Testing Coordination with Minimum Wage against Outgroup "gratuitous" discrimination in a Principal–Agent relationship

Giorgio Michalopoulos[*] and Juan Pablo Gama Torres[†]

We test the legal minimum wage as an instrument to increase productive coordination between workers and employers. Coordination is observed when suggested effort is equal to worker effort. To do so, we set up a multi-period principal agent game involving Brazilian and Italian students at the same time. Principals offer a salary and suggest a level of effort to the agents who can accept or refuse. If they accept, they then choose a level of effort. The game is repeated four times to test ingroup and outgroup coordination with and without minimum wages. We show that the introduction of the minimum wage increases overall coordination, in particular for workers who previously received wages below the minimum wage. We also show that the introduction of the minimum wage reverses what in the literature has been described as "outgroup gratuitous discrimination": members of the same group (ingroup) coordinate better while they engage in discriminatory behavior at the expense of the outgroup.

Key words: Minimum Wage, Principal-Agent Behavioral Economics

1   Introduction

In the first part of this introduction, we will review empirical literature on minimum wage policies and their consequences on collective bargaining and productivity. In the second part, we will analyze the relevant literature on experimental studies and their implications for our research. The minimum wage suffers from a chronic dichotomy in the academic and political debate: while on the one hand it would represent an instrument to fight inequalities and a guarantee for workers, on the other hand it would constitute a threat to employment and price stability because of higher costs for employers. With this article we aim to escape this polarity and open the floor for a broader and more pacific interpretation of minimum wage policies. Furthermore, the analysis of the empirical results on the minimum wage allows us to clearly show the effect of the minimum wage on individual productivity. By isolating wage bargaining from other external variables, our analysis provides a starting point to further study the impact of the minimum wage on motivation and predisposition to productivity. Furthermore, we introduce the concept of 'outgroup gratuitous

---

[*]Center for Regional Development and Planning, Federal University of Minas Gerais; gmichalopoulos@cedeplar.ufmg.br

[†]Center for Regional Development and Planning, Federal University of Minas Gerais; jpgamat@cedeplar.ufmg.br

discrimination' as a novelty in the experimental literature of minimum wage in the principal-agent relationship.

1.1   Minimum Wages in the Empirical Literature

The empirical literature on legal minimum wages shows that its implementation increases wage bins for the lowest ranks of remuneration, without affecting higher wage bins (Dustman et al. 2022, Bossler and Schank 2022). In Europe, a case of study is Germany, where the minimum wage has been implemented and amended effectively since 2015. Recent empirical evidence shows that the implementation of it can account for about half of the decrease in wage inequality in Germany (Bossler and Schank, 2022). Similar results in are observed in developing countries such as Brazil, which has experienced a consistent decline in income inequality since the 1990s, a period in which its real minimum wage more than doubled (Engbom, Moser 2021). Indeed, in Brazil, the Gini Coefficient fell by 20 percent within 1995 and 2012 (Ferreira, Firpo, Messina 2012). The minimum wage has led to results that are also of great interest to employers. In Germany its implementation led to a reallocation of workers from lower to higher-productivity firms, thus leading to higher aggregate productivity and lower unemployment in the country, while inflation did not actually increase (Dustman et al. 2022). In the context of the same firm, it's been shown that minimum wage increases lead to higher productivity in the sales industry in the US (Coviello et al. 2022). On the one hand, this can be explained by showing that, faced with an increase in labor costs, companies need to stimulate higher productivity to compensate for rising internal costs (Riley and Bondibene 2017). On the other hand, workers may be willing to make an extra effort if they feel they are being treated fairly (Fehr and Gächter 2000). In this sense, high wages could motivate workers to put more effort into their tasks as they are conscious of the fair wages they are receiving. Indeed, while neoclassical labor models assume that wages reflect productivity (in which workers are paid the value of their marginal output), it can also be assumed that productivity is a function of the wage. It is the case of the efficiency wages theory, which states that paying wages above subsistence levels can stimulate workers to perform better (Leibenstein 1963). Literature on efficiency wages showed that paying workers above market clearing wages has positive externalities on motivation and productivity, i.e. is an incentive to improve the individual productivity of workers.

1.2   The case for minimum wages in the Experimental Literature

While the theoretical and empirical literature provides good evidence in support of higher aggregate productivity, in this experiment we will focus on individual effort and productivity. The principal-

agent framework is a well-established paradigm in experimental economics which can be used to study labor market dynamics. In such a case, the principal is the employer who hires the agent, the employee, to perform a task or set of tasks. This relationship is characterized by information asymmetry, where the employer has less information about the employee's abilities and effort than the employee. This information asymmetry leads to the potential for moral hazard, where the employee has an incentive to shirk or not put in maximum effort. One policy response to moral hazard in the labor market is the imposition of a minimum wage. In the work relationship, individual worker effort depends on the relation between fair and actual wages (Akerlof and Yellen 1990). The influence of job security and pay on morale and perception of fairness has been increasingly analyzed in the literature. Literature showed that in a principal-agent interaction, trust and reciprocity are fundamental for increasing perceived and actual fairness that stimulate workers to be more engaged in their tasks (Ferh, Goette and Zehnder, 2007). This result has been confirmed in a multiperiod principal-agent game between owners and managers in modern corporation (Guth, Klose, Konigstein and Schwalbach 1998). The significant novelty of our research is to observe the interaction dynamics between principals and agents from Italy and Brazil. The former country has not yet introduced a legal minimum wage, while in the latter it was implemented since the 1940s. Along the experimental design and discussion, we will refer to the interaction between principals and agents as bargaining, as defined by Schelling (1960): "Any activity in which each party is guided mainly by his expectations of what the other will accept". In the psychological literature, in the context of bargaining, competition between parties belonging to different groups leads to increased attraction to the in-group and decreased attraction to the out-group. It is the phenomenon described by Tajfel et.al (1971) as "gratuitous" negative discrimination towards outgroup members. In the economic literature, outgroup discrimination has been tested in different experimental settings: in dictator games (see Abbink and Harris, 2019), and coordination games with minimal groups (see Attanasi et. al, 2016). In the context of groups divided geographically by belonging to different continents (in our case Latin America and Europe), and thus by a different history and cultures of welfare state, a principal-agent experiment testing the effectiveness of the minimum wage on outgroup coordination is not present in the literature. As we will show later, not only does the minimum wage annul the so-called 'outgroup gratuitous discrimination' but also with the introduction of this measure, Brazilian principals are much more responsive and considerably increase the wages offered to Italian agents. This is because of a factor that we can define as 'cultural-historical' due to the consolidated presence of the legal minimum wage in Brazil.

2 Methods

2.1 Why a principal-agent experiment?

Our experimental set-up is interesting for further contributions in the area of bargaining and minimum wages and their implications for labour market policies. There are two main explanations why the experimental method is relevant for the research question:

- Controlled environment: everything constant, we focus on the impact of minimum wage only; all agents have the same cost function and all principals have the same production function through the entire experiment;

- We focus on individual productivity (or predisposition to productivity) regardless of the task.

2.2 Experimental Procedures

In order to study the effects of minimum wages on outgroup coordination in bargaining we deployed the following experimental procedure:

- 2 groups: Italy (26 participants) and Brazil (32 participants);

- Locations: CIMEO Laboratory (Sapienza University of Rome), Computerized Laboratory NIAG1102 (Federal University of Minas Gerais, UFMG);

- Software: Online Experiment through Veconlab;

- Participants: students in economics from Sapienza University of Rome and UFMG;

- Date: 11.11.2022

- Demographic Survey Results (Table 1)

- Experimental Design (2 multi-period treatments): - Ingroups: ITALY - ITALY; BRAZIL - BRAZIL - Outgroups: ITALY - BRAZIL; BRAZIL - ITALY

- 4 treatments: Ingroups x T1; Ingroup x T2 Outgroup x T1; Outgroup x T2

2.3 Experimental Design

We now focus on the main features of experimental design, which will be explained in detail in this same section together with the whole procedure.

- 2 roles: Principals (Employers) and Agents (Employees). Each maintaining the same role for each period and treatment;

- 2 Multiperiod Treatments: No Minimum Wage (T1); Minimum Wage (T2), with t=1,2,3,4,5 ;

- Within subject experiment: all participants are exposed to the same treatments;

- Experimental Currency Unit: dollar $

For this experiment we involved students of Microeconomics courses in Italy (Sapienza University of Rome) and Brazil (Federal University of Minas Gerais). The participants were divided into two groups of principal and agents, both in Italy and in Brazil (the experiment has been led in each faculty's laboratory at the same time). We instructed the participants to access the experimental platform Veconlab. On the website they found the written instructions which informed the players about the rules of the game and that they would interact for each treatment for five periods t = 1,2,3,4,5. We informed the students that their role of principal or agent would be randomly assigned by the platform. In period 1 of the first treatment (T1), player P, the principal or employer, must choose a fixed hourly wage (w) in the range $0 \leq w \leq 100$ to offer to the worker (player A, agent). If the worker does accept the offer, in period t she will receive the wage offered by P. Still in period 1, upon receiving the offer from player P, A decides whether to accept the contract offer, if she refuses, period one ends, if she accepts, she will have to decide what level of effort to employ in her job during period t. The lowest effort level to be offered is 0 and the highest is 10. Workers and and employers in our experiment had concave production and cost functions (See Figure 2), so for each increase in efforts levels corresponded a lower increase in value of produced output. We chose a simple game to observe a clear dynamic of the principal-agent interaction in multiple periods The same interaction scheme (see Scheme 2 for a resume) is repeated for five periods in the first session of the game . In all treatments, principals and agents maintained the same role. In the second treatment, we reduced the salary range that the employer could offer the employee by introducing a minimum wage. From a range of 0 In the second treatment we reduced the salary range that the employer could offer the employee by introducing a minimum wage. From a range of $0 \leq w \leq 100$ to $20 \leq w \leq 100$. Once the minimum wage was introduced, principals again offered contracts with fixed wages, suggesting a level of effort to the worker, the agent could still accept or reject the contract and then define the level of effort to be employed in his job for period t of the second treatment (T2). T2 as well has been repeated for five periods t = 1,2, . . 5. T1 and T2 were first carried out in Italy and Brazil between homogeneous populations of students from the same university, then we mixed the participant in outgroups: the Italian principals interacted with the Brazilian agents and the Brazilian principals interacted with the Italian agents (See Scheme

1). Each effort level (E) of the agents corresponded to a production value (V) for the employer and a monetary cost of effort (C) for the worker. Thus at the end of each period both players were able to compute their payoffs which are A = W – C (for the agent), and P= V – W. The employer's payoff P can be negative, as the employee's level of effort may be so low that it leads to a value of production that does not cover labor costs. Both the worker and the employer at the beginning of the game are aware of the production function of the firm and the cost function for the worker. Player's A and B total income is the sum of their period incomes for each treatment. In the end, the subjects played the game four times against changing opponents but keeping their role. We had 53 participants who were students of economics, from Microeconomics courses both undergraduates and graduates. All monetary values were denoted in dollars. The experiment took about 3 hours. The Brazilian principals averaged payoffs of -30, with great variability, being highest profit was +186 and the lowest -399. On the other hand, the Italian agents averaged +704 as payoff. We observe the same dynamics on the principals' side in Italy, where, however, the average payoff is positive and equal to 16, whereas the average payoff of Italian agents is +760. At the end of the games, subjects had to fill a demographic questionnaire which asked for a few personal characteristics (such as, student course, nationality, sex and so forth).

3   Results

The experimental design of this study generates a simple decision environment which generated the following data:

- Principal's decisions: Initial contract offer (fixed wage) ; Suggested effort level

- Agent's decisions: Accept or reject initial contract offer; Worker efforts

The following sections will describe the results from ingroup and outgroup interactions (see Figure 3 for groups composition).

3.1   Ingroups

3.1.1   Brazilian Ingroup

The experiment had two treatments: T1, where the principals offered 46 contracts below the 20 dollars minimum wage, 20 of which were below 10 dollars, and T2, where the minimum wage was 20$ and the average wage offered by the principals increased by 0.40$. Between T1 and T2 average offered wages increase from 36.93 $ to 37.33$, a slight increase by 1%. However, the

average effort promised by workers decreased between the first and second treatment by 0.24. We looked at the behavior of those who received less than the minimum wage in T1, whom we call "bottom workers". On average, bottom workers promised an effort of 1.47 in T1 and 2.65 in T2, which is a significant increase (+79%). The effort levels of workers increased in all five rounds of the second treatment (see Figure **??**), and the correlation between suggested effort and worker effort levels increased by 14 percent between the two treatments. The increase in effort levels for bottom workers suggests that those who could be defined as "top workers" do not benefit from the introduction of the minimum wage and do not react in terms of coordination with principals. However, bottom workers did see a large increase in wages, with an average increase of 22.69$. This increase may be due to the presence of outliers, such as principals who offered wages close to 0 during the first treatment in the hope of obtaining higher cumulative earnings.

3.1.2   Italian Ingroup

The Italian ingroup showed a similar dynamic to the Brazilian one regarding the dynamics involving bottom and top workers. In the first treatment, only two agents received a salary below the minimum wage of 20$. Between the first and second treatment, the average wages offered decreased from dollars 42.66 to 35.12, and workers in the second treatment decreased their average effort level by 0.67 points. In response to these wage offers, Italian agents promise effort levels of 4.05 and 3.12 respectively in T1 and T2. Bottom workers in T2 promised a higher effort level on average by 0.4, and the correlation between suggested and actual effort for bottom workers increased by 7% in T2, indicating a slight improvement in coordination between principal and agent. Even for those already receiving a salary above 20 dollars in the first treatment, the correlation between suggested and actual effort increased by 12%. However, the fact that average wages decreased by 18 percent between T1 and T2 suggests that coordination between principals and agents negotiating above the minimum wage is played out on other levels independent of the introduction of a statutory minimum wage. This is because so-called "top workers" are not concerned and do not benefit from the introduction of the minimum wage measure. For example, the fact that wages in the second treatment decrease may be due to a misalignment of principals' expectations with agents' effort. Between T1 and T2, the principals gradually go down on the salaries offered, adjusting their demands for suggested effort relative to the actual effort levels shown by the agents.

3.2   Outgroups

Italian principals offered lower wages (36.24) to Brazilian agents in T1 compared to the ingroup (42.66). But when a minimum wage was introduced, the average wage offered increased by 8%

percent up to 39.46 dollars. In T1, Brazilian workers offered an effort of 2.95 (-0.59 compared to their ingroup), but in T2, their effort increased to 3.86 (+0.52 compared to the ingroup). The correlation coefficient between suggested effort and worker effort increased by 65% in aggregate. For workers receiving a salary below 20$, the correlation between suggested and actual effort increased by 7% in the second treatment, and even for those receiving above 20 dollars, the correlation improved by 12 percent. Brazilian principals offered Italian agents an average wage of 27.08 percent in T1, but in T2, the coordination improved with an average wage of 35.97% (+32% compared to T1). The introduction of the minimum wage led to an increase in the average wages offered, with the Italian principals offering 39.46$ average wages and the Brazilians offering slightly lower 35.97$ average wages of 35.97$. The coordination between principals and agents improved thanks to the introduction of the minimum wage, especially for the "bottom workers" who received less than 20$ in the first treatment, and saw an increase in average wages offered of 29.44 dollars, reaching a correlation between suggested and actual effort of 0.76, from -0.26 in the first treatment.

3.3 Efficiency Wages in the Principal-Agent coordination conundrum

In order to analyze how variables such as Wages, Suggested Effort and Cumulative Earnings, affect the probability of coordination between principals and agents, we launched a logistic regression where Coordination is a binary variable Y (0,1) which takes values 1 when Worker Effort $\geq$ Suggested Effort. We also opened for a "quasi-coordination" analysis, in which case Y (0,1) takes value 1 when Worker Effort + 1 $\geq$ Suggested Effort. The results of our experimental study indicate that higher wages have a significant and positive effect on the probability of coordination between principals and agents. Conversely, an excessive suggested effort level that exceeds worker expectations decreases the likelihood of coordination significantly. Additionally, we found that maximizing behavior by the employers has a negative but less pronounced effect on coordination. These findings may help to explain the dynamics observed between T1 and T2 in the Italian ingroup, where agents responded to high wages and a suggested effort level of 4.12 by reducing worker effort by one point. In fact, we observed a 50% increase in cumulative earnings of agents between the first and second periods of T1, leading to a gradual decrease in wages and a further decrease in coordination. We can sum up the analysis of coordination attitude in the following points (See also Figure 5):

- Increasing Wages Increase Probability of Coordination: for the same level of offered wages, the probability of Quasi-coordination is higher than probability of Coordination (See Figure 7)

- Earning too much in the game augments maximising behavior: when principals increase their earnings by suggesting too much effort to more altruistic counterparts, they augment a maximizing behavior that eventually will reduce the coordination with the agents.

3.4   Minimum Wages against outgroup "gratuitous" discrimination

To capture the statistical significance of the results on the outgroups, two mixed-effects regressions were run. Indeed, running a standard linear regression in this case is not sufficient as a simple OLS treats all observations as independent. In our game the agents repeated their choice of effort level 5 times for each treatment, i.e. they repeated the same action on the same data set several times. In a linear model this is defined as a "repeated measurement" on the same statistical unit, we therefore used a linear mixed-effects model. First we aggregated the data from the interactions of agents on the one hand and principals on the other from the games of Italy and Brazil. In this way we were able to obtain two separate data sets on agent and principal choices of offered wages and effort levels respectively. We then integrated the data sets with dummy variables responding to the presence or absence of the minimum wage, one responding to interactions between Italian and Brazilian students and a last one, a nationality dummy. Since some Italian and Brazilian agents and principals in their respective sessions had identical IDs, we had to change their IDs in the data set so that the mixed effects model would not capture their choices as those of the same ID. The wages offered depends positively and significantly on the level of suggested effort (See Table 4). We see that the Italians always start from higher wages as shown by the dummy NAT, the estimate is not significant but the trend is confirmed by the descriptive analysis of the data and we believe that repeating the experiment by increasing the number of periods and treatments, it could easily be a statistically significant estimate. We then see that, consistent with minimal group theory, the outgroup effect is strong when Italians interact at T1, as shown by the ITABR dummy variable. In fact, groups initially perform worse in terms of wages and coordination at T1, coherently with the social identity literature reviewed in the introduction. Entering T2, however, the picture changes drastically. What emerges is that the introduction of the statutory minimum wage corrects this negative discrimination on wage offers. The interaction between Minimum Wage and the interaction variable (ITABR) is indeed strongly positive, as the graph also shows. The result is almost significant, as the t-value is 1.707, while in mixed effects regressions t-value ¿ —2— is equivalent to p-value ¡0.01. On the agents side, we observe that wages always have a positive and significant impact on changes in workers' effort choices. The outgroup interaction makes agents start from significantly lower levels of effort. We see how outgroup interaction with the minimum wage leads to higher values of effort on the agents' side compared with the outgroup interaction without minimum wages, the estimate is statistically significant and leads to a convergence towards

the levels of ingroup coordination. (See Figure 4) In fact, from our logistic model we see that the probability of coordination between agents and principals decreases in the presence of the outgroup and that this dynamic is corrected with the introduction of the minimum wage in outgroups, which brings the probability of coordination almost to the same point as in ingroups without minimum wage (See Figure 5).

4 Discussion

We recall here the two hypotheses we wanted to test in the experiment.

- Hp1: Minimum wages increase wages and coordination between principals and agents. We mentioned here the fair wage-effort hypothesis by Akerlof and Yellen (1982)

- Hp2: Minimum wages improve outgroup offered wages and productive coordination. We referred here to the concept of "outgroup gratuitous discrimination" by Tajfel (1982).

During the ingroups we verified that the first hypothesis is confirmed, in particular for those we defined as bottom workers, i.e. agents who received wages of less than $20 in the first treatment. For those workets, a substantial increase in wages always corresponds to an increase in promised effort. Instead, we saw how top workers, i.e. those earning above $20 in all treatments, negotiate wages and effort differently, which seems to depend more on the effort demands of principals. When they demand an excessive level of effort, the agents always respond with a sharp reduction in the promised effort. For this reason, wages in both ingroups gradually decrease. While this may appear to be a deterioration in wage and effort levels, this dynamic seems to indicate that both principals and agents tend to converge towards a level considered 'fair' in the wage-effort relation. With regard to Tajfel's concept of outgroup gratuitous discrimination, we verified that it is also valid in our experimental context. Namely, when Italian principals interact with Brazilian agents, and Brazilian principals interact with Italian agents, the wages offered are always lower than the wages offered in the ingroups, in which the groups are homogeneous. Mixing the populations allowed us in the first treatment to test the validity of the Tajfel hypothesis, which is particularly valid for Brazilian principals who drastically decrease the wages offered. The situation is reversed with the introduction of the minimum wage. And even here the Brazilian principals are protagonists, in fact their reactivity in increasing wages is very strong, so much so that between T1 and T2 the wages offered by the Brazilian principals increase by 30% while by the Italians only by 8%. The introduction of the minimum wage thus made it possible to reverse the so-called "outgroup gratuitous discrimination" in offered wages (figure wage). This way, both principals and agents converged the levels of coordination between principals and agents to ingroup levels (figure cord).

In order to increase the significance of our observations, what will be useful to do in future experiments will be to increase the negotiation treatments. While in this experiment we have tested the mere introduction of a minimum wage, starting from a context in which the minimum wage is not present at all, the investigation can be extended to other cases. One research opportunity is to test our hypotheses with systematic (positive) adjustments to the minimum wage (i.e. more treatments), as has been the case in Germany since 2015. This will allow us to replicate a desirable dynamic in both countries involved (Brazil and Italy) and on the other hand, to increase the number of observations in our data sets, improving their statistical significance.

5 Conclusions

We started this research with two questions which are related to our investigation hypothesis:

- Can a legal minimum wage increase coordination between principals and agents?

- Can the implementation of a legal minimum wage improve outgroup offered wages and productive coordination?

We tested our hypotheses with four treatments of five periods each. In the first two treatments principals and agents interacted in homogeneous groups with respect to university affiliation. In the first treatment, participants negotiated the employment relationship freely; in the second, principals could not offer wages below $20. From these interactions we derive the results of our first hypothesis. We then repeated the two treatments in heterogeneous groups to test for outgroup coordination. In our experiment coordination is always defined as Worker Effort equal or higher than Suggested Effort. We have seen that the introduction of the minimum wage significantly improves the co-ordination between principals and agents in ingroups, particularly when the agents are workers who received wages below $20 (experimental minimum wage) in the first treatment. This suggests that what we call "bottom-workers" in the analysis, but who are also referred to as "working poors", are much more cooperative with employers once they emerge from the low-wage spiral. We then showed that so-called "outgroup gratuitous discrimination" occurs when the two groups interact with each other. In particular, both Italian and Brazilian principals offer lower wages to their foreign counterparts. The implementation of the minimum wage in the experiment, however, corrects this gratuitous discrimination and brings wage negotiation and coordination levels back to those observed in the ingroups. The results were statistically confirmed by two run regressions, a mixed effects regression that we used to investigate the dynamics of offered wages, and a logistic regression that we used to observe the coordination dynamics between principals and agents.

6 Figures, Tables and Schemes

	UFMG	Sapienza
Average Age	22	23
% Men	74%	76%
% Women	28%	22%

Figure 1: Demographic Survey Results
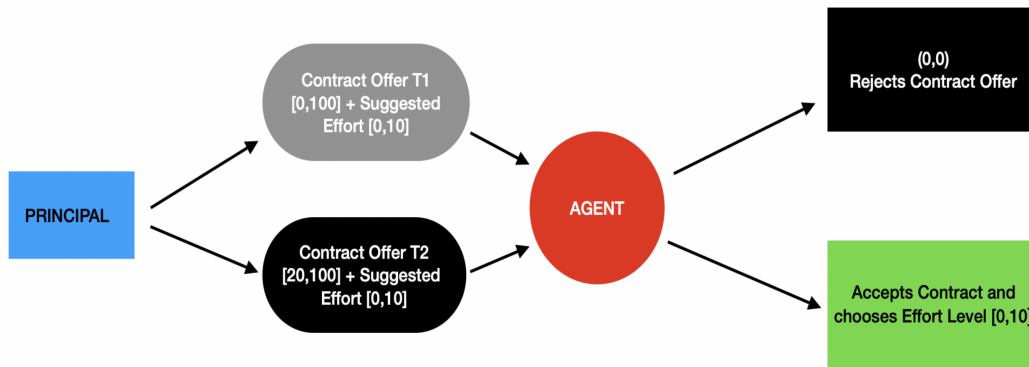
Figure 2: Structure of the Principal Agent Game

Value of Effort Function

Worker's Effort:	1	2	3	4	5	6	7	8	9	10
Value of Output:	$10.00	$20.00	$30.00	$40.00	$50.00	$60.00	$70.00	$80.00	$90.00	$100.00
Cost of Effort:	$0.00	$1.00	$2.00	$4.00	$6.00	$8.00	$10.00	$13.00	$16.00	$20.00

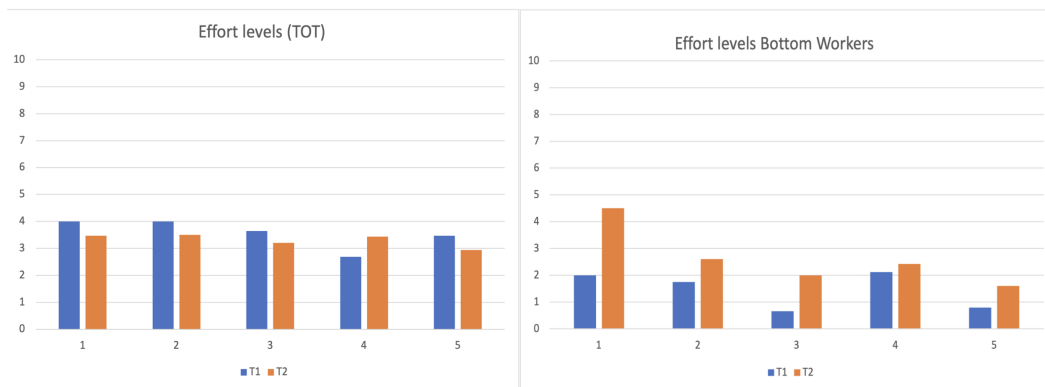Figure 3: Concave Production Function

Figure 4: Aggregate effort levels on the left, Bottom workers' effort levels on the right
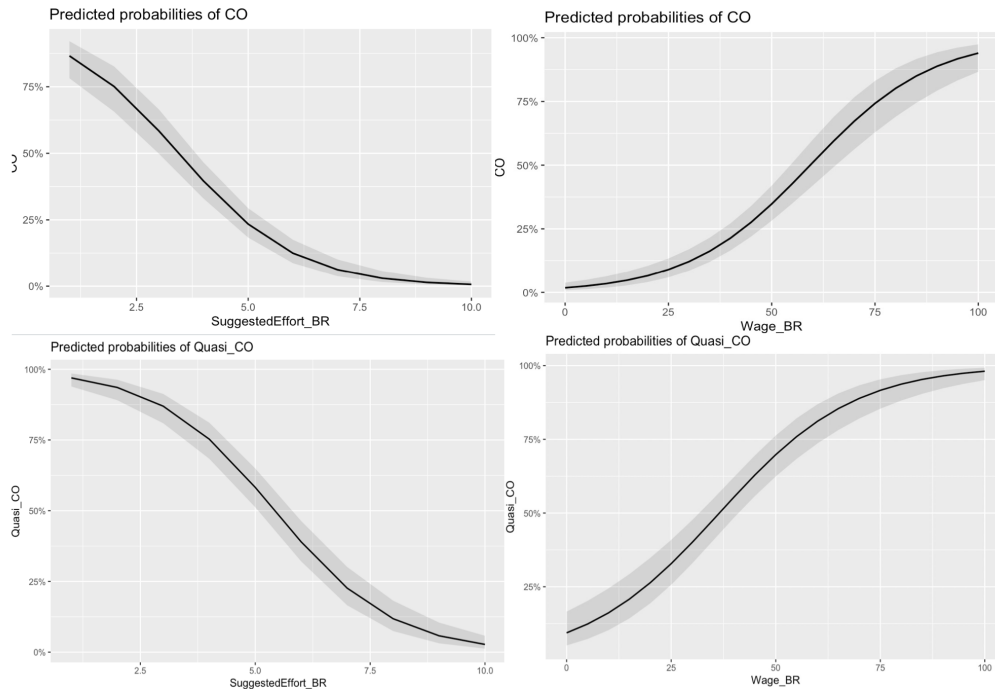
Figure 5: Logistic Regression Table on Coordination and Quasi Coordination

	Estimate	Std. Error	t value
Intercept	6.4151	2.9665	2.163
Suggested Effort	5.9747	0.2905	20.569
ITABR	-3.6650	1.7881	-2.050
MW	-1.0432	1.6174	-0.645
NAT	2.2529	3.8020	0.593
ITABR:MW	4.1913	2.4560	1.707

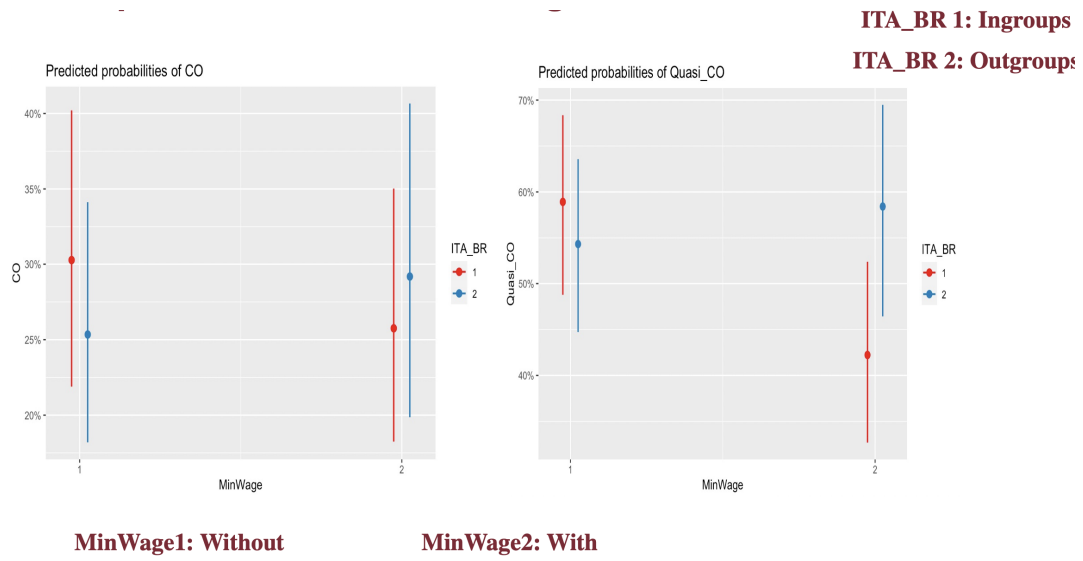Figure 6: Mixed effects regressions

Figure 7: Minimum wages correct outgroup "gratuitous" discrimination of offered wages
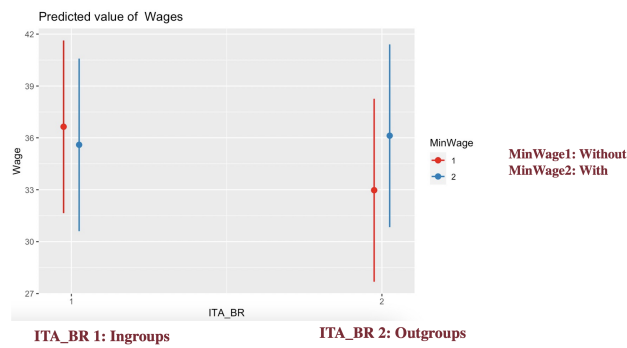

Figure 8: Coordination within outgroups consistently improves with minimum wages

14

References

Acemoglu, D. (2001). Good jobs versus bad jobs. *Journal of labor Economics*, 19(1):1–21.

Adascalitei, D. and Morano, C. P. (2015). *Labour market reforms since the crisis: Drivers and consequences*. Internat. Labour Office.

Ahlfeldt, G. M., Roth, D., and Seidel, T. (2018). The regional effects of germany's national minimum wage. *Economics Letters*, 172:127–130.

Akerlof, G. A. and Yellen, J. L. (1990). The fair wage-effort hypothesis and unemployment. *The Quarterly Journal of Economics*, 105(2):255–283.

Alvi, E. (1998). Job security and unemployment in an efficiency-wage model. *Journal of Labor Research*, 19(2):387–396.

Attanasi, G., Hopfensitz, A., Lorini, E., and Moisan, F. (2016). Social connectedness improves co-ordination on individually costly, efficient outcomes. *European Economic Review*, 90:86–106.

Bernhard, H., Fehr, E., and Fischbacher, U. (2006). Group affiliation and altruistic norm enforcement. *American Economic Review*, 96(2):217–221.

Blanchflower, D. G. and Oswald, A. J. (1994). *The wage curve*. MIT press.

Blanchflower, D. G. and Oswald, A. J. (2005). The wage curve reloaded.

Buettner, T. and Ebertz, A. (2009). Spatial implications of minimum wages. *Jahrbücher für Nationalökonomie und Statistik*, 229(2-3):292–312.

Card, D., Mas, A., Moretti, E., and Saez, E. (2012). Inequality at work: The effect of peer salaries on job satisfaction. *American Economic Review*, 102(6):2981–3003.

Dosi, G., Freeman, R. B., Pereira, M. C., Roventini, A., and Virgillito, M. E. (2021). The impact of deunionization on the growth and dispersion of productivity and pay. *Industrial and Corporate Change*, 30(2):377–408.

Dustmann, C., Lindner, A., Schönberg, U., Umkehrer, M., and Vom Berge, P. (2022). Reallocation effects of the minimum wage. *The Quarterly Journal of Economics*, 137(1):267–328.

Engbom, N. and Moser, C. (2022). Earnings inequality and the minimum wage: Evidence from brazil. *American Economic Review*, 112(12):3803–47.

Galvão, A. and KREIN, J. D. (2019). Reforma trabalhista: efeitos e perspectivas para os sindicatos. *Reforma trabalhista no Brasil: promessas e realidade*, pages 199–223.

Georgiadis, A. (2013). Efficiency wages and the economic effects of the minimum wage: Evidence from a low-wage labour market. *Oxford Bulletin of Economics and Statistics*, 75(6):962–979.

Goette, L., Huffman, D., and Meier, S. (2006). The impact of group membership on cooperation and norm enforcement: Evidence using random assignment to real social groups. *American Economic Review*, 96(2):212–216.

Güth, W., Klose, W., Königstein, M., and Schwalbach, J. (1998). An experimental study of a dynamic principal–agent relationship. *Managerial and Decision Economics*, 19(4-5):327–341.

Hogg, M. A. (2016). *Social identity theory*. Springer.

Morley, I. and Stephenson, G. (2015). *The social psychology of bargaining.* Psychology Press.

Raitano, M. and Fana, M. (2019). Labour market deregulation and workers' outcomes at the beginning of the career: Evidence from italy. *Structural Change and Economic Dynamics*, 51:301–310.

Shapiro, C. and Stiglitz, J. E. (1984). Equilibrium unemployment as a worker discipline device. *The American economic review*, 74(3):433–444.

Struffolino, E. and Raitano, M. (2020). Early-career complexity before and after labour-market deregulation in italy: heterogeneity by gender and socio-economic status across cohorts. *Social Indicators Research*, 151(1):231–257.

Tajfel, H. (1970). Experiments in intergroup discrimination. *Scientific american*, 223(5):96–103.

Tajfel, H., Billig, M. G., Bundy, R. P., and Flament, C. (1971). Social categorization and intergroup behaviour. *European journal of social psychology*, 1(2):149–178.

Tajfel, H. and Turner, J. C. (1978). Intergroup behavior. *Introducing social psychology*, 401:466.

Vom Berge, P. and Frings, H. (2020). High-impact minimum wages and heterogeneous regions. *Empirical Economics*, 59(2):701–729.