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TAX REVENUE, GOVERNMENT EXPENDITURE, GDP, AND BUDGET DEFICIT OF CHINA

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Abstract

This study investigates the relations among China's tax revenue, government expenditure, budget deficit, and gross domestic product (GDP). The tax revenue is divided

into direct and indirect taxes, while the government expenditure is divided into economic, social, and service expenditures. This study's findings show significant relations among the direct tax, indirect tax, economic expenditure, social expenditure, service expenditure, GDP, and the budget deficit of China from 2000 to 2018. Direct tax and indirect tax have a significantly positive impact on the GDP. In contrast, indirect tax, economic, and social expenditure significantly affect the budget deficit.

Keywords: Tax revenue; Government expenditure; GDP; Budget deficit; China

Introduction

Over two decades, China's budget deficit is invariably growing except for a small surplus in 2007. The budget deficit smoothly increases from 1997 to 2002 but slowly decreases from 2003 to 2008. In 2009, the budget deficit rapidly rose (778 billion yuan). The increase in the budget deficit slowed down in 2010 and 2011. However, the budget deficit rises rapidly again from 2012 to 2016. In 2018 the budget deficit increased to 3076.3 billion yuan. Meanwhile, China's gross domestic product (GDP) growth rate has remained between 7% and 8% since 2012. The weak GDP growth and strong budget deficit growth increase the deficit-to-GDP ratio. The ratio for 2017 and 2018 is 3.8% and 3.7%, respectively, which surpasses the international warning standard of 3%.

An increasing budget deficit inevitably damages the economic development of a country (Pei, 2013) and likely causes the long-run unbalanced development of customer demand and investment demand (Chen, 2014). The budget deficit significantly increases with the debt risk of the government (Zhang & Zhang, 2019). The economic growth of a country is related to the population growth, saving rate (Mankiw & Weil, 1992), human capital (Fleisher et al. 2010), and social capital (Rupasingha et al. 2002). The government's fiscal policies play an important role in economic growth (Turnovsky & Sen 1991).

The Chinese government implements a series of reforms in the tax revenue and expenditure assignment to keep GDP increasing and reduce the

budget deficit. There have been three principal stages of tax mechanisms in China since 1949. From 1949 to 1978, the first stage is a period of minimalist tax mechanisms with only six main tax categories. The indirect tax makes up more than 80% of tax revenue. The tax revenue consists of only 47% of the government revenue. Other government revenue comes from the state-owned enterprises' disposable profits (SOEs). The second stage, from 1978 to 1994, was a period of multiple tax mechanisms dominated by the indirect tax and supplemented by the direct tax. The government adopts a series of measures, such as replacing profit delivery with taxes and reforming industrial and commercial tax mechanisms. Accordingly, the SOEs pay corporate income tax. The proportion of the direct tax to the tax revenue arises to 34% in 1985.

The third stage, from 1994 to the present, is a period of the indirect tax mechanism dominated by the value-added tax (VAT) and supplemented by the domestic consumption tax and business tax (BT). After the 1994 tax reform, the value-added and business taxes became two primary taxes in China, making up more than 40% of tax revenue. Moreover, the total numbers of tax categories reduce from 32 to 18. Recent tax reform is the VAT reform to replace all business tax with the value-added tax. The trial implementation of VAT reform results in about 6412 billion yuan of tax cuts from 2012 to 2015. The official implementation of VAT reform led the proportion of direct tax to tax revenue to be 30.5% and 31.5% in 2017 and 2018, respectively.

Although the Chinese government has implemented a series of tax reforms since 1949, the dominant function of indirect tax remains unchanged. The indirect tax provides a stable and substantial source of tax revenue for the Chinese government. However, the tax revenue remains insufficient to finance the budget deficits. The deficiency of tax revenue in China mainly results from the low level of direct tax revenue. Therefore, the government should gradually increase the proportion of direct tax to tax revenue (Research Group, Institute of Scientific Research on Taxation, State Administration of Taxation, 2004).

An important issue is whether the direct and indirect taxes decrease with the budget deficit and increase with

economic growth. The mechanisms of government expenditure in China are broadly separated into three stages too. In the first stage, from 1949 to 1978, the government expenditure served the planned economy. Most government expenditure directly contributes to economic development, especially in industrialized construction. In the second stage, from 1978 to 2006, the government expenditure mechanism tends to the marketization and the development of private sectors. The proportion of economic expenditure to total government expenditure falls rapidly from 68% in 1978 to 26% in 2006, while the ratio of total government expenditure to the GDP declines from 30% in 1978 to 18% in 2006. On the contrary, the proportion of social and service expenditures to total government expenditures increase rapidly.

From 2006 to the present, government expenditure increases rapidly in the third stage. Due to the global financial crisis and the slow economic growth of China, the government has increased investments in the economy. The proportion of economic expenditure to total expenditure then increased to 33% in 2016, almost the same as in 2000. Moreover, the education expenditure on general public services has become the largest government expenditure since 2009. In 2016, the two largest expenditures among the government were the education expenditure and expenditure on the social safety and employment effort, which total up to more than 25% of the total expenditure. The significant increase in budget deficit results in an important issue: whether the increase in government expenditure contributes to economic growth or just a largely fiscal imbalance.

This study investigates the impact of tax revenue and government expenditure on economic growth and the budget deficit in China from 2000 to 2018. The empirical results show that social expenditure and indirect tax significantly impact the budget deficit. Both direct tax and indirect tax have a significant influence on the economic growth in China. A consistent framework of this study is first applied to examine the relationship among the tax revenue, government expenditure, budget deficit, and economic growth in China. The findings of this study seem to provide helpful suggestions for improving the tax revenue and government

expenditure mechanism. The Chinese government should simultaneously maintain the current scale of the indirect tax and increase the direct tax. The government should also improve the financial expenditure efficiency and avoid excessive economic and social expenditures.

Literature Review and Hypothesis Development

Theoretical Literature Review

The tax is a mandatory financial charge or levy imposed upon a taxpayer (an individual or other legal entity) by a governmental organization. The tax is the main source of government revenue. Ruml (1946) explains that the government imposes a tax for four purposes: (1) as a fiscal policy to stabilize the purchasing power of the currency; (2) as a public policy to distribute wealth and income; (3) as a public policy of subsidizing or penalizing various industries and economic groups; and (4) to isolate and assess directly the costs of national benefits. The tax revenue is divided into direct tax and indirect tax. Atkinson (1977) indicates that the direct tax appears to be adjusted to the individual characteristics of a taxpayer. In contrast, the indirect tax is levied on the transactions irrespective of buyer or seller.

In China, the indirect tax comprises domestic value-added and domestic consumption tax, while the direct tax includes the personal and corporate income tax. The Nation Bureau of Statistics in China shows that the sum of domestic value-added tax and domestic consumption tax was 6,960,040 million yuan in 2018, suggesting that more than 59% of tax revenue came from the indirect tax in 2018, while the direct tax composed more than 40% of government revenues.

In China, government expenditure includes agriculture, transportation, education, science and technology, culture, sport and media, social safety, medical and health care, general public services, national defense, and public security. Guo, Liu, and Li (2018) separate government expenditures into expenditures for public goods, technical progress, and transfer payment. Du (2018) divides government expenditure into people's livelihood, economic construction, social security, health care, cultural and educational development,

and public services.

The Organisation for Economic Co-operation and Development (OECD) defines the GDP as an aggregate measure of product equal to the sum of gross values added for all private and public units engaged in the product. The GDP is an estimated point for the economic development of a country and a gauge of the national living level. A series of economic reforms since 1978 has resulted in rapid economic growth in China. The GDP in China has risen tenfold.

Over the period 1978-2012, the increase rate of China's GDP is between 9.5% and 11.5% per year. After 2012, China's GDP growth remains between 7% and 8%. Chen, Quan, and Liu (2013) have found three phases in China's economic development since the late 1980s. Before the mid-1990s, China's GDP is controlled by political activities. After 1995, China's economic growth is mainly driven by domestic factors. After 2006, China's economy developed a new phase of greater volatility influenced by global factors.

The budget deficit results from government expenditures exceeding government revenue. Ding (2016) indicates that the high deficit rate weakens fiscal revenue growth. The weak economic growth decreases with the tax revenue. However, Qi and Li (2018) illustrate that the government should reduce the budget deficit rate because of the faster-than-expected nominal GDP growth. 2018 the budget deficit rate dropped to 2.6%, the first decline since 2012.

Empirical Literature Review

Prior studies indicate that the tax positively affects the national economy. Srivastava, Sharma, and Bhatnagar (2010) find a positive relation between tax revenue and GDP in India. Wei and Yang (2006) demonstrate a Granger causality and a distinctly mutual promoting relation between the fiscal revenue and the GDP in China. Capolupo (2000) conclude a positive relation between the tax and the economy.

In addition, Liu and Ma (2002) conclude that the tax revenue negatively impacts China's economy for investment, labor supply, and total factor productivity (TFP). The different tax has a diverse

impact on economic growth. The capital gains tax and labor tax have an adverse impact on China's economic growth, while the consumption tax positively impacts economic growth. Wang and Yang (2006) find that the capital gains tax significantly reduces the per capita GDP growth rate, unfavorable to China's economic growth. The labor tax has an insignificant impact on the per capita GDP growth rate. Still, the consumption tax significantly increases the per capita GDP growth rate, which is conducive to economic growth.

A few previous studies show that government expenditure benefits economic growth. By investigating 115 countries from 1960 to 1980, Ram (1986) finds that compared to private investment, and government expenditure is more positively related to economic growth. Zhang and Chen (2005) empirically find that China's fiscal expenditure benefits economic growth and marginal productivity.

However, Grier and Tullock (1989) find that government consumption growth is significantly and negatively related to the economic growth of 113 countries. Barro (1990) finds a negative relation between government expenditure and economic growth rate for 98 countries between 1960 and 1985. Talpos, Avram, and Hetes (2013) illustrate that government expenditure has an alternating influence on the GDP. The relationship between government expenditure and GDP turns positive to negative for the European Union.

Lin and Zhuo (2012) indicate that infrastructure expenditure significantly negatively impacts the overall economic growth in China from 1995 to 2006. Such an impact is significantly positive in the east of China but negative in central-western China. In addition, there is an insignificantly negative relation between spending on public services and the economic growth rate. Zhu and Zhong (2008) indicate that the impact of different government expenditures on the economic growth rate has regional differences, including East, middle, and West China from 1997 to 2004.

The budget deficit results from government expenditure exceeding government revenue. Previous studies indicate an inverse relation between tax revenue and budget deficit. Bildirici and Coşar (2005) empirically find a signifi-

cantly positive relation between the budget deficit and the indirect tax from 1985 to 2003. Li and Zhu (2016) reveal that the indirect tax decreased with the budget deficit in China from 1996 to 2011. Chen and Li (2017) suggest that the relation among the value-added tax, business tax, government expenditure, and budget deficit is significant at the 5 percent level. Replacing the business tax with a value-added tax causes massive tax cuts and a substantial increase in the budget deficit.

Furthermore, Alesina and Ardagna (2010) find that the fiscal adjustments based on spending cuts and no increase in tax are more likely to reduce the budget deficit and debt over the GDP ratio than those based on the tax increase for the OECD countries from 1970 to 2007. Zhao and Han (2014) illustrate that the budget deficit caused by the budget expenditure expansion increases with the inflation effect.

Hypotheses

This study examines the relationship between China's tax revenue, government expenditure, budget deficit, and economic growth. This study establishes and investigates the following hypotheses based on the above statement.

H1: There are significant relations among the direct tax revenue, indirect tax revenue, economic expenditure, social expenditure, service expenditure, GDP, and budget deficit of China.

H2: Direct tax revenue, indirect tax revenue, economic expenditure, social expenditure, and service expenditure are significantly related to the GDP of China.

H3: Direct tax revenue, indirect tax revenue, economic expenditure, social expenditure, and service expenditure are significantly related to the budget deficit of China.

Methodology

Sample selection

The data used in this study is collected and coordinated by the National Bureau of Statistics of China. The sample period is from 2000 to 2018, which covers 19 years.

Variables definitions

The classifications of revenue and expenditure accounts were adjusted largely in 2007. The government expenditure account has adopted the new classification since 2007. Based on Liu (2008), government expenditure is separated into economic, social, and service expenditures.

Table 1. Comparison of classification before and after adjustment in 2007

	2000-2006	2007-2018
Economic Expenditure	Expenditure for Capital Construction Additional Appropriation for Circulating Capital of Enterprises Innovation Funds and Science and Technology Promotion Funds Geological Prospecting Expenses Operating Expenses of the Departments of Industry, Transport and Commerce Expenditure for Supporting Rural Product	Expenditure for Environment Protection Expenditure for Urban and Rural Community Affairs Expenditure for Agriculture, Forestry and Water Conservancy Expenditure for Transportation
Social Expenditure	Expenses on Culture, Education, Science and Public Health Expenditure for Pension and Social Welfare Expenditure on Policy-related Subsidies	Expenditure for Education Expenditure for Science and Technology Expenditure for Culture, Sport, and Media Expenditure for Social Safety Net and Employment Effort Expenditure for Medical and Health Care
Service Expenditure	Expenditure for National Defence Administrative Expenses	Expenditure for General Public Services Expenditure for Foreign Affairs Expenditure for National Defense Expenditure for Public Security

Table 2 details the variables of this study.

Table 2. Variables definitions

Variables	Code	Definition
Economic Expenditure	Expec	Expenditure for economic construction and development
Social Expenditure	Expso	Expenditure for benefits with a social purpose
Service Expenditure	Expse	Expenditure for public services
Direct Tax Revenue	DT	The sum of personal income tax and corporate income tax
Indirect Tax Revenue	IDT	The sum of domestic value-added tax, business tax, domestic consumption tax and tariffs
Gross Domestic Product	GDP	The final value of goods and services produced
Budget Deficit	BD	The difference between government revenue and government expenditure

Research Model

To identify the impact of direct tax revenue, indirect tax revenue, economic expenditure, social expenditure, and service expenditure on the GDP of China, the regression model (1) is established and estimated as follows:

$$Y = \beta o + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \beta 5\ X5 + \varepsilon i$$

To identify the impact of direct tax revenue, indirect tax revenue, economic expenditure, social expenditure, and service expenditure on the budget deficit of China, the regression model (2) is established and estimated as follows:

$$Y1 = \beta o + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \beta 5\ X5 + \varepsilon i$$

where Y = Gross Domestic Product Changes; Y1 = Budget Deficit Changes; βo = Constant; β1 = Direct Tax Revenue Changes Slope; β2 = Indirect Tax Revenue Changes Slope; β3 = Economic Expenditure Changes Slope; β4 = Social Expenditure Changes Slope; β5 = Service Expenditure Changes Slope; X1 = Direct Tax Revenue Changes; X2 = Indirect Tax Revenue Changes; X3 = Economic Expenditure Changes; X4 = Social Expenditure Changes; X5 = Service Expenditure Changes; And εi = Random Error

Results

Graphical Analysis

The untabled reports show three main peaks for the budget deficit curve. The budget deficit has risen since 2007, declined slightly from 2009 to 2011, then risen from 2012 to 2013, and has shown a faster growth rate since 2014. The GDP has risen slower since 2012 because of China's slow economic development. Furthermore, the direct tax has slowly risen compared with the indirect tax. Social expenditure has a higher growth rate than economic and service expenditures. Each expenditure tends to increase from 2000 to 2018, particularly education. The education expenditure is also the largest in the government since 2009. In 2013 the expenditure for the social safety and employment effort exceeded the expenditure on the generally public services, which became the second largest expenditure among the government expenditure. The value-added tax (VAT)

was always the largest expenditure among taxes from 2000 to 2018, followed by the corporate income tax. VAT and corporate income tax total up to 61% of tax revenue. The value-added tax fell from 19312 yuan in 2015 to 0 in 2018 as the VAT reform was implemented officially in 2016.

Descriptive Statistic Analysis

Table 3. presents the descriptive statistics for the GDP, budget deficit, direct tax revenue, indirect tax revenue, economic expenditure, social expenditure, and service expenditure of China from 2000 to 2018, in billion RMB as a monetary unit. Compared with the difference between the government expenditure and tax revenue, the mean value of the budget deficit is small as the budget deficit of China has unchanged from 2000 to 2007 and declined slightly from 2009 to 2011. The direct tax revenue is much smaller than the indirect tax. The mean of direct tax revenue is smaller than that of economic, social, and service expenditures. Social expenditure is the highest among the three kinds of expenditure. The mean value of the social expenditure is 40% larger than the economic expenditure and 70% larger than the service expenditure. The Chinese government should control the high-growth government expenditure, especially social expenditure.

Table 3. Results from descriptive statistics

	Mean	Minimum	Maximum	SD
GDP	384410.300	100280.100	827121.700	240763.239
BD	8356.372	-1540.430	30763.000	9545.430
DT	18034.349	1659.270	44076.900	13427.962
IDT	35503.368	8030.720	69600.400	21771.270
Expec	22813.497	4036.270	55838.500	18125.638
Expso	31916.186	5296.730	80350.000	25151.690
Expse	18680.904	2995.120	40372.200	12276.095

Correlation Analysis

Table 4 presents the correlation coefficient and significance among the GDP, budget deficit, direct tax revenue, indirect tax revenue, economic expenditure, social expenditure, and service expenditure. All coefficients are larger than

0.8 with the significance at the 1% level, indicating significantly linear relations among the government expenditure, tax revenue, GDP, and budget deficit. Moreover, the GDP and budget deficit statistically increase with the government expenditure and tax revenue.

Table 4. Results from correlation analysis

	GDP	BD	DT	IDT	Expec	Expso	Expse
GDP	1						
BD	.870**	1					
DT	.998**	.889**	1				
IDT	.995**	.825**	.987**	1			
Expec	.991**	.914**	.992**	.980**	1		
Expso	.996**	.907**	.997**	.984**	.997**	1	
Expse	.989**	.824**	.984**	.989**	.967**	.977**	1

Note: * indicates significance at the 5% level, ** indicates significance at the 1% level

Regression Analysis

Table 5 shows the regression results. The adjusted R^2 value is 0.890, while the F-test value is 28.503, with significance at the 1% level, indicating that the multivariate model has a respectable fit. The direct and indirect tax coefficients are 6.774 and 4.628, respectively, with significance at the 1% level. The findings suggest that the GDP increases by 6.774 billion RMB and 4.628 billion RMB separately when the direct and indirect taxes increase by 1 billion RMB. The tax revenue significantly increases with the economic growth of China. A good tax policy appears to stimulate economic development in China.

Moreover, the direct tax coefficient is larger than the indirect tax, indicating that the direct tax plays a better role in promoting economic growth. The Chinese government should increase the direct tax. On the other hand, government expenditure has an insignificant impact on the GDP, likely because of inefficient use of government expenditure. The Research Group, Institute of Economy, National Development and Reform Commission (2014) reports that the lack of a standardized fiscal supervision mechanism

likely leads to inefficient use of government expenditure. Compared with the strict inspection of public revenue, government expenditure is short of daily supervision and under less scrutiny. The government uses the funds without valid control and supervision. The bad results, such as squandering, embezzling, and arbitrary decisions during the use of funds, easily appear.

Table 5. Results from regression analysis

Variables	Coefficient
△DT	6.774** (3.203)
△IDT	4.628** (3.402)
△Expec	-1.161 (-0.984)
△Expso	2.445 (1.728)
△Expse	1.009 (0.785)
Adjusted R-Squared	0.890
F	28.503**

Note: Dependent variable is △GDP. The t-value is inside brackets.
* indicates significance at the 5% level, ** indicates significance at the 1% level

Table 6 shows the results of the multivariate regression analysis. The adjusted R^2 and F-test values are 0.866 and 23.056, with the significance at the 1% level, respectively, indicating that the regression model has a respectable fit. The coefficient for the direct tax is -1.013, with the significance at the 5% level, while the coefficients for the indirect tax, economic expenditure, and social expenditure are -1.527, 0.783, and 1.280 at the significant level of 1% separately. The results suggest that the budget deficit decreases by 1.013 and 1.527 billion RMB, respectively, when the direct and indirect taxes increase by 1 billion RMB. The budget deficit increases by 0.783 and 1.280 billion RMB separately when economic and social expenditures increase by 1 billion RMB. The budget deficit results from government expenditure exceeding government revenue. The budget deficit increases with the government expenditure or decreases with the tax revenue. Compared to the direct tax, the indirect tax has a better performance in reducing the

budget deficit as the indirect tax provides a stable and abundant capital source for the Chinese government. The indirect tax levies on almost every goods and services easily. From 2000 to 2018, social expenditure is always the largest government expenditure, with a stable proportion of 40%-45% of the total expenditure. Social expenditure has a much more effective impact on the budget deficit increase. Accordingly, the government should desperately reduce government expenditure, especially social expenditure, to decrease the budget deficit.

Table 6. Results from regression analysis

Variables	Coefficient
△DT	-1.013* (-2.750)
△IDT	-1.527** (-6.449)
△Expec	0.783** (3.813)
△Expso	1.280** (5.196)
△Expse	-0.235 (-1.052)
Adjusted R-Square	0.866
F	23.056**

Note: Dependent Variable is △BD. The t-value is inside the brackets
* indicates significance at the 5% level, ** indicates significance at the 1% level

Robustness Test

To ensure the reliability of empirical results, robustness tests are performed in this study. The gross national product (GNP) is used to replace vGDP to evaluate the dependability of regression results.

The regression analysis results in Table 7 show that direct and indirect taxes significantly impact the GNP. The regression results remain robust.

Table 7. Results from regression analysis

Variables	Coefficient
△DT	6.978**
	(3.181)
△IDT	4.832**
	(3.392)
△Expec	-2.165
	(-1.621)
△Expso	3.038
	(1.918)
△Expse	0.369
	(0.229)
Adjusted R-Square	0.880
F	25.897**

Note: Dependent Variable is △GNP. The t-value is inside the brackets
* indicates significance at the 5% level, ** indicates significance at the 1% level

Conclusion and Recommendations

Conclusion

This study investigates the relationship between tax revenue, government expenditure, budget deficit, and the GDP in China from 2000 to 2018. The tax revenue is divided into direct and indirect taxes, while the government expenditure is divided into the economic, social, and service expenditures. The results reveal that tax revenue and government expenditure significantly impact the budget deficit and the GDP. Specifically, the direct and indirect taxes have a statistically positive impact on the GDP of China, suggesting that both direct and indirect taxes significantly promote the economic growth in China.

In addition, the indirect tax is significantly and negatively related to China's budget deficit. Social expenditure is significantly and positively associated with the budget deficit in China. The government should decrease social expenditure to reduce the budget deficit. There are three peaks for the 2002, 2009, and 2018 budget deficit curves, respectively. The budget deficit ratio of 2018 is 3.7% which surpasses the international warning standard of 3%.

The slow growth rate of the GDP in recent years illustrates the economy of China slipped to a lower level. The direct tax rises at a slower rate. The economic expenditure, social expenditure, and service expenditure keep increasing from 2000 to 2018, particularly the so-

cial expenditure has a high-growth rate.

Recommendations

Firstly, the budget deficit should be under control. There is a yearly budget deficit over two decades, except for a small surplus in 2007. A consistent budget deficit impedes economic development in the long term. The government should control the budget deficit and achieve a fiscal balance in the long term by keeping sufficient tax revenue and avoiding excessive social expenditure. The budget deficit in China results from the local government. The central government even creates a budget surplus. In 2018, the local government had a budget deficit of 81759 yuan, while the central government had a budget surplus of 51266 yuan. The local government tends to mega projects, resulting in the grievous over-spending and budget deficit, significant debt risk, and excessive dependence on the bank financing and the income from selling real estate. The Chinese government should strengthen the project approval process and make the projects disclose to the public to enhance transparency and accountability.

Secondly, the government should improve the tax mechanism. The tax mechanism in China is an indirect tax mechanism dominated by the value-added tax and supplemented by the domestic consumption tax and business tax. Based on consumer behavior, rich and poor people pay the same tax amount for consumption. The poor person has a greater burden than the rich one. The Chinese government should maintain the current scale of the indirect tax to ensure a stable and abundant capital source.

Meanwhile, the government should increase the direct tax. As the per capita GDP in China reached 9347 yuan in 2018, the upper-middle-income economy, the Chinese government should shift from the indirect tax mechanism to the direct tax mechanism like other developed countries, such as the United States, the United Kingdom, and Japan. The direct tax, consisting of personal and corporate income tax, significantly increases with economic growth. Meanwhile, the direct tax decreases with the debt crisis risk and increases with social equality through equitable income distribution.

However, there is a complex collection process for direct tax in China. The Chinese tax bureau should improve its management capacity and establish better accounting standards for wealth and property. The tax bureau should also supervise and review the implementation of laws and regulations on taxation. The government should severely punish those who violate tax laws or hinder tax levying. To keep the current scale of indirect tax, the government should stick to the transition policy from the Business Tax to the Value-Added Tax (VAT), extend the tax base, and create new taxes.

Finally, the government should improve financial expenditure efficiency and avoid excessive economic and social expenditures. The efficiency of expenditure in the science, education, culture, public health, and social security should be increased. To improve the financial expenditure efficiency the government can improve the performance evaluation mechanism of the financial expenditure and establish a standardised fiscal supervision system. The performance evaluation mechanism can reduce the randomness and strengthen the rationality in the process of decision-making. The government should also promote the modern procurement mechanism to improve financial expenditure efficiency. The mechanism of government procurement is an important measure for the government to manage finance payout. Establishing an open government procurement mechanism is beneficial for the fiscal balances in China.

The findings of this study show that the economic expenditure fails to create an economic effect but bumps up the fiscal burden. The government should reasonably allocate resources and reduce direct investment and market interventions. Meanwhile, the Chinese government should encourage more private enterprises to participate in administrative projects such as the infrastructure project. To decrease the financial pressure on social expenditure, the government should allow private enterprises to participate in such businesses as education. The education expenditure is the largest expenditure among the government expenditure. More than 60% of education funding is from the state (Wang & Li 2014). The proportion of the private university to the total universities in China accounts for 26%. Such a ratio is lower than the interna-

tional level. The corresponding ratio is 75 % in the United States (Liu, 2019). The Chinese government should ease the restrictions on the foundation of private universities and increase more social donations.

This study investigates the relationship between tax revenue, government expenditure, budget deficit, and GDP from 2000 to 2018. But there appear to be diverse results in different provinces. Future research is suggested to conduct a similar investigation based on the provincial data. Additionally, this study separates the tax revenue into the direct and indirect taxes and divides the government expenditure into economic, social, and service expenditures. Such a classification can be improved by adopting a more specialized method. For example, the tax revenue can be divided into value-added tax, business tax, domestic consumption tax, tariffs and income tax. A detailed classification helps to examine which tax or expenditure positively impacts economic growth and deficit reduction.

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