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The China Miracle in a technological and socio-political framework—The role of institutions

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ABSTRACT

China's economy has grown at an average annual rate of around 9.5% in the past four decades, which is often hailed as the China Miracle. This paper proposes a new theoretical model to analyse the causes of China's phenomenal growth in a technological and socio-political framework. In our new framework, the contemporary technology (T) determines what an economy can achieve; the objective (O) of the society has a fundamental impact on its economic growth; the performance (P) in implementing the social objective largely determines the growth rate of the economy; and the stability (S) of the society determines the sustainability of the economic growth. China's institutions have played key roles in the TOPS framework to initiate and sustain China's rapid growth in the past four decades. Socio-political changes caused by economic growth might affect the capacity of these institutions to promote economic growth in future.

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China model; transaction cost; technological path; social objective; social stability; Beijing Consensus

1. Introduction

China's rapid economic growth since 1978 has often been hailed as the 'China Miracle' (Lin, Cai, and Li 2003). From 1978 to 2018, China's real gross domestic product (GDP) grew at an average annual rate of around 9.5%. Its economy has grown more than 30-fold in real terms and its real per capita GDP more than 20-fold. Since China appears to be more successful in its transformation from a centrally planned economy to a fast-growing market economy (albeit with Chinese characteristics) than Russia and East European countries whose transition has been guided by mainstream economics, many economists think that China has found a new road to economic prosperity, the China Model or Beijing Consensus (Ramo 2004; Zhang 2006). Some of them think that modern economics cannot explain China's phenomenal growth and there is a need to develop new economic theories (Hu 2008; Lin 2008). Many mainstream development economists who are free market supporters disagree with the concept of China Model. To them, the increasing role of the market has served as the foundation of China's rapid growth (Summers and Thomas 1993; Williamson 2012; Huang 2008).

Scholars advocating the China Model generally acknowledge the importance of introducing market mechanism in the China Miracle (Lin 2013). They also agree that many other factors that are important according to modern development economics have contributed to China's rapid growth. One such factor is the advantage of backwardness

in China's pursuit of technological innovation and structural transformation (Lin 2013), which enables it to 'catch up' with developed countries by acquiring advanced technologies from them (Gerschenkron 1962; Abramovitz 1986). Several studies also find that foreign direct investment (FDI) improves firm productivity and contributes positively to China's economic growth (Van Reenen and Yueh 2012; Zhang and Felmingham 2002). Some advocates of China Model, however, believe that something special underlies China's success. Their main argument lies in that many countries with more market mechanism and less government control than China have worse performance in economic growth. This is a very powerful argument, because China's growth success is widely acknowledged and its policies have differed markedly from those recommended in the Washington Consensus (Williamson 2004).

Although mainstream economists may disagree with the claim that modern economics cannot explain China's rapid growth, many of them do find that China has been somehow different (Murphy, Shleifer, and Vishny 1992). Nolan and Wang (1999) think that China's large state-owned enterprises (SOEs) do not fit neatly into existing patterns, which presents a challenge to the 'transitional orthodoxy' and to ideas concerning property rights in development economics. Gabriele (2010) has shown that the role of the state in China is massive, dominant, and crucial to China's industrial development. Chow (1997) thinks that China's rapid economic growth poses several challenges to economics on topics such as private versus public ownership, modern legal system versus 'guanxi' (the Chinese term for close social connections), individual versus collective welfare, and multiparty versus one-party systems. Therefore, despite mainstream economists' attribution of China's growth success to the increasing role of market, China does possess factors that underlie its phenomenal growth.

Putting aside the differences between the two schools of thought, we may find that China's high saving rate and low interest rate may explain a large part of China's rapid growth during its catch-up with developed economies. The low interest rate decreed until recent years by the People's Bank of China (PBOC), the central bank, has a strong investment-promoting effect. When the decreed interest rate is much lower than the marginal product of capital (MPK) which should equal the market equilibrium interest rate, firms will borrow as much as possible to invest in capital stock to expand production. The low interest rate also reduces the proportion of national incomes received by labour, thus increasing the national saving rate and investment (Ma 2017). Therefore, the real miracle in China's rapid growth appears to be China's ability to maintain an almost increasingly high saving rate over a long period. Since maintaining high saving rates for four decades requires more than central bank's decrees on low interest rates, sociopolitical factors with Chinese characteristics have enabled the low interest rate policy as well as China's rapid economic growth. These factors have reduced transaction costs over the past four decades, maintained social stability, introduced functioning markets, and disinhibited private entrepreneurship.

The aim of the present study is to develop a theoretical framework to incorporate technological and sociopolitical factors in explaining China's phenomenal growth over the past four decades, with a special emphasis on the role of China's institutions. The rest of the paper is organized as follows: Section 2 introduces two types of growth in terms of technological progress; Section 3 presents the planner's problem, which was first raised by Ramsey (1928), and a technological and socio-political framework for

understanding economic growth; [Section 4](#) looks into how implementation performance is influenced by institutions; [Section 5](#) examines China's institutions and social stability; and [Section 6](#) discusses the implications of the new framework and concludes the paper.

2. Technological progress and two types of economic growth

According to the neoclassical growth model of Solow and Swan (Solow 1956; Swan 1956), before an economy reaches its steady state within the constraints of contemporary production technologies, its saving rate is the key determinant of its growth rate. Once the economy has reached its steady state, without technological progress its output per unit labour will no longer grow. The two stages of growth are called transitional growth and steady state growth, respectively. In the Solow-Swan model, the saving rate is externally determined and the production function determined by technology only, such that there is no role for institutions in determining economic performance. Technological progress in the Solow-Swan model leads economy to a new production function and new growth path like a quantum transition. Since the most advanced economies such as the United States (US) and Germany still grow and incremental technological progress occurs all the time, Solow's steady state appears to be a theoretical construct which does not exist in the real world in its pure form. Besides, Solow's concept of transitional growth emphasizes the quantity of capital stock and overlooks the qualitative difference between pre-transitional dominant technology and post-transitional dominant technology.

To address this shortcoming, it has been proposed that economic growth can be classified into two types, paradigm-changing growth and normal growth (Ma 2019). Paradigm-changing growth corresponds to Solow's transitional growth, and it is used to emphasize that the transition is a fundamental change in the dominant production technology. Normal growth is post-transitional growth with incremental technological progress, in contrast with steady state that does not have technological progress. This classification borrows Thomas Kuhn's terminology for scientific progress (Kuhn 1962). Kuhn divides scientific progress into normal science which is incremental knowledge creation and scientific revolution which represents a paradigm shift. Following Kuhn's conception, paradigm shift has been widely used in many disciplines. Herman Daly first introduced the term 'growth paradigm' to denote mainstream economists' preference for growth, and he called for a paradigm shift to preference for zero growth (Daly 1972; Schmelzer 2015). In economics, paradigm shift is still mainly used in Daly's tradition. The term 'normal growth' is usually used by biomedical sciences. Although the term 'new normal' is frequently used in recent years, normal growth is not usually used in economics. The concepts of paradigm-changing growth and normal growth appear to be used first by Ma (2019).

Paradigm-changing growth occurs when an economy's dominant production technologies are replaced or shifted by new technologies, such as industrialization of an agricultural country. For a country during its paradigm-changing growth stage, high saving rates and high investment rates will result in high growth rates. Normal growth happens when there is no fundamental change in the economy's dominant production technologies, such as the economic growth of developed countries since the 1970s. Normal

growth relies on small incremental process innovations and product innovations. High saving rates and high investment rates during the normal growth stage may lead to dynamic inefficiency, i.e. further increasing capital stock will reduce the overall utility of current and future generations (Blanchard and Fischer 1989). The gross savings of paradigm-changing economies such as China are mainly net savings used to increase their capital stock; whereas the net saving rates of normal growth economies such as the US and the United Kingdom (UK) are low because their gross savings are mainly used to replace the depreciated capital stock. The Solow-Swan model can explain why a high saving rate leads to a high growth rate in an economy before reaching the steady state, but it cannot explain how the saving rate is determined. Nor can it explain why economies at a similar growth stage and with a similar saving rate might have different growth rates. Therefore, a more comprehensive framework is needed to understand these phenomena.

Many economists especially those who advocate the China Model fail to understand the difference between paradigm-changing growth and normal growth. They compare China's rapid growth with Russia's shock-therapy caused economic contraction to show that China's gradualist dual-track system is the correct approach for reform. They might have thought that Russia could have achieved similar rapid growth, had it used China's approach. However, the two countries are not comparable in their transition to a market economy. According to Maddison's database (Bolt et al. 2018) and the World Bank's data, while China was still to be industrialized in 1978 with per capita GDP at 1,392 USD and 82.1% of its population living in rural areas, Russia had completed its industrialization with 31.3% of its population in rural areas. Russia's real GDP per capita was 19,098 USD (and Japan's was 19,804 USD) in 1978 (Figure 1); China's was 12,569 USD in 2016 and its rural population was 43.26%. All GDP values in this paper are in 2011 constant international dollars.

The Soviet economy stagnated in the 1970s because it was approaching its normal growth under the central planning system. In contrast, China's economy had grown strongly by 1978 whenever its economy was not disrupted by political movements and unrealistic economic campaigns (Borensztein and Ostry 1996). China was far from reaching its normal growth or steady state in 1978. Therefore, the advantage of backwardness enables China to catch up with developed countries by acquiring advanced technologies from them (Gerschenkron 1962; Abramovitz 1986; Lin 2013). Its high saving rate plays a key role in its subsequent paradigm-changing growth. Therefore, to understand an economy's growth, it is essential to know its position in the technological progress path.

The technological progress path is mapped primarily by the most developed economies. These economies will generally have lower growth rates except when they lead a breakthrough in the dominant production technologies, such as the UK in the Industrial Revolution. Generally speaking, the further away is a developing economy from the current technological frontier, the faster is its potential growth rate to catch up with the most developed economies. During an economy's paradigm-changing stage, its growth rate is mainly a manifest of its transition speed from one dominant technological paradigm to a new dominant technological paradigm, which corresponds to the process from near-zero capital stock to the steady-state capital stock in the Solow-Swan model. High saving rates accelerate this transition (Solow 1956; Swan 1956). In the real world, however, an economy's saving rate is largely determined by its institutions and the efficiency of applying the current production technology is also influenced by its institutions. A more realistic growth model should take institutional factors into consideration.

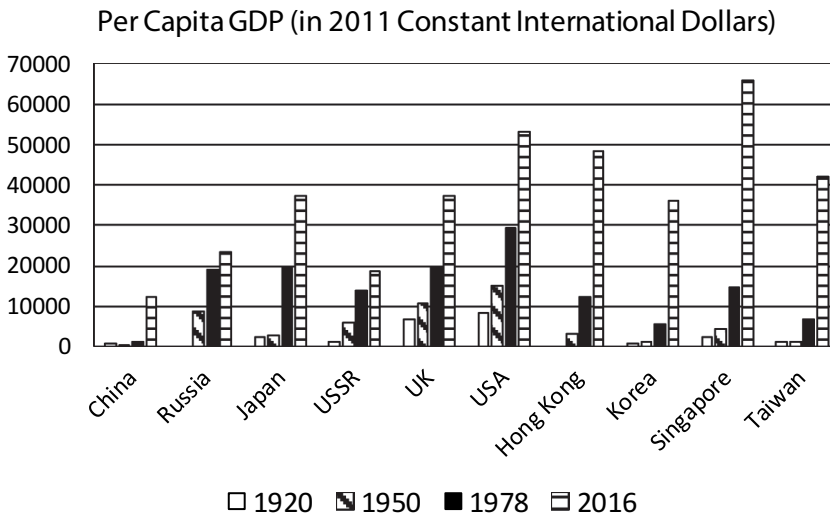


Figure 1. The per capita GDP (in 2011 constant international dollars) of mainland China, Russia, Japan, the Soviet Union (USSR), the United Kingdom (UK), the United States (USA), Hong Kong, South Korea, Singapore, and Taiwan in 1920, 1950, 1978, and 2016, according to Maddison's database (Bolt et al. 2018). There are no data for Hong Kong and Russia in 1920.

Once the paradigm change is completed, the economy enters the stage of normal growth which depends on small incremental innovations in products and business processes. Small incremental innovations also occur during the paradigm-changing stage, but they are not the main cause of its growth. Normal growth can be accelerated by massive investment, but its efficiency is much lower. Economic historians often wonder why the GDP per capita in the world hardly increased for over 1500 years before industrialization (Kremer 1993). The reason is that the world before the Industrial Revolution was in its normal growth for agricultural economies. Since incremental innovations in industrialized economies can be diffused and adopted much faster than in agricultural economies, the normal growth in industrialized economies also has a faster pace than that in agricultural economies. China's paradigm-changing growth has been further helped by the widespread use of information and communication technology. Furthermore, China's institutions also help its economy to operate at a fast pace as well as to maintain social stability.

3. The social planner's objective and a new framework

As an economy in its paradigm-changing stage, China's high saving rate can explain a large part of China's rapid growth with the neoclassical Solow-Swan model (Ma 2017), in which the saving rate is determined externally. In the real world, the saving rate is determined within the economy. To truly understand an economy's growth, it is essential to understand how the saving rate is determined. The Ramsey model provides an internal mechanism to determine the optimal saving rate (Ramsey 1928). The problem in the Ramsey model is how a central planner can maximize the expected total utility of the

present and future members of the society by choosing the optimal saving rate (Ramsey 1928; Blanchard and Fischer 1989),

$$\max U_0 = \sum_{t=0}^{\infty} \beta^t u(c_t) \quad (1)$$

Subject to

$$y_t = f(k_t) \quad (2)$$

$$k_{t+1} = y_t - c_t + (1 - \delta)k_t = s_t y_t + (1 - \delta)k_t \quad (3)$$

In the above equations, U_0 is the expected total utility (per unit labour) at the beginning; β the time discounting factor; $u(c_t)$ the one period utility, which is a function of c_t , consumption (per unit labour) in period t ; y_t the output (per unit labour) in period t ; $f(k_t)$ the production function, which is a function of k_t , the capital stock (per unit labour) in period t ; δ the depreciation rate of capital stock; and s_t the saving rate. David Cass and Tjalling Koopmans have shown that the optimal path for the Ramsey problem in a decentralized market economy is the same as the one chosen by a central planner (Cass 1965; Koopmans 1969; Blanchard and Fischer 1989). The solution for the Ramsey problem in a decentralized market economy is the neoclassical Ramsey-Cass-Koopmans model.

In microeconomics, decision makers base their choices on maximization of their expected utility. However, there is no consensus on what the social utility function of a society is or should be. In the real world, the success of a government or a national leader is often assessed by the country's economic growth. If the planner's objective is to maximize the expected sustainable GDP growth, the optimal saving path would be different from that of the Ramsey-Cass-Koopmans model. The planner's problem with the objective for maximum GDP growth can be expressed as,

$$\max U_0 = \sum_{t=0}^{\infty} \beta^t y_t \quad (4)$$

Subject to

$$y_t = f(k_t)$$

$$k_{t+1} = y_t - \max(c_t, c_{sub}) + (1 - \delta)k_t = \min(s_t, s_{sub})y_t + (1 - \delta)k_t \quad (5)$$

In Equation (5), c_{sub} is the subsistence level of consumption and s_{sub} is the saving rate when consumption is c_{sub} . In this model, the higher the saving rate, the higher the GDP growth rate. The solution to this maximization problem in a closed economy is to have $s_t = s_{sub}$, i.e. the output is all invested to increase the capital stock except c_{sub} consumed to maintain the survival and reproduction of the labour force. The main constraints for maximizing GDP growth rate by reducing consumption to the subsistence level are politics and incentives. In terms of politics, when the social planner saves too much for investment and leaves too little to the current generation for consumption, the current generation may overthrow the social planner. In terms of incentives, leaving too little for

current consumption would disincentivize the current members of the society and lead to low productivity.

Rapid paradigm-changing economic growth needs four conditions: backwardness along the contemporary technological path (T), a high growth rate-based social objective (O), excellent performance (P) in implementing the social objective, and social stability (S) to ensure functioning markets and private property rights. Institutions play key roles in all the four components of this TOPS framework. The technological path has been explored by the (most) developed economies, so the social planner needs to set a social objective which is to be realized along the technological path. The long-term outcome of realizing the planner’s objective depends on its implementation performance and social stability. This TOPS framework can be used to understand not only China’s rapid economic growth in the past four decades, but also those of other countries.

This TOPS framework can be incorporated into the planner’s problem by modifying Equations (2) and (3) as

$$\max U_0 = \sum_{t=0}^{\infty} \beta^t y_t$$

Subject to

$$y_t = f(k_t, m_t) = f(k_t, m_t(s_t, P_t)) \tag{6}$$

$$k_{t+1} = \alpha_t(y_t - c_t) + (1 - \delta)k_t = \alpha_t(T_t, P_t, S_t)s_t(y_t, T_t, P_t, S_t)y_t + (1 - \delta)k_t \tag{7}$$

In Equations (6) and (7), m_t is the motivational factor measuring the efforts of the labour force; P_t the planner’s implementation performance; α_t the transformation efficiency from savings to capital stock; T_t the technological level; and S_t the planner’s ability to maintain social stability. The incorporation of a motivational factor into the production function $f(k_t, m_t)$ implies that workers need to be motivated to exploit the full strength of their equipment and technology (Lazear 2000). The inclusion of α_t implies that not all savings are optimally transformed into capital stock.

Since the technological path is largely determined by the most advanced economies, setting economic objective is the primary decision of a developing country. In a centrally planned economy, the objective is set by the central planner. In a market economy, the objective of the society should be the summation of individual objectives through invisible hands, but the government still has its own objective which has a major impact on the economic performance. In China, since the Third Plenum of the Eleventh Central Committee of the Communist Party of China (CPC) in December 1978, rapid sustainable economic growth has become the country’s objective. The local GDP growth becomes a key measure of a local leader’s performance and a predictor of the person’s promotion opportunity. In order to get faster GDP growth, local governments try all they can to attract foreign and domestic investment into their jurisdiction (Zhou 2007; Li and Zhou 2005), and compete to reduce barriers to investment (Xu 2011).

The above TOPS framework or modified Ramsey model can be used to bridge the gap between the neoclassical growth model and the real world growth cases such as the China Miracle. The neoclassical framework implicitly assumes optimality of outcomes under simplified stringent conditions that are usually not met in the real world. Its

strength lies in providing reference systems or benchmarks for evaluating how the economy actually performs, rather than describing and predicting the economic performance accurately. Instead of a system with linear relations among variables, the actual economy is a complex system which would be analyzed more appropriately by complexity science. The equilibrium in the neoclassical framework might not be stable in the real world, such that government needs to intervene from time to time to correct market failures and deviations from the equilibrium which can lead to disequilibrium. Moreover, government interventions played an important role in the advent of the Industrial Revolution in Great Britain. The British government passed a series of parliament acts in the late 17th and early 18th century to restrict imports and sales of cotton textiles from India, China and Persia (Landes 2003; Eacott 2012). The British colonial authority opened Bengali (Indian) market to British goods and imposed a duty of 75% on export of cotton textiles from Bengal, while raw materials such as cotton can be exported duty-free (James 1840). These measures destroyed the once prosperous Bengali textile industry, which had a 25% share of the global textile trade in the early 18th century, and helped the growth of British textile industry especially that of cotton textiles (Riello and Roy 2009).

To better understand economic development in the real world especially the China Miracle, Zheng (2019) proposes to combine traditional political economy, complexity science, and history and culture with the neoclassical economics general equilibrium to form a comprehensive analysis scheme. Using analogy from adjustments needed to keep the relay satellite Queqiao at the Earth-Moon Lagrangian 2 (L2) point for the Chang'e 4 mission, he shows the important role of government in economics, especially development theory. Zheng and Wang (2014) emphasize the characteristics of Chinese society with its unique history and cultural values as an essential factor in understanding China's rapid economic growth. In the present TOPS framework, the introduction of implementation performance P_t , motivation factor m_t , transformation efficiency a_t , and ability to maintain social stability S_t adds more complexity to the neoclassical growth models, corresponding to Zheng's proposal to include complex systems in analyzing economic growth. The role of institutions in determining these factors implicates political economy as well as historical and cultural influences. The following sections will focus on how institutional factors in China contribute to China's rapid growth via promoting implementation performance and maintaining social stability.

4. Implementation performance and the impact of China's institutions on performance

An economy with the objective for maximum GDP growth should grow faster than one where the representative consumer maximizes her/his own and her/his offspring's utility as in the Ramsey-Cass-Koopmans model. With regard to the implementation of the social objective of maximizing the economic growth rate, improving performance involves 1) raising the saving rate; 2) incentivizing workers (and managers and entrepreneurs) such that equipment and technologies can be more efficiently utilized; and 3) reducing transaction costs such that savings can be transformed into capital stock rapidly and production can be started faster. As indicated by Equation (7), the saving rate s_t is a function of y_t , T_t , P_t and S_t . The output growth enables the increase of the saving rate (Modigliani and Cao 2004). Technology usually reduces labour input and increases returns

to capital including intellectual properties, which increases saving rates. P_t represents the influence of institutions and systems on implementation performance, and different approaches to improve performance may have different long-term effects. Better implementation performance and social stability also make high saving rates more feasible.

High saving rates are essential for high growth rates in both the Ramsey-Cass-Koopmans model and the Solow-Swan model. However, neither does the Ramsey-Cass-Koopmans model concern itself with how savings are efficiently transformed into capital stock and how labour and capital stock efficiently produce output, nor does the Solow-Swan model. They implicitly assume full efficiency in these processes. For simplicity and mathematical convenience, economic theories usually use models with frictionless markets. In such frictionless markets, there are no transaction costs between two parties. Moreover, there are no institutions that could impose a transaction upon any party who does not want it, nor are there institutions that would hinder entrepreneurship. In the real world, however, these assumptions are not valid. Firstly, transactions involve both monetary and time costs. Secondly, there might be institutions that help impose a transaction upon one party such that the transaction decreases that party's utility, and institutions that hinder and suppress entrepreneurship.

Although raising saving rates can increase an economy's growth rate, a social planner has to consider whether its planned high saving rate will affect its own survival, which is the political constraint. Moreover, since supervision of the labour force is not costless, the social planner has to consider whether incentives would be more effective than supervision for maintaining high labour productivity. With available capital, labour and technology, three factors may influence the performance of implementing the social planner's objective: the efforts of employees, the transaction costs between counterparties, and the outcomes of transactions. The efforts of employees directly affect the efficiency of transforming savings into capital stocks and the efficiency of utilizing capital and labour in production. The misalignment between the interests of employees, (state and collectively owned) enterprises and the state before 1976 imposed a systemic cost on China's economy.

The motivation factor m_t in Equation (6) is a function of the saving rate (s_t) and P_t . When s_t reaches a certain level, it begins to demotivate the labour force and reduce the marginal product of k_t . The per unit labour production function $f(k_t)$ or $f(k_t, m_t)$ is a simplified abstraction, because in an economic system there are factory floor workers, foremen/supervisors, middle managers, senior executives, entrepreneurs, investors, civil servants and government leaders who have diverse responsibilities and incomes. Higher saving rates usually imply that entrepreneurs, senior executives and middle managers have higher incomes and become more motivated to initiate and implement business plans and supervise workers more efficiently. This manifests as m_t increases initially with s_t in the per unit labour production function. When saving rates are too high, which means that too little output is left to ordinary workers, m_t would decrease as s_t increases, because its demotivating effects on the ordinary workers cannot be offset by its motivating effects on the entrepreneurs and senior managers. P_t represents the influence of institutions and systems on the motivation of labour force other than saving rates. Different approaches to improve implementation performance may have different long-term effects on motivation.

The transformation efficiency α_t indicates that same saving rates might not result in the same growth rate even if two economies are at the same stage of development. It is a function of T_t , P_t and S_t , since technology may accelerate the diffusion and application of innovations, and better implementation performance and social stability would make the transformation from savings to capital stocks more efficient. The impact of social stability on α_t is not monotonically increasing, as the uniformity of a society enforced by its government usually stifles creativity and entrepreneurship and leads to stagnation during its normal growth. The different approaches to achieve strong implementation performance or social stability may have similar short-term outcomes, but different long-term prospects. The difference between $(y_t - c_t)$ and $\alpha_t s_t y_t$ is the wasted resources because of 'overinvestment' in inventory, unfinished capital stock projects, or inappropriate projects, compared with the optimal transformation from savings to capital stock.

China has been very successful in maintaining high saving rates through increasing the proportion of the GDP received by senior managers, entrepreneurs, enterprises and the state as well as reducing the proportion received by ordinary workers. Its low interest rate policy and prohibition of unofficial financing activities are some of the causes for its high saving rates over the past four decades (Ma 2017). Reduction of social welfare by removing state welfare directly or by privatising SOEs, industrialization of university education, investment supported by huge money issuance and inflation, and reliance more on indirect tax for government incomes have all contributed to raising China's saving rate (Chamon and Prasad 2010). China's tax system is heavily relying on revenues from turnover taxes such as value-added tax, business tax and consumption tax (Brys et al. 2013). Indirect taxes are regressive and borne proportionally more by ordinary households. China's indirect taxes make up over 60% of the total tax revenues, which is much higher than the proportion of indirect taxes in developed countries. In China, personal income tax makes up only 8.9% of total tax revenues in 2018, and corporate income tax is 22.6%. China's success in raising and maintaining high saving rates has roots in its historically strong government in resource allocation and culturally strong concerns for the wellbeing of posterities as well as society as a whole (Ma 2019; Zheng and Wang 2014).

The gradual deregulation, marketization and privatization of small and medium-sized SOEs in China since 1978 made it possible to provide adequate incentives (m_t) to motivate entrepreneurs and managers, to reduce transaction costs and to improve the transformation efficiency α_t . Moreover, China's government has proactively intervened in economic activities by imposing measures and regulations that benefit enterprises and (institutional) investors at the expense of savers, taxpayers, and ordinary residents. The expected outcome of a transaction or a project is the most important determinant of whether it will be carried out. The government often imposes unfavourable transaction terms on the counterparties of business developers, which motivates business developers, reduces their transaction costs, increases their expected profits, and helps them start more business development projects. Ordinary households are usually happier during the early paradigm-changing process, because their absolute incomes increase substantially although their proportion of income in the GDP decreases.

Improving performance P_t involves speedy implementation and efficient use of resources. China's government can usually speed up implementation by pushing through development projects despite strong opposition from residents affected by the projects.

Since 1978, the government has become more and more pro-business especially in supporting housing developers, FDIs, large SOEs and high-tech firms (Dean, Browne, and Oster 2010). The CPC party organization, the government, and the mass organizations controlled by the CPC can all work together to persuade, coerce and force residents to back down from a confrontation with the local government for a government-supported business development project (O'Brien and Deng 2015). Without government involvement in pressurizing residents to accept low demolition compensation, China's housing industry would not have its phenomenal growth between 2004 and 2013. The houses whose owners rejected the low compensation offer were usually vacated and demolished by force under administrative orders from the government (Zhang 2004). From the housing industry, we can understand the logic behind China's rapid growth. Government-enforced demolition and low compensation save developers' time and production costs and increase their profits, which give developers more incentive to expand.

Pro-growth authoritarian governments can forcibly raise national saving rates and stimulate economic growth by increasing the share of the GDP received by capital and entrepreneurs, keeping interest rates below the MPK and suppressing the demand for higher wages from ordinary workers (Ma 2017). Military dictatorships in Latin America during 1960–1970s and East Asian tigers during 1960–1990s all achieved some kinds of growth miracle (Krugman 1994). South Korea and Taiwan, both of which had long-period authoritarian regimes, had the highest growth rates with their economies growing 30-fold (in purchasing power parity) between 1950 and 2016. Mainland China has grown nearly 20-fold, whereas Hong Kong, Singapore and Japan have grown more than 10-fold from much higher levels than China (Figure 1). Hong Kong's success shows that in order to have rapid growth, the government only needs to provide law and order for markets to operate effectively and to implement pro-business policies. Entrepreneurs and enterprises will find the optimal investment opportunities without guidance from the government.

Different approaches to improve performance P_t can have different long-term outcomes. Both the former Soviet Union and China had achieved fast economic growth under central planning, if the negative impacts of China's political movements and economic mismanagement have been taken into account (Borensztein and Ostry 1996; Davies et al. 1994; Nove 1961). The Soviet Union had been the fastest-growing major economy in the world between 1920 and 1950, and second only to South Korea in growth rate between 1920 and 1989 before it began to disintegrate in 1990 with the declaration of independence by Lithuania (Figure 2). The Soviet and Russian economy stagnated after 1978 when their per capita GDP approached 15,000 USD to 20,000, USD whereas the four Asian tigers continue to grow strongly after their per capita GDP exceeded 20,000. USD It seems that central planning is good at speedy implementation and weak at efficient use of resources, while market economy, even under authoritarian regimes, could be more efficient. The inefficient use of resources, which includes the failure to take advantage of local talents, local initiatives, richness and salience of local information, and timeliness of local decision-making, makes centrally planned economies enter their normal growth at a lower per capita GDP level than market economies. It also makes centrally planned economies lack efficiency during their normal growth. China's current economic system sits somewhere between a centrally planned economy and a market economy, so without further reform to optimize its market mechanism, it would share the lack of efficiency to some extent during its normal growth in the future.

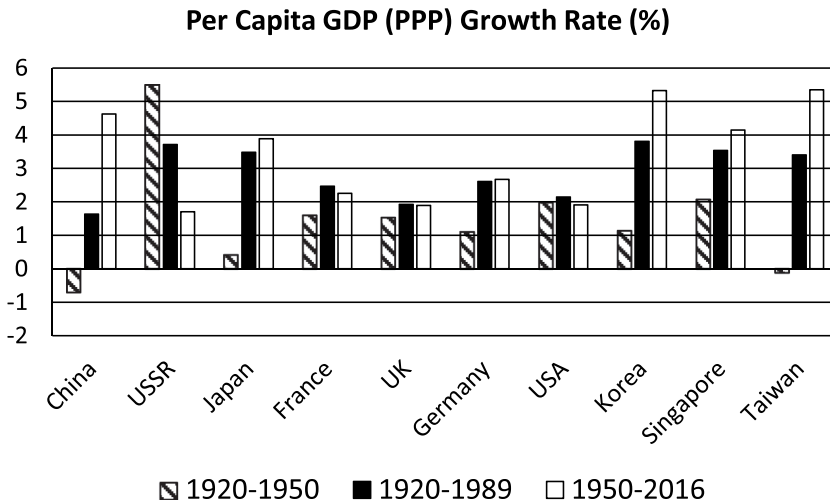


Figure 2. The per capita GDP (in 2011 constant international dollars) growth rates of mainland China, the Soviet Union (USSR), Japan, France, the United Kingdom (UK), Germany, the United States (USA), South Korea, Singapore, and Taiwan during 1920–1950, 1920–1989 and 1950–2016, computed based on Maddison’s database (Bolt et al. 2018). The Soviet Union had the highest growth rate during 1920–1950 and the second highest during 1920–1989 among these economies.

5. Social stability and its institutional causes in China

To ensure that high saving rates and low transaction costs for business will lead to high growth rates, the society needs stability. Economy cannot grow in anarchy, so some forms of law and order need to exist for economy to grow. The longer a society stays stable the more likely its economy has a higher level of productivity. Wars and social upheavals are often the major destroyers of capital stock in an economy (Anderson and Marcouiller 2005; Kang and Meernik 2005). China’s real GDP per capita decreased from 854 USD in 1820 to 637 USD in 1950 (Bolt et al. 2018), because frequent social unrests and wars interrupted economic growth and destroyed capital stock. The CPC’s victory in 1949 brought in the longest peace period in the past 200 years, which provides the social stability for economic growth.

5.1. Social stability and economic growth

Social stability promotes economic growth by reducing transaction costs, increasing business confidence in investment, and decreasing uncertainty, but the relationship between social stability and economic growth is a complicated one. While economic difficulties often bring about political changes, rapid economic growth may also cause political instabilities. When the majority of ordinary people feel that the pro-business and pro-growth policies mainly benefit the elites and enterprises, they would become discontent with the government and want to have a larger share of the increase in national wealth. Popular discontent may lead to political upheavals and the overthrow of government. Many authoritarian regimes could not sustain their pro-growth policy, because they have to abandon or modify their pro-business and pro-growth policy to placate the

disenchanted masses. Abandoning pro-business policy due to either regime change or policy change would scupper the rapid economic growth.

China's phenomenal growth depends on both institutions that ensure strong performance in implementing economic growth objectives and institutions that maintain social stability. The CPC leadership is fully aware of the importance of maintaining social stability to China's economic growth. On 26 February 1989, Deng Xiaoping told US President George W. Bush, 'The overriding problem in China is the need for stability'. Later he emphasized that 'stability overrides everything'. Maintaining stability has become a fundamental policy of the CPC leadership since then. China's budget for maintaining stability is over CNY 760 billion in 2013, and it has been higher than China's defence budget in recent years (Wang and Lin 2014; Cao 2018). The budget for maintaining stability in 2019 is estimated to be nearly CNY 1.4 trillion (Qiao 2019).

5.2. The CPC organizations as a society-stabilizing factor

The ubiquitous existence of the CPC organization are essential to maintaining social stability. The CPC views its organization building with vital importance. Every village in rural areas, every company in the armed force and every factory with three or more CPC members would have a party branch. Governments at different levels are all the executor of decisions made by the CPC Central Committee and local committees. The CPC has also set up mass organizations for various groups of people, such as youth, women, workers, peasants, and literary and art circles. Those organizations are closely guided and led by the CPC leading group within them.

The CPC membership is essential for career progression in public sectors and it also brings economic benefits to private entrepreneurs (Li et al. 2007). All cadres in government offices and SOEs and officers in the armed force were appointed from the CPC members, except some ceremonial positions held by members of the so-called democratic parties which were established before 1949 and aligned with the CPC in opposition to the KMT government (Brødsgaard 2012). The CPC organization follows the Leninist principle, which requires the entire party to obey the party leadership; all members must align themselves with the Central Committee ideologically, politically and operationally. These organizational arrangements ensure that the objective set by the government can be carried out speedily.

The unity of the CPC organization under its Central Committee enables the CPC leadership to promote economic growth by raising saving rates, reducing social welfare and letting entrepreneurs and managers get rich first. Oppositions to its policy can be suppressed or dealt with at their beginning. In democracies, popular votes would have forced ruling parties to implement more social welfare and labour protection regulations which may undermine economic growth by decreasing saving rates. During the COVID-19 pandemic, the government in China acted quickly to lockdown the country after initial delay in Wuhan, and soon gets the disease under control, which shows the strong implementation performance of China's government. In western democracies, opposition from some groups in the society could slow down or delay government's decision on the pandemic prevention measures, which may exacerbate the pandemic situation.

Although social stability in politically centralized countries such as the former Soviet Union and China can promote economic growth during their paradigm-changing growth,

the uniformity of the society enforced by their governments is not conducive to innovation and entrepreneurship, especially during their normal growth. Innovation and entrepreneurship depend more on the diverse opinions and unconventional thinking. The economic stagnation of the former Soviet Union and East European countries illustrates this. The capacity of the CPC to mobilize national resources could also lead to economic disasters such as the widespread famine in 1960–1962 following the Great Leap Forward, when its leadership mismanaged the economy.

5.3. The leadership status of the CPC in China and political campaigns

Some scholars consider the leading status of the CPC a key factor in China's rapid economic growth (Hu 2011). The legitimacy of the CPC's leading role in China like almost all earlier governments in China came from its victory over opponents in civil wars. After the establishment of the People's Republic of China, the CPC led by Mao Zedong launched over fifty nationwide political campaigns between 1950 and 1976, to transform the society and remould individual's ideology in order to consolidate its control of the country. These campaigns were intended to cleanse people considered not loyal to the CPC government and remould people into 'new socialist persons' loyal to the CPC. These campaigns strengthened the leadership status of the CPC and made its organization more efficient in controlling the country.

These political campaigns had profound impacts on the Chinese people. It was estimated that between one and two million landowners and rich peasants were beaten to death by activists or executed by the government in the Land Reform movement in 1950. In the Suppression of Counterrevolutionaries movement between 1950 and 1953 seven hundred thousand to one million people were executed as counterrevolutionaries. The Intellectual Ideological Transformation movement during 1951–1952 made Chinese intellectuals comply willingly with the CPC ideology. The Anti-Corruption, Anti-Waste and Anti-Bureaucracy ('Three Antis') movement and the Anti-Bribery, Anti-Tax Evasion, Anti-Stealing State Property, Anti-Jerry Building and Anti-Stealing State Economic Intelligence ('Five Antis') movement during 1951–1952 caused 133,760 unnatural deaths and disgraced the bourgeois in cities. The Anti-Rightists movement in 1957 labelled over 550,000 people 'rightist', and most rightists were stripped of their jobs and sent to labour camps or countryside to be reformed under supervision. In the Cultural Revolution during 1966–1976, over 4.2 million people had been locked up for investigation of their alleged mistakes, more than 1,728,000 died of unnatural causes, and 135,000 people were executed as counterrevolutionaries.

What is the relationship between China's rapid growth and Mao's political campaigns? Firstly, Mao's political campaigns and economic mismanagement delayed the growth China should have during its 26 years peace and increased the gap between China and the advanced economies. This increased backwardness implies a higher potential catch up growth rate and a longer catch up growth period for China after 1976. Secondly, the fear of government created by Mao's political campaigns made it easier for the post-Mao leadership to push through business development projects without worrying too much about civil unrests and political opposition.

Some economists may ask, if the fear of government created by Mao's political campaigns contributes to post-Mao social stability and economic growth, why it failed

to do so during Mao's time? There are two causes: 1) Mao not only created the fear, but also prohibited entrepreneurship, which explains post-Mao China's economic success because the post-Mao leadership initially tolerates and then encourages entrepreneurship; and 2) Mao's political campaigns affected productive activities more widely and more severely than Stalin's Great Purge and Mao also mismanaged the economy through economic campaigns such as the Great Leap Forward, which explains the economic success of the Soviet Union under Stalin. Taiwan under Chiang Kai-shek, South Korea under Park Chung-hee, and Chile under Pinochet all had economic growth miracles, because these dictators also encouraged entrepreneurship.

5.4. Chinese culture in ensuring social stability and high saving rate

Many people outside China may wonder why Chinese people have tolerated government's pro-business practice especially in the case of forced demolition for new housing development projects. The popular obedience and tolerance can largely be understood from China's history and culture. China had been a centralized autocratic country for over 2000 years and Chinese people had to bear heavy economic exploitation and political suppression during this long history. The Chinese culture, especially Confucianism which advocates respect and obedience to the monarch, the parents and the superiors (Waley 2012), has also helped the CPC and other ruling classes in history maintain social stability.

Confucianism also requires parents to be affectionate and monarchs to be beneficent and virtuous. In Confucian view, if monarchs behave well in virtuous ways, ordinary people will follow their suit and crimes will largely disappear. However, the ruling classes promote more heavily the side of Confucianism that calls for obedience to monarchs, superiors and parents (Shun 1997). Confucian teaching had been an important stabilizer of Chinese society, which seemed more stable than other societies under the same social and economic conditions. Confucianism helped the dynasties in history enforce their will over ordinary Chinese people and made governance relatively smooth.

Confucianism preaches conscientious and rigorous working ethics. Although Confucianism regards learning the highest and praises people who are still optimistic under destitute conditions, it does not oppose commerce and merchants. Zigong (520–456 BC), one of the famous disciples of Confucius, was a very successful and rich merchant (Waley 2012). Confucianism thinks that it is normal for decent people to desire wealth, but wealth should be gained via proper means. Kahn (1979) thinks that the Confucian ethic was playing a 'similar but more spectacular role in the modernization of East Asia than the Protestant ethic played in Europe'.

China's high saving rate is caused by its culture of hardworking and thrifty as well as its economic policies (Garon 2011). The culture of hardworking and thrifty arose partly from the natural environment which requires hard farming for food and partly from the economic and political traditions. The hardship for ordinary people to make a living and Confucian teaching of moderation in spending cultivated the tradition of hardworking and thrifty. This is also true in other East Asian Countries such as Korea and Japan.

6. Conclusion

In this TOPS framework, fast growth in a relatively long period can only be achieved during the paradigm-changing growth stage. As China grows from a low-income to an upper-middle-income economy, it will soon enter the normal growth stage and its growth rate will drop significantly. During the paradigm-changing growth, an economy's growth rate is primarily determined by its capacity to maintain high saving rates as well as social stability. Higher saving rates imply less consumption to clear the domestic market, so that high saving and fast growing countries have to either export massively or invest in heavy industry massively. Japan, Asian tigers and post-Mao China adopted export-led growth, while the former Soviet Union chose to prioritize heavy industry. One severe shortcoming of prioritizing heavy industry is insufficient consumer goods in terms of their income level. Since low-income economies lack capital and heavy industry is capital intensive, entrepreneurs would naturally prioritize labour-intensive consumer goods industries in a market economy.

The TOPS framework also implies that central planning and authoritarian governments can be more capable than democracies in achieving high saving rates, because the desire of ordinary people to live a better life now has a smaller influence on authoritarian decision making. Authoritarian leaders usually stay in power for much longer than those democratically elected, so they can maintain policy stability and social stability by force for a relatively long period. However, as exports cannot grow faster than the importing economies in the long-run (Ma 2017), an export-oriented economy's saving rate has to decrease eventually to boost domestic consumption in order to clear market and sustain a slower economic growth. A heavy industry-oriented economy will also reach the point where more machines cannot add more output and the economy has to decrease saving rates and increase production of consumer goods. Moreover, persistent higher saving rates and pro-business policies demotivate ordinary people when they feel that they get too small a share of the wealth created, which would lead to either less effort in production or political instability.

In the TOPS framework, although central planning and imposing pro-business transaction terms by authoritarian governments could speed up implementation of development plans, they tend to use social resources inefficiently and create more negative externalities compared with market solutions. Bargaining in market and consultation in democracy increase transaction costs and slow down implementation of development plans in the short-run, but they reduce confrontation between opposing groups by reaching compromise and increase efficiency in using social resources in the long-run, thereby market economies under democracy outlast centrally planned economies in the Soviet Union and Eastern Europe. Since 1978, China's government has implemented more and more pro-business policies and pushed through business development projects often at the expense of local residents and environment, which caused huge income inequality and severe environmental pollution. As China tries to move from an upper-middle-income to high-income country, it has to address issues such as income inequality and environmental pollution caused by overemphasis on speed.

Social stability maintained by suppressing different opinions and prohibiting oppositions is to postpone instability rather than to solve problems that would cause instability. Suppression of different opinions might lead to government interference in business activities, demotivate participants in the economy and decrease the efficiency to transform savings into capital stock. The demotivation and low transformation efficiency will become more apparent when the paradigm-changing is nearly completed, causing stagnation of centrally planned

economies such as the former Soviet Union before they catch up with high-income economies. To overcome these negative effects, an economy under authoritarian systems needs to increase the role of market and the participation of ordinary people in decision-making processes. Korea and Taiwan have successfully transformed from authoritarian regimes to modern democracy after they became upper-middle-income economies.

In short, the growth rate of an economy is determined by its level in the technological progress path, its objective set by the society as a whole or its ruling elites, its performance in implementing its objective, and its social stability in the long-run, which has been described as the TOPS framework in this study. China's rapid growth can be understood as the achievement of a social planner who wants to maximize the country's sustainable growth rate and has motivated people to work hard toward the objective, demonstrated strong performance in implementing its objective, and successfully maintained social stability. The authority of the CPC, obtained from its victory in the civil war with the Nationalist government and many political campaigns, has enabled it to maintain social stability, reduce monetary costs and bargaining time for enterprises, and sustain a high level of national saving and investment over a long period. The Confucian culture has also helped stabilize the society and encouraged self-reliance and entrepreneurship. Socio-political changes caused by economic growth might affect the capacity of these institutions to promote economic growth in future. This paper presents a framework for understanding economic growth especially China Miracle, but more work is needed to solve the optimization problem.

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