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# Intelligent Economy and Income Increase for Urban and Rural Residents: Mechanisms and Paths

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## Abstract

The new form of the intelligent economy, based on data, computing power, and algorithms, systematically reshapes all aspects of economic operation through human-machine collaboration, cross-border integration, and co-creation and sharing, profoundly changing the inherent logic of residents' income generation. This paper systematically examines the mechanisms and paths by which the intelligent economy affects the income growth of urban and rural residents from a theoretical perspective. The study found that the intelligent economy, through the elevation of the status of factors of production, the transformation of the form of the production function, and the reconstruction of distribution relations, has formed a whole new income determination mechanism. Due to the structural differences between urban and rural residents in terms of factor possession, infrastructure, human capital, etc., the income-increasing effect of the intelligent economy shows differentiated characteristics. A new type of value cycle is forming between urban and rural areas, and the income-increasing effects are transmitted to each other. To achieve inclusive income growth, systematic policy responses are needed at four levels: infrastructure integration, data revenue distribution, capacity building, and redistribution mechanisms.

## Keywords

New Form of Smart Economy; Increase In Income For Urban And Rural Residents; Income Determination Mechanism; Human-Machine Collaboration; Inclusive Growth

## 1. Introduction

### 1.1. Questions Raised

The sustained growth of residents' income is the core livelihood goal of economic development and the ultimate yardstick to measure the success of the economic system. During the traditional industrialization period, the increase in the income of urban and rural residents followed a relatively stable and repeatedly verified logical chain: industrialization absorbed a large number of rural surplus laborers, urbanization pushed the transfer of laborers from low-productivity sectors to

high-productivity sectors, and agricultural technological progress increased the output per unit of land and farmers' operating income. The core drivers of this path are the accumulation of physical capital, the transfer of labor across sectors, and the increasing returns to scale. Since the reform and opening up, the income of urban and rural residents in China has continued to grow rapidly under this logical framework, hundreds of millions of people have been lifted out of poverty, and the middle-income group has gradually expanded.

However, in the third decade of the 21st century, this traditional path of income growth is undergoing a fundamental shake-up. One clear sign is that even as the economy continues to grow at a medium-high speed, the capacity of traditional industries to absorb jobs is approaching saturation, wage growth for low-skilled workers is slowing, while the income of high-skilled talents with digital skills and intelligent technologies is growing at an accelerated pace. The deeper change lies in the fact that the intelligent revolution, represented by general artificial intelligence, large models and agent technology, is systematically reshaping production, distribution, circulation and consumption. This reshaping is not a gradual improvement at the technical level, but a fundamental reconstruction of the underlying logic of economic operation. The Government Work Report of the National Two Sessions in 2026 listed "creating a new form of intelligent economy" as an important task for the first time, marking the official entry of China's economic development into a new stage dominated by intelligence.

The new form of the intelligent economy is not a simple extension of the digital economy, but an economic revolution with general artificial intelligence as the core engine. It penetrates intelligent capabilities into all areas of the economy and society, going beyond the instrumental application of "AI +" and achieving a leap from "technology empowerment" to "system reconstruction". In this context, a fundamental theoretical and policy question emerges: How will the intelligent economy affect the income growth of urban and rural residents? Will it, like previous technological revolutions, achieve broader, fairer income growth after short-term adjustments, or will it exacerbate income polarization due to its skill bias and platform monopolies? Is there a systemic difference in the income growth effect of the smart economy between urban and rural residents at different factor endowments, infrastructure conditions and human capital levels? If so, what is the root cause of these differences? Can the smart dividend be shared universally through institutional design and technological governance? These questions are not only about the renewal of income distribution theory, but also directly related to the realization of the goal of common prosperity and the quality of the advancement of Chinese-style modernization.

## 1.2. Literature Review

Existing research on the relationship between artificial intelligence, digital

transformation and residents' income can roughly be summarized into three approaches. The first approach focuses on the "substitution and creation" effect, that is, examining the extent to which intelligent technologies replace jobs and the speed at which new jobs are created. The "task model" proposed by Autor et al. has become the standard framework for analyzing automation and skill requirements, with the core insight that routine tasks are easy to automate, while non-routine, cognitive, and creative tasks are difficult to replace. A large number of follow-up studies suggest that intelligent technologies have a strong ability to replace routine and repetitive tasks, but a relatively limited ability to replace unconventional tasks. Therefore, the employment structure will polarize - high-skilled and low-skilled jobs may increase, while medium-skilled jobs may shrink. This finding has important implications for understanding the impact of the intelligent economy on income distribution, but its limitation lies in viewing intelligent technology as an exogenous "shock variable" and failing to fully examine the systematic changes in income generation rules brought about by the intelligent economy as a whole form.

The second approach focuses on the "skill premium" and income gap. Research shows that smart technologies and automation tend to complement high-skilled labor and replace low-skilled labor, thereby widening the skill premium and widening the income gap between high-skilled and low-skilled workers. Subsequent studies repeatedly verified this conclusion in different countries and at different times, and also found that the expansion of the skills premium would be moderated by the supply of education, the labor market system, and the speed of technology diffusion. In the context of China, existing studies have found that the digital economy has significantly increased the income share of highly skilled workers, but not significantly increased the income of low-skilled workers. However, such studies often view technology adoption as an optimization decision at the enterprise level, while ignoring the key moderating role of institutions, infrastructure, and initial conditions in the process of technology diffusion on income distribution outcomes.

The third approach examines the impact of digital platforms on the income of flexible workers from the perspectives of the "platform economy" and the "gig economy". These studies reveal an important phenomenon: platforms have lowered market entry barriers, enabling a large number of workers to have access to flexible work opportunities, but at the same time they have brought about problems such as income instability, lack of social security, and asymmetry in bargaining power due to algorithmic opacity. Platform workers tend to earn less than comparable positions in traditional employment relationships, and their income volatility is significantly higher. This approach provides a useful perspective for understanding the income characteristics of non-standard employment in the smart economy, but its analysis mainly focuses on the digital economy stage and does not fully cover the element structure changes and distribution relationship reconfiguration specific to the new form of the smart economy with general artificial intelligence at its core.

Overall, there are two shortcomings in the existing research. First, most studies view intelligent technologies as exogenous shock variables rather than examining deep changes in income generation rules from an overall perspective of "economic form transition". The intelligent economy not only changes the technological conditions, but also the relative position of the factors of production, the basic form of the production function, and the inherent logic of value distribution. Second, the analysis of the income disparity between urban and rural residents often follows a dichotomy, paying less attention to the new value cycles and interaction mechanisms that are emerging between urban and rural areas. Rural areas are not only passive sources of labor and supplies of agricultural products, but also important producers of data and application scenarios of intelligent technologies; Towns are not only centers of technology research and development and aggregations of high-end services, but also rely on rural data and markets to form a complete smart economy ecosystem. This article attempts to address those deficiencies.

## 2. Reconfiguration of the income determination mechanism

To understand the impact of the smart economy on income growth, one must first answer a more fundamental question: What changes have occurred in the basic rules of how income is "determined" in the smart economy? In the traditional economy, income is determined by the three major elements of labor, capital and land, and marginal productivity is the fundamental basis for the distribution of remuneration. The smart economy reconfigures this rule on three levels.

### 2.1. Data Elementization

In the traditional economy, residents' income mainly came from the contributions of labor, capital and land. The smart economy elevates data to a key factor of production on par with labor and capital, and its far-reaching significance lies in the fact that data contributors are beginning to qualify for income distribution. Urban and rural residents continuously generate data in their lives and production - farmers' planting data, consumers' behavior data, travel data, health data, etc. These data become the basic resources for training artificial intelligence models and optimizing decision-making algorithms.

Data has economic attributes that are distinct from those of traditional elements. First, data is non-consumable - the same set of data can be used countless times without being worn out. Second, data has the characteristic of increasing marginal benefits - the larger and more diverse the data set, the value it contains tends to grow exponentially. Third, data is non-competitive - one person's use of data does not prevent another from using it at the same time. These attributes mean that the data element participates in distribution by contribution, providing urban and rural residents with an income channel that does not rely on physical capital possession.

The agricultural production data of rural residents may become assets that can be priced and traded; The platform behavior data of urban residents may be rewarded through mechanisms such as data trusts and data dividends. Of course, the potential for revenue growth through data elementization depends on the institutional design of data rights, trading rules and anti-monopoly governance.

## 2.2. Human-Machine Collaboration

In traditional production functions, the growth of labor income follows the law of diminishing marginal returns. The intelligent economy internalizes intelligent technologies as independent variables of the production function. More importantly, there is a qualitative change in the human-machine relationship - from "human-led, machine-assisted" to a deep integration of carbon-based intelligence and silicon-based intelligence. Artificial intelligence takes on a large amount of repetitive, predictive, executive and computationally intensive work, while human attention is freed up to focus on value judgments in complex situations, creative thinking that breaks the framework, emotionally warm interaction and communication, as well as supervision and ethical regulations of the artificial intelligence system itself.

This new division of labor enables a unit of labor time to generate several times more value than ever before. A graphic designer who is proficient in using smart design tools can complete five projects in the time it used to take to complete one project. A farmer who has mastered an intelligent agricultural management system can monitor large tracts of farmland in real time via a mobile phone, implement precise policies, and significantly increase the yield and quality. In these cases, the growth of workers' income no longer mainly depends on extended working hours, but on "the extent to which people are empowered by intelligence" - the higher the synergy efficiency, the higher the marginal output, and the higher the distributive return. However, not everyone has equal access to intelligence, and those workers who do not have the skills of human-machine collaboration may be excluded from the intelligent production system.

## 2.3. Distribution Diversification

Traditional distribution revolves around two major subjects: capital and labor. In the intelligent economy, there are significant changes in the subjects and ways of value creation: roles such as data contributors, algorithm designers, model trainers, system optimizers, and scenario innovators are difficult to be classified into the traditional "capital" or "labor" category. The core of the reconfiguration of distribution relations is to recognize multiple contributions and establish a distribution system in which "data contribution, intelligent creation, labor input, capital investment, technological innovation" are all involved.

The implications for increasing the income of urban and rural residents are multifaceted. First, it provides low-income groups with income growth channels

that do not rely on physical capital possession. An elderly rural man may not have much savings, but the experience data he has accumulated over a long period of agricultural production, if effectively digitized and incorporated into the smart agricultural system, could be rewarded accordingly. Second, it enhances the incentive for workers to collaborate with intelligent systems, creating a virtuous cycle of skill improvement and income growth. Third, it provides more stable income expectations for workers in flexible employment and the gig economy. But challenges also exist: poor identifiable contributions, asymmetry in bargaining power, and lagging legal systems.

## 3. Urban residents' income growth

Urban residents are the main bearers of technology research and development and high-end services in the smart economy, and the income-increasing effect is the first to emerge, but there are significant differentiations among different groups.

### 3.1. High-skilled groups

Highly skilled workers - people who master cutting-edge technologies such as artificial intelligence, data science, algorithmic engineering, and human-computer interaction - have become the most sought-after group in the labor market. The skill premium in the smart economy is more reflected in the ability to "work with intelligent systems", an advanced and difficult-to-standardize capability. A good radiologist is no longer just an expert with precise film reading, but an "intelligence-enhanced doctor" who can effectively utilize AI-assisted diagnostic systems, critically evaluate system outputs, and combine machine analysis results with clinical experience.

Human-machine collaboration boosts revenue in two ways. The first is "doubling efficiency" : smart tools have significantly increased the output per unit time of highly skilled workers, which is directly reflected as income growth in performance-based jobs. The second is "value leap" : human-machine collaboration enables workers to take on more complex, higher-value tasks that were previously impossible. With the help of generative AI, an architect can generate dozens of concept plans in a very short time and then focus on optimizing and integrating the plans, transforming from a "draftsman" to a "creative coordinator", with a qualitative change in the value created and the corresponding remuneration.

### 3.2. Intermediate-skilled group

Intermediate-skilled urban residents have access to two types of income-increasing opportunities through the platform economy and the open smart ecosystem. The first category is platform employment - flexible work through platforms such as food delivery, mobility, design crowdsourcing, and content creation. This form of employment has low entry barriers and high flexibility, allowing workers to arrange

their working hours according to their own circumstances. Platform jobs offer a valuable income buffer for those with family care burdens or in the process of career transition.

The second category is smart tool-enabled self-employment. In the past, independent designers, photographers, and consultants had to handle the entire process from customer acquisition, delivery to after-sales. The emergence of smart customer service, smart marketing tools, and smart schedule management tools has enabled self-employed individuals to focus more on the core value creation process and increase output and income per unit of time. However, platform employment faces risks such as income instability and algorithmic power asymmetry. Platforms determine task allocation, pricing mechanisms, and reward and punishment rules through algorithms, leaving workers with little say and difficulty in obtaining transparent and questionable explanations. This requires institutional arrangements to safeguard the rights and interests of platform workers.

### 3.3. Low-skilled groups

The biggest challenge that the smart economy poses to urban revenue growth is the risk that low-skilled groups face income stagnation or even decline. Smart technologies have a strong ability to replace routine and repetitive tasks. Jobs such as administrative clerks, basic data processors, cashiers, telephone customer service representatives, and some assembly line workers in manufacturing have been significantly reduced. Workers in these positions typically have a low level of education, limited ability to update their skills, and high costs for job transitions.

Skill polarization - with the growth of high-skilled and low-skilled service positions and the contraction of medium-skilled positions - is a typical feature. But low-skilled service jobs, such as elderly care, cleaning, and security, are generally low in income and have limited room for growth, making it difficult to fully absorb the replacements. The solution lies in two directions: one is to establish an intelligent skills retraining system to help workers at risk of replacement migrate to higher skill levels; And through social redistribution and social security systems, ensure that vulnerable groups can share the fruits of the development of the smart economy.

## 4. Increase the income of rural residents

Rural residents have long faced three major constraints: low factor return rate, high market access costs, and slow accumulation of human capital. The smart economy offers new tools to break through these constraints, but also faces the challenge of the "smart divide".

### 4.1. Data-driven agriculture

The smart economy shifts agricultural production from "experience-driven" to

"data-driven". Through technologies such as sensors deployed in the fields, drone remote sensing, and satellite images, real-time data on soil moisture, nutrient content, trends of pest and disease occurrence, and crop growth status are collected. After being processed by intelligent algorithms, precise irrigation, fertilization, spraying, and harvesting suggestions are output. Compared with traditional experience-based management, data-driven precision agriculture can significantly reduce input costs, improve output quality, and reduce yield fluctuations. Farmers' operating income and risk control capabilities have improved simultaneously.

The assetization of agricultural data is another important channel. The production data of farmers, after being aggregated and standardized, can become a valuable resource for agricultural technology companies, insurance companies, futures companies and research institutions. If reasonable data rights and income distribution mechanisms are established, farmers will no longer be merely producers of agricultural products but also producers of agricultural data, and will receive a sustained "data rent". The application of large agricultural models provides small-scale farmers with "personal expert" services, alleviating the long-standing problem of insufficient technical promotion in rural areas.

### 4.2. Smart Logistics and E-commerce

The root cause of the difficulty in selling agricultural products lies in scattered production, remote production areas, multi-link circulation and high loss. The smart economy breaks through this bottleneck in three directions. First, smart logistics networks significantly reduce circulation costs and loss rates. Big data-based path optimization, intelligent warehouse management, and the prevalence of cold chain logistics enable agricultural products from remote areas to reach urban consumers at lower cost and higher timeliness. Second, the intelligent recommendation systems of e-commerce platforms enable "goods to find people", precisely pushing characteristic agricultural products from specific regions to potential consumers, significantly reducing customer acquisition costs. Third, the rise of live-streaming e-commerce and content e-commerce has made "storytelling" an important source of premium for agricultural products. Farmers can build an emotional connection with consumers by showcasing their production environment and product features through short videos and live streaming.

The combined effect of these triple changes is that the path of agricultural products from the production site to the table has been greatly shortened, and more profits in the circulation link remain between producers and end consumers. Rural residents can both sell their products at higher prices and obtain the means of production and living at lower costs, achieving "two-way empowerment".

### 4.3. Digital Inclusive Finance

Low availability of rural financial services has long constrained productive

investment. Smart risk control models assess credit by analyzing a variety of information such as production and operation data, transaction flow, and social network behavior, without the need for traditional collateral, enabling smallholders to obtain credit. A farmer who has been selling agricultural products on e-commerce platforms for a long time, the transaction record itself is a valuable credit proof. Smart agricultural insurance is based on remote sensing and the Internet of Things to quickly assess losses, reduce claims costs, and enable farmers to obtain more adequate coverage at more reasonable premiums.

Credit and insurance accessibility means that rural residents' productive investment capacity and risk-resistance capacity are both enhanced simultaneously. They can try new varieties, new technologies and new business models more boldly without having to worry about getting into debt after one failure. This is an important indirect path for the smart economy to boost rural residents' income - unlocking the potential for income growth by improving the efficiency of factor allocation.

### 4.4. The Smart Divide

While the smart economy has opened up new channels for rural residents to increase their income, there are serious challenges in turning these channels from "possibility" to "reality". There are gaps in rural areas in three dimensions: infrastructure, digital literacy, and institutional environment. Insufficient coverage of 5G networks and edge computing nodes in rural areas; Rural residents, especially the elderly, have a low ability to use smart devices; The system of data rights and income distribution is not sound, and farmers' data is often seized for free. Bridging the gap requires targeted measures such as network coverage, localized training, and data rights protection.

## 5. Deepening urban-rural interaction

The paths for increasing income in urban and rural areas are not isolated but are forming a new type of value cycle that is increasingly close. This cycle not only involves the exchange of economic benefits, but also profoundly changes the relationship structure between urban and rural areas, allowing the income-increasing effects to be transmitted and reinforced to each other.

### 5.1. Market Cycle: Mutual gain of goods and services

Smart logistics and e-commerce platforms not only enable agricultural products to flow more efficiently from rural areas to cities, but also industrial goods and services to flow more conveniently from cities to rural areas. The deeper meaning of this two-way flow for the income increase of urban and rural residents is that rural residents earn higher operating income through the upward movement of agricultural products, and at the same time obtain production and living materials at a lower cost through the downward movement of industrial products, thereby

increasing real purchasing power; Urban residents have improved their quality of life by having more convenient access to high-quality, distinctive and traceable agricultural products, while smart e-commerce platforms and logistics systems have created a large number of employment and entrepreneurship opportunities in urban areas.

From the perspective of the transmission mechanism of income growth, the increase in rural income will expand the rural consumer market, thereby increasing the income of urban enterprises and driving urban employment and wage growth; Urban income growth will increase the demand for high-quality agricultural products, which in turn will boost the income of rural producers. This positive feedback loop becomes tighter and faster in the smart economy. Traditional urban-rural circulation may take weeks or even months to complete a cycle, but with the support of smart logistics and precise matching, the cycle can be compressed to days. This means a stronger multiplier effect on income growth and a closer connection of interests between urban and rural areas. More importantly, this market cycle is giving rise to a new form of urban-rural division of labor: the countryside is no longer just a source of raw materials, and towns are no longer just producers of manufactured goods, but rather a symbiotic relationship based on the division of labor along the value chain.

### 5.2. Data Cycle: From one-way Extraction to two-way empowerment

The core of the smart economy is a closed loop of "data - algorithm - intelligence - value." Rural areas are natural producers of vast amounts of agricultural data, ecological data and traditional knowledge data, while urban areas are the main gathering places for algorithm research and development, model training and smart product design. The data provided by rural areas is processed and transformed by urban enterprises and then fed back to rural areas in the form of intelligent decision support systems, precision agricultural tools, and agricultural forecasting services. In this cycle, the creation and distribution of data value are crucial.

There is a clear imbalance in the current data cycle pattern. Platform enterprises and technology companies charge farmers in the name of "service fees," but farmers' data contributions are often not priced. This unbalanced cycle is not conducive to the sustainability of rural income growth. If a fair data revenue-sharing mechanism is established, rural areas will be able to obtain sustainable returns from the data value chain, creating a positive cycle. Specifically, the deepening of the data cycle can be achieved through three paths: First, converting data contributions into discounts or dividends for services to form a "data-for-service" model; 2 Explore the possibility of data equity, allowing farmers or cooperatives that provide high-quality data for a long time to obtain virtual equity in smart agriculture service enterprises; Third, establish regional agricultural data banks where farmers can earn data points after depositing their data, which can be used to exchange for agricultural supplies,

technology or financial products. The core of these mechanisms is to make farmers truly stakeholders on the smart value chain rather than mere service purchasers.

### 5.3. Labor Cycle: From one-way Outflow to two-way Mutual Aid

The smart economy creates new forms of interaction between urban and rural labor forces, breaking the traditional pattern of "one-way flow of rural labor to urban areas". On the one hand, some rural residents can use remote work and online platforms to provide services such as data annotation, content review, customer service support, and remote design for urban enterprises, earning urban-level labor remuneration without leaving their hometowns. This "leaving the land but not the hometown" employment model is particularly valuable for rural laborers who need to take care of their families or are reluctant to leave their hometowns, and it also injects new impetus into the development of consumption and services in rural areas.

On the other hand, people who have accumulated certain skills and experience in towns can bring smart technologies and operational knowledge to rural areas through remote guidance, regular return home, or entrepreneurship, helping local residents make better use of smart tools to increase their income. This "reverse flow of skills" is of great significance in alleviating the shortage of human capital in rural areas. More deeply, this two-way flow is reshaping the mechanism of human capital accumulation between urban and rural areas. In the past, when rural youth left their hometowns to study and work in towns, the knowledge and skills they acquired rarely returned to the countryside. In the era of smart economy, the prevalence of remote collaboration and digital platforms has greatly reduced the cost of cross-regional dissemination of knowledge and skills, and an algorithm engineer working in a town can remotely guide agricultural cooperatives in his hometown to build smart management systems. This "remote embedding" talent return model offers new possibilities for rural areas to access high-end human capital services.

### 5.4. Ecological Cycle: Redefining the Urban-Rural Symbiotic Relationship

In addition to the circulation of markets, data and labor, the smart economy is giving rise to a deeper urban-rural interaction - the ecological cycle. The ecological environment, natural landscapes and traditional cultural resources in rural areas are being transformed into new sources of income, empowered by the smart economy. Smart tourism platforms can precisely deliver characteristic rural Tours to urban consumers, smart monitoring systems can ensure the quality traceability of ecological agricultural products, and virtual reality technology can enable urban residents to remotely experience rural scenery and generate the willingness to consume. The essence of this ecological cycle is that the ecological and cultural values of rural areas are quantified and commercialized with the empowerment of

smart technologies, becoming a new source of income for rural residents. At the same time, urban residents have gained a higher quality of life experience and spiritual satisfaction, forming a value cycle that goes beyond traditional economic exchange.

The comprehensive deepening of the urban-rural value cycle means that the impact of the smart economy on the income growth of urban and rural residents is not two separate processes, but an increasingly closely interwoven and mutually reinforcing overall process. The market cycle provides channels for the flow of goods and services, the data cycle establishes a mechanism for the co-creation and sharing of value, the labor cycle realizes the two-way supplementation of human resources, and the ecological cycle opens up new Spaces for the exchange of non-material value. These four cycles interweave and support each other, together forming a new pattern of urban-rural relations in the era of intelligent economy. Therefore, when formulating policies to promote inclusive income growth, urban and rural areas should not be treated separately. Instead, a systematic and holistic view is needed.

## 6. Systematic Design of Policy Direction

To achieve universal sharing of the smart dividend, a systematic response is needed at four levels: infrastructure, revenue distribution, capacity building, and redistribution, and these four levels need to be organically connected and coordinated. Any policy in a single dimension - focusing only on towns or only on rural areas, only on technology or only on distribution - may be ineffective due to the neglect of the interaction between systems.

### 6.1. Infrastructure Integration: Equalization of smart access

Infrastructure is the material prerequisite for the smart economy. Without accessible computing power, networks, and smart terminals, all discussions about data contribution, human-machine collaboration, and platform revenue increase are nothing but castles in the air. The current policy focus includes three areas.

First, the in-depth extension of network coverage. Accelerate the extension of 5G networks and edge computing nodes to counties and key towns to ensure that rural areas receive network speeds and stability comparable to those in urban areas. For remote mountainous areas and sparsely populated regions, alternative technologies such as low-orbit satellite Internet and microwave relay can be adopted to avoid the "last mile" becoming an access gap. Second, the universal deployment of public terminals. Deploy iot sensor nodes and public smart terminals at the administrative village level to lower the threshold for farmers to access smart services, especially for low-income farmers who cannot afford personal smart devices. Referring to the historical experience of "telephone access to every village", a "Smart Access to every village" project can be established. Third, agricultural adaptation and adaptation for the elderly. Promote the simplification of the operation interface of smart terminals,

the naturalization of voice interaction, and support for multiple dialects and minority languages. Hardware design should take into account the rural usage environment, such as dust and water resistance, solar charging, etc.

Infrastructure integration is not simply "replicating urban facilities to the countryside", but rather customizing deployment based on the usage scenarios and demand characteristics of the countryside. The computing power demands in towns are focused on real-time interaction and video processing, while those in rural areas may be more concentrated on data collection, model inference and remote monitoring, with different technical configurations and cost structures to choose from. Incorporating smart infrastructure into rural public services, like building village health clinics and activity centers, establish "smart service stations" in administrative villages, equipped with public smart terminals and operation instructors, to provide farmers with free or low-cost Internet access, training and technical support services.

### 6.2. Fair Distribution of data revenue: From resources to income

Rural areas have abundant data resources, but most of these resources are currently being seized for free or at low cost. Establishing a fair data revenue distribution mechanism is a key institutional link for rural residents to share the smart dividend. This system design needs to balance incentive compatibility and fairness and justice, protecting the legitimate rights and interests of data producers while leaving room for the efficient circulation and utilization of data.

Specific policy tools could include: First, the data cooperative model. Promote data cooperatives or data trusts in rural areas, where village collectives or cooperatives represent farmers in collective bargaining with data users. Individual farmers have little bargaining power when facing the data platform, but through the aggregation of collective organizations, a "data pool" of sufficient size can be formed to gain a more favorable negotiating position. Second, financialization of data contributions. In agricultural-related financial products such as agricultural insurance and agricultural credit, clearly define the discount or dividend mechanism for farmers' data contributions - farmers who provide the data can get discounts on insurance rates or preferential loan interest rates. This is both an acknowledgement of data contribution and a positive incentive. Third, the standardization of data collection. Establish minimum necessity principles for rural data collection, transparent notification and usage restriction rules to prevent large platforms from taking advantage of data to squeeze farmers' interests and safeguard farmers' rights to know, correct and delete data.

For urban residents, it is also necessary to establish a fair distribution mechanism for data benefits. A "data dividend" system could be explored, requiring platform companies that reach a certain scale threshold to return a portion of their profits to users in the form of data dividends. Dividends can be in the form of cash, service

discounts, or platform tokens. In the longer term, even a "data basic income" system could be explored, where each citizen receives a regular basic income as a data producer, which comes from a tax or share of excess profits along the data value chain. This, though a rather advanced idea, is logically a possible destination for the evolution of distribution relations in the smart economy.

### 6.3. Tiered and categorized Capacity building: Everyone has an entry ticket

The core of smart income growth is the ability of "people". Intermediate skilled workers in urban areas at risk of replacement and rural areas with weak digital literacy need targeted capacity-building support. The core principle of capacity building is the precision of "one person, one policy" - different groups face different skills gaps, and the content and methods of training should also be different.

For urban residents, focus on training in human-machine collaboration skills. This includes how to effectively utilize intelligent tools to boost productivity, how to critically evaluate and creatively integrate AI outputs, and how to maintain human judgment and ethical boundaries in human-machine collaboration. This kind of training should not be limited to technical operations; it should also include soft skills such as workflow redesign and team collaboration model updates. The trainees can be subdivided into three categories: on-the-job employees at risk of substitution (organized by industry), young people about to enter the labor market (integrated into vocational education courses), and unemployed people hoping to change careers (pre-employment training). The government's role is to provide training subsidies and quality standards, enterprises' role is to offer internship and job transfer opportunities, and educational training institutions' role is to develop flexible and modular courses.

For rural residents, focus on popularizing practical skills such as the operation of smart farm tools, the fundamentals of e-commerce operations, and data analysis. The training methods should be flexible and diverse, making full use of the combination of distance education, short video teaching, and face-to-face tutoring at village service stations to lower the learning threshold. It is particularly worth mentioning the "peer education" model - first train a group of rural youth or village cadres to become "digital counselors", and then they will lead elderly farmers and low-quality groups to use smart tools. This model has been validated in digital literacy projects in some areas and is characterized by low cost and high acceptance. Incorporating intelligence literacy into the national education system and vocational skills training subsidies, establishing incentives for lifelong learning, and encouraging urban and rural residents to continuously update their skills.

### 6.4. The bottom-line function of the redistribution mechanism: Maintaining the bottom line of fairness

Even if the first three levels of policy are effectively implemented, technological substitution and structural unemployment may still occur in some groups. These groups are not "not hardworking enough" or "not smart enough", but are vulnerable to technological shocks. For them, the active intervention of the redistribution mechanism is a necessary safety net. The purpose of redistribution is not to deny efficiency, but to provide a fair starting point for those who are at a disadvantage in the market mechanism.

Specific measures could include: First, an expansion of the unemployment insurance system. Improve the unemployment insurance system to better cover flexible workers and platform workers. At present, China's unemployment insurance mainly covers workers under traditional employment relationships, and a large number of platform workers are excluded. The conditions for participation and benefits of unemployment insurance need to be reformed to accommodate the characteristics of non-standard employment, such as paying premiums based on income rather than working hours and allowing intermittent participation. Second, the Smart Transformation Assistance Fund. Establish special funds to provide transitional income support and re-employment services for workers who lose their jobs due to technology substitution. The sources of funds for the fund could include taxes on automated equipment, moderate social contribution requirements for platform excess profits, and appropriate public funds for data transactions. Third, a sharing mechanism for the smart dividend. Explore a "data tax" or "automation tax," with the tax rate linked to the size of the enterprise's data assets or the level of automation, and the tax specifically used for skills training, unemployment assistance, and rural public services. The design of such taxes requires full consideration of international competitiveness and corporate burden and should be coordinated within a multilateral framework.

### 6.5. Four-Strategy coordination: The logic of Systematic advancement

The four policies - infrastructure, revenue distribution, capacity building, and redistribution - are not separate projects, but an organic whole that supports each other. Infrastructure is the prerequisite for capacity building, which cannot be implemented without network coverage and smart terminals. Capacity building is a prerequisite for the distribution of data benefits. Without digital literacy, farmers cannot understand and use the tools of data contribution, let alone safeguard their own data rights. Data revenue distribution provides a financial basis for redistribution, and reasonable data taxation and platform contributions can provide a stable source of funds for the Smart Transformation Assistance Fund. Redistributive outcomes, in turn, provide social consensus and political support for continued investment in infrastructure and expansion of capacity building.

Therefore, there is a need for systems thinking in advancing policies to avoid fragmentation and contradictions. For example, simply subsidizing rural residents

to purchase smart devices without improving the distribution of data revenue may only benefit device providers and even increase farmers' debt burden. Simply encouraging urban enterprises to develop smart agricultural technologies without establishing rural data rights protection may only strengthen the existing data extraction pattern. Only when the four policies work together can a systematic promotion effect be achieved and the new form of smart economy truly become a common engine for increasing the income of urban and rural residents.

## 7. Conclusions and Prospects

The new form of the smart economy is not a technological upgrade of the digital economy, but a systematic reconstruction of the underlying logic of economic operation. This paper conducts a theoretical analysis of this reconstruction from three levels: production factors, production functions, and distribution relations, and on this basis systematically examines the mechanism of its impact on the increase of income for urban and rural residents. The study found that the intelligent economy has opened up new sources of income through data factorization, provided new mechanisms for enhancing labor returns through human-machine collaboration, and broadened qualifications and channels for participating in income distribution through diversified distribution. These changes have created a vast space beyond traditional paths for urban and rural residents to increase their income.

Due to the differences in initial conditions between urban and rural areas, the income-increasing effect of the smart economy shows differentiated characteristics. Among urban residents, the high-skilled group is the first to gain a premium, the medium-skilled group faces both opportunities and risks, and the low-skilled group bears replacement pressure. Rural residents have access to new channels such as data value-added, market access and financial inclusion, but are constrained by the "smart divide". A multi-value cycle of markets, data, labor and ecology is forming between urban and rural areas, with the income-increasing effects reinforcing each other. The depth and fairness of these value cycles will determine the ultimate income distribution pattern of the smart economy.

To achieve inclusive income growth, four policies - infrastructure integration, data revenue distribution, capacity building, and redistribution mechanisms - will need to work in tandem. Infrastructure integration addresses the question of "whether it can be used", capacity building addresses the question of "whether it can be used", data revenue distribution addresses the question of "whether it can be used well", and the redistribution mechanism addresses the question of "what if someone can't use it?" The four policies form a complete policy loop that supports each other and cannot be dispensable. Only when the logic of technological innovation is unified with the logic of inclusive development can the smart economy truly become a common engine for increasing the income of urban and rural residents.

Looking ahead, the relationship between the smart economy and income distribution will continue to evolve with technological advancements and institutional changes. The further enhancement of general artificial intelligence capabilities, the deepening of human-machine collaboration models, and the maturation of the data element market will all bring new revenue growth opportunities and differentiation risks. This paper mainly conducts an analysis of the theoretical mechanism, and further research can be conducted in the following directions: First, use micro-survey data to empirically test the mechanism proposed in this paper and quantify the actual contribution of various income channels; Second, based on the dynamic general equilibrium model, simulate the long-term distributive effects of different policy combinations to provide quantitative basis for policy design; Third, conduct case studies on the practices of innovative models such as data cooperatives, data trusts, and data dividends to extract generalizable experiences; Fourth, pay attention to the income security of the elderly in the context of the smart economy. This group has the most significant "smart gap" and is the most likely to be overlooked by policies. Research on the smart economy and income distribution will remain at the core of economic studies for a considerable period of time in the future. This is an inevitable requirement for achieving common prosperity in the intelligent age and an important element of the path of Chinese-style modernization.

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