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From land to traffic: the conceptual formation and analysis of digital rent

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Abstract. A large number of smallholder farmers face distribution dilemmas amid the development of rural e-commerce, and the structural roots of these dilemmas warrant examination from the perspective of political economy. Drawing on the theory of ground rent in *Capital*, this study systematically traces how differential rent I, differential rent II, and absolute rent are transferred into the digital context. Algorithmic weighting, paid promotion, and platform access are functionally equivalent to the natural conditions of land, additional capital investment, and the monopoly of landownership, respectively, thereby giving rise to three forms of digital rent: digital differential rent I, digital differential rent II, and digital absolute rent. All three forms share the same underlying source: platforms' monopolistic control over the essential means of production in digital space. Together, they form a mutually reinforcing cyclical structure. The conceptualization of digital rent provides a political-economic analytical tool for understanding the distribution dilemmas faced by smallholder farmers in the rural e-commerce industrial chain. It also offers an expandable theoretical framework for examining ownership relations and distribution rules concerning new forms of means of production in the digital age. Accordingly, improving the distribution structure requires institutional restructuring at three levels: platform regulation, policy intervention, and collective action.

Keywords: digital rent, *Capital*, rural e-commerce, distributive justice

1. Introduction

Rural e-commerce is widely regarded as an important means of promoting rural revitalization and increasing farmers' incomes. According to data from the Ministry of Commerce, China's national online retail sales in rural areas exceeded RMB 2.5 trillion in 2024. The number of e-commerce business entities continued to grow, while channels for bringing agricultural products to urban markets continued to expand. However, behind this overall growth, a structural problem has become increasingly apparent: many smallholder farmers encounter the predicament of "increased production without increased income" and "high sales volumes without profits" as they participate in the e-commerce industrial chain. As producers of the value embodied in agricultural products, farmers receive a share of profits that is disproportionate to their labor input and contribution to value creation. As a result, the benefits of digital development are disproportionately concentrated at the platform and distribution-channel end.

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Existing studies on the relationship between rural e-commerce and farmers' incomes have largely developed along two research approaches.

The first focuses on the income-enhancing effects of e-commerce. Based on evidence from 1,809 counties across China, some scholars have found that rural e-commerce not only increases income but also generates positive spatial spillover effects [1]. Other studies indicate that the impact of e-commerce on farmers' income varies across geographical areas, with more pronounced effects in central and western China [2]. Against the backdrop of the common prosperity strategy, another study points out that e-commerce platforms "can enhance farmers' awareness of applying Internet-based thinking to production and daily life, thereby further stimulating income growth" [3]. To some extent, these studies affirm the economic value of e-commerce. However, they do not adequately reveal the internal disparities in the distribution of its income-enhancing effects across different groups. Higher-income farmers are better positioned to achieve greater income growth, whereas lower-income farmers become trapped in a cycle in which "no investment means no traffic, while investment makes profitability difficult".

The second research approach has begun to examine the distributional effects of e-commerce development. Related studies have further found that the agricultural product circulation system dominated by e-commerce platforms involves a restructuring of power relations, with the distribution of benefits tilted toward platforms [4]. When smallholder farmers integrate into e-commerce value chains, they may experience the dual effects of "empowerment" and "burden". Under certain conditions, such integration may even exacerbate income inequality [5]. Although these studies reveal the distributive dimension of the problem, they have yet to examine whether farmers' relative income shares are reasonable from the perspective of the overall distribution of benefits across the industrial chain.

In recent years, some scholars have begun to incorporate the theory of ground rent in *Capital* into analyses of digital platforms. Some have systematically demonstrated the theoretical legitimacy of the concept of rent in digital space [6]. Shaodong Zhou has examined the bilateral monopoly structure of platform capitalism from the perspectives of digital labor and platform rent [7]. However, most of these studies remain at the level of broad descriptions of "digital capital" or "platform exploitation". They lack systematic and in-depth textual interpretations and theoretical extensions of the specific categories of rent developed in *Capital* in the context of the digital age. In particular, empirical studies that combine theoretical reconstruction with empirical verification remain scarce.

2. The analytical framework of the theory of ground rent in *Capital*

2.1. General determinations of ground rent

In Volume III of *Capital*, Marx defines ground rent as follows: "The appropriation of ground rent is the economic form in which landed property is realised, and landed property, in turn, presupposes landed property, the ownership of certain individuals over certain portions of the globe" [8]. The essence of ground rent does not lie in the natural attributes of land, but in its social attributes, namely, the relations of ownership. Differences in the natural fertility or location of land constitute the conditions for the emergence of ground rent, rather than its underlying source. The source of ground rent lies in the monopoly of ownership over the conditions of production. Without such an ownership monopoly, differences in natural conditions would merely give rise to surplus profits rather than being transformed into ground rent.

2.2. The general structure of differential rent

Marx uses waterfalls as an example to illustrate the mechanism through which differential rent is generated. He states: "The surplus-profit of the producer who uses natural waterfalls as a motive power is of the same nature as all surplus-profit which is not caused by accidental transactions in the circulation process, nor by accidental fluctuations in market prices (a category we have already examined in our discussion of prices of production)" [8]. The source of surplus profit is a natural force that is not a product of capital itself but is monopolized by capital and cannot be utilized equally by all producers. The utilization of this natural force enables an individual price of production to fall below the social price of production, with the difference constituting surplus profit. Thus, differences in natural conditions are transformed into surplus profits through the monopoly of ownership, which are subsequently converted into ground rent.

Marx states: "Differential rent I is caused by the following two general factors, which are independent of capital: 1. Fertility; 2. Location of the land. ... Fertility and location may operate in opposite directions" [8]. Marx identifies fertility and location as two independent dimensions of natural conditions that may also exert opposing effects. He particularly emphasizes that although the effects of location may change as a result of technological developments, they will never disappear entirely. This indicates that the existence of differential rent I does not depend on any particular fixed type of natural condition. Rather, it depends on a general structural configuration and the resulting difference between individual and social prices of production arising from the unequal distribution of these conditions.

Marx further argues: "Does it make any difference, as far as the formation of surplus-profit is concerned, whether capitals of different productivity are invested successively in the same plot of land or simultaneously in different plots of land, assuming that the results are the same? ... There is no difference whatsoever between the two cases as far as the formation of surplus-profit is concerned" [8]. He thereby identifies the central mechanism of differential rent II: the increase in ground rent results from additional investment in land and is proportional to the increase in capital invested. Successive investments of capital in the same plot of land can generate differential rent II only after the preceding investment has already produced surplus profit and that surplus profit has been converted into ground rent. Whether the surplus profit generated by additional investment is converted into ground rent depends on whether the monopolistic power of landownership can appropriate this surplus profit from the investor. During the term of a valid lease, improvements in productivity resulting from additional investment by tenant farmers may be partially retained by the tenants themselves. However, upon the expiration of the lease, landowners can appropriate this portion of surplus profit by raising the ground rent. In other words, the realization of differential rent II depends on the power of ownership to redistribute the returns generated by investment.

2.3. The general structure of absolute rent

"When analysing differential rent, we started out from the assumption that the worst land does not pay any rent. ... It must now be pointed out that this assumption is false. On the contrary, land of quality A also yields rent = r" [8]. Absolute rent does not presuppose natural differences between plots of land; rather, it presupposes the existence of landownership itself. As long as landownership exists as a monopolistic force, even the poorest land must pay ground rent. This means that absolute rent constitutes a universal claim to payment, applying to all users of land regardless of the land's relative ranking in terms of fertility or location.

Marx further explains the source of absolute rent: "The monopoly of landed property, landed property as a barrier to capital, is the precondition of differential rent; without this monopoly, surplus profit would not be transformed into ground rent and would not fall into the hands of the landowner... Even where rent in the form of differential rent does not exist, that is, on land of quality A, landed property as a barrier continues to exist"

[8]. Differential rent presupposes differences in land quality, whereas absolute rent presupposes landownership itself. The latter does not depend on any differentiated conditions but solely on an exclusive relationship of possession: land is monopolized by its owner, and every user must pay a price for its use. In this sense, absolute rent is the most fundamental form of ground rent because it is the economic form through which ownership realizes itself, without requiring any form of "superiority" as its basis.

3. The transformation of the category of ground rent in the digital and intelligent era

The applicability of the theory of ground rent in the digital age first encounters a methodological challenge. The analysis of ground rent in *Capital* takes capitalist agriculture as its empirical prototype, and its core categories revolve around land as a material means of production. When the research object shifts from land to data, from farmland to platforms, and from agricultural laborers to smallholder farmers engaged in e-commerce, the theoretical legitimacy of transferring classical categories must be determined by returning to the logical structure of the theory of ground rent itself.

3.1. The digital transformation of differential rent I: from natural conditions to algorithmic conditions

Differential rent I manifests itself in the transformation of differences in production conditions that are not created by labor into surplus profits through the monopoly of ownership, which are subsequently converted into ground rent. Transferring this structure to the context of digital labor requires identifying the variables in digital space that are functionally equivalent to land fertility and location.

When this general structure is transferred to the context of digital labor, search rankings, homepage recommendation slots, and eligibility for promotional campaigns on e-commerce platforms collectively constitute a digital location system. Within this system, different online stores receive systematically different levels of exposure through organic traffic. Such differences are not created by the operational labor of the stores themselves but are determined by the allocation of algorithmic weights by the platform. The algorithmic weighting system constitutes an initial endowment in digital space analogous to the natural conditions of land: it is predetermined, unequally distributed, and independent of the efforts of individual farmers.

Algorithmic weighting is structurally isomorphic to the conditions underlying differential rent I in three respects. Drawing on the perspective of data as a factor of production, Lijun Jia and Qichen Hao point out that the non-rivalrous and reproducible nature of data does not prevent platforms from establishing exclusive "digital location advantages" through algorithms. Such advantages themselves constitute the basis of a new form of monopolistic rent [9]. First, algorithmic weights are not products of farmers' labor but allocation parameters determined by the platform, which is logically consistent with the proposition that natural forces are not products of capital itself. Second, the platform monopolizes the power to allocate traffic, and farmers cannot alter the fundamental structure of algorithmic weights through their own efforts. This is structurally equivalent to the monopoly of ownership over natural conditions. Third, stores occupying high-weight digital locations receive greater organic traffic and enjoy greater profit potential, following the same mechanism through which land with superior fertility or location generates surplus profits. In her analysis of digital rent in contemporary capitalism, Ting Liu likewise emphasizes that algorithmic ranking is essentially a form of "digital differentiation", through which platforms appropriate surplus profits that should otherwise belong to business operators by exercising exclusive ownership over such differentiation [10]. On this basis, the category of digital differential rent I is defined as follows: Digital differential rent I refers to the surplus profits

appropriated by platforms from business operators occupying high-weight digital locations due to their locational advantages, by virtue of the platforms' monopoly over the allocation of algorithmic traffic.

3.2. The digital transformation of differential rent II: from additional investment to paid promotion

Successive additional investments within the same production conditions generate new productivity differences. When ownership exercises exclusive control over production conditions and withholds the surplus profits generated by additional investment from investors, differential rent II arises. Transferring this structure to the e-commerce context requires examining the conditions under which farmers' sustained investments in a fixed online store constitute additional investment and how platforms appropriate the surplus profits generated by such investment.

In the e-commerce context, additional investment primarily takes the form of expenditure on paid promotion. Smallholder farmers continuously invest in promotional services for the same online store to obtain greater traffic, which is equivalent to additional capital investment in the same digital plot of land. Differences in promotional efficiency among farmers give rise to variations in the productivity of additional investment analogous to those underlying differential rent II. Through bidding-based ranking mechanisms, platforms drive the equilibrium price of promotional services toward the marginal returns they generate. When the market price of promotional services equals the marginal increase in sales revenue they produce, the surplus profits that farmers might otherwise obtain through additional investment are entirely appropriated by platforms in the form of promotional fees.

In terms of the equivalence between mechanisms, differential rent II in the e-commerce context corresponds to its classical form in the following structural respects. Jie Bai and Chenghao Liu characterize this phenomenon as a new paradigm of "data rent", arguing that platforms transform business operators' successive investments into their own rental income through bidding-based rankings. In essence, this constitutes the systematic appropriation of surplus profits generated by additional investment [11]. First, the vehicle for additional investment shifts from the same plot of land to the same online store, both of which serve as fixed operating locations. Second, the form of additional investment shifts from material capital to digital capital, both representing upfront investments intended to improve productivity. Third, the right to appropriate the surplus profits generated by additional investment shifts from the landlord to the platform, with both exercising ownership-based appropriation of the returns on investment.

On this basis, the category of digital differential rent II is defined as follows: Digital differential rent II refers to the surplus profits that platforms appropriate from the potential returns generated by smallholder farmers' successive investments of promotional capital in a fixed online store, by virtue of their power to establish and adjust traffic-bidding rules. This category differs from digital differential rent I in that the former arises from differences in initial algorithmic weights among different online stores, whereas the latter arises from differences in the returns on successive investments within the same online store. Although the two forms differ in the sequence of their formation mechanisms, they share the same underlying logic: surplus profits are transformed into rent through the monopoly of ownership.

3.3. The digital transformation of absolute rent: from the monopoly of ownership to platform access control

The general structure of absolute rent consists of a universal claim to payment exercised by ownership itself over all users. Regardless of the quality of production conditions or the level of business performance, anyone using monopolized production conditions must pay rent. Transferring this structure to the e-commerce context

requires addressing two questions: Does a platform possess exclusive monopolistic power analogous to landownership? Does this monopolistic power give rise to a universal claim to payment comparable to absolute rent?

Answering the first question requires examining how platforms exercise control over digital markets. Although platforms do not directly own land, they establish exclusive power over digital space through the following means. Some studies point out that the production of digital space in Western countries has exhibited "quasi-feudal" characteristics, with platforms acting like digital lords that exercise rule-making and resource-allocation powers over their participants [12]. First, platforms exercise monopolistic control over traffic gateways. They control the primary channels through which consumers access product information. Without the traffic allocated by platforms, farmers cannot reach consumers. Second, platforms enjoy exclusive control over data resources. Transaction data, user preference data, and browsing behavior data generated during farmers' business operations are collected and used unilaterally by platforms, leaving farmers unable to control how such data are circulated or utilized. Third, platforms possess unilateral rule-making authority. Commission rates, promotional fee standards, and traffic allocation algorithms are all established and adjusted unilaterally by platforms, while farmers have no channels through which to participate in rule-making.

These three circumstances reflect the structural power that platforms possess as providers of digital market infrastructure. Once farmers choose to sell their products through e-commerce channels, they must accept these rules without having equivalent bargaining power or an equal right of exit. Logically, this structural power is equivalent to the control exercised by landownership over agricultural production: neither directly participates in the production process, yet both derive income through monopolistic control over essential production conditions. They therefore share the same underlying source.

Answering the second question requires examining the universality of the fees charged by platforms. Platforms collect commissions from all merchants operating on their marketplaces, regardless of their business performance, traffic rankings, or sales volumes. Commission charges are not payments for high-quality services but rather an access barrier to entering the platform market. Furthermore, platforms appropriate the data generated during farmers' business operations without compensation, regardless of whether such data are actually used to optimize algorithms or develop value-added services. Once the right to use these data is transferred, it cannot be recovered. This characteristic of obligatory payment regardless of business performance is structurally equivalent to the defining feature of absolute rent: even the poorest land must pay ground rent. Liu Ting argues that this universal claim to payment constitutes the core of digital absolute rent, whose underlying source lies in platforms' absolute control over market access [10].

On this basis, the category of digital absolute rent is defined as follows: digital absolute rent refers to the universal fees collected by platforms from all participating farmers, as well as the uncompensated appropriation of data resources, by virtue of their monopolistic control over digital market infrastructure.

3.4. The internal relationships among the three forms of rent and the general category of digital rent

The three forms of rent are not isolated from one another. Rather, they represent different manifestations of the same platform monopolistic power under different conditions. Digital differential rent I originates from differences in initial traffic weights among different online stores; digital differential rent II originates from differences in the efficiency of additional promotional investments within the same online store; and digital absolute rent originates from platforms' monopolistic control over digital market infrastructure. Although the triggering conditions of these three forms differ, they share the same underlying source: platforms'

monopolistic control over the essential production conditions of digital space, including the power to allocate traffic, the right to use data, and the authority to formulate rules.

There is also a dynamic relationship among the three forms. In the e-commerce context, digital absolute rent constitutes the institutional precondition for the operation of digital differential rent. It is precisely because platforms possess exclusive control over market access that they can adjust traffic weights through algorithms and establish bidding-based ranking rules. At the same time, the operation of digital differential rent further reinforces the power base of digital absolute rent. The more traffic allocation favors farmers who make higher promotional payments, the greater the platforms' control over farmers becomes, the higher the costs farmers face when exiting a platform, and the more firmly established the platforms' control over market access becomes. The three forms thus constitute a self-reinforcing cyclical structure. Some recent scholars have characterized this phenomenon as "technological feudalization" or "platform feudalism", arguing that digital platforms are reconstructing quasi-feudal relations of dependency through rent mechanisms [13]. It can therefore be concluded that digital rent is the economic form through which platforms, by virtue of their monopolistic control over the essential production conditions of digital space, appropriate the surplus value created by agricultural producers at the stage of commodity circulation. It is realized through three forms: digital differential rent I, digital differential rent II, and digital absolute rent. Together, these three forms constitute a comprehensive mechanism through which platforms extract surplus profits in the process of realizing the value of agricultural products produced by smallholder farmers.

4. Policy implications

Through their monopolistic control over the essential production conditions of digital space, platforms systematically appropriate the surplus value created by smallholder farmers in the process of realizing the value of agricultural products through three forms: digital differential rent I, digital differential rent II, and digital absolute rent. The coexistence and mutual reinforcement of these three forms constitute the structural root of smallholder farmers' predicament of "increased production without increased income" and "high sales volumes without profits". Accordingly, improving the distributional position of smallholder farmers in the rural e-commerce industrial chain requires institutional restructuring at three levels: platform regulation, policy intervention, and collective action. From the perspective of governance approaches, some studies propose that regulating digital rent requires addressing the mechanisms through which rent is generated and undermining platforms' rent-extraction capacity through antitrust measures and algorithmic transparency oversight [14].

4.1. Platform regulation: from rule acceptance to rulemaking participation

The formation of digital rent presupposes platforms' monopolistic authority to formulate rules. Commission rates, promotional fee standards, and traffic allocation algorithms are all established and adjusted unilaterally by platforms. Smallholder farmers have no channels through which to participate in rulemaking, nor do they enjoy equivalent bargaining power or an equal right of exit. Therefore, the primary task of platform regulation is to break this monopoly over rulemaking and establish institutional channels through which smallholder farmers can participate in formulating rules and supervising their implementation.

First, transparency requirements and reasonableness assessment mechanisms for platform charges should be established. Platforms should disclose how commission rates are calculated, the pricing logic behind promotional fees, and the basic rules governing traffic allocation. At present, smallholder farmers are in a position where they neither know what they are being charged nor understand the reasons behind the charges.

This not only undermines their right to information but also prevents them from determining whether the charges are reasonable or whether price discrimination exists. It is recommended that relevant government departments introduce regulations requiring platforms to disclose their fee items and standards periodically in a standardized format and intervene in charges that exceed reasonable limits.

Second, a buffer period and consultation procedures should be established for rule changes. Platform rules are characterized by their "immediate effectiveness", allowing platforms to adjust algorithmic weights or fee standards at any time, while leaving smallholder farmers with no transition period in which to adjust their business operations. It is recommended that regulations require platforms to announce rule changes in advance and provide a transitional period. For rule changes involving significant adjustments, the opinions of smallholder farmer representatives or industry organizations should be solicited, and a multi-stakeholder rule consultation mechanism should be established. The purpose of this institutional arrangement is to transform smallholder farmers from passive recipients of platform rules into active participants in rulemaking, thereby placing certain constraints on platforms' unilateral authority to formulate rules.

Third, mechanisms for establishing data rights and sharing data-generated returns should be explored. The central problem of data rent is that the producers of data (smallholder farmers) cannot control how their data are circulated or used, let alone share in the returns generated by data appreciation. It is recommended that smallholder farmers' usufructuary rights over their operational data be clearly defined, including the right to information (knowing what data platforms collect and how they use them), the right of choice (deciding whether to transfer certain data rights), and the right to benefit (sharing in the returns generated by the commercialization of data). When platforms use farmers' data for value-added activities such as algorithm optimization, precision marketing, and industry report development, they should establish benefit-sharing arrangements with the data contributors. Establishing data rights is not only a requirement of distributive justice but also a foundational institutional prerequisite for the market-based allocation of data as a factor of production. Drawing on the two-factor theory of commodities in relation to data as a factor of production, some scholars argue that the distribution of digital rent should follow the principle of contribution by data producers and that benefit-sharing mechanisms should be established accordingly [15].

4.2. Policy intervention: from a growth-oriented to a distribution-oriented approach

Current support policies for rural e-commerce focus on aggregate indicators such as sales revenue, the number of business entities, and Internet coverage. These policies implicitly assume that "growth automatically improves distribution". The existence of digital rent challenges this assumption. Platform commissions and promotional fees create a mechanism through which the benefits of growth are diverted, meaning that an increase in sales revenue does not necessarily translate into a corresponding increase in smallholder farmers' net income. Therefore, policy intervention should shift away from an exclusive emphasis on expansion in scale toward an approach that gives equal consideration to growth and distribution.

First, the governance of digital rent should be incorporated into the policy framework for coordinated regional development. The adverse effects of digital rent on smallholder farmers are more pronounced in less-developed regions. These regions generally face higher logistics costs, lower order density, and weaker levels of organizational development, making the relative burden of digital rent heavier. It is recommended that differentiated traffic subsidy mechanisms be established to provide appropriate subsidies for a proportion of the promotional expenses actually incurred by smallholder farmers in less-developed regions, while preferential traffic allocation should be extended to cooperatives and other collectively operated business entities. The experience of guaranteed-price procurement under the "Shanli Yunxiao" project in Yiwu could serve as a reference. This guaranteed-price mechanism could be extended to traffic costs, with the government

establishing a special fund to provide capped subsidies for keyword bidding expenses incurred by low-income farmers, thereby lowering the initial barriers to entering the e-commerce market.

Second, an evaluation index system for improving distributional structures should be established. It is recommended that indicators reflecting distributional structures be added to the evaluation system for rural e-commerce development, including the "share of smallholder farmers' net income", the "ratio of platform charges to product selling prices", and "income growth disparities among farmers at different income levels". These indicators should replace the exclusive reliance on sales revenue and order volume as measures of development. Improvements in distributional structures should also be incorporated into the performance evaluation systems for local governments and national e-commerce demonstration counties, thereby directing policy resources away from the pursuit of scale expansion alone and toward a balanced consideration of distributive justice.

Third, institutional pilot programs should be conducted in regions with different levels of e-commerce development. Measures concerning data rights protection and platform fee regulation involve complex stakeholder interests and legal issues and should therefore not be implemented uniformly nationwide. It is recommended that differentiated pilot programs be conducted in regions with varying levels of e-commerce development to explore the applicable conditions and institutional designs of governance models such as data cooperatives, platform benefit-sharing, and collective bargaining, thereby accumulating experience with differentiated policy approaches. In e-commerce-developed regions such as Yiwu, priority should be given to exploring institutional arrangements for platform fee regulation and the establishment of data rights. In regions with moderately developed e-commerce sectors, emphasis should be placed on exploring collective bargaining and support policies for the platform-based operation of cooperatives. In regions where e-commerce remains underdeveloped, priority should be given to exploring complementary measures involving traffic subsidies and infrastructure development.

4.3. Collective action: from passive acceptance to autonomous development

The weak bargaining power of smallholder farmers stems not only from their individualized modes of operation but also from the lack of organizational structures through which they can engage in collective negotiations with platforms. The involvement of cooperatives and other collective economic organizations can reduce individual farmers' operating costs to some extent. However, these organizations still have no substantive bargaining power regarding platform commission rates or promotional fee mechanisms. Therefore, the objective of collective action should not be limited to securing more favorable conditions within existing platform rule systems. Instead, efforts should gradually focus on developing the capacity to reduce dependence on platforms and establish independent channels.

First, cooperatives should be supported in independently establishing or jointly developing regional e-commerce platforms. At present, smallholder farmers' dependence on leading e-commerce platforms involves a high degree of asset specificity, as customer reviews, transaction data, and follower relationships accumulated on a particular platform cannot be transferred to other platforms, resulting in substantial switching costs. The fundamental way to break this lock-in is to develop alternative sales channels. It is recommended that cooperatives with the necessary capabilities be supported in independently establishing or jointly developing regional e-commerce platforms, or in building private-domain traffic pools through tools such as WeChat mini-programs and independent websites, thereby reducing their dependence on traffic from leading platforms. The government can provide support in technology development, operational training, and logistics coordination to help cooperatives overcome barriers to digital capabilities.

Second, familiar-community units such as villagers' groups should be utilized to promote resource sharing. Xuefeng He's research indicates that villagers' groups, as units within familiar communities, feature complete internal information transparency and are therefore particularly conducive to establishing collective action mechanisms. In the context of rural e-commerce, smallholder farmers can be organized at the villagers' group level to share resources such as warehousing facilities, logistics services, and livestreaming equipment, while jointly engaging in content creation and follower management. Collective operations can thereby reduce individual operating costs. This form of collective action, grounded in geographical proximity and mutual trust, provides a feasible and low-cost pathway toward organization for smallholder farmers who lack capital accumulation and organizational experience.

Third, the advantages of intergenerational division of labor within households should be activated. A household livelihood model based on intergenerational division of labor, commonly known as the "half-working, half-farming" model, is prevalent in rural areas today. Under this arrangement, younger family members migrate to cities for employment and earn wage income, while their elderly parents remain in the village and engage in agricultural production to generate agricultural income. This model can also be applied to rural e-commerce: younger family members can undertake digital skill-intensive tasks such as platform operations, livestreaming, and customer service, while their elderly parents handle labor-intensive tasks such as agricultural production, packaging, and order fulfillment. Policy design should accommodate this pattern of intra-household division of labor by providing differentiated training and support tailored to different age groups and skill levels. Younger generations should receive training in e-commerce operations, data analysis, and content creation, while older generations should focus on practical skills in standardized agricultural production, packaging, and logistics. By activating intergenerational cooperation within households, labor costs associated with e-commerce operations can be effectively reduced, thereby enhancing the overall competitiveness of smallholder farmers.

Fourth, locally based livestreaming hosts among the new generation of farmers should be cultivated. Livestream commerce is becoming an important channel for agricultural product sales, but most smallholder farmers lack the skills required to operate livestreaming businesses. Drawing on the training experience of Yiwu's "Shanli Yunxiao" project, continuous livestreaming skills training should be provided to smallholder farmers, with a particular focus on cultivating locally based "new farmer" livestreaming hosts. Compared with outside livestreaming hosts, local hosts have several advantages: they maintain long-standing relationships of social trust with farmers, are more likely to retain sales profits within the local community, and are not entirely subject to platform traffic allocation rules. The cultivation of local livestreaming hosts is also a process through which smallholder farmers can strengthen their collective bargaining power and capacity for autonomous development. The governance of digital rent is not merely a distributional issue in the field of rural e-commerce; it also concerns the ownership relations and distribution rules governing new forms of means of production in the digital age, including traffic, data, and algorithms. The monopolistic control exercised by platforms over the essential production conditions of digital space shares the same underlying logic as the control exercised by landownership over agricultural production in the classical theory of ground rent. Therefore, the governance of digital rent is fundamentally a matter of adjusting relations of production. It requires the establishment of a distribution system compatible with the level of development of digital productive forces, ensuring that the efficiency gains generated by technological progress are no longer diverted into monopolistic rents appropriated by a small number of platform enterprises. This is one of the central challenges facing the strategy of common prosperity in the digital age.

5. Conclusion

Applying the theory of ground rent developed in *Capital* to contemporary conditions not only addresses the question of the applicability of classical theory in the digital age but also reveals the structural commonality between platform capital's monopolistic control over data, traffic, and algorithms and land capital's monopolistic control over land. This means that policies based solely on "technological empowerment", such as skills training and logistics subsidies, cannot fundamentally improve the distributional position of smallholder farmers, because they fail to address the core mechanism through which platforms extract rent by monopolizing new forms of means of production. Effective governance must address relations of production at their source by breaking the monopoly over rulemaking through platform regulation, correcting distributional structures through policy intervention, and fostering autonomous capabilities through collective action. Only by theoretically exposing the mechanisms through which capital appropriates surplus value can institutional pathways toward distributive justice be identified in practice. This is precisely why *Capital* and its theory of ground rent continue to possess considerable vitality in the age of digital and intelligent labor.

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