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Dynamics of the Rate of Surplus Value and the “New Normal” of the Chinese Economy¹

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Abstract: This paper builds homogenous series of the rate of surplus value for the Chinese economy over the extended period 1956-2014 with a Marxian approach. It finds that the high profitability that stimulated capital accumulation in the decade before the 2008 crisis had relied on the continuous growth in the rate of surplus value. Given that the global crisis and changes in the domestic economy undermine all the conditions maintaining the accumulation model (an expanding external market, a relatively large reserve army of labor, and a low debt-income ratio), the rate of surplus value has failed to increase and profitability declined since 2008. Thus this paper interprets the so-called “new normal” of the Chinese economy as a stage of declining profitability that results mainly from the stagnant rate of surplus value and the rising value composition of capital.

Keywords: rate of surplus value, profitability, new normal, Chinese economy

JEL codes: B51; O53; P2

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1. Introduction

This paper builds homogeneous series of the rate of surplus (RSV, hereafter) for the Chinese economy using a Marxian approach. This method highlights the division between productive labor and unproductive labor and argues that the value that unproductive labor obtains is a transfer of surplus value. The origin of the approach dates back to classical economists including Adam Smith, David Ricardo, and Karl Marx; in recent decades, Moseley (1985) and Shaikh & Tonak (1994) developed the approach and made it empirically applicable with statistical data. Some country-specific studies have applied the approach and obtained interesting findings (Cronin 2001; Maniatis 2005; S. Mohun 2005; Mohun 2013; Paitaridis & Tsoulfidis 2011); nevertheless, no study following this method has been focused on the Chinese economy. The main barrier for applying the approach to the Chinese economy might be data availability; another might be theoretical issues of implementing the approach to an economy that experienced a transition from a state-socialist system to a capitalist system.

This paper has two objectives. First, it provides data series for the RSV and relevant Marxian variables (value composition of capital, the share of surplus value extracted by unproductive sectors, and gross and net rate of profit) by using recently published China's official statistical data. Although the calculation has to impose assumptions to the estimation procedures due to the lack of data, it makes those assumptions and procedures as transparent as possible. The data series cover an extended period of contemporary China from 1956 to 2014—from the establishment of the state-socialist system to the seventh year since the global crisis broke out. This paper might be the first attempt to build series of Marxian variables for China over such an extended period.²

² Zhang and Zhao (2007) provide series of China's rate of surplus value over the period 1978-2004; however, they only cover manufacturing and do not consider the transfer of surplus value.

The second objective of this paper is to understand China's so-called "new normal" from the dynamics of the RSV and its crucial role in affecting profitability during the reform era.³ The analysis finds that the RSV followed a U-shape from 1978 to 2008, reached the trough in 1997, stagnated and slightly fell after 2008. While the RSV in China was not as high as that in the U.S.,⁴ it reached its historical peak when the global crisis broke out. This paper uses a decomposition method to show that profitability had relied on the growth of the RSV underpinned by a series of economic and institutional conditions.⁵ The global crisis and changes in the domestic economy, however, undermined all the conditions maintaining the accumulation model; therefore, this paper suggests the "new normal" be a stage of declining profitability caused by the failure of keeping the increase of the RSV. As the growth of the RSV cannot offset the increase in the value composition of capital, a falling tendency of profitability is threatening the Chinese economy.

In what follows, this paper is organized into four sections. Section 2 discusses theoretical issues on measuring Marxian variables for a transitioning economy. Section 3 constructs the RSV, discusses data issues, assumptions and estimation procedures, describes the trends of the RSV, and examines the relationship between the RSV and profitability. Section 4 discusses the conditions that had supported the growth of the RSV and why the RSV stagnated after the 2008 crisis. Section 5 concludes the paper.

³ "New normal" in the west refers to the conditions of the financial market and the economy after the global crisis, which Summers (2015) interprets as "secular stagnation". In May 2014, President Xi Jinping proposed that the Chinese economy had entered into a "new normal" phase; however, what the term means for the Chinese economy is ambiguous.

⁴ The RSV in the U.S. was around 3.5 in 2008 (Paitaridis & Tsoulfidis 2011), compared to 2.6 in China.

⁵ The decomposition method utilized here decomposes the growth rate of the net rate of profit into the growth rates of the RSV, value composition of capital, and the share of surplus value distributed to productive sectors. This method does not reveal the causality or interactions among variables. Nevertheless, it reveals the correlation between the growth rate of profitability and the growth rates of the other three variables.

2. Theoretical Issues: Marxian Variables in a Transitioning Economy

The division between productive and unproductive labor is a perspective to see how the new value of an economy is circulated and distributed, which enables us to trace the flow of new value and measure critical Marxian variables (e.g. Marxian value added, variable capital, surplus value). Some heterodox studies (e.g. Weisskopf, 1979) use distributive shares in GDP to measure the bargaining power of labor vis-à-vis capital; however, given that GDP accounting does not consider the transfer of surplus value, distributive shares in GDP do not necessarily reflect the distribution between labor and capital or the rate of surplus value. Another problem with GDP accounting is that it does not distinguish coexisting modes of production, which can also affect distributive shares.⁶

Current studies that take the transfer of surplus value into account start with restructuring the economy by the division of productive and unproductive labor (sectors) and then measure Marxian variables using data from input-output tables and GDP accounting. Empirical studies with this approach have achieved many interesting findings. Moseley (1985), Shaikh & Tonak (1994), and Paitaridis & Tsoulfidis (2011) find that the rise of unproductive activities in the U.S. after WWII has extracted an increasingly large share of surplus value, which repressed the net rate of profit of the economy. Mohun (2005; 2013) integrates the approach with a class analysis and find that distributive shares of the working class (consisted of productive workers and unproductive workers) decreased in recent decades. However, most of the studies are focused on the U.S. economy, whereas no study has applied to the Chinese economy.

China established a state-socialist economic system in 1956 when it accomplished the Socialist Transformation, and experienced the transition to a capitalism-dominated economic system that started in 1978 and accelerated after 1992. There was no capitalist component in the economy from

⁶ This problem with GDP accounting is important especially for developing economies, where a large proportion of total employment is in agriculture (38% in 2010 for low and middle-income economies) and a large proportion of agriculture is non-capitalist. Data sources: WDI database.

1956 to 1978, and the capitalist component did not play a major role until 1992. Given China's economic transition, can one apply the Marxian conceptions designed for a capitalist economy to the Chinese economy, in particular for the period before 1992?

We address this question in two steps. The first step is about the division between variable capital and surplus value. In a capitalist economy, it is the contested terrain in the workplace where exploitation occurs that generates the division between variable capital and surplus value. The micro-foundation of China's state-socialist economy was much different: all means of production were publicly-owned assets; workers enjoyed job security and various benefits; before 1978, especially during the Cultural Revolution, workers had some rights to criticize cadres in factories; the economic inequality between workers and cadres were small. Although no capitalist-worker conflict existed in the socialist economy, there was a contradiction between workers and the state, between the national products distributed to workers as wages and that submitted to the state as surplus. Raising wages could enhance the living standards of workers; nevertheless, the state was aimed at not only enhancing the living conditions but also accomplishing industrialization, for which accumulation of surplus was obviously a prerequisite. Giving this contradiction, the distribution between workers and the state could reflect the realistic contradiction between workers' living standards and the aim of industrialization. For the sake of simplicity, admitting the difference between wages and variable capital and that between surplus and surplus value, the rest of the paper uses variable capital and surplus value for the entire period 1956-2014.

The second step is the division of productive and unproductive labor in a state-socialist economy. This division is not a new topic for Chinese economists. From the late 1970s to the early 1990s, intensive discussions on what is productive labor and unproductive labor in the socialist economy took place among Chinese economists. Meanwhile, China's official statistical system transited from the Material Product System (hereafter, MPS) to the U.N. System of National

Accounts (hereafter, SNA). These discussions played a role in promoting the transition because reforming the official statistical system had to answer what is productive labor and unproductive labor in the first place. The main deficiency of the MPS is that it only treats “material production” (agriculture, mining, manufacturing, utilities, and construction) as productive activities and excludes all services from its scope, while the SNA treats the activities of all sectors as “productive” in the sense of creating GDP. As the state pursued the comparability with the national income of capitalist economies, it finally replaced the MPS with the SNA.⁷ Among the Chinese economists who contributed to the discussions on productive labor and unproductive labor, Yu (1981) asserts that all services are productive and endorses the adoption of the SNA, while Sun (1981) and Wei (1981) insists that only “material production” is productive. Luo (1990) compares the differences between the MPS and SNA and argues that “material production” and some services are productive whereas commerce, finance, and the state non-enterprise sector is unproductive, which shares many similarities with Shaikh & Tonak (1994). Both Luo (1990) and Shaikh & Tonak (1994) point out that there are a general distinction and a particular distinction (i.e. the difference in a specific relation of production) between productive and unproductive labor. Shaikh & Tonak (1994) suggest that household industry in a capitalist economy is productive because it produces certain use value according to the general distinction; however, it is unproductive of capital because it does not produce surplus value for capital according to the particular distinction. Similarly, Luo (1990) argues that agriculture in a socialist economy be unproductive according to the particular distinction.

Table 1 divides the Chinese economy into productive sectors and unproductive sectors with the Marxian approach based on Luo (1990) and Shaikh & Tonak (1994). “Productive sectors” means that there are some productive activities in these sectors, while “unproductive sectors” means that

⁷ For example, in 1979, Deng Xiaoping cited the GDP of developed economies to illustrate the goal of Chinese economic development; in 1987, Deng illustrated the goal of Chinese economic development with GDP numbers, which pushed the shift in the statistical system. (NBS 2009b)

there is no productive activity in these sectors. A kind of labor is productive if it creates objects of use values, while labor is unproductive if it only distributes existing objects of use values or maintains social order (Shaikh & Tonak, 1994). Under this criterion, restaurant services are productive labor, while commercial and financial activities are unproductive labor. This paper focuses on the enterprise sector because first of all it was the dominant part of the economy over the entire period and secondly it was a relatively homogenous sector where the relation of production transited from the worker-socialist state relation to the worker-capital relation as the economic transition proceeded. Specifically, the enterprise sector consists of state-owned enterprises, state-holding enterprises, collective enterprises, and private enterprises.⁸

[Insert Table 1 here]

The enterprise sector does not include agriculture, self-employment units, non-profit institutions for scientific research, education, culture, and medical services (hereafter, non-profit institutions), and the state non-enterprise sector (governments, the legal system, and the military). People's communes were the main organization for agricultural production during the period before 1978, and rural households became the dominant production units after the de-collectivization reform in the early 1980s. Over the entire period 1956-2014, agriculture was different from the enterprise sector in distribution and employment. Luo (1990) suggests that agriculture not belongs to the dominant part of China's socialist economy. The self-employed sector expanded only after 1992, mainly based on household labor and a small fraction of wage labor.⁹ Non-profit institutions

⁸ Private enterprises in this paper correspond to the statistical categories of "private enterprises," "enterprises with funds from Hong Kong, Macao and Taiwan," and "foreign funded enterprises".

⁹ Some self-employment units might be as large as small private enterprises in terms of employment but they are not registered as enterprises; however, there is no data to distinguish those enterprises from real self-employment units.

were mostly public-funded over the entire period. Although Shaikh & Tonak (1994) treat public-funded institutions of education and medical services in the U.S. as government enterprises, the non-profit institutions in China are not any enterprises because they aimed at fulfilling certain needs of the state, rather than economic objectives such as output and profits.¹⁰ The state non-enterprise sector obtains a transfer of surplus value from the enterprise sector in the form of taxes.

Within the enterprise sector, commerce, finance and real estate are unproductive sectors in the sense that no productive activity exists in these sectors. In China's state-socialist economy, a part of the surplus value is transferred from productive sectors to unproductive sectors, similar to the transfer of surplus value in a capitalist economy. Supervisory labor in China's state-socialist economy was partially unproductive because it played a productive role in organizing production and meanwhile it aimed at promoting the absorption of surplus, similar to the supervisory labor in a capitalist economy.

3. Dynamics of the RSV and Relevant Marxian Variables in the Enterprise Sector

This section introduces the procedures for calculating the RSV and related Marxian variables and discusses the assumptions for the estimation procedures and the potential biases that those assumptions may lead to; then this section discusses the trends of the RSV and relevant Marxian variables, and discusses the relationship between the RSV and the net rate of profit.

3.1. Methodology and Data

¹⁰ Shaikh & Tonak (1994) suggest that government enterprises in the U.S. are essentially capitalist enterprises but this need not be the case in other countries.

The RSV is the ratio of surplus value (SV) to variable capital (VC). The RSV, SV, and VC are given by Equation (1)-(3):

$$RSV = SV/VC \quad (1)$$

$$VC = (1 - \alpha)EC_p \quad (2)$$

$$SV = (NV_p - VC) + TO_t + RY_p + RY_t \quad (3)$$

In Equation (2), EC_p is the employees' compensation of productive sectors, consisted of all the wages, salaries, and benefits of workers and managers; α is the share of supervisory labor's compensation in EC_p . In Equation (3), NV_p is the net value added of the productive sector, which equals to the sum of EC_p , operating surplus and net taxes on production; TO_t is the total output of the commerce sector, which equals to the sum of intermediate inputs, depreciation of fixed capital, employees' compensation, operating surplus and net taxes of the commerce sector; RY_p and RY_t are royalty payments paid by productive sectors and the commerce sector to the finance sector as intermediate inputs, respectively.¹¹

Regarding data sources, a rigorous calculation of the Marxian variables requires input-output tables. Although China began to compile input-output tables as early as 1973, the first input-output table that covers all sectors was compiled in 1992 whereas the previous tables only cover "material production" sectors of the MPS. Also, China's basic input-output table is updated every five years,

¹¹ Royalty payments are consisted of two kinds: payments as operating surplus and payments as intermediate inputs. The first kind has been counted by the net value added of productive sectors and the total output of the commerce sector.

so it is not continuous.¹² Thus, the paper uses the data of the income approach national accounts instead, which covers almost all the years from 1978 to 2014. For the period 1956-1977, variables are estimated based on the data of national accounts and labor statistics.

The appendix introduces data sources, assumptions, and estimation procedures in detail. Here we discuss two of these assumptions. Due to the lack of data, we cannot measure supervisory labor's compensation. Thus the first assumption is that $\alpha = 0$. This obviously unrealistic assumption will underestimate the RSV and is likely to cause more underestimation for the post-2000 period because there is evidence to show that since the late-1990s the management-worker inequality has increased for China's listed companies (Qi 2014). On the other hand, some data shows that the employment share of supervisory labor was stable. The supervisory share in mining, manufacturing, utilities and construction employment varied within a narrow range from 9.8 percent to 11 percent over the period 1980-1997;¹³ micro-level data also suggests that supervisory employees accounted for around 10 percent of total employment prior to 1990.¹⁴

The second assumption is that the redistribution of surplus value only takes place within the country. In reality, surplus value produced by China's productive sector can be distributed to a foreign trade sector, and vice versa. For instance, Wal-Mart who sells products imported from China in the U.S. may acquire surplus value created by the manufacturing exporter located in China. It is impossible to estimate this transfer of surplus value without detailed export and import input-output data. Given that current account surplus became increasingly large after 2001 when China joined the

¹² The National Bureau of Statistics conducts a national input-output survey every five years to compile the basic input-output table and conducts a small-scale input-output survey three years after each national survey to compile a simplified input-output table.

¹³ Data sources: China Statistical Yearbook, issues from 1981 to 1988; China Labor Statistical Yearbook, issues from 1991 to 1998.

¹⁴ Data sources: Author's collection of historical materials of the mining industry in Henan Province, Zhengzhou No. 5 Cotton Textile Factory, Guangxi No. 1 Machinery Manufacturing Factory, Changzhou Machinery Manufacturing Factory, and Luoyang Glass Group.

WTO, this kind of transfer might be considerable. Thus, this assumption is likely to underestimate the RSV after 2001.¹⁵

3.2. *Long-term Trends of the RSV and Relevant Marxian Variables*

Figure 1 shows the long-term trend of the RSV. In the Maoist era (1956-1978) the RSV fluctuated severely in the 1950s and 1960s and became relatively stable after 1970. Those severe fluctuations resulted from the massive accumulation during the Great Leap Forward movement (1958-1960) and the economic contractions in the early 1960s and the early period of the Cultural Revolution (1966-1976). In the reform era (1978 to present), the RSV shows a U-shape before 2009: it had a declining trend from 1978 to 1997 and then entered a rising trend until 2008. This U shape of labor's share took place along with fast economic growth and development over the reform era. If we consider the RSV as a proxy for distribution inequality, this U-shape of the RSV contradicts the Kuznets curve that depicts the relationship between inequality and economic development (Kuznets, 1955). Using top income ratios and distributive shares in the national income, Piketty (2014) shows that the experiences of leading capitalist economies do not support the Kuznets curve. Here the Chinese facts do not support the Kuznets curve either.

[Insert Figure 1 here]

Why did the RSV change in such a U manner? In the early stage of the reform era, the reformers undermined the incentive system within the factories of the Maoist era featured by nonmaterial incentives and encouraged the adoption of material incentives such as bonuses and

¹⁵ As the export declined after 2008, one may expect that the surplus value transferred to foreign economies also decreased. If that is the case, this assumption would imply that the rate of change in RSV in the recent period is also underestimated.

piece wages. Workers lost some critical political rights but still enjoyed job security and various benefits. The economic inequality between workers and cadres in factories was small, and cadres tended to pursue higher wages and more benefits for both workers and themselves. In this situation, without the stick of unemployment, material incentives were increasingly ineffective in disciplining workers and absorbing surplus labor, which is why the RSV decreased from 1978 to the 1990s (Qi 2015).

After 1997, despite lower than the RSV of the U.S. economy, China's RSV grew much faster than the latter. The RSV fell from 2.45 in 1978 to 1.59 in 1997 and then increased to 2.55 in 2008. The RSV estimated with similar methods for the U.S. economy was generally in a rising trend in the post-WWII period except the period 1964-1974 (Paitaridis & Tsoulfidis 2011; Shaikh & Tonak 1994); it increased from 2.2 in 1978 to 3.1 in 1997 and 3.5 in 2008 (Paitaridis & Tsoulfidis 2011). The growth rate of China's RSV is comparable to that of the RSV in the Greek economy. Tsoulfidis & Tsaliki (2014) shows that the RSV in the Greek economy increased from 1.4 in 1990 to 2.3 in 2004 and after that slightly declined. Marina & Moseley (2000) find that the RSV in the Mexican economy grew rapidly from 1982 to 1993 at an average annual rate of 1.6 percent, which, however, is much slower than the growth of China's RSV from 1997 to 2008.

The fast growth of the RSV was possible, thanks to the expansion of the private sector and the reserve army of labor. Private enterprises use harsh management practices and disobey the Labor Law on signing labor contracts and restricting working hours. Thus the RSV of the private sector is higher than that of the state-owned sector. The increase of the RSV echoes the falling share of the state-owned sector in the economy. In 1997, when the RSV reached its trough of the reform era, the Fifteenth National Congress of the Communist Party of China accelerated the reform on the state-owned sector, consisted of laying off workers, privatizing small- and medium-scale enterprises, and transforming large-scale enterprises into shareholding companies. Meanwhile, due to market

competition and profit motivation, state-owned enterprises tended to adopt management and employment practices similar to those of private enterprises.

The reserve army of labor emerged as migrant workers from rural areas seek jobs in cities and the state-owned enterprises laid off massively. Despite a large rural underemployed population, the formation of a reserve army of labor requires institutional changes in both the rural and urban sectors. The de-collectivization of the rural economy, the stagnation of rural household income, the expansion of the urban private sector, and the tendency of the state-owned sector to replace urban workers with migrant workers prepared the necessary conditions for the influx of migrant workers. Meanwhile, laid-off workers of the state-owned sector also expanded the reserve army of labor. One of the objectives of the drastic reform of the state-owned sector was “increasing efficiency by reducing employment.” In fact, workers had begun to be laid off even earlier; from the mid-1990s to the early 2000s, more than 30 million workers lost jobs from state-owned enterprises. Employment of state-owned and state holding industrial enterprises dropped by 6 percent in 1997, by 7 percent in 1998, and by about 10 percent each year from 1999 to 2003.¹⁶

The loss of wage and job securities is evident from the comparison of the cyclicity of the RSV in different periods. The RSV was pro-cyclical throughout the entire period; however, it was more pro-cyclical in the Maoist era than in the reform era. Both the correlation between real GDP growth and the RSV and that between real GDP growth and the growth of RSV are higher in the Maoist era than in the reform era. Economic contractions in the Maoist era led to a fall in the new value, but also a drop in the RSV due to the relatively stable wages and job security. As the transition proceeded, economic fluctuations were increasingly relevant to wages and employment because workers increasingly lost their wage and job securities after the expansion of the private sector, the influx of migrant workers, and the drastic reform of the state-owned sector.

¹⁶ Data sources: China Statistical Yearbook 2015.

It is noteworthy that the RSV reached its historical peak in 2008,¹⁷ which was even higher than that in 1978. At the beginning of the reform era, the reformers gained support from workers by raising wages, reducing the RSV, and criticizing that the distribution policies of the Maoist era failed to improve the living conditions of workers.¹⁸ In 2008, when the RSV was higher than the 1978 level, it lost its momentum. One may expect that today a redistribution of income will also gain support from workers, which is likely to produce major institutional changes.

Figure 2 shows the share of surplus value extracted by unproductive sectors, u :

$$u = UP/SV \quad (4)$$

[Insert Figure 2 here]

In Equation (4), UP is the surplus value extracted by unproductive sectors. Given that commerce and finance under the planning economy were small, they did not play a major role in the Maoist era. In the early stage of the reform era, the share of surplus value extracted by unproductive sectors rose slightly but was still relatively small before 2000. This proportion had increased substantially from about 20 percent to about 30 percent after 2000. A fast growing RSV implies that the economy is likely to encounter the underconsumption crisis tendency. The economy had to rely more on not only investment and export but also unproductive activities such as commercial and financial activities to absorb surplus value and avoid an underconsumption crisis.

Figure 3 shows the value composition of capital, σ :

¹⁷ The RSV increased slightly from 2.55 to 2.57 from 2008 to 2011.

¹⁸ Chinese economists held five conferences on distribution from 1977 to 1979 to criticize the distribution and incentive system of the Cultural Revolution and labeled the system “egalitarianism,” “big pot rice,” and “doing more work is the same as doing less work” (Su & Feng 1978).

$$\sigma = K/VC \quad (5)$$

[Insert Figure 3 here]

In Equation (5), K is the non-residential capital stock of the enterprise sector, measured by replacement costs. Although the measure is different from Marx's definition of value composition of capital (the ratio of constant capital to variable capital), it is likely to reveal the trend of Marx's measure. It is noteworthy that the value composition of capital shows a slightly downward trend during the reform era before 2008. One reason for this trend is the changes in the investment priorities of the state from heavy industries to light industries; another is the expansion of the private sector, which concentrate in more labor-intensive industries. After 2008, as the global market stagnated and the Chinese economy relied more on massive investment to sustain economic growth, the value composition of capital increased substantially, which is likely to depress the rate of profit in the overall economy.¹⁹

Figure 4 shows the gross rate of profit GRP and net rate of profit NRP :

$$GRP = SV/K \quad (6)$$

¹⁹ It is worthwhile to note that the massive state-led infrastructure investment after 2008 was relevant to the increase of capital composition. Thus, the decline in the rate of profit might result from the massive state-led infrastructure investment rather than contradictions in capital accumulation. However, given that the state-led infrastructure investment was mostly financed by borrowing, local governments and other agencies have to repay debts with earnings from operating the infrastructure (such as income from rail transportation). Thus, the sustainability of such infrastructure investment is contingent on how profitable the newly built infrastructure is. In this sense, the rate of profit in the overall economy still reflect the health conditions of the economy.

$$NRP = (SV - UP)/K \quad (7)$$

As shown in Figure 4, both the gross and net rates of profit in the 1950s were extremely high, partly because 1952 is the first year in the calculation of capital stock using the perpetual inventory method. From 1960 to 1978, the gross and net rate of profit was on average 33 percent and 27 percent, respectively. In the reform era, both rates of profit were stable from 1978 to 1985, quickly declined from 1985 to 1990, continued to decline slowly from 1990 to 1999, increased substantially from 1999 to 2007, and declined again after 2007. In 2014, the gross rate of profit was as low as the level in 2000, and the net rate of profit was the lowest of the reform era.

[Insert Figure 4 here]

3.3. *Decomposition of the Net Rate of Profit*

To what extent did the net rate of profit rely on the growth of RSV? A decomposition of the net rate of profit is helpful to answer this question, although decomposition does not directly explore the causality between the two variables. Let $\tau = 1 - u$, i.e. the share of surplus value retained by productive sectors. Rewrite the net rate of profit,

$$NRP = RSV\sigma^{-1}\tau \quad (8)$$

From Equation (8), one can obtain the relationship between the growth rates of the variables. Let \hat{X} be the annual growth rate of X ,

$$\widehat{NRP} \doteq \widehat{RSV} + \widehat{\sigma^{-1}} + \widehat{t} \quad (9)$$

Using Equation (9), one can compare the growth rate of the net rate of profit and that of the RSV to measure the “contribution” of the RSV to the net rate of profit. We carry out the decomposition for the four phases of the net rate of profit: 1978-1990, 1990-1999, 1999-2007, and 2007-2014. Table 2 gives the decomposition results.

[Insert Table 2 here]

In the first phase (1978-1990), the RSV declined whereas the value composition of capital turned to increase. In this phase, the RSV was the dominant driving force for the growth of the net rate of profit. In the second phase (1990-1999), the pattern of the first phase persisted, and the RSV continued to be the dominant driving force. Although the value composition of capital slightly declined, its positive effect on the net rate of profit was offset by the increase in the surplus value absorbed by unproductive sectors. In the third phase (1999-2007), the substantial increase in the RSV reversed the declining trend of the net rate of profit, helping the economy achieve the fastest growth of the net rate of profit over the reform era. In this phase, value composition of capital and unproductive sectors played minor roles. In the fourth phase (2007-2014), due to the fast-rising value composition of capital, the net rate of profit fell dramatically. The stagnating RSV could not offset the effect of the value composition of capital. The rising share of unproductive sectors also repressed the net rate of profit.

4. Undermined Conditions for the Growth of the RSV and the “New Normal”

The “new normal” of the Chinese economy witnessed the lowest net rate of profit of the reform era. The decomposition shows that the stagnation of the RSV and the rise in the value composition were the driving forces for the decline in profitability after 2008. It is worthwhile to note that the RSV and the value composition of capital are not independent of each other. One affects the other, and some common factors affect both of the RSV and the value composition of capital. However, given that the decomposition shows that the RSV was the dominant driving force from 1978 to 2007 and greatly contributed to the growth of profitability in the decade before the global crisis, we can start with the causes of the stagnation of the RSV.

First of all, the stagnation of the RSV is a result of the shrinking reserve army of labor. As discussed above, the formation and expansion of the reserve army of labor are a critical reason for the increase of the RSV in the late 1990s and early 2000s, and the two primary components of the reserve army of labor are migrant workers and laid-offs of the state-owned sector. For the laid-offs, after 2004, the employment of the state-owned sector turned to be stable, which implies that there was little increase in the number of laid-offs. Meanwhile, many of the workers being laid off in the 1990s have quit the labor force by now as they reached retirement ages. The other main component of the reserve army of labor did not continue to grow after 2008 as fast as it grew before 2008. The growth of migrant workers from 2008 to 2014 continuously declined.²⁰ The share of migrant workers in total urban employment was increasing in the 1990s and 2000s; by contrast, this proportion became stable after 2008, and slightly declined after 2010. Regarding wages, the economy witnessed fast real wage growth; however, fast real wage growth does not imply that workers afford decent living conditions (Li & Qi 2014; Xu et al. 2015). Insufficient wages for decent living conditions imply that it might be impossible to reverse the rising trend of the real wage.

²⁰ Data sources: National Statistical Bureau, “Investigation Report on Migrant Workers,” from 2008 to 2014.

Secondly, the fast growth of the RSV in the decade before 2008, on the one hand, underpinned the growth of profitability; on the other, it could jeopardize profitability by repressing the domestic consumption demand. Thus, the accumulation model in the decade before 2008 had to find the sources of demand to resolve the realization problem. Export and investment played a crucial role in maintaining aggregate demand. As Zhu & Kotz (2010) observe, Chinese economic growth has increasingly relied on export and investment. After 2008, as the global capitalism entered into the great recession or secular stagnation, demand for China's export dramatically declined. As a result, the role of investment became crucial, which is one of the reasons for the substantial growth of the value composition of capital after 2008 when the state launched the four trillion yuan stimulus package in response to the economic slowdown as a result of the global crisis. The state-controlled banking system supported massive investment that concentrated in infrastructure. Infrastructure investment could expand aggregate demand for enterprises in the short run and enhance productivity in the long run; however, infrastructure investment per se was less profitable, and its positive effect on the profitability of enterprises might be limited within a few relevant industries (such as steel industry). As a result, the massive investment greatly increased the value composition of capital, which further depressed profitability.

Meanwhile, although the state-controlled banking and the relatively large state-owned non-financial sector are favorable to carry out massive investment (Lo & Li 2011), the rising debt-income ratio along with massive investment might jeopardize the growth sustainability. The debt-value added ratio of the non-financial enterprise sector quickly rose from 195 percent in 2007 to 317 percent in 2014. The proportion of the debt of the non-financial enterprise sector to GDP was stable from 1996 to 2008 but increased from 98 percent in 2008 to 149 percent in 2014. The debt-income ratio of the non-financial sector has been the highest among major economies of the world (Li et al. 2015).

5. Conclusion

This paper has constructed homogenous series of the RSV using a Marxian approach and analyzed the relationship between the stagnation of the RSV and China's "new normal" featured by falling profitability. Dynamics of the RSV may result from changes in power relations determined by a series of economic and institutional factors such as the ownership structure of the economy, the formation of the reserve army of labor, the reform of the state-owned enterprises and so on. The main findings of this paper are: over the reform era, the RSV decreased from 1978 to 1997, increased from 1997 to 2008, and then stagnated after 2008. The decomposition analysis has indicated that the RSV was the dominant driving force of the growth of the net rate of profit from 1985 to 2007.

The RSV might have been stagnant or slightly falling after 2008. Some important events took place along with this change. First of all, the financial and economic crisis that initiated in the U.S. led to a recession and stagnation for leading capitalist economies, which affected the Chinese economy through the contraction of the demand for China's exports. China's economic growth fell behind the increase of wages, leading to the decline in the RSV. Secondly, as the decade-long increase of the RSV constrained workers' capacity to maintain decent living conditions, struggles of workers for a living wage surged against this background, and the reduction in the reserve army of labor also enhanced the bargaining power of workers. Given that the massive investment led to a rising value composition of capital, which repressed profitability, and a rising debt-income ratio, which jeopardized the growth sustainability, the Chinese economy might encounter serious problems to maintain profitability in the "new normal." Furthermore, the current accumulation model has also challenged the limits of environmental resources as air pollution has become a serious problem for the Chinese people. Capital accumulation has overused not only labor power

but also environmental resources. Under this circumstance, maintaining the current accumulation model may prepare conditions for not only an economic crisis but also an environmental crisis. Major institutional changes favorable to pro-labor distribution, a wage-led growth model, and sustainable development might be a prerequisite to achieving prosperity in the future.

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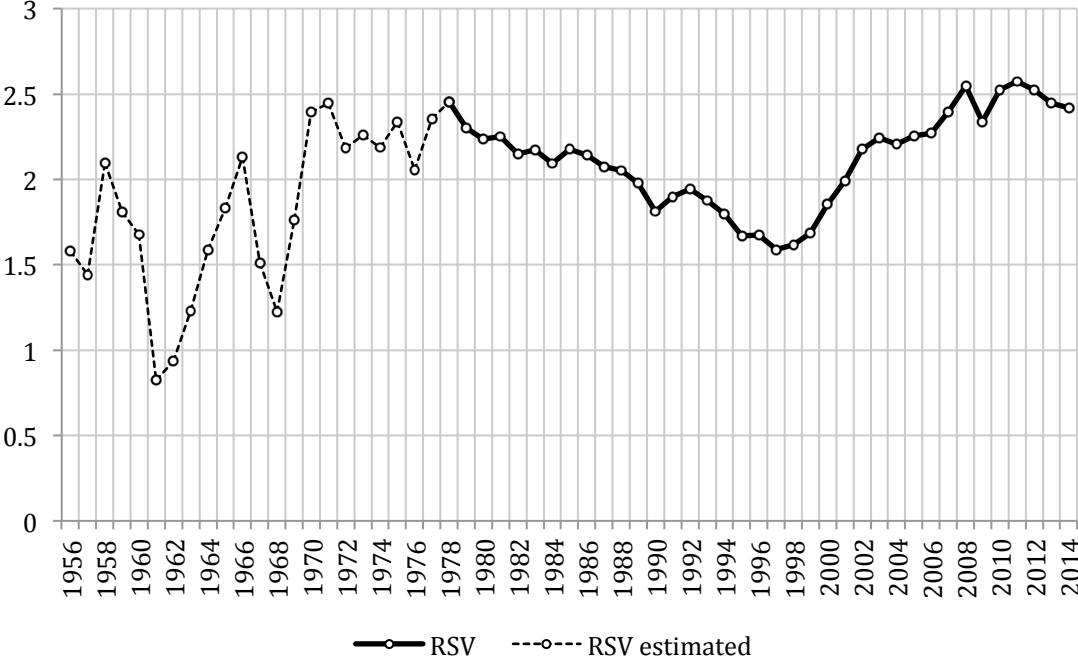
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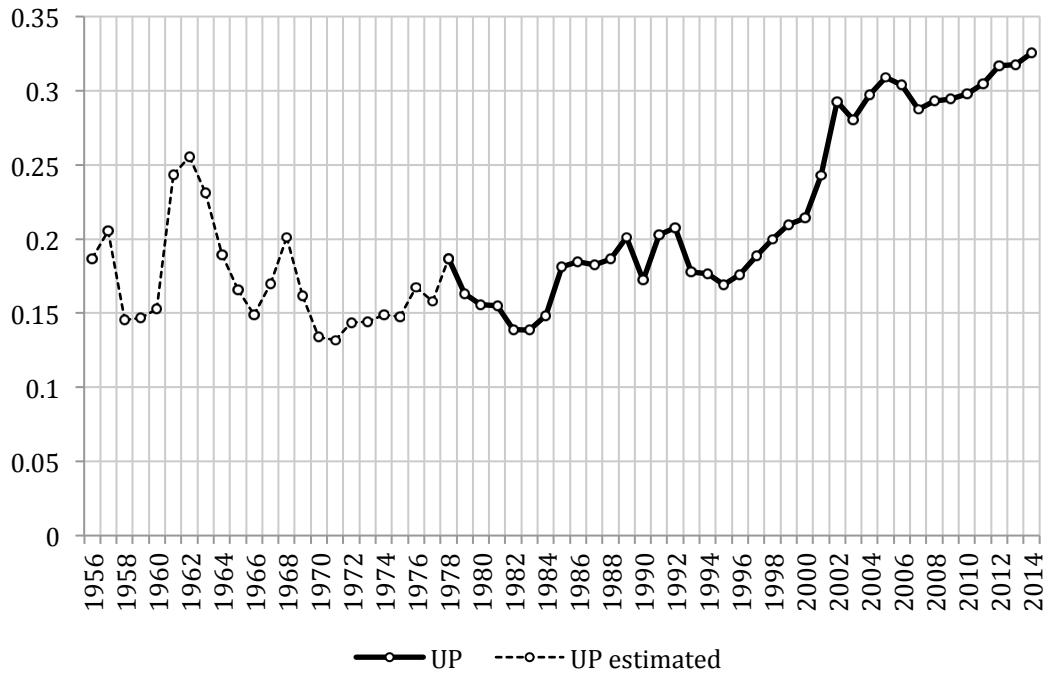
Figures and Tables

Figure 1 Rate of Surplus Value, 1956-2014



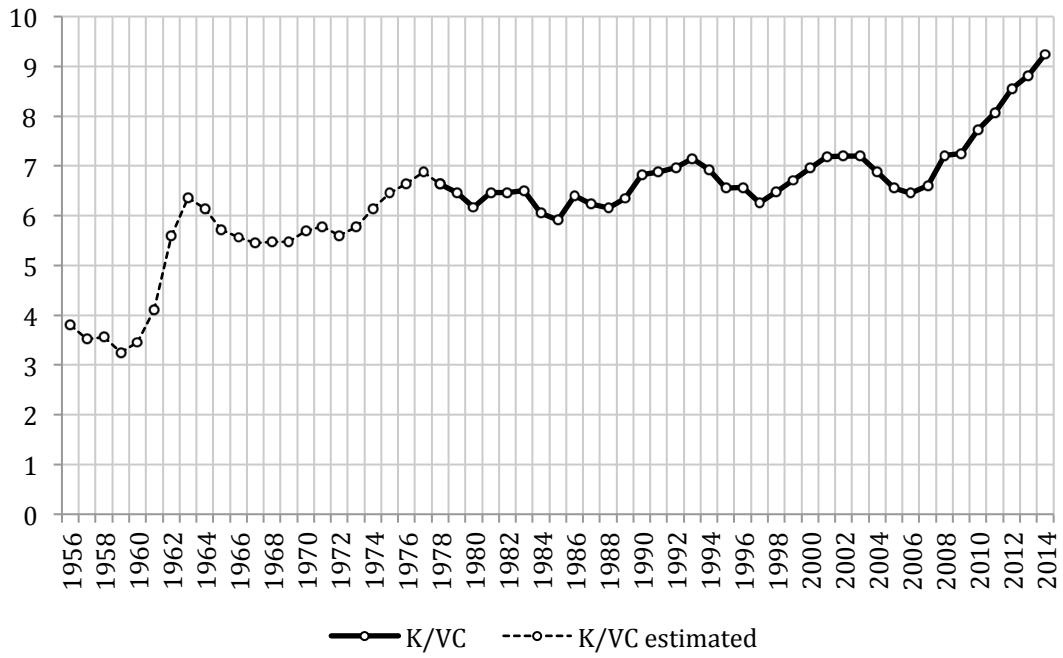
Data Sources: See Data Appendix.

Figure 2 Share of Surplus Value Extracted by Unproductive Sectors, 1956-2014



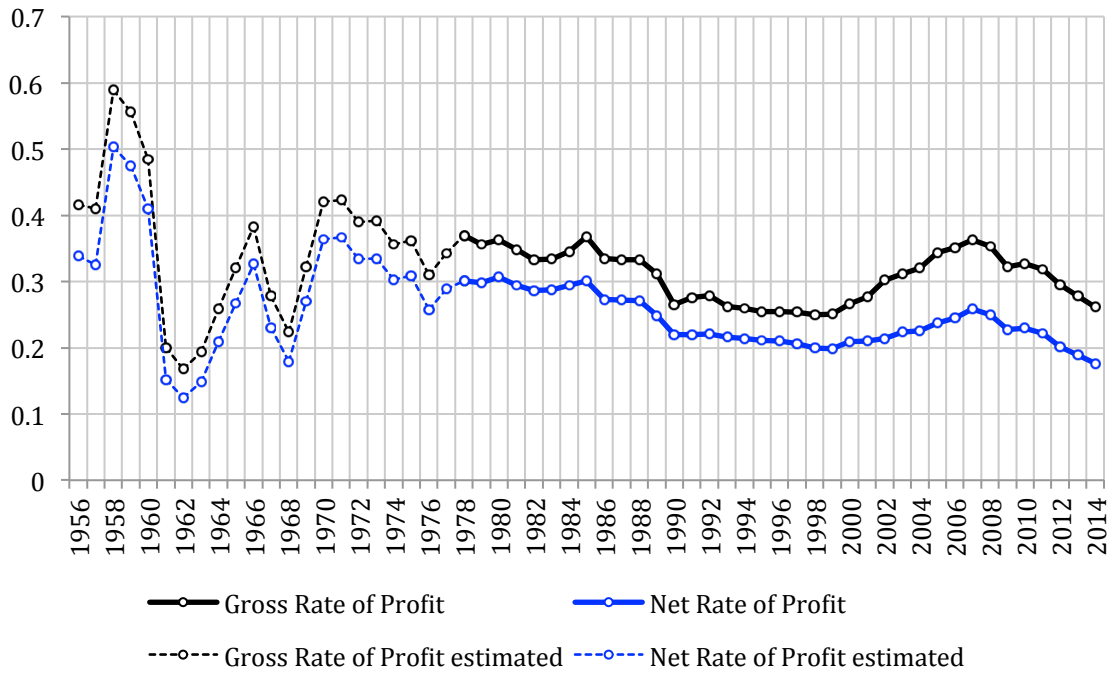
Data Sources: See Data Appendix.

Figure 3 Composition of Capital, 1956-2014



Data Sources: See Data Appendix.

Figure 4 Gross vs. Net Rate of Profit, 1956-2014



Data Sources: See Data Appendix.

Table 1 The Chinese Economy from a Marxian Perspective

The whole economy		
Enterprise sector		Rest of the economy
Productive sector	Unproductive sector	
Mining, manufacturing, utilities, construction, transportation, post and telecommunications, food and hotel services, social services	Commerce Finance Real estate	Agriculture Self-employment units Non-profit institutions for scientific research, education, culture, and medical services The state non-enterprise sector

Table 2 Decomposition of the Net Rate of Profit

%	\widehat{NRP}	\widehat{ROS}	$\widehat{\sigma}^{-1}$	$\hat{\tau}$
1978-1990	-2.58	-2.49 (96.35)	-0.24 (9.46)	0.15 (-5.73)
1990-1999	-1.13	-0.82 (71.91)	0.19 (-17.04)	-0.51 (45.28)
1999-2007	3.36	4.50 (133.98)	0.20 (5.83)	-1.29 (-38.27)
2007-2014	-5.30	0.13 (-2.44)	-4.69 (88.43)	-0.77 (14.56)

Sources: Author's calculation.

Note: Numbers in parentheses are the contribution of each factor in driving the growth of the net rate of profit.

Data Appendix

Capital stock K

K is the non-residential capital stock of the enterprise sector, measured by replacement costs. Use the perpetual inventory method to measure K. The initial year is 1952. The price index of fixed investment is from NBS (2007) and the NBS website. The depreciation rate is assumed to be 7 percent for the period 1952-1978. For the period 1979-2014, the depreciation of the enterprise sector is assumed to grow at the same rate as the depreciation of the economy. The depreciation data is from Hsueh & Li (1999), NBS (2007) and China Statistical Yearbook (hereafter, CSY) 2006-2015.

To measure K, we need the fixed investment of the enterprise sector. Use different methods to estimate the investment of different periods.

(1) 1952-1977

Fixed investment in the enterprise sector = non-agricultural fixed asset formation – fixed investment of non-profit institutions – urban residential investment

Non-agricultural fixed asset formation is assumed to be 65 percent of total fixed asset formation (NBS 2009a). Fixed investment of non-profit institutions is assumed to grow at the same rate as total fixed asset formation, and estimated with these growth rates and the fixed investment of non-profit institutions in 1978 (CSY 1981). Urban residential investment is from CSY 1981.

(2) 1978-1991

Fixed investment in the enterprise sector = (non-agricultural fixed asset formation – fixed investment of non-profit institutions – urban residential investment) * income-approach GDP / expenditure-approach GDP

This equation is different from the equation for the period 1952-1977 because the income approach data for the period 1952-1977 is unavailable. Non-agricultural fixed asset formation is from NBS (1997). Fixed investment of non-profit institutions is China Statistical Yearbook 1981-1992. Urban residential investment is from China Statistical Yearbook 1981 and the NBS website. Income-approach GDP is from Hsueh & Li (1999). Expenditure-approach GDP is from the NBS website.

(3) 1992-2013

Fixed investment in the enterprise sector = (fixed asset formation of the non-financial enterprise sector in the flow of funds account + fixed asset formation of the financial enterprise sector in the flow of funds account) * income-approach GDP / GDP in the flow of funds account

The flow of funds account data is from NBS (2007a) and CSY 2005-2015. Income-approach GDP is from NBS (2007b) and CSY 2005-2015.

(4) 2014

Fixed investment in the enterprise sector is assumed to grow at the same rate as total fixed asset formation in 2014 (NBS website), and estimated with this growth rate and the fixed investment of the enterprise sector in 2013.

Agriculture

NV_1 : Net value added of agriculture. For the period 1956-1977, NV_1 is from CSY 1994. For the period 1978-2003, NV_1 is calculated by subtracting the agricultural depreciation of fixed assets from the agricultural value added (Hsueh & Li 1999; NBS 2007b). Since the definition of “net value” in CSY 1994 slightly differs from that in Hsueh & Li (1999) and NBS (2007), all the data for the period 1956-1977 is adjusted by multiplying the ratio of “net value” in 1978 from Hsueh & Li (1999) to that

from CSY 1994. For the period 2004-2012, NV_1 is calculated by subtracting an estimated depreciation from value added. The estimated depreciation share equals average depreciation share in value added over the period 1990-2003.

Industry (mining, manufacturing, and utilities), construction, transportation, post and telecommunications

NV_2 : Net value added of industry. The industry sector is composed of three sub-sectors: mining, manufacturing, and utilities. The data of NV_2 is from various issues of CSY and Hsueh & Li (1999) and adjusted in the same way as NV_1 .

W_2 : Compensation of employees in industry. For the period 1956-1977, I assume that the ratio of the compensation of employees in industry to the sum of wages, salaries, and benefits in industry is equal to that ratio in 1978. With this assumption, I estimate W_2 for the period 1956-1977. Data of wages, salaries, and benefits is from NBS (1985). I also use this method to estimate the compensation of employees in construction, transportation, post and telecommunications, food and hotel services, and social services over the period 1956-1977. For the period 1978-2003, W_2 is the compensation of employees in industry from Hsueh & Li (1999) and (NBS 2007b). For the period 2004-2012, W_2 is derived from the predictions of the following regression with the observations over the period 1990-2003.

$$W_{2,t} = \alpha_0 + \alpha_1 emp_2 + \alpha_2 meanw_2 + \varepsilon_2$$

In this equation, $W_{2,t}$ is the compensation of employees in industry in year t , emp_2 is the urban employment of industry, and $meanw_2$ is the average wage of urban industrial units. In addition, α_0 is a constant, α_1 and α_2 are coefficients, and ε_2 is the error term. Data of employment and average wages is from various issues of CSY. I also use this method to estimate the compensation of employees in construction, transportation, post and telecommunications, food and hotel services, and social services over the period 2004-2014.

Using the same method and data sources, obtain or estimate the following variables.

NV_3 : Net value added of construction.

W_3 : Compensation of employees in construction.

NV_4 : Net value added of transportation, post and telecommunications.

W_4 : Compensation of employees in transportation, post and telecommunications.

Food and hotel services

NV_5 : Net value added of food and hotel services. Since commerce and food and hotel services are treated as a single sector in the statistics, we need to split the sector into the commerce part and the food and hotel service part. I use the retail sale of commerce and that of food and hotel services to split the sector over the period 1956-1977 and the value added of commerce over the period 1978-2014. The retail sale data is from various issues of CSY, and the value added data is from CSY 2015. With the data of net value from CSY 1994, value added, depreciation, compensation of employees from (NBS 2007b), I exclude commerce and then obtain the data for food and hotel services only. Then I apply the same procedure used in the calculation of NV_1 to obtain NV_5 .

W_5 : Compensation of employees in food and hotel services. With the data for food and hotel services, I apply the same procedure used in the calculation of W_2 to obtain W_5 .

Social services

NV_6 : Net value added of social services. NBS (1997) provides the value added of social services over the period 1956-1978. Hsueh & Li (1999) provide data of value added, compensation of employees, and depreciation of fixed assets of social services over the period 1978-1995. For the period 1978-1995, NV_6 is calculated with the data from Hsueh & Li (1999) by subtracting depreciation of fixed assets from value added. I assume that the ratio of the net value to the value added of social services is a constant that equals this ratio in 1978, with which I estimate NV_6 over the period 1956-1977. NBS (2007b) and CSY 2015 does not provide data of social services but provides data of “other services” which includes social services. Thus, I assume that the share of social services in “other services” is constant and that the depreciation’s share in the value added of social services is the same as the share of depreciation in the value added of “other services”, with which I estimate NV_6 for the period 1996-2012.

W_6 : Compensation of employees in social services. I estimate W_6 for the period 1956-1977 with data of wages, salaries, and benefits from NBS (1985), using the same method for estimating W_2 over the period 1956-1977. For the period 1978-1995, W_6 is the compensation of employees of social services from Hsueh & Li (1999). I assume that compensation’s share in the value added of social services is the same as compensation’s share in the value added of “other services”, with which I estimate W_6 for the period 1996-2003. I use the regression method for estimating W_2 to estimate W_6 over the period 2004-2012.

Commerce

TO_c : Total output of commerce, which equals to the sum of compensation of employees, operating surplus, net taxes on production, and costs of inputs of commerce. This sum coincides with the “social total value” of commerce. CSY only provides the social total value of commerce, food and hotel services over the period 1952-1992. In order to estimate the social total value of commerce, food and hotel services over the period 1993-2014, I estimate the following regression.

$$STV = \gamma_0 + \gamma_1 RS_c + \gamma_2 RS_{fh} + \varepsilon_c$$

In this equation, STV is the social total value of commerce, food and hotel services, RS_c is the retail sale of commerce, and RS_{fh} is the retail sale of food and hotel services. In addition, γ_0 is a constant, γ_1 and γ_2 are coefficients, and ε_c is the error term. I use the estimated coefficients and the data of retail sale to estimate the social total value over the period 1993-2014. Furthermore, I use the retail sale data to split the data of social total value into the commerce part and the food and hotel service part, then obtain TO_c .

NV_c : Net value added of commerce. I use the retail sale of commerce and that of food and hotel services to split the net value added of commerce, food and hotel services. The net value added of commerce, food and hotel services is from CSY 1993 for the period 1952-1977 and Hsueh & Li (1999) and (NBS 2007b) for the period 1978-2003. For the period 2004-2014, I assume the depreciation’s share in value added equals the average depreciation share in value added over the period 1990-2003 and estimate the net value added with the depreciation’s share and value added from the NBS website.

W_c : Compensation of employees of commerce. For 1978-2003, the compensation of employees of commerce, food and hotel services is from Hsueh & Li (1999) and NBS (2007b); then I split it with the retail sale of commerce, food and hotel services. For 1952-77, I use the data for 1978 and the wages, salaries, and benefits of commerce, food and hotel services from NBS (1985) to estimate

the compensation of employees and then split it with retail sale data. For 2004-14, I use the same procedure used in estimating W_2 to estimate the compensation of employees.

Self-employment

W_s : Compensation of employees of self-employment units. Given that wages and profits are not distinguishable for self-employment, the statistical data treats both wages and profits as compensation of employees. Estimate the compensation of employees with the following equation:

$$W_s = \frac{T_s}{T_{sv}} (W_{sv} + \Pi_{sv})$$

T_s is the taxes of self-employment units from various issues of China Tax Yearbook. T_{sv} , W_{sv} , and Π_{sv} is the taxes, wages, and profits of rural self-employment units, respectively, from MOA (2009) and various issues of China Township and Village Enterprise Yearbook.

NV_s : Net value added of self-employment units, which equals to the sum of the compensation of employees and taxes of self-employment units from various issues of China Tax Yearbook.

δ : Share of productive self-employment in total self-employment. I assume this share is the same as the employment share of private enterprises and self-employment of productive sectors. Data for estimation is from SAIC (1992) and various issues of CSY.

Finance and real estate

Π_{fr} : Operating surplus of finance and real estate. For the period 1978-2003, data is from Hsueh & Li (1999) and NBS (2007b). For the period 1952-1977 and 2004-2014, assuming the operating surplus grows at the same rate as the value added of finance and real estate, estimate the operating surplus with value added data from the NBS website and NBS (1997).

T_{fr} : Net Taxes on production of finance and real estate. Data is obtained or estimated with the same sources and method as used for Π_{fr} .

TO_{fr} : Total output of finance and real estate. Obtain the ratio of total output and value added of finance and real estate from input-output tables, extrapolate the missing values, and estimate the total output of finance and real estate with this ratio and value added data from the NBS website and NBS (1997).

β : The ratio of royalty payments counted as intermediate costs of productive sectors and commerce to the net value added of productive sectors and commerce. Estimate this ratio with input-output data.

Variable capital

$$VC = \sum_{i=2}^6 W_i - \delta W_s$$

Marxian value added

$$MVA = NV_p + TO_c + (RY_p + RY_t)$$

$$NV_p = \sum_{i=2}^6 NV_i - \delta NV_s$$

$$TO_c = TO_c' \frac{\sum_{i=2}^6 NV_i - \delta NV_s}{\sum_{i=1}^6 NV_i}$$

$$RY_p + RY_t = \beta (\sum_{i=2}^6 NV_i + NV_c)$$

Net Profit

$$NP = \sum_{i=2}^6 (NV_i - W_i) - \delta(NV_s - W_s) + (NV_c - W_c) \frac{\sum_{i=2}^6 NV_i - \delta NV_s}{\sum_{i=1}^6 NV_i} + (\Pi_{fr} + T_{fr}) \frac{RY_p + RY_t}{TO_{fr}}$$