Getting food prices right: the state versus the market in reforming China, 1979–2006

To Get the Prices Right for Food: The State versus the Market in Reforming China, 1979–2006

This article examines the role of China's gradual reforms in fostering food production by causally assessing China's state policies of food market-rebuilding. To this aim we collect policy material on government food pricing, subsidies and procurement fund from central documents over the period of 1979-2006 and construct a dataset of policy implementation cost for estimation. Our causality test results indicate that fluctuations in food production were unidirectionally caused by food policy transformations determined by the "visible hand" of China's reformist state aiming to guide the economy towards a simulated, price based market signal system.

1. Introduction

By the time when Mao died in 1976, a market economy had been absent in Mainland China for about three decades. Rather, the stiff administrative control over resources and resource allocation in the name of the Soviet centrally planned economy was the economy-wide norm. As a result, economic efficiency was low, and the economic structure and growth were severely distorted (e.g., Feuchtwang 1983; Lin 1990; Perkins 1988).[1]

[1] See e.g. Lin, "Collectivization and China's agricultural crisis in 1959–1961"; Lardy, *Agriculture in China's modern economic development*; Feuchtwang, *The Chinese economic reforms*; Perkins, "Reforming China's economic system"; Li and Zheng, *Deng Xiaoping Yu Gaige Kaifang Shisi Nian*; Fan and Nolan, *China's*

Deng Xiaoping's reforms in the post-Mao Era (i.e. after 1976) began in the food sector, marked by a re-introduction of property rights and economic incentives among producers (McMillan *et al*. 1989). Despite the grassroots initiatives, under a party-state, China's reforms have been clearly state-led and state-promoted (White 1991). Moreover, changes were very gradual without the "shock therapy" of the Russian type (Fan and Nolan 1994). Contrasting a shock therapy of the Soviet type, gradual reforms helped China avoid a macroeconomic downfall that was regarded as an inevitable by-product of a sudden liberalisation of a centally planned economy (Roland 2000). Different from the partial reforms of the state searching and making up frictions related to the prior absence of markets (Murphy Shleifer and Vishny 1992), Chinese state simulated a market-like environment for the food sector before its market liberalisation. Thus throughout the reform era, the visible hand of the interventionist state was busy in creating a food market for the economy, simultaneously handling both the demand and the supply sides.

This was a mammoth task. Being the world most populous country, food security in China has long been a major test for the governing ability. It is also vital for the legitimacy of the ruling class. The Chinese state rarely resorted its staple food supply to international market unless on peculiar occasions such as the Great Leap Famine (1959-1961, see Table 1). Food security in China thus was equivalent to the self-sufficiency in staple food supply. But Mao's three-decade-long exploitative and harsh "food dictatorship" (Ryan 2012) had led to a chronic farming recession to threaten China's food security. On the eve of reform (1976-1978) China's net food imports rebounded to a similar level as in the Great Leap Famine (see Table 1). Any

economic reforms; Leng, *Reform and development in Deng's China*; Larus, *Economic reform in China, 1979-2003*.

reduction in food prices would cause an even deeper recession in the farming sector. In other words, the revitalisation of China's food sector after Maoist mismanagement necessitated a manipulated higher food prices.

Table 1. *Food import-export balance under Maoism*

	South China	North China	China's total
Pre-collectivisation			
1953–1955	688.5	204.3	892.8
Post-collectivisation			
1956–1960	1,950.5	–472.0	1,478.5
1961–1965	669.5	–2,013.5	–1,344.0
1966–1970	942.0	–796.5	145.5
1971–1975	952.5	–1,159.0	–206.5
1976–1978	–22.8	–1,106.4	–1,129.2

Sources: Based on Contemporary Agricultural History Study Group, Rural Economy Institute, Ministry of Agriculture, eds., *Dangdai Zhongguo Nongye Biange Yu Fazhan Yanjiu*, p. 251.

Notes: 10,000 tonnes; negative figures mean food imports to bridge domestic food deficits.

Assuming all individual farmers were rational economic agents who made their production decisions according to their expected future revenue from their grain sales (Schultz 1964), it was the responsibility of the monopsonic state to set the "right price" for food. Meanwhile, urban labour market reforms turned out to be slow and apathetic, which forced the government to spend more on urban food subsidies rather than reducing them. So, in both circumstances the "right price" depended on the depth of the government pocket to pay,[2] *ceteris paribus*. If so, the success of food-marketisation gradualism relied on the state's fiscal affordability (Figure 5).

[2] Here, the Chinese state did not behave like a "developmental state" that purposely "gets the prices wrong" in order to change the growth trajectory of the economy; see Amsden, *Asia's next giant*, p. 139. Rather, the main concern was how to "get the prices right" for China's food security.

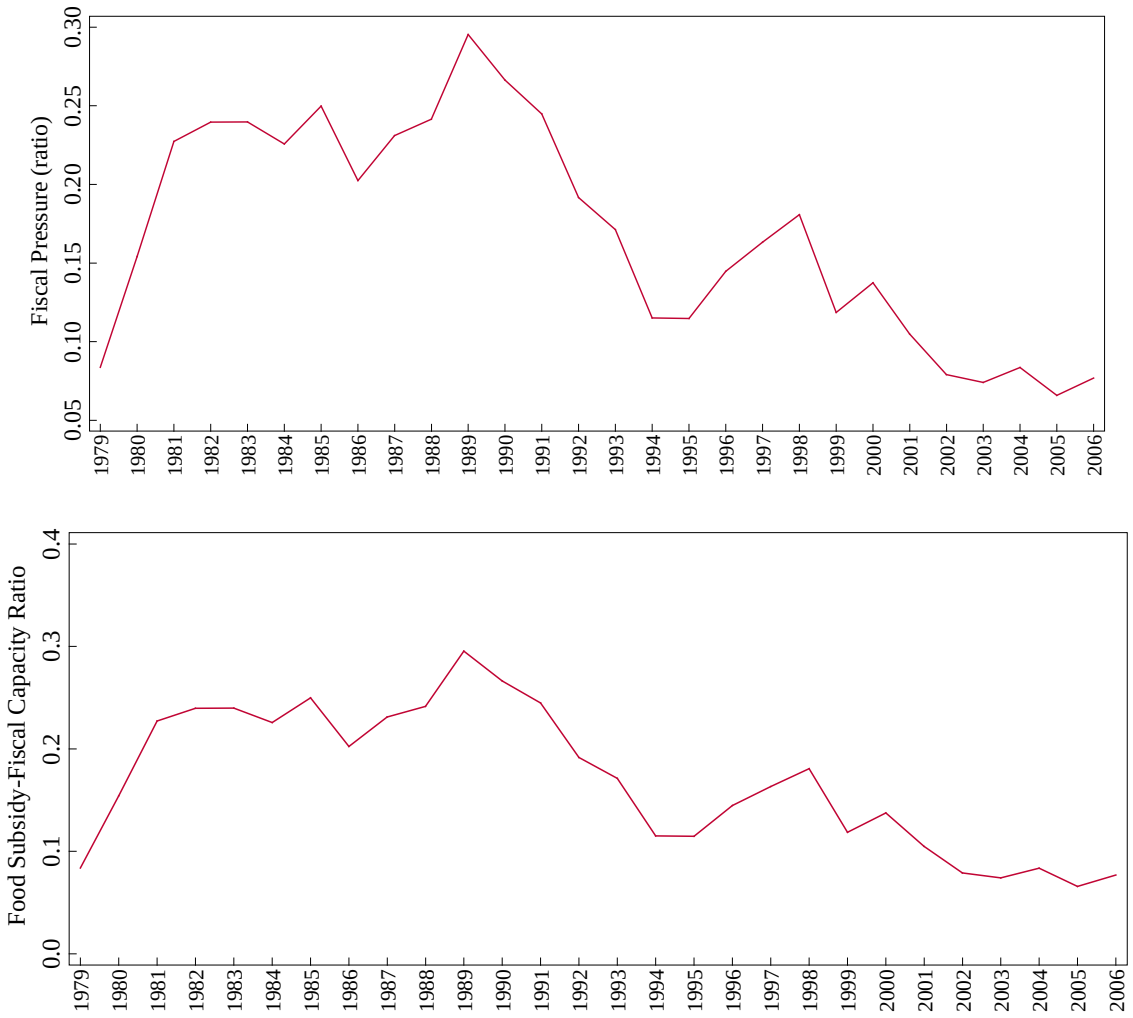

Figure 5. *Gradualism of Chinese government to give way to the food market*

Source: *Finance Yearbook of China*.

Notes: *This figure plots the reducing proportion of total food subsidies paid by government in its annual fiscal expenditure. This figure presents the gradualism of the interventionist Chinese government to give way to the market for food security.*

Our study is inspired by economists who investigate the role of state in market reforms (Perkins 1988; White 1991; Roland 2000; Murphy *et al*. 1992) and who link Chinese agriculture to government food policies, and food security (Kueh 1984; Ash 1988 and 1991; Lin 1989;phay Sicular 1995). The existing empirical studies on

China's food sector usually assess food policies with various output data. Such an approach commonly refers to farming inputs such as new chemical fertilizers (Fan 2000; Ma *et al*. 1989), new seed varieties (Lin 1991; Jin 2010), better irrigation and farming machinery (Yao and Liu 1998). These inputs are quantified in physical terms. Unlike physical inputs, institutions and their effects are not always quantifiable. Thus, input-output analysis is routinely conducted as a proxy for any institution-output inquiry on China's food marketisation.[3] The challenge is whether the input-output proxy is able to reveal the mechanisms with which a gradualist government rebuilds the market . So far, few studies have paid sufficient attention to how Chinese government used food dual pricing to manipulate rural food output and urban wage bill, and how reformist state used monopoly to transit food sector towards a functional market. This work fills in this gap in scholarship.

Our source of information comes mainly from decrees and regulations of the central government in Beijing, in which we found the government's major motives in decision-making were monopsonic availability and the resultant fiscal affordability. Due to data availability,[4] our observations are made for the period from 1979 to 2006 when China moved step by step towards marketisation of food, including procurement pricing (1979), bilateral contractual procurement (1984), abolition of urban grain rationing (1993), new regulations on procurement fund (1995–96), grain bureau deregulation (1998), and grain market liberalization (2004). We also notice

[3] Huang and Rozelle, "Technological change: rediscovering the engine of productivity growth in China's rural economy"; Lin, "An economic theory"; idem "Rural reforms and agricultural growth"; Fan, "Effects of technological change and institutional reform on production growth in Chinese agriculture".

[4] For example, urban subsidy on grain, cotton and edible oil data stops at the year of 2006.

that specific policies appeared in cluster (e.g. urban subsidies during 1990–93, grain procurement during 1995–97, and the grain bureau reforms during 1998–2003).

Methodologically, we set up a conceptual framework of government's choice-making among different pricing policies under a fiscal constraint. We also check whether the model we build qualitatively matches the historical reality. We then build a time series dataset of annual changes in grain output, food procurement price and the central government expenditure for 1979 to 2006. We use the Granger causality method to see if the relationship between food output and government expenditure was causal. Moreover, we adopt an unrestricted vector autoregression (VAR) approach to detect the link between food policies and food output. Our results show that food output in China was causally determined by government capacity to pay for food. Government policies enhanced farmers' physical inputs in food production, as government monopsonic price was positively reflected in grain production in a lagged term. This was the endeavour to get the food price right. Gradualist reforms in China's food security reform worked well.

The rest of this article is organised as follows: Section 2 introduces historical background of China's food sector reform. Section 3 simulates the central policy-making procedure. Section 4 discusses rationales of government policies and their changes. Section 5 is devoted to empirical strategy and results, and section 6 contains the final conclusions.

2. Historical Background

Under Maoism, food supply in the urban sector was heavily protected by the state. The Maoist state acted as *the* sole food dealer between the rural and urban sectors: as a food monopsonist in the rural and a monopolist in the urban, it completely

controlled food circulation from the farming to the industry sectors. Rural food was strictly procured at artificially low prices to sustain low wage cost for industrialisation. A direct consequence was the stifling of all state procurement prices for rural products which in turn stagnated the incentives, growth and development of the farming sector (Deng 2011); not to mention the unprecedented famine in peace time and with good weather during the late 1950s and early 60s (Dikötter 2010).[5] Prices, in a closed food circulation, were used for accounting purposes only, as the consumer had no power to decide how much to eat and what to eat, while the producer was not allowed to decide when and where to grow what food, for whom, and by how much.

Deng Xiaoping's reforms endorsed the incentives of producers in the farming sector. This was achieved by the implementation of the "household contractual production responsibility system" (*jiating shengchan chengbao zeren zhi*) in the early 1980s, which empowered the producers for the first time since the communist takeover in 1949. Overnight, the peasantry became price sensitive again like their ancestors, ready for marketisation of rural produce.

There was, however, an institutional asymmetry. The consumers in urban China, accounting for about 20 per cent of the country's population, were not yet ready for the market for food. Despite the government commitment to "forced industrialisation" which seemingly favoured the urban working class,[6] Maoism systematically halved China's urban real wages.[7] So, the "living wage" under Mao existed but in name. In this context, even with strict urban food ration, government had to pay for the urban

[5] Dikötter, *Mao's great famine*.

[6] For the term, see Spulber, *Organizational alternatives in soviet-type economies*.

[7] Deng, *Mapping China's growth and development in the long run*, pp. 168–9.

food bill, or soaring food prices would deter the industrialisation. Fundamentally, this combination of food-ration and food subsidies was determined by the absence of a labour market that set urban living wages at a market rate. As the re-establishment of an urban labour market appeared much later, food-rationing and food subsidies in the urban sector – the signature pattern of resource allocation under the Soviet central planning for food – had to continue. Low food selling prices were politically safe and politically correct for the post-Mao state.

Consequently, although rural producers were ready to react to the price signal from the food market, urban consumers still responded to non-market signals of rations and subsidies. This rural-urban dichotomy and mismatch resulted in the continuing "dual prices" for the same food (*shuangchong jiage*), as a result of different paces of reforms in the two key sectors of the economy. But this time, price difference could no longer be paid by farmers; otherwise famine would sweep across Chinese cities.

It was now up to the post-Mao reformist state to somehow bridge the two sides of supply versus demand which represented two fundamentally different economies: an increasingly marketised economy and a moribund planned economy. It was a tall order. As far as one can tell, the government fiscal burden was on the rise during the period in question. Sometimes it even outpaced overall fiscal capability (see Figure 2)..

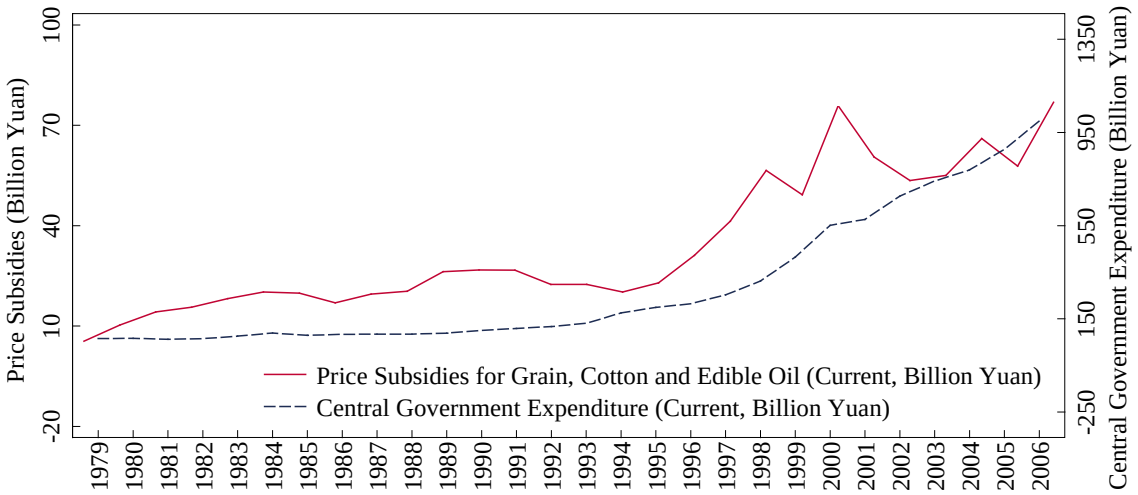

Figure 2. *Urban food price subsidies and government expenditure*

Source: *Finance Yearbook of China*.

Notes: *This figure plots the changes in price subsidies for urban grain consumption and the total central government expenditure. Both indicators are used in nominal term to reflect the policy-makers' observations on the same year's fascial conditions and their food subsidy decision made under the real-time fiscal affordability.*

In the very beginning, the reformist state acted as a price-giver for both the demand and supply sides. For the rural price-taking producers and urban price-taking consumers, the state represented the "proxy market demand" for food and the "proxy market supply" to distribute the same food. Both rural producers and urban consumers relied on the state prices to make choices and decisions. In such a system, it was not just a zero-sum game between the rural and urban sectors. If the procurement prices were set too low, the production shrank. So, China's annual aggregate food output, and hence food availability and food security for China, was at the mercy of the state monopsonic prices for rural output.

Technically speaking, the state was an arbitrager between the two sides but it was by no means a rent-seeker. Rather, as we will show, the state lost money in its arbitraging.

The current study reveals that it is an illusion that with all the resources it controlled, China's almighty party-state was fully capable of assuring the country's food security with ease. This was not the case. For the years 1983–95, China's grain output grew merely in pace with its population. Although food supply increased ahead of the population during 1996–99, it fell behind population growth in the period 2000–6 (see figure 1-A). China's food availability fluctuated violently, meaning that the country's food self-sufficiency was sometimes in jeopardy (see figure 1-B).

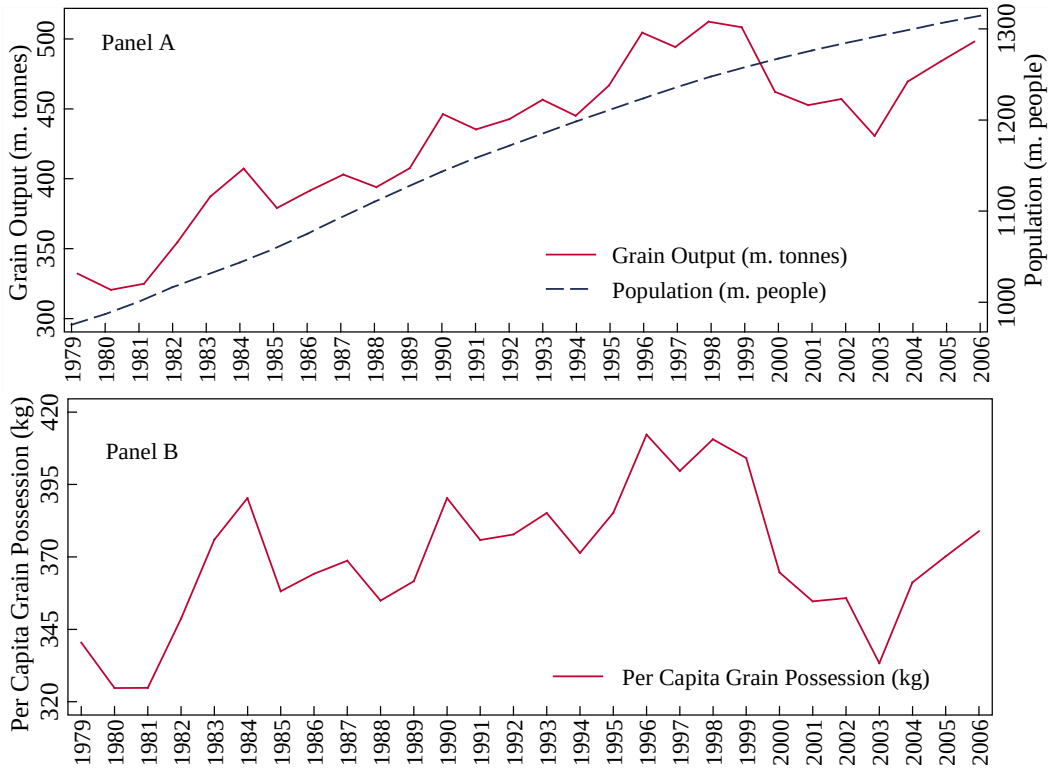

Figure 1. *Fluctuations in food output and per capita food stock, 1979–2006*

Source: *China Statistical Yearbook*.

Notes: *Panel A of figure 1 plots the changes in total grain output in pace with China's population growth. Panel B plots the per capita grain possession for each individual Chinese.*

3. Conceptual Framework for Policy Choices

3.1. Basic setup

The reformist state acted as *the* "substitute for the missing market" (*à la* Alexander Gerschenkron) in the economy. Its role was three-fold: (*i*) to create the price signal for the newly emerged market economy in the food sector, (*ii*) to fade out gradually the failed planned economy in the urban sector in conjunction with the re-establishment of an urban labour market with a real living wage at a market rate, and (*iii*) to obtain food security for the country as a whole. The state thus used three policy instruments to manipulate the market: (*i*) procurement monopsonic pricing (*ii*) urban food subsidy under food monopoly, and (*iii*) a macro control over procurement fund. However, these three major tasks were not always compatible with one another, which was the root cause of the China's food policy swings during the period in question.

To understand the policy-maker's choices, firstly, we assume that farmers always respond to the price signal regardless of whether it is a market price or government monopsonic price, and hence:

$$Y = Y(P), \tag{4}$$

Where Y is positively related to the price level, i.e. $Y'(P) > 0$.

Secondly, the leading price is the state monopsonic price P_s, consisting of the market equilibrium price P_e and the overpriced portion P_g caused by the government output-promotion monopsonic price during the period when food shortage looms large. Thus we have :

$$P_s = P_e + P_g. \tag{5}$$

Both P_e and P_s satisfy $P_e > 0$, $P_s > 0$. When the government procurement price is not the same as the equilibrium level, $P_s \neq P_e$, $P_g \neq 0$, the market clearance level under the government influence becomes $Y_s = Y(P_e + P_g)$, where Y_s differs from the market equilibrium level Y_e, which is free from government influence.

Figure 6 presents the situation when the grain economy is under strict state monopsony. In order to keep the market at clearance levels, the government has to pay for the difference between the urban subsidised price P_d and the monopsonic price P_s. The distortion of the market can be measured by the grain output Y_s at a market clearance price P_d. The total grain subsidies equal to sY_s (ABP_dP_s), in which the rate of subsidies s is the difference between the procurement price and the market clearance price, i.e. $s = P_s - P_d$.

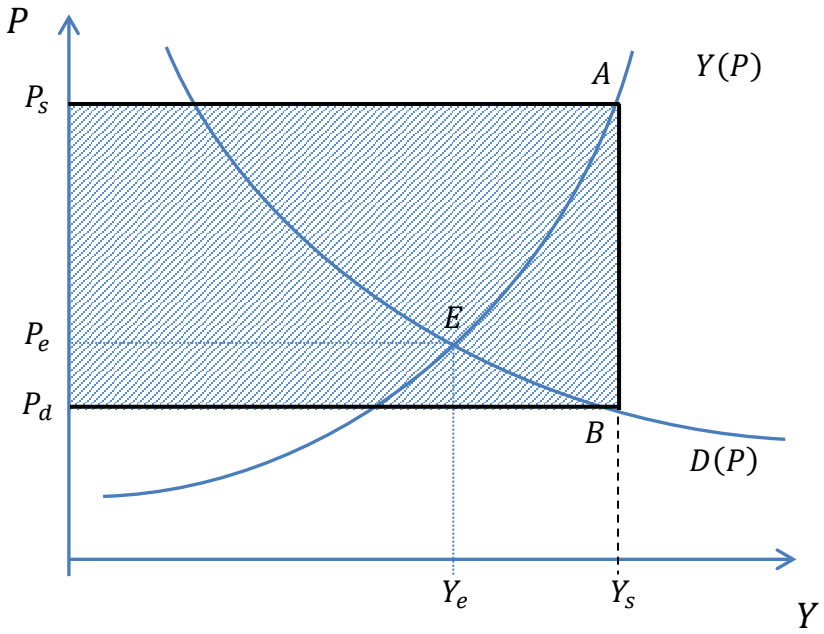

Figure 6. *Grain production under state monopsony*

Notes: *This figure presents the situation when food market is under state monopsonic control. The slashed part indicates the total food subsidies that government has to pay to fulfil national food security under its monopsony. This*

figure demonstrates China's food market simulation and manipulation after 1979.

From the viewpoint of the central government operation, the total expenditure on grain G is confined within the limit of $G \leq \bar{G}$. More specifically, G is determined by (i) the grain procurement cost $R = rP_sY$, where r denotes the interest rate in grain purchasing; (ii) the urban price subsidies sY_s, and (iii) the monopsony management cost $M(Y) = mY$. The government expenditure on grain can be presented as:

$$G = R + sY + M. \tag{6}$$

By the same token, to simulate central policy-making on food security, we assume that policy-makers have to solve a utility function with budget constraint:

$$max\, U = \{min\, G, max\, Y\}, \text{ subjected to } G \leq \bar{G}. \tag{7}$$

*3.2. Market **simulation and** manipulation*

With the premise that food output is determined by farmer's reaction to price signals created by the reformist state, food production and government fiscal capacity shall be on co-movement in the given manipulated market environment. This co-movement can be causal, if government market simulation and manipulation works well; or non-causal if simulation and manipulation fails. Thus the causal relations between government fiscal capacity and food production can be shown in two scenarios.

Scenario 1: fiscal expenditure does not cause food output if G is not capped. When $\bar{G}$ is removed from decision-making, $max\, Y$ is no longer constrained. Then, policy-makers' target is simplified to solve a utility function with a minimal expenditure on grain:

$$max\, U = min\, G = min\{rPY + sY + mY\}. \quad (8)$$

Here, when the government fiscal capacity can afford all grain monopsony costs and at the same time delivers the desirable total output Y at any level, the government policy is simplified to the point of an increase in efficiency of the grain procurement fund and government food monopoly by reducing r and m, because, in reality, both r and m are irrelevant to grain output, only dependent on the governance quality of the food regulator.

Moreover, when the total output is given exogenous $Y = Y_s$, the difference between the food procurement price and the market clearance price s is also exogenous, as $s = P(Y_s) - P_d$. The central government has no impact on Y; and there is no causality from the central fiscal expenditure to food production when G is not capped:

$$max\, U = min\, G(r, m). \quad (9)$$

Scenario 2: fiscal expenditure causes food output if it has an upper limit $G \leq \bar{G}$. If the grain procurement fund $R = rPY$ and administrative cost of monopsony $M(Y) = mY$ both satisfy $R'' > 0$ and $M'' > 0$, then $G''(Y) > 0$. Further, we assume central government's fiscal preference is linear or quasi-linear on increasing

marginal cost, which means that the marginal grain output does not cause extra utility to the central government. Then we have:

$$max\, U = \{min\, G(Y), max\, Y\}, \text{ where } \quad G''(Y) > 0 \;\; and \;\; G \leq \bar{G}. \tag{10}$$

This means any increase in output potential, such as technical progress and demand changes, will increase government expenditure. If the central government grain expenditure is bound to a fiscal capacity which is incapable of financing grain monopsony, to maintain its overall utility the central government either depresses output Y, or reduces subsidy s and abandons $max\, Y$:

$$max\, U = min\, G(s, P), \text{ where } G''(Y) > 0 \text{ and } G \leq \bar{G}. \tag{11}$$

Thus if there exists a long-run unidirectional causal relationship from the central fiscal expenditure to the grain production, it is reasonable to believe that China's food policy-making resembles Scenario 2. Government food market simulation and manipulation works well:

Proposition 1: this causal relations also corroborates upper bounds $\bar{G}$ in the central government's fiscal load on grain monopsony to limit policy-maker's decision making, $G \leq \bar{G}$.

Proposition 2: also, with the monopsony of grain, all government food policies eventually take effect through affecting the final grain output and supply Y_s (hence through affecting China's food security)..

3.3. Policy effect

This framework captures the transmission mechanisms between government market simulation and manipulation and food output. Amongst all three major reasons for fiscal crises, food market reforms are linked to procurement prices P_s, urban subsidised selling prices P_d, grain procurement fund rPY and food system management cost $m(Y)$. Essentially, the former two are about food subsidy system, and the latter two refer to the state's food monopoly. Without affecting the overall approach of a state-led market transition, food subsidy system is reasonably the first to be reformed.

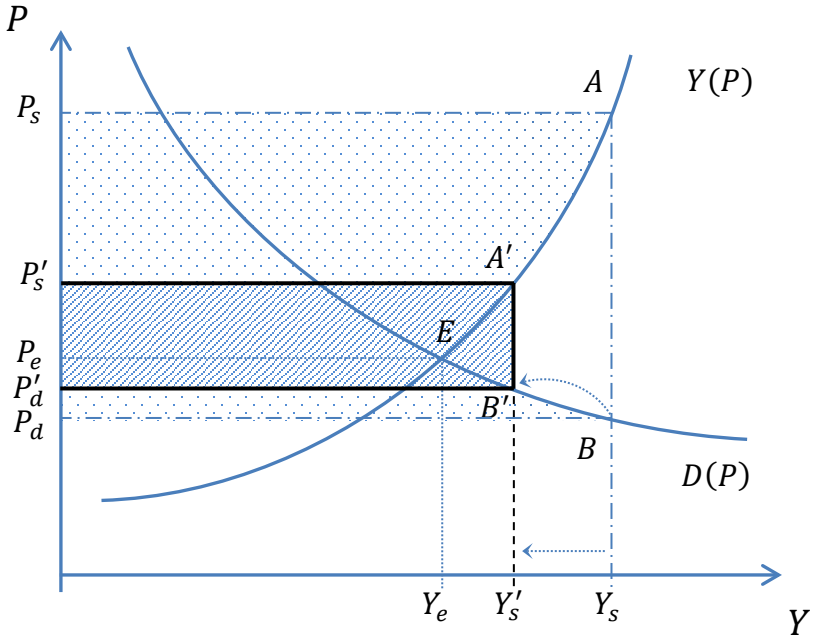

Figure 7. *Ending of food subsidies*

Notes: *This figure presents the situation when urban food rationing and subsidy were stripped off from central finance. When subsidies narrowed to the slashed*

area, food production decreased correspondingly. This figure demonstrates the second round of food policy transformation.

Figure 7 demonstrates the mechanisms of subsidy system changes. The policy-makers can increase urban food price from P_d to P_d'; or they can reduce the rural procurement price P_s to P_s' t reduce subsidy. Both choices reduce the grain market clearance level. However, the result of capping grain subsidies capped grain output as well: when subsidies were narrowed from ABP_dP_s to $A'B'P_d'P_s'$, grain output declined from Y_s to Y_s'. But the urban selling price increased to P_d' with contractions in consumer's surplus and producer's surplus $BB'P_d'P_d$ and $AA'P_s'P_s$, respectively. Once the urban sector is ready for a full market price for food without hardships thanks to the fast rising urban wage rate (e.g., the early 1990s), the food subsidy system shall be swiftly ended as a result.

With the abolition of the urban subsidy, the fiscal pressure will be greatly eased that the government had the resources to increase grain procurement funds and invest in grain monopoly. But when grain output again reached a certain high level, pressure on the government budget returns. At this point, the government expenditure function changes to $G = rPY + mY$, retaining only the grain procurement fund and cost of monopoly.

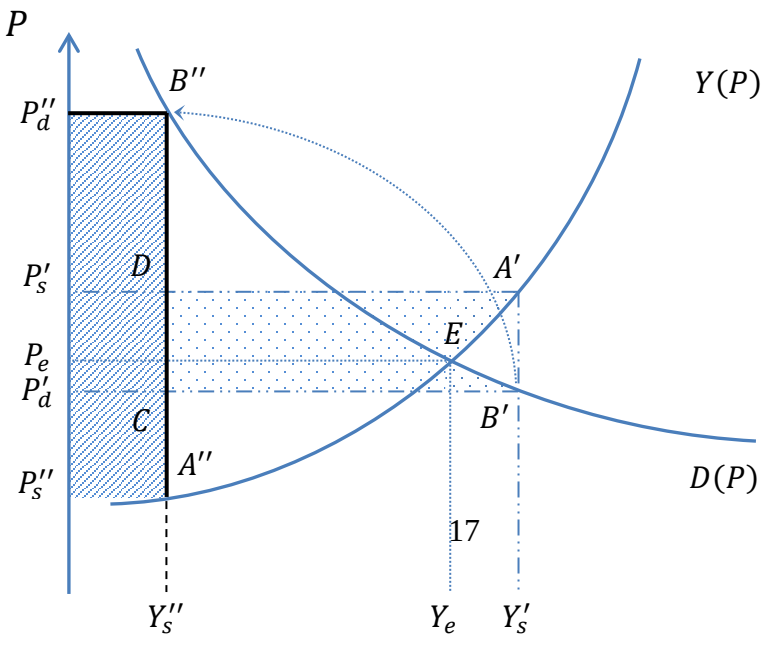

Figure 8. *Grain monopoly reforms*

Notes: *This figure presents the process of welfare loss to both food producer and consumer due to the grain bureaus' monopsony over grain. The slashed area indicates grain bureaus' gains from arbitrage in food circulation. This Figure also demonstrates the third round of food policy transformation when the state gradually relinquished its food monopoly rights to the grain bureaus.*

Figure 8 demonstrates a welfare loss to both the urban consumers and the rural producer due to grain bureaus' arbitrage. With arbitrage, urban grain price leaps to P_d'' plus a depressed grain procurement price P_s''. Grain bureaus make profit $A''B''P_d''P_s''$, which comes from the consumer's surplus and producer's surplus. Meanwhile, the grain output drops to Y_s''. A part of social welfare $A'EB'CD$ becomes the deadweight loss. This process presents a trail of relinquishing monopoly rights granted to state-owned food dealers, in order to guide food sector forward towards a market. Afterwards the government terminated state grain monopsony and arbitrage. Food price and production move back to an equilibrium level P_e and Y_e the government-free market finally returns to the food sector.

This framework also explains why government policy reforms were not random but dictated by costs incurred by some specific choices.

4. Changes in Food Policies

The food market simulation and manipulation modelled in Section III is further supported by output data and food policies shown in Table 4 where the policy and production co-move with each other: (*i*) the 1979–88 procurement price adjustment,

(*ii*) the 1989–93 food subsidy system reform, (*iii*) the 1994–2003 monopoly rights for procurement fund and grain enterprises, and (*iv*) the 2004–06 market liberalisation.[8] Changes in food policies conform to our propositions in the modelling.

Table 4. *Co-movement between food policies and food output, 1979–2006*

Year (1)	Policy Transformations (2)	Key changes (3)	Production turning points (m. tonnes) (4)	Change rate (%) (5)
1979–1984	Price control	Increasing procurement prices (1979); facing budget deficits (1982)	↗407(max, 1984)	5.062
1985–1988		Reversing 30:70 ratio (1985)	⇝379 (min, 1985)	–0.733
1989–1990	Food subsidies	Reforming state procurement (1990);	↗446 (max, 1990)	6.456
1991–1993		increasing the grain rationing price (1991); purchasing and selling at the same price (1992); abolishing urban grain coupon system (1993)	⇝435 (min, 1991)	0.787
1994–1998	Government monopoly (procurement fund and grain bureaus)	Withholding accounts and suspending interests (1994); reforming grain purchase fund and grain bureaus (1998)	↗512 (max, 1998)	2.416
1999–2003		Liberalising the grain trade (2003-4)	↘430 (min, 2003)	–3.342
2004–2006	Marketisation	Abolishing the agricultural tax (2004–5)	↗498 (max, 2006)	5.000

Notes: This table provides a summary of changes in China's food polices and farming performance. Column (2) and (3) presents key food policies collected from China's government documents. The data in column (4) refer to the total grain output in the year of production turning points. Column (5) refers to a stepwise change of average growth rate of grain production. This table shows that each grain production cycle (column 4) coincided with a round of food policy transformation (column 3)

[9] This means that 30 per cent of the government procurement price was subject to a lowered baseline and 70 per cent of government procurement price fetched a bonus price of 50 per cent higher than the baseline price. Overall, the government procurement price increased 135 per cent from the 1984 level. The calculation is as follows:

in China.

4.1. Procurement pricing policy

The first round of reforms took place in 1979 to 1988 to boost grain output with an increase in government "procurement quota pricing" (*tonggou jia*) and "above-quota bonus pricing" (*chaogou jia*) in order to nurture the market for the rural sector for the first time after China's chronic food shortage under Mao's collectivisation. In accordance with the 1979 Decisions of the Fourth Plenary Session of the Eleventh Chinese Communist Party Central Committee (CCPCC), the government procurement price for grain increased 50–80 per cent. The peasantry responded. From 1979 to 1984, China enjoyed successive bumper harvests, with an annual growth rate of 5.1 per cent. The rice output increased 30.2 per cent from the 1978 level, and wheat, 63.1 per cent.

Such a rise in total food output in conjunction with higher procurement prices led to government's fiscal difficulty. It is stated in Document No. 137 issued in 1982 by the CCPCC that the sharp increase in the grain sales has exceeded the state's fiscal capacity. This can only be understood in conjunction with China's urban food subsidies which prevented the government from recouping its grain procurement costs. At that time, to deregulate urban food pricing seems to have been politically dangerous. The government's only option was to reduce its procurement price for the peasantry. The new pricing policy was called the "reversed 30:70 ratio" (*dao san qi*) announced in 1985.[9] The rice procurement price was cut by 6.9 per cent in 1986.

[9] This means that 30 per cent of the government procurement price was subject to a lowered baseline and 70 per cent of government procurement price fetched a bonus price of 50 per cent

This unilateral change reversed the growth momentum in grain production: wheat output fell 10.3 per cent, and China's aggregate grain output declined 0.7 per cent in response to the new pricing. Clearly, the Chinese peasantry became market-price literate. Nevertheless, this drop threatened China's national food security.

To rescue food security, the government introduced stimuli.[10] China's grain production again responded. In 1990, the total outputs of rice and wheat reached their highest level since 1949. China's total rice output in 1990 was 189.33 million tonnes, 11.1 million tonnes higher than the previous peak in 1984 and about 40 per cent higher than in 1978 when reforms began. China's wheat output reached 98.2 million tonnes in 1990, an increase of over 80 per cent from the level of 1978. The government had to buy in more food thanks to its food monopsony despite its unchanged urban monopolistic sale price of grain, which meant an increasing budget burden for the state.[11] As figure 2 shows, the urban food subsidies amounted for 22.4 billion yuan, or a quarter of the central government average revenue of the time.

4.2. Urban subsidy policy

higher than the baseline price. Overall, the government procurement price increased 135 per cent from the 1984 level. The calculation is as follows:

$$\begin{aligned} ProcurementPrice_{1985} &= 30\% \cdot QuotaPrice_{1984} + 70\% \cdot AboveQuotaPrice_{1984} \\ &= 30\% \cdot QuotaPrice_{1984} + 70\% \cdot (150\% \cdot QuotaPrice_{1984}) \\ &= 135\% \cdot QuotaPrice_{1984} \end{aligned}$$

In CCPCC 1 (1985), the state also imposed a "protected price" (*baohu jia*) equal to the preceding year's quota price. Such a price was lower than the baseline price. The policy had a negative influence on farmers' production incentives.

[10] The policy linked production to the provision of subsidized chemical fertilizers (*pingjia huafei*) and diesel oil for farming machines.

[11] This is known as the "inversed urban-rural prices for grain" (*chengxiang liangshi gouxiao jiage daogua*), in which the rural procurement price was higher than the urban sale price.

This ushered in the second round of reforms in 1989 to 1993 (table 4 and figure 4). In 1991, the central government reduced urban food subsidies as a way to introduce the market to the urban consumers. A mere year later, a new "one price" policy, or "purchasing and selling grain at the same price" (*gouxiao tongjia*), was attempted to eradicate urban food subsidies completely. A new law was passed in 1993 to address this issue.[12] The share of the urban food subsidies in central government budget spending soon plummeted from 23.5 per cent in 1993 to 7.0 per cent in 1994.

Soon after the grain deregulation, the urban grain price rose sharply,[13] jeopardising social stability in urban China. It forced the central government to resume monopsony over grain, leading to the third round of policy changes. Predictably, the grain monopsony returned, as too did the pressure on government finance. Then, in 1995 the State Council tightened the grain procurement budget.[14] The central government also commissioned the Agricultural Development Bank of China to manage its grain procurement budget.[15] But cumulative grain deficits kept increasing over the five consecutive years from 1994 to 1998 (figure 4).[16]

[12] See Chapter 4 "Agriculture Product Circulation" in the *1993 Agriculture Law*.

[13] Compared with the previous year, the 1993 and 1994 CPI increased by 14.7 per cent and 24.1 per cent, respectively.

[14] In 1995, the State Council divided government grain bureaus' duties into two parts – "commercial transactions" (*jingying xing yewu*) and "policy-based transactions" (*zhengce xing yewu*), and made clear that commercial transactions should not use grain procurement budgets.

[15] According to the grain budget management rules established by Ministry of Finance 139 (1996), all "special funds for purchasing grain" (*gouliang zhuankuan*) must be jointly managed by the Agricultural Development Bank of China and the State Ministry of Finance.

[16] According to Liu *et al* (2004), the grain-cum-deficits in the grain bureaus had rapidly increased to 120 billion yuan by 1998, or 100 million yuan per day; see Liu, Zhang and Huo, *Zhongguo Sannong Wenti Baogao*.

According to State Council Document No. 15 (1998), the cost of grain overwhelmed the government finance.[17]

4.3. Procurement fund and grain bureau policy

Against this backdrop, a new round of reforms was kick started.[18] From 1998, as part of the marketisation reforms the state-owned grain bureaus were made financially independent.[19] Meanwhile, the State Council's Decree No. 244 (1998) imposed a new principle of "selling grain at a favourable price" (*shunjia xiaoshou*) to recoup the monopsonic procurement cost. This could only mean a price drop in government procurement prices for farmers. It ushered in China's largest trough in food output from 1999 until 2003, which forced the central policy-maker to abandon grain monopsony after 2004.

In a nutshell, in the process of re-establishing the market for agriculture, a high government procurement price warranted more food output and hence better food security; and a low food price helped the urban consumers with their living standards. The reformist state had to strike a balance between the two sectors and gradually introduced the market to both sectors. The state gradually and successfully exited from the food market.

In reality, gradualism had its limits. Every time food procurement pressure on the

[17] The major focus of the State Council of People's Republic of China Document No. 15 (1998) (hereafter SCPRC 15 (1998)) was on how to control grain bureaus' deficits. For the first time the state asked all grain bureaus to conduct independent accounting. The central finance was no longer willing to pay the deficits. SCPRC 15 (1998).

[18] First, in 1997 the state announced a new guideline for grain bureaus as "cost plus slim profit" (*baoben weili*). This principle signalled that the government selling price should bring back a profit.

[19] SCPRC 15 (1998) separated grain procurement and storage enterprises from grain bureaus to better control deficits. SCPRC 15 (1998).

government budget became too high, China's policy-makers opted for deregulation to avoid a fiscal crisis. In doing so, the government either narrows the subsidy gap (procured less grain and offered a lower price) or relinquishes food monopoly and opens the market. Changes in procurement were communicated to the farmers, which in turn reduced China's food output and national food security in the following year. The alarm was then raised by the watchdog the National Statistical Bureau and the government had to reverse its price policy. This is demonstrated by a government food policies chronicle from 1979 to 2006.

5. Empirical Strategy and Results

5.1. Data description

Following the policy classification and changes in food production (see Table 4 in Section 4), we restrict our observations to 10 time series, five for grain production ($Y_t,\ L_t,\ K_t,\ F_t,\ T_t$),[20] four for fiscal conditions of the central government, and one for inflation. The time period chosen covers the years 1979 to 2006. The starting year marks the beginning of Deng Xiaoping's reforms. After 2006, China had undergone fully-fledged marketisation in the food sector.

Most data for this research come from *China's Statistical Yearbooks* and *Finance Yearbooks of China*. National statistics in post-Mao China are often regarded as biased, but they are biased consistently, nevertheless. Also, as the only official data for China, national statistics serve as a reasonable source of information regarding

[20] Five time series selected to analyse grain production in China includes: Y_t grain output; L_t number of employed persons in agriculture, forestry, animal husbandry, and fishery; K_t irrigated land area; F_t volume of effective component of chemical fertiliser used in agricultural production; T_t total power of agricultural tractors.

the challenges and concerns we want to examine faced by China's decision-makers. The data extracted from these yearbooks include (i) a set of change rates of grain inputs ($L_t,\ K_t,\ F_t,\ T_t$) and output (Y_t), as proxies of farmer's effort paid and China's food security, (ii) change rates of procurement fund as a percentage of central government expenditure (eG_t), and (iii) item details ($eP_t,\ eS_t,\ eR_t$) in central government expenditure on food market simulation and manipulation.[21] All are in real terms (deflated by CPI). Table 2 reports basic descriptive statistics for the main variables used in this research.

Table 2. *Summary statistics*

	Obs. (1)	Mean (2)	SD (3)	Min. (4)	Max. (5)
Panel (*a*): macro data					
Procurement fund-central government expenditure ratio (eG_t)	28	–1.206	18.286	–35.765	42.816
Grain output (Y_t)	28	1.896	5.146	–9.090	9.494
Panel (*b*): inputs and institutions					
Physical inputs					
Labour (L_t)	28	0.136	1.960	–4.210	3.130
Land (K_t)	28	0.778	1.285	–0.940	5.530
Fertiliser (F_t)	28	6.438	5.019	0.540	22.880
Machinery (T_t)	28	7.273	4.163	0.250	20.890
Food policies					
Procurement price (eP_t)	28	1.571	11.052	–14.200	31.190
Urban subsidy (eS_t)	28	20.170	75.173	–27.583	383.189
Government procurement fund (eR_t)	28	2.895	14.041	–14.960	46.240

Notes: This table reports summary statistics for key variables used in the empirical study. Panel (*a*) refers to macro data on government fiscal condition and food output in China and is used in the tests reported in table 3. Panel (*b*) refers to detailed physical inputs and food policies used in the regression reported in table 5 and figure 3.

[21] To avoid possibility of a false conclusion flowing from imperfect data, we use year-on-year change rates of original data to obtain less biased trend.

5.2. Causality between government expenditure and food production

Our premise is that in a transition from a centrally planned economy to a market one, China's reformist state needed a sizable budget to create quasi-market incentives for the peasantry to produce more as well as to warrant the urban population its basic needs. In this context, the government food procurement prices determined China's grain production for the subsequent year and hence China's food security. Meanwhile, the food price offered by government grain procurement was subject to the government fiscal capacity. A pairwise Granger-causality test indeed shows the interrelation between the central government fiscal burden of food security and the grain output, following the basic equations below:

$$\begin{pmatrix} eG_t \\ Y_t \end{pmatrix} = c + \begin{cases} \sum_{m=1}^{q} \alpha_{1m} eG_{t-m} + \sum_{m=1}^{q} \beta_{1m} Y_{t-m} + \varepsilon_{1t} \\ \sum_{m=1}^{q} \alpha_{2m} Y_{t-m} + \sum_{m=1}^{q} \beta_{2m} eG_{t-m} + \varepsilon_{2t} \end{cases} . \qquad (1)$$

Table 3 presents our results.

Table 3. *Causality between central government fiscal expenditure and grain output, 1979–2006*

	(1)	(2)	(3)
Panel (a): Unit root test			
Variables	Level (t-statistics)		
Y_t	–5.419 ***	–5.395 ***	–5.017 ***
	(0.193)	(0.200)	(0.187)
eG_t	–3.470 ***	–3.704 **	–3.513 ***
	(0.186)	(0.196)	(0.183)

Panel (*b*): Granger-causality test

Null hypothesis	Observations	*F*-statistics
eG_t *does not cause* Y_t	25	5.119***
Y_t *does not cause* eG_t		1.778

* = Significant at the 10 percent level.

** = Significant at the 5 percent level.

*** = Significant at the 1 percent level.

Notes: The method of unit root test used in panel (*a*) is the augmented Dickey-Fuller (ADF) test with all three model specifications column (1) with constant only, column (2) with constant and time trend, and column (3) with no constant or trend are included. The lag order is chosen based on the Schwarz Criterion (SC). Panel (*b*) reports the pairwise Granger-causality test results. Standard errors are reported in parentheses.

Our results of unit root test imply that year on year change rates are stationary (Table 3, Panel (a)); hence the Granger causality test for statistical significance of lagged level terms can be used. For our purpose, three lag length is chosen. The causality test results are reported in panel (b) of table 3 where the computed *F*-statistics show that sequential unidirectional causality is significant. The *p*-value shows whether the null hypothesis can be rejected. The result from eG_t to Y_t is significant. So, the Granger causality is unidirectional from the central fiscal burden to farmers' grain production for the next production cycle.

5.3. Policy transformations and farming performance

To test this interaction in food policies, we employ the unrestricted VAR model. Upon the policy changes shown in table 4, three new variables are added for regressions: (*i*) government rice procurement price index, (*ii*) urban subsidy index

for cotton and edible oil and grain, and (*iii*) government procurement fund index, all in real terms.[22] To do so, we establish the following equations of food production Y_t as a dependent variable for regression:

$$Y_t = c + \begin{cases} \sum_{m=1}^{q} \alpha_{1m} Y_{t-m} + \sum_{m=1}^{q} \beta_{1m} \boldsymbol{X}_{t-m}^{\boldsymbol{I}} + \varepsilon_{1t} \\ \sum_{m=1}^{q} \alpha_{2m} Y_{t-m} + \sum_{m=1}^{q} \beta_{2m} \boldsymbol{X}_{t-m}^{\boldsymbol{I}} + \sum_{m=1}^{q} \gamma_{2m} \boldsymbol{X}_{t-m}^{\boldsymbol{P}} + \varepsilon_{2t} \end{cases} \quad (2)$$

Where $\boldsymbol{X}_t^{\boldsymbol{I}}$, $\boldsymbol{X}_t^{\boldsymbol{P}}$ stand for inputs (L_t, K_t, F_t, T_t) and policy variables (eP_t, eS_t, eR_t) respectively; α_{km} denotes the coefficients of lagged term of dependent variables; β_{km} for the independent physical input variables and γ_{km} for independent policy variables. The VAR testing aims to see if government monopsony-related policies individually or jointly caused grain production to change in order to establish a link between farmers' producing behaviour seen from a change in physical inputs following the government policy swing.

In addition, we use the impulse-response analysis to identify the responsiveness of food production Y_t when a shock is introduced in the error term. This is noted as follows:

$$\mathrm{Y_t} = \mathrm{c} + \alpha_\mathrm{i} \mathrm{Y_{t-i}} + \theta_\mathrm{i} \mathrm{X_{t-i}} + \varepsilon_\mathrm{t} \quad (3)$$

Where $\boldsymbol{X}_t$ denotes both physical inputs and policy variables. Year-on-year change rates are used as estimators in the unrestricted VAR for variables. All of them are stationary at

[22] Unfortunately, the data for the grain bureau deficits are available only from 1998 to 2006. We omit the data and instead use grain procurement fund for the test.

levels $I(0)$ in unit root test (table 5).[23]

Table 5. *Unit root test*

	Y_t	L_t	K_t	F_t	T_t	eP_t	eS_t	eR_t
Model	–5.394***	–4.643***	–3.741**	–4.871***	–3.571*	–4.906***	–13.817***	–5.257***
(*i*)	(0.200)	(0.273)	(0.197)	(0.156)	(0.130)	(0.180)	(0.058)	(0.186)
Model	–5.015***	–2.373**	–2.827***	–2.788***	–2.602**	–5.180***	–15.776***	–5.460***
(*ii*)	(0.187)	(0.147)	(0.171)	(0.097)	(0.063)	(0.171)	(0.051)	(0.174)

* = Significant at the 10 percent level.

** = Significant at the 5 percent level.

*** = Significant at the 1 percent level.

Notes: We test two ADF models with (*i*) with constant and trend, and (*ii*) with no constant or trend in the model specification. The lag order is chosen based on the SC. Standard errors are reported in parentheses.

After minimising testing statistics,[24] two-lag length is used on each variable to secure the whiteness of residuals. To do so, we run the regression without policy variables first to test input-led output changes only. The results are reported in column 1 of table 6. After three policy variables are introduced, the fitness of regression R^2 increases from 0.52 to 0.86. It thus conforms that policy changes increased the significance of physical inputs (table 6 columns 2 and 4).[25]

[23] L_t has a unit root at level in the model with a constant, but is still stationary at level with a 99 per cent confidence interval for the other two models. We consider this variable stationary at level.

[24] Here we use Akaike information criterion (AIC).

[25] Intuitively, resource inputs such as fertilizer were insignificant for the long-run agricultural output. However, Fan Shenggen found that fertilizer was only an important input at early stages of China's reforms before 1985; see Fan, "Technological Change". Our testing result conforms this, i.e. when observations are extended to a longer period, the significance of fertilizer was critically reduced in grain production.

However, one of the health diagnostic checks on residual shows heteroskedasticity.[26] Weighted Least Squares (WLS) is used to address this problem (columns 4 and 5). The results are significant at the five per cent level or higher, derived either from the procurement price index (eP_t) or from the procurement fund (eR_t). Furthermore, we test the joint-causality of all three policy variables together. The results are significant at a 99 per cent level (columns 3 and 5).

With one to two years' lag length, most significant physical inputs are negative (Column 2). This is especially true for land input, taking values of –1.750 and –2.149 for one and two lag length, respectively. Labour and machinery inputs only significant with one lag length, implying these two variables have little impact on in the subsequent production cycle. In reality, China's agricultural technology is geared towards land-saving.

In addition, the VAR test reveals a long-term equilibrium between China's national grain output on the one hand and the government procurement price/fund in the preceding year on the other. Coefficient of procurement fund is positive, taking values of 0.804 and 1.241 for one and two year lag length, respectively. An increase in procurement fund causes an immediate increase in food output with almost an equal magnitude. Different from procurement fund, government procurement price shows us a negative sign. In reality, when procurement price increases, the government needs a larger budget to purchase the same amount of food for the urban sector. The higher price government provides, the more it spends on procurement, hence influence the procurement budget in the follow year. The negative sign of procurement price to food production implies the instability of procurement pricing

[26] Our model passed ARCH heteroskedasticity check but not Breusch-Pagan-Godfrey test. To make sure the power of regression, we use the WLS to further correct the heteroskedasticity.

policies of the government (e.g., the post-1985 slowdown). Although the variable for urban food subsidies (eS_t) is not individually significant in either the Ordinary Least Square (OLS) or the WLS tests, eP_t, eS_t and eR_t jointly influence the grain output in the future one to two years with an above-95 per cent level of significance.

Table 6. *Unrestricted VAR of grain output on inputs and policy variables, 1979–2006*

	OLS			WLS	
	(1)	(2)	(3)	(4)	(5)
Physical Input Variables					
Grain output (–1) (Y_{t-1})	–0.287	–1.215 ***		–1.215 ***	
	(0.285)	(0.317)		(0.186)	
Grain output (–2) (Y_{t-2})	0.124	–0.700		–0.700 **	
	(0.287)	(0.383)		(0.225)	
Labour (–1) (L_{t-1})	1.251	1.810 **		1.810 ***	
	(0.881)	(0.761)		(0.448)	
Labour (–2) (L_{t-2})	–0.254	–1.198		–1.198 **	
	(0.772)	(0.774)		(0.455)	
Land (–1) (K_{t-1})	–1.041	–1.750 **		–1.750 ***	
	(0.890)	(0.719)		(0.423)	
Land (–2) (K_{t-2})	–2.611 **	–2.149 **		–2.149 ***	
	(1.112)	(0.926)		(0.545)	
Fertiliser (–1) (F_{t-1})	0.286	0.262		0.262	
	(0.352)	(0.304)		(0.179)	
Fertiliser (–2) (F_{t-2})	–0.051	0.181		0.181	
	(0.320)	(0.273)		(0.161)	
Machine(–1) (T_{t-1})	–0.721	–1.214 *		–1.214 ***	
	(0.621)	(0.623)		(0.367)	
Machine (–2) (T_{t-2})	–0.239	–0.329		–0.329	
	(0.505)	(0.524)		(0.308)	
Policy Variables					
Procurement price (–1) (eP_{t-1})		–0.695 **	22.371***	–0.695 ***	64.629***
		(0.301)		(0.177)	
Procurement price (–2) (eP_{t-2})		–1.349 ***		–1.349 ***	
		(0.347)		(0.204)	
Urban subsidy (–1) (eS_{t-1})		0.007		0.007	
		(0.041)		(0.024)	
Urban subsidy (–2) (eS_{t-2})		–0.004		–0.004	
		(0.020)		(0.012)	
Government procurement fund (–1) (eR_{t-1})		0.804 **		0.804 ***	
		(0.275)		(0.162)	
Government procurement fund (–2) (eR_{t-2})		1.241 ***		1.241 ***	
		(0.317)		(0.186)	
Constant	9.949 **	13.424 **		13.424 ***	
	(4.570)	(4.930)		(2.901)	
Observations	26	26		26	
R^2	0.518	0.862		0.862	
Serial correlation [a]		0.893 [0.452]			

Heteroscedasticity [b]	0.228 [0.638]
Normality [c]	0.369 [0.832]
Stability [d]	Stable

* = Significant at the 10 percent level.

** = Significant at the 5 percent level.

*** = Significant at the 1 percent level.

Notes. [a] Breusch-Godfrey serial correlation LM test; [b] Auto-regressive conditional heteroscedasticity (ARCH) test; [c] Jacque-Bera normality test; [d] Cumulative sum of recursive residuals (CUSUM) test. Standard errors are reported in parentheses, while *p*-values are reported in square brackets.

Our impulse-responses' results demonstrate the findings in VAR regression from the view of each individual variable (figure 3). An increase in procurement fund causes an increase in food output in the follow year (response extent at 9.876, see lower right panel in Figure 3). The influence fades in five years (response extent at 1.119 in the fifth year, see lower left panel in Figure 3). By contrast, an increase in government's real procurement price does not necessarily cause food output increase in the subsequent years. Instead, when food expenditure approximates its peak and is forced to reduce, it shows effect of reducing food output by the minimum (taking value of –6.992) in the following year and quickly bouncing back to a positive maximum in the fourth year (taking value of 9.389) when procurement price policy stabilises. This conforms to the results of VAR tests. The unilateral changes in government grain procurement price and grain purchase fund caused long-run volatile fluctuations in food production. But response to changes in food subsidies was weak. Empirically, this result is reasonable since urban food subsidy was most effective from 1979 to 1993. In contrast to the regression result, food production returned quickly to equilibrium from shocks to non-policy variables, which indicates that China's agricultural technology was advanced enough to cope with shocks to physical inputs for food production. Compared with physical inputs, food production in China was more sensitive to policy changes.

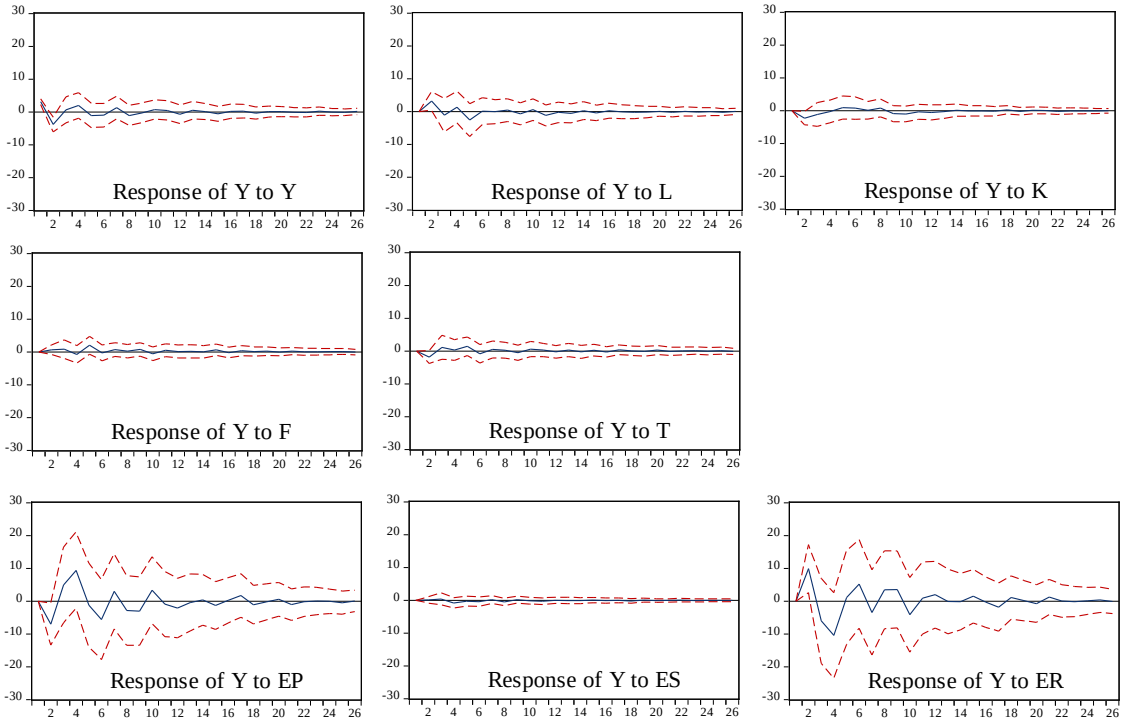

Figure 3. *Impulse responses in the production-inputs-policy VAR*

Note: *The shock corresponds to one standard deviation of the residual in each variable.*

In all, our empirical results are reasonable since all three new variables played a major part in government fiscal expenditure for grain procurement between 1979 and 2006. The largest component of urban subsidy – the grain coupons – was in place from 1979 to 1993. The Wald joint causality test and impulse-response empirical results also confirm food policy intensity in Table 4.

The food policy framework empirically tested above is further supported by evidence shown in Figure 4 where the policy trajectory shows (*i*) the 1979–88 procurement price data, (*ii*) the 1989–93 food subsidy data, (*iii*) the 1994–2003 rice budget data, and (*iv*) the 2004–06 price index data.[27] Considering the lag in the agricultural production cycle, we move the policy trajectory to the right. Changes in

[27] Data for government grain bureau deficits are available only for 1997 to 2003.

food production mirror the trend of food policy changes. This conforms to our findings of policy review in Section 2.

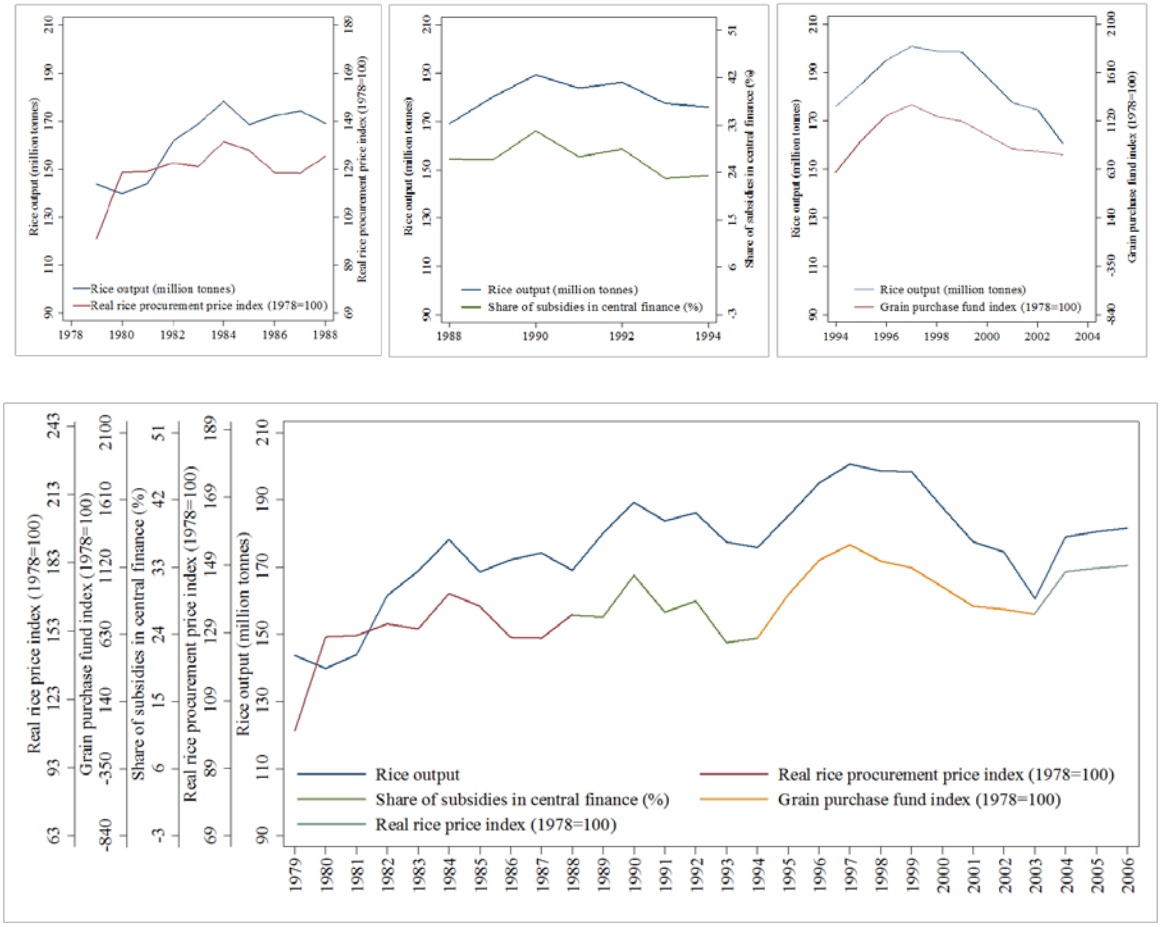

Figure 4. *Changes in policies and food security, 1979–2006*

Sources: *China Statistical Yearbook*, *Finance Yearbook of China*, *China Price Statistical Yearbook* and *China Agriculture Yearbook*.

Notes: *This figure plots the key changes in China's food policies and food production from 1979 to 2006. The upper curve plots the changes in rice production in China. The lower curves present policies changes which are estimated by procurement price, urban subsidy load, grain procurement fund, and grain market price sequentially. The procurement price indices used in this figure excludes the weight of the current year's CPI.*

What can be argued from the above empirical results is that output fluctuations in China's food production were a result of the government food policy swings that were ultimately determined by the "visible hand" of the reformist state that aimed to

guide the economy towards a simulated, price based market signal system. Eventually, the state trained the peasantry to read the price signals and at the same time weaned the urban consumers from generous food subsidies to allow them to face the market (see Figure 9). In the end the “visible hand” withdrew, as intended.

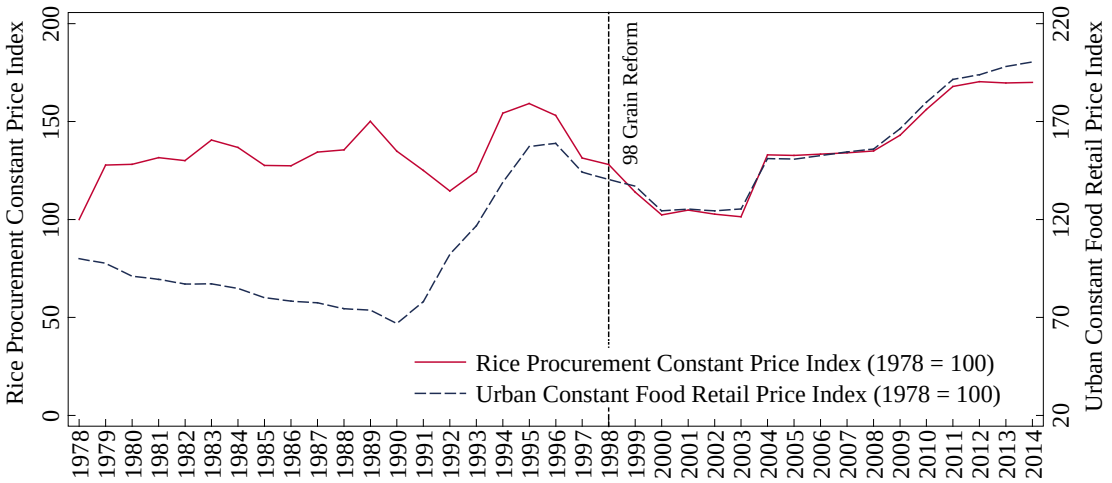

Figure 9. *Food price conversion in rebuilding food security*

Source: *Same as figure 2.*

Notes: *This figure plots the conversion between the grain procurement price and urban food retail price. Food prices diverged until 1990 and after 1998 it converged to the same trend. This figure also indicates the process that how China’s Gerschenkron state manipulated price signals for both rural and urban sector to meet the price gap between production and consumption.*

6. Conclusion

By establishing the causality from government fiscal capacity in Beijing to grain production in villages, this article reveals the mechanisms in which a reformist state acted as a proxy for the market by creating and sending the peasantry artificial price signals under a state monopsony on behalf of the demand side to generate food output from the supply side composed of more or less autonomous producers for a market.

In particular, China's Gerschenkronian policies aimed to re-establish the market economy for food after 1979. But there was no market economy yet. The Gerschenkronian prices (either government procurement prices for the rural sector or government subsidised prices for the urban sector) served as a learning process for the economy to get used to resource allocation in a non-planned economy; a step towards revival of the market that was eliminated by the state after 1949. The challenge to the reformist state was how to get food prices right so that enough food was produced by the peasantry during the first stage of the post-Mao reforms when a functional market was long absent due to the Soviet system adopted by Maoist China.

The Gerschenkronian price signals were received positively by the rural producers. High procurement prices encouraged food supply in the next food production cycle and hence improved China's food security. But a low food price suited the urban sector that lived on government subsidies. The result was dual prices for the same food. The price gap had to be bridged by government fiscal capacity.

This nurturing and tutoring of the market by the state was largely a process of trial and error which in turn determined inevitable frequent changes to get the food prices "right" (meaning that the food market clears itself). Operationally, the state food monopsony caused policy swings, sometimes on a massive scale. Meanwhile, the new price-responsive food outputs fluctuated accordingly, which sometimes threatened China's food security in the short run.

Even so, the purpose was clear: to strike a balance between government grain procurement for the rural producers and affordable food for urban residents. In the end, the Gerschenkron state did succeed in getting the prices right; China's agriculture was successfully marketised. This is shown in figure 9: After 1998, the

government procurement price for rice was the same as the market price; and the urban food retail price was practically identical with the market price for rice as well. The “reform mission” was accomplished.

Our findings also show that for China’s food production physical inputs were necessary but not the only sufficient factors. Institutions and policies played a significant role. This point differs from the traditional view on China’s post-reform agricultural performance. State intervention and monopsony helped government achieve reform goals, but the Gerschenkron state had to struggle with its fiscal limits. Even so, in the end, the state did get the price right for food on behalf of the market, an important deed that we should not underestimate or take for granted.

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