefs about working while ill. *Journal of food protection*, *76*(12), pp.2146-2154.

Cengiz, D., Dube, A., Lindner, A., & Zipperer, B. (2019). The effect of minimum wages on low-wage jobs. *The Quarterly Journal of Economics*, *134*(3), 1405-1454.

Centers for Disease Control and Prevention. (2017). Surveillance for Foodborne Disease Outbreaks, United States, 2015, Annual Report. Available at https://www.cdc.gov/foodsafety/pdfs/2015FoodBorneOutbreaks_508.pdf.

Centers for Disease Control and Prevention. (2018). Fast Food Consumption Among Adults in the United States, 2013-2016. Available at https://www.cdc.gov/nchs/data/databriefs/db322-h.pdf.

Centers for Disease Control and Prevention. (2019). Food Safety Differences Between Restaurants Linked and Not Linked to Outbreaks. Available at https://www.cdc.gov/nceh/ehs/ehsnet/plain_language/differences-restaurants-linked-to-outbreaks.htm.

Chakrabarti, S. K., Devaraj, S., & Patel, P. C. (2021). Minimum wage and restaurant hygiene violations: Evidence from Seattle. *Managerial and Decision Economics*, *42*(1), 85-99.

Clayton, M. L., Clegg Smith, K., Neff, R. A., Pollack, K. M., & Ensminger, M. (2015). Listening to food workers: Factors that impact proper health and hygiene practice in food service. *International Journal of Occupational and Environmental Health*, *21*(4), 314-327.

Clemens, J., Kahn, L. B., & Meer, J. (2018). *The minimum wage, fringe benefits, and worker welfare* (No. w24635). National Bureau of Economic Research.

Clemens, J., & Strain, M. R. (2021). *The heterogeneous effects of large and small minimum wage changes: Evidence over the short and medium run using a pre-analysis plan* (No. w29264). National Bureau of Economic Research.

Clemens, J., & Wither, M. (2019). The minimum wage and the Great Recession: Evidence of effects on the employment and income trajectories of low-skilled workers. *Journal of Public*

Economics, *170*, 53-67.

Coviello, D., Deserranno, E., & Persico, N. (2018). Minimum wage and individual worker productivity: Evidence from a large US retailer. *Workforce Science Project of the Searle Center for Law, Regulation, and Economic Growth, Northwestern University*, *29*.

Dube, A. (2019). Minimum wages and the distribution of family incomes. *American Economic Journal: Applied Economics*, *11*(4), 268-304.

Dube, A., Lester, T. W., & Reich, M. (2016). Minimum wage shocks, employment flows, and labor market frictions. *Journal of Labor Economics*, *34*(3), 663-704.

Egan, M. B., Raats, M. M., Grubb, S. M., Eves, A., Lumbers, M. L., Dean, M. S., & Adams, M. R. (2007). A review of food safety and food hygiene training studies in the commercial sector. *Food control*, *18*(10), 1180-1190.

Giupponi, G., & Machin, S. J. (2018). Changing the structure of minimum wages: firm adjustment and wage spillovers. *IZA Discussion Papers, No. 11474*

Goodman, S. F., & Turner, L. J. (2013). The design of teacher incentive pay and educational outcomes: Evidence from the New York City bonus program. *Journal of Labor Economics*, *31*(2), 409-420.

Gopalan, R., Hamilton, B. H., Kalda, A., & Sovich, D. (2021). State minimum wages, employment, and wage spillovers: Evidence from administrative payroll data. *Journal of Labor Economics*, *39*(3), 673-707.

Green, L. R., & Selman, C. (2005). Factors impacting food workers' and managers' safe food preparation practices: A qualitative study. *Food Protection Trends*, *25*(12), 981-990.

Ho, D. E. (2012). Fudging the nudge: Information disclosure and restaurant grading. *Yale LJ*, *122*, 574.

Imberman, S. A., & Lovenheim, M. F. (2015). Incentive strength and teacher productivity: Evidence from a group-based teacher incentive pay system. *Review of Economics and Statistics*, *97*(2), 364-386.

Jin, G. Z., & Leslie, P. (2003). The effect of information on product quality: Evidence from restaurant hygiene grade cards. *The Quarterly Journal of Economics*, *118*(2), 409-451.

Jin, G. Z., & Leslie, P. (2009). Reputational incentives for restaurant hygiene. *American Economic Journal: Microeconomics*, *1*(1), 237-67.

Jones, D. C., Kalmi, P., & Kauhanen, A. (2010). Teams, incentive pay, and productive efficiency: evidence from a food-processing plant. *ILR Review*, *63*(4), 606-626.

Ku, H. (2022). Does minimum wage increase labor productivity? Evidence from piece rate workers. *Journal of Labor Economics*, *40*(2), 325-359.

Leung, J. H. (2021). Minimum wage and real wage inequality: Evidence from pass-through to retail prices. *Review of Economics and Statistics*, *103*(4), 754-769.

Lew, C. (2020). As restaurants go, so goes the economy. *Available at https://www. forbes. com/sites/forbesbusinesscouncil/2020/04/20/as-restaurants-go-so-goes-the-economy*.

Luca, D. L., & Luca, M. (2019). *Survival of the fittest: the impact of the minimum wage on firm exit* (No. w25806). National Bureau of Economic Research.

Makofske, M. P. (2020). The effect of information salience on product quality: Louisville restaurant hygiene and Yelp. com. *The Journal of Industrial Economics*, *68*(1), 52-92.

Mani, A., Mullainathan, S., Shafir, E., & Zhao, J. (2013). Poverty impedes cognitive function. *science*, *341*(6149), 976-980.

Meltzer, R., Rothbart, M. W., Schwartz, A. E., Calabrese, T., Silver, D., Mijanovich, T., & Weinstein, M. (2019). What are the financial implications of public quality disclosure? evidence

from New York City's restaurant food safety grading policy. *Public Finance Review*, *47*(1), 170-201.

Pragle, A. S., Harding, A. K., & Mack, J. C. (2007). Food workers' perspectives on handwashing behaviors and barriers in the restaurant environment. *Journal of Environmental Health*, *69*(10), 27-33.

Renkin, T., Montialoux, C., & Siegenthaler, M. (2020). The pass-through of minimum wages into US retail prices: evidence from supermarket scanner data. *The Review of Economics and Statistics*, 1-99.

Roberts, K. R., Barrett, B. B., Howells, A. D., Shanklin, C. W., Pilling, V. K., & Brannon, L. A. (2008). Food safety training and foodservice employees' knowledge and behavior. *Food protection trends*, *28*(4), 252-260.

Ruffini, K. (2021). Worker earnings, service quality, and firm profitability: Evidence from nursing homes and minimum wage reforms. *Service Quality, and Firm Profitability: Evidence from Nursing Homes and Minimum Wage Reforms (April 20, 2021)*.

Salop, S. C. (1979). A model of the natural rate of unemployment. *The American Economic Review*, *69*(1), 117-125.

Shapiro, C., & Stiglitz, J. E. (1984). Equilibrium unemployment as a worker discipline device. *The American Economic Review*, *74*(3), 433-444.

Shierholz, H. (2014). Low wages and few benefits mean many restaurant workers can't make ends meet. Available at https://www.epi.org/publication/restaurant-workers/.

U.S. Bureau of Labor Statistics. (2021). Characteristics of minimum wage workers, 2020. Available at https://www.bls.gov/opub/reports/minimum-wage/2020/home.htm.

Vaghul, K., & Zipperer, B. (2021). Historical state and sub-state minimum wage data. *Washington*

Center for Equitable Growth.

Weiss, A. (1980). Job queues and layoffs in labor markets with flexible wages. *Journal of Political economy*, *88*(3), 526-538.

Yu, Q., Mankad, S., & Shunko, M. (2021). Evidence of The Unintended Labor Scheduling Implications of The Minimum Wage. *Available at SSRN*.