The Effects of Minimum-wage Increases on Firms’ Wage Offers and Employees’ Effort under Incomplete Contracts

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October 2018
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ABSTRACT: We experimentally investigate how increases in legally required minimum wages affect wage offers and employee effort. Prior research suggests that gift exchange between firms and employees leads to employee effort that exceeds the economically enforceable level. However, when the minimum wage increases, expectations regarding compensation levels may also change. We predict that, following such a change, firms and employees will self-servingly determine their reference point regarding fair compensation. As a result, while firms will increase compensation, the excess of compensation over the minimum wage will decline, and thus employees will not respond with effort proportionately to the increase in compensation. The results of a laboratory experiment and an online experiment are consistent with our predictions, suggesting that minimum-wage increases can have a negative effect on employee effort. Ultimately, employees respond to equivalent wages differently depending on the context surrounding the wage level. Implications for theory and practice are discussed.
I. Introduction

This study experimentally examines how increases in the legally required minimum wage affect firms’ wage offers and employees’ effort in an incomplete contracting setting. Since the establishment of the federal minimum wage, the majority of states, as well as numerous cities/municipalities, have established their own minimum wages. Proposals have pushed for an increase from the current federal minimum wage of $7.25 to $10.10, and more recently up to $15. The Congressional Budget Office (CBO) estimated in 2014 that raising the federal minimum wage to $10.10 would affect over 16 million workers (https://www.cbo.gov/publication/44995), and, undoubtedly, an increase to $15 would affect millions more. Increases in the minimum wage occur more frequently at city and state levels. For example, many cities and states, including Birmingham (Alabama), Portland (Oregon), Connecticut, Hawaii, Maine, and Maryland, have passed laws that will, if not already having done so, increase the minimum wage to $10.10. On January 1, 2018 alone, minimum-wage increases took effects in 18 states and 20 cities (Donnelly 2017). Prior economic studies, including the one conducted by the CBO, typically evaluate the macro-level effects of the minimum wage, focusing on variables such as overall employment and income distribution (Brown 1999; Neumark and Wascher 2008). However, minimum wage legislation also has a direct impact on firms’ contracting and compensation practices. This study takes a micro-level approach to examine the effects of minimum-wage increases on compensation as a control mechanism for firms in an incomplete contracting environment.

Despite the prevailing trends of raising minimum wages, scholars and practitioners have expressed concerns that, at the firm level, higher minimum wages would increase labor costs and, thus, affect firm profitability (e.g., Draca, Machin, and van Reenen 2011; Wilson 2012;
Saltsman 2013, 2016). In fact, recently the city of St. Louis has revoked a municipal minimum-wage increase because of local business groups’ concerns about “higher labor costs” (Morath 2017). As another example, the mayor of Baltimore has vetoed a proposal for increasing the municipal minimum wage, again due to labor cost concerns (Calvert and Morath 2017). On the other hand, prior research in economics and accounting has documented a gift-exchange relationship between wage levels and employee effort: that is, employees tend to respond to higher wages with higher effort (e.g., Fehr and Gachter 2000; Hannan 2005; Kuang and Moser 2009; 2011; Chen and Sandino 2012). These studies suggest that offering wages higher than the economically optimal level can function as effective controls within organizations. Along these lines, if paying higher wages motivates employees to provide higher levels of effort, the concerns about the possible negative effect of minimum-wage increases on firm profitability may not be warranted (in fact, the effect could even be positive). Therefore, we explore how legally required increases in the minimum wage influence firms’ wage setting and employees’ effort provision.

The gift-exchange relationship is founded on reciprocity. Underlying the decision to reciprocate by a responder is his or her perception of the kindness of the proposer’s intent in the action (Falk and Fischbacher 2006). In incentive contracting practices, this suggests that employees will only participate in the gift exchange if they perceive the wage offer to be kind. Firms likely consider the minimum wage in setting the wage. Employees also may consider the minimum wage in evaluating firms’ wage offers. When the minimum wage increases, there are multiple references available for determining the fairness of wage offers. Specifically, individuals can potentially compare, before versus after the minimum-wage increase, the absolute wage levels or the size by which the wage offered exceeds the minimum wage (hereafter referred to as the “wage premium”). We posit that firms and employees will self-
servingly focus on different references when assessing the fairness of wage offers. Firms are likely to focus on absolute wages (i.e., whether the absolute wage increases after the minimum-wage increase), whereas employees may focus on wage premiums (i.e., whether the absolute wage increases to a level that maintains the same premium). The different references can make it difficult for firms to meet employees’ fairness expectations, thus affecting firms’ ability to invoke high effort from employees.

To test our predictions, we conduct a laboratory experiment. Experimental studies are particularly useful for our research purposes, given the difficulty in acquiring proprietary data from organizations (Levitt and List 2007; Sprinkle and Williamson 2007). Even when archival data are available, the minimum wage represents an exogenous policy implementation that does not happen in isolation and includes noise produced by other market factors. In our experiment, participants act as either a firm or an employee, and interact over multiple periods in an incomplete contracting environment. The firm has discretion over what wage to offer the employee. The employee, after accepting the wage offer, makes a costly effort choice, with the cost increasing with the effort level.

Our experiment consists of three between-participant conditions, including a baseline condition and two treatment conditions. A minimum wage is imposed in all three conditions. To reflect the CBO reviewed increase in the federal minimum wage, we select 37 Lira (an experimental currency) and 51 Lira, from a given range of 0–120 Lira, to represent the minimum wages of $7.25 and $10.10, respectively. In the baseline condition, the minimum wage is constant in all periods at the higher level of 51 Lira. In the two treatment conditions, the minimum wage starts off at 37 Lira and (1) immediately increases to 51 Lira, remaining constant.

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1 The choice of an increase to 51 from 37 Lira represents an increase of 38%. This is a close match to the proposed change from $7.25 to $10.10, which would be an increase of 39%.
thereafter (the immediate condition), or (2) first increases to 44 Lira before being raised to 51 Lira (the gradual condition).²

We predict that, after the increase in the minimum wage, firms and employees will interpret differently what wage would be fair. Consequently, the absolute level of firms’ wage offers will increase, but the level of wage premium will likely decrease. Given the declining wage premium, employees’ effort will not respond proportionately to the increase in absolute wages following the minimum-wage increase. Consistent with our predictions, we find that wages in the two treatment conditions increase to equivalent levels as in the baseline condition when the minimum wage of 51 Lira is in effect across all conditions. On the other hand, after the minimum-wage increase, the level of wage premium declines in the treatment conditions. As a result, effort in the treatment conditions actually decrease, despite the increase of absolute wages. These results do not significantly differ between the immediate and gradual conditions, suggesting that gradually increasing the minimum wage does not mitigate the consequences on employees’ effort. Across all periods, firm profitability is the highest in the baseline condition in spite of the higher minimum-wage requirement in the early rounds of the experiment.

The results of the laboratory experiment suggest that simply increasing wages may not be effective in motivating employees’ effort due to employees’ self-serving fairness judgments. An intriguing question, then, is whether offering gift wages would be more effective in eliciting effort if firms indeed satisfied employees’ fairness expectations. To explore this issue and provide additional evidence of the underlying effect in our laboratory experiment, we conduct an online experiment using Amazon Mechanical Turk. In the online experiment, the discretionary range of firms’ wage offers is reduced to provide for greater experimental control. Specifically,

² The gradual increase is the typical method for increasing the minimum wage at the federal level.
after a minimum-wage increase, firms can only offer the initial wage, the average wage offered in our laboratory experiment, or a wage that contains the same premium as before the minimum-wage increase. Consistent with the findings of the laboratory experiment, the results show that, after the minimum-wage increase, employees *decrease* effort both when the wage does not change and when the wage simply increases to the average level offered by firms in the laboratory experiment. However, we do observe an *increase* in effort if the wage is increased to the level that maintains the same premium. These findings corroborate our laboratory results and, more importantly, suggest that firms do have the ability to capitalize on gift wages even when minimum wages increase, though they have to fully meet employees’ fairness expectations and carry the cost of the minimum-wage increase.

Our results about the differences in employees’ behavior when the minimum wage increases has important implications for theory and practice. Prior minimum-wage studies have not explored how increases in the minimum wage affect behavior, but instead have focused on the presence or absence of a minimum wage (Brandts and Charness 2004; Owens and Kagel 2010). Such a manipulation does not allow for the self-serving bias that generates our results to occur because employees do not have a sense of what is an appropriate gift in the absence of a minimum wage. Moreover, the presence/absence manipulation of a minimum wage is not representative of naturally occurring settings, where a minimum wage is present as default. In our laboratory experiment, the use of a baseline condition in which the minimum wage exceeds all other minimum wage levels allows us to capture the dynamic effects in comparison to static environments. A comparison between the baseline and treatment conditions shows that, ultimately, employees respond differentially to equivalent wages depending on the context.
surrounding the wage level, revealing an interesting behavioral implication of minimum-wage increases.

Our results also make an important contribution to the gift-exchange literature. Prior research suggests that increasing wages is a useful tool for organizations to motivate employee effort, particularly when responding to environmental changes such as profit shocks and outsourcing opportunities (Hannan 2005; Brown et al. 2015). However, we find that, with an increase in the minimum wage, effort levels may not increase with absolute wages as had been found in prior gift-exchange studies, suggesting that employees react negatively when the higher wages induced by the minimum-wage increase do not meet their expectation pertaining to the size of the gift which is based on the wage premium. Our findings demonstrate that consideration must be taken before using gift wages as a control strategy because the benefits may be situational. In fact, we observe decreases in profitability from reduced effort despite firms’ increased wage offers in response to the change in the minimum wage.

In terms of practice, how organizations set wages is an important business decision. Organizations have increasingly used gift wages as a control mechanism to induce desirable employee effort (e.g., Irwin 2016), but the wage-setting decision can become more complicated when the environment changes, as with changes to the minimum wage. Our study helps firms understand the potential negative impact of changes in the minimum wage on management control effectiveness. Firms should consider such impact in determining wage offers, especially when the firm elects to employ incomplete contracts. For example, firms that have limited abilities to raise compensation may benefit most from other control mechanisms when employing incomplete contracts or from general movements toward more complete contracts.
The remainder of this paper is organized as follows. In the next section, we provide theoretical background and develop the hypotheses. Section III describes the method of our laboratory experiment. Section IV reports the results of the laboratory experiment and a supplemental online experiment. Section V concludes the paper with a summary and discussion.

II. Background and Hypotheses Development

Gift Exchange and Minimum Wages

In an incomplete contracting environment, firms cannot perfectly monitor employees, and employees’ output is either non-contractible or a noisy measure of their actual effort. As a result, firms often pay employees a fixed wage (Lazear 1986). From a standard agency perspective, once a fixed wage is offered, the firm has no means to assure greater than minimal effort and, consequently, should only offer the market-clearing wage. However, prior literature shows that firms typically offer wages higher than the market-clearing level, and employees offer higher than minimal effort in return (Fehr and Gächter 2000). This relationship has been formally modeled as a gift exchange (Akerlof 1982).

The gift-exchange model suggests that employees respond to higher compensation with higher effort. This proposition has been supported by numerous field and archival studies (e.g., Blinder and Choi 1990; Campbell and Kamlani 1997; Bewley 1999; Chen and Sandino 2012), as well as experimental research (Fehr, Kirchsteiger, and Reidl 1993; Fehr, Gächter, and Kirchsteiger 1997; Hannan, Kagel, and Moser 2002; Hannan 2005; Kuang and Moser 2009, 2011), in economics and accounting. These prior findings suggest that gift wages may be an effective component of management control systems. In particular, gift wages can be used as a control strategy to cope with environmental factors or changes that potentially affect employee effort. For example, offering a signing bonus motivates higher effort when there is an excess
supply of labor than when there is an excess demand for labor (Choi 2014). Additionally, a wage increase induces higher effort when firm profitability decreases than when firm profitability increases (Hannan 2005). However, as elaborated later, we propose that increasing wage offers may not be effective in inducing employee effort when firms face legally required increases in the minimum wage. Therefore, our study extends this literature by shedding light on the boundary conditions for using gift exchange to induce employee effort in management control practices.

The gift-exchange model is founded on reciprocity, which is defined in the economics literature as an in-kind response to a kind or unkind act (Dohmen et al. 2009). This definition suggests a positive relationship between firms’ wages offers and employees’ effort. In order to offer a “gift,” the firm has to offer a wage above a reference point. While the gift-exchange model assumes that the market-clearing wage is a natural reference (Akerlof 1982), firms may be constrained in the minimum level of wages that they are legally allowed to offer, due to minimum wage legislation or contract negotiations through collective bargaining. In practice, for the legally required minimum wage to have an effect, it must be set above the naturally occurring market-clearing wage for at least some industries. For our purpose, we argue that changes in the minimum wage can impact the reference points that firms and employees rely on in forming fairness judgments and, in turn, affect their behavior.

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3 We use the economic definition because it establishes both positive and negative reciprocity. While consistent with most definitions of reciprocity, other fields, such as sociology, have often focused more on positive reciprocity (e.g., Gouldner 1960).

4 There are no guidelines for when increases to the minimum wage will occur. Being a highly politicized issue, expectations over the likelihood can vary by political climate. Changes to the U.S. federal minimum wage, for example, occur through acts of Congress. Particularly at the federal level, the minimum wage is gradually increased from the pre-legislative level to the final level approved by Congress. The most recent minimum wage increase at the federal level, based on legislation passed in 2007, took place in 2009 and increased the minimum wage to $7.25. Recent proposals have called for an increase in the minimum wage ranging from $10.10 to $15.
Experimental Minimum-wage Research

Given concerns over macro-level effects and the difficulty in acquiring proprietary data from organizations, the majority of the studies in labor economics have used publicly available data to assess the effects of minimum wage legislation on employment and the overall income (e.g., Brown 1999; Neumark and Wascher 2008). Recent studies in experimental economics have looked at micro-level behavior. For example, Falk, Fehr, and Zehndar (2006) examine the impact of a minimum wage on labor markets in two treatments: one condition in which the minimum wage is present, then removed, and the other where the minimum wage is introduced after being absent. Uniquely, Falk et al. (2006) do not allow for workers’ discretion over effort choices (workers only have a dichotomous choice of accepting or declining the wage), and focus instead on employers’ wage offers and workers’ perceptions of reservation wages. They find that compensation and reservation wages are higher under a minimum wage than in its absence, with reservation wages significantly below the minimum wage level prior to the introduction of the minimum wage but not so after its removal. However, this study does not allow for a true test of the gift-exchange model because the effort under these conditions is not elicited.

Other research examines workers’ effort choices. Brandts and Charness (2004) include a condition with a required minimum wage in a broader study exploring how labor supply and demand affect gift exchange. Results show that imposing a minimum wage leads to lower wage offers, which in turn induce lower effort. Owens and Kagel (2010) explore the effect of minimum wages on wages and effort in two treatment conditions similar to Falk et al. (2006): one condition in which the minimum wage is absent, then introduced, and the other where the minimum wage is present and then removed. They find that the presence of minimum wages
increases wage offers and workers’ effort. In the accounting literature, Brown et al. (2015) examine an incomplete contracting labor market in which compensation restrictions vary. In their study, after several rounds, an additional worker is introduced to the market that has either the same minimum wage as the original workers or a lower minimum wage. Results show that employers offer lower wages to lower-minimum-wage new workers than to same-minimum-wage new workers. However, these lower wage offers are responded with lower effort from lower-minimum-wage new workers (compared to same-minimum-wage new workers), suggesting that the workers base their effort decisions on the absolute wage levels.

These prior studies provide useful insight into the role of minimum wages in labor markets, but have significant deviations that makes direct application to our study difficult. To facilitate discussion, we elaborate on the implications of these prior findings for our study after we develop our hypotheses in the next section.

**Choices of Fairness References when Minimum Wages Change**

In this paper, we posit that the focus of firms and employees on different references for fairness judgment is central to their behavior. In social interactions, individuals seek to achieve a fair outcome, but “the rules of fairness are often ambiguous” (Kahneman 1992, 302). Specifically, the judgment of fairness depends largely on comparison of the outcome against a reference, which is often selected from salient, relevant transactions that have occurred in similar environments (Kahneman et al. 1986; Wood 1989). When multiple standards are available that could be used to decide what is fair, people tend to choose the standard that serves their own interest (Kahneman et al. 1986; Babcock et al. 1995). Relatedly, Shannon (2000, 304) suggests

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5 Owens and Kagel (2010) note that the presence of a minimum wage increases wage offers in their study but decreases wage offers in Brandts and Charness (2004). Due to various contextual differences between the two studies, they are not able to provide any conclusive explanation for these seemingly inconsistent results.
that people may opportunistically interpret whether their behavior is compliant with social norms when the norm’s “prescriptions and parameters are situationally limited, undefined, or ambiguous.” In particular, in incomplete contracting environments, firms and employees may have divergent, egoistic beliefs about “what each owes the other” (Robinson and Rousseau 1994, 246; Morrison and Robinson 1997). Such differences in the interpretation of fairness can result in interpersonal conflicts, negatively affecting efficiency (Thompson and Loewenstein 1992).

For our purpose, after a legally required increase in the minimum wage, two possible reference points can be used to assess the fairness of wage offers: that is, the absolute wage or the excess of the wage offer over the minimum wage (i.e. wage premium). We posit that firms and employees will focus on different reference points, representing a self-serving bias. As a result, firms’ wage offers may not satisfy employees’ fairness expectations, failing to induce desired effort. First, we consider firms’ wage-setting behavior. When the minimum wage is increased, firms need to decide (1) whether to increase wages, and (2) whether to offer the same wage premium as before. To the extent that an increase in the minimum wage represents a fundamental change to the compensation practice, firms may feel compelled to increase wages because not doing so would seem overtly selfish and difficult to justify (Kahneman et al. 1986; Bandura 1999). On the other hand, firms may be unwilling to increase wages to a level that contains the same premium as before, because this would require additional resources. Therefore, we predict that firms will seek to justify offering a smaller premium by focusing on the absolute level of the wage. We formally state these predictions in the following hypotheses:

**H1a:** Firms will offer higher levels of *absolute wages* after the increase in the minimum wage.

**H1b:** Firms will offer lower levels of *wage premiums* after the increase in the minimum wage.
Next, we consider employees’ effort choices. In incomplete contracting settings, employees usually are “second movers” in the gift-exchange relationship because they provide effort after accepting the wage offer. Prior economic research notes that second movers tend to take advantage of their position and make more self-interested choices (Fehr and Schmidt 1999; Bolton and Ockenfels 2000; Brandts and Charness 2004). Other research shows that people derive utility from wealth and compliance with social norms (including fairness and reciprocity), and make tradeoffs between the two to reach a compromise (Rabin 1993; Mittendorf 2006). An increased opportunity cost for norm compliance can reduce people’s willingness to comply with the norm, pushing them toward economic self-interest (Luft 1997; Hannan, Rankin, and Towry 2006). Hence, employees may be reluctant to increase effort even if wages increase. In order to justify this self-interested behavior, employees may focus attention on the size of the wage premium, making it more difficult for firms to offer a wage high enough to invoke norm compliance. As a result, employees may anchor to the wage premium offered by firms prior to the minimum-wage increase, and react negatively if new wage offers fail to provide the same level of gift.

Based on the above discussion, we make the following hypothesis:

**H2:** When wage offers increase after an increase in the minimum wage, there will not be a proportional increase in employee effort.

As noted earlier, prior economic studies (Brandts and Charness 2004; Owens and Kagel 2010) focus on the presence versus absence of a minimum wage, which have different effects on behavior compared to changes in the minimum wage. Specifically, in the absence of a minimum wage, wage premium is undeterminable. Thus, when a minimum wage is introduced, individuals
do not have a distinct prior wage premium as a possible reference, but rather may only rely on the absolute wage in forming a fairness judgment.

By comparison, with a preexisting minimum wage, as in our setting, individuals can always disaggregate the wage into the requirement (the minimum wage) and wage premium (the excess wage above the requirement). We posit that, when the minimum wage increases, employees will self-servingly focus on changes in wage premiums. Such self-serving biases are not likely to occur in settings where a minimum wage is absent and then introduced (as in prior studies) because, as suggested above, in those settings people may focus primarily on the absolute wage level and there is no basis for alternative references. In other words, our research questions cannot be addressed in the setting used by prior studies. Notably, given the historical establishment of minimum wages, the setting of introducing a minimum wage when there was no minimum wage prior may not be generalizable. Furthermore, the results of these studies are consistent with prior findings that higher wages lead to higher effort, whereas we contend that, with a mandated increase in the minimum wage, higher wages may not be able to induce higher effort.

Brown et al. (2015) examined wages and effort when cheaper labor (i.e., workers with a lower minimum wage) is available. Their study differs from ours in several important ways. First, they do not change the minimum wage for any worker, but rather change the setting by adding a new worker. In their setting, because each employer hires two workers, fairness is likely assessed based on relative comparison of compensation. By contrast, we investigate the behavior of firms and employees when they experience changes in the minimum wage. Fairness judgments on an interpersonal basis can differ considerably from those on an intrapersonal basis

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6 Research in mental accounting has shown that individuals are acute at categorizing different forms of compensation such as base pay and bonus (Thaler 1985, 1999).
because different standards are used (e.g., others’ compensation as opposed to one’s own expected compensation) (Messe and Watts 1983; O’Manlley 1983). Second, Brown et al. (2015) examine the effects of a lower minimum wage, whereas our study manipulates an overall increase in the minimum wage. Thus, the two studies speak to fundamentally different settings: their study focuses on firms where job-outsourcing opportunities are available, and our study looks at the effects of the temporal trends of minimum-wage requirements inherent in naturally occurring labor markets. Finally, Brown et al. (2015, 958) find that even cheaper labor seem to make effort choices based on the absolute wage level, “lowering their effort in response to their lower wages.” These findings reinforce the “standard gift exchange” relationship that workers respond to higher wages with higher effort (Brown et al. 2015, 943). By comparison, we depart from prior gift-exchange literature and investigate how minimum-wage increases may undermine the effectiveness of offering higher wages to induce higher effort.

III. Method

Experimental Setting and Design

We design our experiment around the basic setting used in prior gift-exchange studies in accounting and economics (Fehr et al. 1997; Fehr et al. 1998; Hannan et al. 2002; Hannan 2005; Kuang and Moser 2009; 2011; Brown et al. 2015). Participants are randomly assigned to the role of the employer or the worker. Employers and workers interact for 12 independent periods, and are re-matched each period. Each period, the employer decides whether to make a wage offer to the worker, and if so what the wage offer will be. If the worker accepts the offer, he or she selects an effort level.

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7 In our experiment we use the terms employer and worker in order to personalize the role of employer in contrast to the more abstract notion of the participant as a firm.
The employer can offer a wage up to 120 Lira (an experimental currency later converted to cash at 50 Lira = $1), but is limited in how low the wage can be in each period. In this way, we introduce a minimum wage.\(^8\) We initially select two different minimum wage levels, 37 Lira and 51 Lira. These minimum wage levels were selected given their proportionate resemblance to the proposed increase from $7.25 to $10.10. As will be discussed in more detail, we also have an intermittent minimum wage of 44 Lira in one condition.

If workers accept the wage offer, they then have discretion over the effort level they will provide.\(^9\) There is a positive relationship between the worker’s effort level and the output level (or productivity). However, the level of effort the worker provides comes at a cost to the worker that increases at an increasing rate. The specific costs of effort for the worker are given in the table below:

<table>
<thead>
<tr>
<th>Effort Level</th>
<th>0.1</th>
<th>0.2</th>
<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
<th>0.6</th>
<th>0.7</th>
<th>0.8</th>
<th>0.9</th>
<th>1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost in Lira</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>15</td>
<td>18</td>
</tr>
</tbody>
</table>

The employer’s payoff is determined as:

\[
\text{Employer Payoff} = (120 - \text{Wage}) \times \text{Worker’s effort level}
\]

The worker’s payoff is determined as:

\[
\text{Worker Payoff} = \text{Wage} - \text{Cost of effort}
\]

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\(^8\) Given that minimum wages could be viewed as a loaded term, at no point in the instructions or task is “minimum wage” explicitly referred to. We do, however, ask final demographic questions that include attitudes towards minimum wages.

\(^9\) We gave the worker the option to not work because the worker may use rejection of wage offer as a (costly) penalty against an unkind employer (Kuang and Moser 2009). We also gave the employer the decision over whether to make an offer so that such a decision set was symmetrical. As we observed no statistically significant levels of employers not making offers or workers rejecting offers, we make no further discussion on this part of the design. We only make reference for completeness when we lay out our procedures.
As mentioned earlier, in our setting, we place restrictions on the lowest wage that can be offered in order to operationalize a minimum wage. We investigate employers’ wage decisions and workers’ responses to wages following an increase in the minimum wage (specifically in our setting from 37 Lira to 51 Lira). We design three between-participant conditions. In order to provide a clean comparison to the reaction following the minimum wage increase, we run a baseline condition in which the minimum wage is always 51 Lira during the 12 periods. This baseline condition allows us to isolate the behavior invoked by the minimum-wage change from any behavior simply associated with wages at the given (higher) level of the minimum wage. We also run two treatment conditions. In the first treatment condition, the minimum wage starts at 37 Lira in the first period, increases to 51 Lira in the fifth period, and remains at this level for the remaining periods. This condition is referred to as the “immediate” condition. In the second treatment condition, the minimum wage starts at 37 Lira in the first four periods, then increases to 44 Lira in the fifth through eighth period and 51 Lira in the final four periods. This condition is referred to as the “gradual” condition.\textsuperscript{10}

\textbf{Experimental Procedures}

The experiment is programmed using the Z-Tree computer software (Fischbacher 2007). We conducted seven experimental sessions using undergraduate students at a U.S. public university. Each session included 16–22 participants. The average age of the participants was 20.6 and 40.3 percent were male. Participants entered the laboratory and took a seat at one of the computer terminals. Participants signed a consent form and read through instructions that were at

\textsuperscript{10} In the immediate condition, participants are informed prior to beginning period 5 that “For the remainder of the study any wage offer must be equal to or greater than 51 Lira.” In the gradual condition, participants are informed, prior to the beginning of period 5, “Any wage offer must now be equal to or greater than 44,” and prior to the beginning of period 9, “For the remainder of the study any wage offer must be equal to or greater than 51 Lira.” This condition is run as it generalizes better to how minimum wages are actually implemented, and there is reason to believe such a strategy for implementation may have behavioral implications.
the computer terminal. The experimenter then gave a brief synopsis of the experiment, reviewing the basic steps in each period. Participants completed a quiz to assure their understanding. The experimenter individually checked each quiz for correctness, instructed the participant of any incorrect responses, and answered any questions the participants had.\textsuperscript{11} Next, participants were assigned their role as either an employer or worker, and stayed in the same role for the duration of the study.

Each period has the same steps. First, the employer decided whether to hire the worker with whom they had been paired. Second, the employer decided on a wage offer. Third, the worker viewed the wage offer (if made) and decided whether to accept or reject the offer. In the event that the worker rejected the offer or the employer did not make an offer, each participant received zero payoff for the period. If the worker accepted the wage, then the next step is for the worker to choose an effort level. Finally, the employer and worker were given feedback on their payoff for the period, and all participants proceeded to the next period, with employers and workers re-paired. After all 12 periods were completed, participants answered a post-experiment questionnaire, and were paid their experimental earnings in cash before leaving.

**IV. Results**

Table 1 provides the descriptive results of our experiment, with wage offers in Panel A and effort levels in Panel B. We break down the 12 periods into three stages, with each stage representing four periods. As described earlier, in stage 1 (the first four periods), participants in

\textsuperscript{11} One session in the "gradual" condition was dropped from inclusion. In this session, one of the participants during the quiz phase spent a considerable amount of time asking why the payoffs between participants was so inequitable. The student maintained a prolonged discussion on this point that produced a significant difference in behavior over the first four periods from other sessions, primarily driven by participants seated on that student’s half of the room who likely overheard the prolonged discussion, an example of this behavior includes one employer participant not making wage offers in several periods and effort levels from several worker participants significantly exceeding the amount of any other session.
the baseline condition had a minimum wage of 51 Lira, while each treatment condition (immediate and gradual) had a minimum wage of 37 Lira.

[Table 1]

Basic Behavior before Increases in Minimum Wages (Stage 1)

Before testing our hypotheses, we examine the basic behavior across conditions prior to the change in the minimum wage (i.e., stage 1). In stage 1, the minimum wage is given as default in all conditions and participants are not aware of future increases in the minimum wage. We do not make any prediction *ex ante* about the behavior of employers and workers in stage 1 because our main focus is on wages and effort after the minimum-wage change rather than prior to the change. For that purpose, we use stage 1 as a base for comparing later wages and effort.

We collapse the immediate and gradual conditions into a single treatment because all instructions and parameters are identical. Additionally, the results of our measures of interest are not statistically different across these two conditions in stage 1. The average wage offer in stage 1 of the baseline condition was 65, which is significantly higher ($t = 3.04; p < 0.01$) than the average wage offer of 56 in stage 1 of the treatment conditions. The average wage premium is 14 in stage 1 of the baseline condition, which is significantly lower ($t = -1.83; p = 0.04$, one-tailed) than the average wage premium of 19 in stage 1 of the treatment conditions. These results suggest that, when different minimum wages are imposed as default, employers offer higher wages (but smaller premium) under a higher minimum wage.

We next examine workers’ effort choices in stage 1. Using a repeated measure linear mixed model, we find that effort in stage 1 is significantly higher ($F = 3.71; p = 0.03$, one-tailed)
in the baseline condition (0.39) than in the treatment condition (0.29). This difference remains highly significant when wage premium is included in the model as an independent variable (F = 5.38; p = 0.01, one-tailed), but becomes non-significant when the absolute wage is included as an independent variable (F = 1.35; p = 0.13, one-tailed). These results suggest that, when the minimum wage is given as default and workers are not informed of the minimum-wage increase, their effort choices seem to be influenced largely by absolute wages, probably because there is no obvious alternative standard for the size of the gift. However, as discussed earlier, when the minimum wage is increased, the premium contained in previous wage offers becomes a salient reference point, and workers may react negatively if the level of premium is not maintained.

**Test of Hypotheses**

*Tests of H1a*

H1a predicts an increase in absolute wages in the treatment conditions after the increase in the minimum wage. In a post-experimental question, we have employers respond on a 7-point Likert scale to the following, “When setting the wage, I gave considerable attention to the restrictions placed on what wage I could offer,” where 1 is “strongly disagree” and 7 is “strongly agree.” The average response of 5.24 is significantly higher (t = 5.70, p < 0.01) than the midpoint of 4, suggesting that employers tend to incorporate the minimum wage in setting wages. To test H1a, we compare the average wage between stage 1 and stage 3 in the treatment conditions. Given a lack of statistical differences in our measures of interest between the gradual and immediate conditions in stage 3 (as with stage 1), we collapse these two conditions into one

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13 The repeated measure model is used because of the multiple observations per worker in each period. Given the influence of the wage and the need to include it in the model, we could not simply average effort levels across the stages. A mixed model is most appropriate because of the presence of intermittent observations (i.e., the fact that in some rounds employers did not make an offer and resulted in missing observations for that pairing in that round) for which these types of models automatically adjust.
treatment in all tests unless otherwise noted. Consistent with H1a, the average wage offer in the *treatment* conditions increases from 56 in stage 1 to 65 in stage 3, and this increase is statistically significant ($t = 3.48; p < 0.01$).\textsuperscript{14} By comparison, the average wage offer in the *baseline* condition was 65 in stage 1 and 64 in stage 3, and this difference is not statistically significant ($t = 0.43; p = 0.68$). We find no statistical difference in wages across conditions in stage 3 ($t = 0.28; p = 0.78$), suggesting that wages were essentially equivalent across conditions under the same minimum wage.

**Tests of H1b**

H1b predicts that wage premium will decrease after the increase in the minimum wage. To test H1b, we examine changes in wage premiums between stage 1 and stage 3. In stage 1 of the treatment conditions, the minimum wage is 37 and the average wage is 56; the average wage premium is 19. In stage 3 of the treatment conditions, the minimum wage is 51 and the average wage increases to 65; the average wage premium is 14, which is not statistically different from the average wage premium of 14 in stage 3 of the baseline condition ($t = -0.28, p = 0.78$), but is statistically lower than the 19 in stage 1 of the treatment conditions ($t = 2.46, p < 0.02$). These results are consistent with H1b.\textsuperscript{15}

\textsuperscript{14} We also examine the immediate condition and the gradual condition separately. In the immediate condition, the average wage significantly increases ($t = 2.70; p = 0.01$) from 57 (stage 1) to 65 (stage 2) after the increase in the minimum wage, and is not significantly different ($t = 0.11; p = 0.92$) between stage 2 and stage 3. In the gradual condition, the average wage does not significantly change ($t = 0.87; p = 0.39$) from 56 in stage 1 to 59 in stage 2 after the first increase in the minimum wage, and then marginally increases to 64 in stage 3 after the second increase in the minimum wage ($t = 1.49; p = 0.07$, one-tailed). These results are generally consistent with H1a.

\textsuperscript{15} We also look into the immediate condition and the gradual condition separately. In the immediate condition, the average wage premium significantly decreases ($t = 2.43; p < 0.02$) from 20 in stage 1 to 14 in stage 2 after the increase in the minimum wage, and is not significantly different between stage 2 and 3 (14 vs.14; $t = -0.29; p = 0.88$). Wage premium in stage 3 is significantly lower than in stage 1 ($t = 2.33; p < 0.02$). In the gradual condition, the average wage premium significantly decreases from 19 in stage 1 to 15 in stage 2 after the first increase in the minimum wage ($t = 2.38; p = 0.02$), but the decrease is not significant from 15 in stage 2 to 13 in stage 3 after the second increase in the minimum wage ($t = 0.64; p = 0.34$). Wage premium in stage 3 is significantly lower than in stage 1 ($t = 2.11; p = 0.03$). These results are generally consistent with H1b.
As a supplemental test, we examine whether offers of just the minimum wage are more likely in the treatment conditions than in the baseline condition in stage 3. Controlling for repeated measures and period effects, a logistic regression finds that in stage 3 employers in the treatment conditions were marginally more likely ($Z = 1.27; p = 0.10, \text{ one-tailed}$) to offer a wage equal to 51 Lira (the minimum wage) than employers in the baseline condition. Table 2 shows that 43 minimum-wage offers (26.4 percent of all offers) were made in stage 3 of the treatment conditions, compared to 13 minimum-wage offers (16.9 percent of all offers) in stage 3 of the baseline condition. This suggests that a non-trivial portion of employers, while increasing wages, actually offer zero premium after the minimum-wage increase in the treatment conditions. This result is consistent with our theory that employers self-servingly make wage decisions (i.e., rely on absolute wages rather than wage premiums) when the minimum wage changes.

**[Table 2]**

**Tests of H2**

H2 predicts that increases in absolute wages will not lead to a proportional increase in workers’ effort in the treatment conditions. Using a repeated measure mixed model controlling for wage, we find that effort levels significantly decrease ($F = 6.65; p = 0.069, \text{ one-tailed}$) from stage 1 (0.29) to stage 3 (0.27) in the treatment conditions, despite the significant increase in absolute wages from stage 1 to stage 3. This provides support for H2. When we include the wage premium as an independent variable in the model, the decrease in effort becomes non-significant ($F = 0.34; p = 0.56$). These results suggest that, consistent with our theory, the decrease in effort from stage 1 to stage 3 in the treatment conditions is mainly driven by changes in wage premiums. By comparison, controlling for wage, effort does not significantly change ($F = 0.01; p = 0.92$) from stage 1 to stage 3 in the baseline condition. Further, controlling for wage and period
effects using a repeated measure mixed model, we find that the effort level in stage 3 of the treatment conditions (0.27) is significantly lower ($F = 3.04; p = 0.04$, one-tailed) than the effort level in stage 3 of the baseline condition (0.33), despite equivalent wages in these conditions, suggesting the perceived fairness of these wages differed among workers between conditions.

In particular, we test whether the decline in effort in the treatment conditions compared to the baseline condition is related to the higher frequency of minimum-wage (51 Lira) offers in the treatment conditions (26.4 percent, relative to 16.9 percent in stage 3 of the baseline condition). We run an additional repeated measures mixed model, whereby we treat the minimum-wage offer as a dummy variable that is equal to one if the offer was 51 Lira (the minimum wage) and zero otherwise. We also test the interaction of this dummy variable with condition to see if minimum-wage offers are more severely punished (i.e., workers exhibit greater negative reciprocity) in the treatment condition. Results show that minimum-wage offers do have an effect on effort ($F = 16.09; p < 0.01$), and we find no interaction effect ($F = 0.45; p = 0.64$), suggesting that minimum-wage offers are punished with lower effort across conditions.

**Firm Profit**

Table 3 summarizes firm profits across stages and conditions for employers that elect to enter the market.\(^{16}\) In stage 1, recall that both wage offers and effort are higher in the baseline condition than in the treatment condition. A t-test reveals that firm profit in stage 1 is statistically indistinguishable ($t = 1.34; p = 0.18$) between the baseline condition and the treatment conditions. In stage 3, firm profit is significantly lower ($t = 2.12; p = 0.04$) in the treatment conditions than in the baseline condition, which is not surprising given the finding that effort levels are lower in the treatment conditions despite the effectively equivalent wages. Overall

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\(^{16}\) All results discussed are inferentially the same if employers that remained out of the market (i.e., received no profits) are included.
across all periods, firms in the baseline condition experienced the highest profits ($t = 3.20; p < 0.01$).

Table 3

Supplemental Online Experiment

The results of the laboratory experiment suggest that minimum-wage increases can affect the fairness perceptions of wages. In the treatment conditions, following the minimum-wage increase, we observe decreases in effort despite increased wage offers. Consistent with our theory, these findings are indicative of the self-serving bias of workers that define fairness in accordance with wage premium serving as the reference point. To further test our theory, we conduct a follow-up online experiment at the Amazon Mechanical Turk.

The online experiment is a sequential, truncated version of our original design (participants’ tasks and payoff functions are the same as in the laboratory experiment). The experiment consists of two single-period stages, with a minimum wage of 37 Lira in stage 1 and a minimum wage of 51 Lira in stage 2. We conducted the online experiment in two separate sessions, with all participants in the first (second) session acting as employers (workers). In the first session, we collected employers’ wage decisions. In stage 1, employers chose one of two wage offers, either 37 Lira (the minimum wage) or 56 Lira (the average wage in stage 1 of the treatment conditions of the laboratory experiment). Then in stage 2, they could offer a wage of either 56 Lira, 65 Lira (the average wage across stage 3 of all conditions of the laboratory experiment), or 70 Lira (the wage that maintains the same premium at the new minimum wage). After the employer data were collected, we conducted the second session, where the employer decisions were distributed to workers. In stage 1, workers were offered a wage of either 37 or 56, and made an effort choice. In stage 2, workers were offered a wage of either 56, 65, or 70, and
made an effort choice. After the worker data were collected, employers and managers were matched and paid.\textsuperscript{17}

Table 4 shows the effort choices made by the workers that received a wage offer of 56 in stage 1, grouped by the wage that they received in stage 2.\textsuperscript{18} Based on our theory and the laboratory results, we expect that effort levels will decrease from stage 1 to stage 2 when workers are offered a wage of 56 or 65 in stage 2. As expected, paired t-tests reveal a significant decrease in effort when offered 56 in stage 2 (p = 0.03, one-tailed) and a marginally significant decrease in effort despite the increase in the absolute wage to 65 in stage 2 (p = 0.07, one-tailed). Notably, because these workers were offered a wage of 56 in stage 1 (minimum wage is 37), the wage of 70 in stage 2 (minimum wage is 51) contains the same wage premium (19), thus satisfying workers’ fairness expectation. We therefore predict that effort should not decrease when offered 70 in stage 2. Indeed, in this case we observe a significant increase in effort (p < 0.01).\textsuperscript{19} Overall, the results of the online experiment are consistent with the main findings from the laboratory experiment. In addition, we find strong evidence that, after the increase in the minimum wage, workers view a fair wage to be a wage that maintains the premium over the minimum wage. These findings lend additional credence to our theory.

V. Conclusion

\textsuperscript{17} To follow the design of the laboratory experiment, workers were matched with a different employer in stage 1 and stage 2, though all workers who were given a wage of 56 in stage 1 were also matched with an employer that offered 56 in stage 1.\textsuperscript{18} We only collect a full sample of responses from workers at the 56 wage level in stage 1 given the objective of the experiment. We do distribute offers of 37 made by the employers in stage 1 to workers to maintain the authenticity of the design. These participants were then paid based on the responses as outlined in the instructions. In total, eight employer participants made offers of 37 in stage 1 of the online experiment.\textsuperscript{19} Because the increase in effort is induced by a rather high wage offer, the ultimate impact on firm profit is an empirical question. Given the parameters of our online experiment, for workers who received a wage of 56 in stage 1 and 70 in stage 2, firm profit is not significantly different (p = 0.489) between stage 2 (24.5) and stage 1 (25.5).
In this study, we investigate the effects of increases in the legally required minimum wage on several managerial accounting variables including compensation, employee effort, and firm profit. We predict that firms offer higher absolute wages, but lower wage premiums, as the minimum wage increases. We also predict that employees will not increase effort as wage offers increase to levels that decrease the wage premium because they self-servingly anchor to the previous premium level and react negatively when the level of premium declines. The results of a laboratory experiment and an online experiment are consistent with our predictions.

Our study extends the gift-exchange research literature by shedding light on the role of an important policy factor, the minimum wage regulation, in management control practices. Our findings suggest that increases in the minimum wage moderate the effectiveness of management control through gift exchange by affecting the reference point in employees’ effort choices. While prior research suggests that higher wages induce higher effort, we find that the effort-inducing effect of gift wages may be dampened when the minimum wage increases if firms do not appreciate employees’ fairness perceptions, thus providing caveats for using gift wages as a control mechanism. Firms need to carefully consider these effects in designing control systems in order to maximize the overall organizational efficiency.

Contractual arrangements, including incomplete contracts, have become a primary area of research in management accounting. The minimum wage represents an environmental variable that can affect perceptions of wages and thereby the outcome of using incomplete contracts. We use the unique design of a baseline condition in which participants only experience the higher minimum wage because it allows for a cleaner test of the unbiased responses to the higher minimum wage. This then allows for a direct comparison to the treatment conditions and a direct test of our research questions.
Some limitations of the study provide avenues for future research. We focus on an incomplete contracting environment, where employers are not able to contract upon workers’ effort or productive output. In practice, however, employers may be able to obtain some sort of informational signals that are correlated with workers’ performance. To the extent that obtaining such signals is costly, whether it can improve contracting efficiency is an empirical question. Future research can explore whether our findings hold in settings where workers are compensated based on a performance-contingent contract.

In our experiments, we do not consider the effect of labor supply and demand but rather focus on a balanced labor market whereby one employer is matched with one worker. The labor market conditions, however, could impact employers’ and workers’ behavior. For example, employers might make wage decisions differently if workers have alternative employment opportunities. If workers who are dissatisfied with the current employer’s wage offer can switch to another employer, the occurrence of the negative effort responses observed in this study might be less frequent. To preclude reputation concerns, we use a repeated one-shot experimental setting where employers and workers are randomly matched each period. On the other hand, reputation concerns may exist in naturally occurring employment relationships, and such concerns can have both an economic effect (e.g., re-contracting; renegotiation) and a behavioral effect (e.g., impression management) on workers’ effort. It would be interesting to investigate whether these effects can be incorporated in the management control system to improve operating efficiency.
References:


Morath, E. 2017. In St. Louis, a rare effort to lower the minimum wage. Dow Jones Institutional News, August 27th.


Shannon, V.P. 2000. Norms are what states make of them: The political psychology of norm violation. *International Studies Quarterly* 44: 293-316.


Table 1 - Descriptive Statistics for the Laboratory Experiment

Panel A – Wage Levels

<table>
<thead>
<tr>
<th>Condition</th>
<th>Stage 1 (periods 1-4)</th>
<th>Stage 2 (periods 5-8)</th>
<th>Stage 3 (periods 9-12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>65 (14)</td>
<td>64 (11)</td>
<td>64 (10)</td>
</tr>
<tr>
<td>(n = 21)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate</td>
<td>57 (13)</td>
<td>65 (13)</td>
<td>65 (15)</td>
</tr>
<tr>
<td>(n = 20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gradual</td>
<td>56 (17)</td>
<td>59 (14)</td>
<td>64 (14)</td>
</tr>
<tr>
<td>(n = 21)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The entry is the mean (standard deviation) of wage offers.
Baseline: Minimum wage in Stage 1, 2 and 3 is 51 Lira
Immediate: Minimum wage in Stage 1 is 37 Lira and in Stage 2 and 3 is 51 Lira
Gradual: Minimum wage in Stage 1 is 37, in Stage 2 is 44 and Stage 3 is 51 Lira

Panel B – Effort Levels

<table>
<thead>
<tr>
<th>Condition</th>
<th>Stage 1 (periods 1-4)</th>
<th>Stage 2 (periods 5-8)</th>
<th>Stage 3 (periods 9-12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>0.39 (0.32)</td>
<td>0.36 (0.32)</td>
<td>0.33 (0.28)</td>
</tr>
<tr>
<td>(n = 21)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate</td>
<td>0.29 (0.27)</td>
<td>0.27 (0.25)</td>
<td>0.28 (0.26)</td>
</tr>
<tr>
<td>(n = 20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gradual</td>
<td>0.29 (0.23)</td>
<td>0.26 (0.23)</td>
<td>0.26 (0.24)</td>
</tr>
<tr>
<td>(n = 21)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The entry is the mean (standard deviation) of effort levels.
Baseline: Minimum wage in Stage 1, 2 and 3 is 51 Lira
Immediate: Minimum wage in Stage 1 is 37 Lira and in Stage 2 and 3 is 51 Lira
Gradual: Minimum wage in Stage 1 is 37, in Stage 2 is 44 and Stage 3 is 51 Lira
Table 2 – Minimum-wage Offers in Stage 3 of the Laboratory Experiment

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number (percentage) of Minimum-wage Offers (wage = 51)</th>
<th>Number (percentage) of Offers Greater than the Minimum Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>13 (16.9%)</td>
<td>69 (84.1%)</td>
</tr>
<tr>
<td>Treatments</td>
<td>43 (26.4%)</td>
<td>120 (73.6%)</td>
</tr>
</tbody>
</table>
Table 3 – Firm Profit in the Laboratory Experiment

<table>
<thead>
<tr>
<th>Condition</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (n = 21)</td>
<td>20.35 (8.30)</td>
<td>18.55 (7.97)</td>
<td>17.09 (7.03)</td>
</tr>
<tr>
<td>Immediate (n = 20)</td>
<td>17.52 (8.07)</td>
<td>13.77 (6.34)</td>
<td>13.94 (7.05)</td>
</tr>
<tr>
<td>Gradual (n = 20)</td>
<td>17.03 (9.43)</td>
<td>14.74 (6.22)</td>
<td>12.87 (5.39)</td>
</tr>
</tbody>
</table>

The entry is the mean (standard deviation) of firm profit. 
Baseline: Minimum wage in Stage 1, 2 and 3 is 51 Lira. 
Immediate: Minimum wage in Stage 1 is 37 Lira and in Stage 2 and 3 is 51 Lira. 
Gradual: Minimum wage in Stage 1 is 37, in Stage 2 is 44 and Stage 3 is 51 Lira.
Table 4 – Descriptive Statistics for the Online Experiment

<table>
<thead>
<tr>
<th>Groups</th>
<th>Effort in Stage 1</th>
<th>Effort in Stage 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workers who were offered a wage of 56 in stage 2 (n = 48)</td>
<td>0.46 (0.29)</td>
<td>0.42 (0.31)</td>
</tr>
<tr>
<td>Workers who were offered a wage of 65 in stage 2 (n = 51)</td>
<td>0.49 (2.94)</td>
<td>0.45 (0.26)</td>
</tr>
<tr>
<td>Workers who were offered a wage of 70 in stage 2 (n = 50)</td>
<td>0.40 (0.25)</td>
<td>0.49 (0.26)</td>
</tr>
</tbody>
</table>

The entry is the mean (standard deviation) of effort levels provided by workers who were offered a wage of 56 in stage 1.