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Abstract

This article probes performance and mechanisms of the Maoist economy from 1950 to 1980, a period commonly regarded as a turning point that ushered in a bumpy but new path for China's new economic fortune, including industrialisation and modernisation. Mao and his government have often been regarded as a developer and moderniser for China. This study questions it.

To that end, the Maoist economy is re-conceptualised, re-examined, and re-assessed with qualitative and quantitative evidence including empirical modelling. The key findings suggest that the Maoist economy was a closed one with industrial dependence on agriculture in an urban-rural zero-sum. In the end, despite the official propaganda agriculture declined, industrial workforce stagnated, and the population was poor. This gloomy performance justified the post-Mao reforms and opening up, a game changer that put China on a very different trajectory of growth and development.

1. Introduction and motivations

The period of economic Maoism from 1950 to 1980 has been debated ever since Mao's death which ushered in Deng Xiaoping's path-breaking economic reforms,

partly because of the transitional nature of the economy and partly due to the opaqueness of the state activities.¹

1.1. Mao's actual priority after 1949

First of all, despite the positive light shed by many authors on Maoist economic performance,² overwhelming evidence indicates that Mao was a political and ideological guru who never allowed economic growth and development to be prioritised on his agenda. Rather, he devoted most of his time and energy “remoulding and purifying society” (*gaizao shehui*) with his internecine notion of “continuous revolution” (*jixu geming*),³ which turned out to be his lifetime *forte*. He thus ran a long list of political campaigns: (1) “1950–3 Suppression of Anti-revolutionaries” (*zhenfan, sufan*) under which 4.6 million accused and 710,000 executed;⁴ (2) “1951–2 Three-Anti and Five-Anti Movement” (*sanfan wufan*) that purged 1.2 million;⁵ (3) “1955 Purge of the Hu Feng Anti-Party Clique” (*hufeng*

¹ K. Deng, *China's Political Economy in Modern Times: Changes and Economic Consequences, 1800–2000* (London: Routledge Press, 2011), chs 9-10.

² As summarized neatly by Mark Selden as (1) a self-sufficient economy free from foreign control, (2) the elimination of capitalist exploitation and the creation of a highly egalitarian society, (3) the feeding of one billion people and the provision of basic welfare for all, (4) rapid industrialisation, (5) the solution to the peasantry problem of unemployment and social marginalization; see his “Mao Zedong and the Political Economy of Chinese Development,” *China Report*, 24/2 (1988), pp. 125-39. See also, S. Heilmann and E. J. Perry (eds), *Mao's Invisible Hand* (Cambridge [MA]: Harvard University East Asian Center, 2011).

³ Mao Zedong, “Gongzou Fangfa Liushi Tiao” (Sixty Methods of the Party Work), in Institute of Documents of the Chinese Communist Party Central Committee, ed., *Mao Zedong Wenji* (*Selected Works of Mao Zedong*) (Beijing: People's Press, 1999), p. 352.

⁴ Anon., Anon., *Mao Zedong Sixiang Wansui* (*Long Live Mao Zedong's Thought*) (Beijing: Peking University, August 1969, SOAS Library Copy), p. 15; Bai Xi, *Kaiguo Da Zhenfan* (*Sweeping Suppression of Anti-revolutionaries in the Early Days of the People's Republic*) (Beijing: Chinese Communist Party History Press, 2006), p. 494.

⁵ Allegedly against embezzlement, waste, and bureaucracy among officials; and against bribery of the government officials, tax evasion, stealing from the state, cutting corners in state-contracted works, and spying on state economic secret by the private sector. For the data, see Liao Luyan, “Guanyu Jieshu Wufan Yundong He Chuli Yiliu Wentide Baogao” (Report on the Ending of the

fandang jituan) which began his open oppression of the intelligentsia, affecting thousands of intellectuals;⁶ (4) “1957 Anti-Rightist Movement” (*fanyou*) that persecuted over 500,000 (or 10 percent) of the educated;⁷ (5) “1966–76 Great Proletarian Cultural Revolution” (*wuchan jieji wenhua dageming*), designed to wipe out modern education, persecuted over 100 million (10 percent of China’s total population of 1976). Inside Mao’s party, purges took place, including (1) “1959 Lushan Purge against the Party Right-Wingers” against Marshall Peng Dehai and his army comrades (*lushan huiyi*), (2) “1964 Four Cleansings” (*siqing*) against officials below the provincial level,⁸ (3) purges of Liu Shaoqi (in 1966), Lin Biao (in 1971), and Deng Xiaoping (in 1966 and 1975) during the Cultural Revolution.⁹ To accommodate victims of the purges, the Soviet Gulag camp was

Five-Anti Movement and Its Residual Issues), 17th October, 1952 (Beijing: Central Archives); An Ziwen, “Guanyu Jieshu Sanfan Yundong He Chuli Yiliu Wentide Baogao” (Report on the Ending of the Three-Anti Movement and Its Residual Issues), 18th October, 1952 (Beijing: Central Archives).

⁶ “1955 Hu Feng Pure” was a total fabrication from start to finish, a sinister dry run for much wider purges. It was the first time when the Maoist secret police practised their muscles. It set up the model for the following purges. It victimised 2,100 well-educated intellectuals of whom majority were communist party members and communist supporter. None had their freedom back until 1980 (if they were still alive). See Li Hui, *Hu Feng Jituan Yuan-a Shimo (A History of the Fabrication of the “Hu Feng Clique”)* (Wuhan: Hubei People’s Press, 2003); Sheng Guofan, *Wo Suo Qinlide Hu Feng An, Faguan Wang Wenzheng Koushu (My Personal Experience of the Hu Feng Clique, Memoir of Judge Wang Wenzheng)* (Beijing: Chinese Communist Party History Press, 2007).

⁷ Official figures, see Cong Jin, *Quzhe Fazhande Suiyue (Period of Tortuous Development)* (Zhengzhou: Henan People’s Press, 1989), p. 61; see also Li Rui, *Li Rui Tan Mao Zedong (Li Rui’s Memoir on Mao Zedong)* (Hong Kong: Time International Publishing Co., 2005), p. 2. See also Di Ren and Mai Dao, *Mao Zedong He Tade Junshi Gaoacan (Mao Zedong and His Military Aide)* (Beijing: Red Flag Press, 1993), p. 132.

⁸ Li, *Memoir on Mao*, pp. 147–8.

⁹ See Central Liaison Department of the Chinese Communist Party (ed.), *Dangnei Shici Luxian Douzheng Ziliao (Materials of Ten Two-Line Struggles within the Chinese Communist Party)* (Beijing: The Central Liaison Ministry of the Chinese Communist Party, 1972). Noted, Gao Gang was seen by Mao as a treat because Gao’s close link with Stalin; see Zhang Hua and Su Caiqing (eds), *Huizhou Wedge, Zhongguo Simian Wedge Benxi Yu Fans (Recollection of the Decade of Cultural Revolution, Analyses and Soul-Researching)* (Beijing: Chinese Communist Party History

copied.¹⁰ The only years in which no new political crusade was launched were 1958, 1960-63, and 1965, or 1 percent of Mao's active rule (1949-76).

Moreover, victims of Mao's campaigns, often the best-educated minds and prime-aged workers in society, totalled 105.2 million; and over half (60 million) were assumed dead,¹¹ including 40 million during the notorious Great Leap Famine when Mao decided to push for an iron-and-steel take-off.¹² Such multitudes suggested inevitable human cost, economic cost, opportunity cost, as well as negative externalities to the China's national economy. In the case of the Cultural Revolution, it was announced in 1978 by Premier Hua Guofeng (1921–2008) that “From 1974 to 1976, due to the Gang of Four's activities, we lost 100 billion *yuan* in industrial GDP, 28 million tons of steel, 40 billion *yuan* worth fiscal revenue. Our entire economy was on the brink of collapse.”¹³ It has been

Press, 2000), vol. 2, p. 605.

¹⁰ For a case called “The Narrow Valley” (*Jiabian Gou*) in the Gobi Desert in remote Gansu, see survivors' accounts: He Fengming, *Jingli – Wode 1957 Nian (The Year 1957 When A Disaster Struck on Me)* (Lanzhou: Dunhuang Literature and Art Press, 2001); Yang Xianhui, *Jiabian Gou Jishi (Diary in the Narrow Valley)* (Shanghai: Shanghai Literature and Art Press, 2003).

¹¹ Estimates, see Li, *Memoir on Mao*, p. 2; Hu Ping, “Ping Mao Zedong Re” (The “Mao Zedong Fever”), in Song, ed., *Cultural Revolution*, vol. 2, p. 951. See also Jung Chang and Jon Halliday, *Mao, the Unknown Story* (London: Vintage Books, 2005), p. 3.

¹² Jasper Becker, *Hungry Ghost, China's Secret Famine* (London: John Murray, 1996), ch. 18; Jin Hui, “Sannian Ziyanzaihai Beiwanglu” (Memorandum on the Alleged Three Years of Natural Disasters, 1959–62), *Shehui (Society)* 4–5 (1993), pp. 13–22; J. K. Kung and J. Y. Lin, “The Causes of China's Great Leap Famine, 1959–1961,” *Economic Development and Cultural Change*, 51/2 (2003), pp. 51–73; Cao Shuji, *Da Jihuang, 1959–1961 Niande Zhongguo Renkou (Great Famine and China's Population in 1959–1961)* (Hong Kong: Times International Publishing Co., 2005). By far, the best works have been (1) Yang Jisheng's *Mubei – Zhongguo Liushi Niandai Dajihuang Jishi (Gravestone for the Great Leap Famine Victims, Evidence from History)* (Hong Kong: Tiandi Books, 2008), and (2) F. Dikötter, *Mao's Great Famine: The History of China's Most Devastating Catastrophe, 1958-62* (London: Bloomsbury, 2010).

¹³ Hua Guofeng, “Tuanjie Qilai, Wei Jianshe Shehuizhuyide Xiandaihua Qianguo Er Fendou” (United to Build a Socialist Modern Power), *Renmin Ribao (People's Daily)*, 27th February, 1978, p. 1.

agreed that the Cultural Revolution cost China 800 billion *yuan*,¹⁴ equivalent to China's total state-owned capital stock in 1979.¹⁵ Ironically, such damages were written in Mao's own playbook, "I achieve a total control over society (*tianxia dazhi*) after making a total pandemonium (*tianxia daluan*). I do this every seven to eight years."¹⁶ The end result? According to John Pomfret, an American exchange student in China who travelled extensively in the country in the early 1980s when China just re-opened to the outside world, "China was as close as I could imagine to living on another planet. Though it had some of the elements of modern life, ... [it was] a nuclear-armed power whose people lived in unheated hovels."¹⁷ Thus, the notion of "Mao being pro-growth" is still subject to debate today.¹⁸

After Mao's mismanagement of the political life and economy was unveiled after his death, the Chinese official line for assessing Mao has however been a wishy-washy 30-70 split, meaning that overall speaking Mao was/did 70 percent right politically and economically.¹⁹ As a result, in Mainland China there has been an orchestrated narrative that praises Mao's rule typically in term of accumulations

¹⁴ Jiang Yuanming, *Wangshi 1966 Xiezhen (Memory of 1966)* (Tianjin: Hundred-Flower Art Press, 1998), p. 3.

¹⁵ For China's 1953 GDP, see National Bureau of Statistics, *Zhongguo Tongji Nianjian, 2002 (China's Statistical Year Book, 2002)* (Beijing: China's Statistics Press, 2002), p. 51. For the state assets, see Xi Xuan and Jin Chunming, *Wenhua Dagemin Jianshi (A Short History of the Great Cultural Revolution)* (Beijing: Central Party History Press, 1996), pp. 349, 352.

¹⁶ Mao Zedong, "Gei Jian Qingde Xin, 1966 Nian 7 Yue 8 Ri" (A Letter to Wife Jiang Qing on 8th July 1966), in Anon., *Zhonghua Renmin Gongheguo Chunqiu Shilu (Records of Changes of the People's Republic of China)* (Beijing: The People's University Press, 1992), p. 691.

¹⁷ J. Pomfret, *Chinese Lessons* (New York: Henry Holt, 2007), p. 13.

¹⁸ K. Deng, *Mapping China's Growth and Development in the Long Run, 221 BC to 2020* (London: World Scientific Press and Imperial College Press), ch. 7.

¹⁹ E.g. H. Schmidt-Glintzer, "70 per cent good, 30 per cent bad, China has found a simple formula to assess Mao Zedong's Legacy," *The Politics of Memory*, 10.08.2017, online *vide*: <https://www.ips-journal.eu/in-focus/the-politics-of-memory/70-per-cent-good-30-per-cent-bad-2216/>, available on 2nd August 2022.

of capital (physical and human), construction of infrastructure and ambition for industrialisation/modernization.²⁰ Horrendous damage inflicted by Maoism were either downsized, vindicated or overlooked altogether with a few exceptions.²¹ Such an attitude has been infectious beyond China's borders. Many in the West have favoured advantages possessed by central planning for "speedy changes" under Mao's rule, be it total output (GDP), or economic structure, or mass education, or gender equality, and so forth.²²

²⁰ E.g. Dong Zhikai, *Xinzhonghua Gongye Jingjishi, 1958-1965 (An Economic History of Industry of New China, 1958-1965)* (Beijing: Economic Management Press, 1995); Liu Zhongli, *Dianji – Xinzhongguo Jingji 50 Nian (Laying the Foundation – 50 Years of the Economy of New China)* (Beijing: China's Financial Economics Press, 1999); Dong Zhikai and Wu Li, *Zhonghua Renmin Gongheguo Jingjishi, 1953-1957 (An Economic History of the People's Republic of China, 1953-1957)* (Beijing: Social Science Literature Press, 2011); Zheng Yougui, *Zhonghua Renmin Gongheguo Jingjishi, 1949-2019 (An Economic History of the People's Republic of China, 1949-2019)* (Beijing: Contemporary China Press, 2019).

²¹ Yang, *Gravestone*. For early works that opened the discussion, see B. K. Ashton, H. A. Piazza and R. Zeitz, "Famine in China, 1958-61," *Population and Development Review*, 10/4 (1984), pp. 613-45; T. P. Bernstein, "Stalinism, Famine and Chinese Peasants: Grain Procurements during the Great Leap Forward," *Theory and Society*, 13/3 (1984), pp. 339-77.

²² A string of early samples includes D. Perkins, *Market Control and Planning in Communist China* (Cambridge [MA]: Harvard University Press, 1966); A. Eckstein, W. Galenson, and T. Liu (eds), *Economic Trends in Communist China* (Chicago: Aldine Pub. Co, 1968); N-R. Chen and W. Galenson, *The Chinese Economy under Communism* (Chicago: Aldine Press, 1969); E. L. Wheelwright and B. McFarlane, *The Chinese Road to Socialism* (New York: Monthly Review Press, 1970); C. Hoffmann, "The Maoist Economic Model," *Journal of Economic Issues*, 3/5 (1971), pp. 12-27; J. Gray, "Mao Tse-Tung's Strategy for Collectivization of Chinese Agriculture: An Important Phase in the Development of Maoism," in E. De Kadt and G. Williams (eds), *Sociology and Development* (London: Tavistock Press, 1974), pp. 39-108; A. Eckstein, *Chinese Economic Revolution* (Cambridge: Cambridge University Press, 1977); T. G. Rawski, *Economic Growth and Employment in China* (London: Oxford University Press); Chu-yuan Cheng, *China's Economic Development, Growth and Structural Change* (London: Routledge Press, 1982); N. Lardy, *Agriculture in China's Modern Economic Development* (New York: Cambridge University Press, 1983); R. Bideleaux, *Communism and Development* (London: Methuen, 1985); V. Bodrova and R. Anker, *Working Women in Socialist Countries* (Geneva: International Labour Office, 1985); C. Bramall, "Inequality, Land Reform and Agricultural Growth in China, 1952-55," *Journal of Peasant Studies*, 27/3 (2000), pp. 30-54; B. Naughton, *The Chinese Economy, Transitions and Growth* (Cambridge [MA]: MIT Press, 2006), ch. 3; Y. Y. Kueh, *China's New Industrialization Strategy: Was Chairman Mao Really Necessary?* (Cheltenham: Edward Elgar, 2008), ch. 2.

1.2. Official self-contradiction

Once the priority of Mao's rule has been identified, it makes a good propaganda sense why Mao's regime needed window-dressing China's economic growth and development as the state policy primacy. *Prime facie*, China seems to have become heavily industrialised, as the industrial GDP share appeared to be unusually high by international standards for a developing economy (see Table 1). One may take the face value of the argument for the time being.

Table 1. Sectoral Shares Compared, % in Total

Case	A	B	C	D
China, 1978	16.0	28.4*	48.6*	23.0*
Japan, 1920s	18.0	15.0	20.0	65.0
India, 1960s	17.3	44.0	22.0	34.0
3rd World, 1993†	-	17.0	28.0	55.0

Sources: R. K. Ray, *Industrialization in India: Growth and Conflict in the Private Corporate Sector, 1914-47* (Oxford: Oxford University Press, 1979), p. 17; D. Lal, *The Hindu Equilibrium, Cultural Stability and Economic Stagnation* (Oxford: Clarendon, 1988), vol. 1, pp. 126-7; D. Rothermund, *An Economic History of India, from Pre-Colonial Times to 1991* (London: Routledge, 1993), p. 177; P. R. Gregory, *Before Command: An Economic History of Russia from Emancipation to the First Five-Year Plan* (Princeton: Princeton University Press, 1994), pp. 28, 30; Li Jingwen, "Lun Woguo Chanye Jiegoude Biandong Qushi" (Trend of Structural Change in China's Economy), *Xinhua Wenzhai (Xinhua Compilation)*, 12 (1995), pp. 46-8; Zhang Zhuoyuan, "Zhongguo Jingji Tizhi Gaigede Zongti Huigu Yu Zhanwang" (Review and Speculation of the Reform of China's Economic System), *Xinhua Wenzhai (Xinhua Compilation)*, 7 (1998), pp. 48-50; Xinhua News Agency, *People's Republic of China Yearbook, 1996/97* (Hong Kong: NCN Ltd., 1997), p. 397; National Bureau of Statistics, *Zhongguo Tongji Nianjian, 1983 (China's Statistic Yearbook, 1983)* (Beijing: Economy Press, 1983), p. 24. C. D. Harris, "The Urban and Industrial Transformation of Japan," *Geographical Review*, 72/1 (1982), pp. 50-89; J. Colmer, "Urbanisation, Growth, and Development: Evidence from India," online *vide*: <https://urbanisation.econ.ox.ac.uk/materials/papers/24/urbanisationindia.pdf>, available on 1st December 2020.

Note: *Official figure. †Global average. A = Urbanisation rate, B = Agricultural GDP. C = Industrial GDP, D = Services GDP.

Moreover, available official figures also show that Mao's engine of growth was heavy industry (Table 2). It is also commonly claimed that the initial push came

from Stalin's Soviet Union.²³ So far, the Maoist economy seems to have embarked on a structural change (changes in GDP shares), driven by heavy industry, neatly fitted in with the destiny of modernity. One may take the face value for the time being, too.

Table 2. Period Capital Investment, % in Total, 1953-75

Period	A	B	A/B
1953-7	36	7	5.1
1958-62	54	7	7.7
1963-5	46	4	11.5
1966-70	51	4	12.8
1971-5	50	6	8.3
Average	47	6	7.8

Source: Based on Lan Xia, “1957-1976 Nian Woguo Jingji Jilei Yu Fenpei Zhuangkuang” (Capital Accumulation and Distribution in the Chinese Economy, 1957-1976), *Chengdu Daxue Xuebao (Bulletin of Chengdu University)*, 1 (2000), pp. 21-3.

Note: A = Heavy industry, B = Light industry.

However, other categories for economic growth and development seem to disagree a corollary that the rest of the Maoist economy moved towards industrialisation and modernisation. We begin first of all with capital accumulation and re-investment. Allegedly, achievements displayed in Tables 1 and 2 were powered by the super-human ability of the government in capital accumulation and re-investment: It was claimed that under Mao's rule the earmarked amount by the state to re-invest was mandatorily a quarter of China's annual GDP with an investment-to-GDP yielding ratio of 1:1 (after 1957).²⁴

However, after each round of re-investment China's GDP would increase a

²³ H. Y. Li, *Mao and the Economic Stalinization of China, 1948-1* (New York: Rowman & Littlefield, 2006).

²⁴ Ministry of Finance, *Zhongguo Caizheng Nianjian, 1997 (China's Financial Yearbook, 1997)* (Beijing: China's Finance Magazine Press, 1997), p. 479; National Bureau of Statistics, *Zhongguo Tongji Nianjian, 2002 (China's Statistical Yearbook, 2002)* (Beijing: China's Statistics Press, 2002), p. 51.

quarter, *ceteris paribus*. Hypothetically, therefore, China's capital stock would have grown *pro rata* 264.7 times from 1952 to 1977 from its humble start with 24.1 billion *yuan* to a total of 6,379.3 billion *yuan* (1952 constant price).²⁵ In 1978, however, the registered state-owned fixed capital assets were 448.2 billion *yuan* (constant price),²⁶ or merely 7 percent of the expected total. The official explanation was capital waste: "A high rate of accumulation and large-scale capital construction alone cannot bring about sustained fast growth and good economic result."²⁷ Capital waste does explain to a great extent a stagnant industrial workforce. But the same capital waste will throw China's fast industrialisation story out of the window.

Secondly, China's employment structure based on simple arithmetic headcount also challenges China's fast industrialisation story. Table 3 shows industrial workforce falling behind the country's population increase. This demographic pattern (an annual deficit of -0.27%) basically means that China's economy was in a process of "deindustrialisation," as disproportionately more people were employed in the non-industrial sectors, mainly farming.

²⁵ National Bureau of Statistics, *Statistical Yearbook, 2002*, p. 51.

²⁶ Ministry of Finance, *Financial Yearbook, 1997*, p. 479.

²⁷ Yu Guangyuan (ed.), *China's Socialist Modernization* (Beijing: Foreign Language Press, 1984), p. 458.

Table 3. Stagnation of Industrial Workforce, Persons x 10⁶, 1959-74

Year	Total population (A)	Industrial workers (B)	B/A (%)
1959	672.1	45.5	6.8
1964	705.0	36.4	5.2
1969	806.7	40.9	5.1
1974	908.6	59.1	6.5
Annual %	2.03	1.76	-
Annual deficit (B-A)	-	-0.27	-

Sources: Data for the industrial workforce are based National Bureau of Statistics, *Zhongguo Laodong Tongji Nianjian, 1998 (China's Labour Statistic Yearbook, 1998)* (Beijing: China's Statistics Press, 1998), p. 81. Data for China's population are based on National Bureau of Statistics, *Zhongguo Tongji Nianjian, 1986 (China's Statistic Yearbook, 1986)* (Beijing: China's Statistics Press, 1986), p. 91.

Thirdly, stagnation of industrial workforce finds a perfect match with the rural dominance in China's employment structure with which a rapid industrialisation was at best in a dormant form (Table 4).

Table 4. Employment Shares, % in Total Population

Case	All sectors	Agriculture	Non-agriculture
China, 1978	100	71	29
Japan, 1872	100	72	28
Russia, 1914	100	75	25
India, 1901	100	65	35

Sources: Li Jingwen, “Lun Woguo Chanye Jiegoude Biandong Qushi” (Trend of Structural Change in China’s Economy), *Xinhua Wenzhai (Xinhua Compilation)*, 12 (1995), pp. 46-8; Zhang Zhuoyuan, “Zhongguo Jingji Tizhi Gaigede Zongti Huigu Yu Zhanwang” (Review and Speculation of the Reform of China’s Economic System), *Xinhua Wenzhai (Xinhua Compilation)*, 7 (1998), pp. 48-50; N. Charlesworth, Neil, *British Rule and the Indian Economy* (London: MacMillan, 1982), p. 20; A. Feuerwerker, “The State and the Economy in Late Imperial China,” *Theory and Society*, 13/3 (1984), pp. 299, 302, 312-13; K. Chao, *Man and Land in Chinese History: An Economic Analysis* (Stanford: Stanford University Press, 1986), ch. 3; R. Minami, *The Economic Development of Japan* (London: MacMillan, 1986), p. 24; S. G. Wheatcroft, R. W. Davies and J. M. Cooper, “Soviet Industrialization Reconsidered: Some Preliminary Conclusions about Economic Development between 1926 and 1941,” *Economic History Review*, 39/2 (1986), p. 273; P. Maitra, *Indian Economic Development. Population Growth and Technical Change* (New Delhi: Ashish, 1991), pp. 101, 132; P. Francks, *Japanese Economic Development, Theory and Practice* (London: Routledge, 1992), p. 29; R. W. Davies, M. Harrison and S. G. Wheatcroft, *The Economic Transformation of the Soviet Union, 1913-1945* (Cambridge: Cambridge University Press, 1994), p. 112; P. R. Gregory, *Before Command: An Economic History of Russia from Emancipation to the First Five-Year Plan* (Princeton: Princeton University Press Gregory, 1994), pp. 21, 42.

Moreover, if the data in Tables 3 and 4 are reliable and believable, with a 16-18 percent urban share in the total population, a country’s industrial GDP is most likely to be around 20 percent of its total GDP (see again Table 1). One has no reason to believe that Mao’s China should be an exception. Thus, the official numbers for China’s industrial GDP are likely to be inflated.

1.3. Hidden engine of growth under Mao’s rule

This study hypothesizes an agricultural-industrial dichotomy for a closed economy. A hint comes from a zero-sum between capital investment and economic austerity (Table 5).

Table 5. New Capital Investment vs Economic Austerity

Year	New capital GDP%	Ind ex I	Consumption GDP%	Index II	I/II
1952	21.4	100	78.6	100	1.0
1955	22.9	107	77.1	98	1.1
1958	33.9	158	66.1	84	1.9
1961	19.2	90	80.8	103	0.9
1964	22.2	104	77.8	99	1.1
1967	21.3	99	78.7	100	1.0
1970	32.9	154	67.1	85	1.8
1973	32.9	154	67.1	85	1.8
1976	30.9	144	69.1	88	1.6
Average	26.4	123	73.6	74	1.3

Source: Based on V. D. Lippit, *The Economic Development of China* (New York: M.E. Sharpe, 1987), p. 155.

Note: Over 80 percent consumers were made of the rural population.

Such economic austerity is highly visible in Mao's *pro patria* rural food-rationing which in turn determined rural wages (which had little to do with marginal product of labour or labour productivity in Mao's China). The official guideline in the mid-1950s for annual *per capita* ration for a rural adult was set at 180 kilograms for North China (360 *jin*, if in wheat, millet, maize, and sorghum) and 200 kilograms for South China (400 *jin*, if in rice). After milling and husking, this is a subsistence level of food intake. The following is a breakdown for South China as the upper bound:²⁸

Age	Raw grain in kg/head/year
2–5	60
6–10	90
11–15	190
15+	210–40

²⁸ E. Croll, *The Family Rice Bowl, Food and the Domestic Economy in China* (Geneva: UNRISD, 1983), p. 80.

These quantities were in raw grain. Weight loss of 20 (wheat) to 30 (rice) percent to milling and husking is normal.²⁹ In real terms, an adult peasant received 140 kilograms (rice) to 144 kilograms (wheat) *per annum*. This ration provided the recipient with merely 1,300 calories per day, about a half of energy needed to maintain an adult male. This amount qualifies a famine diet by any standard.

But Mao's economic austerity to save up resources needed to find an outlet. The outlet was industry. The vital link was the "scissors-prising differentials" which inflated industrial outputs and at the same time discounted farming products, a *repertoire* policy copied from the Soviet Union.³⁰ From the early 1950s onwards most agricultural products, as many as 230 items (or just about everything the peasantry produced), were controlled by state monopsony for scissors-prising.³¹ The state also monopolised industry outputs to make a complete circuit. In short, the state acted as the single dealer between sectors.³²

There is no systematic information of this rip-off practice presumably due to its socio-political sensitiveness. Even so, one can to piece together fragmented facts. Table 6 shows how a zero-sum game was played between industry and agriculture.

²⁹ Gao Wangling, *Zhongguo Nongmin Fanxingwei Diaocha (Investigation into a Quiet Rebellion of the Chinese Peasantry against Maoism)* (Beijing: Central Party History Press, 2006), p. 5.

³⁰ A. N. Malafeev, *Istoriia Tsenoobrazovaniia v SSSR (The History of Price Formation in the USSR)* (Moscow: Mysl, 1964), p. 286; P. R. Gregory and R. C. Stuart, *Soviet and Post-Soviet Economic Structure and Performance* (New York: HarperCollins, 1994), p. 62.

³¹ Ling Zhijun, *Lishi Buzi Paihuai (History, No More Hesitation)* (Beijing: People's Press, 1997), p. 137.

³² In the West, the only place where a similar game can perpetuate is a prison where a prison shop has a monopolistic power over the captured population behind bars.

Table 6. A Glance at China's Scissors-Pricing, 1950-56

Year	Industrial goods	Food stuff	Price ratio
1950	100	100	1.00
1952	110	90	1.22
1954	123	78	1.58
1956	125	77	1.62
Annual average%	4.6	-5.4	-

Source: National Price Commission, *Wujia Tongji Ziliao Jianbian (Price Statistics)* (Beijing: People's Press, 1964), p. 21.

It was documented that Mao's state compulsorily purchased private-owned domestic animals like pigs half the market price from rural households.³³ The same rule applied to the grain stock, as stated in a State Council decree in 1965 that "Currently, prices for grain and cooking oil at rural fairs are 120 percent and 90 percent higher than the state procurement prices, respectively."³⁴ This policy continued until the end of the 1970s: It was officially announced by China's People Congress in December 1978 that "In order to reduce the price differentials between industrial and agricultural products, this congress has requested the State Council to issue a decree to increase the state procurement prices for targeted grain quotas by 20 percent in the 1979 summer season and to increase another 50 percent in price thereafter. ... The wholesale and retail prices of agricultural machinery, chemical fertilizers, agricultural chemicals, and agricultural plastics should be reduced by 10 to 15 percent in 1979 and 1980."³⁵

³³ Yuan Xiaolun, "Jibuzeshide Yuedu Jiyi" (Readings during the Cultural Revolution), *Yanhuang Chunqiu (History of Chinese)* 11 (2008), pp. 68-9.

³⁴ Anon., *Zhonggong Zhongyang Guowuyuan Guanyu Tiaozheng Dangqian Shichang Wujiade Jueding* (Decree of the Chinese Communist Party Central Committee and the State Council on Re-adjustment of Current Market Prices, 1965), online *vide*: http://news.xinhuanet.com/ziliao/2005-02/02/content_2539275.htm, available on 20th September 2020.

³⁵ Anon., "Zhongguo Gongchandang Dishiyijie Zhongyangweiyuanhui Disanci Quanti Huiyi Gongbao" (Communiqué on the Third Plenary Meeting of the Eleventh Central Committee of Chinese Communist Party), *Renmin Ribao (People's Daily)*, 24th December, 1978, p. 1.

Based on such limited information, the compounded extra price for the peasantry to pay can be calculated as 115 percent.³⁶ Incidentally, in Stalin's Soviet Union, peasants had to pay 75-200 percent above the market prices for industrial goods and services.³⁷ China's scissors-pricing arbitrage ended only after Mao died.³⁸

Consequently, both economic austerity and scissors-pricing effectively removed incentives for the peasantry to produce. China's once productive agricultural sector was in a steady decline, leading to nation-wide food deficits. North China went under first and South China followed (Table 7).³⁹

Table 7. Food Surpluses and Deficits, x 10⁴ Tons, 1953-78

Period	South China	North China	China's total
1953-5	+688.5	+204.3	+892.8
1956-60	+1950.5	-472.0	+1478.5
1961-5	+669.5	-2013.5	-1344.0
1966-70	+942.0	-796.5	+145.5
1971-5	+952.5	-1159.0	-206.5
1976-8	-22.8	-1106.4	-1129.2

Source: Rural Economy Institute, Ministry of Agriculture (ed.), *Dangdai Zhongguo Nongye Biange Yu Fazhan Yanjiu (A Study of Agricultural Reforms and Development in Contemporary China)* (Beijing: China's Agriculture Press, 1998), p. 251.

Note: Positive values = food surpluses; negative values = exports due to food deficits.

³⁶ A simple formula is $P_{ext} = (1 - 1/0.5p_{gr}) + 0.15 p_{gi}$, where P_{ext} is extra price; p_{gr} , government rural price mark-down; p_{gi} , government industrial price mark-up.

³⁷ Malafeev, *History of Price Formation*, p. 286; Gregory and Stuart, *Structure and Performance*, p. 62.

³⁸ K. Deng and J. Du, "To Get the Prices Right for Food: The State versus the Market in Reforming China, 1979-2006," *European Review of Economic History* 21/3 (2017), pp. 302-25.

³⁹ M. Elvin, *The Pattern of the Chinese Past* (Stanford: Stanford University Press, 1973); D. H. Perkins, *Agricultural Development in China, 1368-1968* (Edinburgh: Edinburgh University Press, 1969); S. R. Dittrich, and R. H. Myers, "Resource Allocation in Traditional Agriculture," *Journal of Political Economy*, 79/4 (1971), pp. 887-96; B. Li, *Agricultural Development in Jiangnan, 1620-1850* (London: Macmillan, 1998); K. Pomeranz, *The Great Divergence* (Princeton: Princeton University Press, 2000), Pt 1.

Inevitably, China's agricultural GDP declined (Table 8), something that ironically suited the government agenda rather well to boost China's nominal industrial GDP share.

Table 8. Decline in Agricultural Output Value, in Billion Yuan, 1957-77

Year	Current price	Index	1950 price*	Index
1957	53.7	100	48.1	100
1977	80.7	150	28.7	60
Nominal annual %	2.0		-2.6	
Net annual %¶	-0.6		-5.2	

Source: National Bureau of Statistics, *Zhongguo Nianjian (China's Statistic Yearbook, 1985)* (Beijing: Economy Press, 1986), p. 239.

Note: * Conversion is based on China's average inflation rate of 2.01 percent per year from 1950 to 1978; see Li Jingwen, "Zhongguo Jingji Tizhi Zhuanxing Guochengzhongde Hongguan Tiaokong" (Macro Control in the Process of Switching China's Economic System), *Xinhua Wenzhai (Xinhua Compilation)*, 4 (1997), pp. 49-50. ¶ Net value is obtained by discounting China's population growth at 2.6 percent per year under Mao's rule, see He Bochuan, "2000 Nian Zhongguo Mubiao Xitongde 20 Ge Cuiruodian" (Twenty Weak Points in China's Targets for the Year 2000), *Xinhua Wenzhai (Xinhua Compilation)*, 5 (1994), p. 7.

After our step-by-step detective work, it becomes clear that savings made from inflated industrial outputs and discounted farming products functioned as the headwaters of China's closed economy under Mao's rule. Thus, the hidden engine of growth was the humble agricultural sector.

By now, one legitimately doubts the *idée fixe* of a perfect harmony between "progressiveness" "self-reliance" (*zili gengsheng*, literally meaning "making life go-forever by own efforts") and "balanced growth" under Mao's sleeves.⁴⁰ To

⁴⁰ S. Paine, "Balanced Development: Maoist Conception and Chinese Practice," *World Development*, 4/4 (1976), pp. 277-304; N. Lardy, *Economic Growth and Distribution in China* (Cambridge: Cambridge University Press, 1978); Y. Y. Kueh, "Mao and Agriculture in China's Industrialization," *China Quarterly*, no. 187 (2006), pp. 700-23.

some extent the Maoist economy may be qualified for “progressiveness” and “self-reliance,”⁴¹ but not for a “balanced growth.”⁴²

1.4. Theoretic inkling

Despite the official line, this study avoids the use of the Soviet Union as *the* benchmark for China because Maoist planning was far cruder because of China’s extensive agricultural sector (that accommodated over 80 percent of China’s total population until 1980) whose traditional technology and *force majeure* climatic conditions were largely not plannable by a political centre.

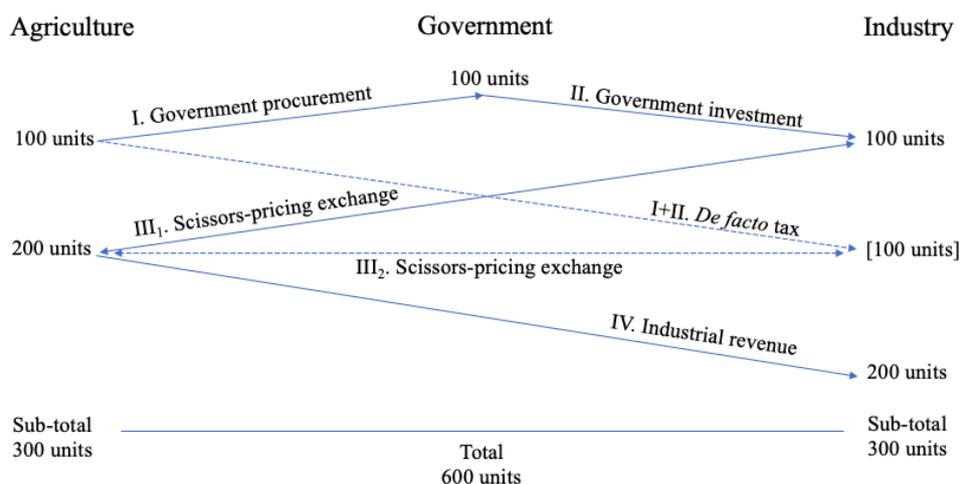
An economic system that matches well the Maoist model in which the industrial sector rides on agriculture is the *Tableau Économique* of François Quesnay (1694-1774) associated with the French classical economic thought of physiocracy for a closed economy, and hence the “Quesnay-Mao model” (Figure 1).⁴³

⁴¹ See F. Wemheuer, *A Social History of Maoist China, Conflict and Change, 1949-1976* (Cambridge: Cambridge University Press, 2019).

⁴² Although the achievability of a planned “balance growth” with millions of demand-supply equations all settled in a Walrasian general equilibrium has been seriously doubted; see e.g. M. Ellman, *Planning Problems in the USSR* (Cambridge: Cambridge University Press, 1973); J. Wilhelm, “Does the Soviet Union Have a Planned Economy?” *Soviet Studies*, 31/2 (1979), pp. 268-74; M. Bornstein (ed.), *The Soviet Economy* (New York: Routledge Press, 1981), chs 1-3; D. K. Bose, “Market and Plan in Soviet Union,” *Economic and Political Weekly*, 24/2 (1989), pp. 95-99; M. N. Rothbard, “The End of Socialism and the Calculation Debate Revisited,” *Review of Austrian Economics*, 5/2 (1991), pp. 51-76.

⁴³ E.g. R. L. Meek, *The Economic of Physiocracy* (London: Allen & Unwin, 1963), Pt. 3. Noted, Quesnay’s system accommodates the role of the state and limited industrial growth, see R. V. Eagly, “A Physiocratic Model of Dynamic Equilibrium,” *Journal of Political Economy*, 77/1 (1969), pp. 66-84; and A. L. Muller, “Quesnay’s Theory of Growth: A Comment,” *Oxford Economic Papers*, New Series, 30/1 (1978), pp. 150-6.

Figure 1. Stylised the Quesnay-Mao Closed Economy



Note: (1) Solid arrows = real flows in the economy; broken arrows = simplified flows. Thus, Arrows I and II can be simplified by I+II. *De facto tax*; Arrows III₂ serves the same purpose of Arrows III₁. (2) Quesnay's original zigzag flows are based on equal exchanges, a principle which was not observed by Mao's model due to price manipulation in both state monopsony procurement (Arrow I) and rural-urban scissors-pricing (Arrows III₁)

This study divides Quesnay-Mao's economy into three sectors with zigzag links with which much of industrial growth comes from agriculture. However, there is a fundamental difference between Quesnay and Mao: The former explained an economy *ex post* with an idealised attitude; and the latter remoulded a living economy *ex ante* by sheer force.

The present task is essentially to measure the Quesnay-Mao zigzag links. The remaining article is made of three parts: mathematical conceptualisation, empirical modelling, and final conclusions.

2. Mathematical conceptualisation of the Quesnay-Mao economy

Now, in line with Barany and Siegel as well as Quesnay's physiocracy,⁴⁴ we develop a general equilibrium to capture the Quesnay-Mao interplay between the agricultural and industrial sectors in China's economy.

2.1. Production function of the Quesnay-Mao economy

To suppose that the Quesnay-Mao closed economy runs two sectors - the agricultural sector (R) and the industrial sector (M), a Cobb-Douglas production function can be established as follows:

$$Y_i = A_i(N_i)^\alpha(K_i)^\beta \quad (1)$$

Where $i = R, M$; $\alpha + \beta = 1$ (α and β being respectively the output elasticities for labour and capital). Then, the per capita capital stock in agricultural and industrial sectors can be denoted as:

$$k_i = \frac{K_i}{N_i} \quad (2)$$

Plugging (2) into (1), keeping $\alpha + \beta = 1$, we obtain:

$$Y_i = A_i(k_i)^\beta N_i \quad (3)$$

Denoting $V_i = A_i(k_i)^\beta$ Formula (3) becomes:

$$Y_i = V_i N_i \quad (4)$$

⁴⁴ Z. L. Bárány and C. Siegel, "Job Polarization and Structural Change," *American Economic Journal: Macroeconomics*, 10/1 (2018), pp. 57-89.

To denote the artificial rural-urban scissors-pricing between agricultural and industrial sectors as P_i , the wage level of the two sectors is decided by the following equation:

$$W_i = \frac{P_i Y_i}{N_i} = V_i P_i \quad (5)$$

2.2. Consumption austerity as the headwaters for the Quesnay-Mao closed model

To suppose that household consumption is made of the utility of both agricultural and industrial sectors, the household maximizes its consumption utility function with the CES form as follows:

$$\underbrace{Max}_{C_R, C_M} U = [\gamma_R C_R^{\frac{\rho-1}{\rho}} + \gamma_M C_M^{\frac{\rho-1}{\rho}}]^{\frac{\rho}{\rho-1}} \quad (6)$$

s.t

$$P_R C_R + P_M C_M \leq m \quad (7)$$

$$W_R N_R + W_M N_M = m \quad (8)$$

Where $C_R \geq 0$, $C_M \geq 0$; γ_R and γ_M respectively stand for agricultural and industrial consumption shares; $\rho < 1$ which represents the constant elasticity of substitution between the two sectors.

In Formulae (7) and (8), P_R , P_M , C_R and C_M are price level and consumption levels of agricultural and industrial sectors. W_R , W_M , and N_R N_M are wage and employment levels of the two sectors, respectively; m is the aggregate wage level of all households in the economy. Now, the constrained optimization problem set by (6), (7) and (8) can be solved as follows:

$$\frac{C_R}{C_M} = \left(\frac{P_{RYM}}{P_{MYR}} \right)^{-\rho} \quad (9)$$

In addition, an important assumption required to be made here is that the total factor productivity is negative, meaning that the rural-urban scissors-pricing mechanism causes technological stagnation in the rural sector. Hence,

Assumption 1: $A_R < 0$

This suggests a real danger of a down-spiral, “low-level equilibrium trap” for the Quesnay-Mao zero-sum model if the agricultural sector declines (see Tables 7 and 8).⁴⁵

2.3. Solution to the Quesnay-Mao closed economy

It is assumed that the aggregate output of the economy is Y , the proportional outputs (R) of agricultural and industrial sectors can be respectively written as:

$$R_r = \frac{Y_R}{Y} \quad (10)$$

$$R_m = \frac{Y_M}{Y} \quad (11)$$

Based on (10) and (11), output proportion dynamics of the agricultural sector over the industrial sector can be established as:

$$\frac{R_r}{R_m} = \frac{Y_R}{Y_M} = \frac{A_R(N_R)^\alpha(K_R)^\beta}{A_M(N_M)^\alpha(K_M)^\beta} \quad (12)$$

⁴⁵ For negative TFP under Mao’s rule, see L. Brandt and T. G. Rawski, *China’s Great Economic Transformation* (Cambridge: Cambridge University Press, 2008), ch. 20.

Rearranging Formula 12 to get:

$$Y_M = \frac{Y_R A_M (N_M)^\alpha (K_M)^\beta}{A_R (N_R)^\alpha (K_R)^\beta} \quad (13)$$

And,

$$K_m = \left[\frac{Y_M A_R (N_R)^\alpha (K_R)^\beta}{Y_R A_M (N_M)^\alpha} \right]^{\frac{1}{\beta}} \quad (14)$$

Based on Formulae 13 and 14, capital accumulation for industrial growth is determined by the output of agricultural sector, hence:

$$\frac{\partial K_m}{\partial Y_R} = -\frac{1}{\beta} (Y_R)^{-\left(\frac{1}{\beta}+1\right)} \left[\frac{Y_M A_R (N_R)^\alpha (K_R)^\beta}{A_M (N_M)^\alpha} \right]^{\frac{1}{\beta}} > 0$$

Proposition 1. In a Quesnay-Mao closed model, industry is agriculture-dependent whereby a change in agricultural output induces a corresponding change in the same direction in industrial capital investment.

3. Empirical modelling

In this section, empirical modelling is conducted with multiple linear regressions to test the zigzag flows in the Quesnay-Mao zero-sum economy of China.

3.1. Data

Our data come from available official data published mainly by China's Statistics Press and China's Social Sciences Press. Our chosen period is from 1950 to 1980 which covers the whole era of Maoism until China's "reforms and opening-up" (*gaige kaifang*). Table 9 lists our sources in detail.

Table 9. Data Sources

Type	Source
Industrial investment	(1) <i>Statistics for China's Fixed Asset Investment, 1950-1985</i> , p. 43; (2) <i>Statistical Yearbook of the China's Investment in Fixed Assets, 1950-1995</i> , p. 102.
Agricultural output	(3) <i>China's Statistical Yearbook, 1984</i> , pp. 141-8; (4) <i>China's Statistical Yearbook, 1987</i> , p. 43.
Rural food rationing	(4)' <i>China's Statistical Yearbook, 1987</i> , p. 89; (5) <i>China's Population and Employment Statistical Yearbook, 2020</i> , p. 8.
Agricultural export	(6) <i>Fifty Years of New China, 1949-1999</i> , p. 567; (7) <i>China Statistical Yearbook, 1981</i> , p. 354.
Scissors-pricing	(8) <i>Comprehensive Statistical Data for Fifty Years of New China, 1949-1998</i> , p. 21.
GDP	(9) <i>China Statistical Yearbook, 2001</i> , p. 49.

Sources: (1) National Bureau of Statistics, *Zongguo Guding Zichan Tongji Ziliao, 1950-1985* (*Statistics for China's Fixed Asset Investment, 1950-1985*) (Beijing: China's Statistics Press, 1987); (2) Liu Xiangcheng (ed.), *Zhongguo Guding Zichan Touzi Nianjian* (*Statistical Yearbook of the China's Investment in Fixed Assets, 1950-1995*) (Beijing: China's Statistics Press, 1997); (3) National Bureau of Statistics, *Zhongguo Tongji Nianjian, 1984* (*China's Statistical Yearbook, 1984*) (Beijing: China's Statistics Press, 1984); (4) and (4)' National Bureau of Statistics, *Zhongguo Tongji Nianjian, 1987* (*China's Statistical Yearbook, 1987*) (Beijing: China's Statistics Press, 1987); (5) National Bureau of Statistics, *Zhongguo Renko He Jiuye Tongji Nianjian, 2020* (*China's Population and Employment Statistical Yearbook, 2020*) (Beijing: China's Statistics Press, 2020); (6) Liu Hong, Shao Zongming, Lu Chunheng, Zhai Ligong, He Keng and Qiu Xiaohua (eds) *Xin Zhongguo Wushinian, 1949-1999* (*Fifty Years of New China, 1949-1999*) (Beijing: China's Statistics Press, 1999); (7) National Bureau of Statistics, *Zhongguo Tongji Nianjian, 1981* (*China's Statistical Yearbook, 1981*) (Beijing: China's Statistics Press, 1981); (8) National Bureau of Statistics, *Xin Zhongguo Wushinian Tongji Ziliao Huibian, 1949-1998* (*Comprehensive Statistical Data for Fifty Years of New China, 1949-1998*) (Beijing: China's Statistics Press, 1999); (9) National Bureau of Statistics, *Zhongguo Tongji Nianjian, 2001* (*China's Statistical Yearbook, 2001*) (Beijing: China's Statistics Press, 2001).

Note: Of all variables, “industrial investment,” “agricultural output,” “agricultural export,” and “GDP” come directly from the yearbooks.

Four variables need defining: (1) Total investments in industry is taken as a proxy for the dependent variable of industrial growth. (2) rural consumption, an independent variable, is measured by *rural food rationing* based on quantities permitted by the Maoist government according to genders and ages to enforce artificial rural austerity.⁴⁶ Since available data are only for censused years, for robustness we use the end-period value for missing data in-between censused years.⁴⁷ (3) Disasters, another independent variable, are designed as a dummy to reflect farming conditions.⁴⁸ Value 1 is for severe annual precipitation anomaly (including floods and droughts); otherwise, the value is 0.⁴⁹ (4) The price ratio between the wholesale purchasing price index of farm products and the rural retail price index of industrial products is used as a proxy for scissors-pricing, again an independent variable.⁵⁰ Table 10 contains a summary of statistics.

⁴⁶ To be specific, food rationing of each group = the proportion of an age group in population \times food rationing per head of the same age group. Due to limited data, we divide the total population into a children's group (aged 0-15 years) and an adult group (aged 16 and over).

⁴⁷ If the adult share in China's total population were 60.26% (1950), 59.30% (1953) and 58.34% (1956), for the data-missing years, we fill 1951 and 1952 with 59.30%, and 1954 and 1955 with 58.34%.

⁴⁸ See relevant discussions in Z. Wang, P. Zhai, and H. Zhang, "Variation of Drought over Northern China during 1950–2000," *Journal of Geographical Sciences*, 13/4 (2003), pp. 480–7; and M. Yu, Q. Li, M. J. Hayes, M. D. Svoboda, and R. R. Heim, "Are Droughts Becoming More Frequent or Severe in China Based on the Standardized Precipitation Evapotranspiration Index: 1951–2010?" *International Journal of Climatology*, 34/3 (2014), pp. 545–58. The precipitation anomaly data are collected from P. Zhai, X. Zhang, H. Wan, and X. Pan, "Trends in Total Precipitation and Frequency of Daily Precipitation Extremes over China," *Journal of Climate*, 18/7 (2005), pp. 1096–1108.

⁴⁹ Specifically, the disaster variable equals 1 if the *normalized annual precipitation anomaly* (percentage) is over 7.9 percentage points (Quartile 4), which includes 5 flood years (1953, 1954, 1959, 1964, 1973) and 2 drought years (1965, 1978).

⁵⁰ See J. Y. Lin, and M. Yu, "The Political Economy of Price Scissors in China: Theoretical Model and Empirical Evidence," *Economic Research Journal*, 1 (2009), pp. 42–56.

Table 10. Summary Statistics

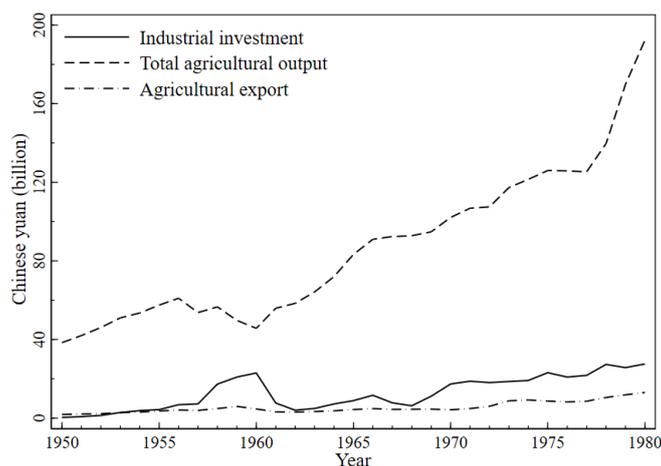
Type	N	Mean	Standard deviation
Total industrial investment (billion <i>yuan</i>)	31	12.79	8.61
[Heavy industrial investment (billion <i>yuan</i>)	31	11.38	7.60]*
[Light industrial investment (billion <i>yuan</i>)	31	1.38	1.14]*
Cotton output (billion kg)	31	1.78	0.59
Oilseed output (billion kg)	31	3.96	1.21
Rural food rationing (billion kg)	31	109.02	18.87
Agricultural export (billion <i>yuan</i>)	31	5.46	2.94
GDP (billion <i>yuan</i>)	31	189.03	105.60
Scissors-pricing†	31	1.62	0.37
Purchasing price index of farming products†	31	182.16	41.31
Retail price index of industrial products†	31	112.62	5.40

Sources: See Table 9.

Note: * To be used later. †All price indexes used in our empirical analyses are in a constant price of 1950.

Our preliminary observations are demonstrated in Figures 2 in which agriculture takes the lead between the two sectors.

Figure 2. A General Pattern: Agriculture vs Industry

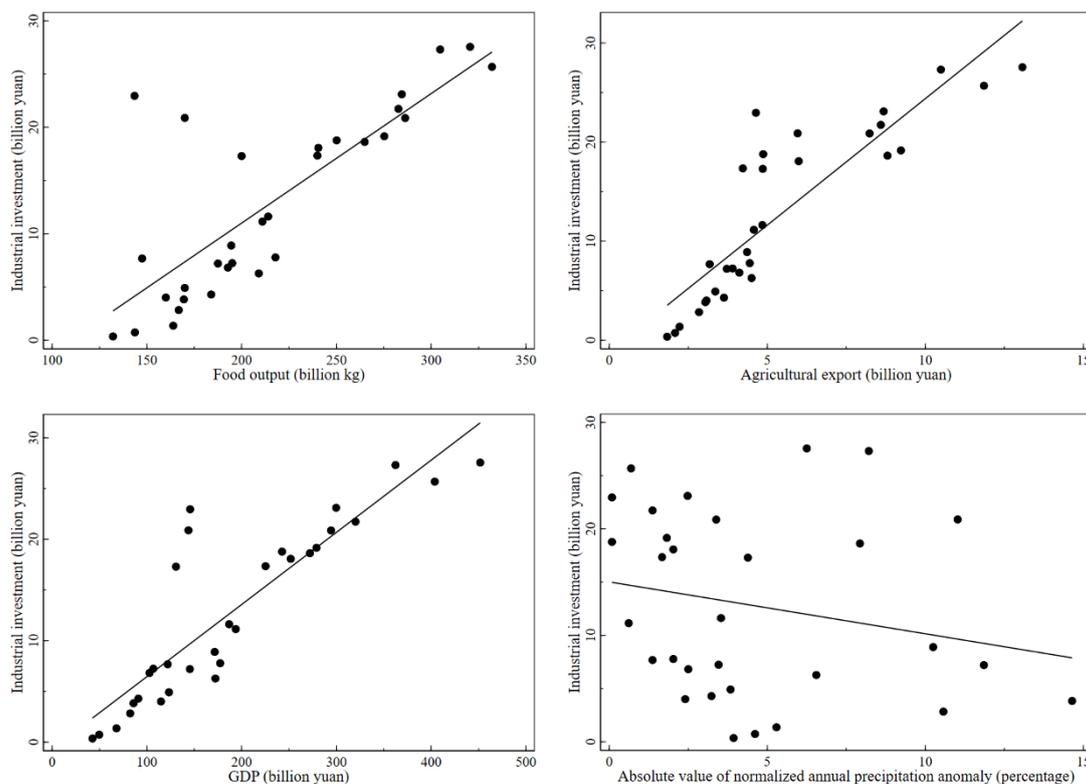


Sources: See Table 9.

Figure 2 contains scatter plots with fitted lines, suggesting a positive linear relationship between industrial investment and food output, agricultural export

and GDP, and a negative linear relationship between industrial investment and natural disasters. Such observations warrant further regression analyses.

Figure 3. Linear Relationships between Various Factors and Industrial Investment



Sources: See Table 9.

3.2. Model specification

To take the advantage of the works by Kitchens, Graddy, and de Zwart *et al.*,⁵¹ we specify a multiple log-linear regression model with OLS as follows:

⁵¹ C. Kitchens, “A Dam Problem: TVA’s Fight Against Malaria, 1926–1951,” *The Journal of Economic History*, 73/3 (2013), pp. 694–724; Graddy, Kathryn, “Taste Endures! The Rankings of Roger de Piles and Three Centuries of Art Prices,” *Journal of Economic History*, 73/3 (2013), pp. 766–91; P. de Zwart, D. Gallardo-Albarrán, and A. Rijpma, “The Demographic Effects of Colonialism: Forced Labor and Mortality in Java, 1834–1879,” *Journal of Economic History*, 82/1 (2022), pp. 211–49.

$$\ln(\text{Industrial investment}_t) = \beta_0 + \beta_1 \ln(\text{Food output}_t) + \beta_2 \ln(\text{Rural food rationing}_t) + \beta_3 \ln(\text{Agricultural export}_t) + \beta_4 \ln(\text{GDP}_t) + \beta_5 \text{Scissors-pricing}_t + \beta_6 \text{Disasters}_t + \text{Great Leap Famine}_t + \varepsilon_t \quad (15)$$

Where *industrial investment* (the dependent variable) uses the logarithm value for the year t . The independent variables are, in the logarithm values, *food output*, *rural food rationing*, *agricultural export*, *GDP*, *scissors-pricing*, *disasters* (a dummy for natural shocks), and *Great Leap Famine* (a dummy for political shocks).⁵² Item ε_t is the random error term.

3.3. Baseline results

Table 11 contains baseline results of Formula 15. Column by column, more independent variables are added.

⁵² In Figure 2, the Great Leap Forward (1958–1962) caused an abnormal increase in industrial investment at the expense of agricultural output and hence the Great Leap Famine. We include the famine as additional control variable, which equals 1 if the year is between 1959 and 1961, otherwise 0.

Table 11. Baseline Results

Independent variable	Dependent variable: $\ln(\text{Total industrial investment})$					
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(\text{Food output})$	4.014*** (0.498)	5.486*** (1.811)	3.738 (2.366)	1.799 (1.172)	1.224 (0.803)	1.038 (0.743)
$\ln(\text{Rural food rationing})$		-2.241 (2.301)	-2.243 (2.219)	-6.002*** (1.415)	-4.817*** (0.983)	-5.121*** (0.885)
$\ln(\text{Agricultural export})$			0.848 (0.748)	0.275 (0.503)	0.171 (0.282)	0.298 (0.283)
$\ln(\text{GDP})$				2.327*** (0.298)	3.310*** (0.314)	3.442*** (0.271)
<i>Scissors-pricing</i>					-1.732*** (0.179)	-1.879*** (0.176)
<i>Disasters</i>						-0.197** (0.090)
Great Leap Famine Observations	Yes 31	Yes 31	Yes 31	Yes 31	Yes 31	Yes 31
R^2						0.977
<i>Adjusted R</i> ²	0.798	0.801	0.807	0.919	0.965	0.970
<i>F</i> test						194.94
Prob > <i>F</i>						0.0000
Durbin-Watson test						1.504

Sources: See Table 9.

Note: (1) Robust standard errors are in paratheses. (2) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Column (1) shows that food output has significant influence on industrial capital accumulation (and hence industrial growth): one percentage point increase of food output would result in 4.014 percentage point increase in total industrial investment. In other words, 2.15 billion kg increase of food output is equivalent to 0.13 billion *yuan* industrial investments.⁵³

⁵³ Noted here, food output is no longer significant. This may be reasonable because grain output cannot always easily and directly be turned into industrial capital. The government either

Column (2) confirms that rural food rationing is negatively correlated to industrial growth, which suggests that food was persistently extracted from the rural household consumption baskets and shipped out to finance urban workers' wages. One percentage point increase in food at rural dinner tables would reduce Mao's industrial investment by 2.2 percent, which represents a ducton leverage. However, on the current stage the influence of rural food rationing is insignificant a situation that changes later.

Column (3) adds agricultural export on as an independent variable, as Mao's regime exported food to earn hard currencies and import industrial equipment. Agricultural export is positively correlated to industrial investment although one percentage point increase in agricultural export would bring about only 0.8 percentage point increase in industrial investment; and the influence of this variable on industrial investment is insignificant. Even so, with a value between 0.171 and 0.848, food export would deserve a place in Mao's economic system.⁵⁴

Column (4) agrees that GDP growth is both significant and positively correlated to industrial investment. But, as a predictor, GDP's influence is not as strong as agricultural output, not to mention the large standard deviation for GDP (see Table 10) This should be regarded as a characteristic of Maoism.

Column (5) shows that scissors-pricing is also significant but negatively correlated to the dependent variable. One percentage point increase in scissors-

exports food for foreign exchange and imported equipment, or extracts funds from peasants (e.g. taxes and scissors-pricing) to finance investment in industry. Therefore, adding agricultural export variable and scissors-pricing decreases the influence of food outputs.

⁵⁴ These results may be reasonable because during the sample period, the average of agricultural export was only 5.46 billion yuan, or 2.8% of the total GDP (189.03 billion yuan). This suggests a thin margin of agricultural surplus left after the main extraction. Even so, agricultural export still contributes positively to industrial investment.

pricing index (thus industrial goods becoming more expensive) would generate 1.7 percentage point growth in industrial investment.

Column (6) indicates that disasters are significant and negatively correlated to industrial investment: a severe precipitation anomaly would reduce industrial investment 19.7 percentage points.⁵⁵

Finally, our coefficient determinant *Adjusted R²* reaches 0.970 (Column 6) indicating that 97% of the variance of the outcome of industrial investment can be explained by our regression model. Moreover, our *R²* value (0.977) is very close to *Adjusted R²* (0.970), indicating that the explanatory power of the model is not brought about by the added independent variables.⁵⁶ Meanwhile, our F test (129.94) rejects the null hypothesis that all the regression coefficients are equal to zero. And the Durbin-Watson test (1.504) indicates no autocorrelation in residuals.⁵⁷

3.4. Robustness

To assume that heavy industry was the main beneficiary of Maoist investment strategy,⁵⁸ We rerun the regression with the logarithm values of investments in

⁵⁵ We now replace the dummy variable with the logarithm of normalized annual precipitation anomaly. It turns out that one percentage point increase of normalized annual precipitation anomaly would reduce the total industrial investment by 0.07 percentage point, which is less weighty than Table 11.

⁵⁶ Noted, our high *r* (0.988), *R²* and *Adjusted R²* are as good as empirical analyses achieved in natural sciences.

⁵⁷ The VIF test is 15.16 (greater than 10) in our preferred estimation, which indicates multicollinearity in our regression. However, given the limited observations available, it indicates that multicollinearity concern may be quite limited. A high VIF may be a result of a certain correlation between food output and other independent variables. After the logarithm of food output is removed, the VIF test is 9.90 (now less than 10), implying that there is no multicollinearity problem anymore.

⁵⁸ On average, light industry only accounts for around 10 percent of the total industrial

heavy and light industries, respectively. Shown in Table 12, as expected, a balance overwhelmingly tilts towards heavy industry, as military-*cum*-heavy industry received special attention of the Maoist state.⁵⁹ Influence of predictors on light industry is often weaker and insignificant.

Table 12. Additional Results

Independent variable	Dependent variable: $\ln(\text{Industrial investments of two types})^\dagger$		
	(1) Baseline	(2) Heavy industry	(3) Light industry
$\ln(\text{Food output})$	1.038 (0.743)	0.768 (0.779)	1.400 (2.018)
$\ln(\text{Rural food rationing})$	-5.121*** (0.885)	-5.142*** (0.864)	-1.169 (4.219)
$\ln(\text{Agricultural export})$	0.298 (0.283)	0.244 (0.283)	0.127 (0.774)
$\ln(\text{GDP})$	3.442*** (0.271)	3.684*** (0.271)	1.688*** (0.554)
<i>Scissors-pricing</i>	-1.879*** (0.176)	-1.982*** (0.187)	-0.727 (0.811)
<i>Disasters</i>	-0.197** (0.090)	-0.211** (0.086)	0.179 (0.358)
Great Leap Famine	Yes	Yes	Yes
Observations	31	31	31
<i>Adjusted R</i> ²	0.970	0.972	0.672

Sources: See Table 9.

Note: (1) Robust standard errors are in paratheses. (2) *** p<0.01, ** p<0.05, * p<0.1. † See Table 10.

investment (1.38/12.79, see Table 10).

⁵⁹ E.g. T-T. Hsueh and T-O. Woo, “The Political Economy of the Heavy Industry Sector in the People's Republic of China,” *The China Journal*, 15/1 (1986), pp. 57-82; E. A. Feigenbaum, “Soldiers, Weapons and Chinese Development Strategy: The Mao Era Military in China's Economic and Institutional Debate,” *China Quarterly*, v. 158 (1999), pp. 285-313; C. F. Meyskens, *Mao's Third Front, the Militarization of Cold War China* (Cambridge: Cambridge University Press, 2020).

Moreover, in *circa* 1980, the engine of China's industrial growth was switched from agriculture to the market in post-Mao "reforms and opening-up."⁶⁰ To reflect this ideological and policy shift, we run a placebo test for the period of 1981 to 2000 with Formula 15. Now, the influence of predictors becomes insignificant which in turn implies that our theoretical model holds for the period until China operated a new system different from Maoism (Table 13).

⁶⁰ E.g. D. W. Chang, *China Under Deng Xiaoping: Political and Economic Reform* (New York: Palgrave Macmillan, 1988); B. Naughton, "Deng Xiaoping: The Economist," *China Quarterly*, vol. 135 (1993), pp. 491-514; M. Y. Kau and S. H. Marsh, *China in the Era of Deng Xiaoping* (New York: Routledge, 1993); C. Tisdell, "Economic Reform and Openness in China: China's Development Policies in the Last 30 Years," *Economic Analysis and Policy*, 39/2 (2009), pp. 271-94; M. Dillon, *Deng Xiaoping: The Man who Made Modern China* (London: I. B. Tauris, 2015).

Table 13. Placebo Test

Independent variable	Dependent variable: $\ln(\text{Total Industrial investment})$	
	(1) Baseline	(2) 1981-2000
$\ln(\text{Food output})$	1.038 (0.743)	-0.009 (0.227)
$\ln(\text{Rural food rationing})$	-5.121*** (0.885)	0.798 (0.836)
$\ln(\text{Agricultural export})$	0.298 (0.283)	0.060 (0.114)
$\ln(\text{GDP})$	3.442*** (0.271)	0.961*** (0.094)
<i>Scissors-pricing</i>	-1.879*** (0.176)	0.082 (0.047)
<i>Disasters</i>	-0.197** (0.090)	0.044 (0.026)
Great Leap Famine	Yes	No
Observations	31	20
<i>Adjusted R²</i>	0.970	0.998

Note: (1) Robust standard errors are in paratheses. (2) *** p<0.01, ** p<0.05, * p<0.1.

Admitted, statistics for Mao's China are very limited. Scholars may doubt the suitability of independent variables used in this study. To safeguard our approach, replacing some independent variables with other measures, we rerun Formula 15. The results are presented in Table 14.

Table 14. Alternative Measures

Dependent variable: $\ln(\text{Total Industrial investment})$						
Independent variable	Baseline	Alternative measures				
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(\text{Food output})$	1.038 (0.743)	0.910 (0.645)	0.666 (0.794)	0.941 (0.847)	1.467* (0.734)	1.174 (0.788)
$\ln(\text{Rural food rationing})$	-5.121*** (0.885)			-5.009*** (1.009)	-4.829*** (1.032)	-5.183*** (0.951)
$\ln(\text{Rural age groups})$		-4.907*** (0.690)				
$\ln(\text{Rural population})$			-5.601*** (0.965)			
$\ln(\text{Agricultural export})$	0.298 (0.283)	0.045 (0.247)	0.212 (0.287)	0.288 (0.291)	0.154 (0.257)	0.372 (0.319)
$\ln(\text{GDP})$	3.442*** (0.271)	3.754*** (0.259)	3.826*** (0.313)	3.423*** (0.373)	3.198*** (0.336)	3.196*** (0.306)
<i>Scissors-pricing</i>	-1.879*** (0.176)	-1.933*** (0.167)	-1.977*** (0.194)		-1.718*** (0.178)	-1.678*** (0.210)
<i>Monopsony price index of farming products</i>				-0.017*** (0.001)		
<i>Rural retail price index of industrial products</i>				0.025*** (0.008)		
<i>Disasters</i>	-0.197** (0.090)	-0.187** (0.075)	-0.207** (0.090)	-0.195** (0.090)	-0.134* (0.075)	
$\ln(\text{Normalized annual precipitation anomaly})$						-0.070** (0.026)
Great Leap Famine	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31	31	31	31	31	31
<i>Adjusted R</i> ²	0.970	0.977	0.970	0.970	0.967	0.969

Sources: See Table 9.

Note: (1) Robust standard errors are in paratheses. (2) *** p<0.01, ** p<0.05, * p<0.1.

Column (2) uses alternative value for “rural age groups” to eliminate possible bias between censused years. Column (3) substitutes rural food rationing with “rural population” proxying rural food consumption. Column (4) disentangles

“scissors-pricing” and uses “monopsony price index of farming products” and “rural retail price index of industrial products.” Apart from their weaker influences, monopsony price index and rural retail price index remain significant.⁶¹ Column (5) redefines the disaster dummy variable with area-averaged annual precipitation.⁶² And, Column (6) uses the logarithm of normalized annual precipitation anomaly as a disaster proxy. The alternative results are by and large compatible with the baseline, which further supports our analytical design.

Moreover, as the Great Leap Famine was not the only negative shock to China’s economy, two other major shocks are introduced as dummies - the Korean War and the Cultural Revolution⁶³ - and the regression is again rerun. The results in Table 15 are consistent with the baseline, indicating that political shocks did not change the way the Quesnay-Mao economy behaved.

⁶¹ Even so, it becomes clear that the influence of “monopsony price index of farming products” moves in the opposite direction of “rural retail price index of industrial products.” The former is negatively correlated to industrial investment; and the latter supports it.

⁶² Previously, the disaster dummy equals 1 if the *normalized annual precipitation anomaly* (percentage land hit by disasters) is over 7.9 percentage points (Quartile 4), which includes 5 flood years (1953, 1954, 1959, 1964, 1973) and 2 drought years (1965, 1978). For robustness, we now define the disaster dummy as 1 if the *area-averaged annual precipitation anomaly* (mm) is over 43 millimeters (Quartile 4). This approach includes 11 flood years (1951, 1952, 1953, 1954, 1959, 1961, 1964, 1973, 1983, 1990, 1998) and 2 drought years (1978, 1986).

⁶³ The Korean War is a dummy that equals 1 for 1950-53. And the Cultural Revolution is a dummy that equals 1 for 1966-76.

Table 15. Political Shocks to the Maoist Economy

Independent variable	Dependent variable: $\ln(\text{Total Industrial investment})$		
	(1) Baseline	(2) Korean War	(3) Cultural Revolution
$\ln(\text{Food output})$	1.038 (0.743)	1.284** (0.570)	1.286** (0.583)
$\ln(\text{Rural food rationing})$	-5.121*** (0.885)	-4.338*** (1.124)	-4.290*** (1.206)
$\ln(\text{Agricultural export})$	0.298 (0.283)	0.237 (0.257)	0.219 (0.268)
$\ln(\text{GDP})$	3.442*** (0.271)	2.987*** (0.385)	3.002*** (0.409)
<i>Scissors-pricing</i>	-1.879*** (0.176)	-1.732*** (0.210)	-1.749*** (0.275)
<i>Disasters</i>	-0.197** (0.090)	-0.153 (0.090)	-0.156 (0.093)
Great Leap Famine	Yes	Yes	Yes
Korean War	No	Yes	Yes
Cultural Revolution	No	No	Yes
Observations	31	31	31
<i>Adjusted R²</i>	0.970	0.973	0.972

Sources: See Table 9.

Note: (1) Robust standard errors are in parentheses. (2) *** p<0.01, ** p<0.05, * p<0.1.

4. Final conclusions

After four-decade long ending of Mao's rule in Mainland China, this study re-examines performance and mechanisms of the Maoist economy in a new light. Our approach begins with preliminary observations of a mismatch between political instability (purges) and an inflated industrial GDP share on the one hand, and an unfavourable urban-rural employment divide, persistent austerity in food consumption, and perpetual arbitrage via rural-urban scissors-pricing on

the other. As a result, under Mao's rule China's economy was visibly rural and its growth was limited.

These observations lead to a hypothesis that the Maoist economy was operated in accordance with a Quesnay bi-sectoral model (hence the term "Quesnay-Mao model") with which industry rode parasitically on the agricultural sector, an economic system which lacked incentives, sophistication, flexibility, opportunities, momentum unless the agricultural sector was healthy and innovative. This is a true revelation in terms of the limits and constraints faced by China from 1950 to 1980, which challenges the conventional wisdom about the heavily glorified performance of the Maoist economy.

To test the industry-riding-on-agriculture hypothesis, this study applies a two-pronged approach with mathematical conceptualisation and empirical modelling with multiple linear regressions. The former reveals a tendency of a "low level equilibrium trap"; and the latter yields high values of coefficient determinators. Thus, the Quesnay-Mao straitjacket worked exceedingly well in China from 1950 to 1980. If so, it was a tall order for Mao and his economic planners to make China modern at the same time.

The closed nature of the Quesnay-Mao economy also explains why and how post-Mao China has been able to outperform Mao's gloomy record in a big way on both scale and scope.⁶⁴ The post-Mao reforms and opening-up was indeed a game changer that opened China's door to a radically different growth trajectory by

⁶⁴ E.g. D. W. Chang, *China Under Deng Xiaoping: Political and Economic Reform* (New York: Palgrave Macmillan, 1988); R. Evans, *Deng Xiaoping and the Making of Modern China* (London: Hamish Hamilton, 1993); E. F. Vogel, *Deng Xiaoping and the Transformation of China* (Cambridge [MA]: Harvard University Press, 2013); M. Dillon, *Deng Xiaoping: The Man who Made Modern China* (London: I. B. Tauris, 2015).

unleashing China's un-tapped "absolute advantage" (Adam Smith) and "comparative advantage" (David Ricardo),⁶⁵ both being historically tested and validated in the past two-to-three centuries. In other words, post-Mao China has merely followed an internationally proven norm for growth and development to take place. If so, serious scepticism is to be aroused on the alleged uniqueness of what has now been widely circulated as the "China Model."

⁶⁵ E.g. A. Maneschi, *Comparative Advantage in International Trade, A Historical Perspective* (Cheltenham: Edward Elgar, 1998); R. Ruffin, "David Ricardo's Discovery of Comparative Advantage," *History of Political Economy*, 34/4 (2002), pp. 727-48; R. A. Brecher, Z. Chen and E. U. Choudhri, "Absolute and Comparative Advantage, Reconsidered," *Review of International Economics*, 10/4 (2002), pp. 645-56; S. Parrinello, "National Competitiveness and Absolute Advantage in A Global Economy," *Working Paper* of Dipartimento di Economia Pubblica, vol. 95 (2006): pp. 1-23; E. Bellino and S. M. Fratini, "Absolute Advantage and Capital Mobility in International Trade Theory," *The European Journal of the History of Economic Thought*, 29/2 (2022), pp. 271-93.

References

- An Ziwen, "Guanyu Jieshu Sanfan Yundong He Chuli Yiliu Wentide Baogao" (Report on the Ending of the Three-Anti Movement and Its Residual Issues), 18th October, 1952 (Beijing: Central Archives).
- Anon., "Zhongguo Gongchandang Dishiyijie Zhongyangweiyuanhui Disanci Quanti Huiyi Gongbao" (Communiqué on the Third Plenary Meeting of the Eleventh Central Committee of Chinese Communist Party), *Renmin Ribao* (*People's Daily*), 24th December, 1978, p. 1.
- Anon., *Mao Zedong Sixiang Wansui* (*Long Live Mao Zedong's Thought*) (Beijing: Peking University, August 1969, SOAS Library Copy).
- Anon., *Zhonggong Zhongyang Guowuyuan Guanyu Tiaozheng Dangqian Shichang Wujiade Jueding* (Decree of the Chinese Communist Party Central Committee and the State Council on Re-adjustment of Current Market Prices, 1965), online *vide*: http://news.xinhuanet.com/ziliao/2005-02/02/content_2539275.htm, available on 20th September 2020.
- Ashton, B. K., H. A. Piazza and R. Zeitz, "Famine in China, 1958-61," *Population and Development Review*, 10/4 (1984), pp. 613-45.
- Bai Xi, *Kaiguo Da Zhenfan* (*Sweeping Suppression of Anti-revolutionaries in the Early Days of the People's Republic*) (Beijing: Chinese Communist Party History Press, 2006).
- Bárány, Z. L., and C. Siegel, "Job Polarization and Structural Change," *American Economic Journal: Macroeconomics*, 10/1 (2018), pp. 57-89.
- Becker, J., *Hungry Ghost, China's Secret Famine* (London: John Murray, 1996).
- Bellino E. and S. M. Fratini, "Absolute Advantage and Capital Mobility in International Trade Theory," *The European Journal of the History of Economic Thought*, 29/2 (2022), pp. 271-93.
- Bernstein, T. P., "Stalinism, Famine and Chinese Peasants: Grain Procurements during the Great Leap Forward," *Theory and Society*, 13/3 (1984), pp. 339-77.
- Bideleaux, R., *Communism and Development* (London: Methuen, 1985).
- Bodrova, V. and R. Anker, *Working Women in Socialist Countries* (Geneva: International Labour Office, 1985).
- Bornstein, M. (ed.), *The Soviet Economy* (New York: Routledge Press, 1981).
- Bose, D. K., "Market and Plan in Soviet Union," *Economic and Political Weekly*, 24/2 (1989), pp. 95-99.
- Bramall, C., "Inequality, Land Reform and Agricultural Growth in China, 1952-55," *Journal of Peasant Studies*, 27/3 (2000), pp. 30-54.
- Brandt, L. and T. G. Rawski, *China's Great Economic Transformation* (Cambridge: Cambridge University Press, 2008).
- Brecher, R. A., Z. Chen and E. U. Choudhri, "Absolute and Comparative Advantage, Reconsidered," *Review of International Economics*, 10/4 (2002), pp. 645-56.
- Cao Shuji, *Da Jihuang, 1959-1961 Niande Zhongguo Renkou* (*Great Famine and China's Population in 1959-1961*) (Hong Kong: Times International Publishing Co., 2005).

- Central Liaison Department of the Chinese Communist Party (ed.), *Dangnei Shici Luxian Douzheng Ziliao (Materials of Ten Two-Line Struggles within the Chinese Communist Party)* (Beijing: The Central Liaison Ministry of the Chinese Communist Party, 1972).
- Chang, D. W., *China Under Deng Xiaoping: Political and Economic Reform* (New York: Palgrave Macmillan, 1988).
- Chang, J. and Jon Halliday, *Mao, the Unknown Story* (London: Vintage Books, 2005).
- Chao, K., *Man and Land in Chinese History: An Economic Analysis* (Stanford: Stanford University Press, 1986).
- Charlesworth, N., *British Rule and the Indian Economy* (London: MacMillan, 1982).
- Chen, N-R. and W. Galenson, *The Chinese Economy under Communism* (Chicago: Aldine Press, 1969).
- Cheng, Chu-yuan, *China's Economic Development, Growth and Structural Change* (London: Routledge Press, 1982).
- Colmer, J., "Urbanisation, Growth, and Development: Evidence from India," online *vide*:
<https://urbanisation.econ.ox.ac.uk/materials/papers/24/urbanisationindia.pdf>, available on 1st December 2020.
- Cong Jin, *Quzhe Fazhande Suiyue (Period of Tortuous Development)* (Zhengzhou: Henan People's Press, 1989).
- Croll, E., *The Family Rice Bowl, Food and the Domestic Economy in China* (Geneva: UNRISD, 1983).
- Davies, R. W., M. Harrison and S. G. Wheatcroft, *The Economic Transformation of the Soviet Union, 1913-1945* (Cambridge: Cambridge University Press, 1994).
- De Zwart, Pim, D. Gallardo-Albarrán, and A. Rijpma, "The Demographic Effects of Colonialism: Forced Labor and Mortality in Java, 1834–1879," *The Journal of Economic History*, 82/1 (2022), pp. 211–49.
- Deng K. and J. Du, "To Get the Prices Right for Food: The State versus the Market in Reforming China, 1979–2006," *European Review of Economic History* 21/3 (2017), pp. 302-25.
- Deng, K., *China's Political Economy in Modern Times: Changes and Economic Consequences, 1800–2000* (London: Routledge Press, 2011).
- Deng, K., *Mapping China's Growth and Development in the Long Run, 221 BC to 2020* (London: World Scientific Press and Imperial College Press, 2015).
- Di Ren and Mai Dao, *Mao Zedong He Tade Junshi Gaocan (Mao Zedong and His Military Aide)* (Beijing: Red Flag Press, 1993).
- Dikötter, F., *Mao's Great Famine: The History of China's Most Devastating Catastrophe, 1958-62* (London: Bloomsbury Press, 2010).
- Dillon, M., *Deng Xiaoping: The Man who Made Modern China* (London: I. B. Tauris, 2015).
- Dittrich, S. R. and R. H. Myers, "Resource Allocation in Traditional Agriculture," *Journal of Political Economy*, 79/4 (1971), pp. 887–96.
- Dong Zhikai and Wu Li, *Zhonghua Renmin Gongheguo Jingjishi, 1953-1957 (An Economic History of the People's Republic of China, 1953-1957)* (Beijing: Social Science Literature Press, 2011).

- Dong Zhikai, *Xinzhonghua Gongye Jingjishi, 1958-1965 (An Economic History of Industry of New China, 1958-1965)* (Beijing: Economic Management Press, 1995).
- Eagly, R. V., "A Physiocratic Model of Dynamic Equilibrium," *Journal of Political Economy*, 77/1 (1969), pp. 66-84.
- Eckstein, A., *Chinese Economic Revolution* (Cambridge: Cambridge University Press, 1977).
- Eckstein, A., W. Galenson, and T. Liu (eds), *Economic Trends in Communist China* (Chicago: Aldine Pub. Co, 1968).
- Ellman, M., *Planning Problems in the USSR* (Cambridge: Cambridge University Press, 1973).
- Elvin, M., *The Pattern of the Chinese Past* (Stanford: Stanford University Press, 1973).
- Evans, R., *Deng Xiaoping and the Making of Modern China* (London: Hamish Hamilton, 1993).
- Feigenbaum, E. A., "Soldiers, Weapons and Chinese Development Strategy: The Mao Era Military in China's Economic and Institutional Debate," *China Quarterly*, v. 158 (1999), pp. 285-313.
- Feuerwerker, A., "The State and the Economy in Late Imperial China," *Theory and Society*, 13/3 (1984), pp. 297-326.
- Francks, P., *Japanese Economic Development, Theory and Practice* (London: Routledge, 1992).
- Gao Wangling, *Zhongguo Nongmin Fanxingwei Diaocha (Investigation into a Quiet Rebellion of the Chinese Peasantry against Maoism)* (Beijing: Central Party History Press, 2006).
- Graddy, K., "Taste Endures! The Rankings of Roger de Piles and Three Centuries of Art Prices," *The Journal of Economic History*, 73/3 (2013), pp. 766–91.
- Gray, J., "Mao Tse-Tung's Strategy for Collectivization of Chinese Agriculture: An Important Phase in the Development of Maoism," in E. De Kadt and G. Williams (eds), *Sociology and Development* (London: Tavistock Press, 1974), pp. 39-108.
- Gregory, P. R. and R. C. Stuart, *Soviet and Post-Soviet Economic Structure and Performance* (New York: HarperCollins, 1994).
- Gregory, P. R., *Before Command: An Economic History of Russia from Emancipation to the First Five-Year Plan* (Princeton: Princeton University Press, 1994).
- Harris, C. D., "The Urban and Industrial Transformation of Japan," *Geographical Review*, 72/1 (1982), pp. 50-89.
- He Bochuan, "2000 Nian Zhongguo Mubiao Xitongde 20 Ge Cuiruodian" (Twenty Weak Points in China's Targets for the Year 2000), *Xinhua Wenzhai (Xinhua Compilation)*, 5 (1994), pp. 7-8.
- He Fengming, *Jingli – Wode 1957 Nian (The Year 1957 When A Disaster Struck on Me)* (Lanzhou: Dunhuang Literature and Art Press, 2001).
- Heilmann S. and E. J. Perry (eds), *Mao's Invisible Hand* (Cambridge [MA]: Harvard University East Asian Center, 2011).
- Hoffmann, C., "The Maoist Economic Model," *Journal of Economic Issues*, 3/5 (1971), pp. 12-27.

- Hsueh, T-T. and T-O. Woo, "The Political Economy of the Heavy Industry Sector in the People's Republic of China," *The China Journal*, 15/1 (1986), pp. 57-82.
- Hua Guofeng, "Tuanjie Qilai, Wei Jianshe Shehuizhuyide Xiandaihua Qianguo Er Fendou" (United to Build a Socialist Modern Power), *Renmin Ribao* (*People's Daily*), 27th February, 1978, p. 1.
- Jiang Yuanming, *Wangshi 1966 Xiezhen* (*Memory of 1966*) (Tianjin: Hundred-Flower Art Press, 1998).
- Jin Hui, "Sannian Ziyanzaihai Beiwanglu" (Memorandum on the Alleged Three Years of Natural Disasters, 1959–62), *Shehui* (*Society*) 4–5 (1993), pp. 13–22.
- Kau, M. Y. and S. H. Marsh, *China in the Era of Deng Xiaoping* (New York: Routledge, 1993).
- Kitchens, C., "A Dam Problem: TVA's Fight Against Malaria, 1926–1951," *The Journal of Economic History*, 73/3 (2013), pp. 694–724.
- Kueh, Y. Y., "Mao and Agriculture in China's Industrialization," *China Quarterly*, no. 187 (2006), pp. 700-23.
- Kueh, Y. Y., *China's New Industrialization Strategy: Was Chairman Mao Really Necessary?* (Cheltenham: Edward Elgar, 2008).
- Kung, J. K. and J. Y. Lin, "The Causes of China's Great Leap Famine, 1959–1961," *Economic Development and Cultural Change*, 51/2 (2003), pp. 51–73.
- Lal, D., *The Hindu Equilibrium, Cultural Stability and Economic Stagnation* (Oxford: Clarendon, 1988).
- Lan Xia, "1957-1976 Nian Woguo Jingji Jilei Yu Fenpei Zhuangkuang" (Capital Accumulation and Distribution in the Chinese Economy, 1957-1976), *Chengdu Daxue Xuebao* (*Bulletin of Chengdu University*), 1 (2000), pp. 21-3.
- Lardy, N., *Agriculture in China's Modern Economic Development* (New York: Cambridge University Press, 1983).
- Lardy, N., *Economic Growth and Distribution in China*, Cambridge: Cambridge University Press, 1978).
- Li, B., *Agricultural Development in Jiangnan, 1620–1850*, London: Macmillan, 1998).
- Li, H. Y., *Mao and the Economic Stalinization of China, 1948-1* (New York: Rowman & Littlefield, 2006).
- Li Hui, *Hu Feng Jituan Yuan-a Shimo* (*A History of the Fabrication of the "Hu Feng Clique"*) (Wuhan: Hubei People's Press, 2003).
- Li Jingwen, "Lun Woguo Chanye Jiegoude Biandong Qushi" (Trend of Structural Change in China's Economy), *Xinhua Wenzhai* (*Xinhua Compilation*), 12 (1995), pp. 46-8.
- Li Jingwen, "Zhongguo Jingji Tizhi Zhuanxing Guochengzhongde Hongguan Tiaokong" (Macro Control in the Process of Switching China's Economic System), *Xinhua Wenzhai* (*Xinhua Compilation*), 4 (1997), pp. 49-51.
- Li Rui, *Li Rui Tan Mao Zedong* (*Li Rui's Memoir on Mao Zedong*) (Hong Kong: Time International Publishing Co., 2005).
- Liao Luyan, "Guanyu Jieshu Wufan Yundong He Chuli Yiliu Wentide Baogao" (Report on the Ending of the Five-Anti Movement and Its Residual Issues), 17th October, 1952 (Beijing: Central Archives).

- Lin, J. Y. and M. Yu, “The Political Economy of Price Scissors in China: Theoretical Model and Empirical Evidence,” *Economic Research Journal*, 1 (2009), pp. 42–56.
- Ling Zhijun, *Lishi Buzi Paihuai (History, No More Hesitation)* (Beijing: People’s Press, 1997).
- Lippit, V. D., *The Economic Development of China* (New York: M.E. Sharpe, 1987).
- Liu Hong, Shao Zongming, Lu Chunheng, Zhai Ligong, He Keng and Qiu Xiaohua (eds) *Xin Zhongguo Wushinian, 1949-1999 (Fifty Years of New China, 1949-1999)* (Beijing: China’s Statistics Press, 1999).
- Liu Xiangcheng (ed.), *Zhongguo Guding Zichan Touzi Nianjian (Statistical Yearbook of the China’s Investment in Fixed Assets, 1950-1995)* (Beijing: China’s Statistics Press, 1997).
- Liu Zhongli, *Dianji – Xinzhongguo Jingji 50 Nian (Laying the Foundation – 50 Years of the Economy of New China)* (Beijing: China’s Financial Economics Press, 1999).
- Maitra, P., *Indian Economic Development. Population Growth and Technical Change* (New Delhi: Ashish, 1991).
- Malafeev, A. N., *Istoriia Tsenoobrazovaniia v SSSR (The History of Price Formation in the USSR)* (Moscow: Mysl, 1964).
- Maneschi, A., *Comparative Advantage in International Trade, A Historical Perspective* (Cheltenham: Edward Elgar, 1998).
- Mao Zedong, “Gei Jian Qingde Xin, 1966 Nian 7 Yue 8 Ri” (A Letter to Wife Jiang Qing on 8th July 1966), in Anon., *Zhonghua Renmin Gongheguo Chunqiu Shilu (Records of Changes of the People’s Republic of China)* (Beijing: The People’s University Press, 1992).
- Mao Zedong, “Gongzou Fangfa Liushi Tiao” (Sixty Methods of the Party Work), in Institute of Documents of the Chinese Communist Party Central Committee, ed., *Mao Zedong Wenji (Selected Works of Mao Zedong)* (Beijing: People’s Press, 1999).
- Meek, R. L., *The Economic of Physiocracy* (London: Allen & Unwin, 1963).
- Meyskens, C. F., *Mao’s Third Front, the Militarization of Cold War China* (Cambridge: Cambridge University Press, 2020).
- Minami, R., *The Economic Development of Japan* (London: MacMillan, 1986).
- Ministry of Finance, *Zhongguo Caizheng Nianjian, 1997 (China’s Financial Yearbook, 1997)* (Beijing: China’s Finance Magazine Press, 1997).
- Muller, A. L., “Quesnay’s Theory of Growth: A Comment,” *Oxford Economic Papers*, New Series, 30/1 (1978), pp. 150-6.
- National Bureau of Statistics, *Xin Zhongguo Wushinian Tongji Ziliao Huibian, 1949-1998 (Comprehensive Statistical Data for Fifty Years of New China, 1949-1998)* (Beijing: China’s Statistics Press, 1999).
- National Bureau of Statistics, *Zhongguo Laodong Tongji Nianjian, 1998 (China’s Labour Statistic Yearbook, 1998)* (Beijing: China’s Statistics Press, 1998).
- National Bureau of Statistics, *Zhongguo Nianjian, 1985 (China’s Statistic Yearbook, 1985)* (Beijing: Economy Press, 1986).
- National Bureau of Statistics, *Zhongguo Renko He Jiuye Tongji Nianjian, 2020 (China’s Population and Employment Statistical Yearbook, 2020)* (Beijing: China’s Statistics Press, 2020).

- National Bureau of Statistics, *Zhongguo Tongji Nianjian, 1981 (China's Statistical Yearbook, 1981)* (Beijing: China's Statistics Press, 1981).
- National Bureau of Statistics, *Zhongguo Tongji Nianjian, 1983 (China's Statistic Yearbook, 1983)* (Beijing: Economy Press, 1983).
- National Bureau of Statistics, *Zhongguo Tongji Nianjian, 1984 (China's Statistical Yearbook, 1984)* (Beijing: China's Statistics Press, 1984).
- National Bureau of Statistics, *Zhongguo Tongji Nianjian, 1986 (China's Statistic Yearbook, 1986)* (Beijing: China's Statistics Press, 1986).
- National Bureau of Statistics, *Zhongguo Tongji Nianjian, 1987 (China's Statistical Yearbook, 1987)* (Beijing: China's Statistics Press, 1987).
- National Bureau of Statistics, *Zhongguo Tongji Nianjian, 2001 (China's Statistical Yearbook, 2001)* (Beijing: China's Statistics Press, 2001).
- National Bureau of Statistics, *Zhongguo Tongji Nianjian, 2002 (China's Statistical Yearbook, 2002)* (Beijing: China's Statistics Press, 2002).
- National Bureau of Statistics, *Zongguo Guding Zichan Tongji Ziliao, 1950-1985 (Statistics for China's Fixed Asset Investment, 1950-1985)* (Beijing: China's Statistics Press, 1987).
- National Price Commission, *Wujia Tongji Ziliao Jianbian (Price Statistics)* (Beijing: People's Press, 1964).
- Naughton, B., "Deng Xiaoping: The Economist," *China Quarterly*, vol. 135 (1993), pp. 491-514.
- Naughton, B., *The Chinese Economy, Transitions and Growth* (Cambridge [MA]: MIT Press, 2006).
- Paine, S., "Balanced Development: Maoist Conception and Chinese Practice," *World Development*, 4/4 (1976), pp. 277-304.
- Parrinello, S., "National Competitiveness and Absolute Advantage in A Global Economy," *Working Paper of Dipartimento di Economia Pubblica*, vol. 95 (2006): pp. 1-23.
- Perkins, D. H., *Agricultural Development in China, 1368-1968* (Edinburgh: Edinburgh University Press, 1969).
- Perkins, D., *Market Control and Planning in Communist China* (Cambridge [MA]: Harvard University Press, 1966).
- Pomeranz, K., *The Great Divergence, Europe, China and The Making of the Modern World Economy* (Princeton [N.J.]: Princeton University Press, 2000).
- Pomfret, J., *Chinese Lessons* (New York: Henry Holt, 2007).
- Rawski, T. G., *Economic Growth and Employment in China* (London: Oxford University Press).
- Ray, R. K., *Industrialization in India: Growth and Conflict in the Private Corporate Sector, 1914-47* (Oxford: Oxford University Press, 1979).
- Rothbard, M. N., "The End of Socialism and the Calculation Debate Revisited," *Review of Austrian Economics*, 5/2 (1991), pp. 51-76.
- Rothermund, D., *An Economic History of India, from Pre-Colonial Times to 1991* (London: Routledge, 1993).
- Ruffin, R., "David Ricardo's Discovery of Comparative Advantage," *History of Political Economy*, 34/4 (2002), pp. 727-48.
- Rural Economy Institute, Ministry of Agriculture (ed.), *Dangdai Zhongguo Nongye Biange Yu Fazhan Yanjiu (A Study of Agricultural Reforms and*

- Development in Contemporary China*) (Beijing: China's Agriculture Press, 1998).
- Schmidt-Glintzer, H., "70 per cent good, 30 per cent bad, China has found a simple formula to assess Mao Zedong's Legacy," *The Politics of Memory*, 10.08.2017, online *vide*: <https://www.ips-journal.eu/in-focus/the-politics-of-memory/70-per-cent-good-30-per-cent-bad-2216/>, available on 2nd August 2022.
- Selden, M., Mao Zedong and the Political Economy of Chinese Development," *China Report*, 24/2 (1988), pp. 125-39.
- Sheng Guofan, *Wo Suo Qinlide Hu Feng An, Faguan Wang Wenzheng Koushu* (*My Personal Experience of the Hu Feng Clique, Memoir of Judge Wang Wenzheng*) (Beijing: Chinese Communist Party History Press, 2007).
- Tisdell, C., "Economic Reform and Openness in China: China's Development Policies in the Last 30 Years," *Economic Analysis and Policy*, 39/2 (2009), pp. 271-94.
- Vogel, E. F., *Deng Xiaoping and the Transformation of China* (Cambridge [MA]: Harvard University Press, 2013).
- Wang, Z., P. Zhai, and H. Zhang, "Variation of Drought over Northern China during 1950–2000," *Journal of Geographical Sciences*, 13/4 (2003), pp. 480–7.
- Wemheuer, F., *A Social History of Maoist China, Conflict and Change, 1949-1976* (Cambridge: Cambridge University Press, 2019).
- Wheatcroft, S. G., R. W. Davies and J. M. Cooper, "Soviet Industrialization Reconsidered: Some Preliminary Conclusions about Economic Development between 1926 and 1941," *Economic History Review*, 39/2 (1986), pp. 264-94.
- Wheelwright, E. L. and B. McFarlane, *The Chinese Road to Socialism* (New York: Monthly Review Press, 1970).
- Wilhelm, J., "Does the Soviet Union Have a Planned Economy?" *Soviet Studies*, 31/2 (1979), pp. 268-74.
- Xi Xuan and Jin Chunming, *Wenhua Dagemin Jianshi* (*A Short History of the Great Cultural Revolution*) (Beijing: Central Party History Press, 1996).
- Xinhua News Agency, *People's Republic of China Yearbook, 1996/97* (Hong Kong: NCN Ltd., 1997).
- Yang Jisheng, *Zhongguo Liushi Niandai Dajihuang Jishi* (*Gravestone for the Great Leap Famine Victims, Evidence from History*) (Hong Kong: Tiandi Books, 2008).
- Yang Peixin, "Dui Guoyou Qiye Gaige Wentide Tantao" (State-owned Enterprises and Reform), *Xinhua Wenzhai* (*Xinhua Compilation*), 10 (1995), pp. 43-5.
- Yang Xianhui, *Jiabian Gou Jishi* (*Diary in the Narrow Valley*) (Shanghai: Shanghai Literature and Art Press, 2003).
- Yu, M., Q. Li, M. J. Hayes, M. D. Svoboda, and R. R. Heim, "Are Droughts Becoming More Frequent or Severe in China Based on the Standardized Precipitation Evapotranspiration Index: 1951–2010?" *International Journal of Climatology*, 34/3 (2014), pp. 545–58.
- Yuan Xiaolun, "Jibuzeshide Yuedu Ji" (Readings during the Cultural Revolution), *Yanhuang Chunqiu* (*History of Chinese*) 11 (2008), pp. 68-9.

- Zhai, P., X. Zhang, H. Wan, and X. Pan, "Trends in Total Precipitation and Frequency of Daily Precipitation Extremes over China," *Journal of Climate*, 18/7 (2005), pp. 1096–1108.
- Zhang Hua and Su Caiqing (eds), *Huizhou Wedge, Zhongguo Simian Wedge Benxi Yu Fans (Recollection of the Decade of Cultural Revolution, Analyses and Soul-Researching)* (Beijing: Chinese Communist Party History Press, 2000).
- Zhang Zhuoyuan, "Zhongguo Jingji Tizhi Gaigede Zongti Huigu Yu Zhanwang" (Review and Speculation of the Reform of China's Economic System), *Xinhua Wenzhai (Xinhua Compilation)*, 7 (1998), pp. 48-50.
- Zheng Yougui, *Zhonghua Renmin Gongheguo Jingjishi, 1949-2019 (An Economic History of the People's Republic of China, 1949-2019)* (Beijing: Contemporary China Press, 2019).