

**UNRAVELLING CHINA'S FOOD
SECURITY PUZZLE, 1979-2008**

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Abstract

This article provides an empirical study of China's state policies and strategies in relation to (i) food market formation and (ii) food security in the 1979–2008 period. It traces main changes in government grain procurement pricing, urban subsidised food selling and monopolistic control of food circulation from 1979 to 2008 in a bid to fulfil both food availability and accessibility under budget constraint. By observing the government's switch from state monopoly to the market, this article reveals the mechanisms through which the Chinese government acted as a monopsony by creating and sending to farmers artificial price signals to generate food availability, and as a monopolistic dealer from the supply side by providing subsidised low price food to urban consumers in order to keep costs at a low level for industrialisation. Thus China's food security largely hinges on the government's budget. The Chinese government juggled between food security and fiscal affordability to formulate a food budget that would not excessively impact food security nor cause a crisis to government finance. China's food security puzzle was eventually worked out in the mid-2000s with boosted national income which enhanced the food accessibility of its population and eased Beijing's concern on food security.

When Mao passed away, China's food market had already been out of function for three decades,¹ attributable to the Soviet-style central planning system which exercised strict administrative control of food production and circulation. As a result, farmers' incentive to produce was low, severely distorting food production (Lin, 1990).² Deng Xiaoping implemented post-1978 reforms in the farming sector with a reintroduction of land use rights (e.g. Home Responsibility System) and production incentives among farmers (McMillan, Whalley and Zhu, 1989).³ However, unlike the Russian type of shock therapy the change was very slow (Fan and Nolan, 1994),⁴ with the state's visible hand busy interfering with the newly re-established food market.

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¹ Food market here refers to the rationing food market, mainly for wheat and rice staple grain crops.

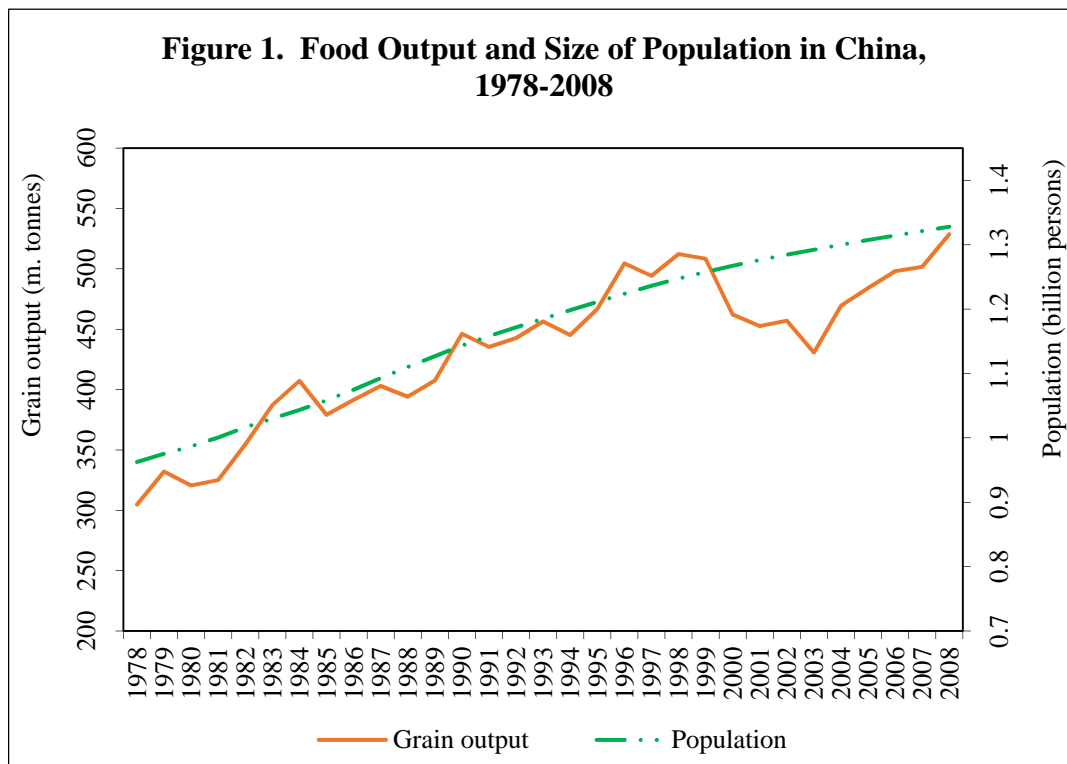
² For example, Lin, 'Collectivization and China's Agricultural Crisis in 1959–1961'.

³ For example, McMillan, Whalley and Zhu, 'The Impact of China's Economic Reforms on Agricultural Productivity Growth'.

⁴ Fan and Nolan, eds., *China's Economic Reforms*.

Food supply in the urban sector was heavily protected by the state at low subsidised prices to support China's industrialisation. The state acted as the main food dealer between the rural and urban sectors: as the food monopsonist in the rural and the monopolist in the urban, it largely controlled food circulation from the farming to the industry sectors. Given that China ran basically a controlled economy when the reform began in 1978, the state in reality acted as a price-giver on both the demand and supply sides to manipulate China's food security.

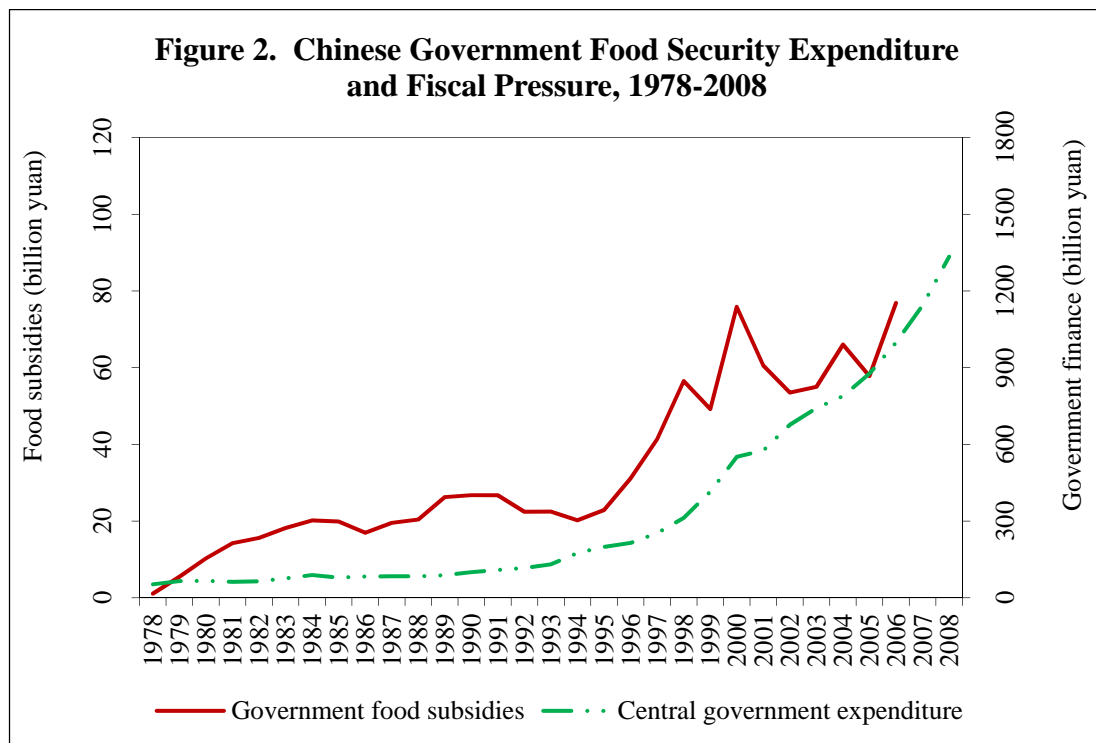
For the rural price-taking farmers and urban price-taking food consumers, the state represented the demand to procure food and the supply to sell out the same food. Both rural farmers and urban workers relied on state prices to make choices and decisions. In such a system, the state's monopsony in procuring food and prescribing its prices dictated, to a great extent, farmers' incentive to produce in the next production cycle and thus the country's food availability. On the other hand, China's food accessibility was shaped by the state's subsidised urban selling price instead of government-free market prices.



Source: National Bureau of Statistics of China, *Zhongguo Tongji Nianjian* (China Statistical Yearbook). Beijing: Zhongguo tongji chubanshe. 1981–2009 editions.

The general impression is that China's almighty party state with all the resources it controlled was fully capable of ensuring the country's food security. In reality, China's food security was not entirely secure during the reform era. During the 1979-95 period, China's domestic food output had grown almost *pari passu* with population growth. Though supply outpaced population growth from 1996 to 1999, it soon lagged behind population growth from 2000 to 2008 (Figure 1), registering severe per capita food output fluctuations.

Fiscal constraint has been cited as a factor behind the food fluctuation. Food budget and food security of a country are in complementarity: a larger budget allows a higher procurement price and a lower subsidised selling price, resulting in larger food stock and greater food consumption. Assuming all farmers and urban consumers were rational (Schultz, 1964) and made decisions in accordance with their expected farming revenue and food consumption, respectively, it was up to the state to set the right prices for both food procurement and urban food sale. However these two *right* prices were highly dependent on the government's fiscal conditions. In China, government spending on food subsidies is on the rise, outstripping that of central finance at times (Figure 2). The government's fiscal load thus loomed large in the country's food security.

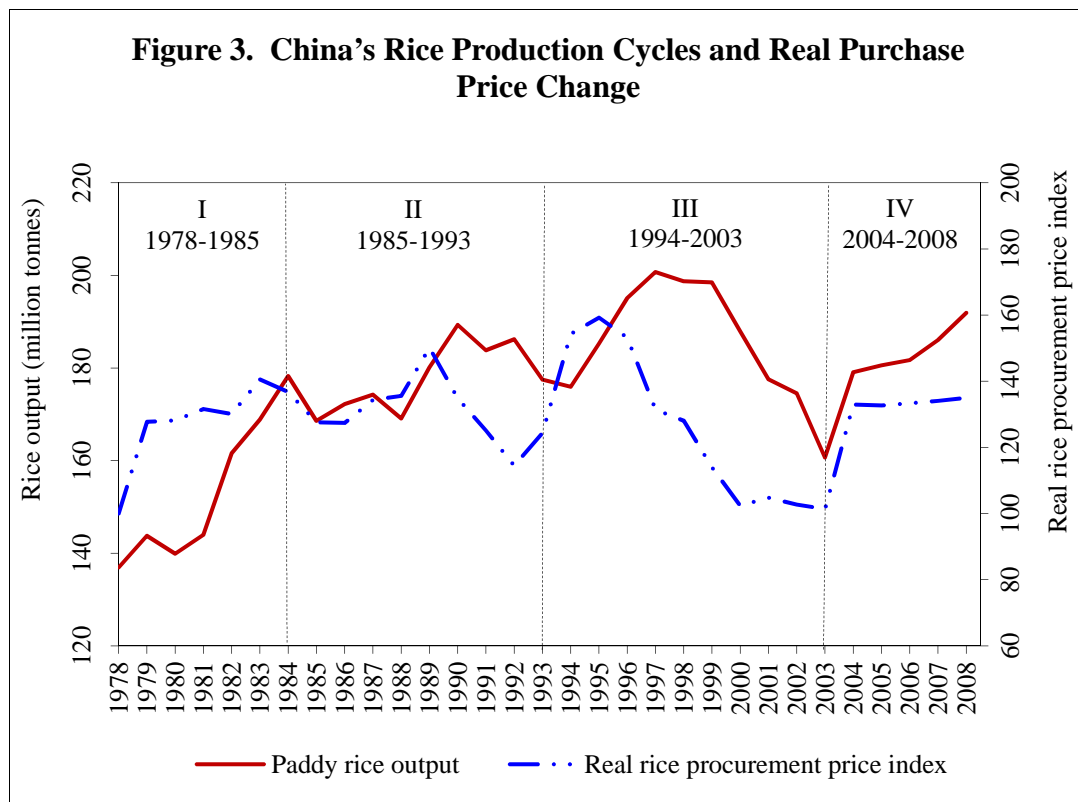


Source: Ministry of Finance, *Zhongguo Caizheng Nianjian (Finance Yearbook of China)*, Beijing, China's Finance Magazine, 1991–2009 editions.

Three food security scenarios can be established. The first is implementing stiff food control where the state pays farmers a meagre price for their grain to support low-cost industrialisation. This was the case in the Mao era, which discouraged food output. The second is liberalising the food sector and re-introducing the market. High food market prices will incentivise farmers to produce more. The flip side is its effect on urban food consumption and industrialisation. The higher food prices will negatively impact on food consumption and increase demand for wage rise, thus escalating the cost of industrialisation. The third is a half-way house scenario, one that is between state monopoly and a complete functional market. In this scenario, the government acts both as a monopsonistic buyer, paying a better price to farmers in order to guarantee food supply, and as a monopolistic provider of subsidised low-price food to urban workers. However,

the third scenario could prove to be a constraint on the government budget since food is sold below its procurement price. The sustainability of this half-way house approach largely depends on the strength of government finance, presenting a trade-off puzzle between government finance and the country's food security. The China case was the third scenario.

This study is inspired by scholars who link China's food output to policy factors. Such an approach commonly assesses food policies with output data, referring to some key inputs such as chemical fertiliser (Fan, 2000), seed varieties (Lin, 1991), farm machinery and irrigation (Yao and Liu, 1998); however, unlike physical inputs, policy-led food market institutions are not easily quantifiable. Therefore input-output analysis is routinely used as a proxy for this institution-production inquiry (Lin, 1992; Ash, 1988). The challenge is to ascertain whether the input-output analysis could delineate the changing patterns of food policies which directly determine China's food security. If affirmative, when each output peaks as shown in Figure 3, it should be reflective of favourable food policy(-ies). The issue in focus is in the incoherent way the apparently positive policies behave. This work is possibly the first to study the factors leading to the incoherence of China's food security policies.



Note: Rice purchase price index was replaced with rice production price index from 2001; real rice purchase price excluded the weight of the current year's consumer price index value and was based on an index of 1978=100.

Source: National Bureau of Statistics of China, *Zhongguo Tongji Nianjian (China Statistical Yearbook)*. Beijing: Zhongguo tongji chubanshe, 1981–2009 editions.

The gathering of time series data for food output,⁵ the monopsonistic procurement price, government food subsidies and central government expenditure comes from *China Statistical Yearbook* and *Finance Yearbook of China*. Policy materials came from decrees and regulations passed by the central government in Beijing. The observation period is restricted to the period 1979 to 2008 when China's food sector moved gradually from stiff administrative control to a market one. Following food output and pricing policy changes as shown in Figure 3, the observation period could be divided into four phases: 1979–85, 1986–93, 1994–2003 and 2004–08. Officially published macro data and central documents are sound sources for discerning policymakers' perception of China's food security, or, at least, to understand their situational conditions when formulating the food policies.

The research shows that the Chinese government's notion of food security includes aims of not only maximising food output (food availability),⁶ but also ensuring subsidised low-price urban food supply (food accessibility), implying a rural-to-urban welfare transfer via the state food monopoly mechanism. When fiscal budget conflicted with food security,⁷ the central government was compelled to lessen fiscal pressure by either reducing procurement prices or partially enabling market functions (e.g. reduce urban subsidies). It was only through state monopoly and not the market that the rural-to-urban welfare transfer could be achieved. The uncompromising tension between food security and fiscal capacity required the Chinese government to identify an appropriate food budget – one that would neither excessively depress farmer's incentives and urban consumption, nor create a potential fiscal crisis for the state. When food security was severely threatened by the government's fiscal constraint, China was eventually compelled to rely on the market to provide the state with an exit from the food circulation system.

In the subsequent sections, this article will interpret the dilemma that the Chinese government faces in tackling its national food security issue. Section I reviews the evolution of food policies, while Section II theorises the process of food policymaking and Section III presents the conclusion.

I

1979–1985

After the death of Mao and the end of the Cultural Revolution, one of the most important issues faced by the Chinese government was to feed the population. In 1979, the procurement quota price and the above quota price of all major grain

⁵ The reasons for selecting rice as the research focus are twofold. First, the long-term evolution of rice-planting techniques in China has enabled Chinese farmers to react more rationally to changes. Second, rice is one of China's major staple food crops. Although the state has eased its control of other agricultural products, rice (and wheat for most of the reform) has consistently remained under especially tight state control. Thus rice-based policy studies can provide unbiased findings of China's post-1979 agricultural reform.

⁶ National Development and Reform Committee, 2008.

⁷ Fiscal budget, as one focus in the research on China's agricultural reform, was mentioned in many works, among which Lu (2004) is the most representative.

crops were increased by 20% and a further 50% respectively.⁸ The sharp rise in procurement prices gave farmers a major incentive to increase food production. Together with the implementation of a new land use rights system,⁹ the sharp rise in procurement price strengthened the early agricultural reform: 1979-84 saw successive bumper harvests, with increased rice output of 30.18%, and wheat output of 63.10% above the 1978 level.¹⁰

However, with the rapid growth in food output and the substantial increase in the procurement price another problem began to emerge – that of the state’s fiscal affordability. To completely monopolise food procurement, the Chinese government would have to fund the food circulation system and foot all costs. In 1985, the government began to re-adjust its procurement policy and reduce the food procurement price on the basis of the “reverse 30:70 ratio” (*dao san qi*). As a result, the 1986 real rice procurement price dipped by 6.88% compared with that of 1984,¹¹ while wheat price fell by 10.33%.

The food purchase pricing mechanism underwent two significant changes within just six years after the reform: the rapid increase in the state procurement price in 1979 and the introduction of the reverse 30:70 ratio in 1985. These rapid changes within such a short period weakened farmers’ incentives for production, generating output fluctuations and resulting in a significant post-1985 slowdown in food output.

1985–1993

The strong inflationary pressures in the late 1980s¹² saw a sharp rise in food production costs and a decline in the purchasing power of the farming sector vis-à-vis that of the industrial sector.

Due to the continuously slow (negative at times) growth in food output in the mid-1980s, the state introduced a series of price incentive policies and linked food contractual procurement to the provision of lower-quota-price chemical fertilisers (*pingjia huafei*), diesel oil and the grain procurement deposit to

⁸ Maximum quota price was increased a further 50% from the quota price of the same year, which meant a de facto increase of 80%.

⁹ To change the highly collective food production model under the central planning system, the government in its Document No. 75 of 1980 sought to popularise a new land use rights system – Home Responsibility System (HRS). In 1982 rural China kick-started the process of decollectivisation and HRS was popularised nationwide.

¹⁰ The real grain purchase price increase is calculated from the grain price and consumer price index (CPI) of *China Statistical Yearbooks*. Compared with that of 1978, the real rice price rose by 36.79% in 1984 alone (64.02% in nominal terms).

¹¹ Real procurement price excluded fixed-based consumer price index.

¹² For example, the 1987 real rice procurement price was similar to the 1981 level, while that of wheat was slightly lower than the 1979’s.

guarantee food supply. This was known as the “three links” (*san guagou*) to encourage food production.¹³

At the end of the 1980s food output started to recover quickly from the post-1985 slowdown in response to increased procurement price and physical inputs. Taking the 1988 rice output level of 169.11 million tonnes as the baseline, China’s rice output in 1989 increased by 6.52% and a further 5.44% in 1990. Two years of rapid growth had brought China two unprecedented bumper grain harvests. In 1990, both rice and wheat outputs had reached their peak since 1949.¹⁴

In the mid-1980s China’s food production remained at a high level, necessitating the state to procure and sell more. When the nominal grain procurement price was raised several times by policies set, leaving the subsidised selling price fixed and unchanged in the urban sector, the urban-rural inversion between food procurement and sales prices deteriorated further.¹⁵

The large urban food subsidies and successive grain harvests squeezed government finance even further.¹⁶ Meanwhile, the deficit arising from food monopoly and the arrears deriving from the heavy fiscal burden resulted in a “financial registration” (*caiwu guazhang*) situation in the grain bureau.¹⁷ In addition to the direct subsidies to the urban sector, this development shows that the state food monopolistic system – the grain bureau – became yet another source of leakage of government revenue. By the end of 1991 “the total amount of financial registration of the grain bureau reached 54.50 billion yuan” (Liu, Zhang and Huo, 2004).¹⁸

¹³ The “three links” were formally endorsed in the Chinese Communist Party Central Committee’s (CCPCC) document No. 1 in 1988.

¹⁴ The 1990 rice output was 189.33 million tonnes, 11.07 million tonnes higher than the first historical peak (1984) and nearly 40% higher than the 1978 level. Wheat output reached 98.23 million tonnes in 1990, a more than 80% increase compared to that during the initial stage of the reform in 1978.

¹⁵ The inversion of grain procurement and selling prices means that the grain purchase price was higher than the grain urban selling price. This was a manifestation of the agricultural pricing policy when economic reform was in favour of the urban and industrial sectors to support China’s industrialisation. The price difference was filled by the annual state budget.

¹⁶ According to Liu, Zhang and Huo (2004), from 1986 to 1991 the state’s “fiscal budget distributed 136.30 billion yuan in subsidies (to the urban sector), mainly for food, cotton and edible oil”, accounting for 27.10% of central government expenditure and around 1.27 times the amount paid by the state to the whole agricultural sector during the same period.

¹⁷ The grain bureau took out a loan with state-owned banks (mainly the Agricultural Bank of China and Agricultural Development Bank of China) to deal with annual grain circulation work, and used grain sales revenue and state grain purchase fund to repay the loan and interest. When grain losses occurred in circulation or the state’s grain fund was not made in full, the bureau then became insolvent. The part of overdue debt from bank borrowing was called “grain financial registration” (*liangshi caiwu guazhang*) (or financial registration in short).

¹⁸ Along with the deepening of marketisation in urban China, wage levels and the running costs of the grain bureau resulted in a drastic increase in the state’s annual fiscal budget for grain purchase fund. The increased running cost of the bureau was an inevitable result of the deepening market reforms in the industrial and urban sectors.

To narrow the large fiscal deficits, in March 1992 the central government comprehensively raised urban food subsidised prices and eased its control of the selling prices of wheat flour, rice and corn in accordance with a new rule called “purchase and sales at the same price” (*gouxiao tongjia*).¹⁹ This was the first time that the Chinese government had wavered on its urban food subsidy policy. “Purchase and sales at the same price” was basically designed to lessen the fiscal deficit of the state through relinquishing its right to price food and to greatly reduce its direct urban food subsidies.

The 1987 to 1992 grain pricing system reforms were the first trial by the Chinese government to partly use the market as an instrument to enhance the country’s food accessibility since collectivisation in the 1950s.

1993–2002

1993 Grain Reform. After Deng Xiaoping made his inspection tour to the south in 1992, marketisation was re-established as the main direction of economic reform. Market-oriented food system reforms were rapidly adopted by all provinces.²⁰ By the end of 1993 more than 98 per cent of cities (and counties) in China had liberalised local food markets. The 1993 reform removed most of the barriers to China’s food market. In particular, private traders were now allowed to procure grain directly from individual farmers.

However, the deregulation of the food market was accompanied by high inflation in the early 1990s which sharply raised the urban food selling price during the 1993–94 period.²¹ To maintain urban food accessibility and social stability the state once again tightened its control of all food issues by (1) appointing provincial governors to take charge of local food circulation;²² (2) authorising only state-owned grain enterprises to procure staple food crops from farmers; (3) ensuring that the grain bureau must “take tight control of 70 to 80 per cent of commodity grain in circulation ... roughly 90 million tonnes” on the basis of 1993 output; and (4) procuring farmers’ excess food output at a “negotiated price” (*xieyi jiage*) that was much higher than the state procurement price.

In effect, the 1993 reintroduction of the market was completely abandoned and food circulation again came under state dominance. The state took absolute control of food production, procurement and urban sales, strictly prohibited the

¹⁹ State Council Document No. 15 (1992) mainly sought to raise the state grain ration price in the urban sector. However, appendix 9 of the same document made it clear that the purchasing cost attributable to the grain bureau should be the same as the state procurement price for farmers.

²⁰ After Deng Xiaoping’s *Nanxun*, Guangdong took the lead to sanction free market purchases and sale of provincial grain in April 1992 with support and permission of the central government.

²¹ The 1993 and 1994 CPI, compared to that of the preceding year, increased by 14.70% and 24.13% respectively.

²² This is known as the Provincial Governor’s Grain Responsibility System (PGGRS, *liangshi shengzhang fuze zhi*). Under the PGGRS, provincial governors were charged with the “rice bag” project (*midaizi gongcheng*). In this way, the state could delegate relevant grain tasks to provincial governments in order to achieve and balance nationwide grain supplies.

involvement of all individuals and unauthorised enterprises in the circulation of food and strengthened the status of its monopolistic tool – the grain bureau. The 1994 re-establishment of a new state monopoly of food circulation led to the further fiscal deterioration of the state.

Along with the 1994 strengthening of regulations the state raised the food procurement prices in the 1994-96 period. As a result the 1995-97 grain output was at a historical peak.²³ The raised procurement price, together with the strengthening of the food circulation system, brought the state not only bumper harvests but also an unprecedentedly large fiscal deficit. Soon thereafter, when fiscal conditions worsened, the requirement for fiscal security again forced the central government to switch its policy emphasis to the sustainability of government finance.

1998 Grain Reform. Although the state had continually implemented regulatory policies to control the grain deficit, the grain bureau and grain reserve system continued to suffer a deficit of 120 billion yuan by 31 May 1998 (Liu, Zhang and Huo, 2004).²⁴ The state subsequently realised that the grain bureau was the major source of the fiscal deficit, leading to a focus on the state food monopolist tool in the 1998 grain reform.²⁵

In May 1998, State Council Document No. 15 (1998) took the responsibility of state-owned grain procurement and overseeing storage enterprises from the grain bureau, making the food system financially independent of the central government. In the following month, Decree No. 244 (1998) on Regulations on Grain Purchase (*liangshi shougou tiaoli*) gave the grain bureau more rights to price food and introduced two new pricing principles: (1) grain pricing based on quality (*anzhi lunjia*); and (2) selling grain at a favourable price (*shunjia xiaoshou*) to cover all food purchase costs. The 1998 Grain Purchase Regulations granted all food pricing rights to the grain bureau. The 40-year food subsidy system was terminated and stripped from the state's food security package.

The 1998 reform focus gave complete monopolistic rights to the grain bureau. In the national grain market, small monopolisers (local state-owned grain enterprises) claimed full food circulation rights to their product of dominance, administratively carving out “little kingdoms” in the wholesale market.

²³ In 1997, rice and wheat outputs had reached their highest level since 1949, with rice output at 200.73 million tonnes (6.02% higher than the next highest record in 1990) and wheat output at 123.29 million tonnes (25.51% higher than in 1990).

²⁴ Central government's revenue in 1998 was 489.20 billion yuan, while national government revenue (including local governments) in the same year was 987.60 billion yuan.

²⁵ First, in August 1997 the state announced a new basic principle to guide the grain bureau's work known as “cost plus slim profit” (*baoben weili*) and pointed out that state-owned grain enterprises could mark up (grain) prices (*shunjia zuojia*) in accordance with the new principle of ensuring that the grain selling price should not only cover costs (including its own running cost), but also be profitable. A subtle change in policy implementation was witnessed.

Under severe fiscal pressures, the 1998 grain reform stopped subsidising the urban sector and fundamentally changed the rural-to-urban welfare transfer. The devolvement of food circulation system control had enhanced the power of the grain bureau, including giving it pricing rights which had previously been held centrally.²⁶ At the end of the 1998 reform the central government had successfully avoided a fiscal deficit. However, the 1998 grain reform had essentially changed state monopoly to sole monopoly of food circulation exercised by the grain bureau, and the food monopolistic tool into a monopolist.

2002–2008

Due to the failure of the price protection system,²⁷ the 1998 grain reform provided an opportunity for local grain bureaus to depress farm-gate procurement prices in order to lower their costs. Together with a further decrease in the staple food crops' protection price in 1999, the average real procurement price of 2000 fell to below the 1979 level.²⁸ Alongside real price decline, by 2003 the output of rice and wheat had dropped to the levels of 1982 and 1984, respectively.²⁹

Thereafter in 2003, the Chinese government faced the largest systemic food crisis since 1979. The crisis eventually forced the central government to fully open up the food circulation system under the terms of Central Document No. 1 (2004). In the subsequent State Council Document No. 17 (2004), the State Council adjusted the protection prices for major crops in the main producing regions. Subsequently the state started to grant direct subsidies to farmers via county-level governments. This was the first time that the Chinese government subsidised food producers after the founding of the People's Republic of China (PRC).

Central Document No. 1 (2004) established a competitive food market. Thereafter Decree 407 (2004) on Regulations on Administration of Grain Distribution (*liangshi liutong guanli tiaoli*) confirmed that diversified-ownership traders had the right to participate in the grain market, and that food prices were to be decided by market supply and demand. Four years thereafter, Document No. 1 (2008) further endorsed marketisation as the main direction of China's agricultural reform. In 2008 the Chinese government eventually encapsulated all its agricultural policy goals under the single heading of "food security".³⁰

²⁶ Except the ceiling price.

²⁷ The 1998 grain reform abolished procurement protective price, or this price was kept unchanged under fast inflation.

²⁸ The 2003 rice and wheat real purchase price was 80.12% and 64.07% that of 1979, respectively.

²⁹ The 2003 rice and wheat output was 80.03% and 70.15% that of 1997, respectively.

³⁰ National Development and Reform Committee, *Guojia liangshi anquan zhongchangqi guihua gangyao (2008-2020 nian) (Medium and Long-term Plan for National Food Security (2008-2020))*, Beijing, National Development and Reform Committee, 13 November 2008.

In sum, the 2004 reform fundamentally changed the food circulation system in China. For the first time since the founding of the PRC, the state used the market to ensure food security. Since 2004, China's food sector has once again geared towards the market.³¹

II

The theme running throughout the post-1979 food system reforms is the amendments of food policies that veered between food security and fiscal affordability via a pair of policy instruments (monopoly and market) that run in alternation to achieve food security (see Table 1).

Table 1. China's Food Security Policy Package and Policy Instrument

	1978–1992	1993	1994–1997	1998–2002	2003–2008
Food Security Policy Package	① Maintaining sufficient food output to guarantee food availability ② Maintaining subsidised low-price food supply to the urban sector ③ Avoiding excessive food budget deficits to central finance	① Maintaining sufficient food output to guarantee food availability	① Maintaining sufficient food output to guarantee food availability ② Maintaining subsidised low-price food supply to the urban sector	① The financial independence of the grain bureau from central finance ② The grain bureau's monopoly over the food system	① Maintaining sufficient food output to guarantee food availability
Policy Instrument	State monopoly	Market	State monopoly	Grain bureau monopoly	Market

Source: Compiled by the authors.

Pre-1998 Reform: Veering between Goals and Instruments

After a long period of food shortage since the 1950s, the first priority of policymaking at the beginning of the reform was maximising food output to secure food availability. With the use of the grain bureau as the policy instrument, excess agricultural products were dominated by the central government's planning system in which it purchased food from producers at a low price and sold it at an even

³¹ After the release of the Central Committee Document No. 1 (2005) the state began to reduce agricultural tax. The following year's Document No. 1 (2006) completely cancelled agricultural tax and in Document No. 1 (2007) the state increased its subsidies for agricultural production. Document No. 1 (2008) re-emphasised the importance of grain production without instituting any non-market-oriented policies.

lower price to the urban sector. This food circulation mechanism was to subsidise the industrial sector by squeezing the farming sector. The costs of this mechanism were completely absorbed by the central planning system through the monopolised food circulation system.³²

As a result, the higher the grain output, the larger the fiscal budget for procuring and distributing food. Consequently the conflict between food production (to ensure food availability) and fiscal budget control (arising from food procurement and urban subsidy) was the core theme of the state's policymaking on food from the mid-1980s to the end of the 1990s.

Meanwhile, the fiscal revenue of the Chinese government did not grow rapidly until the 2000s; from the mid-1980s to late 1990s this uncompromising tension between food security and fiscal constraint required the state to identify an appropriate fiscal budget – one that would neither excessively depress farmers' incentives and reduce production, nor create a potential fiscal crisis for the state.

Before the 2004 food marketisation the Chinese government's main method for achieving food security was state monopoly by the grain bureau. Although the government offered price incentives for stable food production, the grain bureau failed to prevent three major output dips in China after 1979 (see Figure 3). From the late 1980s the rapid expansion of the grain bureau's administrative capacity has also led to a sharp increase in its running costs.

With the 1993 reform the state realised that the market could fully replace state monopoly to service national food security. However, the high inflation in the 1990s led the state to attribute soaring food prices to market failure. The market was quickly abandoned as a policy instrument, and the state once again pinned its hopes on food monopoly and introduced a series of food policies to comprehensively tighten its control of the production, procurement and sale of major grain crops. The sudden reversal in 1994 was because the market could only replace the grain bureau in delivering food products, but not in performing the function of transferring welfare from the agricultural to the urban industry. Since the market could not satisfy the government's need for providing food accessibility (e.g. welfare transfers), food monopoly remained the state's primary and preferred policy instrument until 1998; the main theme of China's food policymaking was to provide a balance between food security and the resultant fiscal deficit.

The 1998 Reform: Redefining Food Security Goals

China's food policy goals underwent a series of major revisions in the late 1990s. In particular, welfare transfer to the urban sector was removed from the state's food security package and reducing the grain bureau's fiscal deficit was prioritised over the hitherto major policy goal – sufficient food supply.

³² The cost of the mechanism refers to the inverse price difference between grain purchase and urban sales, as well as the associated costs of grain transportation, storage and distribution.

The driving force behind these policy amendments was the state's effort to eliminate fiscal deficits and to avoid using policy methods apart from the state monopoly. In 1994, the government reaffirmed the grain bureau's rights over all food security work, mainly by comprehensively increasing the food procurement price and maintaining welfare transfer to the industry sector. The result of such moves was the provision of most urban food subsidies by the government instead of the farming sector. Although the raised procurement price had motivated farmers to increase their output, by the end of the 1990s the accumulated fiscal burden had grown so large that it was almost impossible for the Chinese government to maintain a reasonable fiscal balance.

Not surprisingly, in the next stage the 1998 reform aimed to relieve fiscal pressure arising from food monopoly. Policymakers attributed the fiscal deficit during the 1994–98 period to the urban-rural welfare/cost gap as the central government had maintained subsidies to the industrial sector and increased food procurement price to motivate rural production incentives. The 1998 reform thus introduced two main measures, namely, to abandon the distribution of urban food subsidies and to allow the grain bureau to decide on the farm-gate procurement price in most provinces.

The essence of the 1998 reform was to integrate the policy instrument into the food policy goals, making the grain bureau not only a monopolistic instrument but also the food policy goal-setter. Before 1998 the grain bureau as an instrument did not have the authority to determine either the rural procurement price or the subsidised urban selling price; the 1998 reform delegated these two pricing responsibilities to the bureau without it having to take any political responsibility for ensuring food security.

Maintaining fiscal affordability, the main constraint in food policymaking, was very much left to the grain bureau. Before 1998 fiscal deficits in food control came from direct payment transfers (e.g. urban subsidies). However these deficits were itemised as an unpaid balance in the grain bureau's account and the books of its subordinate grain enterprises. Subsequently, when the subsidies ceased, the central government relinquished most of its food monopoly interests to the grain bureau in the 1998 reform to leave this deficit with the grain bureau without drawing from the national treasury.

The 1998 reform finally resulted in the grain bureau's acquisition of the monopoly of the food market during the 1998–2003 period, leading to a continuous decline in the food supply. By 2003 China faced the biggest systemic food crisis it had encountered since 1979.

The 2003 Grain Reform: Newly Established "Food Security"

The emergence of the 2003 crisis compelled policymakers to systemically overturn its food monopoly system. It pushed the central government to further liberalise food trading and adjust the deployment of welfare transfers between China's rural and urban sectors. This significant transformation of food policy depended on two facilitating economic conditions.

Condition one. After more than two decades of economic growth, the purchasing power of China's urban sector had strengthened sufficiently to withstand a higher food price. As shown in Table 2, China's urban households' average per capita disposable income (nominal) increased approximately 14 times in the 20 years from 1978 to 1998, and another 10 times in the next five years (1998–2003). Although grain price had also increased since the early 1980s, it was quickly surpassed by the rise in urban income. From 1985 to 1998, the share of grain expenditure in per capita urban household disposable income halved, and from 1998 to 2003, it dropped further by another half to 2.29 per cent. As a result, there was a quantum leap in the urban sector's purchasing power for food. The importance of grain consumption in the construct of urban household expenditure fell so quickly that the importance of subsidising urban grain consumption correspondingly declined in the state's policy goal-setting.

Table 2. Urban Households Per Capita Disposable Income and Grain Expenditures

	1978	1981	1985	1993	1998	2003
Urban household per capita disposable income (yuan)	343.40	500.40	739.10	2,577.40	5,425.10	8,472.20
Urban households per capita expenditures on grain consumption (yuan)	--	59.16	62.28	129.96	226.79	194.15
Share of grain expenditure in urban household per capita income (per cent)	--	11.82%	8.43%	5.04%	4.18%	2.29%

Source: National Bureau of Statistics of China, *Zhongguo tongji nianjian* (China Statistics Yearbook), Beijing, Zhongguo tongji chubanshe, 1981–2013 editions.

Condition two. The “tax sharing reform” (*fenshui zhi gaige*) that began in the 1990s rapidly enhanced the central government's fiscal capacity.³³ Thanks to the fast-growing tax base and the adjustment of central-local finance structure, central finance grew sufficiently for it to make good the share of food-related expenditures in annual central government revenue in the 2000s (see Table 3).

As China's state revenue rapidly strengthened, its share of expenditure on supporting agricultural production (*zhinong zhichu*) and urban food consumption steadily decreased. In 1993, central government spending on this was 25.71 billion yuan, 26.85 per cent of the year's central revenue. This proportion decreased by 78.47 per cent in 10 years after the tax reform (1993–2003) to 5.78 per cent in 2003 and further to the almost negligible level of 4.71 per cent in 2006. Thus, unlike the huge fiscal deficits from food monopoly before the 1998 reform, by 2003 central

³³ The tax sharing reform introduced the “fiscal responsibility system” (*caizheng baogan zhi*) implemented since the 1980s and successfully reversed the structure of central-local government revenue. After the 1993-96 tax sharing reform, central government's revenue increased sharply, both at the absolute level and share in national government revenue.

government's expenditure on rural production support and urban food consumption were no longer compromised by government finance which was backed by very strong economic conditions that enabled the Wen Jiabao government to distribute large-scale food producing subsidies. This was in sharp contrast with the 1993 reform when the government's financial condition was still unsatisfactory.

Table 3. Central Government Revenue and Explicit Subsidies for Agriculture

	1993	1994	1998	2003	2006
Central government revenue (billion yuan)	95.75	290.65	489.2	1,186.53	2,045.66
Central government expenditures on explicit subsidies for supporting agricultural production and urban grain, cotton and oil consumption (billion yuan) ^a	25.71	24.70	63.38	68.57	96.31
Share of explicit subsidies in central government revenue (per cent)	26.85%	8.50%	12.96%	5.78%	4.71%

Note: ^a This is a sum of 'central government expenditures for supporting agricultural production' and 'subsidies on price increase in grain, cotton and edible oil'.

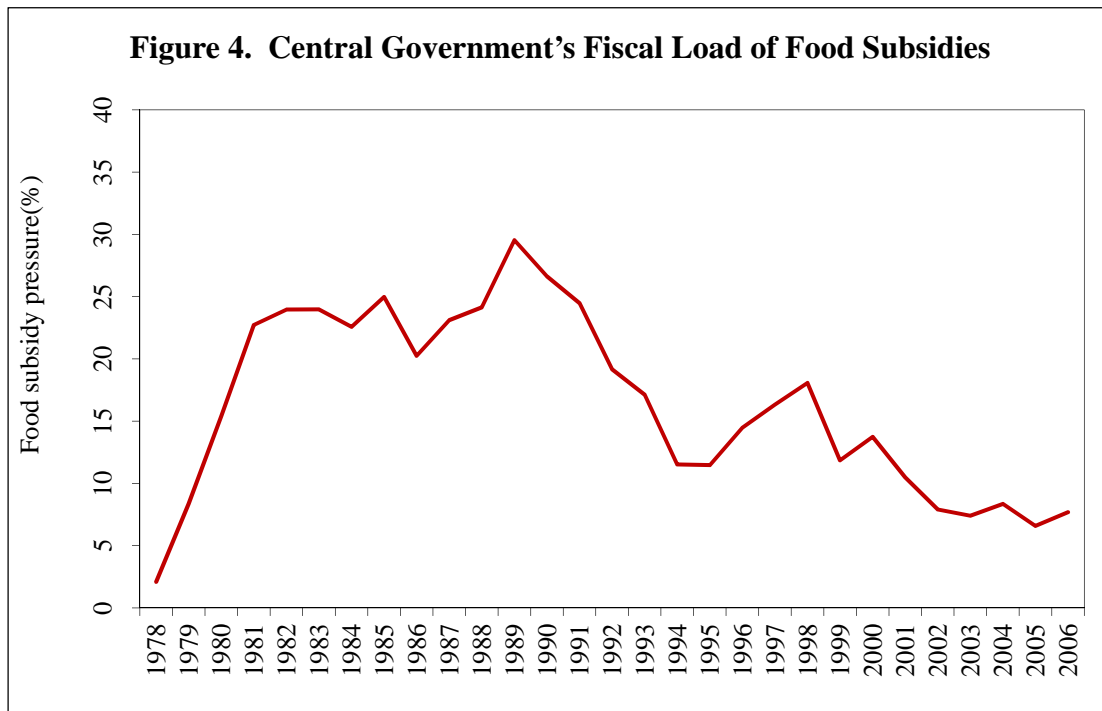
Source: The Ministry of Finance of the People's Republic of China. *Zhongguo caizheng nianjian (Finance Yearbook of China)*, Beijing, Zhongguo caizheng zazhishe. 1991–2012 editions.

The core of the 2003 reform was the newly defined food security and the use of the market as the main policy instrument. With the elimination of urban food subsidies and the termination of most food monopoly interests,³⁴ the major target of the state's goal of food security was now almost equivalent to sufficient grain supply or food availability. With the 2003 market-oriented reform, the grain bureau, as a monopoly power, was removed from the food circulation system, utilising the urban sector's purchasing power to guard food accessibility and urban food selling price is mostly translated into production incentives for farmers.

Policy Instrument Alternation and Cyclical Growth Pattern

Since 1978, the amendments to food security goals have been made in tandem with changes in fiscal affordability. Food security, as the major food policy goal of China, experienced two types of shocks: fiscal insecurity and the grain bureau's monopoly interests. In the first 30 years of reform, three turning points, all shaped by the impact of food security, separated China's food output into four phases (Figure 3). The shaping forces of the first two turning points were one-dimensional, due to pressures from the Chinese government's fiscal security (1983–1984 and 1987–1992) (see Figure 4). The 1993–2003 shock to food security was brought about not only by fiscal pressure but also largely by the grain bureau's monopoly (1999–2002). Thus in the reform era, the Chinese government's changes in food policies were reflective of amendments to its food security goals.

³⁴ Strategic grain reserve was still tightly controlled by the central government.



Note: Food subsidy data stops at 2006 in the *Finance Yearbook of China*.

Source: The Ministry of Finance of the People's Republic of China, *Zhongguo Caizheng Nianjian* (*Finance Yearbook of China*), Beijing, Zhongguo caizheng zazhishe, 1991–2012 editions.

First is the gradual delink of urban food subsidies from its food security policy package to deal with the fiscal deficit. This process began with the 1992 selling price adjustment and ended with 1998's "selling grain at a favourable price" approach, which was fully accomplished by the grain bureau's sole monopoly of the wholesale grain market's upstream urban food distribution. In addition to the fiscal affordability, another important precondition for the state to stop using food to support industrialisation lay in the rapid growth of industrial wage, enhanced by the country's economic growth. A high food consumption price was seen as endangering the country's food accessibility before 1998 as the Chinese government's definition of food security equates food accessibility with low-price food supply in the urban sector to support fast industrialisation. By the end of the 1990s the low-wage low-price features were unsustainable in the urban sector: the rapid growth of the non-state-owned industrial sector pushed up average urban income.³⁵ Thus the state saw urban subsidised food selling price as overwhelming and in fact redundant.

³⁵ SOEs only accounted for around one third of total industrial production in 1997–98.

Second is the use of the food monopolistic tool – the grain bureau. In the 1998–2003 period the grain bureau was authorised to set policy goals. Grain bureau’s food monopoly triggered the 2003 food crisis in China and to the de facto termination of most grain monopoly interests. The bureau’s monopoly of food circulation was closely related to government behaviour in the late 1990s. With the 1998 SOE reform, the Chinese government realised that converting large state-owned sectors into state-owned monopoly enterprises would prevent continuous loss in the state-owned sectors. However, unlike industrial state-owned enterprises (SOEs),³⁶ the grain bureau and its affiliated enterprises were not food producers and therefore could not directly determine total food output. The bureau’s monopoly thus created an inherent conflict between its control of food and the nation’s food availability.

The central government’s response to the impact of these two shocks showed the state’s preference for the shock-response mode and food monopoly as a policy instrument.

The government’s reactions to the lack of food security were normally very slow. Its reaction to any potential threat to food security (e.g. the 2003 crisis) is the adoption of the shock-response mode and only when food insecurity has reached a crucial point. After 1979 the periodic depletion of grain supply was a direct result of years of continuous fall in food output; although the central was clearly aware that the continuously decreasing food monopsonistic procurement price was a factor, it did not attempt to act within the first few years of output decline. This implies that the central government was not a proactive decision-maker in policymaking but a negative and passive responder, a reason for the wide fluctuations of China’s food output as shown in Figure 3.

The government’s strong preference for food monopoly, the rudimentary tool of the central planning system, as a policy instrument is also evident. In China’s post-1979 agricultural reform the market was seen as antagonistic to urban food accessibility. To some extent the marketisation of the food sector after 2003 can be understood as a retreat of the state from food security. The Chinese government used to view both sufficient food availability and urban subsidised food accessibility as essential components of food security; however when seen under the stringent monopoly system these two components are seemingly in fundamental conflict with fiscal constraint.

The tight fiscal budget eliminated all possibilities of including the subsidised low-price food accessibility in the Chinese government’s food security agenda. After the 1998 grain reform, the grain bureau no longer played the role of a policy tool; it had become a profit-maximising monopolist at the expense of maintaining sufficient food supply, a key initial policy objective. This change threatened China’s food security from the availability side.

³⁶ For example, energy and mining sectors.

The driving force behind China's post-1978 food sector reforms was the government's fiscal constraint. The success of food marketisation reform hinged greatly on the highly enhanced national income which helped the Chinese government walk out on the food security puzzle.

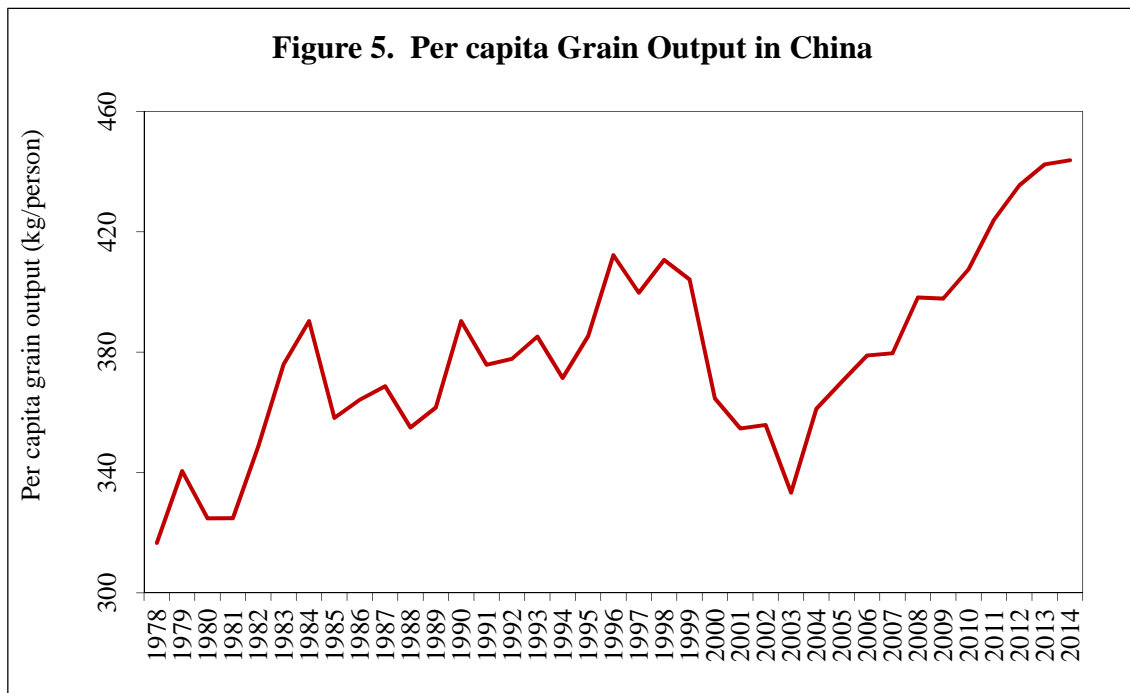
III

In China's food security, though some favourable policies may explain the periodic food sufficiency at different stages of the reform, they cannot account for the output dips (Figure 3). This alternation of output peaks and troughs throughout the reform era is not a random process, but has occurred in a cyclical pattern.

When the real food procurement price is introduced into the research, the cyclicity of food output is found to perfectly match changes in the real procurement price, indicating a correlation between the pricing mechanism of food price and its underlying causes and the cyclical nature of China's post-1979 food security.

The clue of price (monopsonistic and monopolistic) was used to trace the underlying intentions of the Chinese Communist Party's policymaking, and the alternations between the two major goals (food security and fiscal security) and policy methods (monopoly and the market). Put simply, the biggest issue facing the state is how to guard food security with state monopoly under limited fiscal budget.

Food security as defined by the Chinese government refers to not only the maximisation of food availability, but also the maintenance of the state's food monopoly interest and a rural-to-urban welfare transfer to support the state's overall industrialisation goal. As the market was not capable of fulfilling the latter two policy goals, only the grain bureau has had the capacity to implement the state's food security policy package. However, the welfare transfer and the food monopoly have affected not only the fiscal budget (if the state bears the cost), but also farmers' incentives to increase food output. In 2003 when basic food availability was in crisis due to the grain bureau's monopoly of food circulation, the state finally abandoned the use of the bureau for the market. Meanwhile, thanks to improved economic conditions and the long-term outcome of the 1993–98 tax reform, the state successfully dropped welfare transfer from its food security package, making it possible for the state to use it as an instrument for China's food security after the 2003 reform. China's per capita grain output has entered a monotonic increasing path since 2004 (Figure 5), with food accessibility backed by the country's national income.



Source: National Bureau of Statistics of China, *Zhongguo Tongji Nianjian (China Statistics Yearbook)*, Beijing, Zhongguo tongji chubanshe, 1981–2009 editions.

The Chinese government's compromises in the conflict between policy goals and instruments have shaped the country's complex market institutions and determined the cyclical nature of China's food security. Price, as a clue to changing food policies, works as an unbiased estimator of the government's veer in the Chinese food security puzzle.

The veer may explain why, when the observation period is extended to 30 years, single-factor-determinant could no longer explain the changing patterns of China's food production. Meanwhile, the state's passive response to shocks has shown a state-oriented agricultural transition facilitated by food pricing system reforms. The alternations in food policy instruments alongside the evolution of food security goals have intermittently sparked agricultural growth and shaped the cyclical character of three decades of China's agricultural growth.

Footnote references

Ash, R., 'The Evolution of Agricultural Policy', *The China Quarterly*, 116 (1988), pp. 529–55.

Chinese Communist Party Central Committee Document No. 1 (1988), *Guowuyuan Guanyu Wanshan Liangshi Hetong Dinggou 'Sanguagou' Zhengce De Tongzhi* [Notice of the State Council on improving grain contractual purchase via the 'three links'] (Beijing, 3 January 1988).

Chinese Communist Party Central Committee Document No. 1 (2004), *Zhonggong Zhongyang, Guowuyuan Guanyu Cujin Nongmin Zengjia Shouru Ruogan Zhengce De Yijian* [Opinions of the Central Committee and the State Council concerning several policies on promoting the increase of farmers' income] (Beijing, 31 December 2003).

Chinese Communist Party Central Committee Document No. 1 (2005), *Zhonggong Zhongyang, Guowuyuan Guanyu Jin Yibu Jiaqiang Nongcun Gongzuo Tigao Nongye Zonghe Shengchan Nengli Ruogan Zhengce De Yijian* [Opinions of the Central Committee and the State Council Concerning several policies on further strengthening rural works and promoting the comprehensive agricultural productivities] (Beijing, 31 December 2004).

Chinese Communist Party Central Committee Document No. 1 (2006), *Zhonggong Zhongyang, Guowuyuan Guanyu Tuijin Shehui Zhuyi Xin Nongcun Jianshe De Ruogan Yijian* [Opinions of the Central Committee and the State Council on promoting the construction of the new socialist country] (Beijing, 31 December 2005).

Chinese Communist Party Central Committee Document No. 1 (2007), *Zhonggong Zhongyang, Guowuyuan Guanyu Jiji Fazhan Xiandai Nongye Zhashi Tuijin Shehui Zuyi Xin Nongce Jianshe De Ruogan Yijian* [Opinions of the Central Committee and the State Council on actively developing modern agriculture and steady promoting the construction of the new socialist country] (Beijing, 31 December 2006).

Chinese Communist Party Central Committee Document No. 1 (2008), *Zhonggong Zhongyang, Guowuyuan Guanyu Qieshi Jiaqiang Bongye Jichu Jianshe Jinyibu Cujin Nongye Fazhan Nongmin Zengshou De Ruogan Yijian* [Opinions of the Central Committee and the State Council on fortifying the foundation of agriculture and promoting the increase of farmers' income] (Beijing, 31 December 2007).

Chinese Communist Party Central Committee Document No. 75 (1980), *Zhonggong Zhongyang Guanyu Jinyibu Jiaqiang He Wanshan Nongye Shengchan Zerenzhi De Jige Wenti* [Circular on several problems in further strengthening and improving the responsibility system in agricultural production] (Beijing, 27 September 1980).

Chinese Communist Party Central Committee Document No.1 (1985), *Zhonggong Zhongyang Guowuyuan Guanyu Jinyibu Huoyue Nongcun Jingji De Shixiang Zhengce* [Ten policies of the Central Committee and the State Council for further enlivening the rural economy] (Beijing, 1 January 1985).

Decree No. 244 of the State Council of the People's Republic of China, *Liangshi Shougou Tiaoli* [Regulations on grain purchase] (Beijing, 6 June 1998).

Decree No. 407 of the State council of the People's Republic of China, *Liangshi Liutong Guanli Tiaoli* [Regulations on administration of grain distribution] (Beijing, 26 May 2004).

Du, R., *Du Runsheng Zishu: Zhongguo Nongcun Tizhi Biange Zhongda Juece Jishi* [The readme of Runsehng Du: documentary of major decisions of institutional change in rural China] (Beijing, 2005).

Fan, Q. and Nolan, P., eds., *China's Economic Reforms: The Costs and Benefits of Incrementalism* (Basingstoke, 1994).

Fan, S., 'Technological Change, Technical and Allocative Efficiency in Chinese Agriculture: The Case of Rice Production in Jiangsu', *Journal of International Development*, 12 (2000), pp. 1–12.

Fourth Plenary Session of the Eleventh Chinese Communist Party Central Committee, *Zhonghua Renmin Gongheguo Tudi Guanli Fa* [Land administration law of the People's Republic of China] (Beijing, 28 September 1979).

General Office of the State Council of the People's Republic of China (Plain Text) No. 38 (1997), *Guowuyuan Bangongting Guanyu Zuohao Qiuliang Shougou Gongzuo De Tongzhi* [Circular of the general office of the State Council on doing the autumn grain purchase work well] (Beijing, 2 October 1997).

General Office of the State Council of the People's Republic of China No. 76 (1994), *Guowuyuan Bangongting Guanyu Jiaqiang Liangshi Shichang Guanli Baochi Shichang Wending De Tongzhi* [Circular of the general office of the State Council on tightening up the management of grain markets and maintaining stability of the market] (Beijing, 16 June 1994).

Lin, J., 'Collectivization and China's Agricultural Crisis in 1959–1961', *Journal of Political Economy*, 98 (1990), pp. 1228–52.

Lin, J., 'Education and Innovation Adoption in Agriculture: Evidence from Hybrid Rice in China', *American Journal of Agricultural Economics*, 73 (1991), pp. 713–23.

Lin, J., 'Rural Reforms and Agricultural Growth in China', *American Economic Review*, 82 (1992), pp. 4–51.

Liu, B., Zhang, Z. and Huo, G., *Zhongguo Sannong Wenti Baogao* [China Farming Countryside and Peasantry Issues Report] (Beijing, 2004).

Lu, F., 2004. *Banzhouqi Gaige Xianxiang: Woguo Liangmian Liutong Gaige He Shiwu Anquan Yanjiu* [The phenomenon of half-cycle reform: studies on the reforms of grain and cotton circulation and the food security] (Beijing, 2004).

McMillan, J., Whalley, J. and Zhu, L., 'The Impact of China's Economic Reforms on Agricultural Productivity Growth', *Journal of Political Economy*, 97 (1989), pp. 781–807.

National Bureau of Statistics of China, *Zhongguo Tongji Nianjian* (China statistics yearbook) (Beijing, 1981–2013 Editions).

National Development and Reform Committee, *Guojia Liangshi Anquan Zhongchangqi Guihua Gangyao (2008–2020 Nian)* [Medium and long-term plan for national food security (2008–2020)] (Beijing, 13 November 2008).

Perkins, D., 'Reforming China's Economic System', *Journal of Economic Literature*, xxvi (1988), pp. 601–45.

Schultz, T., *Transforming Traditional Agriculture* (New Haven, 1964).

Second Session of the Ninth Standing Committee of the National People's Congress, *Zhonghua Renmin Gongheguo Nongye Fa* (Agriculture law of the People's Republic of China) (Beijing, 2 July 1993).

Sicular, T., 'China's Agricultural Policy During the Reform Period' in M. E. Sharpe, eds., *China's Economic Dilemmas in the 1990s: The Problems of Reforms, Modernization, and Interdependence* (New York, 1992).

State Council of the People's Republic of China Document No. 12 (1995), *Guowuyuan Pizhuan Zhongguo Renmin Yinhang Deng Liu Bumen Guanyu Jiaqiang Liang Mian You Zhengce Xing Shougou Zijin Guanli Yijian De Tongzhi* [Circular of the State Council of the People's Republic of China on the proposal of the Chinese People's Bank and five other departments on strengthening the management of funds for the purchase of grain, cotton and edible oil within the framework of state policies] (Beijing, 30 May 1995).

State Council of the People's Republic of China Document No. 137 (1982), *Guowuyuan Guanyu Renzhen Zuohao Liangshi Gongzuo De Tongzhi* [Circular on the diligent execution of all operations affecting grain] (Beijing, 28 November 1982).

State Council of the People's Republic of China Document No. 15 (1998), *Guowuyuan Guanyu Jinyibu Shenhua Liangshi Liutong Tizhi Gaige De Jueding* [Decision of the State Council on further reform over the grain circulation system] (Beijing, 10 May 1998).

State Council of the People's Republic of China Document No. 17 (2004), *Guowuyuan Guanyu Jinyibu Shenhua Liangshi Liutong Tizhi Gaige De Yijian*

[*Opinions of the State Council on further deepening the reform to the grain distribution system*] (Beijing, 23 May 2004).

State Council of the People's Republic of China Document No. 20 (1998), *Guowuyuan Guanyu Jinyibu Wanshan Liangshi Liutong Tizhi Gaige Zhengce Cuoshi De Buchong Tongzhi* [Supplementary circular of the State Council on policies and measures for further improving grain circulation system reform] (Beijing, 11 October 1999).

State Council of the People's Republic of China Document No. 31 (1994), *Guowuyuan Guanyu Yinfa 'Liangshi Fengxian Jijin Shishi Yijian' De Tongzhi* [Circular of the State Council on issuing the proposals on implementing the grain risk fund] (Beijing, 30 April 1994).

State Council of the People's Republic of China Document No. 35 (1998), *Guowuyuan Guanyu Yinfa Dangqian Tuijin Liangshi Liutong Tizhi Gaige Yijian De Tongzhi* [Circular of the State Council on issuing the proposals on promoting the reform of the grain circulation system under current circumstances] (Beijing, 7 November 1998).

State Council of the People's Republic of China Document No. 46 (1990), *Guowuyuan Pizhuan Shangyebu Deng Ba Bumen Guanyu Shi Ban Zhengzhou Liangshi Pifa Shichang Baogao De Tongzhi* [Circular of the State Council of on the report of the ministry of commerce and other eight departments on the trial initiation Zhengzhou grain wholesale market] (Beijing, 27 July 1990).

State Council of the People's Republic of China Document No. 60 (1991), *Guowuyuan Guanyu Jinyibu Gaohuo Nongchanpin Liutong De Tongzhi* [Circular of the State Council of how to further improve the circulation of agricultural products] (Beijing, 28 October 1991).

State Council of the People's Republic of China Document No. 9 (1993), *Guowuyuan Guanyu Jiakuai Liangshi Liutong Tizhi Gaige De Tongzhi* [Circular of the State Council on speeding up reform of the grain circulation system] (Beijing, 15 February 1993).

State Council of the People's Republic of China Document No.15 (1992), *Guowuyuan Guanyu Tigao Liangshi Tongxiao Jiage De Jueding* [Decisions of the State Council on increasing the state monopoly selling price of grain] (Beijing, 6 March 1992).

State Price Bureau and Ministry of Commerce Document No. 64 (1992), *Guanyu Tigao Liangshi Dinggou Jiage De Tongzhi* [Circular of the State Council on increasing the grain procurement price] (Beijing, 2 June 1992).

The Ministry of Finance of the People's Republic of China, *Zhongguo Caizheng Nianjian* [Finance yearbook of China] (Beijing, 1991–2012 Editions).

Yao, S. and Liu, Z., 'Determinants of Grain Production and Technological Efficiency in China', *Journal of Agricultural Economics*, 49 (1998), pp. 171–84.