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Protection of Atypical Workers in the Platform Economy

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Abstract

The platform economy has given rise to atypical labor relationships marked by formal autonomy and substantive economic dependence, challenging traditional "employee/self-employed" dichotomies in labor law. This paper analyzes how platform workers face classification dilemmas, with weakened personal, economic, and organizational subordination leading to inadequate social security, algorithmic opacity, and loss of collective rights. Drawing on international experiences like Germany's "quasi-employee" framework and California's ABC Test, it proposes a threefold institutional reconstruction: constructing a dynamic status determination system based on economic subordination and factual control, enhancing algorithmic regulation and data protection to address covert digital control, and establishing a tiered social security mechanism tailored to workers' dependency levels. These measures aim to balance worker autonomy with protective safeguards, adapting labor law to the hybrid nature of platform work.

Keywords

platform economy, platform workers, labor rights protection, algorithmic regulation

1. Introduction

The platform economy, an emerging economic model, differs fundamentally from traditional economies in market structure, operational frameworks, and user convenience. It enables more efficient and rational distribution of resources to balance societal supply and demand.

Driven by advancing digital technologies, digital platforms have now permeated all sectors, playing a pivotal role in every link of social production. As they reshape economic ecosystems, platform-based industries such as ride-hailing, food delivery, and e-commerce are transforming global labor markets. In 2022, China's sharing economy recorded transaction volumes of 3.832 trillion RMB, a year-on-year increase of 3.9%, reflecting an overall upward trajectory. The lifestyle services sector led with 1.8548 trillion RMB in transactions, where online food delivery accounted for 25.4% of the national catering industry's revenue, and ride-hailing trips made up 40.5% of total taxi passenger volume—signaling

deep integration into daily consumer life (National Information Center of China, 2023).

U.S. Census Bureau data shows that the quantity of non-employer firms in the United States rose by 60 percent from 1999 to 2014 (Rozzi, F., 2018, p. 33). This economic model based on digital platforms accurately matches fragmented service demand with distributed labor supply through technological empowerment.

However, as traditional labor law is based on the "employment and self-employment" dichotomy of the industrial era, its pre-existing theories and institutions are not well-suited to the present situation. "In Independent Workers' Union of Great Britain v. RooFoods Ltd [2017] TUR1/985, the UK Central Arbitration Committee ruled that Deliveroo riders lacked "personal obligation" to perform services, thus denying employee status (Independent Workers' Union of Great Britain v. RooFoods Ltd t/a Deliveroo [2017] TUR1/985, 2016). The court ruled that the rider qualified as an independent contractor and thus was not entitled to termination compensation under the Fair Work Act. A platform worker's contract gives him "virtually unlimited right of substitution" (i.e., the platform worker can delegate work to others), which is contrary to the "personal obligation" requirement in traditional employment relationships. Platform workers are highly flexible in their working hours, with the ability to choose their own time slots, and the platform does not have direct control over how they work (e.g., route planning, dress code, etc.)

Confronting the crisis of institutional adaptation in the transformation of labor relations triggered by the platform economy, how to construct an innovative and inclusive system for platform worker's rights and interests protection has become an urgent matter.

2. Characterization of Atypical Labor Relationships in the Platform Economy

The platform economy has structurally reshaped labor relations. Differing from the traditional employment model, its core features are as follows: First, technology-driven diversification of labor forms, forming composite modes such as crowdsourcing (e.g., TaskRabbit task subcontracting), subcontracting (e.g., regional contracting on logistics platforms), and self-employed cooperation (e.g., Uber drivers independently accepting orders), and so on. Second, the functionality of subordinate elements is weakened, personality subordination is dissolved due to the independent choice of working time and place, economic subordination evolves into the dynamic balance between platform commission and workers' multi-source income; organizational subordination is replaced by algorithmic rules and digital monitoring, and the traditional theory of "three subordinates" can hardly completely cover the new type of employment relationship. Third, through the implicit control of data and algorithms, platforms establish algorithmic systems using user ratings and order-allocation algorithms. These systems disguise the profound interference of algorithmic rules in the labor process beneath the surface-level autonomy granted to workers. As a result, it becomes challenging to identify the organizational subordination inherent in the labor relationship. In reality, however, this setup gives rise to a new form of domination known as "de-organizational control" (Rani, U., Furrer, M., Gerecke, M.,

& Berg, J., 2021).

2.1 Diverse and Complex Labor Patterns

The cooperation model can be broadly ambient crowd-sourced labor relations, subcontracted labor relations, and self-employed labor relations.

Crowdsourcing is a new type of labor model that relies on Internet technology. The online platform disassembles various tasks such as transportation, food and beverage delivery, and domestic service into fragmented units such as “gig work: and “tasks”, and outsources them to a large-scale and dispersed group of workers (Cherry, M. A., 2019, p. 32). The platform serves as an intermediary hub, connecting the demand side at one end and the workers at the other end, assigning work and coordinating the task completion process as needed. The core of this model lies in the in-depth application of information technology: through algorithmic systems, it realizes the intelligent distribution of tasks, the precise matching of workers and needs, and the standardized acceptance and delivery of labor results. It covers a wide range of fields, from basic manual labor (e.g., distribution of goods) to professional services (e.g., design and programming, data processing), all of which can be accomplished through task splitting and distributed collaboration, combining flexibility and resource integration efficiency.

In Romania, some platforms use “partner companies” to contract with workers, creating a “platform-third party company-worker” subcontracting structure, which is Subcontracting model. Workers are classified as independent contractors, responsible for their own equipment and social security contributions. Platforms leverage this model to sidestep labor law obligations like minimum wage and paid leave. Yet they often retain operational control through algorithms, leaving workers with insufficient protections and unstable incomes (Rosioru, F., 2020, pp. 423-442).

Self-employed work arrangements involve individuals who operate as independent contractors, freelancers, or similar professionals. It is not same as traditional employment. Workers are paid by providing their customers directly with goods or services—instead of through an employer/employee relationship. Typically, they manage their own business activities, take on business risks like financial obligations, and may use contractors or digital platforms to access customers, such as Uber. This model gives employees considerable operational autonomy, enabling them to make their own schedules, select projects, and define service conditions. But there is a trade-off: while there are no restrictions imposed by employers, there is no standard job protection. There is no such thing as health insurance, pension plans, or paid holidays, and labor law guarantees—such as a minimum wage guarantee or anti-discrimination clause—are rare (Katz, L. F., & Krueger, A. B., 2016).

2.2 Erosion of Traditional Labor Subordination in Work Processes

Because of the weakening of traditional individual, economic, and organizational subordination, coupled with the effects of hidden algorithmic control, the platform labor relations exhibit distinct characteristics (Xie, Z., 2018, pp. 1546-1569).

2.2.1 The Weakening of Subordination

Platform workers' apparent autonomy in choosing hours and locations challenges traditional notions of personal subordination. Unlike traditional jobs, which have a fixed schedule and an employer's job, the platform economy appears to have its own schedules and service areas. In Romania, for example, Uber and Glovo drivers have formal flexibility: they select active hours and order zones via the platform interface. But this autonomy is strictly regulated by algorithmic rules: Uber drivers must respond to orders within 15 seconds and accept at least 70% of ride requests, with account restrictions for non compliance (Rosioru, F., 2020, pp. 423-442). This tension between "technology empowerment" and "algorithmic control" removes the direct control of traditional work hours/places, while creating a new form of individual subordination by means of digital surveillance.

2.2.2 Decreasing Economic Subordination

It is Diversification of revenue sources and different levels of economic dependence on platforms. Redefine economic subordination. Some workers earn across multiple platforms—e.g., Uber, Deliveroo, and TaskRabbit—adopting a decentralized model that lessens reliance on any single intermediary (Goldschmidt and Schmieder, 2015). In contrast, those who depend on a platform for order dispatch—such as food-deliver riders or ride-hailing drivers—exhibit pronounced economic dependence. Their earnings are tightly governed by platform algorithms determining order volume and payment rates, creating financial vulnerability despite their formal status as independent contractors.

2.2.3 The Weakening of Formal Organizational Subordination

Platform workers lack strict binding to traditional enterprise rules, driving a fundamental shift in organizational affiliation. In traditional employment, employers directly govern workers through rules like attendance and discipline. However, platform exercise indirect control via implicit mechanisms: user ratings, algorithmic incentives, and penalties. For example, Uber drivers sign third-party contracts with platforms—arrangements outside traditional corporate structures. Yet platforms establish virtual management systems through service quality metrics (e.g., low ratings triggering reduced order allocations) and task completion rules (e.g., delivery time limits). Workers remain subject to these digital dispatch regulations, even without formal employer-employee ties (O'Connor v. Uber Technologies, Inc., 82 F. Supp. 3d 1133, 1149 (N.D. Cal. 2015)).

3. The Reality of the Dilemma Faced by Workers in the Platform Economy

Platform workers often face a dilemma: they are caught between identifying as employees or self-employed, with weakened subordination leaving them unable to access adequate labor protections. This ambiguity complicates the legal identification of labor relationships. Additionally, platform-specific issues—such as algorithmic opacity and the absence of collective labor rights, which exacerbates their challenges (Rosenblat, A., & Stark, L., 2016, pp. 3758-3766).

3.1 Identity Challenges

Traditional law defines labor relations using three subordination criteria "personal, economic, and organizational": employees are under direct employer control, economically reliant on a single entity, and part of the employer's organizational structure, while independent contractors operate fully autonomously. However, platform employees exhibit "hybrid characteristics" that blend elements of both categories. Romanian Uber drivers have formal autonomy to choose their working hours, logging on and off the platform at will. Yet the platform imposes substantive control through algorithms: drivers must accept over 70% of ride requests and respond to orders within 15 seconds, with penalties like reduced visibility for noncompliance. These mandates create a contradiction: while legally classified as independent contractors, their ability to decide work terms—both in practice and business autonomy—is deeply circumscribed by platform rules. They remain neither fully independent in operational choices nor in economic decision-making, blurring the boundary between employment and self-employment (Rosioru, 2020, pp. 433-434). Additionally, Economic dependence decentralization and risk transfer are evident in platform labor. Workers rely on platforms for order allocation and income, yet they are legally classified as "independent contractors." This classification obligates them to bear individual social security costs, while platforms evade obligations like minimum wage and paid leave. The model shifts financial responsibilities to workers—who depend on platform algorithms for earnings—while preserving platforms' legal distance from employer obligations, creating a structural imbalance between economic reliance and legal liability (Rosioru, 2020, p. 433).

Spanish Deliveroo riders exemplify this issue: though they follow the platform's delivery rules in practice, their "service agreement" contracts classify them as independent contractors, excluding them from employee protections. Despite adhering to algorithmic mandates like delivery time limits and route optimizations, their legal status under these agreements denies those rights such as minimum wage and social security. This mismatch between operational subordination to platform rules and contractual independence reveals how platforms use legal structures to avoid labor obligations (Rodriguez-Pinero Royo, Miguel, 2020, pp. 443-472).

3.2 Deficiency in Basic Social Security Coverage

The rapid expansion of the digital platform economy has given rise to new forms of employment. Yet, globally, the welfare system for platform workers is lagging far behind. For example, in Romania, its open social security framework covers the self-employed. However, the available data reveal continuing problems for platform workers. In spite of the legal provisions, obstacles such as complicated registration procedures, algorithm-driven income volatility, and unclear job classification create practical loopholes. These problems highlight a critical disconnect: although the regulatory framework tries to adapt, the unique nature of platform work outpaces social protection design, leaving workers vulnerable to systemic weaknesses.

Romanian platform workers face substantial social security gaps, primarily due to mismatches between their legal status and system design. The country's social security framework theoretically covers all workers—whether employed or self-employed. Yet key protections like unemployment and workplace injury insurance remain optional for self-employed individuals. Yet low wages and weak enrollment drive low actual coverage: Self-employed platform workers often earn below the national minimum wage (2,230 lei/465 EUR monthly), with those making less than six months' minimum wage annually required to pay health insurance based on a six-month salary base (1,338 lei/279 EUR annually), exacerbating financial strain (Ordonanță de Urgență nr. 26/2020 art. 1, M.Of. pt. I, nr. 232/25 (25 mar. 2020)).

This creates a heavy financial burden, as low wages and voluntary enrollment lead to minimal actual coverage. The result: a critical gap between legal eligibility and practical access to social security, leaving these workers vulnerable to economic risks. These institutional challenges unfold in two key ways: First, platform companies classify workers as self-employed to avoid employer obligations. They contribute just 2.25% of total wages to unemployment and workplace injury funds—far less than formal employer responsibilities (Ordonanță de Urgență nr. 79/2017 art. 282(1), M.Of. pt. I, nr. 937/29 (29 nov. 2017)). Meanwhile, workers enroll voluntarily at low rates due to limited information about their options, deepening coverage gaps. Second, the income-based contribution system shortchanges low-wage earners. Pension levels remain constrained: the 2020 median pension stood at 1,436 lei/300 EUR (Felicia Rosioru, 2021).

3.3 The Impact of Algorithmic Non-Transparency on Labor

In the platform economy, algorithms act as primary tools for labor allocation and management. Platforms collect and analyze vast worker and user data to refine these algorithms internally, ensuring matching and management mechanisms serve both user needs and profit goals. This process transforms data into operational control: algorithms dictate task assignments, pricing models, and performance metrics, shaping how workers engage with the platform (Zhang, L. H., 2019, pp. 63-75). Yet the decision-making logic behind these algorithms often operates as opaque "black boxes." Consider Uber: the company exclusively controls its surge pricing algorithms and task allocation systems. Drivers have no visibility into how these algorithms function or how their earnings fluctuate. Research shows Uber's algorithmic "black box" operates as a digital puppeteer: while drivers perceive autonomy in logging on/off, the invisible strings of surge pricing and acceptance rate thresholds dictate their earnings mobility. Rosenblat (2016) likens this to a digital panopticon where drivers' behavioral choices are algorithmically constrained (Alex & Luke, 2016, p. 3757, p. 3763, p. 3766).

Additionally, algorithmic details are shielded as "trade secrets," making it difficult for workers to prove violations. Uber's contracts typically include mandatory arbitration clauses, blocking drivers from pursuing class-action lawsuits (Cotter v. Lyft, Inc., 176 F. Supp. 3d 930, 943 (N.D. Cal. 2016)). Reviewing a platform's data often requires algorithmic reverse engineering, which often runs into compliance issues (Uber specifically prohibits reverse engineering of its app in the terms of service.

Terms, Uber). For example, Facebook contend that a researcher's breach of the platform's terms of service constitutes unauthorized access under the Computer Fraud and Abuse Act (CFAA), as their actions allegedly went beyond the scope of permitted use defined in the contractual agreement (17 U.S.C. § 1201 (2012); Facebook, Inc. v. Power Ventures, Inc., 844 F.3d 1050 (9th Cir. 2016)).

3.4 Loss of Collective Labor Rights

The lack of collective labor rights under the platform economy is reshaping the pattern of labor relations and has a huge impact on workers in various countries. This puts workers at a disadvantage under the platform labor relationship.

3.4.1 Difficulty in Forming Traditional Trade Union Models

As the core carrier of collective labor relations, trade unions rely on four characteristics of "group community" to function: interdependence among members, shared interest goals, psychological identification, and long-term attachment to the group (Malin, M. H., 2000). In traditional industrial settings, physical agglomeration (e.g., factories, workshops) and stable employment relationships provided a natural foundation for unions—workers developed identity through shared workspaces and collaborative interaction, forming not just interest communities but also social identity communities that underpinned the institutional basis for collective bargaining.

However, in today's platform economy, workers rely on mobile apps to accept orders independently, shifting the workplace from physical sites to digital platforms and transforming collaboration from offline interaction to algorithm-driven virtual matching. Take food delivery riders as an example: they receive orders via apps and complete services individually, lacking meaningful communication with fellow riders. Moreover, under the platform's "decentralized" task allocation model, workers engage with demand-side entities as individuals, with divergent work goals and income structures that hinder the formation of shared interest objectives. As a result, safeguarding workers' basic rights becomes extremely challenging, as shown in the table below on the economic security and social security of platform workers.

3.4.2 Loss of Workers' Collective Bargaining Power

Platform enterprises reconstruct labor control through algorithms, whereby workers lack collective bargaining rights, making it difficult for individuals to negotiate pricing with companies. Due to the unique characteristics of platform employment relations, negotiation outcomes often fall short of expectations, potentially leading to legal challenges. For example, in 2018, Seattle ride-hailing drivers seeking collective bargaining rights were denied by courts due to antitrust law restrictions (Iglitzin, D., & Robbins, J. L., 2017, pp. 49-50). In European countries like Denmark, Belgium, and Germany—where self-employed individuals are granted collective labor rights to negotiate with enterprises—economic dependence complicates legal determinations of such rights (Fulton, L., 2018). Spain adopted specific regulations on self-employment in 2007, requiring economically dependent self-employed workers to sign contracts with enterprises to explicitly declare their economic dependence (Agut García, C., & Núñez González, C., 2012, pp. 117-132). However, in 2017 data

shows only 9,991 economically dependent self-employed workers in Spain, starkly contrasting with the total self-employed population of nearly two million during the same period—revealing that protections for this group remain inadequate to meet legislative expectations (Lionel, 2018, p. 62).

4. An Empirical Analysis of Labor Protection Experiences in the Platform Economy

4.1 Analysis of the Applicability of the Introduction of the German Quasi-Employee System

The concept of "quasi-employee" was first introduced in the 1926 Labor Court Act (Bundesministerium der Justiz, 1953). Subsequent legislation, such as the Federal Vacation Act （Bundesurlaubsgesetz [BUrlG] [Federal Vacation Act], 1963, §3) (Bundesanzeiger Verlag, 1963), granted procedural rights (e.g., labor court jurisdiction) and substantive protections (e.g., paid leave, workplace accident insurance). The 1974 amendment to §12a of the Collective Bargaining Act (Tarifvertragsgesetz) further refined the definition of "employee-like persons," emphasizing their high economic dependency and social protection needs akin to employees, covering groups such as home-based workers and exclusive commercial agents (Dübler, W., 1999).

In a German labor case clarifying standards for the "quasi-employee" (arbeitnehmerähnliche Person) system, the Federal Labor Court analyzed a dispute involving a retired self-employed insurance agent who had a service contract with an insurance company. The contract allowed the plaintiff to freely choose whether to accept individual insurance commissions and negotiate commission rates. Arguing their economic dependence qualified them as quasi-employees entitled to collective agreements, the plaintiff sought legal recognition of this status. However, the court rejected the claim, ruling the plaintiff remained a self-employed worker (Bundesarbeitsgericht [BAG] [Federal Labor Court of Germany], Mar. 22, 2000, Case No. 5 AZR 244/99, Neue Zeitschrift für Arbeitsrecht (NZA) 2000, 963 (Ger.)).

The court focused on two key factors. First, it examined the plaintiff's income structure: their fixed monthly pension (2,402 DM)—matching Germany's median income at the time—meant they could sustain basic living expenses even without annual insurance commissions (approximately 14,000 DM). This negated the core requirement for quasi-employee classification under the German Collective Agreements Act (TVG §12a): "existential-level" economic dependence, where loss of contract income would threaten livelihood. Second, the court scrutinized the plaintiff's contractual autonomy. He declined specific insurance tasks without penalties or contract termination and successfully renegotiated commission terms for multiple products, demonstrating genuine bargaining power.

The court's ruling in this case articulated two pivotal criteria for determining quasi-employee status in Germany. First, the "ocial need for protection" standard focuses on whether declining assignments would realistically jeopardize the worker's livelihood—a determination rooted in their reliance on income from the contracting entity (Bundesarbeitsgericht [BAG] [Federal Labor Court of Germany], Mar. 22, 2000, Case No. 5 AZR 244/99, Neue Zeitschrift für Arbeitsrecht (NZA) 2000, 963 (Ger.)). Second, while the "income share factor" (where over 50% of total income stems from a single source)

is referenced in TVG §12a(1)(1)(b), courts typically dismiss protection claims if workers have alternative income streams adequate to meet basic needs. This decision highlights a central tenet of the German quasi-employee framework: it requires more than just financial ties to the customer. On the contrary, the test of law looks at whether workers would be exposed to an economic threat if they were deprived of that income—in other words, if their deprivation would endanger their ability to maintain a basic standard of living. That limit is not satisfied by mere financial dependence, but by the fact that it is virtually impossible to waive contractual earnings without serious difficulties.

4.1.1 Feasibility Analysis of Applying the Quasi-Employee System to Platform Labor Relations

Platform labor providers, though formally autonomous—supplying their own tools and setting flexible schedules. But they face significant structural constraints from platform rules, such as algorithmic scheduling, rating systems, and performance-based incentives, which shape their work processes, while financial reliance on platform revenues is often their main source of income. This dual nature—formal independence coupled with substantive reliance—aligns with the German employee framework.

First, platform workers exhibit absence of personal subordination but pronounced economic dependence. Unlike traditional employees, they lack direct employer control over work details; no mandatory schedules or specific task instructions exist. Yet they operate within rigid platform ecosystems: The established rules govern task allocation and performance evaluation. This aligns with the core feature of employee-like status: formal autonomy coupled with substantive economic dependence. Second, Platforms monopolize labor demand information, creating an "internal labor market" that severs direct access between providers and clients. Like Uber drivers, for example, they cannot accept street-hailed rides; delivery workers rely exclusively on platform-order allocations. This strips them of traditional self-employment rights: pricing autonomy, client acquisition freedom, and direct market access.

4.1.2 Challenges in Applying the Quasi-Employee System

In the previous case, the German Labor Federal Court rejected the plaintiff's claim, holding that the income percentage is not the only criterion, but also needs to be combined with subjective factors such as "whether or not one is dependent on the platform for survival", i.e., the need for social protection. However, platform workers' income fluctuates greatly, and how to dynamically assess economic dependence and social protection needs is an issue that remains to be resolved. In addition, the complexity of decentralized employment on platforms, where platform workers often serve multiple platforms at the same time (e.g., online car drivers taking orders across platforms), and their income sources are decentralized, makes it difficult to apply the traditional criterion of "single economic dependence."

4.2 Practical Insights from California's ABC Test in Labor Relationship Classification (California Assembly Bill 5, § 2, 2019 Regular Session (Cal. 2019))

The AB-5 Act replaces traditional multi-factor tests with a strict ABC test—requiring businesses to prove workers operate free from control, perform tasks not central to the business's core operations,

and work independently. It significantly increases the likelihood of classifying gig workers as employees entitled to labor law protections. Employee status entitles workers to medical care, workers' compensation, paid sick leave, and safeguards against arbitrary termination through statutory procedures, enhancing job security (California Assembly Bill 5, 2019). Additionally, this classification legally enables union formation and collective bargaining, empowering groups like ride-hail drivers to advocate for higher wages and better working conditions, while clarifying dispute resolution pathways and raising corporate compliance costs to foster fairer labor relations. However, AB5's implementation directly threatens the core demand of casual laborers: work flexibility. Data shows 45% of Uber drivers work fewer than 10 hours weekly, and 92% work less than 40 hours—most choose this casual arrangement to control their schedules and balance family or other commitments. Classifying them as employees would strip drivers of the right to accept orders freely or work across multiple platforms. Companies might introduce mandatory scheduling systems, requiring drivers to work in specific zones or during set hours—a direct clash with the gig economy's "on-demand" model built on worker autonomy (Remarks made for Uber AB5 Press Call, UBER: UBER NEWSROOM, (Sept. 11, 2019)).

Additionally, tech companies have actively resisted AB5 through lawsuits, referendum initiatives, etc. Uber, Lyft, and others have jointly invested $60 million to launch a referendum in an attempt to obtain an exemption through a voter referendum that would advocate for maintaining the independent contractor status of drivers and provide limited benefits. At the same time, if the bill is strictly enforced, it could significantly increase the price of services (e.g., higher taxi fares), with the associated costs being passed on to consumers (Roosevelt, M., Bhuiyan, J., & Luna, T., 2019, September 11). Or companies may reduce their employment scale and even withdraw from the California market. If 400,000 drivers are classified as employees, businesses will face huge labor costs, which may result in about a large number of drivers losing their jobs (Margot Roosevelt, Johana & Taryn Luna, 2019).

5. Conclusion: Path to Institutional Reconstruction for the Protection of Atypical Workers' Rights in the Platform Economy

Given the complexity of determining labor relations in the platform economy, the diverse forms of employment relationships, and enterprises' covert managerial control over workers through algorithmic systems, it is necessary to explore dynamic status determination models and regulate algorithmic control to protect workers, while also avoiding imposing overly broad requirements on enterprises.

5.1 Construction of a Dynamic Status Determination System

A comprehensive evaluation of multi-dimensional factors is essential in defining platform labor relations. Taking economic subordination and factual control as core criteria, analysts must also integrate factors like workers' reliance on platform resources, the substitutability of their tasks, and the platform's degree of dominance over work processes to establish holistic judgment standards. This approach ensures that classification does not rest on formal contractual labels alone but accounts for the substantive power dynamics inherent in algorithmic management—such as how platforms dictate task

allocation, performance metrics, and income structures.

To determine whether workers are controlled by employers (i.e., exhibit subordination) through the "dominant attributes" of algorithms, we can draw from the subordination factors considered in a UK court ruling: whether the platform possesses the power to set service fees and commission rates, the authority to design transaction rules, discretion in order allocation, control over algorithmic decision-making, control over communication channels with customers, and control over opportunities for profit generation (Uber BV and others v. Aslam andothers, UKSC5, paras.94-100, 2021).

The establishment of a third category of workers should be approached with prudence. This institutional design must carefully balance fundamental worker protections with avoiding excessive burdens on enterprises that could stifle platform economy development. Worker classification should first be determined through traditional subordination criteria to distinguish between employees and self-employed individuals, before considering potential qualification for this third category. Specifically, we should draw upon international practice when exploring the creation of this intermediate worker status (Arbeitnehmerähnliche Personen, Tarifvertragsgesetz [TVG] [Collective Bargaining Act] § 12a (Ger.)).

Where the above elements of subsidiarity are fully satisfied, workers shall be accorded the same treatment and protection as if they were employees. If the requirements are not fulfilled, minimum requirements for protection, such as minimum wages and maximum working hours, shall be established. At the same time, the basic obligations of workers, such as minimum working hours and the obligation to work faithfully and diligently on the platform, should also be defined, so as to clarify the boundaries of the rights and obligations of workers.

Corresponding industry associations or government agencies can set up standardized documents to clarify the rights and obligations of both parties, and at the same time quantify the elements of subordination, according to the degree of satisfaction of subordination, taking the rights and interests of regular employees as the benchmark, the more the degree of satisfaction of the platform to give the rights and interests of this type of workers such as wages and social security, the closer to the rights and interests of regular employees. Dynamically assessing the subordination of workers can also effectively address complex employment patterns, such as workers participating in multiple platforms.

5.2 Enhancing Algorithmic Regulation and Data Protection Mechanisms

The non-transparent nature of algorithms in platform economies fundamentally undermines workers' ability to protect their rights. As these algorithmic labor rules exhibit inherent concealment through coded and dynamically adjusted operations, jurisdictional complexity across multiple platforms and entities, and illusory consent achieved through standardized terms that workers must passively accept—characteristics that collectively exceed the regulatory scope of traditional labor governance systems, necessitating the urgent establishment of an algorithmic auditing mechanism to ensure transparency and accountability while maintaining operational efficiency for platforms. This approach must carefully balance the imperative for worker protections with the need to preserve the innovative

potential of digital labor markets, requiring nuanced implementation that considers both the technical feasibility of algorithmic oversight and the economic realities of platform operations (Sandvig, C., Hamilton, K., Karahalios, K. et al., 2022).

5.2.1 Addressing Covert Violations from Algorithmic Control

Firstly, to address the issue of "false self-employed or self-employed" in platform labor, the audit needs to verify whether the algorithm constitutes substantive labor control. For example, the dispatch rules, attendance system, and performance evaluation of the algorithm of the takeaway platform are analyzed to determine whether the workers are subject to mandatory scheduling by the algorithm (e.g., order-taking response rate thresholds, regional restrictions), and whether their income is dependent on a single platform and lacks bargaining space. If the algorithm causes the worker to lose autonomy in terms of working time and task allocation, even if the relationship is formally a contractual relationship, it should be recognized as a de facto labor relationship and be included in the scope of labor law protection.

Secondly, it's important for compliance with data collection and privacy protection. Review the scope and use of data collected on workers by the platform and prohibit monitoring beyond what is reasonably necessary. For example, detecting excessive monitoring through movement tracks, biometric data (e.g., facial recognition), or the use of data to manage "hidden overtime" for workers (e.g., pushing tasks outside of work hours). Audits need to confirm that data collection complies with data protection regulations and that algorithms do not violate workers' rights to privacy and rest in the name of "management optimization".

5.2.2 Risk-Based Auditing: Systematic Risk Review of Algorithmic Decision-Making

Risk-based audits focus on the potential threats of algorithmic operations to workers' rights, establishing risk early-warning and corrective mechanisms through quantitative assessment and dynamic monitoring. They analyze whether algorithmic pricing and order allocation lead to income discrimination or instability. For instance, a ride-hailing platform's "dynamic pricing" algorithm may systematically depress earnings in specific regions or for particular groups, necessitating audits to check for discriminatory categorization based on geography, gender, or other factors, as well as "data-driven exploitation" that squeezes workers' earnings margins.

Risk-based audits for high-risk positions like food delivery riders examine whether algorithms prioritize efficiency at the expense of safety thresholds. For example, delivery platforms' overtime penalty algorithms may compel riders to speed, necessitating assessment of whether algorithms include reasonable time buffers and integrate traffic violation data to dynamically adjust delivery routes. Additionally, audits should review whether algorithms excessively compress rest periods, normalizing "covert overtime" and infringing on workers' right to health.

5.2.3 Construction of Audit Mechanism

Establish a tripartite audit system of "government regulation, third-party institutions and worker participation": Government authorities lead the filing and compliance review process, with cyber

regulatory bodies and labor administrative agencies jointly formulating the Platform Algorithmic Labor Rules Filing Checklist to mandate platforms to disclose core parameters of scheduling-decision algorithms (such as order dispatch and compensation algorithms) and their impact assessment reports. Independent third-party audit institutions, composed of technical experts, labor law practitioners, and union representatives, will be cultivated to conduct evaluations of both the technical compliance and social impacts of algorithms—for example, using "anti-discrimination" testing to verify the fairness of algorithmic output results. A worker participation mechanism will be established through the creation of worker representative committees endowed with the right to access algorithmic audit information and raise objections to algorithmic rules that may infringe on labor rights.

Additionally, Algorithmic audit tools can detect whether algorithms contain discriminatory logic or hidden control mechanisms—for example, by analyzing the legality of "exclusivity clauses" or "anti-subcontracting clauses" in platform service agreements to ensure they do not unjustly restrict workers' autonomy. Data trajectory tracking leverages blockchain technology to record the full life cycle of algorithmic decisions, making processes like order allocation, reward/penalty applications, and performance evaluations fully traceable—such as creating a delivery data ledger for riders to prevent platforms from arbitrarily deducting payments or restricting order acceptance.

5.3 Progressive Mechanism for Tiered Social Security System

5.3.1 Tiered Protection Strategy

First, classify platform workers into distinct tiers (e.g., core, semi-dependent, casual) based on their degree of platform affiliation and income stability, then design differentiated social security schemes for each tier.

5.3.2 Flexible Security Fund Mechanism

Establish a dedicated flexible security fund for the platform economy. For workers earning below the statutory minimum wage, platforms and governments shall jointly prepay subsidies to cover insurance contributions and provide temporary relief payments, thereby enhancing workers' risk resilience.

5.3.3 Establishment of Platform Enterprise Employee Committees

Corporate labor management systems must constrain corporate power while protecting worker rights. In the platform economy, flexible employment arrangements prevent traditional labor contracts, leading platforms to unilaterally define rights and obligations through standardized agreements. Workers lack channels to voice objections, creating systemic risks of rights violations. Given traditional unions' ineffectiveness and potential antitrust conflicts, platform enterprises should create employee-led committees with union-like functions. These committees shall negotiate with platforms on minimum wages, working hours, and basic social security. Members must have verified platform work tenure, and labor regulations must incorporate their input. Jointly developed rules between committees and platforms shall be publicly disclosed and apply equally to current and future workers with binding force. The validity of such rules must be legally guaranteed to safeguard workers' rights and interests.

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