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WHEN MANAGERS CROSS THE LINE: A THEORY OF MANAGERIAL OPPORTUNISM IN THE EMPLOYMENT RELATIONSHIP *

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Abstract

A manager acts opportunistically by unilaterally deviating from agreed contractual terms while reducing the worker's welfare. The paper develops a four-stage game with perfect information that considers managerial opportunism as an endogenous choice constrained by productivity and judicial penalties, and contingent to the worker's reservation utility. The empirical research uses panel data from 30 OECD countries (1995-2020) to provide patterns consistent with the model's predictions. Macroeconomic shocks that weaken workers' outside options (e.g., high unemployment) exacerbate power asymmetries, enabling opportunism, while generous unemployment benefits strengthen fallback options and mitigate vulnerability. Higher trade union density appears to reduce opportunism by amplifying productivity penalties, while stricter dismissal protections may encourage opportunistic behavior in weak enforcement contexts. From a public policy perspective, these findings reveal a dual role of labor institutions: they can discipline managerial behavior when well-enforced, but may backfire in weak institutional contexts.

Keywords: Managerial opportunism, labor market institutions, employment relationships, unemployment rate, unemployment benefits, trade union density, worker welfare, dismissal protections, contract renegotiation, power asymmetries.

JEL: J50, J53, J83, K42, M12, M54, M55

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1 INTRODUCTION

The employment relationship is often characterized by inherent power imbalances and information asymmetries, giving rise to potential opportunistic behavior. Extensive research in the literature has focused on deterring opportunistic actions by employees. However, less attention has been paid to managers taking opportunistic advantage toward their workers. Once contracts are signed, managers often hold greater authority to revise contract terms and exploit workers' limited bargaining power. Under what conditions does a manager leverage her position to extract value from workers after contracts are signed? What forces discipline such managerial behavior, and how effective are they?

This paper develops a theoretical model of managerial opportunism, with *managerial opportunism* defined as the manager's capacity to unilaterally impose new conditions that exceed previously agreed contractual limits while reducing the worker's welfare. We conceptualize managerial opportunism not as a pathological deviation, but as an endogenous response within the employment relationship to organizational and market frictions.

In a four-stage game with perfect information, a manager and a worker first bargain over a labor contract. After the contract is signed, and before work is performed, the manager can unilaterally deviate from the agreed terms. If the worker's reservation utility has deteriorated—for example, due to rising unemployment or cuts in social protection—the worker may accept worse conditions despite suffering a net welfare loss. The manager extracts additional surplus from this deviation unless it is offset by internal disciplining costs (productivity penalties) or external legal costs (judicial penalties).¹

This stylized framework views power and efficiency not as mutually exclusive, but as complementary forces shaping organizational design (Pitelis, 1993; Marginson, 1993). While much of modern contract theory has emphasized the efficiency gains from authority in incomplete contracting settings (Simon, 1951; Aoki, 1984; Williamson, 1985), alternative traditions have long underscored the coercive and rent-shifting potential of hierarchical structures (Marglin, 1974; Bowles and Gintis, 1993).² Specifically, these ideas lead us to draw on institutional and cross-disciplinary perspectives long developed in sociology (Pfeffer, 1981), psychology (Argyris, 1960; Rousseau, 1989), and political economy (Berle and Means, 1932; Bowles and Gintis, 1993), and formalize them within a conventional economic framework.

The paper concludes by empirically exploring the theoretical propositions derived from the model. Using panel data for 30 OECD countries over 1995-2020, we measure opportunism as the share of workers exceeding legal weekly hours. Trade union density captures the extent to which collective labor can raise internal organizational costs (productivity penalties), while the strictness of dismissal legislation reflects the institutional likelihood that opportunistic deviations will trigger legal consequences (judicial penalties). Labor market conditions,

¹This structure mirrors classic time inconsistency problems in macroeconomic policy (Kydland and Prescott, 1977): just as governments may renege on commitments once investments are sunk, managers may initially offer attractive terms to elicit worker-specific investments and then revise conditions ex post to capture a greater share of the surplus.

²Recent experimental evidence supports this view, showing that hierarchical authority fosters opportunistic behavior, particularly when information asymmetries limit workers' bargaining power to detect or resist managerial deviations (Nikiforakis et al., 2014). Research in organizational economics and strategy further demonstrates that firms often design practices that simultaneously pursue efficiency gains and surplus extraction (Carson and Ghosh, 2019).

including unemployment benefits and unemployment rates, capture variation in workers' outside options, which are a central determinant of opportunism in the model.

Our results provide empirical patterns consistent with the model's predictions: managerial opportunism increases when workers' outside options deteriorate and declines when institutions raise the cost of opportunistic renegotiation. Macroeconomic shocks that weaken workers' outside options (e.g., high unemployment) exacerbate power asymmetries, enabling opportunism, while generous unemployment benefits strengthen fallback options and reduce vulnerability. Strong unions amplify productivity penalties by making organizational disruptions more salient, while dismissal protections have conditional effects: they deter opportunism when judicial enforcement is strong, but may backfire otherwise, with results robust across specifications.

Related literature. The paper responds to a long-standing asymmetry in the economics of employment contracts: for decades, the dominant concern has been how to deter opportunism by workers, rather than by employers. Classical agency models posit that delegating authority to agents creates opportunities for moral hazard and loss of control (Jensen and Meckling, 1992; Armstrong, 1994; Gal-Or and Amit, 1998), especially in labor relationships where contracts are incomplete due to bounded rationality and environmental uncertainty (Simon, 1951; Williamson et al., 1975). Human capital investments often generate bilateral monopoly situations (Klein et al., 1978), making employment relationships heavily reliant on trust and incentive alignment (Casas-Arce et al., 2019; Albanese et al., 2015; Kabwe and Tripathi, 2020).

Traditional analyses of employment contracts have portrayed the manager's role primarily as one of discipline and coordination. Managerial authority is assumed to fill contractual gaps and ensure that workers do not shirk or act against firm objectives (Ménard, 1997). While this perspective has yielded important insights, it has systematically underexplored a critical dimension of employment relationships: the potential for opportunism by principals.

A growing body of work has drawn attention to this imbalance. Dow (1987, 1996) argues that economic analysis has largely neglected the power asymmetries that allow managers to extract rents from workers, through practices such as withholding information about market conditions, manipulating internal reporting, or unilaterally introducing technical changes. Even Williamson (1996, p.23) acknowledged that "power has more bearing on labor and final product markets" than on capital markets, reinforcing the idea that hierarchical authority can be a fertile ground for opportunism. Yet these mechanisms represent only part of a broader phenomenon. In imperfect labor markets, firms can leverage workers' limited outside options to impose policies that prioritize short-term extraction over long-term efficiency (Grimshaw and Rubery, 1998). Contemporary labor market dynamics have further expanded the scope for managerial opportunism: the fissuring of workplaces through outsourcing and subcontracting weakens worker protections and diffuses accountability (Weil, 2014); monopsonistic conditions systematically suppress wages below marginal productivity (Naidu et al., 2018; Azar et al., 2020); digital platforms create environments where reputational mechanisms only partially discipline opportunistic behavior (Benson et al., 2020); and technological change increasingly serves to erode labor's bargaining power rather than purely enhancing efficiency (Acemoglu and Restrepo, 2019).

Together, these findings suggest that employer opportunism is not an anomaly, but a systematic and evolving feature of contemporary labor markets. Yet despite increasing recog-

dition of these dynamics, the literature has yet to develop a formal framework that treats opportunistic behavior as an endogenous managerial choice. Previous work has highlighted the economic and organizational significance of power asymmetries and contract breaches (Vázquez, 2004, 2006; Foss et al., 2006; Arocena et al., 2011), but has primarily offered empirical or institutional analyses rather than formal modeling. More recent contributions, including principal-agent models that explore strategic wage rigidities (Navarra and Tortia, 2014; Albanese et al., 2015) and studies on incomplete contracting within firms (Casas-Arce et al., 2019; Gibbons and Henderson, 2012; Malcomson, 2016), have illuminated adjacent mechanisms; yet, none explicitly model post-contractual deviation by employers. By formalizing managerial opportunism in economic terms and examining it empirically, we bring into the analytical core of labor economics a set of dynamics that have too often remained at its margins.

The remainder of the paper proceeds as follows. Section 2 presents the theoretical model and derives key propositions. Section 3 describes the data and empirical strategy. Section 4 reports the results and discusses their interpretation. Section 5 concludes with implications for labor policy and future research.

2 A THEORY OF MANAGERIAL OPPORTUNISM TOWARD WORKERS

This section formalizes the conditions under which a manager may behave opportunistically toward a worker. We model the employment relationship as a four-stage game with perfect information, where the manager can revise the terms of an accepted contract before production begins. The worker then chooses whether to accept the new (worse) terms or reject them, given her outside options. Opportunism arises whenever the manager finds it profitable to exploit the worker’s weakened outside options by proposing a new contract that reduces worker welfare and increases the firm’s residual claim.

In our framework, the profitability of opportunism depends on two types of frictions that discipline managerial behavior. First, productivity penalties (e.g., demotivation, conflict, reduced discretionary effort) represent internal costs that may undermine output or cooperation when the employment relationship is damaged. Second, judicial penalties capture the expected external costs from formal breach, including litigation risk, regulatory sanctions, or reputational losses. These frictions shape the strategic environment in which managers decide whether or not to deviate from agreed-upon terms.

The remainder of this section presents the formal structure of the game and derives equilibrium outcomes. We characterize the manager’s optimal strategy given the worker’s reservation utility and identify the conditions under which opportunism occurs. These comparative statics form the basis for the empirical strategy in Section 3, where we test the model’s predictions using institutional proxies for the relevant disciplining mechanisms.

2.1 *The Model*

We present a simple perfect-information, four-period, bilateral negotiation model between a manager and a worker.³

³Although there exists perfect information, our framework and notation follow the principal-agent literature (e.g., Salanié, 1997 or Macho-Stadler and Pérez-Castrillo, 2001).

2.1.1 The Agents Two agents interact in the model: a manager and a worker.

The Manager. The manager is in charge of a firm that produces an output x with worker's labor e as the required input, hired in exchange of a total compensation W . A *labor contract* is a triple (W, w, e) with $W = we$, being w the wage per unit of labor. The technology is described by a production function $x = x(e)$, where $x(\cdot)$ is a strictly monotone, strictly concave and twice-differentiable function. The manager maximizes the firm's profit:

$$\pi = x(e) - W.$$

The Worker. The worker receives a wage income W in exchange for the labor provided to the firm, resulting in a budget constraint $c = W$. The worker's welfare is represented by the utility function $U(c, e) = u(c) - v(e)$, where $u(c)$ is a differentiable, strictly concave and strictly increasing function representing the utility from consumption, and $v(e)$ is a differentiable, strictly convex and strictly increasing function representing the disutility from labor. The worker's reservation utility \underline{U} depends on individual expectations and external economic conditions, such as unemployment rates or social benefits. The worker will accept a labor contract $(\widehat{W}, \widehat{w}, \widehat{e})$ provided the participation constraint is satisfied:

$$u(\widehat{W}) - v(\widehat{e}) \geq \underline{U}. \tag{1}$$

2.1.2 The Bargaining Process The bargaining process between the manager and the worker comprises of four periods (see Figure I):

1. At period $t = 1$, the manager offers a labor contract $(\widehat{W}, \widehat{w}, \widehat{e})$ to the worker that maximizes the firm's profits.
2. At period $t = 2$, the worker accepts or rejects the contract based on the reservation utility \underline{U} .
3. At period $t = 3$, once the worker accepts the job, the manager decides whether to honor the contract offered at $t = 1$ or to propose a new informal contract (W^*, w^*, e^*) .
4. At period $t = 4$, in the case the manager does not honor the contract, the worker decides to accept the new informal contract, or to leave the firm and receive the reservation utility \underline{U} . In the case the worker accepts the new informal contract, the firm's profits are negatively affected by both a productivity penalty and judicial costs.

2.1.3 Managerial Opportunism Managerial opportunism occurs whenever the manager does not honor the initial contract and offers instead a new informal contract at period $t = 3$, and the worker accepts labor conditions at period $t = 4$ despite the welfare deterioration involved. As explained next, this opportunistic behavior can be influenced by two main factors: a productivity penalty and a judicial penalty, which negatively impact on firm's profits

$$\pi = (1 - \rho)x(e^*) - W^* - \lambda[\widehat{W} - W^*]^+. \tag{2}$$

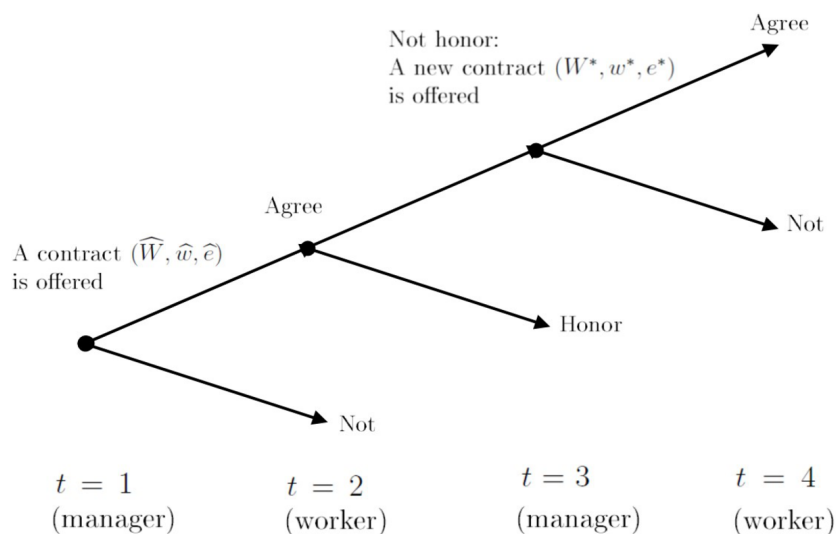


Figure I.

The timing of the bargaining process between the manager and the worker

Productivity Penalty The exogenous *productivity penalty* $\rho \in [0, 1]$ measures the productivity loss due to decreased worker motivation, increased conflict, and/or worse quality of new hires resulting from the manager’s decision to renegotiate the contract. The higher the productivity penalty ρ , the negative impact on the firm’s profits makes managerial opportunism less likely. The following result follows:

Proposition 1. *Managerial opportunism is negatively associated with the expected productivity penalty, ρ . The higher the productivity penalty, the less likely the manager will renegotiate the contract, as the costs of reduced productivity outweigh the benefits of opportunism.*

Judicial Penalty The *judicial penalty* comprises the payments the firm might eventually face due to renegotiating the initial labor contract (e.g., severance pay, trial costs). These judicial costs are considered proportional to the total compensation not received by the worker, $\lambda[\widehat{W} - W^*]^+$. The parameter λ can be interpreted as the present value of the expected number of times the firm has to pay the unpaid wages, or as the probability of receiving an adverse verdict. The higher the judicial penalty λ , the additional costs imposed by the potential judicial consequences of renegotiation make managerial opportunism less likely. Hence the following proposition:

Proposition 2. *Managerial opportunism is negatively associated with the expected judicial penalty, $\lambda[\widehat{W} - W^*]^+$. The higher the expected judicial costs, the less likely the manager will renegotiate the contract, as the potential financial costs outweigh the benefits of opportunism.*

2.2 Equilibrium without Renegotiation

We begin by studying the case where the manager honors the initial contract. At period $t = 1$, the manager offers a labor contract $(\widehat{W}, \widehat{w}, \widehat{e})$ that maximizes the firm’s profits, while

providing the worker with enough incentives, in terms of welfare, to accept the job at $t = 2$. Specifically,

$$\begin{aligned} \max_{W,w,e} \quad & x(e) - W, \\ \text{s.t.} \quad & u(W) - v(e) \geq \underline{U}, \\ & W = w \cdot e \end{aligned} \quad (3)$$

First-order conditions are

$$\begin{aligned} x'(e) &= \frac{v'(e)}{u'(we)} \\ u(we) - v(e) &= \underline{U} \\ W &= w \cdot e. \end{aligned} \quad (4)$$

To obtain the labor contract $(\widehat{W}, \widehat{w}, \widehat{e})$, we initially set wages per hour as a function of working hours in the participation constraint, $w = \phi(e; \underline{U})$. Then, substituting into (4), the firm's profit maximization condition, we find the labor hired, \widehat{e} . Wages per hour are set at $\widehat{w} = \phi(\widehat{e}; \underline{U})$, and the total compensation is $\widehat{W} = \widehat{w} \cdot \widehat{e}$.

At period $t = 2$, the worker decides whether to sign the labor contract based on his participation constraint being fulfilled, i.e., $U(\widehat{W}, \widehat{e}) \geq \underline{U}$. At period $t = 3$, the manager honors the contract, so there are no decisions at period $t = 4$. The firm's profits become $x(\widehat{e}) - \widehat{W}$.

This solution can be interpreted within a simple demand-supply diagram of the bilateral labor market. Three key functions are drawn in Figure II. The negative-sloped **demand function for labor** represents that the firm stops hiring additional units of labor whenever its marginal productivity equals its marginal cost, $x'(e) = w$. The positive-sloped **supply function of labor** is found at the worker's consumption-leisure problem and represents the marginal income received equals the marginal rate of substitution between labor and consumption, $w = \frac{v'(e)}{u'(we)}$. The participation constraint, represented by the indifference curve $\mathcal{I}_{\underline{U}} = \{(e, w) : u(we) - v(e) = \underline{U}\}$, shows the combinations of labor and wage rate that make the worker indifferent between accepting the labor contract or not. Any feasible contract will be placed at the upper-contour set of $\mathcal{I}_{\underline{U}}$.

2.3 Equilibrium with Renegotiation: Managerial Opportunism

Once the labor contract $(\widehat{W}, \widehat{w}, \widehat{e})$ has been signed at period $t = 2$, the manager might find it profitable not to honor the contract. If so, the manager designs a new *informal contract* (W^*, w^*, e^*) at period $t = 3$, maximizing the firm's profits –net of penalties– (2), while still providing the worker with enough incentives to keep the job at $t = 4$. We define **managerial opportunism** as a situation such that:

1. The manager does not honor the initial labor contract $(\widehat{W}, \widehat{w}, \widehat{e})$ and offers the worker a new informal contract (W^*, w^*, e^*) at period $t = 3$, finding it profitable to rebargain (i.e., the firm's profits –net of penalties– after rebargaining are higher than the profits obtained by honoring the initial contract); and,
2. The worker accepts the new informal contract at period $t = 4$ although his welfare decreases, $U(W^*, e^*) < U(\widehat{W}, \widehat{e})$.

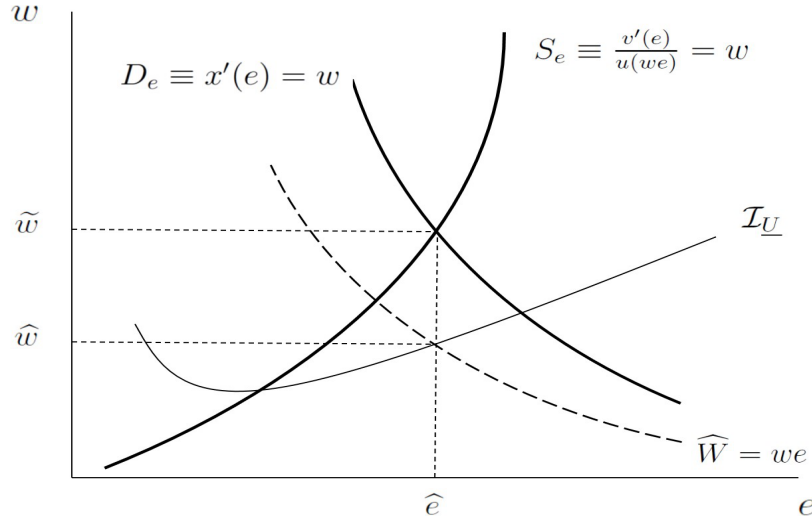


Figure II.

A graphical interpretation of the bilateral labor market

The monopsonist-manager sets the labor contract $(\widehat{W}, \widehat{w}, \widehat{e})$ at the participation constraint \mathcal{I}_U , being the iso-remuneration curve $\widehat{W} = w \cdot e$ with $\widehat{W} \equiv \widehat{w} \cdot \widehat{e}$. The wage rate \widehat{w} equalizes the demand and supply functions for labor.

The key issue to clarify is what makes rebargaining possible, as the possibility that the manager behaves opportunistically is the cornerstone of this paper. At period $t = 1$, the manager solves her problem (3) to obtain the labor contract $(\widehat{W}, \widehat{w}, \widehat{e})$ that maximizes her firm's profits, $x(\widehat{e}) - \widehat{W}$. To find rebargaining profitable by modifying labor conditions to increase profits at period $t = 3$ requires, roughly speaking, increasing the worker's labor hours ($e^* > \widehat{e}$) without further compensation, reducing the worker's compensation ($W^* < \widehat{W}$), or both. In addition, to be accepted by the worker, the new informal contract (W^*, w^*, e^*) must be located in the upper-contour set of his participation constraint. Accordingly, for a rebargaining process to be successful, the initial labor contract signed at period $t = 2$, $(\widehat{W}, \widehat{w}, \widehat{e})$, must be located on the *strict* upper-contour set of the worker's participation constraint in Figure II.

This is the case of the (unexpected) deterioration of the worker's opportunity costs (e.g., due to worsening labor market conditions or reduced unemployment benefits). Although the manager's initial contract aligns with the worker's participation constraint (\mathcal{I}_U), leading the worker to accept it at $t = 2$, should outside opportunities unexpectedly deteriorate, the worker's reservation utility \underline{U} would decrease to a lower level \underline{U}^* , expanding the set of feasible labor contracts. The initial contract (unexpectedly) lies in the strict upper-contour set of the new worker's participation constraint (\mathcal{I}_{U^*}). This shift opens an opportunity for the manager to renegotiate the labor contract, while still retaining the worker, by imposing favorable terms that improve firm's profits, despite any retaliatory actions that might be taken against the firm.

Under the new conditions, the manager will propose an informal labor contract (W^*, w^*, e^*) at period $t = 3$ provided (i) it maximizes the firm's profits net of penalties (2), while providing the worker with enough incentives to accept the job at $t = 4$; and, (ii) the resulting

profits are higher than those obtained with the initial labor contract, that is:

$$(1 - \rho)x(e^*) - W^* - \lambda[\widehat{W} - w^*e^*]^+ > x(\widehat{e}) - \widehat{W}. \quad (5)$$

The informal contract is obtained from the firm's maximization problem:

$$\begin{aligned} \max_{W,w,e} \quad & (1 - \rho)x(e) - W - \lambda[\widehat{W} - we]^+, \\ \text{s.t.} \quad & u(W) - v(e) \geq \underline{U}^* \ [< \underline{U}] \\ & W = w e \\ \text{given} \quad & (\widehat{W}, \widehat{w}, \widehat{e}) \end{aligned} \quad (6)$$

The first order conditions for this maximization are:

$$\frac{1 - \rho}{1 - \lambda} x'(e) = \frac{v'(e)}{u'(we)}, \quad (7)$$

$$u(we) - v(e) = \underline{U}^*, \quad (8)$$

$$W = w e \geq \widehat{W}. \quad (9)$$

Within the demand-supply diagram of the bilateral labor market, condition (7) entails that the demand for labor is influenced by the judicial cost parameter λ and the productivity penalty parameter ρ . The higher the judicial costs λ , the more cautious the manager becomes in reducing wages; while the higher the productivity penalty ρ , the less productive workers become (and the less labor is demanded). To obtain the informal labor contract, (W^*, w^*, e^*) , we set wages per hour as a function of working hours in (8), $w = \phi(e; \underline{U}^*)$; then, substituting into (7) we find the informal labor hired, e^* . Wages are set at $w^* = \phi(e^*; \underline{U}^*)$, and the total compensation is $W^* = w^*e^*$.

The manager proposes this informal labor contract at $t = 3$, provided she finds it profitable (i.e., firm's profits increase, see condition (5)). In addition, as the resulting informal contract is set on the indifference curve $\mathcal{I}_{\underline{U}^*}$, the worker accepts the informal contract at $t = 4$ although his welfare is reduced below that obtained with the original labor contract, $U(W^*, e^*) = \underline{U}^* < \underline{U} = U(\widehat{W}, \widehat{e})$. In the terminology of this paper, we consider that the manager is exerting *managerial opportunism*.⁴

All these arguments can be summarized as follows: When outside opportunities deteriorate, represented by a decrease from \underline{U} to \underline{U}^* , the set of feasible contracts enlarges, rebar-gaining becomes more attractive to the manager, and the worker is more prone to accept less favorable terms. Conversely, if the worker's outside opportunities improve, the reservation utility \underline{U} increases, making it harder for the manager to renegotiate the contract without providing additional compensation or benefits. Hence the following proposition:

Proposition 3. *Managerial opportunism is negatively associated with the outside opportunities available to workers. When external opportunities deteriorate, the manager is more likely to renegotiate the contract, taking advantage of the worker's weaker bargaining position.*

⁴Theorem A.1 in the Appendix proves the existence of a set of penalty parameters that makes rebar-gaining process succeed after a deterioration of the worker's opportunity cost. Specifically, managerial opportunism is feasible for the combination of parameters (ρ, λ) , such that the values of the productivity penalty (ρ) are low enough for every judicial penalty (λ) that do not increase firm's overall labor compensation.

3 DATA AND VARIABLES

To explore the relationships outlined in the propositions above, we compiled a dataset for 30 OECD countries over the period 1995-2020. The dataset integrates a diverse range of economic, labor, and legal indicators from major international sources, including the OECD Labour Force Statistics, ILO's Key Indicators of the Labour Market, and the Employment Protection Legislation database (Table I). Even when the dataset's nature imposes certain constraints on causal inference, its cross-country coverage and temporal depth offer a valuable opportunity to identify broad patterns and correlations that inform our theoretical propositions.

Our dependent variable, managerial opportunism, is defined as the proportion of workers exceeding the legal maximum weekly hours. This measure captures both direct violations of labor law and broader indicators of managerial overreach. It is constructed using data on workers' weekly hours from ILO's Key Indicators of the Labour Market (KILM) and country-specific legal limits sourced from ILO's Working Conditions Laws Database, supplemented as needed with information from NATLEX, another ILO resource.

Our explanatory variables capture the three mechanisms through which economic, legal, and labor market factors influence managerial opportunism, as hypothesized in our theoretical framework.

The expected productivity penalty caused by managerial opportunism arises from two main sources. First, there are increased organizational transaction costs, driven by internal conflicts with current workers. These conflicts manifest as absenteeism, resignations, devious behavior, distorted information, and even sabotage. Second, reputational damage in the labor market reduces the availability of human capital from new recruits, as firms perceived as exploitative struggle to attract talent. Building on the insights of Bryson et al. (2006) and Doucouliagos and Laroche (2009), we posit that both transaction and reputational costs are closely linked to the strength of organized labor. Trade union density—the ratio of wage and salary earners who are union members to the total number of wage and salary earners—serves as a natural proxy for this strength. Data for this variable is sourced from the OECD Labour Force Statistics dataset.

To measure the costs, firms face for non-compliance with labor laws when managers act opportunistically toward workers—referred to as judicial costs—we rely on the Employment Protection Legislation (EPL) index from the OECD. Specifically, we use dismissal strictness, a component in the index that measures the strictness of individual dismissal regulations for regular workers. This measure captures both the level of severance pay required and the procedural requirements firms must fulfill, which together represent significant financial and administrative burdens. Therefore, it serves as an effective proxy for judicial penalties because it reflects the broader legal environment governing employment relationships. Higher values of dismissal strictness indicate stricter labor protections, translating into higher costs for firms that fail to comply with contractual obligations. As several studies have shown (Belot et al., 2007; Blanchard and Portugal, 2001), employment legislation influences labor market dynamics, shaping both managerial behavior and compliance with labor laws. Empirically, the EPL index and its components have been widely used to assess labor market rigidity and enforcement strength, further underscoring its reliability as a measure of the legal constraints that limit managerial opportunism.

Moreover, outside opportunities in each country are proxied by the unemployment rate and unemployment benefits. The unemployment rate measures the share of the labor force without work but actively seeking employment, sourced from the OECD's Labour Force Statistics database. Unemployment benefits, instead, represent the public and mandatory private expenditure on unemployment benefit programs, expressed as a percentage of GDP, with data collected by the OECD in the Social Expenditure Database (SOCX). These two variables capture the availability of alternative employment opportunities for workers, which can influence their willingness to tolerate managerial opportunism. Higher unemployment rates may reduce workers' outside options, while more generous unemployment benefits can provide a safety net that weakens managers' leverage over workers.

Beyond the independent variables included in our propositions, we introduced several control variables. First, total population size is linked to the size of the labor market and, consequently, the number of potential workers with whom firms can transact. We conjecture that higher competition among workers in the labor market will lead to an increase in managerial opportunism. Second, we control for each country's technological strength using the number of triadic patent families (patents registered in Japan, the USA, and Europe). A higher number of triadic patents indicates greater technological strength (Sternitzke, 2009), which is often associated with a more educated workforce with more bargaining power than workers in low-cost countries. Lastly, GDP per capita serves as a control for various macroeconomic and political factors that influence the business climate and the professional skills of managers. Higher GDP per capita levels should be positively correlated with less managerial opportunism.

Table II provides summary statistics for the variables used in the analysis. The key variable of interest, *managerial opportunism* –measured as the percentage of employees working beyond legally allowed hours– exhibits considerable variation, with a mean of 20.6 % and a range from 0 to 68.4 %. This variation underscores differences in compliance with labor regulations across countries, with certain nations showing marked improvements in labor practices after regulatory reforms, such as Poland following its alignment with the EU's 48-hour workweek directive.

Other critical variables include *trade union density* and *individual dismissal*. Trade union density, which captures the productivity penalties associated with internal conflicts and reputational costs, exhibits substantial variation across countries. On average, 33.1 % of wage and salary earners are union members, but this ranges from 93.3 % in Iceland to just 9.9 % in Turkey, reflecting significant differences in the strength of organized labor. Similarly, the dismissal strictness index, a proxy for judicial costs, displays considerable heterogeneity. With an average value of 1.15, the index spans from 0 in Finland, Germany, and the US –indicating minimal restrictions– to 6 in Portugal, where strict labor protections imply higher compliance costs for firms. These patterns underscore the diversity in labor market regulations and suggest that both organized labor and legal constraints could impose varying degrees of penalties on managerial opportunism across countries.

Finally, measures of unemployment rates and unemployment benefits –key proxies for workers' outside opportunities– show significant variation across countries. The unemployment rate, which we expect to reflect the availability of alternative job options, averages 7.6 % but peaks at 27.7 % during economic crises such as the global financial crisis and the European sovereign debt crisis. Similarly, unemployment benefits, which provide financial

safety nets that may empower workers to resist managerial opportunism, exhibit notable disparities. On average, benefits represent 0.9 % of GDP, with a standard deviation of 0.8 %, reflecting very diverse national approaches to social protection.

4 EMPIRICAL RESULTS AND DISCUSSION

Our estimates correspond to the basic model,

$$\begin{aligned} ManOpp_{it} = & \alpha + \beta_1 Trade\ Union\ Density_{it} + \beta_2 Dismissal\ Strictness_{it} \\ & + \beta_3 Outside\ Opportunities_{it} + \phi CVar_{it} + \varepsilon_{it} \end{aligned}$$

where i and t denote country and year, respectively; $ManOpp$ is the percentage of employees working more hours than legally allowed; $Trade\ Union\ Density$ represents the percentage of the workforce affiliated with unions; $Dismissal\ Strictness$ serves as a proxy for the costs a firm may face when dismissing a worker or unilaterally breaking the contract; $Outside\ Opportunities$ represents the alternative measures for outside opportunities, namely unemployment rate and unemployment benefits; $CVar$ represents the control variables; and ε is the error term.

To select the most appropriate estimator, we conducted several standard tests: the modified Wald statistic for groupwise heteroskedasticity (Greene, 2000), the Wooldridge test for autocorrelation in panel data, and the (Pesaran, 2004) test for cross-section dependence. The tests confirmed the presence of heteroskedasticity, autocorrelation, and cross-section dependence. We therefore rely on the Driscoll-Kraay estimator because it yields heteroskedasticity and autocorrelation-consistent standard errors robust to general forms of spatial and temporal dependence.

We further evaluated whether to apply a random effects (RE) or fixed effects (FE) model using Mundlak's approach, which incorporates heterogeneity bias by adding an additional term accounting for unobserved characteristics between groups (countries, in our case). Mundlak (1978) demonstrated that, when the model is correctly specified, the RE estimator is equivalent to the FE estimator but offers greater flexibility and is better suited for modeling context, including variables only measurable at a higher level (Bell and Jones, 2015) that often change slowly over time (GDP per capita, population, market constraints, etc.).

Table III shows the results across different model specifications. All of them include total population, the number of triadic patent families, and GDP per capita as covariates.

Proposition 1. Consistent with this proposition, the empirical patterns suggest that strong trade unions –indicative of a substantial productivity penalty– are associated with lower levels of managerial opportunism ($\beta_{Trade\ Union\ Density} = -0.250$; $s.e. = 0.038$). This negative relationship highlights the influence of organized labor on managerial behavior, likely operating through two main mechanisms. First, trade unions heighten the direct costs of opportunism through collective action, including strikes or grievances, which disrupt organizational operations and reduce profitability. Second, unions impose indirect costs by affecting the firm's external reputation, particularly in competitive labor markets where a perceived lack of fairness can hinder the recruitment and retention of skilled workers. These findings align with prior research showing that unions reduce workplace conflict and

contribute to higher worker satisfaction (Bryson et al., 2006; Doucouliagos and Laroche, 2009; Blanchflower et al., 2022; Choi, 2018).

If policymakers are concerned with the prevalence of managerial opportunism and its implications for labor market fairness, our findings suggest that collective bargaining institutions can play a significant role in shaping equitable employer-employee relations. In particular, policies that strengthen unions may help to sustain a power balance in labor markets, especially during economic downturns or periods of regulatory reform. However, it is equally important to recognize that unions themselves are not without economic trade-offs, such as potential impacts on labor market flexibility, physical capital formation, and firm-level productivity (Doucouliagos et al., 2017). These dynamics merit further investigation.

Proposition 2. Table III reports a positive and significant relationship between stricter dismissal protections and managerial opportunism ($\beta_{Dismissal\ Strictness} = 0.250; s.e. = 0.03$). The observed pattern therefore appears inconsistent with the expectations of Proposition 2, suggesting that managers may bypass formal constraints through informal mechanisms (e.g., extending working hours, intensifying workloads), effectively undermining the intended protective effects of dismissal laws. Therefore, dismissal protections, on their own, may be insufficient to curb opportunistic behavior unless they are complemented by institutions or enforcement structures that empower workers to assert their rights effectively (Sanga, 2018). It follows that the impact of dismissal protections would depend on the extent to which legal provisions are enforced in practice, highlighting the critical role of enforcement intensity and monitoring capacity in shaping their effectiveness.

To further explore this idea, we interact trade union density with dismissal protections (Table IV). If the quality of monitoring and enforcement is indeed relevant, trade unions should moderate the effect of dismissal protections on managerial opportunism by enhancing enforcement capacity and making judicial costs a credible deterrent for managers. The observed interaction suggests that higher trade union density mitigates the positive association between dismissal protections and opportunism ($\beta_{Trade\ Union\ Density \times Ind.\ Dismissal} = -0.309; s.e. = 0.03$). Specifically, as trade union density increases, the positive effect of dismissal protections on opportunism diminishes and eventually disappears.

This finding underscores the importance of unionized environments, where workers are more likely to leverage legal support and collective bargaining mechanisms to hold managers accountable for opportunistic behavior. Furthermore, unions' ability to mobilize reputational resources—such as publicizing exploitative managerial practices—may amplify the potential reputational and financial costs of opportunism, thereby reinforcing compliance with protective labor regulations. One caveat is in order, though. Reputational costs, often touted as a natural check on opportunism, may be less effective than assumed. As Williamson (1996) observes, the transmission of reputational information is imperfect and may fail to constrain opportunistic behavior. Potential employees may discount anecdotal evidence of poor practices, and managers themselves often move across firms, leaving their reputational liabilities behind.

Given the contingent nature of dismissal protections, future research should investigate whether informal renegotiations or other hidden practices enable firms to navigate strict labor protections, and how these dynamics vary across industries or firm sizes. For instance, in smaller firms with fewer resources, the cost-benefit calculus of opportunism might differ significantly from that of larger firms operating in highly regulated industries.

Proposition 3. The empirical patterns are consistent with the idea that shifts in outside opportunities –proxied by unemployment rates and unemployment benefits– shape the emergence of managerial opportunism. Across all model specifications, we observe a positive and statistically significant relationship between unemployment rates and managerial opportunism (Table III ($\beta_{Unemployment\ Rate} = 0.297$; $s.e. = 0.04$). This finding suggests that as labor market conditions deteriorate, workers’ bargaining power erodes, increasing their susceptibility to opportunistic managerial practices. For instance, when the unemployment rate rises, the reservation utility of workers decreases, effectively lowering the threshold at which they are willing to remain in their current employment. Managers may exploit this vulnerability, rationalizing their actions based on short-term profitability or organizational pressures. Alternatively, managers may also act opportunistically to derive private benefits, such as achieving cost reductions that enhance their promotion prospects. Even if such actions ultimately destroy firm value (Foss et al., 2006), these behaviors are consistent with broader models of time inconsistency (Kyddland and Prescott, 1977; Weingast and Marshall, 1988), where promises made ex-ante are abandoned when incentives change ex-post.

Conversely, the analysis reveals a negative and statistically significant relationship between unemployment benefits and managerial opportunism ($\beta_{Unemployment\ Benefits} = -0.183$; $s.e. = 0.015$). Generous unemployment benefits provide workers with a financial cushion, enabling them to exercise greater selectivity in their employment decisions and resist exploitative contract modifications. By increasing workers’ reservation wages, unemployment benefits enhance their bargaining position, deterring managers from engaging in opportunistic behavior. Therefore, these findings underscore the importance of social safety nets in shaping the balance of power within the employment relationship and the policy relevance of unemployment insurance schemes, particularly in economic downturns when workers’ outside options are constrained. Beyond the direct monetary value of unemployment benefits, unemployment benefits’ broader psychological and strategic effects—such as reducing workers’ immediate reliance on a single employer—are also likely to amplify their impact.

These results suggest several directions for future research. A better understanding of how unemployment insurance design, active labor market programs, and industry-specific labor conditions influence managerial opportunism could illuminate the broader institutional mechanisms that shape employment relations. For example, more generous unemployment benefits or effective retraining programs may strengthen workers’ outside options and reduce their susceptibility to opportunistic practices. Similarly, minimum wage laws and maximum working hours regulations could affect managers’ incentives to renegotiate employment terms, particularly in institutional environments where legal constraints create strategic opportunities for employers. Further work linking these policy dimensions to firm-level behavior would provide important insights into the organizational dynamics underlying labor market outcomes.

More generally, broadening the scope of economic analysis to account for managerial opportunism requires revisiting foundational assumptions. Existing theoretical frameworks have often abstracted away from power asymmetries within firms, treating managers as neutral coordinators rather than strategic actors with their own objectives. Insights from political economy, sociology, and organizational psychology highlight the importance of authority, fairness, and enforcement dynamics in shaping employment relationships, yet these perspectives remain underexplored in mainstream economic theory. Scientific progress depends not

only on empirical observation but also on the conceptual frameworks used to interpret evidence. Incorporating a broader range of disciplinary insights could yield a richer, more realistic understanding of employment relations in imperfect markets.

5 CONCLUSIONS

This study brings managerial opportunism toward employees to the forefront of economic analysis, addressing a critical yet underexplored aspect of labor relations. Our theoretical model delineates those conditions that allow managerial opportunism to emerge and thrive, emphasizing its dependence on two primary dimensions: the erosion of workers' outside opportunities and the cost-benefit calculus of managers, shaped by productivity penalties and judicial constraints. Although the empirical analysis is constrained by data limitations and does not offer definitive causal claims, the observed patterns align with these theoretical predictions and underscore the need for more granular data to deepen these insights.

From a policy perspective, our results call for a reevaluation of labor market regulations and enforcement mechanisms. While economic dynamism is essential for growth, safeguarding workers' welfare requires striking a balance between labor market flexibility and protections against exploitative practices. Policies aimed at enhancing the portability of worker skills, strengthening unemployment safety nets, and bolstering enforcement mechanisms for labor contract violations are essential to mitigating the power imbalance that facilitates opportunistic behavior. At the same time, managers themselves must consider the long-term productivity costs associated with opportunistic practices, including reduced worker morale, increased turnover, and reputational damage.

At a deeper theoretical level, the neglect of managerial opportunism within economic theory highlights a broader asymmetry in the analytical treatment of agency problems. A striking asymmetry is the attention devoted to managerial moral hazard toward shareholders, contrasted with the near absence of concern for managerial opportunism toward workers – despite its institutional relevance, as noted by Berle and Means (1932). This neglect likely stems from the assumptions embedded in competitive labor market models, where worker mobility and reputational costs are expected to discipline employer behavior. Yet most real-world labor markets deviate sharply from these conditions. Workers' outside options are often constrained by legal, cultural, and macroeconomic factors that reduce their bargaining power and heighten their exposure to opportunistic practices. By examining how employers exploit positional authority under incomplete contracts and shifting labor market conditions, this study extends the principal-agent framework and offers a more realistic foundation for analyzing the employment relationship.

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APPENDIX

A.1 On the possibility of managerial opportunism

Would the manager benefit from breach of the labor contract and propose a new informal contract to the worker at period $t = 3$? She would provided the firm's profits increase (see condition (5)). The following Theorem A.1 identifies the set of penalty parameters that makes rebargaining process succeed after a deterioration of the worker's opportunity cost. Specifically, the combination of low enough productivity penalty values (ρ) for every judicial penalty that do not increase firm's overall labor compensation –i.e., the western ρ - λ region in Figure IV.

The Theorem also describes how the informal labor contract (W^*, w^*, e^*) is designed at the rebargaining region. If the judicial penalty is high enough (i.e., $1 > \lambda \gg \rho$), then the manager avoids judicial costs by not modifying the total labor compensation ($W^* = \widehat{W}$), and increase profits by requiring additional number of hours ($e^* > \widehat{e}$). In the case the judicial penalty is moderate (i.e., $1 > \lambda > \rho$), the manager decreases the total labor compensation ($W^* < \widehat{W}$) while increases the number of working hours ($e^* > \widehat{e}$). Finally, if judicial penalty is low enough (i.e., $\lambda < \rho$), the manager increases profits by both decreasing total labor compensation and the number of working hours ($W^* < \widehat{W}$ and $e^* < \widehat{e}$), as the manager behaves like a monopsonist extracting more surplus from the worker.

Theorem A.1. Managerial opportunism: rebargaining after a deterioration of the worker's opportunity cost. Consider a labor contract $(\widehat{W}, \widehat{w}, \widehat{e})$ signed at period $t = 2$. The manager proposes a new informal labor contract at period $t = 3$ if and only if the productivity penalty $\rho < 1$ is low enough for each judicial penalty $\lambda < 1$. At this rebargaining region of parameters (i.e., the western region of Figure IV), the informal labor contract (W^*, w^*, e^*) is designed as follows for each given $\rho > 0$:

- (i) if $\lambda < \rho$, then $e^* < \widehat{e}$, $w^* < \widehat{w}$ and $W^* < \widehat{W}$;
- (ii) if $\lambda = \rho$, then $e^* = \widehat{e}$, $w^* < \widehat{w}$ and $W^* < \widehat{W}$;
- (iii) if $\lambda \in (\rho, \check{\lambda}(\rho))$, then $e^* > \widehat{e}$, $w^* < \widehat{w}$ and $W^* < \widehat{W}$; and,
- (iv) if $\lambda \in [\check{\lambda}(\rho), 1)$, then $e^* = \check{e} > \widehat{e}$, $w^* = \check{w} < \widehat{w}$ and $W^* = \widehat{W}$,

being $\check{\lambda}(\rho)$ for each $\rho < \lambda$ the threshold that results in an informal contract with the same total remuneration as in the initial contract (i.e., $W^*_{(\rho, \check{\lambda}(\rho))} = \widehat{W}$).

Proof of Theorem A.1. Initially, let us denote the function representing the difference between both sides of (5) as

$$G(w, e; \widehat{w}, \widehat{e}, \rho, \lambda) = (1 - \rho)x(e) - we - \lambda[\widehat{w}\widehat{e} - we]^- - [x(\widehat{e}) - \widehat{w}\widehat{e}]. \quad (\text{A.1})$$

Observe that for every $\lambda < 1$, this function is monotonically decreasing in wages per hour (i.e., $G_w(w, e; \widehat{w}, \widehat{e}, \rho, \lambda) = -(1 - \lambda)e < 0$); and, it is also strictly increasing in the number of hours (i.e. $G_e(w, e; \widehat{w}, \widehat{e}, \rho, \lambda) = (1 - \lambda) \left[\frac{1-\rho}{1-\lambda} x'(e) - w \right] > 0$), as the contract lies below the demand function because of the manager's monopsonistic behaviour (i.e. $\frac{1-\rho}{1-\lambda} x'(e^*) > w^*$). Next, we explore particular values for the parameters to identify when the manager finds it profitable to propose an informal labor contract to the worker at period $t = 3$, i.e. $G(w, e; \widehat{w}, \widehat{e}) > 0$.

Case 1. Judicial costs increase firm's overall labor compensation (net of penalties), $\lambda > 1$. Initially, observe that a necessary condition at the Kuhn-Tucker Theorem (Mas-Collel et al. 1995, Th.M.K.2) for the maximization problem (6) requires that the judicial penalty parameter must satisfy $\lambda < 1$.⁵ In

⁵The first-order condition of the Lagrangian function of the maximization problem (6) are:

$$\begin{aligned} (1 - \rho)x'(e) - (1 - \lambda)W + \mu[u'(W)w - v'(e)] &= 0 \\ -(1 - \lambda) + \mu u'(W) &= 0, \end{aligned}$$

being μ the Lagrangian multiplier of the participation constraint. The Kuhn Tucker Theorem requires that $\mu \geq 0$ for the solution being a maximum.

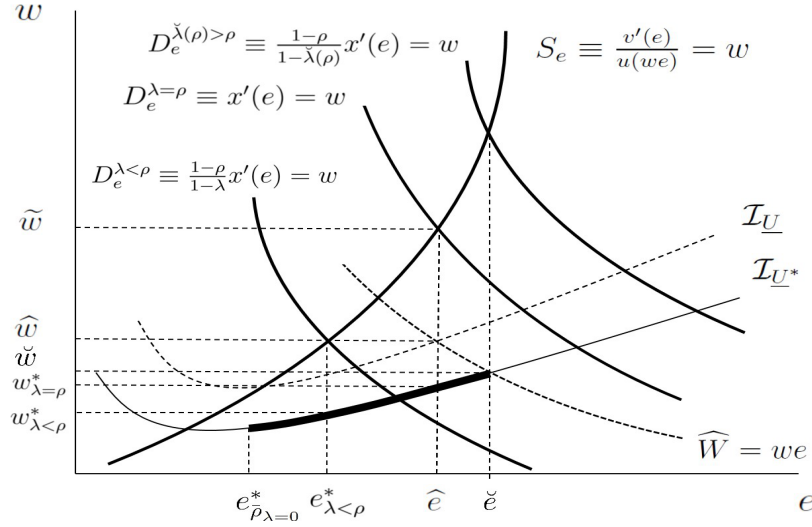


Figure A.1.

Managerial Opportunism: the set of informal labor contract (W^*, w^*, e^*) after a deterioration of labor conditions

The figure presents the set of informal contracts (dark thick curve). Some informal contracts are displayed from different firm’s demand function D_e obtained from different relative values of the penalty parameters: specifically for $\lambda < \rho$, $\lambda = \rho$ and $\check{\lambda}(\rho) > \rho$ (with $\check{\lambda}(\rho)$ being the threshold that places the informal contract on the iso-remuneration curve).

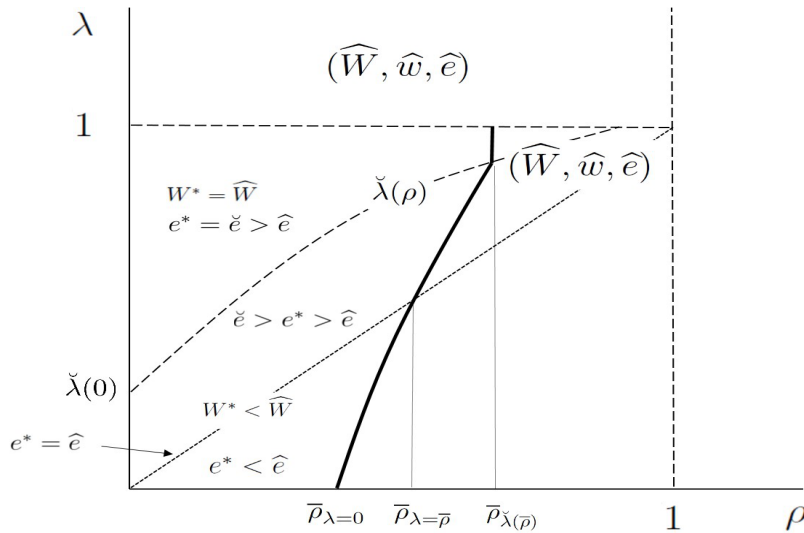


Figure A.2.

The rebargaining region under a deterioration of the opportunity cost $\underline{U}^* < \underline{U}$

The western region of the ρ - λ -space describes the parameter combinations that makes rebargaining profitable. The *informal labor contract* (W^*, w^*, e^*) depends on the value of the penalty parameters: if the judicial penalty is high enough ($1 > \lambda \gg \rho$), then $W^* = \widehat{W}$ and $e^* > \widehat{e}$; if the judicial penalty is moderate ($1 > \lambda > \rho$), then $W^* > \widehat{W}$ and $e^* > \widehat{e}$; and, if judicial penalty is low enough ($\lambda < \rho$), $W^* < \widehat{W}$ and $e^* < \widehat{e}$. There exist two thresholds that keeps unchange the labor compensation ($W^* = \widehat{W}$) and the number of working hours ($e^* = \widehat{e}$), namely the function $\check{\lambda}(\rho)$ and the $\lambda = \rho$ -line respectively.

addition, by monotonicity of preferences, the multiplier can never be zero. Thus, if the judicial costs are too high ($\lambda \geq 1$), then the manager is not interested in proposing an new informal contract at period $t = 3$.

Case 2. No judicial penalty, $\lambda = 0$. In this case the demand function with penalties in (7) is located below the original demand function (see Figure III with $\lambda = 0$). The informal contract results in a lower the number of hours, wage per hour and total labor compensation (i.e., $e_{\lambda=0}^* < \widehat{e}$, $w_{\lambda=0}^* < \widehat{w}$, and $W_{\lambda=0}^* < \widehat{W}$). Now, the difference function (A.1) becomes

$$G(w_{\lambda=0}^*, e_{\lambda=0}^*; \widehat{w}, \widehat{e}, \rho, 0) = (1 - \rho)x(e_{\lambda=0}^*) - w_{\lambda=0}^*e_{\lambda=0}^* - [x(\widehat{e}) - \widehat{w}\widehat{e}].$$

This difference is negative for the maximum productivity penalty $\rho = 1$ (i.e. $G(w_{\lambda=0}^*, e_{\lambda=0}^*; \widehat{w}, \widehat{e}, 1, 0) < 0$); and, it is positive for $\rho = 0$ (i.e. $G(w_{\lambda=0}^*, e_{\lambda=0}^*; \widehat{w}, \widehat{e}, 0, 0) > 0$, because $\rho = 0$ implies $w_{\lambda=0}^* < \widehat{w}$ and $e_{\lambda=0}^* = \widehat{e}$). The Bolzano Theorem states that there must exist a productivity threshold $\bar{\rho}_{\lambda=0}$ such that $G(w_{\lambda=0}^*, e_{\lambda=0}^*; \widehat{w}, \widehat{e}, \bar{\rho}_{\lambda=0}, 0) = 0$. For any $\rho < \bar{\rho}_{\lambda=0}$ the manager proposes a new informal contract.

Case 3. Judicial and productivity penalty parameters coincide, $\lambda = \rho$. In this case, the demand function with penalties in (7) coincides with the original demand function (4). See Figure II, and Figure III with $\lambda = \rho$. The informal contract results in the same the number of hours, while both wage per hour and total labor compensation decreases (i.e., $e_{\lambda=\rho}^* = \widehat{e}$, $w_{\lambda=\rho}^* < \widehat{w}$, and $W_{\lambda=\rho}^* < \widehat{W}$). Now, the difference function (A.1) becomes

$$G(w_{\lambda=\rho}^*, \widehat{e}; \widehat{w}, \widehat{e}, \rho, \rho) = -\rho x(\widehat{e}) + (1 - \rho)[\widehat{w} - w_{\lambda=\rho}^*]\widehat{e}.$$

This difference is negative for $\rho = 1$ (i.e. $G(w_{\lambda=1}^*, \widehat{e}; \widehat{w}, \widehat{e}, 1, 1) < 0$) and positive for $\rho = 0$ (i.e. $G(w_{\lambda=0}^*, \widehat{e}; \widehat{w}, \widehat{e}, 0, 0) > 0$), so the Bolzano Theorem states that there must exist a unique productivity threshold $\bar{\rho}_{\lambda=\bar{\rho}}$ such that $G(w_{\lambda=\bar{\rho}}^*, \widehat{e}; \widehat{w}, \widehat{e}, \bar{\rho}_{\lambda=\bar{\rho}}, \bar{\rho}_{\lambda=\bar{\rho}}) = 0$. For any $\rho < \bar{\rho}_{\lambda=\bar{\rho}}$ the manager proposes a new informal contract.

Case 4. Judicial penalty parameter is higher than productivity penalty parameter, $1 > \lambda > \rho$: an upper threshold for the informal labor compensation. In the case that $\lambda > \rho$, and for each productivity penalty ρ , there exists a level of the judicial penalty $\check{\lambda}(\rho) > \rho$ such that, if offered, the manager would propose an informal contract $(W^*, w^*, e^*) = (\check{W}, \check{w}, \check{e})$ with a higher number of hours $\check{e} > \widehat{e}$, a lower labor compensation per hour $\check{w} < \widehat{w}$, but the informal contract results in the same total labor compensation, $\check{W} = \widehat{W}$. Figure III depicts this case, with the curve iso-remuneration $\widehat{W} = we$ crossing the indifference curve \mathcal{I}_{U^*} . So, this case $\lambda > \rho$ embodies three subsets of parameters λ for each ρ : a region with $\lambda < \check{\lambda}(\rho)$; the case $\lambda = \check{\lambda}(\rho)$; and, the region with $1 > \lambda > \check{\lambda}(\rho)$.

Case 4.a Relative moderate judicial penalty parameter $\lambda \in (\rho, \check{\lambda}(\rho))$. The informal contract results in higher the number of hours, while both wage per hour and total labor compensation decreases (i.e., $e_{\lambda>\rho}^* = \widehat{e}$, $w_{\lambda>\rho}^* < \widehat{w}$, and $W_{\lambda>\rho}^* < \widehat{W}$ as the informal contract lies below the iso-remuneration curve). Now, the difference function (A.1) becomes

$$G\left(w_{\lambda>\rho}^*, e_{\lambda>\rho}^*; \widehat{w}, \widehat{e}, \rho, \lambda \in (\rho, \check{\lambda}(\rho))\right) = (1 - \rho)x(e_{\lambda>\rho}^*) - w_{\lambda>\rho}^*e_{\lambda>\rho}^* - \lambda_{\lambda < \check{\lambda}(\rho)}[\widehat{w}\widehat{e} - w_{\lambda>\rho}^*e_{\lambda>\rho}^*]^- - [x(\widehat{e}) - \widehat{w}\widehat{e}].$$

This difference is negative for $\rho = 1$ (i.e. $G\left(w_{\lambda>1}^*, e_{\lambda>1}^*; \widehat{w}, \widehat{e}, 1, \lambda \in (1, \check{\lambda}(1))\right) < 0$) and positive for $\rho = 0$ (i.e. $G\left(w_{\lambda>0}^*, e_{\lambda>0}^*; \widehat{w}, \widehat{e}, 0, \lambda \in (0, \check{\lambda}(0))\right) > 0$ as the firm is producing facing less remuneration costs), so the Bolzano Theorem states that there must exist a unique productivity threshold $\bar{\rho} \equiv \bar{\rho}_{\lambda \in (\bar{\rho}, \check{\lambda}(\bar{\rho}))}$ such that $G(w_{\lambda>\bar{\rho}}^*, e_{\lambda>\bar{\rho}}^*; \widehat{w}, \widehat{e}, \bar{\rho}, \lambda \in (\bar{\rho}, \check{\lambda}(\bar{\rho}))) = 0$. For any $\rho < \bar{\rho}_{\lambda \in (\bar{\rho}, \check{\lambda}(\bar{\rho}))}$ [$\equiv \bar{\rho} < \check{\lambda}(\bar{\rho})$], the manager proposes a new informal contract.

Case 4.b Judicial penalty parameter threshold $\lambda = \check{\lambda}(\rho) > \rho$. For each $\rho < \check{\lambda}(\rho)$, the informal contract becomes $(W^*, w^*, e^*) = (\widehat{W}, \check{w}, \check{e})$, with $e_{\lambda=\check{\lambda}(\rho)}^* = \check{e} > \widehat{e}$, $w_{\lambda=\check{\lambda}(\rho)}^* = \check{w} < \widehat{w}$, and $W_{\lambda=\check{\lambda}(\rho)}^* = \widehat{W}$ as the informal contract lies on the iso-remuneration curve. Now, the difference function (A.1) is not affected by the judicial penalty, and becomes $G\left(\check{w}, \check{e}; \widehat{w}, \widehat{e}, \rho, \check{\lambda}(\rho)\right) = (1 - \rho)x(\check{e}) - \widehat{W} - [x(\widehat{e}) - \widehat{W}]$. This difference is negative for $\rho = 1$ and positive for $\rho = 0$, so the Bolzano Theorem states that there must exist a productivity

threshold $\bar{\rho}_{\check{\lambda}(\bar{\rho})}$ such that $G(\check{w}, \check{e}; \widehat{w}, \widehat{e}, \bar{\rho}_{\check{\lambda}(\bar{\rho})}, \check{\lambda}(\bar{\rho}_{\check{\lambda}(\bar{\rho})})) = 0$. For any $\rho < \bar{\rho}_{\check{\lambda}(\bar{\rho})}$, the manager proposes a new informal contract.

Case 4.c Relative high judicial penalty parameter $\lambda \in (\check{\lambda}(\rho), 1)$. For each $\rho < \check{\lambda}(\rho)$, if the judicial penalty is relatively high, $\lambda > \check{\lambda}(\rho)$, then the worker will accept an informal contract in period 4 provided the manager pays a total remuneration higher than the one received at the initial contract (i.e., $W^* > \widehat{W}$), so the firm will not face judicial costs. The manager's maximizing problem (6) is analogous to the one in *Case 4.b*, as the term $\lambda[\widehat{W} - W^*]^-$ is not considered. Accordingly, the optimal informal contract coincides, i.e. $(W^*, w^*, e^*) = (\widehat{W}, \check{w}, \check{e})$.⁶ That is, any informal contract requiring higher hours of labor and higher wage per hour (i.e. $e^*_{\lambda > \lambda(\rho)} > \check{e}$ and $w^*_{\lambda > \lambda(\rho)} > \check{w}$) results in lower profits.

Due to the smooth properties of the production function and the preferences, we can link the thresholds found in *Cases 1-4* to find a rebargaining region (at western area of the ρ - λ region in Figure IV). This concludes the proof of Theorem A.1. ■

⁶The reason is that the concavity of the technology function $x(e)$ and the utility function $u(c) - v(e)$ implies that the profit function $\pi(e, w)$ evaluated at the optimal contract (so that $w = \phi(e; \underline{U}^*)$) is concave, i.e. $d\pi'(e^*, \phi(e; \underline{U}^*)/de^* = 0$ and $d^2\pi'(e^*, \phi(e; \underline{U}^*)/(de^*)^2 < 0$.

Variable	Source	Description	
Dependent variable			
Managerial Opportunism	Construct		Share of persons working over maximum legal weekly hours (= persons working between a-b hours; when a > max.legal weekly working hours)
% of employed persons by hours worked per week	ILO (2015, Table 7a) from Key Indicators of the Labour Market (KILM)		Percentage of employed persons by hours worked per week (mostly calculated on the basis of information on employment by usual-hours bands provided primarily by household-based surveys which cover all person in employment)
Maximum weekly legal working time	ILO (2021b) Working Conditions Laws Database, (complemented with other sources when needed such as ILO 2021a, database of national labour, social security and related human rights legislation)		Legally established working time: weekly hours limit, including overtime, established by labour laws for each country
Independent variable			
Productivity Penalty			
<i>Trade Union Density</i>	OECD (2022b) Labour Force Statistics database - Trade Union Density dataset		Trade Unions Density is the ratio of wage and salary earners that are trade union members, divided by the total number of wage and salary earners.
Judicial Costs			
<i>Dismissal Strictness</i>	OECD (2022a) Employment Protection Legislation (EPL) Indexes		This variable considers procedural inconveniences, notice and severance pay for no-fault individual dismissals and the difficulty of dismissal (the latter quantifies its legal definition, trial period, monetary compensation and the reinstatement option following unfair dismissal). To construct our variable, we take the average of the individual dismissal indexes for contracts of 9 months, 4 years, and 20 years. Higher values represent stricter regulation.
Outside Opportunities			
<i>Unemployment Rates</i>	OECD (2022b) Labour Force Statistics database		Share of the labour force that is without work but available for and seeking employment (
<i>Unemployment Benefits</i>	OECD (2024a) Social Expenditure database (SOCX)		Public and mandatory private expenditure in unemployment benefits programs (in
Control Variables			
<i>Total Population</i>	United Nations, Department of Economic and Social Affairs, Population Division (2024) World Population Prospects: The 2024 Revision		Total population in millions
<i>Triadic Patents</i>	OECD (2024b) Statistics (database)		Number of triadic patent families (in hundreds)
<i>GDP per capita</i>	OECD (2024b) Productivity Compendium of Productivity Indicators		GDP per capita (in thousands of US dollars, current prices and PPPs)

Table I.
Variable Descriptions

Model	Variable	Mean	Std. Dev.	Min	Max
<i>Managerial Opportunism</i>	Managerial Opportunism	20.6	15.1	0	68.4
<i>Productivity Penalty</i>	Trade Union Density	33.1	22.3	4.5	93.3
<i>Judicial Costs</i>	Dismissal Strictness	1.15	1.3	0	6
<i>Outside Opportunities</i>	Unemployment Rate	7.6	4.1	1.8	27.7
<i>Outside Opportunities</i>	Unemployment Benefits	0.9	0.8	0	3.8

Table II.
Descriptive statistics for selected variables

Model	Variable	(1)	(2)	(3)	(4)
<i>Productivity Penalty</i>	Trade Union Density	-0.248*** (0.0201)			-0.250*** (0.0377)
<i>Judicial Costs</i>	Dismissal Strictness		0.269*** (0.0214)		0.250*** (0.0278)
<i>Outside Opportunities</i>	Unemployment Rate			0.210*** (0.0299)	0.297*** (0.0353)
<i>Outside Opportunities</i>	Unemployment Benefits			-0.118*** (0.0138)	-0.183*** (0.0152)
Model Summary					
	Controls	Yes	Yes	Yes	Yes
	Observations	638	598	622	545
	R-squared	0.387	0.387	0.399	0.482

Table III.
Main Results

Notes: Standard errors in brackets. All variables are standardized. Control variables include total population, number of triadic patent families, and GDP per capita. *** p<0.01, ** p<0.05, * p<0.1.

Model	Variable	(1)	(2)
<i>Productivity Penalty</i>	Trade Union Density	-0.105*** (0.0333)	-0.449*** (0.0478)
<i>Judicial Costs</i>	Dismissal Strictness	0.304*** (0.0363)	0.132*** (0.0340)
	Trade Union Density × Individual Dismissal	-0.311*** (0.0251)	-0.309*** (0.0272)
<i>Outside Opportunities</i>	Unemployment Rate	0.328*** (0.0338)	0.230*** (0.0319)
<i>Outside Opportunities</i>	Unemployment Benefits	-0.106*** (0.0246)	-0.0891*** (0.0217)
Model Summary			
	Controls	No	Yes
	Observations	548	545
	R-squared	0.374	0.517

Notes: Standard errors in brackets. All variables are standardized. Control variables include total population, number of triadic patent families, and GDP per capita. *** p<0.01, ** p<0.05, * p<0.1.

Table IV.
Moderating effect of Trade Union Density on Individual Dismissal.