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# THE FUTURE OF STATE CAPACITY IN THE FACE OF FACTOR PRICE MANIPULATION AND BUREAUCRATIC CORRUPTION

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**Abstract:** The relationship between tax revenue and economic growth is a complex one, with no clear consensus among economists. Some studies have found that a high tax burden can stifle growth, while others have found that it can actually promote growth by providing the government with the resources it needs to invest in infrastructure and other productive activities.
This paper argues that the key to understanding the relationship between tax revenue and economic growth is to consider the political regime of the country in question. In countries with extractive political regimes, where the government is primarily concerned with enriching itself at the expense of the people, high taxes are likely to be counterproductive. This is because extractive regimes are often characterized by corruption and rent-seeking, which can discourage investment and economic activity. In contrast, countries with inclusive political regimes, where the government is more accountable to the people, are more likely to benefit from high tax revenues. This is because inclusive regimes are more likely to use tax revenue to invest in productive activities that promote growth.
**Keywords:** Tax revenue, Economic growth, Political regime, Extractive regime, Inclusive regime, Corruption

## I. Introduction

An interesting paradox ubiquitously observed in the literature is a seemingly true proposition that a prudent fiscal stance accompanied by a low tax will generally stimulate growth.[2]However, there is much evidence to show that the ratios of tax revenue to GDP are higher on average in developed than in less developed countries (LDCs).For instance, the Heritage Foundation (2015) shows that tax ratio for Sweden is 50%, for France 48%, and for the US 26%, which is much higher than that for Gabon of 10%, that for the Congo of 6%, and that for Chad of 4%. In our opinion, rather than focusing on the association between these two variables, the inconsistency between theoretical predictions and observational data can be explained by using the insight of North (1981, p. 25):"*the politically determined structure of society* [e.g., tax regimes] *does not necessarily maximize the efficiency and social welfare; instead, it strives to maximize the returns to the monarchs or politically strong groups*." North argues that there always exists a persistent tension between the political structure which maximizes the rents to the elite ruler and an efficient system that encourages growth. He further suggests that this kind of elite extraction is the root cause of the failure of societies to experience sustained economic growth. Therefore, the insight is not whether a high tax can promote growth, but

whether the political regime is extractive or not. For most of the LDCs, their economic failures and low tax revenues are mainly caused by the extraction of corrupt governing elite.

To further North's insight into the problem, this article classifiestheLDCsinto two categories: First, weak states arecountries in which the main barriers to economic development are those that arise due to the lack of state capacity or state power to levy tax effectively. As indicated by Acemoglu (2005) and Besley and Persson (2010), most of the LDCs fall into the category of weak states, in which the inability to govern stems from the resistance posed by local chiefs, rich landlords, and clan leaders. Basically, their economic failures are related to their governments' inability to dominate subjects, collect taxes, and provide public goods. This provides the opposing elites with an opportunity to establish entry barriers, regulations and inefficient institutions to extract their economic rents. At this point, even though the tax is low, the government still does not provide much of an incentive for economically sound behavior.

Second, a minority of LDCswith strong centralization of authority (e.g., North Korea)have enough capacity to tax more resources from their societies. However, as indicated by North, this does not imply that the monopoly of legitimate violence will be used to tax and provide public goods. This is because pervasive corruption constrains how the country is governed. If the ruler is unable to keep corruption in check, then he has to keep the tax rate low to reduce rebellion threat arising from overtax.

For instance, North Korea is ranked as the third most corruption-ridden country in the word. Instead, its personal income tax rate is only 0 - 20%, which is much lower than 11.4% - 41.8% of South Korea, not to mention high tax rates of the European countries.

In both cases, state capacity does not guarantee tax collection, and tax levying also does not necessarily reflect a predictable and beneficial effect on public goods provision or economicgrowth, since theself-interested elite mostly use the ability of the state to tax and coerce citizens in ways that might be detrimental to economic performance. Therefore, if political organizations are structured to maximize the rents captured by the ruling elite, it is meaningless to discuss whether there exists any association between taxation and economic growth.

One might argue that, since both strong and weak states lead to poor economic outcomes in the LDCs, their state capacity should be balanced at an intermediate level between weak and strong states, so as to encourage entrepreneurship and achieve an efficient allocation of resources, such as the possibility suggested by Acemoglu (2005, p.1203). However, in differentiating from this, this article proposes that the key issue is not whether state capacity is balanced or not, or whether the state can collect the tax, but rather whether the self-interest of ruling elites is checked by the rule of law or not. We believe that, although the contrast between economically weak and economically strong states is an interesting point, the power of the elite still has to be constrained by the political power of the citizens, in particular their power to replace the ruler.

To support this idea, we use a case regarding oriental despotism, which concerns a comprehensive change in historical Chinese society, including its politics, demography and economy, that occurred in the period of the Song dynasty in the 9$^{th}$ to 13$^{th}$ centuries. The literature commonly referstothis as the "Tang-Song transition (唐宋變革)," which may be seen as a watershed in the transition from the medieval (中古) to early modern (近世) period of Chinese history (Naitō Konan, 1922). Among these

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changes, the most important one with profound political implications was the collapse of the medieval aristocracy of local lineages that had dominated China politically from roughly the 1stcentury BC through to the 9thcentury AD and the growing powers of central emperors since the 10th century. The interesting point is that the state's capacity to tax in the former period was extremely weak dueto the local lineages' boycott. By contrast, in the latter period, central emperors had successfully consolidated the political power and could strengthen the state's capacity totax. However, due to bureaucratic corruption arising from principal-agent problem, the government still failed to collect appropriate level of tax for public goods.

Regarding to this issue, this article shows that, if the power of the elite is not constrained by the rule of law, then, regardless of whether political power rested in the hands of central emperors or local lineages, and regardless of whether the tax was high or low, poor economic outcomes would still emerge. Therefore, the key issue is not whether or not a high tax rate can promote growth, but rather whether the political regime is extractive or not. If political organizations are structured to maximize the rents captured by the elite, it is meaningless to discuss whether there exists any association between taxation and economic growth.

Thisresultthus suggests the importance of building a better political institutional framework to control the power of the state rulers. The remainder of this paper is organized in the following manner. Section II presents some basic features of Chinese politics. Sections IIIand IV describe the politically unified and fractious periods in Chinese history, respectively. Section V concludes the paper.

## II. Some Features of Chinese Politics

*A. China as a Case Study*. There are two advantages of using Chinese politics as evidence to support the proposition of North (1981). First, between 3000 BC and 1800 AD, there were more than sixty mega-empires that used to control at least one million square km of territory (Turchin, 2009). However, the Chinese empire was the only one that continually maintained an autocratic and unitary state during the entire period. Second, China had evolved in relative isolation in the corner of southeastern Eurasia, and had maintainedvery little contact with the foreign world for at least three millennia. This naturally prevents the possibilities of foreign political interference and offers a fascinating case to investigate the relationships among state capacity, tax collection, and politics.

From both theoretical and practical perspectives, these advantages allow researchers to conduct their experiments in a designated environment almost like in a science laboratory.

*B.Tang-Song Transition*. This article focuses on a comparison based on the Tang-Song transition (唐宋變革論), which characterizes the changes in Chinese political status from fragmentation to unification. As shown by Ge (2008), before Tang dynasty, the 2,135 years of Chinese political development from the Qin to Qing dynasties can be roughly divided into two regimes: political fragmentation in the first millennium (Qin to Tang, 221BC907AD) and political unification under one ruler in the second one (Tang to Qing, 908-1911). Naitō Konan (1922) also shows that Song dynasty is a period in which China witnessed a series of technological innovations, the rise of commercial wealth, and, more critically, the replacement of hereditary aristocracy by a system of emperor's autocracy. However, despite the changes in many aspects of society, we barely see any change in government tax revenue. In the former period tax collection was low due to ineffective taxation caused bya "weak central

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statevs. strong local powers". Alternatively, in the latter period, the state capacity held by central emperors was strong enough to enable them to collect more tax. However, due to the pervasive bureaucratic corruption, the emperors still had to keep taxes low to mitigate the "tyranny at the bottom" effect and to preempt the farmers' revolt(Sng, 2014). Based on these facts, the following sections of this paper will use the theoretical perspective of the new institutionalism to investigate how taxation and politics were interrelated during these two periods.

## III. Political Fragmentation Period: Weak State Capacity

*A. Weak Central Emperors*. Before the Song dynasty, Chinese politics exhibited a type of political fragmentation. As in medieval Europe, the central emperors faced impenetrable restraints from the resistance of local nobles to state predominance. In fact, most of the economic rents gained from the autocratic ruling accrued to the local noble lineages. Besides, the evidence also suggests that the economic failure of fragmented China is directly related to the central government's inability to extract resources through taxation from the locals (Ma, 2012).

Seen from the viewpoint of politics, the regional noble lineages had strong influences on both central and local governments. They had enough political power to dismiss the authority of emperors, which can be evidenced by several facts. First, although the dejure tax was extremely high, however, the landlord lineages not only held the right to be exempted from tax obligations, but were also bestowed with the privilege of legal immunity. In the local power structure, theyheldthe ultimate power of land expropriation, such as mining, fishing, and commercial privileges. Nevertheless, the common land-owners were subject to a full tax liability that they could not afford, and hence were forced to dedicate their land to noble lineages and turned themselves in as slavesso as to evade the tax on labor and land. These slaves or serfs settled in nearby satellite villages and played a key role in cultivation. As a later section will show, this institution is in essence a redistribution mechanism that transfers income from middle-class entrepreneurs to lineage landlords through the lineages' manipulation of factor prices to employ labor at the subsistence wage. It is unlikely to generate a spirit of entrepreneurship in society that will promote economic growth.

Second, government officials, at both the central and local level, were appointed based on the recommendation of regional noble lineages through the cha ju ( 察舉 ) andchiu-p'inchung-cheng (九品中正). Hence, it is not surprising that central governments were ruled by these aristocratic elites who colluded to monopolize the affairs of state by dominating the appointment of officials and practicing endogamy. They developed and implemented state policy within closed cabinet meetings chaired by the Chancellor (宰相). A Chancellor had considerable power and shared final decisions with the emperor and could challenge or even veto (封駁) imperial edicts drafted by the imperial secretariat.

Therefore, the bureaucrats had enough power to act independently of, and against the interest of the emperors, since they were supported by the political power from the local all the way up to the national level.

On the other hand, the central emperor was weak vis-à-vis the local lineages. The post of the emperor sometimes even became the property of the aristocratic families and their relatives. Sporadically, emperors could be dethroned or even murdered if the interests of the aristocracy were violated.

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Although the emperors in the Sui and Tang dynasties attempted to implement examination systems to recruit civilian scholars to staff the government and replace the lineage officials, however, these policies did not last for long due to the bitter opposition from the lineages (Quan, 1972).

*B. Structure of Economic Equilibrium*. To investigate this issue, this article extends the models of Acemoglu (2006, 2010) and Sng (2014) to explain the relationships between state capacity and taxation in historical China. We hope that this might provide some hints to understand the causes of low tax collection in contemporary LDCs.

Consider an infinite horizon economy populated by a continuum $L + \theta^m + \theta^e$ of risk neutral agents. There is a unique non-storable final good denoted by $y$. Agents are divided into three groups. The first comprises a total mass of farmers, $L > 1$, whose only action in the model is to supply their labor inelastically. In addition, assume that the subsistence wage is zero for convenience of analysis. Second, there are two sets of potentially competing producers: (1) middle-class entrepreneurs; (2) local elite (noble lineages or bureaucrats). The middleclass group has a total population $\theta^m > 1$ of entrepreneur agents, who hire farmers ($l^m$) to produce $y$. They can work as an owner of a farming business, a self-employed farmer, or a household farming in which the labor forces are mainly family members. The local elite has size $\theta^e$ and hires farmers($l^e$)to produce and become entrepreneurs. The sets of elite producers and middle-class producers are denoted by $S^e$ and $S^m$, respectively.

Each agent in local elite and middle-class has an access to the following Cobb-Douglas production technology to produce:

$$y^j = \frac{1}{1-\alpha}\left(A^j\right)^{\alpha}\left(l^j\right)^{\alpha}\left(k^j\right)^{1-\alpha}, \quad (1)$$

where$l^j$ ($j \in S_e$ or $S_m$)denotes the labor employed by agent $j$, and$k^j$denotes the capital (mainly land). The key difference between an elite producer and a middle-class producer lies in the productivity, meaning that the productivity of a middle-class agent is higher than that of a local elite agent $A^m \geq A^e$. Also assume that there is a maximum scale of production, so that each entrepreneur can hire at most λworkers, i.e., $l^j \leq \lambda$.

As to the policy side, there is a linear tax rate on production for local lineages($\tau^e \geq 0$)and middle-class ( $\tau^m \geq 0$), respectively. The proceeds of taxes can be redistributed as nonnegative lump-sum transfers to the agent in the groups of elites, middle-class, and farmers($T^e \geq 0$, $T^m \geq 0$ and$T^f \geq 0$).Since the farmers constitute the majority of the population, $T^f$is thus specified to include a public goods provision.

$$LT^f + \theta^m T^m + \theta^e T^e \leq \int_{j \in S^m \cup S^e} \tau^j y^j \quad (2)$$

Since only farmers can be employed, the labor market clearing condition can be expressed as:

$$\int_{j \in S_e \cup S_m} l^j \, dj \leq L. \quad (3)$$

*C. Factor Price Manipulation*. We now characterize the first best solution of the allocation of labor to different entrepreneurs ($l^e$ and $l^m$). Since, under a given set of tax and the wage ($\tau^j$and $w$), the transfers do not affect the economic equilibrium, the planner takes$A^j$ as given and chooses$l^j$ and$k^j$to maximize the net output (total surplus) $_1$ for both the elite and middle-class entrepreneurs:

$$\max_{l_j, k_j} \frac{1}{1-\alpha}\left(1-\tau^j\right)\left(A^j\right)^{\alpha}\left(l^j\right)^{\alpha}\left(k^j\right)^{-\alpha} - wl^j - k^j + T^j, \quad (4)$$

In which $w$ is the wage and the capital price is normalized to 1. The maximization of equation (4) yields:

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$k = (1-\tau^j)^{1/\alpha} A^j l^j$, and(5)

$$l^j = 0 \quad \text{if} w > \frac{\alpha}{1-\alpha}(1-\tau^j)^{1/\alpha} A^j$$
$$l^j \in [0,\lambda] \quad \text{if} w = \frac{\alpha}{1-\alpha}(1-\tau^j)^{1/\alpha} A^j \quad (6)$$
$$l^j = \lambda \quad \text{if} w < \frac{\alpha}{1-\alpha}(1-\tau^j)^{1/\alpha} A^j$$

In equation (6), $MP_L = \frac{\alpha}{1-\alpha}(1-\tau^j)^{1/\alpha} A^j$, which represents the marginal product of a farmer. If the wage rate is above $MP_L$, the producer will not employ any workers; if it is equal to $MP_L$, the employment will be any amount between 0 and λ; and if it is lower than $MP_L$, the producer will prefer to hire as many workers as possible until the maximum rate $\lambda$ is reached. We now use this model to illustrate how the elites'rent extraction may lead to economic inefficiency. This is done by introducing political institutions to the model such that local elites could decide the policies, which include the levying of a high tax on middle-class producers as an entry barrier.

During the fragmentation period, the combination of policy tools constituted an entry barrier $B^M$ for the lineages to expropriate rents. The barrier not only prevented the entry of middle-class agents wishing to become entrepreneurs and to hire labor, but also turned them into slaves. The concrete method was to set an extremely highde jure tax rate for the middle-class farmers. The tax, $\tau^m y^m = B^m l^m$, was so high that the middle-class farming entrepreneurs could not afford to pay it, and hence they were forced to dedicate their land to noble lineages and sell themselves as slaves in order to evade the tax.

Besides, the elite would never have taxed themselves $\tau^e = 0$, and middle-class farmers have evaded all of the tax by abandoning their land and citizenships. Hence, the de facto tax was zero. Also note that since local elites control the state, central emperors had no power to tax.

Next, for a given set of taxes and entry barriers, $\{\tau^e, \tau^m, B^m\}$, the middle-class producers choose the labor employment optimally and the labor market clears. By substituting (5) into (4) and incorporating an entry barrier for each individual middle-class farmers $B^m = \frac{\tau^m y^m}{l^m}$ caused by an unaffordable tax, we can obtain the profit function for the middle-class entrepreneurs:

$$\pi^m(w, B^m) = \frac{\alpha}{1-\alpha} A^m l^m - w l^m - B^m l^m . \quad (7\text{-}1)$$

We also obtain the profit function for the elite entrepreneurs who were exempted from tax, and hence did not face entry barriers:

$$\pi^e(w) = \frac{\alpha}{1-\alpha} A^e l^e - w l^e . \quad (7\text{-}2)$$

By following Acemoglu (2010) and setting an employment constraint as shown below:

$$\theta^e < \frac{L}{\lambda} < \theta^m . \quad (8)$$

If this constraint holds, then there will be enough middle-class entrepreneurs to employ all workers, but there can never be full employment for labor demand coming only from the elite groups. Finally, by combining equations (6), (7-1) and (8), one can obtain the equilibrium wage

$$w^* = \max\left\{\frac{\alpha}{1-\alpha} A^m - B^m, 0\right\} . \quad (9)$$

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Given this model of wage determination, if the elite set $B^m = 0$, they will generate zero profits, but farmers are paid their marginal productivity. On the contrary, by setting $B^m \geq \frac{\alpha}{1-\alpha} A^m$,(and they will certainly do so), they can ensure that they will become entrepreneurs by drivingmiddle-class producers out of the market. More importantly, this kind of entry barrier could also push the equilibrium wage rate down to zero(or the subsistence wage) by manipulating labor prices and enslaving farmers. Since $w_t = 0 < MP_L$ , each elite entrepreneur could hire λworkers and earn a profit of $\frac{\alpha}{1-\alpha}\lambda A^e$. At this point, the total net output becomes

$$Y = \frac{\alpha}{1-\alpha} A^e \theta^e \lambda, \qquad (10)$$

And all output is produced by elite entrepreneurs. But, there is no tax or public goods provision.

There are three sources of inefficiency under entry barriers due to the unfair tax system. First, from the viewpoint of efficiency, since$A^m \geq A^e$, it is better to let middle-class entrepreneurs produce the entire output. This arrangement not only maximizes the total surplus, but also guarantees a wage rate that is better than the

subsistence wage (i.e.,$w = \frac{\alpha}{1-\alpha}\left(1-\tau^j\right)^{1/\alpha} A^m \geq 0$). However, the real world results were actually the opposite of the ideal one: the farming slaves had to work for a subsistence wage; and the high-efficiency producers were driven out of business by the low-efficiency ones. Second, since$\theta^e < L/\lambda$, the elite producers cannot provide employment for the entire workforce. There always remains some unemployment. Finally, the inefficiency of slave farming would reduce agricultural productivity even in the case of large-scale slave farming (Schaefer and Schmitz, 1979).

*D. Political Conflicts*. Since there are two sets of competing elites to extract economic surplus of the commoners (central emperors/local elite), the political wrangling as to who could grab the surplus should be determined by the political power of central emperors and local lineages. Evidently, the local elite grabbed all the surplus created by famers in the fragmentation period. However, as explained in the following section, the allocation of power was altered by two exogenous events, rice technology innovation and the improvement and renovation of the canal system, which both by coincidence took place during the Song dynasty.

## IV. Political Unification Period: Strong State Capacity

*A. From Political Fragmentation to Political Unification*. Prior to the Song dynasty, the political structure granted the lineages huge benefits, and allowed them to manipulate factor prices through unfair and inefficient taxation regimes. However, from the Song dynasty onwards, the balance of power had decisively tilted towards the emperors and that allowed the central emperors to take over all governmental functions and achieved enough political power to suppress local lineages. By the Ming dynasty, even the post of chancellorship was abolished and replaced by the secretariat of the emperors (殿閣大學士), who, like faithful servants, could be dismissed at will by a capricious emperor. This enabled the emperor to wield ultimate power without institutional constraints.

The only restraint on the emperors was the insurrection constraint, meaning that, if farmers at the bottom of the ladder were pushed below subsistence by excessive imperial abuses, they would resort to a violent rebellion to overthrow the imperial power.

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This transformation from fragmentation to unification provides a vital division between medieval and modern times of China. It encompasses at one end the collapse of the medieval aristocracy at the fall of the Tang, and at the other end the unification of China under the emperor's autocratic regime staffed by mobilized bureaucrats dedicated to fortifying the central government. The highly centralized power of the emperors can be seen by the change in the appointment of officials through the imperial examinations (科舉) rather than through the recommendations of the local lineages. Although the imperial examination system was initiated in the Sui and Tang dynasties, however, the candidates were largely restricted to the graduates of official schools already monopolized by elite lineages (Ma, 2012). Moreover, passing the exammerely means being qualified to be a candidate of bureaucrat. It still needed the approval of the lineages to be a formal officer. Therefore, the fair and competitive system that allowed more people to sit for the examinations and to facilitate the formation of a new bureaucracy did not begin until the Song dynasty. The opening up of the examination system for bureaucratic recruitment undoubtedly weakened the pre-existing social structure rooted in the hereditary control of the aristocratic lineages. More importantly, because the plebeian officials lacked of the support from local political elites, they unsurprisingly did not have sufficient power to counterbalance the power of the emperor. Basically, the Song dynasty marked the transition from feudalism to central rule.

But, why could the central emperors have political power to repress the nobles, to implement imperial examination, and to possess the ultimate authority after Song dynasty? As is well known, a dictator's capacity to control his serving men varied with the technical and organizational conditions under which he operated. Hence, the answers in the literature are diverse, ranging from heavy reliance on the construction of large-scale irrigation work making bureaucratic despotism inevitable (Wittfogel, 1957) to military conflicts between Han and Nomadic societies (Ma, 2015). Nevertheless, this article focuses on the influences of rice technology innovation and the Grand Canal on the state's capacity to levy taxes.

*B. State Capacity and Taxation.* Due to China's huge territory, its state capacity to tax encountered two significant difficulties: tax evasion and the transportation cost of taxed grain. However, these difficulties were progressively overcome in the post-Song era.

*B-1: Prevent Tax Evasion by Taxing Land Rather Than People.* Due to the small population relative to land mass, land per capitain the pre-Song era (e.g.,0.15square kilometers in the Tang dynasty) was muchhigherthan that of the post-Song (e.g.,0.07 in the Ming dynasty), as indicated by Table 1. Therefore, in the former case, the constraint on agricultural production was labor rather than land, whichmade the labor price much higher than the land price. For instance, the Han Wooden Strips found in Inner Mongolia (居延漢簡) show that a female slave was worth 20,000 coins in the Han dynasty, but 50 mu of land was only worth 5,000 coins. This means that a female slave was worth 200 mu of land, which was enough land for 10 farming households to cultivate crops in the Song dynasty (Ho, 1990).

Owing to the low value of land in the pre-Song era, the principal source of tax revenue was based on labor rather than on land. However, in a vast country like China, information asymmetry often led to serious underreporting of population (especially the number of adult males), that in turn led to tax evasion and an enfeebled state capacity. Nevertheless, after the Song dynasty, China's fiscal revenue begun to shift from a "tax on labor" to a "tax on land." (Please refer to Table 2.) As indicated by Wang (1973), land taxes accounted for 74% of officially-recorded revenue in 1753 AD and became the main

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source of government revenue. Since land tax cannot be evaded, this change thus facilitated the building of the state capacity to collect tax residency information and secure tax revenues. The basic reason that allowed a shift in the tax base from labor to land was a huge population which enhanced the land's value. More importantly, the huge population could not be sustained for long without technical progress in rice production**.**

After the Song dynasty, there was a dramatic population increase driven by a food increase due to technological innovation in rice production (e.g., the adoption of early-ripening strains of rice and the intensive development of irrigation systems). Technical progress in rice production mainly occurred in the rice-growing territory of Southern China. Henan Tz《河南志》shows that the productivity of the rice wetlands in Southern China was four times higher than that of the wheat dryland in Northern China.

As shown by Elvin (1973), this innovation not only made Chinese fields produce the highest yields in the world, but was also the most important factor in stimulating population growth. Before the Song dynasty, China's population largely remained at a stable size of 50-60 million (Maddison, 2007). After the technical progress in rice and its extensive cultivation in central and southern China, the Chinese population grew rapidly to 100 million in the Ming dynasty and to 400 million by the end of the Qing dynasty in the 1900s. The dramatic population increase unsurprisingly raised the relative scarcity and value ofland, and that allowed central emperors to substitute it for labor as the main tax base. Since the land is immovable and cannot be hidden. This change thus facilitated the development of an efficient tax administration.

*B-2 Reduce Transportation Costs by Constructing the Great Canal.* Rice technology innovation would not have been worthwhile in a subsistence economy without the ability to transport the rice from the surplus-producing area to the populous market area (especially the capital city). Therefore, transportation improvement driven by **technical progress of canal navigation** was another factor that strengthened the state's capacity to levy taxes. SinceChina was vast in terms of territory, the far-flung regions could only be linked to the central capital by networks of slow preindustrial transport. In pre-Song China, transportation costs seriously limited the ability to raise taxes. The government had to waste a lot of resources to deliver taxed grain from the collecting place to the capital or military front. For instance, Pingjin Hou in the Shiji (史記．平津侯主父列傳)shows that, in the Qin dynasty, ittookup 192 tams(石) of forage to feed the mules in order to transport one tam of grain from Langya Shandong (山東琅琊) to Hetao (河套). Hence, the delivery of taxed grain involved extremely high transaction costs. Thesedifficultiesunsurprisingly weakened the political power of the central government to control local authorities. Hence, as long as communications were poor (highways and navigation canals not well developed …) and as long as a natural economy prevailed, the ranking officials tended to hold their office land hereditarily (Wittfogel, 1957, pp.355-356).

However, the improvement of the canal system greatly enhanced the ability to transport the taxed grain. Early Chinese canals (from Qin to Tang) were mainly developed for military use given the limited traffic volume (Kelly, 1997).

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From economic considerations, it is unfeasible to use canal transportation to move taxed grain from surplus districts to the capital. However, after the Song dynasty, the central government began constructing and renovating a national waterway network – the Great Canal, which provided great convenience to imperial taxation. The change was based on two reasons. First, on the supply side, technical progress in industrial transport raised the carrying capacity of Great Canal. As indicated by Joseph Needham (1954), the industrial technology in China reached its peak in the Song dynasty, which caused China to become a global leader in many fields of technological progress, such as the invention of "navigation lock" to raise and lower ships between stretches of water of different levels on canal waterways. Second, on the demand side, huge transportation demand arising from marketable surplus of rice output created a derived demand for the transportation systems. Both factors henceallowedthe government capable of developing a canal system through the construction of new waterways and the improvement of existing ones by deepening, removing rapids, and adding locks. Over that period of time, this waterway networkwasthe world's largest artificial waterway, and came increasingly to be used for transporting taxed grain from Southern to Northern China, in which the capital city was located (Wittfogel, 1957).

Through the 30,000-mile-long national network of canals and navigable rivers, all economically important regions of China had been linked into a single territory (Chi, 1936),and 30-40% of agricultural products were marketed during the early 12$^{th}$century (Perkins, 1969). Brandt et al. (2014) also indicate that, roughly, one-fourth of these shipments were used in long-distance trade. Besides, a wide literature surveyed by Quan (1972) also shows that the Grand Canal facilitated the northward shipment of taxed grain to the capital, and allowed the central government to tax entrepreneurs nationwide.

Seen from the viewpoint of politics, the waterway network played a key role in strengthening the political power of central emperors. It helped the emperors to exert political control over the locals. Prior to the Song dynasty, the central government was faced with the difficult logistical task of transporting large quantities of taxed grain from the south to support the imperial court and armies that were concentrated in the north.

However, the Great Canal provided central emperors with the ability to transport grain cheaply over long distances and helped to strengthen the state capacity. This not only transferred political power from local lineages to central emperors, but also changed the source of economic inefficiency from factor price manipulation to bureaucratic corruption.

*C.Bureaucratic Corruption under Strong States.* When the state's capacity to tax was strong, it "seems" likely that the central emperor could levy taxes efficiently and raised the ratio of tax to GDP. However, the real world is far from being that simple. Although central emperors might eliminate entry barriers created by local lineages, and might avoidthe inefficiency resulted from factor price manipulation, so that high efficiency producers (middleclass farmers) could produce without interferences. However, they are still subject to a practical difficulty to tax enough. This is because China's size is too large to avoid the principal-agent problem. Huge size of territory imposed substantial complexity and difficulty in transmitting information over distance, especially in the premodern world. In addition, regional differences in climate and crops also bestowed local agents (bureaucrats) with high flexibility in implementing central government decrees, and made gathering information for anti-corruption

investigations more difficult. Given these information asymmetries, it was difficult for a central emperor to monitor the tax over-collection by local bureaucrats. Thisgavelocal bureaucrats strong incentives to extort the farmers and engage in corruption.

Although the evidence is sketchy and fragmented, it still suggests that low threat of detection of corruption led to a pervasive corruption. For instance, Sng and Moriguchi (2014) indicate that regional diversity forced the government to collect land taxes ina variety of ratios between crops and silver money. This means that the farmers had to pay part of their taxes in kind, which, depending on the region, might be rice, wheat, millet, or other staple crops. The remaining part of the tax denominated in silver also had tobe paid in copper coins when and where silver was scarce. To deal with such kind of diversity, the central government had no choice but to allow native magistrates to set commutation rates based on local conditions. However, the heterogeneity across regions made it difficult to monitor the tax over-collection by local administration and led to endemic corruption.

*One popular form of over-collection was the manipulation of commutation rates, wherein magistrates demanded households to*

*pay taxes in copper (instead of the officially stipulated silver or grain) and set the commutation rate above the market rate … commoners paid up to 16,000wen of copper cash for every shi of rice that they owed in taxes, when the market price of rice was less than 3,000 wen per shi* (Sng and Moriguchi, 2014, p.457).

Historians also agree that bureaucratic corruption grew over time in Ming and Qing dynasties (de Bary, 1993; Rowe, 2009). In particularly, Ni and Van (2006) empirically estimate that corruption consumed more than 20% of China's agricultural output in 1850. Ma and Rubin (2019) also find that, in 1884, the unofficial income for officials above the provincial level was 63 million taels, amounted to 81% of the total official tax quota. On an individual basis, a magistrate in the early 19$^{th}$ century could embezzle 30,000 silver taels annually, which were about 12.8 times of his legal income, 2340 taels (Chang, 1962). Besides, the corruption ranged from bottom to top. Provincial level officials relied on the contributions from the lower level officials (magistrates), who were asked to pay for bribes, and were often punished for any shortfall in quota payments. Worse still, the rulers were completely unable to keep corruption in check through any monitoring institution. *These problems were difficult to resolve under the existing political institution as efforts from the center to monitor bureaucrats only multiplied the problem of monitoring the monitors. Indeed, internal staffers sent initially as imperial plenipotentiaries to control the outer layers of administration often found themselves turned into a new layer of formal bureaucracy superimposed on the external bureaucratic structure stationed outside the imperial capital. The subsequent dispatch of another layer of inner court personnel to monitor the previous monitors could end up repeating the process, leading to what many historians referred as the "externalization"* [localization] *of* [central emperor's] inner *staff*(Ma, 2012, pp.16-17).Hence, the improvement in fiscal capacity merely turned the political conflict from a contest between central emperors and local lords into a contest between central emperors and local bureaucrats.

The Qing dynasty and was extended northward to connect with commodity flows along the Liao River in Manchuria (Brandt et al., 2014).

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*D. Corruption Leads to Low Tax and Under-Provision of Public Goods*. In Ming and Qing, China was a typical small peasant economy, in which 50%-60% of farmers were tenants (Perkins, 1984). On the other hand, as corruption become rampant, most of the wealth was concentrated in the hands of few bureaucratic families. Therefore, the landlords were also bureaucrats who passed the imperial examinations (Moore, 1966).

Under such production relation, the middle-class farming was conducted by the small farming in which a household rented the land ($k^m$) from the landlords,and labor forces ($l^m$ ) weremainly family members. Because$A^m > A^e$, and there were enough middle-class farminghouseholds to employ all workers ($L > \theta^e \lambda$ ), the misallocation of resources resulting from factor price manipulation disappeared. Hence, total output was larger than that in the case of the period of fractiousness (see equation 10) and became

$$\hat{Y} = \frac{\alpha}{1-\alpha} A^m L > \frac{\alpha}{1-\alpha} A^e \theta^e \lambda, \quad (11)$$

The economic intuition is easy: with the factor price manipulation mechanism, the objective of the local elites is to impoverish the middle-class as much as possible so as to prevent them from competing for labor, whereas for revenue extraction, the emperors would like the middle-class to produce and generate more revenue. Ideally, this kind of production arrangement has the potential to fuel a burgeoning middle class that leads to wages higher than subsistence level, more tax revenue, and pubic goods provision in China. However, bureaucratic corruption destroyed this potential, because the corruption of local bureaucrat would force the emperors to levy a low tax rate and provide an insufficient public goods for economic development. First, assume that a middle-class farmer had to pay $l^m C^m$ to local bureaucrats as the bribery or extortion. Second, his profit function wassubject to corruption and tax, but did not have to face entry barriers:

$$\pi^m(w, C^m) = (1-\tau)\frac{\alpha}{1-\alpha} A^m l^m - w l^m - C^m l^m. \quad (12)$$

Since the middle-class farming can ensure full employment, the equilibrium wage became:

$$w^* = \max\{(1-\tau)\frac{\alpha}{1-\alpha} A^m - C^m, 0\}. \quad (13)$$

Equation (13) is different from (9) by the source of unfairness and inefficiency. In (9), local lineages decided entry barriers to drive middle-class producers out of the market, and pushed the equilibrium wage rate down to subsistence wage. Conversely, in (13), it was the central emperor who decided the tax rate $\tau$. The higher the tax rate is, the more likely that $\boldsymbol{w}^*$would be lower than subsistence wageand triggers the rebellion. Hence, as indicated by Sng (2014), the emperors were forced not to overtax the farmers to preempt rebellion. This means that they had to set a tax rate not to exceed marginal productivity minus the corruption of bureaucrats. After some manipulation, this leads to

$$\tau \leq 1 - \frac{C^m(1-\alpha)}{A^m \alpha}. \quad (14)$$

The higher bureaucratic corruption was, the lower the tax rate that the emperor had to set in order to preempt rebellion. At this point, low tax revenues and pervasive corruption predictably led to extremely low provision of public goods($T^f \to 0$.) and poor economic performances, which is the same as that of the fractious period. The crucial point is that no-revolt constraint applied only to emperors but not to local bureaucrats. In this setting, pervasive bureaucratic corruption was pre-given and determined by exogenous factors, such as: large corruption rents (population growth increased economic surplus

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available for corruption), and low probability to be detected (large size and heterogeneity rendered the detection of corruption particularly difficult).

As in the fractious period, it is still the case that local elite extracted the farmers, rather than central emperors. Kiser and Tong (1992), Brandt etal. (2014), and Ma and Rubin (2019) unanimously indicate that the state in late imperial China can best be described as a large dictatorship where excessive exploitation came not from the emperors, but from their agents who had shorter decision horizons and less encompassing interests than the "benevolent" emperors themselves. Sng (2014) and Sng and Moriguchi (2014) also empirically show that no revolt constraint applied only to emperors but not to local bureaucrats. Hence, the emperors were motivated not to overtax the population to preempt rebellion, but, on the other hand, his agents had sufficient private incentives to expropriate rent from the farmers.

Basically, this setting is a typical principal-agent game, in which the sequence of events is as follows: first, the emperors have to set a tax rate low enough to ensure a farmer's income to be higher than or at least equal to "taxes plus corruption"as shown in equations (13) and (14).Second, the nature gives a positive and high-level of$C^m$. At this point, in order to ensure $w^* \geq 0$,even though the emperor is a dictator, in practice,he stillcould hardly obtain any surplus exceeding $\hat{y} - (w^* + C^m)$from a farmer.[10]Therefore, high corruption in the second

[10] $\hat{y} = \hat{Y}/_L$

stage would force the ruler in the first stage to keep taxes low to mitigate the "tyranny at the bottom" effect as referred to bySng (2014).As he shows,"*… the Qing state taxed lightly. Its annual tax revenue between 1650 and 1850 averaged around four billion liters of rice in real terms. This is equivalent to less than 4% of China's hypothetical output in 1800* (Sng, 2014, p.118)." More importantly, it is the informal extractions from local bureaucrats that can explain the apparent simultaneity of low tax and insufficient public infrastructure to support modern industrial growth. This makes the source of inefficiency results from bureaucratic corruption rather than factor price manipulation.

*E. Bureaucratic Corruption and Government Inefficiency*. Bureaucratic corruption inevitably created resource misallocation and governmental inefficiency. For instance, due to the pervasive corruption, the emperors had to implement a vertically integrated monitoring system to avoid corruption. However, the use of the power vertical as a pillar of political order inevitably involved huge agency costs, such as monitoring performance, gathering information, and enforcing decisions, especially at the local level (Gel'man and Ryzhenkov, 2011).

This led to a highly inefficient administrative structure. Even the emperors set up multiple layers of bureaucracies in order to ensure the monitoring system, however, the problem is that the monitoring is done by individuals who may themselves be corruptible. This means that more anti-corruption institution, in fact, increased rather than decreased corruption. In the end, nothing gets accomplished since everyone is corruptive. More importantly, this kind of regime of brought about an environment that was inhospitable to the incentive of entrepreneurship (such as business and industry) without which a jump from the traditional technology to the modern technology is not possible. Not to mention that the low taxation also led to a sustained decline in public goods provision which caused the military and socioeconomic failures of the 19th century.

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Although some literature identifies the source of the problem as the empire being too large for the principal to effectively monitor the agents' behaviors, this article emphasizes that the root cause of the failure still lies in the lack of checks on elite power. There has always existed persistent tension between the political structure that maximizes the rents to the elite rulers and the efficient system that reduces transaction costs and encourages growth. For this reason, the system of centralized rule merely replaced the problem of there being a conflict between the central emperors and local lineages with a set of principal-agent problems within a centralized hierarchy (Laffont and Guessan, 1999; Ma, 2012).

*F. Farmers' Position.* Dynastic struggles largely involved matters between central emperors and local lineages (or bureaucrats), but were completely unrelated to the lives of the farmers. Despite the change in the distribution of political power between central and local elites, the farmers' position remained the same in that their wages were still at the subsistence level, there being no improvement. Regardless of whether they were in a strong or weak state, the political institutions were always developed to be beneficial for the ruling elite at the expense of the people. This argument can be verified by the long-run analysis of Perkins (1969, pp.16–17) and Maddison (2007), which shows that the annual consumption of grain for a Chinese farmer constantly remained within a range of about 10% on either side of 285 kg from the 13$^{th}$to the 20$^{th}$ centuries. Adam Smith even wrote that "*The poverty of the lower ranks of people in China far surpasses that of the most beggarly nations of Europe. Many thousand families have no habitation on the land, but live constantly in little fishing boats upon the rivers and the canals. The subsistence which they find there is so scanty that they are eager to fish up the nastiest garbage thrown overboard from any European ship*." (Wealth of Nations, Chapter VIII, p. 86).

## V. Concluding Remarks

This article draws on the insights of new institutional economics to investigate the relations among state capacity, taxation, and economic performance in historical China. The results show that, throughout the history of autocratic rule, most of the agricultural surplus was extracted by the elites in the form of factor price manipulation or corruption. However, regardless of whether the political power was concentrated at the central or local level, the backward outcome of bureaucratic governance would emerge. Based on unfavorable outcome, our results imply that efficient resource allocation requires an environment that allows a well-functioning political replacement mechanism to control the power of the rulers and to ensure tax revenues are used for the provision of public goods.

Therefore, the insight is not whether or not a high tax can promote growth, but rather whether the political regime is extractive or not. This provides a solid framework to explain why the governments of developed countries mostly impose significantly high tax burdens, and function better than the weaker states in sub-Saharan Africa. It also appears that: (1) although China's historically autocratic framework might be effective in exploiting the potential of a traditional technology and in increasing the ruling elite's benefit, it cannot ensure the welfare of the public; and (2) the same setting has given rise to an environment that is inhospitable to the incentive of entrepreneurship without which a jump from the traditional technology to the modern technology is not possible.

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Table 1: Chinese Population and Land

| Period | (1) Population (thousands) | (2) Land (square kilometers) | (3) Land per capita (square kilometers) |
|---|---|---|---|
| West Han (157 BC) | 60,000 | 666 | 0.11 |
| East Han (28 AD) | 60,000 | 655 | 0.11 |
| Jin (236 AD) | na | 616 | na |
| Tang (685 AD) | 50,900 | 890 | 0.15 |
| Song (1010 AD) | 100,000 | 483 | 0.05 |
| Ming (1447 AD) | 100,300 | 750 | 0.07 |
| Qing (1711 AD) | 130,800 | 1,284 | 0.09* |

Sources: Maddison, A. 2007. *Chinese Economic Performance in the Long Run 960-2030 AD*. OECD.
* Although in the Qing dynasty, the land per capita (0.09) seems to be larger than that in the Song dynasty (0.05), this merely reflects the fact that the Qing dynasty's territory was larger than that of the Song dynasty due to the addition of Xinjiang (the "new frontier"), which is a remote desert region incapable for cultivation.

Table 2：Classification of the Chinese Tax System

| | Tax Based on Labor | Tax Based on Land |
|---|---|---|
| Spring and Autumn | Xiāngdìérshuāizhēng (相地而衰征) | |
| Spring and Autumn | Chūshuìmǔ (初稅畝) | |
| West Han | Biānhùqímín (編戶齊民) | |
| Sui and Former Tang | Zu yongdiao (租庸調) | |
| Later Tang | | Liǎngshuìfǎ (兩稅法) |
| North Song | | Fāngtiánjūnshuìfǎ (方田均稅法) |
| Later Ming | | Single whip law |

| | | |
|---|---|---|
| | | (一條鞭法) |
| Qing | | De dīngyín (地丁銀) |

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