Analysis of the Dynamic Adjustment Mechanism of Structural Unemployment and Income Support Policies Driven by Artificial Intelligence

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Abstract: The rapid advancement of artificial intelligence has significantly changed the employment structure, leading to structural unemployment marked by the decline of middle-skilled positions and the polarization of employment opportunities. This evolution creates challenges for traditional income support policies. This paper analyzes the formation logic and manifestations of structural unemployment, points out the limitations of traditional policies in design, coverage accuracy, and tools, and demonstrates the necessity of dynamic adjustment. Furthermore, this study constructs a dynamic adjustment mechanism including core objectives, operating principles, and core dimensions. It suggests optimization methods from three perspectives: reshaping the relationship between policies and skills, enhancing adaptive inclusiveness, and reinforcing long-term security. It offers theoretical and practical ideas for responding to the employment challenges in the AI era and promoting the inclusive development of the social economy.

1. Introduction

1.1 Research Background

With the rapid development of artificial intelligence, the global labor market is undergoing unprecedented changes. Automatic and intelligent production modes have gradually replaced traditional labor-intensive industries, resulting in a sharp decline in the demand for some professional positions. At the same time, it has spawned new employment opportunities. The reform is not completely synchronized, and many workers fall into structural unemployment because of the mismatch between skills and market demand.

Faced with the challenges, governments need to re-examine the existing income support policies to ensure that all members of society can share the economic benefits brought about by technological progress fairly. Policymakers need to develop an adjustment mechanism to adapt to the rapidly changing employment environment and promote the inclusive development of the social economy [1].

1.2 Research Significance

In the face of the profound transformation of the job market led by artificial intelligence, it is of great significance to comprehensively study the dynamic adjustment mechanism of structural unemployment and income support policies. It allows us to analyze the new unemployment phenomenon in the economy and its impact on social stability. It provides a theoretical foundation for developing more targeted and adaptive public policies. Research can offer guidance for policymakers and help to create a more flexible and inclusive policy framework, ensuring that technological changes do not marginalize workers.

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Additionally, exploring an effective policy adjustment mechanism will promote the sustainable development of society and coordinate economic growth with social welfare. Through systematic analysis and suggestions for practice, this research will promote the formation of a set of dynamic and sustainable coping strategies and provide support for the sustained and healthy development of the future economic structure and labor market.

2. Formation Logic and Manifestation of Structural Unemployment Driven by AI

2.1 The Core Characteristics of Structural Unemployment

The structural unemployment driven by AI presents a distinct imbalance, the core of which is the polarization of the job market and the systematic contraction of middle-level jobs. The repercussions of this phenomenon are most acutely felt by those occupying middle-skilled occupations. Conventional office work and standardized customer service operations, which depend on process operations, are undergoing a decline due to the adoption of AI automation tools, which poses a significant risk of unemployment [2].

In contrast, the job market exhibits a trend of "expansion up and down, contraction in the middle." High-end AI-related occupations, such as algorithm research and development, intelligent system operation and maintenance, and related fields, experience rapid growth due to the demand for technical iteration. In contrast, low-end manual service occupations, including personalized housekeeping and on-site auxiliary services, persist due to the difficulty of automation replacement, resulting in an "hourglass" employment structure. This differentiation directly led to the disintegration of the employment base of the "old middle class". Individuals in middle-skilled jobs often face job instability, leading to weakened mobility between social classes and a rise in class differentiation, emphasizing the structural and long-term nature of unemployment.

2.2 The Underlying Causes of Structural Unemployment

The root of structural unemployment lies in the fundamental mismatch between the speed of technological advancement and the pace of labor market adjustment. On the one hand, AI technology evolves at an exponential pace, and its reshaping of production methods and business models far exceeds the rigid cycle of labor skill renewal. The traditional education system and vocational training mode struggle to keep pace with technological evolution, resulting in a disconnection between labor skills and market demand.

On the other hand, AI's breakthrough in the law of marginal income of production factors has changed the transmission logic of employment demand: intelligent algorithms have improved the marginal income of capital and data, making enterprises more inclined to achieve efficiency improvement through technological substitution rather than human expansion, which has an asymmetric impact on labor demand: The diminution of middle-skilled employment can be attributed to the phenomenon of strong substitutability. Concurrently, the paucity of high-end employment opportunities is attributable to the elevated technical threshold, thereby giving rise to an imbalance between supply and demand. The impact of AI on labor productivity has led to a heightened differentiation in employment demand, with technology-related jobs experiencing a significant premium. Therefore, low-end jobs can be retained because of irreplaceability, which further solidifies the formation mechanism of structural unemployment.

3. Using Income Support Policies to Deal with Structural Unemployment

3.1 Limitations of Traditional Income Support Policies

Previous income support policies have shown significant limitations in dealing with structural unemployment driven by AI. There is a fundamental conflict between policy design and technological change. Traditional policies are mostly based on a stable employment structure and a predictable unemployment mode, which makes it difficult to adapt to the rapid reconstruction of the job market brought about by the exponential iteration of AI, resulting in a policy adjustment lagging behind

unemployment [3].

There is a contradiction between the ambiguity of coverage groups and the need for precise data on structural unemployment. Traditional policies tend to emphasize inclusiveness or focus on groups affected by cyclical unemployment. In contrast, structural unemployment is defined by the decline of middle-skilled jobs and the polarization of the job market. Therefore, it is necessary to accurately cover specific groups, such as the old middle class, and it is difficult for existing policies to achieve targeted protection. In addition, there is a mismatch between the simplification of policy tools and the diversification of unemployment causes. Traditional policies mostly rely on passive subsidies such as unemployment relief and minimum living security. In contrast, structural unemployment stems from underlying causes such as skill mismatch and changes in market demand [4]. It is necessary to combine skills training, incentives, and transitional support for emerging jobs, because the existing tools are difficult to address the root causes of unemployment.

3.2 The Necessity of Dynamic Adjustment

Dynamic adjustment of income support policy is an inevitable requirement to deal with structural unemployment in the AI era. It is an urgent need to alleviate the intensification of social differentiation. Structural unemployment leads to the erosion of the employment base of the "old middle class" and the strengthening of social stratification. If the policy remains unchanged, it will further widen the income gap of different groups and aggravate social contradictions. Thus, in the dynamic adjustment process, the risk of class solidification is minimized through accurate guarantees.

Dynamic adjustment is the key to balancing the mobility of the labor market and economic efficiency. Due to the progress of AI, the labor force will shift to high-end jobs and emerging fields, and the solidified support of traditional policies may weaken the motivation for labor force transformation. Dynamic adjustment can guide the rational flow of the labor force through incentive tools, considering security and efficiency. Moreover, it is an inherent requirement to adapt to the transformation of the production mode and value distribution mode. AI reshapes the law of marginal income of production factors and the logic of value creation. The design of traditional policies, based on the linear correlation between labor and income, has not adapted to the new distribution model. Dynamic adjustment will promote the adaptation of policies to the value distribution system in the AI era [5].

4. The Construction Framework of Dynamic Adjustment Mechanism of Income Support Policy

4.1 The Core Goal of Mechanism Design

As for the dynamic adjustment mechanism of income support policy, its core goal is to realize the deep adaptation between policy and structural changes in the AI era, which specifically includes three aspects. First, it is necessary to promote the coordinated evolution of policy and technology iterations. By implementing a policy update system that aligns with the rapid advancement of AI technology, income support policies can better anticipate the effects of technology on the employment structure. This includes recognizing the reduction of middle-skilled jobs and the rising demand for high-end AI positions. Such a proactive approach can help prevent policies from lagging behind shifts in unemployment patterns, creating a cohesive feedback loop of "technological evolution, employment adjustment, and policy response."

Second, it is necessary to improve the protection for individuals affected by structural unemployment. To effectively support the groups most affected by unemployment, particularly the older middle class, we need to move beyond traditional methods that offer broad and imprecise coverage. Instead, we should create tailored support programs that address specific causes of unemployment, such as skills mismatches, job displacement, and industry transformation. This approach will help us tackle the income disparities faced by middle-skilled workers, provide better protection for low-end job groups, and meet the transitional needs of high-skilled job groups. Our goal is to achieve "targeted protection" for those in need.

Third, it is suggested to promote the rational allocation of labor resources in emerging fields. To

effectively guide the labor force in adapting to the AI-driven industrial transformation, it's essential to use policy tools that address both immediate and long-term needs [6]. While providing short-term income support can help alleviate the survival pressure on the unemployed, we should also encourage the workforce to transition into high-end AI jobs and positions within the digital economy. They can be achieved through incentive policies such as skills training subsidies and employment incentives for emerging jobs. By doing so, we can avoid the tendency for policies to become merely passive relief measures and instead foster a positive cycle of "guarantee, transformation and re-employment".

4.2 The Basic Principles of Mechanism Operation

In the AI era, the mechanism operation needs to conform to the complexity and dynamics of technological development, so it needs to follow three core principles.

The first one is the forward-looking principle. By predicting the development trend of AI technology, including the iterative direction of large models and the path of industrial penetration, the coverage and support of the policy will be adjusted in advance. For example, to avoid delays in policy responses to potential unemployment issues, we can proactively establish a "preventive support pool" for jobs that may be replaced by AI in the future, such as primary data processing and standardized copywriting.

The second is the principle of flexibility. Breaking the "fixed-cycle adjustment" mode in traditional policies, we should build an elastic framework of "real-time monitoring-quick response": policy tools should be combined, such as unemployment relief and skills training subsidies can be dynamically switched; Support standards need to remain floating, such as adjusting the subsidy amount according to the technical substitution rate; Coverage groups need to be dynamically updated, such as bringing emerging unemployment types into the policy category, to cope with the uncertainty brought about by technological changes.

The third is the principle of considering fairness and efficiency. While ensuring the basic income of structurally unemployed groups, it is necessary to avoid the inhibition of "welfare dependence" on the vitality of the labor market. By establishing a differentiated incentive mechanism—such as increasing the subsidy amount for individuals who participate in skill training and providing periodic rewards for those who transition to new jobs—we can balance the relationship between ensuring a bottom line and encouraging incentive transformation. This approach not only addresses the issue of social disparities but also allows for greater labor mobility, which is essential for improving economic efficiency in an AI-driven environment.

4.3 Core Dimension of Mechanism

The core dimension of the mechanism includes three mutually supporting systems: monitoring and early warning, policy tools, and subject coordination. For the monitoring and early warning dimension, it is suggested to build a linkage monitoring system between AI technology diffusion and employment structure change. On the one hand, it monitors the depth of AI influence across various industries in real-time, including the rates of automatic replacement and the application scope of intelligent algorithms. It also forecasts areas of job contraction and expansion, as well as the speed of these changes. On the other hand, it is essential to continuously monitor labor market data, including the unemployment rate for middle-skilled jobs, the disparity between the supply and demand for high-end AI jobs, and the rate of skill mismatches. Additionally, we should develop a corresponding model based on the technical shock index and unemployment risk level to provide data support for policy adjustments.

For the dimension of policy tools, it is suggested to build a "multi-level tool combination" system. The primary focus is on short-term income tools, such as special subsidies for structural unemployment and transitional basic income, aimed at alleviating the immediate survival pressure on unemployed individuals; The middle layer is a skill reshaping tool (such as AI skill training subsidy and emerging industry entry certification subsidy) to promote the upgrading of labor skills; The top level is a transformation incentive tool (such as employment subsidies for emerging jobs and entrepreneurship support funds), which guides the labor force to flow to AI-related fields and forms a tool chain of "guarantee, promotion and transformation".

For the dimension of subject collaboration, it is necessary to establish a linkage network among the government, enterprises, and social institutions. The government is responsible for designing policies, monitoring their implementation, and providing early warnings. Enterprises, on the other hand, are tasked with disclosing information about technical disruptions and offering post-transformation training, such as reemployment guidance for displaced employees. Social institutions, including trade associations and vocational colleges, play a role in skills training and connecting individuals to job opportunities. This division of responsibilities ensures that no single entity bears the entire burden of policy implementation, thereby creating a collaborative model of "multi-party governance."

5. Prospect of Optimizing the Dynamic Adjustment Mechanism of Income Support Policy

5.1 Strengthen the Connection Between Policy and Skill Remolding System

In the AI era, to solve the problem of skill mismatch and structural unemployment, the core path lies in strengthening the deep connection between income support policy and skill remolding system. To this end, relevant departments need to build a closed-loop mechanism of "policy guarantee-skill training-employment transformation": directly link the income support policy with the goal of skill remolding, such as raising the short-term income subsidy standard for structural unemployed groups who participate in AI-related skills training (such as algorithm foundation and intelligent system operation); Groups that have passed skill certification and successfully transformed into high-end AI positions or emerging fields will be given phased incentives and subsidies. Through this series of measures, a positive cycle of "ensuring support, enhancing skills, and promoting employment" will be established to prevent the policy from becoming merely passive relief.

It is necessary to promote the dynamic adaptation of skill training content to the evolving AI. It is suggested to update the skill training catalogue in real time by relying on the monitoring data of AI technology: focus on developing skills upgrading for the unemployed individuals with medium skills (such as changing from traditional copywriting work to AI-assisted content creation); For low-end post practitioners, train their digital basic skills, including the use of intelligent tools and online service specifications, to ensure that the training content is synchronized with market demand.

In addition, it is suggested to build a cross-subject collaborative network for skill remolding. Encourage enterprises, vocational colleges, and industry associations to engage in the provision of skills training through policy guidance. Enterprises should contribute to training costs by, for instance, offering internal job transfer training for employees affected by AI substitution. Vocational colleges adjust their curriculum systems in line with the AI industry's development trends. Trade associations publish white papers outlining skills requirements. By activating the participation kinetic energy of multiple subjects, the income support policy will realize the deep transformation from "financial subsidy" to "capacity empowerment."

5.2 Improve the Adaptability and Inclusiveness of Policies

To improve the adaptability and inclusiveness of policies, we need to respond to the diversified characteristics of employment patterns and unemployed groups driven by AI. It is suggested to build a differentiated policy toolkit based on unemployed individuals. For high-end post-transformation groups (such as engineers transitioning to AI R&D auxiliary roles), the income compensation during the transition period is designed to offset the income loss during the skill upgrading period. Additionally, it is essential to provide "skills learning subsidies and entrepreneurial support" for unemployed groups in middle-skilled jobs (such as office workers replaced by automation technology). For practitioners in low-end manual service positions, there is a need to strengthen the "basic income guarantee and digital skill subsidy" to address the policy's coverage gap for specific groups.

Second, it is essential to carry out policy innovation to adapt flexible employment and new employment forms. Driven by AI, the odd-job economy, and platform employment, these trends are becoming increasingly common. Therefore, it is necessary to break through the traditional policy

design of "full-time employment as the benchmark" and extend the scope of income support to non-standard employment groups. For example, for groups relying on AI platforms for flexible work, floating subsidies should be provided based on the length of labor or the amount of service completed. At the same time, it should be incorporated into the vocational skills training system to balance employment flexibility and security.

Moreover, it is important to pay attention to the policy adaptability of vulnerable groups. For the elderly and individuals with low education who are more vulnerable to structural unemployment due to AI technology, a simplified version of the support scheme is designed. For example, relevant institutions provide offline skills training channels and develop training courses on aging-adaptive smart tools to avoid "technical exclusion" caused by excessive dependence on digital means, and ensure the fairness of policy coverage.

5.3 Improve Long-Term Security and Risk Prevention and Control

Perfecting the long-term guarantee and risk prevention and control mechanism is the key to ensuring the sustainability of the dynamic adjustment of income support policies. First, there is a need to establish a dynamic evaluation and feedback system to assess the policy's effectiveness. Regular evaluation of the policy's implementation effect is necessary, based on monitoring data of employment structure changes. They involve assessing the coverage accuracy of various unemployed groups, such as the proportion of the "old middle class," from an equity perspective. Second, assess the incentive effects of the policy on the flow of labor into emerging fields, for example, the employment rate following skills training, from an efficiency standpoint. Third, examine the financial sustainability of the policy from an economic perspective. Additionally, adjust the combination of policy tools and support in real-time based on the evaluation results to prevent rigidity in the mechanism.

Second, we should guard against potential risks in policy operation. First, to prevent welfare dependence, a gradient exit mechanism for income support is established, which gradually reduces the subsidy amount as employment income increases. Second, in light of financial pressure risks, consider exploring multiple funding sources, such as allocating a specific percentage of AI enterprise profits to a special guarantee fund. Third, considering the risk of technical substitution forecast deviations, create a buffer for policy adjustments, such as establishing an "emergency protection pool" to address sudden large-scale unemployment.

In addition, it is necessary to build a multi-subject responsibility-sharing mechanism. It is essential to clarify the boundaries of rights and responsibilities of the government, enterprises and society in income support: the government is responsible for policy design and bottom-up protection; Enterprises bear the responsibility of early warning of technical shock and part of the cost (such as paying "AI replacement adjustment fund"); Social institutions participate in policy implementation supervision and effect evaluation, reduce pressure by dispersing responsibilities, and ensure the mechanism to maintain stable operation in the long-term evolution of AI.

References

[1] Goulas E, Zervoyianni A. Suicide mortality, long-term unemployment, and labor-market policies: Evidence from European countries[J]. Bulletin of Economic Research, 2023, 75(4): 1112-1139. DOI: 10.1111/boer.12397.

[2] Xu G, Xue M. The relationship between proactive personality and migrant workers' perception of technical unemployment risk under the impact of artificial intelligence in China[J]. Frontiers in Psychology, 2025.DOI:10.3389/fpsyg.2025.1474639.

[3] Frank M R, Yong-Yeol A, Esteban M .AI exposure predicts unemployment risk: A new approach to technology-driven job loss[J]. PNAS Nexus, 2025(4):4. DOI:10.1093/pnasnexus/pgaf107.

[4] Merola R. Inclusive Growth in the Era of Automation and AI: How Can Taxation Help?[J]. Frontiers in Artificial Intelligence, 2022, 5.DOI:10.3389/frai.2022.867832.

[5] Loukis E N, Maragoudakis M, Kyriakou N. Artificial intelligence-based public sector data analytics for economic crisis policymaking[J]. Transforming Government People Process and Policy, 2020, ahead-of-print(ahead-of-print).DOI:10.1108/TG-11-2019-0113.

[6] Salari N, Beiromvand M, Hosseinian-Far A, et al. Impacts of generative artificial intelligence on the future of labor market: A systematic review[J]. Computers in Human Behavior Reports, 2025, 18.