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Semi-Proletarianization in a Dual Economy: The Case of China

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Abstract

This paper proposes a model to explain the wage increase for migrant workers in China since the mid-2000s. First, the model consists of a capitalist sector and a non-capitalist sector. Second, households are semi-proletarianized because they participate in both family farming and wage production. Third, capitalist firms determine the wage level in order to extract labor. The paper demonstrates that semi-proletarianization is one of the three stages of the long-term dynamics of a dual economy like China. In so doing, it provides an alternative to the Lewis turning point literature.

JEL Classification: B51, O53, E24

Keywords

semi-proletarianization, dual economy, China's economy, migrant workers, labor extraction

1. Introduction

Economic reform in the past four decades has substantially changed the composition of Chinese workers. By 2017, migrant workers from rural areas amounted to 40 percent of total urban employment in China (NBS 2018a). After being stagnant for a long period, the wage level for migrant workers—as shown in figure 1—has risen since the mid-2000s. The annual average increase in the real wage was 8.2 percent from 2003 to 2017, compared with 2.3 percent from 1995 to 2002.

This pattern of wage growth has triggered a series of studies on the hypothesis that China has passed the Lewis turning point (LTP) (Cai 2010; Zhang, Yang, and Wang 2011; Knight, Deng, and Li 2011). That literature focuses on whether demographic changes in China (such as population aging, slower population growth, lower fertility rate, etc.) have constrained labor supply by empirically examining the changes of crucial indicators about wages (such as wage growth, the skilled-unskilled wage gap, marginal labor productivity, etc.). The literature pre-assumes that a particular version of Lewis' dual-economy model is applicable to China—namely, that the rural population is a massive supply of labor that will be gradually absorbed by the urban sector; during that time, the wage level for migrant workers will remain stagnant until the urban sector exhausts all of the surplus labor; and at that point, wage growth for migrant workers will thus signal a turning point.

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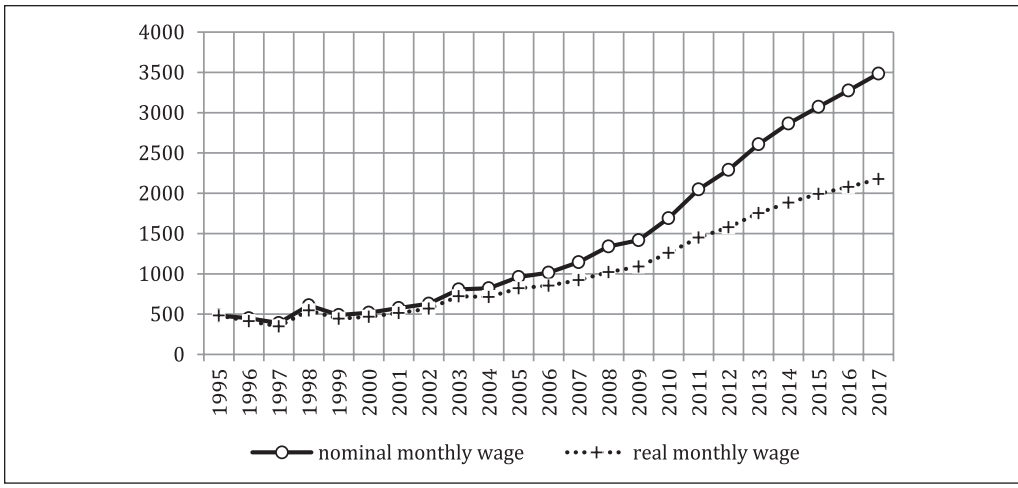

Figure 1. Wage growth for migrant workers.
Notes: Real monthly wages are deflated with the urban consumers' price index.
Sources: Wages between 1995 and 2007 are from Lu (2012). Other wages are from the annual surveys on migrant workers conducted by the National Bureau of Statistics (NBS). The price index is from NBS (2018b).

However, the LTP literature has omitted the phenomenon of semi-proletarianization, which I argue is a crucial feature of China's economy. Semi-proletarianization means migrant workers' households participate in both family farming and wage labor; both farming income and wages are necessary for the reproduction of households. Typically within a household, the older generation work as cultivators in the countryside and the younger generation work as migrant workers in cities. However, migrant workers' households have to rely on family farming income, given that their wages are lower than a living wage that is sufficient for the reproduction of their households (Li and Qi 2014). The majority of migrant workers are therefore unable to bring their families to cities and live together (NBS 2015), creating negative effects on the children, elderly, and women left behind. This phenomenon has been well documented in the literature (Huang 2006; Zhan and Huang 2013). As Arrighi (1970) and Arrighi, Aschoff, and Scully (2010) argue, semi-proletarianization allows capitalists not to pay a living wage to workers; put differently, family farming has subsidized capital accumulation by providing workers with a non-wage income source. Therefore, semi-proletarianization may play a crucial role in the wage determination for China's migrant workers; nevertheless, neither the LTP literature nor the semi-proletarianization literature has examined this role.

This paper proposes a model to fill this gap. This model has three features. First, it has a dual structure, consisting of a capitalist sector (capitalist firms) and a non-capitalist sector (small-farming households). Second, small-farming households are semi-proletarianized because they participate in both family farming in the non-capitalist sector and wage labor in the capitalist sector. Third, capitalist firms determine the wage level in order to extract labor. This model provides an alternative to the LTP literature that may contribute to offering a consistent explanation to wage increases for migrant workers.

The following paragraphs are organized into four sections. Section 2 discusses the problems with the LTP literature. Section 3 introduces the model. Section 4 analyzes the long-term implications for the dual economy. Section 5 concludes the paper.

2. Problems with the Lewis Turning Point Literature

It is noteworthy that the LTP literature is not equivalent to the Lewis model defined by Arthur W. Lewis's original theory (Lewis 1954) but instead is only a particular version of the model that has

been influenced by Ranis and Fei's (1961) theoretical interpretation and Minami's (1968) empirical methods. In general, the LTP literature exhibits the following three problems.

The first problem is that it narrowly defines the category of surplus labor, which usually refers to the rural workers unneeded by agricultural production; thus it omits various forms of potential labor supply to capital accumulation. By contrast, the Lewis model has a much larger category of surplus labor: "the farmers, the casuals, the petty traders, the retainers (domestic and commercial), women in the household, and population growth" (Lewis 1954: 145). Put differently, the sources of workers include those working in the informal sector as well as those initially not belonging to the active workforce. Lewis's wider category of surplus labor largely echoes what Marx called the reserve army.

Looking at the reserve army in China, one may still find evidence for its massive size. The employment share of agriculture declined from 52 percent in 1995 to 27 percent in 2017; however, there are still over 200 million people working in agriculture (NBS 2018b). More importantly, China in the past two decades witnessed a substantial expansion in the growth of informal employment, of which the majority of jobs are those of migrant workers. Current studies have estimated that informal workers amount to a significant proportion of urban employment (Huang 2013). More than 60 percent of migrant workers do not have labor contracts (NBS 2017a)—this informal status implies that migrant workers tend to take precarious jobs and face underemployment. Given that there is still a massive reserve army of labor that exists in various forms, the wage increase can hardly be explained by the exhaustion of this reserve army.

Second, the LTP literature lacks a consistent theory of wage determination. LTP studies tend to suggest the wage is associated with farming income; however, the annual wage of migrant workers was on average 5.4 times that of the farming income per rural worker between 1995 and 2016 (NBS 2017b, 2018b).[1] In this respect, Lewis's own theory contains much flexibility and historical concreteness. As Lewis argues, the wage level in the capitalist sector can increase with the growth of the average product in the subsistence sector, the improvement of the terms of trade of the subsistence sector, and the advance of agricultural technologies; more importantly, the wage level may rise because of the upgrading of workers' needs.[2] The latter is largely consistent with Marx's theory of labor power, which stresses that the value of labor power can change due to moral and historical factors.

I argue that the upgrading of workers' needs—or the requirements for the labor reproduction of semi-proletarianized households—may change with the expansion of the capitalist sector for three reasons.[3] First, as the capitalist sector expands, more members of the household will participate in wage labor, and more reproduction activities take place in urban areas; thus the household obtains fewer benefits from the cheap living conditions in rural areas and has to bear the costs from the commodification of housing, education, and medical services in urban areas. Second, working in the capitalist sector may gradually change the self-identity of migrant workers from peasants to workers. Labor reproduction will be escalated to higher levels. For instance, migrant

[1]The annual wage of migrant workers does not distinguish self-employed income from wages because the relevant data are available only from 2009 to 2011; nevertheless, according to the available data, the average wage of migrant workers as employees was only slightly lower than the average income of self-employed migrant workers. The farming income per rural worker is obtained by dividing the average farming income per rural household by the average number of rural workers.

[2]"Even if the productivity of the capitalist sector is unchanged, the workers in the capitalist sector may imitate the capitalist way of life, and may thus need more to live on. The subsistence level is only a conventional idea, and conventions change" (Lewis 1954: 172).

[3]The upgrading of workers' needs does not guarantee that workers are paid higher wages; however, the model in section 3 illustrates that, under certain circumstances, the wage chosen by employers is positively associated with workers' needs.

workers tend to expect their children to become skilled workers or office workers rather than peasants; thus, they have to expend more on education and training. Third, the change in self-identity is associated with the rising class consciousness of workers, which may play a role in promoting the bargaining power of workers (Smith and Pun 2018).

The third problem is that the LTP literature lacks an analysis of capital accumulation. In Lewis' own theory, capital accumulation is the driving force for the transition of the economy, and capitalist employment is endogenous to capital accumulation. By contrast, the LTP literature lacks such an analysis of capital accumulation as the driving force. In this sense, Lewis's own theory again shares similarities to Marx's theory on the relationship between capital accumulation and the reserve army of labor.

However, both Lewis's own theory and the LTP literature ignore labor extraction in the production process. Labor supply is not equivalent to the number of workers; it is the total labor effort of workers. Determined by a series of social and economic factors, the labor effort that a worker expends in the production process may affect the total labor supply. In section 3, I argue that semi-proletarianization is one of the determinants of labor effort.

In summary, the LTP literature cannot explain why wages have increased despite a relatively massive reserve army of labor that exists in various forms; it lacks a consistent theory of wage determination as well as an analysis of capital accumulation. Comparatively, Lewis' original model has more explanatory power, sharing many similarities with Marx's theory.

3. The Model

3.1. Semi-proletarianized households

The first step in developing a semi-proletarian model is to assume the economy consists of a capitalist sector (capitalist firms) and a non-capitalist sector (small-farming households). All workers in the capitalist sector come from small-farming households. Suppose b is a level of income that is necessary for the reproduction of labor power for a small-farming household.[4] All small-farming households are semi-proletarianized—they participate in both family farming and wage employment, receiving both farming income and wage income. Assume the farming income of a household is a constant a, which is valid in China's context because a rural household in China has the right to use only a small plot of land, and participating in wage employment has minimum impact on the farming income of the household. Assume each small-farming household has n workers but only l wage workers ($l < n$). Denote the wage level for a worker as w, which is determined by capitalist firms. Define the degree of proletarianization as:

$$\rho = \frac{wl}{b-a} \tag{1}$$

where ρ is the ratio of the total wage income to the necessary wage income for reproduction. If $\rho = 0$, the household has no participation in wage labor. If $0 < \rho < 1$, the household participates in wage labor; however, since $wl < b - a$, the household relies on both income sources for reproduction. If $\rho > 1$, there are two scenarios: if $\rho > 1$ but $wl < b$, then the household is less reliant on farming, although it is still semi-proletarianized; if $\rho > 1$ but $wl \geq b$, then the household could quit farming and become fully proletarianized.

[4]Changes in b are discussed in section 4.

3.2. Labor extraction

To denote labor extraction, let e be the labor effort of a worker in a capitalist firm. As in the labor extraction model developed by Bowles (2004), the effort is a function of the cost of job loss for the worker (c), which is defined as the difference between the wage level and the expected income in the status of unemployment. Given that the farming income is assumed to be a constant, the worker cannot increase the farming income of the household after being fired. Thus, the replacement income of the worker is zero. However, the worker can find another job in the capitalist sector with the probability ($1–v$), where v is the probability of failing to find another job. If one denotes the wage of an alternative job as $\bar{w}$, the cost of job loss for the worker is:

$$c = w - (1 - v)\bar{w} \tag{2}$$

The first crucial assumption of the model is that the labor effort is a decreasing function of the degree of proletarianization. Given that the objective of a household is to meet the necessary income for labor reproduction, the worker tends to take every means to avoid job loss and increase the wage income. Being obedient to supervision can reduce the probability of being fired. As shown in equation (1), a lower ρ means stronger living pressures, making the worker more obedient and at the same time making supervision less costly; thus, given the same cost of job loss, a lower ρ is associated with a higher level of effort. The labor effort can be written as:

$$e = e(c, \rho), e_c > 0, e_\rho < 0 \tag{3}$$

The second crucial assumption is that the adverse impact of the degree of proletarianization on labor effort exists only when it exceeds a particular level θ, which means e_ρ is negative when $\rho \geq \theta$ and zero when $\rho < \theta$. Moreover, θ is the threshold of the difficulty in labor reproduction. For instance, suppose $\theta = 0.9$ and $\rho = \theta$, which means 90 percent of the living costs uncovered by the farming income can be covered by the wage income. The threshold exists because different levels of difficulty may have different implications for labor reproduction. A household has few pressures to increase wage income when it faces only a small difficulty; however, when it faces a sufficiently large difficulty, the household has to take all means to avoid job loss and acquire the wage income, making the worker more obedient. Thus in the example, if ρ is greater than 0.9, then an increase in ρ would have a negative effect on labor effort since workers are not faced with significant pressure. On the contrary, if ρ is smaller than 0.9, then there would be significant pressure, and an increase in ρ would have no impact on labor effort.

3.3. An example

For an example, I use an explicit function of labor extraction. Convert equation (3) to the following form:

$$e = \begin{cases} \alpha_0 - \alpha_1 (c - \beta)^2 - \alpha_2 (\rho - \theta) \textit{if } \rho \geq \theta, \\ \alpha_0 - \alpha_1 (c - \beta)^2 \textit{ otherwise.} \end{cases} \tag{4}$$

In equation (4), α_0, α_1, α_2, and β are all positive parameters. With equation (1) and equation (2), the labor extraction function equation (4) can be written as a quadratic piecewise function of the wage level. To ensure $e_w > 0$ (otherwise, the function is meaningless), the wage should be

smaller than particular levels.[5] It is easy to see that the function satisfies the second-order condition of the maximization problem.[6] Figure 2 presents the possible shapes of the function and corresponding optimal wages for firms.

Let w' be the wage level that makes $\rho = \theta$; thus:

$$w' = \frac{\theta(b-a)}{l} \tag{5}$$

As in the labor extraction model, the capitalist chooses the wage level to maximize the effort/wage ratio. Let w^* be the optimal wage for firms when the labor extraction function is $e = \alpha_0 - \alpha_1 (c-\beta)^2 - \alpha_2 (\rho - \theta)$ and w^{**} be the optimal wage when the function is $e = \alpha_0 - \alpha_1 (c-\beta)^2$. It is easy to see that w^{**} is always greater than w^*. In principle, there are three scenarios for the shapes of the function (see figure 2). In Scenario 1, there is $w' < w^{**} < w^{**}$. In this scenario, since $\rho \geq \theta$, households have little or no difficulty in labor reproduction. Furthermore, w^* is as expected positively associated with $\bar{w}$ and negatively associated with v. In Scenario 2, there is $w^* < w' < w^{**}$. The optimal wage is w', which, as shown in figure 2, is a corner solution. This wage level implies that households can meet the majority of living costs. Besides, w' increases with b and decreases with a and l. In Scenario 3, there is $w^* < w^{**} < w'$. The optimal wage is w^{**}.

4. Long-Term Implications for the Dual Economy

This section discusses how the wage level may change as the capitalist sector expands. In Scenario 2, the optimal wage is w', which is equal to $\frac{\theta(b-a)}{l}$. As discussed in section 2, because of the expansion of the capitalist sector, the necessary income for reproduction will increase as the capitalist sector expands. Thus, eventually the difference between the necessary income and the farming income will be larger. Furthermore, the number of wage workers within a household (l) will increase as the capitalist sector expands; however, it cannot exceed the size of the household. Thus, w' tends to increase with the expansion of the capitalist sector.

The optimal wages in Scenario 1 and 3 are w^* and w^{**}, respectively, both of which are associated with capital accumulation over time. As the capitalist sector expands, more workers will participate in wage labor, and eventually the reserve army will be reduced. Thus w^* as well as w^{**} will increase with the expansion of the capitalist sector.

I propose a possible dynamic trajectory of the dual economy, consisting of three stages, as shown in table 1. Please note that this is not the only possible trajectory.

In Stage 1, there are only a few semi-proletarianized households, and there is a massive reserve army that imposes considerable pressures on w^*. Although the necessary income for reproduction is small, there could still be $w' > w^*$ due to the reserve army pressures; thus, this stage corresponds to Scenario 2 in figure 2. The wage level in this stage is determined by equation (5). In this stage, most activities of labor reproduction take place in rural areas; thus, the necessary income for reproduction is largely stagnant. As a result, w' is also largely stagnant.

In Stage 2, as the capitalist sector expands, more semi-proletarianized households emerge, and more workers within those households participate in wage labor; however, the size of the reserve army is still relatively large. As increasingly more activities of labor reproduction take place in urban areas, the necessary income begins to rise. As a result, w' increases more rapidly than w^*

[5]If $\rho < \theta$, then the wage would have to be smaller $(1-v)\bar{w} + \beta$ in order to ensure $e_w > 0$. If $\rho \geq \theta$, then $e_w > 0$ requires $2\alpha_1\left[(1-v)\bar{w} + \beta - w\right] - \frac{\alpha_2 l}{b-a} > 0$.

[6]The second order condition is $e_{ww} < 0$. In both cases of $\rho < \theta$ and $\rho \geq \theta$, $e_{ww} = -2\alpha_1$.

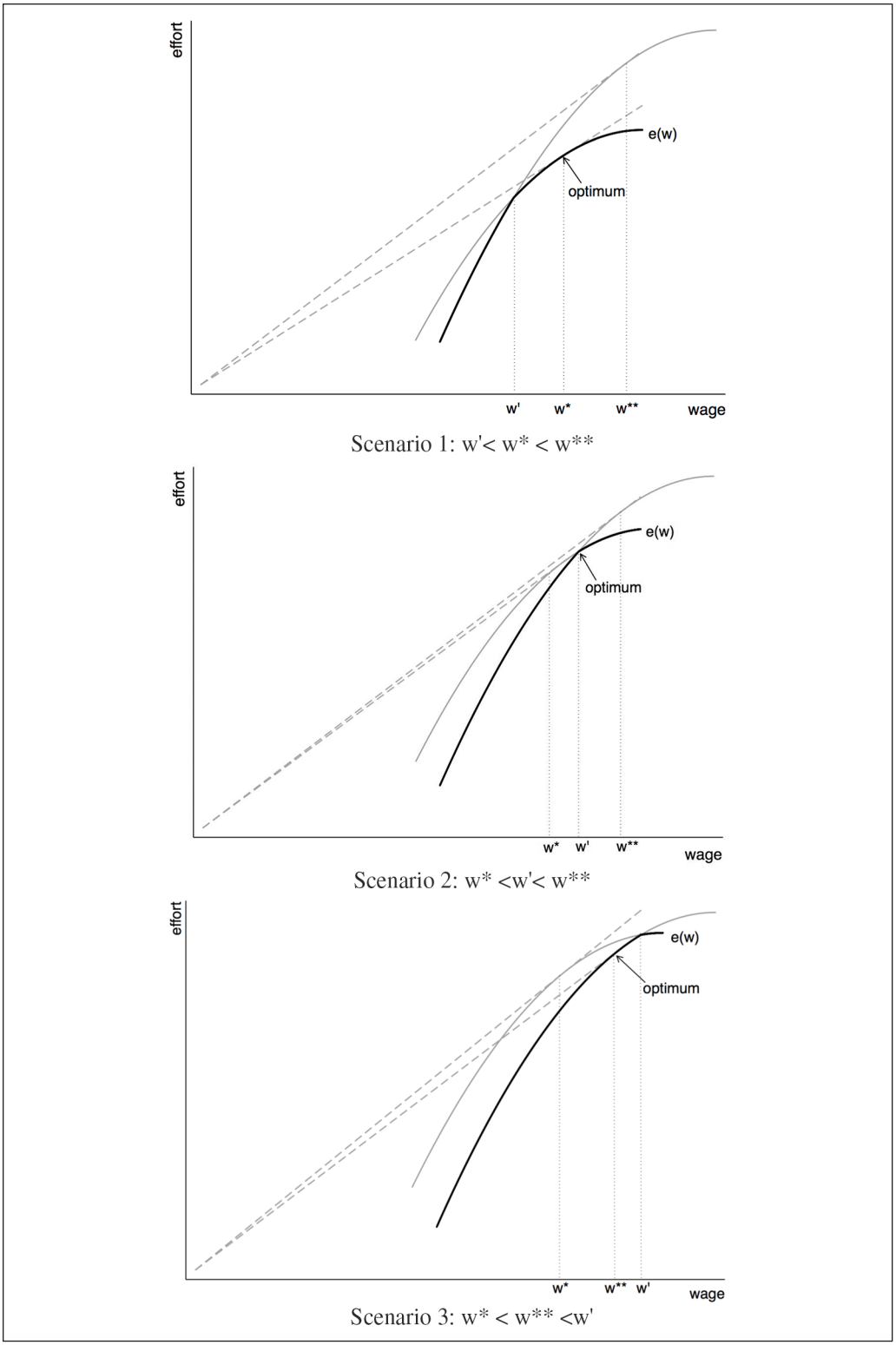

Figure 2. Three scenarios of the labor extraction function e(w) and the optimal point.
Note: Black solid lines are the labor extraction function e(w). Gray solid lines are $e = \alpha_0 - \alpha_1 (c - \beta)^2 - \alpha_2 (\rho - \theta)$ when $\rho < \theta$ and $e = \alpha_0 - \alpha_1 (c - \beta)^2$ when $\rho \geq \theta$. Gray dashed lines are tangent lines.

Table 1. Three stages of the trajectory of a dual economy.

	Locations of reproduction	Size of the reserve army	Necessary income for reproduction	Main determinant of the wage level	Wage growth
Stage 1	Rural areas	Large	Low and stagnant	Necessary income, reserve army	Stagnant
Stage 2	Increasingly more in urban areas	Relatively large	Increasing	Necessary income, reserve army	Rise
Stage 3	Urban areas	Small	Increasing	Reserve army	Rise

does; thus, the wage level is still determined by equation (5). Contrary to Stage 1, the second stage witnesses relatively fast wage growth that is largely driven by the rise in the necessary income. In addition, it is noteworthy that w' will not exceed w^{**} in the long term because $w^{**} < w'$ means the optimal wage level is w^{**}, and the household has to face significant difficulties in reproduction, which is unsustainable over time. If that were to happen, households would have to reduce the standards of reproduction, making w' fall below w^{**}.

In Stage 3, the reserve army of labor becomes smaller as increasingly more households participate in wage labor. As a result, w^* grows more rapidly than w'. This stage corresponds to Scenario 1 in figure 2, where the optimal wage is w^*. Households meet the necessary income for reproduction and reduce their reliance on farming income; thus, they become fully proletarianized households. Throughout the last two stages, the wage level continuously increases but is driven by different factors: the wage growth in Stage 2 is largely driven by the growth of the necessary income, whereas the wage growth in Stage 3 is largely driven by the shrinking of the reserve army. It is noteworthy that in Stage 1 and 2, the reserve army also plays a crucial role because it is the massive reserve army that makes w^* smaller than w'; otherwise, w' cannot be the optimal wage.

5. Conclusion

In the previous sections, I discussed the inconsistencies of the LTP literature, and proposed a model to take into account the role of semi-proletarianization on wage determination. The model suggests that in the short term the degree of proletarianization affects the wage level, whereas over the long term, capital accumulation may affect the necessary income for the labor reproduction of semi-proletarianized households. There might be three stages in the development of a dual economy like China's, rather than the two stages described in both Lewis's own theory and the LTP literature. China might be in the second stage, signified by both a relatively massive reserve army and at the same time considerable wage growth.

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