

How Does COVID-19 Impact the Relative Bargaining Power of the Workers?

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Abstract

This paper takes a new look at the impact of COVID-19 on worker relative bargaining power over wages in the USA more than a year after the onset of the pandemic in early 2020. The empirical analysis uses a Differences-in-Differences technique and the equilibrium of the Nash Bargaining model to estimate the treatment effect on the relative bargaining power of workers. The average weekly wages data is from the U.S Bureau of Labour Statistics, the median gross profit data from Ready ratios and the COVID-19 restrictions data from an American daily, USA Today. There is no indication of a statistically significant average treatment effect of COVID-19 restrictions on bargaining power, suggesting that the effect of COVID-19 and restrictions varies widely across industries.

Keywords: Nash Bargaining Model, Differences-in-Differences Estimation, Bargaining Power

1. Introduction

How does COVID-19 impact the relative bargaining power of the workers? The paper explores the bargaining power of workers with respect to wage negotiations with their employers in the age of COVID-19 and the role that essential workers have played in the employer-employee relationship during the pandemic. The onset of COVID-19 restrictions represent a natural experiment, potentially influencing the bargaining process between firms and workers. This unanticipated event is exploited to assess the impact of COVID-19 restrictions on worker bargaining power. The empirical analysis relies on the Nash bargaining model and the Differences in Differences estimation technique that allows to isolate the average treatment effect that COVID-19 and the ensuing restrictions have had on worker bargaining power. The case of the United States of America is used to track the impact of the

pandemic for a year from its beginnings in March 2020 until March 2021. The empirical analysis uses industry-level data from the U.S Bureau of Labour Statistics and Ready Ratios, comparing outcomes before and after the pandemic started.

2. Background

The COVID-19 pandemic has disrupted lives, pushed the hospital system to its capacity, and created a global economic slowdown. As of September 15, 2020, there have been more than 6.5 million confirmed COVID-19 cases and more than 195,000 deaths in the United States. The pandemic has precipitated an unprecedented health and economic crisis, creating extraordinary challenges for households and businesses. Worker bargaining power is the ability of an employee to command higher wages or benefits and set terms about their working conditions. Since the 1950s, worker power has generally been on the decline as the power of

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corporations and shareholders grew and union strength fell. But now the nation has the most job openings it has ever had since the Bureau of Labor Statistics started tracking data in December 2000. There were 10.1 million job openings recorded at the end of June 2021. That means that for every available 100 jobs, there were only 94 unemployed people available. The balance of power had shifted to the worker for the first time in decades. Employees were using their newly-found bargaining position to demand more from their employers –they wanted decent wages, career progression and greater flexibility to come with their job.

The past year has also increased the value placed on wider benefits such as healthcare, childcare and sick leave. The COVID-19 induced labor market collapse has impacted industries differently, hitting mainly (at least in this early stage) the low-wage services and retail sectors of the economy. The service sector, and particularly its low-wage segment, experienced by far the largest drop in employment. In the leisure and hospitality industry, which includes restaurants and hotels, employment fell by nearly half between February and April 2020. Other services, which include repair and maintenance services, personal and laundry services, and services to private households, were the second most impacted, with more than 20% of employment lost by April.

Some economists are skeptical as to whether any potential changes to worker power are permanent. Worker protection policies, unions and norms of fairness haven't strengthened much during the pandemic. The pandemic-related labor shortages won't be resolved overnight, even when expanded unemployment benefits end.

3. Literature Review

Several studies have documented the enormous impact of the COVID-19 pandemic on labor outcomes in both developed and less-developed countries. For example, Baek et al.(2020), Jin Cho et al.(2020), Couch et al.(2020), Genoni et al,(2020), Kikuchi et al.(2020). Most of the available evidence, however, focuses on the early months of the pandemic. This paper examines the medium-term effects of the COVID-19 pandemic on labor

outcomes in one of the hardest-hit countries in the world by using the differences-in-differences estimation and the Nash bargaining model.

Differences-in-Differences estimation is one of the most important identification strategies in applied economics. (Card and Krueger 1993) studied the impact of a New Jersey rise in the minimum wage on employment in fast-food restaurants using the differences-in-differences technique. The paper uses a two-period dataset, February 1992 (before) and November 1992 (after). On April 1, 1992, New Jersey's minimum wage rose from 4.25 to 5.05 per hour. The minimum wage in neighboring Pennsylvania stayed constant. Card and Krueger collected data on employment at fast-food restaurants before and after the wage increase in the two states. The treatment is the increase in the minimum wage, the treated group is New Jersey fast-food restaurants and the control group Pennsylvania fast-food restaurants. By using DiD, the paper implicitly assumes parallel trends. The authors conclude that the minimum wage increase had no negative effect on fast-food restaurant employment.

The Nash equilibrium is a decision-making theorem within game theory that states a player can achieve the desired outcome by not deviating from their initial strategy. It has been widely applied and adapted in economics and other behavioral sciences. Binmore et al.(1986) established the relationship between the static axiomatic theory of bargaining and the sequential strategic approach to bargaining. They consider two strategic models of alternating offers. The models differ in the source of the incentive of the bargaining parties to reach agreement: the bargainers' time preference and the risk of breakdown of negotiations. Each of the models has a unique perfect equilibrium. When the motivation to reach agreement is made negligible, in each model the unique perfect equilibrium outcome approaches the Nash bargaining solution with utilities that reflect the incentive to settle and with the proper disagreement point chosen. The results provide a guide for the application of the Nash bargaining solution in economic modeling.

4. Methods

The equilibrium of the commonly known Nash

Bargaining Model is used to estimate the bargaining power of a worker. Collective bargaining is the process by which working people, through their unions, negotiate contracts with their employers that determine their terms of employment, including pay, benefits, hours, leave, job health and safety policies, ways to balance work and family, and more. It is a way to solve workplace problems. It is also the best means for raising wages in America. Indeed, through collective bargaining, working people in unions have higher wages, better benefits and safer workplaces.

The basic strategic bargaining model between two parties starts with the first party suggesting an offer that the second party can choose to accept or reject. If the second party accepts the offer the bargaining stops and the outcome is the offer of the first party. However, if the second firm rejects the offer, it will come back with a counter offer after some time. Now the first party can choose to accept or reject the offer. Again, if the offer is accepted the bargaining stops with that outcome, otherwise the first party comes back with a counter offer after time. The bargaining game continues with this procedure until either an agreement is achieved or until it is evident that an agreement can never be reached.

The measure of relative bargaining power is defined from the equilibrium of a simple Nash Bargaining model between workers and their employers: simply the ratio of wages to profit for a particular industry, in a particular state at some point in time.

$$y_{ist} = w_{ist} / \pi_{ist}$$

where w_{ist} is the wage in state s in industry i at time t and π_{ist} is profit in state s in industry i at time t .

The differences-in-differences technique is used next to measure the effect of COVID-19 on worker's bargaining power. DID is a quasi-experimental design that makes use of longitudinal data from treatment and control groups to obtain an appropriate counterfactual to estimate a causal effect of some intervention. DID is typically used to estimate the effect of a specific intervention or treatment (such as a passage of law, enactment of policy, or large-scale program implementation) by comparing the changes in outcomes over time between a population that is enrolled in a program (the intervention group) and a

population that is not (the control group). In this case, the "interventions" are COVID-19 restrictions, which are used to define the control and treatment groups to mimic a controlled experiment.

In order to estimate any causal effect, three assumptions must hold: exchangeability, positivity, and Stable Unit Treatment Value Assumption (SUTVA). The parallel trend assumption is the most critical of the assumptions to ensure internal validity of DID models. It requires that in the absence of treatment, the difference between the 'treatment' and 'control' group is constant over time. Another important assumption is the Stable Unit Treatment Value Assumption, which implies that there should be no spillover effects between the treatment and control groups, as the treatment effect would then not be identified. Furthermore, the control variables should be exogenous, unaffected by the treatment. By using DID, this paper implicitly assumes the above assumptions.

This paper formally explores the patterns in the data by estimating a DID model which compares outcomes across states and industries, some of which were impacted with COVID-19 restrictions, before and after the beginning of the COVID-19 pandemic in March 2020. Specifically, the following regression model is estimated:

$$y_{ist} = \gamma_i + \alpha_s + \lambda_t + \delta D_{ist} + \epsilon_{ist}$$

where y_{ist} is the labour's relative bargaining power in industry i , state s and at time t . γ_i is the industry fixed effect, α_s is the state fixed effect and λ_t is the time fixed effect. In other words, any factors that influence bargaining power that do not vary across states and time will be controlled for with the industry fixed effect. Corresponding explanations can be given for the state and time fixed effects. D_{ist} is the dummy variable which equals 1 if industry i in state s at time t is under covid restrictions and 0 when not. ϵ_{ist} is the error term. The coefficient delta δ in the econometric specification captures the treatment effect of COVID-19 restrictions on workers' relative bargaining power. Combined with the fixed effects, these specifications control for variation in worker bargaining power due to differences across industries,

across states, and across time periods. The remaining variation in bargaining power turned out to be a result of COVID-19 restrictions.

5. Data

The empirical analysis aims to examine the impact of the COVID-19 pandemic on labor market outcomes over time. The data is collected for 19 industries in 53 US states and territories. The 19 industry sectors are listed according to the North American Industry Classification System (NAICS) code order which includes Agriculture, Forestry, Fishing and Hunting (NAICS 11), Mining, Quarrying, and Oil and Gas extraction (NAICS 21), Utilities (NAICS 22), Construction (NAICS 23), Manufacturing (NAICS 31-33), Wholesale Trade (NAICS 42), Retail Trade (NAICS 44-45), Transportation and Warehousing (NAICS 48-49), Information (NAICS 51), Finance and Insurance (NAICS 52), Real Estate and Rental Leasing (NAICS 53), Professional and Technical Services (NAICS 54), Management of Companies and Enterprises (NAICS 55), Administrative and Waste Services (NAICS 56), Educational Services (NAICS 61), Healthcare and Social Assistance (NAICS 62), Arts, Entertainment and Recreation (NAICS 71), Accommodation and Food Services (NAICS 72), Other Services except public administration (NAICS 81). The variables are average weekly wages, median gross profit ratio and COVID-19 restrictions that vary by industry and state. The data is collected for the first quarter from 2017-2021. This resulted in 5000 industry-state-time observations. The paper relies on three primary sources to collect data for the empirical sample. It uses average weekly wage data from the U.S. Bureau of Labour Statistics. The profit data is collected from Ready Ratios, an online software that produces a complete financial analysis of a company’s statements. The COVID-19 restrictions data is collected from an American daily called USA Today.

This paper assumes the profit for an industry to be the same across all states. Therefore, the variation in the measure of bargaining power across states in a given industry and time period comes through variations in wages. This assumption is motivated by

the limitations in profit data. It can be observed that the profit data is disaggregated by industry and time but isn’t disaggregated by state. The unit of the profit data is percentage. It is also assumed that the COVID-19 restrictions have remained the same as 2020 in 2021.

The equilibrium of the Nash microeconomic foundation is used to derive the worker’s bargaining power with firms over compensation. For industry *i* in states at time *t*, the relative bargaining power of the worker is defined as wage by profit i.e .It should be noted that due to data limitations, the wage data varies across industries, states, and times while the profit data only varies across industry and time.

6. Results and Discussion

Table 1 contains descriptive statistics for the empirical sample and Table 2 displays the main results of the Differences-in-Differences estimation for the impact of COVID-19 restrictions on average worker bargaining power. The 4 main variables are wage, profit, bargaining power and the COVID-19 restrictions treatment indicator. With respect to the regression model, the dependent variable is relative worker bargaining power and the independent variable is COVID-19 restrictions for each industry and state. Looking at all these variables individually, the average weekly wage is 1256, average profit is 0.316, and the average bargaining power is 3228. The percentage of observations that are treated are 0.0326 and the rest are in the control group.

Table 1: Descriptive Statistics for the empirical sample

<i>Variables</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Median</i>	<i>Min / Low Percentile</i>	<i>Max / High Percentile</i>
Wage	1256.	791.	1036	188	9145
Profit	0.316	0.239	0.350	-1.51	0.709
Bargaining Power	3228.	4610.	2971.	-38012.5	29677.68
Covid Restrictions	0.0326	0.178	0	0	1

The standard deviation of wage is 791, profit is 0.239 and bargaining power is 4610. The median wage is 1036, median profit is 0.350 and median

bargaining power is 2971. The minimum value or the lowest percentile wage is 188, profit is -1.51, and bargaining power is -38012.5. The maximum value or the highest percentile wage is 9145, profit is 0.709, and bargaining power is 29677.68.

There are 6 models that measure the average treatment effect of COVID-19 restrictions on relative bargaining power of the workers by controlling for differences across industries, states and time by use of fixed effects. The stars (*) in models 1, 2 and 5 explain that there is a statistically significant average treatment effect of COVID-19 restrictions on worker's bargaining power. But, Model 6 is preferred as it controls differences in bargaining power between industries, across states, and between time periods. The results of Model 6 suggest that there is no average treatment effect of COVID-19 restrictions on average worker bargaining power. Comparing the different versions of Model 6, it can be seen that most of the variation in bargaining power is driven by differences in industry. It can be explained by comparing the R² measure. R² is a statistical measure in a regression model that determines the variance in the dependent variable that can be explained by the independent variable. When R² is equal to zero, it means that there is no variation in the dependent variable i.e. the worker bargaining power. The closer it gets to one, the more it explains variation in the worker bargaining power. The R² measure in Models 1, 4, and 6 include the industry fixed effect and Models 2, 3, and 5 do not. The industry fixed effect explains a much greater share of variation in worker bargaining power compared to state and time differences. When state and time effects are controlled i.e Model 2, 3 and 5, it can be seen that there is a negative treatment effect of the COVID-19 restrictions on the bargaining power. This implies that COVID-19 restrictions reduced the bargaining power, before considering the variation due to industrial differences in wages. When variations across industries and time are also controlled i.e Model 6, there is no longer a statistically significant treatment effect of the COVID-19 restrictions on average. These two results together suggest that the impact of COVID-19 restrictions varies widely across industries.

Table 2: Main Results of the Differences-in-Differences estimation

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Covid Restrictions	0.0336*	0.2901***	-0.3056	0.0427	0.3002***	0.0534
	(0.0143)	(0.0159)	(0.1341)	(0.1445)	(0.0166)	(0.1468)
Fixed effects						
Industry	Yes	No	No	Yes	No	Yes
State	No	Yes	No	No	Yes	Yes
Time	No	No	Yes	Yes	Yes	Yes
R ²	0.47448	0.02089	0.01568	0.48730	0.03388	0.50688

7. Conclusion

This paper examines the average treatment effect of COVID-19 on relative bargaining power of the workers in the USA. It was found that once the differences across industry-state-time are controlled, there is no impact of COVID-19 restrictions on the bargaining power. Further study of this topic would benefit from richer data, such as wages for individual workers and profits for individual firms. It should also be noted that only the wage of the average worker is considered in the analysis. It would also be interesting to see how this impact varies across worker skill groups.

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