

Infrastructural Power and Maoism: A Comparative Study of Piecework Wage

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The emergence and decline of the piecework wage were explained either in terms of economic incentive or as a political or cultural consequence. In exploring the multiple trajectories of the piecework wage in Mao's China, we associated it with the fiscal state that mediates which explanation matters in a specific case and suggest three different patterns. A center state-owned enterprise develops intensively by technological upgrading, where to incent using piecework wages is practically difficult and vulnerable to political dynamics. In contrast, a collective-owned enterprise is self-funding and uses piecework wage more as an accounting device than an incentive, which explains its economic orientation and ideological indifference. A local state-owned enterprise develops extensively by expanding scale and finds both mechanisms in its running.

Introduction

Along with timely wage, piecework wage, to pay workers by the units they produced with a given rate, used to be one of the two dominant payment forms in production industries. It has been in decline, however, since WWII and remained very rare in the contemporary advanced economies (Hart 2016). Although economists have widely discussed the disadvantages of piecework wages, the explanation is still absent to address why timely wages, which also has

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disadvantages, outstripped piecework wages globally. To resolve the puzzle, a deeper understanding of the conditions that piecework wage functions is necessary. The current literature in social sciences primarily takes two approaches. An economic approach suggests that employers would use piecework wages as an economic incentive where the economic pressure is stronger (Akerlof 1984). Whereas, a cultural approach associates the differences with the cultural traditions of the relationship between labor and its payment (Biernacki 1995). However, it is unclear how the two models are intersected to explain an empirical case if both conditions exist.

In Mao's China, piecework wage was firstly developed across the nation as an effective way to promote economic growth in the early 1950s. It soon became an ideological symbol of "individualism" and stigmatized in the political campaigns from the late 1950s. With occasional policy attempts to resume it in the early 1960s, it was formally canceled after the launch of the Cultural Revolution in 1966. Historians provided explanations consistent with the two models of piecework wages. The political-cultural explanation argues that the piecework wages are to stimulate workers' production with material motivations, while Maoism praised diligent workers motivated by collectivism (Howe et al. 1973; Yang 2007). Therefore, the trajectory of piecework wage is dominated by the wax and wane of Maoism in policymaking. On the other hand, the economic-technological proponents hold that piecework wages no longer improved production in many workshops as the campaigns interrupted its functioning in many ways (Bernstein, Thomas P 2010; Lin 2015b).

Both models explain the implementation of piecework wages holistically, and hold empirically that till the Cultural Revolution, piecework wages totally disappeared in China. However, our archival work shows a more fragmented and stratified picture of piecework wages in Mao's China. We discovered that piecework wages had stronger resilience to political

campaigns in some factories and some worker groups than others. The discovery indicates that a singular explanation is not enough for understanding the conditions of implementing piecework wages. Multiple mechanisms exist to bound the implementation of piecework wages; its trajectory is a result of the joint forces. Our empirical goal is to find out these mechanisms and explain the distribution of piecework wages in the industry of Mao's China.

For the purpose, we use multiple sources of evidence and compare three enterprises to look into why or why not they canceled the piecework wage in different phases of Mao's era. By comparison, we conclude that the piecework wages would not be wanted if a factory has abundant investments from the state to constantly upgrade its technology. Also, piecework wage would be politically safer to use if it is necessary to its self-sustained financing and under-mechanized production. We induct three factors to bound the implementation of piecework wage in a factory: its political significance, the direction of the state investment, and the level of its autonomy of accounting. As all the three factors are consequences of a factory's fiscal relationship with the state, we propose a theory that the fiscal state mediates the economic and political-cultural roles of piecework wage through mapping out the infrastructure.

Our findings challenge two assumptions in the literature. In the first place, it is assumed, at least by the historians, that piecework wage would always be wanted if an enterprise desires to improve the production. We show that piecework wages could instead be a burden if a factory has enough funds, allowing it to constantly improve its technology. The second assumption is that the cultural image of the piecework wage is stable across an economy. Our research suggests its cultural image would change with its functions to a factory. Piecework wage is less associated with individualism if it is necessary for accounting. The study associates the discussion of piecework wage to what MacKenzie (2017) termed as "the material political economy." The

fiscal state, at least in Mao's China, resulted in a hierarchical distribution of infrastructure among different types of enterprises and further configured economic reasoning and political-cultural image of piecework wages.

The Uneven Distribution of Piecework Wage

Piecework wages were first introduced to the Chinese factories in Shanghai and Northeast China before the Communist Party (CCP) established its national government in 1949. After that, the Soviet Union's influence expanded with its technological aids to China (Li 1991; Shen 2003). In the early 1950s, the piecework wage system was perceived as advanced management of the developed industrial system. In the wake of the 1956 wage reform, the piecework wage system was dramatically expanded among the factories as the best wage system. The central government set a goal to impose the system on factories. The coverage of piecework wages among the state-employed workers reached its peak of Mao's era at 45.41%. The radical transition created a lot of problems in production. These troubles included the conflicts between skilled workers and manual workers, workers and managers, senior workers and apprentices, etc(Lin 2015a; Zhong guo ke xue yuan shang hai jing ji yan jiu suo[Chinese Academy of Sciences - Shanghai Economic Research Institute] 1960). In the adjustment of wage policy later in 1957, many of those factories repealed the piecework wage, and the percentage of the piecework wage among workers dropped to 39.29%, a level closer to 1953.

At the end of 1957, Mao launched the Great Leap Forward (GLF), a campaign aimed to promote production by mass political mobilization. The piecework wage system was in sharp conflict with the radicalized ideology encouraging voluntarism and rejecting individualism. Meanwhile, the scale of production (regardless of the quality) and employment in the state-

owned sectors had grown so fast under the mobilization that it became difficult for the central government to control the total amount of salaries. The tensions in both ideology and economic planning further politicized the piecework wage system. Mao's ideological aversion to piecework wages became widely known in the era, as his confidence in the Chinese pattern over the Soviet one soaring high. For multiple times in 1958, he asserted that piecework wage was "not a good system" and criticized workers struggling for personal interests (Yang 2007). The aversions on piecework wages concurred his life-long disagreement with the ranked wage system as a whole.

It was estimated 40 percent of all workers in the whole country, approximately 3.5 million, were paid by piecework wage before the GLF. The figure dropped to 1.2 million in 1958 (source). Shanghai witnessed a decline from 245 thousand factory-employed workers by piecework wage to only 5 thousand (Municipal Archives] 1961a). Notably, heavy laborers and employees of collective-owned enterprises seem to be exceptions. A 1959 archive reports that 15 thousand stevedores in Shanghai Port had been paid in piecework wage since 1954 (Municipal Archives] 1959), and piecework wage remained in small collective owned enterprises in the suburban areas around Shanghai (Municipal Archives] 1961a, 1961b).

After the GLF ended in 1960, piecework wages started to revive. The Labor Ministry acknowledged, "it is inappropriate to repeal piecework wages in a few enterprises or industries that fit the system... The future wage system should combine the time-work wage system with a supplementary system of piecework wage." But the same notification also pointed out that industries "working well with piecework wage" were those "of simple manual labor" (Chinese Academy of Social Sciences and National Archives Administration of China 2011). *Directions on Managing State-owned Industrial Enterprises*, trial guidance made by the CCP central

committee in 1961, encouraged enterprises to select piecework wages or time-based wages based on their own needs. For example, the handicraft industry in Shanghai and Suzhou generally adopted the piecework wage in 1962-4 (Arts and Crafts 1962; Shanghai History 1997).

Since the Cultural Revolution started in 1966, the Maoist ideology became dominant in almost every aspect of social life. The system of piecework wage was again widely repealed due to its “capitalist” nature of encouraging monetary incentives. Previous research, official history, and even the work of Xue Muqiao, who used to be head of the National Bureau of Statistics of China, all state that piecework wage was eradicated during this period. Nevertheless, the recently-uncovered archives that we use have indicated that, even in the heyday of the Cultural Revolution, the piecework wage system still existed among informal workers and enterprises not owned by the central government. We will discuss two such cases, Changsha Transportation Company and Jiujiang Brick Factory in a more detailed way later. It is notable that both enterprises were poorly industrialized and not supervised by the central government. We found no evidence that piecework wages were still in practice among the larger and more industrialized factories.

To summarize our findings, the trajectory of piecework wage was unevenly distributed in the planned economy across various periods and industries. There are two empirical puzzles behind such observation. First, given Mao’s general aversion to hierarchical wage, why had piecework wage never been completely eradicated even during the most radical eras like the Great Leap Forward and the Cultural Revolution? Second, why did piecework wages remain among certain types of enterprises and workers while vanishing in others? How can we explain such a pattern, which predicts the future autonomy enjoyed by the local enterprises after Mao’s

death? These puzzles guide us to explore the relationship between Maoism, the Planned Economy, and the fiscal states.

Literature Review

In the first volume of *Capital*, Karl Marx argued that “the piece-wage is the form of wage most appropriate to the capitalist mode of production”(Marx et al. 1990). His reasons were both ideological and economic, that “piece-wages give to individuality tends to develop both that individuality, and with it the worker’s sense of liberty, independence and self-control, and also the competition of workers with each other.”(Marx et al. 1990) These two genres of explanations of piecework wage are still prevailing in general and in specific in the literature about piecework wages in Mao’s China.

The economic explanation of piecework wage is most resonated in labor economics. Piecework wages wage is implemented where it can generate more profits for the employers by boosting the productivity of workers. This body of literature widely agrees that the hourly wage of pieceworkers is higher than those of time workers undertaking equivalent works (Hart and Roberts 2013). Then why in an equilibrium situation would employers willingly pay higher wages, piecework wages included, to workers? The Efficiency-Wage theory tries to address this question by referring to the fact that incentives like piecework wage also promotes workers’ efforts. Thus, a labor contract should be seen as a partial gift exchange, instead of being a pure agreement driven by supply and demand(Akerlof 1984). This is especially true when the benefits of piecework wages exceed the monitoring costs(Chen and Edin 2002). This economic reasoning is also behind the explanation about the rise and fall of piecework wages in advanced economies. argued that, due to the technological advancements like “Just-in-time” productions and broader

economic transformation under competitions from emerging economies like China and India where labor and production costs were lower, the disadvantages of the piecework wage were amplified among advanced economies since the 1960s. As a result, we witness a dramatic decline of piecework wage there. In general, this view regards the piecework wage as a purely economic phenomenon.

Meanwhile, the cultural and political components in explaining the form of payment are picked up by historians and sociologists. In a seminal paper, Hobsbawm (1960) argued that piecework wage was not naturally the most suitable payment method for capitalism. It was first picked up as a tool to prevent the productivity from failing below the norm when workers learned that the customary payments they received were far less than the market value of their labor by the 1840s, and only became an active method to utilize workers' labor time more efficiently during the scientific management revolution toward the end of the Great Depression. In a classical ethnography, Roy (1953) observes that, although piecework wage did bring higher output, it was not because it offered economic incentives, but because it offered a sense of game. Burawoy (2012) reaffirmed and further elaborated this point in his revisit to the same factory along with sociological Marxism. He suggested that piecework wage was a component of the hegemonic production regime in capitalism, and carried out ideological roles. Biernacki (1995) illustrated in detail that different ways of organizing piecework wage in England and Germany were determined by distinct understandings of labor, and this divide could be further traced to trajectories of capitalist development. Lampland (2016)'s work about the piecework rate in Hungary during the 1950s shows that the piecework rate was not imposed by the socialist regime unilaterally but rooted in the larger global management revolution that had been already accepted before the founding of a socialist economy. Although this body of literature does not deny that

the piecework wage might have economic functions, it emphasizes that cultural and political preconditions of the piecework wage are more important in explaining its emergence and trajectories.

Both views can find their followers, conscious or not, in studies about piecework wages in Mao's China. In explaining the rise and decline of piecework wages in early PRC, researchers often consider piecework wages as an effective material incentive to push economic growth in spite of an ideological implication of the individualism unfavorable to Maoism. During the phases that it was supported by the state, piecework wage was accepted as a material incentive; when it became unfavored, it was concerned as an ideological heresy. Howe et al. (1973) suggests that Maoism opposed piecework wages with the belief that "proletarian enthusiasm does not require the support of material incentives" but should be motivated only by their collectivism. This view is also echoed by later researchers concluding piecework wages were impossible in a despotic regime, in spite of its practical success, under Mao's opposition (Lin 2015b; Yang 2007). Only when Mao ceded to the technocrats after an economic fiasco (e.g., the Great Famine of 1960-62) would piecework wages come back as a panacea to the crisis. But the backwardness of working conditions and the lack of trained technocrats and managers often limited the economic effect of piecework wage, and provided a favorable condition for Maoism to rise again (Franzier 2002; Howe et al. 1973; Lin 2015a; Yu 2010; Zhong guo ke xue yuan shang hai jing ji yan jiu suo [Chinese Academy of Sciences - Shanghai Economic Research Institute] 1960). The trajectory of piecework wages, therefore, is explained as a cycle of Maoism, on the one side, to cancel piecework wages when the economic condition is favorable, and technocracy, on the other side, to resume piecework wages and promote people's living when the economy is in a mess (typically found in Hoffmann (1964)).

The two genres of explanations of piecework wages reflects a broader trend in economic sociology and political economy, i.e., the analytical separation of economic field and other social fields(Granovetter 1985; Somers 1995). Based on such a division, “on the most general level, economic sociology’s programmatic ambition is to demonstrate how economic elements infiltrate social life; or vice versa, to show how the economy is based on or permeated by social factors.”(Aspers, Dodd, and Anderberg 2015) Both kinds of explanations adopt a holistic approach by addressing the causal priority of certain categories, either economic or political-cultural. Studies about China’s economy does not escape such a paradigm. They take a periodized form and distinguish ideology-oriented eras from technocracy-oriented eras. In the former eras, the industrial production is guided by political goals and political values bypass the economic rationality. In contrast, in the later eras, economic policymaking is guided by instrumental rationality regardless of ideologies. The history of Mao’s China is described as an example of politics that kept distorting the development of the planned economy. Respectively, the reform era was featuring the removal of such distortion. Within Mao’s era, the Great Leap Forward (1956-9) is usually considered as a fruit of the radical Maoism (MacFarquhar 2006), while the success of the Reform is attributed to the local governments running “as industrial firms” (Anon 1988, 1995). The research about piecework wage during Mao’s China is a sub-variant of this periodization. They fail to explain the uneven distribution of piecework wages that we have observed.

To move beyond this holistic quandary, some works suggest that we should problematize the linkages between the political and the economy (). The recent revival of fiscal sociology contributes to this by revealing the tax state/fiscal state as an important linkage between the “politics” and “economy”(Martin 2019). Previous research in fiscal sociology mostly focuses on

how fiscal arrangement shaped the interest, thus the behaviors of actors such as enterprises, citizens, or local states(Campbell 1993; Pacewicz 2016; Schumpeter 1991). In this research, we add to this body of literature, identifying that the fiscal state also affects the distribution of the material infrastructure. The configuration of logistic power that resulted from it further influences the boundary between “politics” and “economy.” As we have shown above, the unilateral form of piecework wage as a material incentive or an ideological heresy is no more than a myth. We argue with our empirical cases that the extent to which piecework wage works as a monetary incentive or an ideological heresy is bounded by the infrastructural conditions. In this sense, the fiscal state is not merely a channel between “politics” and “economy,” but a space between them(Eyal 2013).

Method and Data

The major methodological challenge for this project, as any historical study about China under Mao in general, is the limited access to the primary resources. The access to historical material about the Great Leap Forward and the Cultural Revolution is strictly controlled by the state, and many of these materials are destroyed or lost. In short, there is rare systematic preservation of archives for this period, and the access to what remains is very difficult to get. Such a lack of data also partly led previous research about the incentive system during Mao’s China to conclude that piecework wage was absent during the Cultural Revolution when the pressure of Maoism reached its apex. Many of such research, either took the stand of policy documents from the central government, or relies on oral history that is mostly about the large state-owned enterprises. This problem cannot be solved, but only alleviated.

Our study is also subject to this methodological quandary. Compared to previous research, we adopt two strategies to better deal with this difficulty. Primarily, we incorporate diverse archival materials into the research. We mobilized three corpora of historical archives. First, we used local archives from the provincial level, county level, and factory level. These materials were collected from Changsha County Archives, Fudan University, Shanghai Municipal Archives, Suzhou Municipal Archives, and Stanford East Asia Library via multiple field trips. Second, we collected data from the published compiles of governmental documents. The part of archives includes *The Selection of Important Official Documents Since the Foundation of PRC*, *The Selection of Documents of CCP Central Committee, 1945-1966*, *The Selection of PRC's Economic Archives* and the compiles of *Labor Documents* edited by local governments. The last body of materials is newspapers, magazines, paper collections, local official histories, and other published research. Combined, these materials allow us to have an understanding of piecework wage that is different from previous research.

The second strategy we adopt is a comparative research design. Here, the comparison is not a logic tool that generates truth claims, but a rhetoric tool that highlights the theoretical importance of specific aspects in each case and inter-case connections. The actual inference is mapped out in the description/narrative of each case. From the materials mentioned above, we single out three enterprises as an example of three different kinds of enterprises in Mao's China: the Anshan Steel Complex is an example of central state-owned enterprises; the Jiujiang Brick Factory is an example of local state-owned enterprises; and the Changsha Transportation Company is an example of collective enterprises. We do not attempt to "control" some characters of these enterprises to make the cases more "comparable." This is because the fiscal relationship of an enterprise to the state is consequential in different ways. And we suggest it was

many of these differences that explain the various trajectories of the piecework wage. The choice of these three cases, of course, is also subjected to the accessibility of historical materials. Out of various cases of enterprises we encountered, these cases provide the richest account of how piecework wages fluctuated during Mao's China, in which specific factors performed on the workshop floor. Given such limitations of materials, they cannot be justified as being technically sampled, since sampling is not practical in this situation. Nevertheless, these cases are still theoretically connected under the material political economy of Mao's China in our comparison.

In terms of ideology, all of the three factories had to adopt the time work wages during the Cultural Revolution. In contrast, a prediction from the technocratic view may argue that Anshan Steel was more likely to adopt piecework wages due to its stronger capacities in management and abundant resources. Both of the predictions, however, were different from the fact: the piecework wage was canceled in Anshan Steel even before the Cultural Revolution, it partly existed in Jiujiang Steel Factory and persisted in Changsha Transportation Company. The detailed comparison between them highlights their connections to the state and the consequences of these connections. We further supplement this between-cases comparison by an in-case comparison in Jiujiang Brick Factory. In this specific case, we compare the trajectories of three different groups of workers: formal workers, affiliated workers, and peasant workers, who constitute an interesting analogy to three types of enterprises during Mao's China. We use it to highlight how political and material factors mattered specifically on the workshop floor.

Admittedly, our data are scattered in multiple areas of China. One might question that the evidence could not reflect the general situation of China's socialist economy since China is such a vast country and one might find anything she/he wants. We believe that, though documentary data cannot be as representative as randomly sampled one, our evidence is actually strong,

especially with no systematic evidence gathered or even ever existing. Compared to previous research, our data collection has been more comprehensive by collecting more detailed documents with more varieties in genre. We also document any details that does not fit our explanation in footnotes to facilitate future studies in criticizing our work.

More importantly, the new archive resources and the comparative angle lend us a unique advantage in the situation where primary materials are systematically absent like the case of the Cultural Revolution. We avoid two opposite extremes: one that takes high-level politics as the crus and generalizes its impact to all-over China(MacFarquhar 2006); and one that only focuses on local cases that leads to a rejection of national contexts like Maoism(Brown and Johnson 2015). New materials on the workshop floor help us overcome the limits of the first stand, and a comparative approach allows us to develop a more systematic understanding of Mao's China by drawing our attention to factors on the trans-local level. Guided by the comparative research design and the new material we collected, we delineate the wage forms and their conditions in the following section.

Anshan Steel

Being the largest steel complex in Mao's China, Anshan Steel was seen as the eldest son of the Republic's industry. Anshan Steel is a case highlighting the overwhelming importance of politics in influencing the trajectory of piecework wage. It was a prototypical SOE that produced for the governmental goals and achieved full supports from the administration. During the 1960s, it became a model of the Maoist management of factory, which was even named after it. A political-cultural explanation of piecework wage would argue that the political significance of Anshan Steel allowed it to sacrifice economic efficiency for political allegiance. In this section,

however, we argue that canceling piecework wage did not necessarily violate the economic ration, and politics alone cannot fully explain the overall implementation of wage forms in Anshan Steel. To further expound the trajectory of piece work wage in Anshan Steel, it is indispensable to take into consideration how the mechanism of politics was bounded in the production condition on the workshop floor resulted from the fiscal relationship between Anshan Steel and the Chinese state.

Anshan Steel was of great symbolic significance in politics, not only as a landmark of socialist economy but also as a model of Maoism in the economy. It was the stage of numerous movies and novels to represent the Chinese socialist economy. During the GLF, it became a pioneer to explore the Maoist pattern in industrial management. Its report of the Mass Line (Qun zhong lu xian) Campaign in 1960, titled “Report About the Unfolding of Technical Innovation and Technical Revolution Movement in the Industrial Front”(Mao 1960), was singled out by Mao from many similar reports. Mao praised that Anshan Steel had evolved from the Soviet style to a new and Maoist model by implementing “two kinds of participation, one reform, and the combination of three”(Liang can yi gai san jie he). The principle was named “the Constitution of Anshan Steel” and concerned as a Chinese alternative to the Soviet-style factory administration.

As a centered SOE, the fiscal relation of Anshan Steel with the state was schemed as “Unified Control Over Income and Expenditure”(Tong shou tong zhi)(Xue 1983). All of their working capital and their investment funds directly came from the government budget, and their profits also went back to the government revenue. Although they received a loan tantamount to roughly 20% of their working capital from the bank system, it was mainly for maintaining liquidity rather than expanding production(An gang zhi bian zuan wei yuan hui[Committee of

editing Gazetteer of Anshan Steel] 1991b). Different from local SOEs, centered SOEs were administrated directly by central ministries, similar to the Soviet model. Between 1952 and 1970, Anshan Steel was first managed by the Ministry of Heavy Industry and later the Ministry of Metallurgical Industry(Su 1991). As the most developed steel maker with significant political importance, the state support on it stood out even among central SOEs. It enjoyed direct technological assistance from the Soviet Union in the 1950s as one of the 156 major industrial projects, including designing the wage system and workshop regulations(Yan 1953). Huge amount of investment poured in for its recovery and expansion (3 out of 20 billion yuan invested in the 156 projects and 47.4% of all investment to the steel industry during 1952-60, calculated from data from Dong, Zhikai (2004) and Su (1991)).

Thanks to the special fiscal relationship, the state investment was not only to extensively expand its scales, but also intensively promote the technical conditions on the workshop floor. Such intensive effects of the state investment distinguished Anshan Steel from most other factories in two ways. First, the increase of production brought by technological renewal significantly surpassed the effects of stimulating labor forces, making the later less important. As we will show later, in most eras of the 1950s and the 1970s, the increase of Anshan Steel was driven by the capital-intensive factors as technological advancement, rather than the labor-intensive factors as overtime labor or more labor forces. Second, the production process was highly collaborative and mechanized, making the count of piece work difficult. Different from both the political-cultural and the economic explanations, we suggest that Anshan Steel might have to abandon piecework wage anyway even if the ideology allowed it to do so.

It is true that the trajectory of piecework wage in Anshan Steel was driven by political dynamics in general. After the CCP took power, Anshan Steel was reorganized into the Soviet

style, so was its piecework wage system(Yan 1953). The proportion of workers paid by piecework wage in Anshan Steel grew rapidly from 26.2% in 1951 to 48.6% in 1952 and 63% in 1958(An gang zhi bian zuan wei yuan hui[Committee of editing Gazetteer of Anshan Steel] 1991a). The GLF constituted a turning point in applying the piece work wage. With acquaintances from higher-level cadres, some Shanghai enterprises rejected the piece work wage and made the news nationally known in 1958. The Party committee quickly responded to the news by canceling the piecework wage after having a perfunctory discussion among the workers, in which only 20% of them explicitly agreed to cancellation(Gao 2000). Ahead the raw material and food shortage of 1959, the decision was driven by the political signals from Shanghai.

After the GLF was over, the use of piecework wages was permitted again in 1963. Song Renqiong, the highest leader in Northeast China, encouraged factories to resume piecework wages. Anshan steel quickly increased the coverage of piecework wage to 42% of the workers. However, as the “Socialist Education Campaign” (She hui zhu yi jiao yu yun dong) began in 1964, piece work wage was singled out as an example of “Money in Command” and “material incentive” and fiercely criticized. In 1965, the percent of workers paid in piece work wage dropped to only 3.5%. The use of piece work wage in Anshan Steel was almost eradicated when the Cultural Revolution was launched(An gang zhi bian zuan wei yuan hui[Committee of editing Gazetteer of Anshan Steel] 1991b). During the Cultural Revolution, Song, among many other party leaders in the Northeast, was reprehended in Anshan, partly for advocating piece work wages(Municipal Party and Committee] 1967). Under such high political pressure, implementing the piece work wage was nothing more than being impossible.

In the case of Anshan Steel, nevertheless, piecework wage was not an incentive to the production as much as technological advancement. For example, Anshan Steel mainly relied on

open hearths for steel making during Mao's period. Two major technological advancements took place in the period. One was expanding the volume of the hearths during 1952-60, the other was to introduce the top blown basic oxygen furnace from Europe and Japan after 1971(An gang zhi bian zuan wei yuan hui[Committee of editing Gazetteer of Anshan Steel] 1991a). These technical changes were made possible owe to the larger quantity of investments in the two phases. As the technologies were under improvement, the increase in the total output was much faster than the increase of workers. As a comparison, in other periods with less state investment, the increase in the total output actually lagged behind the increase of workers(Wang 1991).

With the constant technological advancement, Anshan Steel might have to abandon piece work wage in near future even without the political aversion, just like what happened in its counterparts in the Soviet Union. The material features in the mechanized production made the implementation of piece work wage extremely difficult. Take the open-hearth steelmaking as an example. Producing a furnace of steel is complicated and time-consuming, requiring two to three shifts to work continuously. To implement piece work wages in this non-stop process brought up two questions: how to count the unit for wage and how to calibrate the amount of labor. Anshan Steel tried two ways when piecework wage was allowed but neither worked well. One way was "Comprehensive Working Group Method" (Zhong he gong zu ji jian), which used the open hearth as the unit of calculation. The corresponding amount of wage would be separated evenly into shares for three shifts of workers(Shen 1954). Within each shift, workers got an average weighted with their technical ranks. The method had two problems. For one thing, the open-hearth steelmaking comprised five steps. It would be hard to know in which step did workers become more motivated and productive for higher efficiency(An gang zhi bian zuan wei yuan

hui[Committee of editing Gazetteer of Anshan Steel] 1991b). For another, workers in the same shift faced a free-rider program and the stimulation could hardly work.

An alternative way was “Working Group Based Method,” to organize piece work wages based on working groups. It predetermined certain points to each technical step in proportion to the time demanded in the step(Shen 1954). Each group would be granted the respective points when finished a step. This method still left unresolved problems. A major one was that the amount of labor one put into the production process varied along with the types of steel in making and the technical conditions of the open hearth(Shen 1954). Constant technical improvements left hearths in different conditions, thus technical conditions not only varied across workshops but also within each workshop as the technical improvement going on. Therefore, the difficulties in implementing piece work wage in a central state-owned enterprise like Anshan Steel was not of the backwardness of the technical conditions, as some researchers argue, but rather the rapid and persistent promotion of the technical conditions. The output target was constantly increased during the GLF. All these made the re-calibration of work norms twice per year far from being enough for implementing piecework wages.

As a within-case comparison, the implementation of piecework wage among porters employed by Anshan Steel lasted for longer time. With the same political pressure, piecework wage remained the major payment form among porters through the GLF and Socialist Education Campaign and only stopped it before the Cultural Revolution began. Individual work was simply counted and calculated with a piece price before the GLF(Ji 1958). No work norm existed until 1963, two years after the GLF(Wang 1991). Investment on technical improvement was limited. Although the whole transportation sector made up almost 1/10 of the total working force, it received only 146 million yuan in total during 1949-1985 for basic construction(An gang zhi

bian zuan wei yuan hui[Committee of editing Gazetteer of Anshan Steel] 1991a). Anshan Steel's logistic infrastructure did expand as it grew larger, but its productivity per capita did not change much. In this specific example, technical backwardness was not a barrier but a condition for the porters to make piece work wages more resilient under the political pressure of Maoism.

Changsha Transportation

Changsha Transportation Company was a county-affiliated collective enterprise located in mid-southern province Hunan. It consisted of several smaller transportation units and became an independent accounting unit in 1959. Except for one of them switching to the time wage in August 1971, all of its other units kept piece work wages during this period(County Archives] 1987). Changsha Transportation is only one of the many cases that we found still implemented piece work wage during the CR in many personal memoirs, local archives, and also local gazetteers. Like Changsha Transportation, all these cases are collective enterprises. If an enterprise was left as collective after 1956, it usually meant that it was filtered as insignificant and unqualified to be a SOE in the wave of nationalization. Most collective enterprises were craftsman guilds with only a very limited level of mechanization.

Changsha Transportation showed the typical feature of collective enterprises during that time: dramatically different from the two other cases we discussed, collective enterprises like Changsha Transportation, no matter in rural or urban areas, were on their own financially (sometimes also as “self-financing” or “zi fu ying kui”). They received little or no investment from the state only until the early 1970s when some collective enterprises began to receive small loans from the bank to expand their production(Zhong hua ren min gong he guo jing ji da shi ji bian xuan zu[Editor Group of PRC's Major Economic Events] n.d.). During Mao's China, their

main fiscal relationship with the state was no more than paying taxes to local governments. Working in marginal industries with small sizes from the very beginning, it was unlikely for these enterprises, with no way of external financing, to significantly mechanize their production. As Fei (1999) and Huang (1990) documented, only very few collective enterprises could achieve the outdated machines from SOEs via informal connections with them. Though a transportation company, Changsha Transportation only brought in a few trucks as late as 1978. Before that, its major vehicles were rickshaws and trishaws(County Archives] 1987).

As its transportation was majorly based on manual labor, the labor of workers from Changsha Transportation was different from person to person, time to time. Changsha Transportation managed its production through the transportation mileages and volumes. But mileages and volumes could not be standardized in time units as cargo freight were not implemented in a mechanical vehicle, whose speed and volume should be predetermined. The solution of Changsha Transportation was to introduce an artificial way of standardization, the work point system (County Transportation Company] 1964). A work point was defined in certain kilometers with certain tons of cargo. Each transportation of a worker was transferred into respective work points. Work points among the collective enterprises were very common at least in Shanghai(Municipal Archives] 1969). Without loans or investments, Changsha Transportation was vulnerable to the risk of default if predetermining a fixed wage standard. It was natural, therefore, that it used work point system to pay afterwards based on its profits.

In Mao's era, work point system had been conceived as a form of piece work wage, which previous studies all ignored. It was a politically safer way to implement piece work wage without using the term. Work Point System was created in the rural areas while launching "people's commune," the rural administration to develop collective farms, across the nation. Its

creators explicitly called it “piece work wages”(Li, Jiuyou 1958; Zhong guo ke xue yuan shang hai jing ji yan jiu suo[Chinese Academy of Sciences - Shanghai Economic Research Institute] 1960). A fully developed work point system assigns a “base point” (di fen) for a laborer’s working day based on his/her working ability and political attitude (thus politics had been taken into account). “Living point” (huo fen) or “work norm point” (Ding e fen) assign work points to certain tasks and are more similar to piece work wage in the factories(Zhang 2005). Different kinds of work points could coexist in a village. Letian Zhang’s detailed work about people’s communes shows that in the busy season, a group-based version of “work norm point” would be used. “Living point” would be applied mainly to non-routine tasks. At the end of each year, these points would be valued according to the total output of the commune, and then be paid in the form of grain and currency. Concerning our case here, a file concerning wages in collective enterprises issued by Hunan Revolution Committee in 1972 also sees the work point as a form piece work wage(Province Revolution Committee the Bureau of Labor and Wage] 1972).

The problem of payment in Changsha Transportation resembled a people’s commune in two ways. First and foremost, as both economies were self-financing, they had to pay workers with flexible wages afterward based on profits. Fixed wage would increase the risks of default, a serious problem for self-sustained economies with little credits. Second, workers from both were assigned to non-routine tasks a lot due to the under-mechanized means of production.

Researchers often argue that collective enterprises had stronger economic motivation under stricter budget restraint(Qian and Roland 1996). This is inaccurate as we noticed the similarity of the production between collective enterprises and agriculture. Without external capitals, a collective enterprise had little motivation for growth or “economic incentive” but to survive. It

was the need to pay wages flexibly, rather than the motivation to stimulate the workers, that explained Changsha Transportation's use of work point system.

We suggest that the necessity of work point system to the production of collective enterprises weakened the "economic incentive" image of the piece work wage de facto. A major difference between the work point and the piece work wage of piece price lies in accounting. The value of a work point was usually determined at the end of an accounting cycle. The necessity of the work point system granted it a very ambiguous political status. During the CR, although the work point was also criticized, it had never been massively canceled in the rural area. It was familiar to people near or in rural areas and still had some legitimacy. Despite the consistence, people thought work points system was different from the wage system. We assume this explains why the work point survived the ideological campaigns as piece work wage de facto.

We would modify the political-cultural explanation, which holds that collective enterprises were "exempted" because of its political insignificance. Although political insignificance was the reason of their inferior position in the fiscal state, it was too simplified, if not incorrect, to argue that enterprises could be exempted because of it. Informal workers and workers from collective enterprises played an unignorable role in Mao's political campaigns. In a massive movement in Shanghai during the early years of the CR, later known as economism (jing ji zhu yi), temporary workers and workers from collective enterprises requested the equality with the formal workers and the protection from the socialist welfare. The desires of the workers were not for material benefits, as they were criticized by the administration, but rather for the egalitarianism suggested by Maoism(Li 2015). However, their political insignificance did not protect their requests from rejection and their organization - National Red Workers Rebel Corps (quan hong zong) - from dismissal.

It was also notable that the work point system did not only survive in “invisible” cities like Changsha but also in the most “visible” city of Shanghai. Shanghai during Mao’s China was under the control of left-oriented leaders. It was the first one to cancel the piece work wage during the GLF. It was also the origin of workers’ Cultural Revolution, known as January Revolution of 1967 and later the center of the anti-economism campaign. Even in such a city, piece work wage by no means vanished among the collective enterprises. A commune reported that the piece work wage existed in enterprises like sock factories and brick factories, and work points were very common (Municipal Archives] 1969). The adjacent county of Wuxi, where was seen as a model of developing Township and Village Enterprises (xiang zheng qi ye) later, reported that collective enterprises had paid mostly via work points. In the end of the CR, Shanghai surveyed that 70% of the rural collective enterprises were implementing work points and among the rest 30%, direct piece work wages still existed(Municipal Archives] 1975).

To summarize, the direct reason to sustain piecework wage in collective enterprises was not the economic reasoning, which was beyond their scopes, or the political insignificance, which was not enough for an ideological exempt. The match between the piece work wage and the infrastructure of collective enterprises like Changsha Transportation weakened the role of economic incentive behind and made piece work wage less problematic. All of the three factors, the political insignificance, the self-financing status, and the under-mechanized way of production, resulted from their fiscal relation with the state. These factors combined contributed to the lingering of piecework wages among the collective enterprises during the CR.

Jiujiang Brick

Jiujiang Brick Factory was a local state-owned brick manufacturer. Located in the mid-size city Jiujiang in the midsouth province of Jiangxi, it was managed by the government of Jiujiang County, ranked only the fourth in the five-level hierarchy of the SOE ownership (i.e., center, province, region, county, township). Comparing to steel making, brick crafting required relatively low technology by nature. Thus, Jiujiang Brick had little chance to represent the level of national industry, which implied its trivial political significance, along with many other local brick manufacturers.

The fiscal relationship of Jiujiang Brick, as a SOE, was also under the “Unified Control” scheme but in a way significantly different from that of Anshan Steel. Table ~ shows the direct investment and loans that Jiujiang Brick received during 1953-72. It is notable that the bank loan of Jiujiang Brick was almost twice as much as the direct investment. In contrast, it was much smaller in Anshan Steel’s revenue, equivalent to 20% of the working capitals. Different from Anshan Steel, the bank loan that Jiujiang Brick received was not merely for working capital but also for fixed investment. The differences made the usage of loans in Jiujiang Brick resembled a “capitalist” enterprise in a free market. The larger proportion of bank loan, instead of direct investments requiring no repayment, indicated a stronger budget restraint imposed by the government on Jiujiang Brick.

Since the brick crafting required less technology and the state support was limited, the development of Jiujiang Brick was of an *extensive* pattern by expanding its production scales with a similar technological level, rather than intensively upgrading its technological levels. Started with only one 24-chamber Hoffman kiln, it introduced three larger kilns of the same type and a cement production line across the 1960s and early 1970s(Zhong gong jiu jiang shi wei zu

zhi bu[The Department of Organization, CCP Jiujiang Committee] 1999). Although expanded into a much larger factory, the production means of brick craft did not change constantly in Jiujiang Brick. That means the count of piece works kept persistent across the period and the increases of labor force, rather than technological upgrading, would be a major source to promote productivity. It was not surprising, therefore, that we found no record in Jiujiang Brick to complain about the implementation of piecework wages.

Another outcome of Jiujiang Brick's political insignificance and inferior fiscal position was its stratified structure of workers. We observed three groups of workers in Jiujiang Brick. The first group was formally employed and usually worked in the mechanized positions like transportation, crashing, moulding, and kiln burning. The second group was nominally employed via a third company but usually the family members of formal workers. These "affiliated workers" worked on the supplementary positions of brick craft, like removing coal ashes from where trucks were not accessible(Jiu jiang zhuan wa chang ge ming wei yuan hui[The Revolutionary Committee of Jiujiang Brick] 1969a). The third group of workers, different from the previous two, was usually temporarily employed from the nearby villages for only a few months(Jiu jiang zhuan wa chang ge ming wei yuan hui[The Revolutionary Committee of Jiujiang Brick] 1969b). A typical position for them was to dig the clay for brick craft. Jiujiang Brick employed 500-600 temporary workers for six months each year(Jiu jiang zhuan wa chang dang wei[The CCP Committee of Jiujiang Brick] 1974). These peasant workers were provided only basic labor protection during their employment without more welfare, accommodation, or food (Jiu jiang zhuan wa chang dang wei[The CCP Committee of Jiujiang Brick] 1969c). A major reason of the stratification was that the semi-mechanization of the production process separated the positions into mechanized and manual. The factory could not afford to employ all

its employers with the limited fiscal support. As we will show below, the implementation of piecework wage among the three groups followed different mechanisms.

The trajectory of wage forms among the formal workers were similar with the Anshan Steel workers in many ways but with a certain nuance. Just like the steelmaking workers in Anshan Steel, politics played a major role among the formal workers to implement the piecework wage. The effect of political pressure was more real in Jiujiang Brick because piecework wages functioned well as economic incentives under the infrastructural conditions here. On the other hand, Jiujiang Brick showed a stronger resilience to the political pressure because the enterprise was granted less. Known to be used since the early 1960s after the GLF, piecework wage among the formal workers lasted until August 1968. Although it was finally interrupted by the CR, the cancellation had been four years after Anshan Steel made the same decision in 1963, and a half year after Mao encouraged workers to destroy all traditions in early 1967(Jiu jiang zhuan wa chang dang wei[The CCP Committee of Jiujiang Brick] 1968). The canceling of piecework wages among formal workers was obviously a top-down political requirement given the meeting process and the grumbles among workers (Jiu jiang zhuan wa chang dang wei[The CCP Committee of Jiujiang Brick] 1969d). The timing point of the decision was immediately after the Revolutionary Committees, the form of administration based on military control during the later stage of the Cultural Revolution, were founded across places. Different from the case of Anshan Steel, we would expect piecework wage to last among the formal workers without the political pressures.

The peasant workers, on the other end, resembled the case of Changsha Transportation. The payment of these workers was not covered by the governmental budget, and their labors were under-mechanized and not feasible for standardizationJiu jiang zhuan wa chang dang

wei[The CCP Committee of Jiujiang Brick] (n.d.). Jiujiang Brick shared the reason with Changsha Transportation to pay them afterwards using piece work wages. Also, as the peasant workers were hardly concerned as the working class, their political responsibility was much lessened. As a result, piecework wages were paid through the CR among them. A contract in 1969 (Jiu jiang zhuan wa chang ge ming wei yuan hui[The Revolutionary Committee of Jiujiang Brick] 1969b) showed that most of the peasant workers were still paid in earthwork unit price, and only handymen were paid by a daily wage after Jiujiang Brick decided to cancel piecework wage among the formal workers.

The role of affiliated workers was caught in between the previous two groups. Their payment form during 1966-74 was unclear, but it was sure that piecework wage was conducted before 1966 and shortly resumed in 1974 (discuss later). Before the canceling of the piecework wage, they were paid by piecework wages (2.05 yuan/ton to carry coal ashes) with additional fees paid to the third party(Jiu jiang zhuan wa chang ge ming wei yuan hui[The Revolutionary Committee of Jiujiang Brick] 1969a). On one hand, piecework wages were used as an economic incentive among them. Employing affiliated workers per se was a means to supplement the labor forces, as the extensive state investment did not improve the productivity per worker. When piecework wages were canceled among the formal workers, affiliated workers became more important as the productivity declined(Jiu jiang zhuan wa chang dang wei[The CCP Committee of Jiujiang Brick] 1969b). Before the piecework wages was canceled in 1968, the formal workers of the transportation team had two trucks and 30 affiliated workers to assist them. After 1968, the transportation team, though added a new truck, needed approximately 100 affiliated workers to finish the similar amount of work. On the other hand, affiliated workers, just like peasant

workers, were paid by the revenues of Jiujiang Brick. It preferred not to pay a fixed wage for budget balance.

Thus, piece work wages among the affiliated workers were both for incentives and accounting. Because it was used to motivate workers, it was vulnerable to the political pressures. In 1969, affiliated workers were reorganized into “Service Team of Revolutionary Workers” and claimed to be managed similarly to the formal workers (Jiu jiang zhuan wa chang ge ming wei yuan hui[The Revolutionary Committee of Jiujiang Brick] 1969a). However, for budget purpose, it was more rational to pay affiliated workers afterward in a result-oriented way, especially as the affiliated workers became more in number after 1968. This gave Jiujiang Brick a strong desire to resume piece work wages among them.

When the restriction on piecework wage “among collective enterprises and peasant workers” was relaxed in 1974, the piecework wages to the “Service Team” was resumed immediately. The tension became explicit in a following meeting to decide that paying the piecework wages to affiliated workers were “reactive and recessive” and had to be stopped again (Jiu jiang zhuan wa chang dang wei[The CCP Committee of Jiujiang Brick] 1974).

The income of affiliated workers also played as a subsidy to their family members of formal workers. When the income decreased among the formal workers after the cancellation of piecework wages, the increasing numbers of affiliated workers provided a more extensive backup to their families. Even though the affiliated workers were not included in the socialist welfare, their employment could be interpreted as a part of the welfare protection to the formal workers.

Different from the intensive investment on Anshan Steel, the state support on Jiujiang Brick was extensive, to expand its production scales without improving the productivity. The

limited and extensive fiscal support led to the stratification of workers and low mechanization. Comparing to Anshan Steel, the low mechanization of Jiujiang Brick made it more feasible to implement piece work wages as an economic incentive. As the informal employers of Jiujiang Brick was not supported by the governmental budgets, Jiujiang Brick preferred to use piece work wages as an accounting tool to manage their production, just like Changsha Transportation. On the other hand, Jiujiang Brick was still a SOE faced with greater state support as well as political pressure, comparing to collective enterprises like Changsha Transportation. It had little room to camouflage its economic motivations in the ideological tide of the CR. As a result, we observed the greatest tension, among the three cases, between the desires to implement piece work wages and the pressures to cancel it in Jiujiang Brick.

Conclusions

This research has showed the political and economic effects of piecework wages are mediated by the fiscal state with the infrastructural relationship. The fiscal state is a hierarchy not only to stratify the amount of capital leading to the economy from the state, but also to categorize the mode of the state involvement. The difference between our three cases, Anshan Steel, Jiujiang Brick, and Changsha Transportation, is firstly a continuum of direct investment from abundant generosity to almost none. It also illustrates three modes of development: the intensive development by technological upgrading, the extensive development by scale expansion, and the self-funding development. Piecework wages becomes less an economic incentive if the factory has constant technological upgrades under the state's strong support, which is found in the top end of the fiscal hierarchy with abundant governmental investment. Also, its cultural implication

of individualism turns weaker if the factory is implementing piecework wages for accounting purposes, which is prevalent for self-funding enterprises at the low end of the fiscal hierarchy.

One implication of this research is situated in the connection between Mao's China and the economic reform after his death. Near the end of the Cultural Revolution, Shanghai conducted an economic survey about the industry. It was revealed that the economy actually grew during the years of the Cultural Revolution. The value of output was 1.1 times that of a decade ago for state owned enterprises while this figure was 3.3 times for collective owned enterprises(Municipal Archives] 1975). With less fiscal and political constraints from the government, their flexibility in production and management lent their comparative advantages in some fields. As some historians point out, these collective-owned factories laid the foundation for China's economic growth after Mao(Gray 2002). Within the party system, local governments and state-owned enterprises they were in charge of were the main supporters of Deng's economic reformation(Padgett 2012). As an unintended consequence, Mao's intervention in the economy actually results in the constituency of the "capitalist restoration" after his death.

Many studies point out correctly that the collective enterprises grew faster because it kept larger economic reasoning(Oi 1995; Qian and Xu 1993a, 1993b). Our research supplements this branch of literature by indicating that the economic reasoning was a result of not only political insignificance but also the infrastructure corresponded the fiscal relationship, which made the collective enterprises both under-mechanized and self-funded. Market devices, like piecework wages under investigation, survived from the political pressures and functioned well in the low-technological environment of these enterprises. Assume a counterfactual scenario when the Maoist egalitarianism was practiced comprehensively and the under-mechanized collective enterprises were more supported by the state than the high-tech SOEs. The market transition of

the collective enterprises would not be as smooth as their lack of existing market devices to manage.

Beyond the context of China, this study also contributes to theory about fiscal state more broadly speaking. For a long time, tax state was related to traditional state-building activities like waging war, bureaucratization or democratization in the discussion (Martin 2019; Tilly 1993). In this sense, as Deleuze (1992) argues, tax state is all about sovereign, or a negative conception of power. Our study demonstrates that if one takes into the materiality of the state building into consideration (Carroll 2009; Joyce and Mukerji 2017; Mukerji 2010), the tax state also wields productive power by distributing infrastructure in different places, shaping people's behavior in a more implicit way. The fiscal arrangement of the planned economy in Mao's China shaped the materiality of the workshop, where the hierarchy of political requirement and hierarchy of state supports met, and finally led to the distribution of piecework wages. From this view, the planned economy, with its experts and fiscal arrangement, constituted the "logistic power" that configured the second nature of economic practices (Mukerji 2010). When competing with the planned economy, Maoism tried to realize itself via political engineering through the party system. Meanwhile, the logistic power of the planned economy was more persistent and hid in Mao's theoretical blind points. Both of them were partly successful in different places.

The case of piecework wage in Mao's China illustrates again that the economic field is not a natural category (Mitchell 1991, 2002). What element should be included in it is a specific historical effect. Our paper suggests that such an effect, not only relies on the rhetoric power of the theory about the economy, nor solely on the materiality. What really matters, using the words from Licoppe (2010), is things that "words in combination of words" can do. As the case of piecework in Mao's China suggests, exploration about the diversity within the socialist economy

will potentially benefit from looking into articulations between materiality and other elements. Exploring how these articulations differs and what their influences were would be a long task for future research.

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