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NEW INSIGHTS INTO THE DETERMINANTS OF THE URBAN-RURAL INCOME GAP IN CHINA

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Abstract: This article analyzes the determinants of the urban-rural income gap in China by taking the endowment structure as a starting point. The paper proposes a theoretical hypothesis and proves it with a mathematical model, demonstrating that policy measures can effectively narrow the urban-rural income gap by narrowing the urban and rural endowment structure gap. The authors used China's provincial panel data from 2006 to 2019 to empirically test the theoretical model. The paper also summarizes previous literature on the impact of industrial structure upgrading on the urban-rural income gap and unifies the impact of policy factors and economic factors on the upgrading of the endowment structure to provide a general analytical framework for studying their relationship. The study concludes that the fluctuation of the endowment structure difference in urban and rural areas fundamentally determines the urban-rural income gap. Overall, the article highlights the importance of narrowing the urban and rural endowment structure gap through policy measures to reduce the urban-rural income gap in China.

Keywords: China, endowment structure, urban-rural income gap, policy measures, industrial structure upgrading, comparative advantage.

Introduction

China's rapid economic growth has led to a significant urban-rural income gap, which has become a major challenge to the sustainability of its development. The impact of urbanization and industrialization on the urban-rural income gap has been widely discussed, but the role of the endowment structure in determining the gap has not been fully explored. This article aims to analyze the determinants of the urban-rural income gap in China by taking the endowment structure as a starting point.

The paper proposes a theoretical hypothesis and proves it with a mathematical model, demonstrating that policy measures can effectively narrow the urban-rural income gap by narrowing the urban and rural endowment structure gap. The study also used China's provincial panel data from 2006 to 2019 to empirically test the theoretical model. The paper summarizes previous literature on the impact of industrial structure upgrading on the urban-rural income gap and unifies the impact of policy factors and economic factors on the

upgrading of the endowment structure to provide a general analytical framework for studying their relationship.

Overall, the article highlights the importance of narrowing the urban and rural endowment structure gap through policy measures to reduce the urban-rural income gap in China. The study is significant in advancing the understanding of the determinants of the urban-rural income gap in China and provides insights for policymakers to effectively address this challenge.

2. Theoretical Hypothesis

In new structural economics, endowment structure represents the economic resources that an economy can use at a certain point, and it is the basis for establishing the industrial structure. At the same time, heterogeneous industries have heterogeneous demands for endowment, so the need for different levels of industrial structure for endowment structure is different. Only when the demand for endowment structure matches its supply, can the optimal industrial structure that maximizes labor productivity be established.

Justin Yifu Lin (2019) regards the per capita capital stock as the core of the endowment structure, this paper also uses it to express the endowment structure. This choice conforms to the reality and theoretical logic of the urban sector. For the rural sector, the reason for choosing per capita capital stock are as follows: on the one hand, the land endowment can be regarded as exogenous which is difficult to accumulate; on the other hand, the rapid economic growth depends fundamentally on the accumulation of capital factor, the latter can increase the capital investment to purchase equipment and improve the production efficiency.

Therefore, this paper chooses per capita capital stock to represent the endowment structure to explain the fluctuation of the urban-rural income gap. On this basis, the accumulation of endowment structure refers to the increase of per capita capital stock through investment, and the flow of endowment structure refers to the flow of capital and labor between urban and rural areas, which causes the change of per capita capital stock.

First, it is assumed that at an initial time point, there is no accumulation and flow of endowment and policy influence. The initial endowment structure of urban and rural sectors determines the initial optimal industrial structure and then determines the initial output level of urban and rural sectors, which determines the initial urban-rural income gap. Specifically, in the initial state, the rural sector is relatively scarce in capital and rich in labor, so the per capita capital stock is relatively low. The urban sector is relatively rich in capital and scarce in labor, and the per capita capital stock is relatively high. Therefore, under the theoretical framework of optimal industrial structure, the optimal industrial structure in the rural area is labor-intensive, which determines the relatively low output level of the rural area. However, the optimal industrial structure of the urban sector is capital-intensive, which determines the relatively higher output level of the urban area. Thus, the first hypothesis of this paper is obtained:

Hypothesis 1: The initial difference in the level of endowment structure fundamentally determines the difference in per capita output between the urban and rural areas, and thus determines the initial urban-rural income gap.

Second, relax the assumption that there is no endowment accumulation, and consider the change of urban-rural income gap determined by the difference of initial endowment structure and endowment accumulation. According to the Solow model, the growth of per capita capital stock depends on the output level, savings rate, and depreciation rate, assuming that there is no difference in depreciation rate between two areas. Among them, the output level is fundamentally determined by the initial endowment structure level. The savings rate depends on the capital income, and the latter is endogenously and determined by the initial endowment structure. Therefore, the savings rate is fundamentally determined by the initial endowment structure level, and the higher the latter, the higher the savings rate. Therefore, under the condition that both urban and rural

areas conform to the comparative advantage to establish the optimal industrial structure, the capital accumulation level of urban sectors is higher. 2. It is assumed that the growth rate of the labor force in the two areas is the same. The change in the ratio of capital stock to labor force determines the level of endowment accumulation. The endowment structure of the urban area accumulates relatively faster, which aggravates the urban-rural output gap and the urban-rural income gap. This leads to the second hypothesis.

Hypothesis 2: When the urban and rural sectors are separated from each other and conform to their comparative advantage to establish industry, the initial endowment structure gap determines that the endowment accumulates faster in the urban area, expanding the urban-rural output gap, and ultimately expanding the urban-rural income gap.

Third, relax the assumption that there is no endowment flow. 1. Consider capital flow. Under the condition that capital can flow freely between urban and rural areas, the direction of capital flow depends on the difference in capital return between the two sectors. The amount of capital flow depends on the level of capital accumulation and the flow ratio, which is positively related to the absolute amount of the urban-rural income gap. As the capital income level in the urban sector is higher, the capital will flow from rural to urban. The income level, savings rate, and flow ratio of the rural sector jointly determine the amount of capital flow from rural to urban. 2. Consider labor mobility. When the labor force can flow freely, the urban-rural income gap determines that the labor force flows from the countryside to the city. The quantity of labor mobility depends on the quantity of rural labor and the proportion of rural labor mobility, which is positively related to the urban-rural income gap. Under the influence of economic factors, the capital and labor force will both flow from the countryside to the city. Therefore, it is impossible to determine the impact of endowment flow on the difference in the upgrading speed of the endowment structure between two areas through qualitative analysis, and it is impossible to determine the direction of its impact on the urban-rural output gap and the urban-rural income gap. This needs to be further analyzed in combination with policy factors.

Fourth, relax the assumption that there is no policy impact. 1. The endowment flow is affected not only by economic factors, but also by policy factors, and the effect of the latter is often greater than that of the former. In China's economic reality, urban-biased policies have existed for a long time since the three major reforms, including the registered residence system, the urban-biased welfare system, and fiscal policies. These urban-biased policies will accelerate the capital flow from rural to urban areas, and limit or promote the labor flow according to the need of urban development: labor flow will be restricted when there is too much labor supply in cities, and labor flow will be promoted when labor is inefficient in cities. Urban-biased policies and economic factors jointly promote the capital flow from rural to the urban areas, while the regulation of the labor force fluctuates, it will promote the upgrading of the urban endowment structure in general, which will be compounded with the endowment accumulation to expand the urban-rural income gap.

When the urban-biased policy leads to a large income gap between urban and rural areas, there are sometimes rural biased policies, including increasing the purchase price of agricultural products, relaxing the household registration system, and increasing government subsidies, which are mixed with economic factors to reduce or reverse capital transfer, accelerate the labor flow to cities, and make the output growth of rural area faster than that of cities in a certain period time. It can offset the expansion of the urban-rural output gap caused by the effect of endowment accumulation to a large extent, thereby narrowing the urban-rural income gap. Based on Hypothesis 1 and Hypothesis 2, the core hypothesis of this paper is obtained by adding the effect of endowment flow.

Hypothesis 3: The fluctuation of the difference in the endowment structure, which is jointly determined by the difference in the initial endowment structure, the effect of endowment accumulation and endowment flow,

fundamentally determines the fluctuation of the output gap between urban and rural sectors, and ultimately determines the fluctuation of the urban-rural income gap. This is the core theoretical hypothesis of this paper, which is then demonstrated by a mathematical model and empirical test respectively.

3. Mathematical Model

3.1 Theoretical Basis: Endowment Structure, Industrial Structure, and Optimal Per Capita Income

3.1.1 Profit Maximization and Optimal per Capita Income

Set the production function and per capita output function as:

$Y = F(K, L) = AK^{\alpha}L^{1-\alpha}$, $y = f(k, l) = Ak^{\alpha}$ (1) Assume that the factor density feature is α and it is constant, technology progress rate A is exogenous, p is the exogenous price of products, and the profit function of per capita output is:

$\pi(x) = p\,y - r\,x - w$ (2)

W is the wage per worker and r and x represent respectively the unit price and quantity of per capita capital. Suppose that the per capita income of the previous period is all used for the production activities in the next period, that is $rx + w = py_0$. py is the per capita nominal income of the current period, π(x) represents the new value created by the unit labor force, and the per capita income of the current period is equal to the per capita income of the previous period determined by exogenous factors plus the new value created by personal labor of the current period:

$py = \pi(x) + rx + w$ (3) The logic of neoclassical economic theory is that a single department chooses the input level of factors to pursue the maximization of profits:

$max*\pi(x) = p\,y - r\,x - w +$ (4)

$r = p \cdot \frac{\partial y}{\partial x}$ (5)

Under the given exogenous conditions that $y_0 = rx + w$, the maximization of profit in the current period is equivalent to the maximization of per capita income in the current period, that is, the optimal per capita income is: $max*p\,y = \pi(x) + r\,x + w +$ (6)

3.1.2 Optimal Industrial Structure and Optimal per Capita Income

Relax the assumption that the feature of factor density α is exogenous, and establish the optimal industrial structure by selecting the feature of factor density. Let the value creation function of the labor force be:

$v(a(k)) = \pi(x) + w = py - rx = py - rk = pAk^{\alpha} - p \cdot \frac{\partial y}{\partial k} \cdot k$ (7)

The optimal industrial structure is determined by making the supply and demand of the endowment structure equal, that is x = k, to maximize the value created by the labor force, that is, maximize the labor productivity:

$max\{v(a(k)) = pAk^{\alpha} - p \cdot \frac{\partial y}{\partial k} \cdot k\};\ s.t. x = k$ (8)

$\frac{\partial v(\alpha)}{\partial \alpha} = p \cdot A \cdot (k^{\alpha} \cdot lnk - k^{\alpha} - k^{\alpha} \cdot \alpha \cdot lnk) = 0$ (9) The structure change equation is obtained:

$\alpha = 1 - \frac{1}{\ln k}$ (10)

The per capita income function is:

$pf(\alpha(k)) = \pi(x) + rk + w = pAk^{\alpha}$ (11)

$p \cdot \frac{\partial f}{\partial \alpha} = p \cdot A \cdot k^{\alpha} \cdot lnk$ (12)

The supply of endowment structure is given as k, and $\alpha = 1 - \frac{1}{\ln k}$, because $1 \geq \alpha \geq 0$, so $k \geq e$ and the above function can be written as:

$p \cdot \frac{\partial f}{\partial \alpha} = p \cdot A \cdot \frac{1}{e} \cdot \frac{k}{\ln k} > 0$ (13)

Given the level of price p and endowment structure k, the optimal per capita income increases with the increase of factor density α. At this time, the maximization of the value created by the labor force is realized at the same time as the maximization of the profit, the latter is equivalent to the maximization of the per capita income. The structural change equation reveals that the level of the endowment structure determines the optimal industrial structure which is the result of labor productivity maximization.

3.1.3 Endowment Structure Level and Optimal per Capita Income Relax the assumption that k is exogenous:

$$pf(\alpha(k)) = pAk^{\alpha} = p \cdot A \cdot k^{1-\frac{1}{\ln k}} = p \cdot A \cdot \frac{1}{e} \cdot k \quad (14)$$

$$p \cdot \frac{\partial f}{\partial k} = A \cdot \frac{1}{e} > 0 \quad (15)$$

Therefore, given the price and technology level, the optimal per capita income is fundamentally determined by the level of the endowment structure, and the above reveals the path that the endowment structure determines the optimal per capita income.

3.2 Initial Endowment Structure of Two Sectors, Endowment Accumulation and the Widening of the Urban-rural Income Gap

3.2.1 Initial Endowment Structure, Endowment Accumulation and Optimal per Capita Income in the Rural Area Suppose that the production function of the rural sector and per capita production function is:

$Y_r = F_r(K, L) = A_r K^{\alpha} L^{1-\alpha}$, $y_r = f_r(k, l) = A_r k_r^{\alpha}$ (16) The initial endowment structure supply of the rural sector is k_r, and the optimal production structure to maximize the value of rural labor is $\alpha = 1 - \frac{1}{\ln k_r}$. Therefore, the initial optimal per capita income in the rural sector is:

$$p_r y_r = p_r A_r k_r^{\alpha} = p_r A_r \frac{1}{e} k_r \quad (17)$$

The price level and technical level are exogenous.

Relax the assumption that there is no endowment accumulation, consider the accumulation effect based on the initial endowment structure, and consider the impact of the endowment accumulation on the optimal per capita income growth.

First, consider the change in the capital stock in the rural sector:

$$\Delta K_r = s_r F^r(\alpha(k)) - \delta_r K_r \quad (18)$$

s_r represents the savings rate of the rural sector, $F^r(\alpha(k))$ represents the total output of the rural sector, $\delta_r K_r$ represents the capital depreciation and assumes that the depreciation rate is exogenous. The steady state of capital, consumption, and gold saving rate is available:

$$s_r f^r(\alpha(k)) = \delta_r k_r^* \quad (19)$$

$$k_r^* = \frac{\delta}{s}^{\frac{1}{\alpha-1}} \quad (20)$$

$$c^* = (1 - s_r) f^r(k_r^*) = f^r(k_r^*) - \delta k_r^* = \frac{\delta}{s}^{\frac{\alpha}{\alpha-1}} - \delta \frac{\delta}{s}^{\frac{1}{\alpha-1}} \quad (21)$$

$$s_r^* = \alpha = 1 - \frac{1}{\ln k_r} \quad (22)$$

Therefore, the level of the savings rate is fundamentally determined by the level of the endowment structure, which rises with the accumulation of the endowment structure. Then, consider the change in the labor force in the rural sector:

$$\Delta L_r = n_r L_r \quad (23)$$

n_r represents the net growth rate of the rural labor force that is exogenous. Thus, the accumulation level of the endowment structure can be obtained:

$$\Delta\left(\frac{K_r}{L_r}\right) = \Delta k_r = s_r f^r(\alpha(k)) - (\delta_r + n_r) k_r \quad (24)$$

Then we can get the growth rate of the endowment structure:

$$\gamma_{k_r} = \frac{\Delta k_r}{k_r} = \frac{s_r}{e} - (\delta_r + n_r) \quad (25)$$

The growth rate of the endowment structure increases with the increase of the savings rate, while the savings rate increases with the accumulation of the endowment. Therefore, given the exogenous depreciation rate and the net growth rate of labor, the accumulation level of the endowment is fundamentally determined by the level of the initial endowment structure.

Then consider the upgrading of the industrial structure of the rural sector:

$$\alpha = 1 - \frac{1}{\ln k_r} \quad (26)$$

$$\Delta\alpha = \frac{\partial\alpha(t)}{\partial k(t)} \cdot \Delta k_r = \frac{1}{\ln k(t)^2} \cdot \gamma_{k_r} \quad (27)$$

$$\frac{\Delta\alpha}{\alpha} = \gamma_\alpha = \frac{\partial\alpha}{\partial k} \cdot \frac{k(t)}{\alpha(t)} \cdot \Delta k_r = \mu_{\alpha k_r} \cdot \gamma_{k_r} \quad (28)$$

$$\gamma_\alpha = \frac{1}{(\ln k_r - 1)\cdot \ln k_r} \cdot \gamma_{k_r} \quad (29)$$

$\mu_{\alpha kr}$ represents the elasticity of α and k_r. It can be seen that the upgrading speed of the industrial structure depends on the accumulation speed and supply level of the endowment structure.

Finally, consider the optimal per capita income change in the rural sector. Per capita output growth in the rural sector: $\ln y_r = \alpha \ln k_r$ (30)

$$\gamma_r = \frac{\Delta y}{y} = \alpha(t)\gamma_{k_r} + \alpha(t)\ln k_r(t)\gamma_\alpha = (\alpha(t) + 1 - \alpha(t))\gamma_{k_r} = \gamma_{k_r} = \frac{s_r}{e} - (\delta_r + n_r) \quad (31)$$

Therefore, the growth rate of per capita output is equal to the growth rate of the endowment structure. The latter is determined by the level of the savings rate, which is fundamentally determined by the supply level of the initial endowment structure. Therefore, the optimal per capita output growth rate of the rural sector is fundamentally determined by the supply level of its endowment structure.

The initial optimal per capita income of the rural area is known as:

$$p_r y_0 = p_r A_r \frac{1}{e} k_{r_0} \quad (32)$$

After considering the accumulation of endowment, the optimal per capita income of the rural sector in the first period is:

$$p_{r1} y_1 = p_{r1} A_r \frac{1}{e} k_{r_0} \left(\frac{s_r}{e} - (\delta_r + n_r)\right) \quad (33)$$

3.2.2 Initial Endowment Structure, Endowment Accumulation, and the Optimal per Capita Income of the Urban Sector

Set the urban sector production function and per capita production function as:

$Y_u = F_u(K, L) = A_u K^\beta L^{1-\beta}$, $y_u = f_u(k, l) = A_u k_u^\beta$ (34) The initial endowment structure supply of the urban sector is $k_u > k_r$. Thus, the optimal industrial structure of the urban sector can be obtained as:

$$\beta = 1 - \frac{1}{\ln k_u} > \alpha \quad (35)$$

The initial optimal per capita income of the urban sector is:

$$p_u y_u = p_u A_u k_u^{\ \beta} = p_u A_u \frac{1}{e} k_u \quad (36)$$

The price level and technical level are exogenous. The change in total capital in the urban sector is:

$$\Delta K_u = s_u F^u(\beta(k)) - \delta_u K_u \quad (37)$$

s_u represents the savings rate of the urban sector, $F^u(\beta(k))$ represents the total output of the urban sector, and $\delta_u K_u$ represents the depreciation of capital, assuming that the depreciation rate is exogenously given. The saving rate that maximizes steady-state consumption is:

$$s_u^{\ *} = \beta = 1 - \frac{1}{\ln k_u} \quad (38)$$

Next, consider labor force changes in the urban sector:

$\Delta L_u = n_u L_u$ (39)

n_u represents the net growth rate of the labor force in the urban sector. Thus, the accumulation and growth rate of the endowment structure can be obtained:

$\Delta(\frac{K_u}{L_u}) = \Delta k_u = s_u f^u(\beta(k)) - (\delta_u + n_u)k_u$ (40)

$\gamma_{k_u} = \frac{\Delta k_u}{k_u} = \frac{s_u}{e} - (\delta_u + n_u)$ (41)

Consider the upgrading of the industrial structure of the urban sector:

$\beta = 1 - \frac{1}{\ln k_u}$ (42)

$\gamma_\beta = \frac{1}{(\ln k_u - 1)\cdot \ln k_u} \cdot \gamma_{k_u}$ (43)

Considering the optimal per capita income growth of the urban sector, the optimal per capita output growth rate of the urban sector is:

$\gamma_u = \frac{s_u}{e} - (\delta_u + n_u)$ (44)

The initial optimal per capita income of the city is:

$p_u y_0 = p_u A_u \frac{1}{e} k_u$ (45)

After considering the accumulation of endowment, the optimal per capita income of the urban sector in the first period is:

$p_{u1} y_1 = p_{u1} A_{u1} \frac{1}{e} k_{u0} (\frac{s_u}{e} - (\delta_u + n_u))$ (46)

3.2.3 The Change in Urban-rural Endowment Structure Difference and the Widening of the Urban-rural Income Gap The initial endowment structures of urban and rural sectors are k_r and k_u respectively.

The difference in the initial endowment structure is $k_u - k_r$. After the accumulation of endowment structure, the

urban-rural endowment structures are $k_{r_0}(\frac{s_r}{e} - (\delta_r + n_r))$ and $k_{u_0}(\frac{s_u}{e} - (\delta_u + n_u))$ respectively. Since the level of the endowment structure determines the level of the saving rate, the gap of the initial endowment structure determines the difference in the saving rate and endowment accumulation, which expands the gap of endowment structure between the two areas. The gap in endowment structure in the first period is:

$k_{u_0}(\frac{s_u}{e} - (\delta_u + n_u)) - k_{r_0}(\frac{s_r}{e} - (\delta_r + n_r)) > k_u - k_r$ (47)

The widening gap in endowment structure brings about the widening of the urban-rural income gap:

$p_{u1} A_u \frac{1}{e} k_{u_0}(1 + \frac{s_u}{e} - (\delta_u + n_u)) - p_r 1 A_r \frac{1}{e} k_{r_0}(1 + \frac{s_r}{e} - (\delta_r + n_r)) > p_u A_u \frac{1}{e} k_u - p_r A_r \frac{1}{e} k_r$ (48)

3.3 The Endowment Flow of the Two Sectors and the Fluctuation of the Urban-rural Income Gap

3.3.1 The Endowment Flow of the Rural Sector and the Optimal per Capita Income

The direction of capital flow depends on the urban-rural capital income gap and policy impact. The amount of capital flow depends on the savings rate, output level, and capital flow rate. The capital flow rate depends on the urban-rural income gap and policy impact.

First, consider capital flows. The capital gains of urban and rural sectors are:

$r_r = p_r \alpha k_r^{\alpha-1} = p_r \frac{1}{e}\left(1 - \frac{1}{\ln k_r}\right),\ r_u = p_u \beta k_u^{\beta-1} = p_u \frac{1}{e}(1 - \frac{1}{\ln k_u})$ (49)

The gap in the endowment structure of urban and rural sectors determines that the level of capital returns of urban sectors is higher:

$r_u > r_r$ (50)

Therefore, under the influence of economic factors, capital flows from rural to urban areas. This is different from the traditional conclusion. According to neoclassical economics, when other factors remain unchanged, marginal productivity decreases with the increase of capital investment. Therefore, capital will flow from urban areas with low capital prices to rural areas with high capital prices. This analysis only considers the supply and demand factor of the endowment structure but neglects the influence of structural factors. In the theory of optimal industrial structure, the per capita capital price r depends on the combined effect of the supply and demand factors of the endowment structure and the level of industrial structure. The increase in capital investment in urban areas will not lead to the decline of the marginal price, on the contrary, its marginal contribution will increase, which makes the per capita capital price higher in the urban sector with abundant capital. In addition, in the presence of policy impact, urban-biased policies and urban-rural capital income gap will compound to accelerate the flow of capital from rural to urban areas. The impact of rural-biased policy on capital flow is opposite to the impact of the urban-rural capital income gap, and the former will reverse the direction of capital flow, making capital flow from cities to villages. Second, consider the amount of the capital flow. The change of rural capital after considering capital flow is:

$$\Delta K_r = s_r F^r(\alpha(k)) - (\varphi s_r F^r(\alpha(k)) - \epsilon s_u F^u(\beta(k))) - \delta_r K_r \quad (51)$$

$\varphi s_r F^r(\alpha(k))$ represents the capital transferred from the countryside to the city, and $\epsilon s_u F^u(\beta(k))$ represents the capital transferred from the city to the countryside. $s_r F^r(\alpha(k)) - \delta_r K_r$ represents the capital accumulation effect and $(\varphi s_r F^r(\alpha(k)) - \epsilon s_u F^u(\beta(k)))$ represents the net outflow of capital from the rural sector. It reflects the compound effect of capital flow and accumulation. Under the influence of purely economic factors, $(\varphi s_r F^r(\alpha(k)) - \epsilon s_u F^u(\beta(k)))$ is positive, which means capital flow from rural to urban areas. φ is positively related to the level of the urban-rural income gap, and ϵ is negatively related to the amount of the urban-rural income gap. Then we consider the influence of policy factors. When the policy is urban-biased, the amount of net capital outflow is positively related to the policy strength, φ is positively related to the policy strength, and ϵ is negatively related to the policy strength. The urban-rural income gap and policies will compound to increase net capital outflows. When the policy is rural-oriented, the net capital outflow quantity is negative, and the net capital outflow quantity is negatively correlated with the policy intensity, φ is negatively correlated with the policy intensity, and ϵ is positively correlated with the policy intensity. Since China is a socialist country, policy factors will play a more important role than economic factors and bring net capital inflow to the countryside.

The direction of labor mobility depends on the urban-rural wage gap and policy impact, the number of labor mobility depends on the number of rural laborers and the proportion of migration, and the proportion of migration depends on the urban-rural wage gap and policy impact.

First, consider the direction of labor mobility. Wages of urban and rural departments are respectively:

$$w_u = \frac{\partial Y}{\partial L} = \frac{1}{e} \frac{k_u}{\ln k_u}, \quad w_r = \frac{\partial Y}{\partial L} = \frac{1}{e} \frac{k_r}{\ln k_r} \quad (52)$$

$$w_u > w_r \quad (53)$$

Therefore, under the influence of economic factors, the direction of labor flow is from the rural areas to urban areas. Second, consider the number of rural labor flows. The change in rural labor after considering labor mobility is:

$$\Delta L_r = n_r L_r - \omega L_r = (n_r - \omega) L_r \quad (54)$$

ω indicates the proportion of labor mobility. Under normal circumstances, there is almost no labor flow from cities to villages, so it is not considered. The quantity of labor transfer depends on the total amount of labor and the mobility ratio, which is positively related to the urban-rural wage gap. When the policy is urban biased,

ω may be negatively related to the policy intensity or positively related to the policy intensity, because the demand for urban labor will fluctuate in different stages. When the policy is rural biased, it is positively related to the policy intensity and accelerates the transfer of the labor force.

Third, consider the growth of rural endowment structure that joins in the flow of endowment structure. The growth formulas of rural capital and labor force are:

$$\Delta K_r = s_r F^r(\alpha(k)) - \delta_r K_r - (\varphi s_r F^r(\alpha(k)) - \epsilon s_u F^u(\beta(k))) \quad (55)$$

$$\Delta L_r = (n_r - \omega) L_r \quad (56)$$

The modified endowment structure growth formula is obtained:

$$\Delta(\frac{K_r}{L_r}) = \Delta k_r = s_r f^r(\alpha(k)) - (\delta_r + n_r)k_r - \varphi s_r f^r(\alpha(k)) + \frac{\epsilon s_u F^u(\beta(k)))}{L_r} + \omega k_r \quad (57)$$

$-\varphi s_r f^r(\alpha(k)) + \frac{\epsilon s_u F^u(\beta(k)))}{L_r} + \omega k_r$ is the difference between the unmodified endowment structure growth formula and the modified endowment structure growth formula, which represents the flow effect of the endowment. The first item is the decrease of per capita capital caused by capital outflow from rural sectors, the second item is the increase of per capita capital caused by the capital inflow, and the third is the increase of per capita capital caused by labor outflow. The growth formula of the endowment structure reflects the combined effect of the accumulation effect and the flow effect of the endowment. The growth rate of the endowment structure is:

$$\gamma_{k_r} = \frac{\Delta k_r}{k_r} = (\frac{s_r}{e} - (\delta_r + n_r)) - (\frac{\varphi s_r}{e} - \omega - \frac{\epsilon s_u F^u(\beta(k)))}{k_r L_r}) = \gamma_{y_r} \quad (58)$$

The optimal per capita income in rural areas is determined by the accumulation effect and mobility effect of the endowment:

$$p_{r1} y_1 = p_{r1} A_r \frac{1}{e} k_{r_0}\{1 + (\frac{s_r}{e} - (\delta_r + n_r)) - (\frac{\varphi s_r}{e} - \omega - \frac{\epsilon s_u F^u(\beta(k)))}{k_r L_r})\} \quad (59)$$

The flow effect will fluctuate with policy bias, and the direction of its influence cannot be analyzed in a blanket way. When the policy is rural-biased, the outflow effect of the endowment structure is small or even negative. Under the compound effect of the endowment accumulation effect and flow effect, the endowment structure and the optimal per capita income of rural areas increase rapidly. When the policy is urban-biased, the outflow effect of the endowment is positive, which will offset the accumulation effect of endowment in the rural areas, hindering the upgrading of rural endowment structure and the growth of optimal per capita income.

3.3.2 Flow of Urban Sector Endowment and Optimal per Capita Income

The formulas for the growth of capital and labor in the urban sector with capital flows are:

$$\Delta K_u = s_u F^u(\beta(k)) - \delta_u K_u + \varphi s_r F^r(\alpha(k)) - \epsilon s_u F^u(\beta(k)) \quad (60)$$

$$\Delta L_u = n_u L_u + \omega L_r \quad (61)$$

The modified endowment structure growth formula of the urban sector is:

$$\Delta(\frac{K_u}{L_u}) = \Delta k_u = s_u f^u(\beta(k)) - (\delta_u + n_u)k_u + (\frac{\varphi s_r F^r(\alpha(k))}{L_u} - \epsilon s_u f^u(\beta(k)) - \frac{\omega L_r \cdot k_u}{L_u}) \quad (62)$$

Compared with the unmodified growth formula of urban endowment structure, there are three different items, which represent the flow effect of the endowment. The first item is the increase of per capita capital caused by rural capital inflow, the second item is the decrease of per capita capital caused by urban capital outflow, and the third item is the decrease of per capita capital caused by population inflow. Then we can get the growth rate of the endowment structure:

$$\gamma_{k_u} = \frac{\Delta k_u}{k_u} = (\frac{s_u}{e} - (\delta_u + n_u)) + (\frac{\varphi s_r F^r(\alpha(k))}{L_u \cdot k_u} - \frac{\epsilon s_u}{e} - \frac{\omega L_r}{L_u}) = \gamma_{y_u} \quad (63)$$

The optimal per capita income of the urban sector in the first phase determined by the accumulation effect and mobility effect of the endowment is:

$$p_{u1}y_1 = p_{u1}A_u\frac{1}{e}k_{u_0}\{(1+(\frac{s_u}{e}-(\delta_u+n_u))+(\frac{\varphi s_r F^r(\alpha(k))}{L_u\cdot k_u}-\frac{\epsilon s_u}{e}-\frac{wL_r}{L_u})\} \quad (64)$$

Generally, the two effects strengthen each other to promote the growth of the endowment structure and optimal per capita income. However, if the policy is rural biased, the flow effect of the endowment will be negative, which will offset the accumulation effect of endowment and inhibit the growth of the endowment structure and the optimal per capita income.

3.3.3 The Flow of Endowment and the Fluctuation of the Urban-rural Income Gap

The gap in the endowment structure in the first phase after joining the endowment flow is:

$$k_{u_0}\{(1+(\frac{s_u}{e}-(\delta_u+n_u))+(\frac{\varphi s_r F^r(\alpha(k))}{L_u\cdot k_u}-\frac{\epsilon s_u}{e}-\frac{wL_r}{L_u})\}-k_{r_0}\{1+(\frac{s_r}{e}-(\delta_r+n_r))-(\frac{\varphi s_r}{e}-\frac{\epsilon s_u F^u(\beta(k)))}{k_r L_r}) \quad (65)$$

The urban-rural income gap in the first phase after joining endowment flow is:

$$p_{u1}A_u\frac{1}{e}k_{u_0}\{(\frac{s_u}{e}-(\delta_u+n_u))+(\frac{\varphi s_r F^r(\alpha(k))}{L_u\cdot k_u}-\frac{\epsilon s_u}{e}-\frac{wL_r}{L_u})\}-p_{r1}A_r\frac{1}{e}k_{r_0}\{(\frac{s_r}{e}-(\delta_r+n_r))-(\frac{\varphi s_r}{e}-\omega-\frac{\epsilon s_u F^u(\beta(k)))}{k_r L_r})\} \quad (66)$$

Assuming that the policy is urban-biased, the mobility effect of endowment in urban and rural sectors is positive, and both are positively related to the urban-rural income gap and policy strength. The combination of the accumulation effect and the mobility effect of endowment further expands the urban-rural output gap. When the policy is rural biased, the mobility effect of endowment in the two sectors is negative, which makes the endowment structure gap between the two sectors and the urban-rural income gap smaller than when only considering the accumulation effect of the endowment. When the effect is large enough, it can make the urban-rural income gap smaller than the initial income gap. Therefore, the urban-rural income gap fluctuates with the fluctuation of the endowment structure gap in different economic development stages.

Considering the above analysis, this paper verifies the core hypothesis through mathematical models: Without considering the price factor, the initial endowment structure gap and the accumulation effect of endowment expand the income gap between urban and rural sectors. The combination of economic factors and policy bias determines the mobility effect of the endowment. The combination of the accumulation effect and the mobility effect of endowment determines the optimal industrial structure of urban and rural sectors, and ultimately determines the fluctuation of the urban-rural income gap in different economic development stages.

4. Regression Model, Variables, and Data

4.1 Model Settings

In the mathematical model, Hypothesis 1 and Hypothesis 2 are the basis of Hypothesis 3, and Hypothesis 3 is the modeling of economic reality, which is the theoretical core of this paper. The core explanatory variable is the per capita capital stock, which represents the level of the endowment structure. The per capita capital stock data displayed in the statistical yearbook is the final result of the combined effects of the initial endowment structure, the accumulation effect of the endowment structure, and the flow effect of the endowment structure. Therefore, it can be directly used as an indicator to measure the level of the endowment structure in the urban and rural sectors. According to the theoretical model and hypothesis 3, this paper believes that the per capita capital stock will have a positive impact on the urban-rural income gap, which is the conclusion to be demonstrated by the empirical test in this part. The following will study the impact of per capita capital stock on China's urban-rural income gap based on provincial panel data from 2006 to 2019. The benchmark regression model is set as follows:

GAPit □□0 □□1lnk□□4*Xit* □□*i* □□*it* (67)

i represents the province and t represents the year. GAP_{it} represents the urban-rural income gap, lnk represents the logarithm of the ratio of urban-rural per capita capital stock, X_{it} represents control variables, γ_i is the provincial fixed effect, ε_{it} is a random perturbation term.

4.2 Variable Description

4.2.1 Explained Variable

This paper chooses Theil index to measure the urban-rural income gap. Theil index refers to the weighted average sum of the logarithms of the ratio of income share and population share in urban and rural areas, where the weight is the income share in urban and rural areas. Thiel index is more sensitive to the income changes of people in both the low-income and high-income groups, which is in line with the changes in the urban-rural income gap reflected primarily in the high-income and low-income groups in China. Therefore, this paper uses the Thiel index to measure the urban-rural income gap. Its expression is as follows:

$$T = y_1 \ln(\frac{y_1}{p_1}) + y_2 \ln(\frac{y_2}{p_2}) \quad (68)$$

y1 and y2 respectively represent the proportion of urban and rural income in total income; p1 and p2 respectively represent the proportion of urban and rural population in total population; x1 and x2 represent the per capita income of the urban and rural population; n1 and n2 represent the number of the urban and rural population.

$$p_1 = \frac{n_1}{n_1+n_2},\ p_2 = \frac{n_2}{n_1+n_2},\ y_1 = \frac{n_1x_1}{n_1x_1+n_2x_2},\ y_2 = \frac{n_2x_2}{n_1x_1+n_2x_2} \quad (69)$$

When there is no income gap between urban and rural areas, the income share is equal to the population share, and the Theil index is 0, that is, y1=p1, y2=p2.

$$\ln\left(\frac{y_1}{p_1}\right) = 0,\ \ln(\frac{y_1}{p_1}) = 0,\ T = 0 \quad (70)$$

When there exists an income gap between urban and rural areas, the expressions p1, p2, y1 and y2 are substituted into Theil index calculation formula to obtain:

$$T = \frac{x_1p_1}{x_1p_1+x_2p_2}\ln\frac{x_1}{x_2} + \ln\frac{x_2}{x_1p_1+x_2p_2} \quad (71)$$

$$\frac{\partial T}{\partial x_1} = \frac{x_2p_1p_2\ln(\frac{x_1}{x_2})}{(x_1p+x_2-x_2p)^2} \quad (72)$$

$$\text{if} x_1 > x_2, \frac{\partial T}{\partial x_1} > 0;\ \text{if}\ x_1 < x_2, \frac{\partial T}{\partial x_1} < 0 \quad (73)$$

The greater the urban-rural income gap, the greater the Theil index.

4.2.2 Explanatory Variable

This paper selects the logarithm of the ratio of urban and rural per capita capital to measure the difference between urban and rural endowment structures. The perpetual inventory method is adopted to measure the physical capital stock in urban and rural areas of each province. The calculation formula for the physical capital stock is:

$$K_{i2006} = \frac{I_{i2006}}{g+\delta} \quad (74)$$

K_{i2006} represents the capital stock of region i in the base year 2006, I_{i2006} represents the fixed asset investment of region i in the base year 2006, g and δ represent the investment growth rate and depreciation rate respectively. Among them, the data of I_{i2006} is taken from the China Statistical Yearbook, and the value of g is calculated by the formula:

$$g = \frac{I_{it}^{\frac{1}{n}}}{I_{i0}} \quad (75)$$

and the depreciation rate refers to the data used in the literature. Then we can calculate the capital stock of each region in 2006. Based on the data in 2006, we can calculate the capital stock for the following years:

$$K_{it} = \frac{I_{it}}{P_{it}} + (1-\delta)K_{it-1} \quad (76)$$

P_{it} refers to the fixed asset price index of year t in region i.

This paper selects the provincial consumer price index (last year=100) to measure the price change. This is because the common price change in urban and rural areas can explain the income gap to a certain extent on the one hand, and is conducive to the simplified expression of the equation on the other hand. Therefore, this paper selects the consumer price index of each province.

4.2.3 Control Variables

First, the degree of opening up, which is measured by the proportion of total imports and exports of each province in GDP. Second, the government's support for agriculture, which is measured by the proportion of the local government's expenditure on supporting agricultural production in local fiscal expenditure. Third, the degree of industrialization, which is measured by the proportion of the added value of the secondary industry in GDP. Fourth, the urbanization rate, which is measured by the proportion of the urban population in the total population.

4.3 Data Source

The data used in this paper are mainly from the China Statistical Yearbook, the China Rural Statistical Yearbook, and the database of the National Bureau of Statistics. Among them, Beijing, Shanghai, Tianjin, and Chongqing are special samples of municipalities that are not included in this empirical test. At the same time, interpolation and extrapolation are used to supplement some missing data. The sample period of selected data is 2006-2019.

5. Empirical Results and Analysis

5.1 Benchmark Regression

In the analysis of panel data, it is necessary to test the model setting to determine the empirical analysis form of the model. Therefore, mixed effect regression is made at first. Secondly, the fixed effect regression is carried out. The P value in F test is 0, indicating that fixed effect regression is better than mixed effect regression. Thirdly, the random effects model is tested. The LM test rejected the original hypothesis that there are no individual random effects, indicating that the random effect regression is better than the mixed-effect regression. At last, the Hausman test indicates that fixed effect regression is better than random effect regression, and we choose the fixed-effect model.

Next, we will examine the impact of the ratio of urban and rural per capita capital on the urban-rural income gap. Table 2 shows the results of benchmark regression from 2006 to 2019. It can be found that the goodness of fit of the model (3) is more ideal which adds control variables and fixed effects of year and provinces. According to model (3), the marginal effect of the endowment structure on the urban-rural income gap is 0.015, which is significant at the level of 5%, indicating that under the control of other factors, the net effect of the endowment structure on the urban-rural income gap is significantly positive, and a 1% increase in the endowment structure will lead to a 0.015 increase in the urban-rural income gap. So Hypothesis 3 is verified.

Table 2. Benchmark regression

Variables	(1) Theil index	(2) Theil index	(3) Theil index
lnk	0.019**	0.017***	0.016**
	(0.009)	(0.004)	(0.007)
CPI	0.003*	0.002***	0.003***
	(0.002)	(0.000)	(0.001)

trade		-0.033*	-0.062***
		(0.019)	(0.014)
gov		0.118	0.238**
		(0.106)	(0.104)
industry		0.456***	-0.054
		(0.086)	(0.088)
Constant item	-0.213	-0.328***	-0.214
	(0.172)	(0.054)	(0.145)
Year fixed effect	Not control	Not control	Control
Province fixed effect	Not control	Not control	Control
Observation numbers	378	378	378
R2	0.784	0.539	0.814

Note: t values are in parentheses; * , * * , and * * * represent the significance levels of 10%, 5%, and 1%, respectively. The below is the same.

5.2 Robustness Test

5.2.1 Instrumental Variable

When the urban-rural income gap expands to a certain extent, the government will increase its support for the development of the rural area through rural biased policies, thus increasing the per capita capital stock in the rural areas, which may lead to the emergence of reverse causal problems and result in inconsistent estimates. For example, during 2004-2012, in response to the three rural issues of "agriculture, rural areas, and farmers", the central "No. 1 Document" made strategic arrangements and instructions around increasing farmers' output and income, forming a systematic policy framework for strengthening, benefiting and enriching farmers. Taking agriculture as an example, the Land Contract Law of the People's Republic of China was implemented in 2003, the minimum purchase price policy for rice, wheat, and other agricultural products was introduced in 2004, the direct subsidy policy for grain planting was implemented in 2004, the fine seed subsidy for livestock products was implemented in 2005, the comprehensive subsidy for agricultural materials was implemented in 2006, and the agricultural tax was completely abolished in 2006. During this period, the urban-rural income ratio shrunk from 3.23 in 2004 to 3.10 in 2012. To avoid the endogenous problem caused by the above reverse causality, this paper uses two-stage least squares regression to test the relationship between the endowment structure and the urban-rural income gap. Since the urban-rural income gap in each year does not affect the ratio of urban and rural per capita capital stock in the past and meets the exogenous assumption of instrument variables and disturbance terms, this paper uses the ratio of urban and rural per capita capital stock that lags behind two periods as the instrumental variable for 2SLS regression and the result is listed in column (4) of Table 4. The test of the correlation between instrumental variables and endogenous variables can be identified by the following two tests: first, the value of Kleibergen-Paap rk LM statistic is 62.011, and the P value is 0.0000<0.01, which strongly rejects the original hypothesis, indicating that tool variables are related to endogenous variables. Second, the Wald F statistic of the weak instrumental variable test is 541.528, strongly rejecting the original hypothesis, indicating that the instrumental variable is not a weak instrumental variable. According to the results in column (4) of Table 4, the marginal effect of the endowment structure on the urban-rural income gap is significantly positive at the level of 1%. At the same time, the regression coefficient of the endowment structure that lags behind two periods is greater than the benchmark case, indicating that the lag

effect of the endowment structure gap on the income gap may be more important, and hypothesis 3 is still valid.

5.2.2 Indicator Replacement

This paper conducts a robustness test by replacing the Thiel index with the logarithm of the ratio of the urban-rural per capita income gap. The results are shown in column (5) of Table 4. It can be seen from the results that the marginal effect of the endowment structure on the urban-rural income gap is significantly positive at the level of 1%. Hypothesis 3 is still valid.

5.2.3 Adding Control Variable

This paper further conducts a robustness test by adding the control variable of urbanization rate, and the results are shown in column (6) of Table 3. It can be seen from the results that the marginal effect of the endowment structure on the urban-rural income gap is positive, but its significance has decreased, and it is significant at the 10% level. Hypothesis 3 is still valid.

Table 3. Robust test

Variables	(4) IV(2sls)	(5) Indicator replacement	(6) Adding control variable
lnk	0.031***	0.040***	0.014*
	(0.005)	(0.011)	(0.007)
CPI	0.008***	0.004	0.003**
	(0.003)	(0.003)	(0.001)
trade	-0.005	-0.172***	-0.044**
	(0.012)	(0.027)	(0.019)
gov	0.292***	0.645***	0.232**
	(0.088)	(0.145)	(0.102)
industry	0.043	-0.382***	-0.084
	(0.033)	(0.092)	(0.080)
urban			-0.149
			(0.090)
Constant items	-0.890***	0.707**	-0.077
	(0.309)	(0.340)	(0.118)
Year fixed effect	Control	Control	Control
Province fixed effect	Control	Control	Control
Observation numbers	324	378	378
R2	0.530	0.882	0.819

5.3 Heterogeneity Test

This paper examines the impact of the endowment structure gap on the urban-rural income gap in provinces with different government support for agriculture. We calculate the average of government support to agriculture in each province from 2006 to 2019, and take the average of government support to agriculture in the national sample from 2006 to 2019 as the dividing line, then divide the sample into two groups and conduct regression respectively. According to the results in Table 4, on the one hand, the impact of the endowment structure gap on the urban-rural income gap is significant at 5% and 10% levels respectively. On the other

hand, in regions with less government support for agriculture, the regression coefficient of the endowment structure is higher and the impact is more significant, which indicates that the income gap effect caused by the endowment structure change due to policies is higher in these areas.

Table 4. Heterogeneity test

Variables	(7) Areas with less support for agriculture	(8) Areas with great support for agriculture
lnk	0.022**	0.013**
	(0.008)	(0.006)
CPI	0.003*	0.005**
	(0.001)	(0.002)
trade	-0.036***	-0.164***
	(0.007)	(0.041)
gov	0.015	0.354***
	(0.073)	(0.086)
industry	-0.133	0.004
	(0.121)	(0.054)
Constant item	-0.164	-0.349*
	(0.131)	(0.211)
Year fixed effect	Control	Control
Province fixed effect	Control	Control
Observation numbers	196	182
R	0.919	0.778

6. Conclusion

Based on the basic principle of new structural economics, this paper conducts mathematical and empirical analysis of the fundamental determinants and transmission paths of urban-rural income gap fluctuations.

First of all, through theoretical analysis and mathematical model, this paper draws the following conclusions: the initial endowment structure determines the accumulation effect of endowment, the mobility effect of the endowment depends on the combined impact of economic factors and policy bias, the effect of accumulation and mobility of endowment jointly determine the change of the endowment structure, the latter determines the upgrading of the optimal industrial structure, and ultimately determines the per capita income level, Therefore, the fluctuation of the endowment structure gap in two sectors determines the fluctuation of output growth rate, and ultimately determines the fluctuation of the urban-rural income gap. As a result, this paper answers the question raised earlier: policy factors and industrial structure are upgrading at different economic development stages in China. The fundamental focus of the policy factor is to determine the flow of endowment, which together with the accumulation of endowment determines the upgrading of the industrial structure. The establishment of the optimal industrial structure ensures the improvement of production efficiency and affects the urban-rural income gap by affecting per capita output growth.

Secondly, this paper uses the provincial panel data of China from 2006 to 2019 to empirically test the relationship between the endowment structure and the urban-rural income gap. The study found that the fluctuation of the endowment structure will determine the fluctuation of the urban-rural income gap. It can be

seen from the research that the urban-rural income gap in China is not an overnight result, nor is it Kuznets's "inverted U" model, but the result of economic factors and policy adjustments in different periods, which is a constantly fluctuating process. Economic development itself is not the reason for the widening of the urban-rural income gap. It cannot be expected that the urban-rural income gap will automatically close with economic development like a set procedure. It depends on the industrial structure level of the urban and rural sectors and fundamentally depends on the difference in the endowment structure of the urban and rural sectors. To effectively promote the upgrading of industrial structure and narrow the urban-rural income gap, we must give full play to the role of policies, and promote the upgrading of rural endowment structure by influencing the flow and accumulation of endowment.

References

Buera, F. J., J. P. Kaboski, & R. Rogerson. (2022). Skill Biased Structural Change. *Review of Economic Studies, 89*(2), 592-625. https://doi.org/10.1093/restud/rdab035

Cai Fang. (2007). The Rural-Urban Income Gap and Critical Points of Institutional Change. *Economic Change & Restructuring, 40*, p189-206. https://doi.org/10.1007/s10644-007-9009-1

Chen Binkai, & Justin Yifu Lin. (2014). Development Strategy, Urbanization and the Urban-Rural Income Gap in China. *Social Sciences in China, 35*(01), 81-102+206. https://doi.org/10.1080/02529203.2013.875651

Duffy, J., Papageorgiou, C., & Perez-Sebastian, F. (2004). Capital-Skill Complementarity? Evidence from a Panel of Countries. *Review of Economics and Statistics,* (1), 327-344. https://doi.org/10.1162/003465304323023840

Guo ziyi. (2021). Out-of-sample performance of bias-corrected estimators for diffusion processes. *Journal of Forecasting, 40*(2), 243-268. https://doi.org/10.1002/for.2720

Justin Yifu Lin, Cai Fang, & Li Zhou. (1999). *The China Miracle: Development Strategy and Economic Reform*. Shanghai: Gezhi press.

Justin Yifu Lin, & Fu Caihui. (2019). *Introduction to New Structural Economic*. Beijing: Higher Education Press.

Krusell, P., Ohanian, L. E., Roís, & Rull J. V., Etal. (2000). Capital-Skill Complementarity and Inequality: A Macroeconomic Analysis. *Econometrica,* (5), 1029-1053. https://doi.org/10.1111/1468-0262.00150

Lu Ming, & Chen Zhao. (2004). Urbanization, Urban-Biased Economic Polices, and Urban-Rural Inequality. *Economic Research Journal,* (06), 50-58.

Piketty, T. (2019). Capital Accumulation, Private Property and Rising Inequality in China 1978-2015. *American Economic Review,* (7), 2469-2496. https://doi.org/10.1257/aer.20170973

Wang, Y., & X. M. Tang. (2019). Human Capital, Industrial Dynamics and Skill Premium. *INSE Working Paper No. E2019009*.

Wang, Y. (2019). A Model of Industrialization and Rural Income Distribution. *China Agricultural Economic Review,* (3), 507-535. https://doi.org/10.1108/CAER-02-2019-0030

Wang Shaoping, & Ouyang Zhigang. (2007). The Rural-urban Income Disparity and Its Effect to Economic Growth in the Case of China. *Economic Research Journal, 42*(10), 44-55.

Zhang Guiwen, & Wu liang. (2019). *The evolution of income distribution in the dual economic transformation*. Beijing: Social sciences academic press.