The Correlation between Corruption, Tax Compliance and

Tax Loss

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Abstract: The new administration has adopted a "zero tolerance" attitude toward corruption and carried out new measures to punish corruption, which was well accepted and welcome by the public. Will anti-corruption ramp improvement taxpayers' tax compliance and then reduce tax losses? Base on this hypothesis, we analyse the issue by the multiple regression method using the time series data from 2000 to 2014 in China. The empirical results show that there is a significant negative correlation between corruption and tax compliance. The less the corruption, the higher the tax Compliance of taxpayers. It means that anti-corruption system construction should continue to strengthen and perfect, it will benefit to increase the revenue as well as reduce the tax loss.

1. Introduction

As Montesquieu Wrote in the Spirit of Law: "Everyone with power is easy to abuse power, which is an immutable fact." Since ancient times, corruption is the common enemy of people and common problems of countries. In the economic sense, corruption is defined as the act of private use by a public official in violation of the rules to exploit the rights of the individual (Shliefer and Ishny, 1993), it is driven from lack of effective supervision of the contract between the public and the government officer. In recent years, quantitative and qualitative research on corruption made by international corruption indicators has made the research more accessible, such research has been continuously pushed by international organisations. International institutes and scholars are paying more attention to the impact of corruption on various fields. The report produced by the World Bank asserted that: Corruption, with destructive consequences, is not conducive to economic and social development. On one hand, corruption will worsen the system of income distribution, leading to serious inequality in income distribution, thus affecting the stability of economy. On the other hand, corruption reduces the efficiency of the government, undermines the government's correct decision, that costs public expenditures, thereby distorting the allocation of resources; In addition, corrupting undermines law and regulations, and leads to a serious loss of national prestige.

Since the Open Door Policy reform, Chin's rapid economic growth achieved a brilliant record in world's economy. The ruling ability of government officials under the leadership of the Communist Party of China (CPC) is recognised by all over the world. The Chinese model has also been highly appreciated in the world. At the same time, however, the corruption of Chinese government officials has worsened. From the central government level to the county level staff, corruption occurred in all government units involving large number of officers and huge amount of shocking. According to the Transparency International which realised the "2015 Global Refusal Index", it is shown that China's corruption index in the 2015 scored 37 points in the survey, ranked on No. 83 out of 168 countries, which is 51 points less than New Zealand ranked No. 1 and 5.57 points less than the average score: 42.57 points, China, in this index, was classified as the countries with relatively serious corruption. On the other hand, China's tax revenue was lost quite serious under that situation. According to the calculation by the end of 20th century, the average tax loss rate was over 26% (Shaohua JIA, 2002, Biyun YANG, 2003).

Corruption has become a "Cancer" in the nation while corrupt officials become the "thorn" in people's eyes. Officials of corruption have negative effects on all aspects of the country, which seriously worsened the image of the government, affecting the relationship between the people and the government. Foreign studies have shown that there is a significant positive correlation between corruption and the underground economy (Schinder, 2008). The study also shows that a country's underground economy is bigger, the more severe tax losses. So, has the current serious corruption situation in China exacerbated the taxpayer's tax non-compliance? What kind of mechanism does corruption affect taxpayers' willingness to pay? The answers to these two questions can also provide a reference for the anti-corruption road of our central government. Therefore, it is important to study the impact of corruption on the tax compliance of taxpayers.

2. Literature Review

Chinese and foreign scholars on corruption research mainly commenced from two aspects: one is the cause of corruption; the second is the impact of corruption.

In term of the causes of corruption, foreign scholars believe that the factors leading to corruption are mainly the following three categories: First, a country on the macroeconomic level of openness. (Fisman, R. and Gatti, R. (2002). The more the government controls and intervenes in the market, the more likely it is, for its officials to corrupt. Moreover, government policy distortions (such as state monopolies, high tariffs, etc.) are more likely to breed corruption than foreign competition. Alvaro Cuervo (2008) pointed out that the authoritarian dictatorship will increase the cost of investment, resulting in corruption. Second is the micro-government staff welfare benefit. People have always believed that high salaries to honesty, low salary will make civil servants have a stronger motive of corruption, this phenomenon has also been empirical proof of scholars. Van Rijchkeghem and Weder (1997) use multiple regression analysis to study the relative wage and official corruption of public servants, and the empirical results show that the lower the relative wages of public servants, the higher the degree of corruption. In addition, the World Bank in 1997, the World Development Report also pointed out the same point of view. Third is the internal and external supervision system. Since government officials are both policy-makers and policy-supervisors, the scope and intensity of internal and external supervision system will reduce the opportunity cost of corruptions of public servants, leading to a greater possibility of corruption. Tanzi (1998) points out that, in a considerable number of countries, especially in developing countries, corruption is subject to a much greater degree of penalties than corrupt penalties prescribed by laws and regulations. This is the reason why corruption is widespread around the world.

Chinese and foreign scholars who studied the impact of corruption were more concentrated, mainly focused on the relationship between corruption and economic growth. From the current research, the role of corruption on economic growth is a controversial point. Scholars on corruption and economic growth research have produced three main points: First, the "Lubricants" theory. Proponents of "Lubricants" argue that moderate corruption helps economies overcome their over-regulation of bureaucracy during economic operations, saves decision-making time, and improves the efficiency of government administration (Leff, 1964; Liu, 1985; Beck and Maher, 1986, and so on), and proposes the classical queuing model and auction model. The second is "sand" theory. On the Theory of "Sand", supporters argue that corruption can have a significant negative impact on the functioning of the macro economy, damaging the government's image, distorting government decisions, leading to irrational and inefficient allocation of resources, hampering the normal functioning of the market (Buchanan and Tullock, 1962; Bhagwati, 1982; Mauro, 1997, etc.). The third is neutral theory. Lui (1996) pointed out that corruption has dual effects on the economy, on the one hand, corruption is conducive to improving government efficiency and efficiency of resource allocation, on the other hand, corruption is not conducive to long-term economic growth. Although many scholars have made considerable achievements in the study of corruption, the research on corruption still needs to be further explored.

Such as corruption on the taxpayer's tax compliance research is not enough depth. Picur R.D, Riahi-Belkaoui A (2006) revealed that tax compliance was negatively correlated with the level of bureaucracy based on empirical evidence in 30 developed and developing countries of the bureaucracy, corruption and tax compliance. However, the research in this aspect in China is almost blank. As a result, this paper focuses on aspects from theoretical and empirical of corruption on China's taxpayer tax compliance.

3. Corruption and Tax Compliance: A Theoretical Analysis

Corruption is defined as the behaviour of a public servant who uses his or her rights to seek personal gain in violation of the rules. In particular, corruption can be divided into economic crime and non-economic crime, in which economic crime is mainly manifested as corruption and bribery, non-economic crime, there are a variety of major manifestations, such as the current exposure of the extramarital sexual issues be officials, corrupt moral behaviour and dereliction of duty (Gong, 1994; He, 2000; Wederman, 2004). Tax compliance is taxpayers to comply with the tax payment behaviour by the law. The taxpayer has a correct understanding of tax payment obligations, so taxpayers are always able to fulfil their tax obligations in a conscious, accurate and timely manner. Tax non-compliance can be divided into three types: selfishness non-compliance, ignorance non-compliance and emotional non-compliance.

The reason that corruption can lead to non-compliance of taxpayers is because corruption can cause taxpayers' emotional non-compliance mood and selfishness. The specific analysis shows the following reasons: First, corruption is not conducive to economic and social development, with devastating consequences. According to the World Bank report (1996): Corrupt countries have lower private investment and slower economic growth. Tax corruption will erode more government revenue, the government, in order to maintain the normal expenditure, will have to take measures to increase revenue, however, the adoption fiscal policy or monetary policy, will affect the economic behaviour of market players, that brings impact on economic stability and normal growth. Corruption in this case will erode the tax base, which can be called as tax-based corruption.

Second, corruption distorts the government's correct decision-making. Whether taxpayers bribe government officials for private gain or government officials, will directly or indirectly lead to rent-seeking and government policy distortions. This distortion will lead to the loss of government resources, abnormally making government resources transferred to the government officials and taxpayers hands. Through conspiracy, government officials and taxpayers are benefited from corruption, while the benefits are from the government ought to be the tax revenue. Corruption in this case will encroach taxes, which is called tax-payable corruption.

Third, corruption distorts the allocation of resources and reduces the efficiency of resource allocation. Currently, tax incentives across the country occur frequently. For example, many companies which did not meet the standards of high-tech enterprises, but was rated as high-tech enterprises through bribery, so that their corporate tax rate is reduced, resulting reduction in the country's Tax revenue. Corruption in this case led to abuse of tax incentives, especially for the lower

tax rate, which is called tax-rate corruption. In addition, the deterioration of the income distribution of corruption, leading to serious inequality in income distribution and corruption in laws and regulations, so that a serious loss of national credibility will make taxpayers do not trust the government and to choose the emotional tax non-compliance. Based on the above analysis, this paper proposes the following Hypothesis.

The Hypothesis: The higher the degree of corruption, the lower the tax compliance of taxpayers.

4. Corruption and Tax Compliance in China

4.1 Corruption in China

"China is the country that appreciates the ceremonies ", since ancient times that China has the reputation of the state of ceremonies, as well as paying attention to interpersonal relationships is the performance of our etiquette, but this ritual in today's society has been changed materially. Helping relatives and friends becomes giving gifts, which evolved into a major form of corruption. Data published by the "People's Procuratorate Statistical Yearbook" shows that: Since the Open Door Policy, China's corruption has intensified. From the national point of view, in 1979 the national case amount was only 703, by 2015 the number of national registered cases rose to 33.6 million. In 36 years, the number of cases of corruption increased by 478 times. According to the anti-corruption data disclosed by the Central Commission for Discipline Inspection, in 2015, China's suspected violation of discipline in the management of cadres and the case reviewed 90 people, including 42 people who were suspected as criminals and who were transferred to the judiciary.
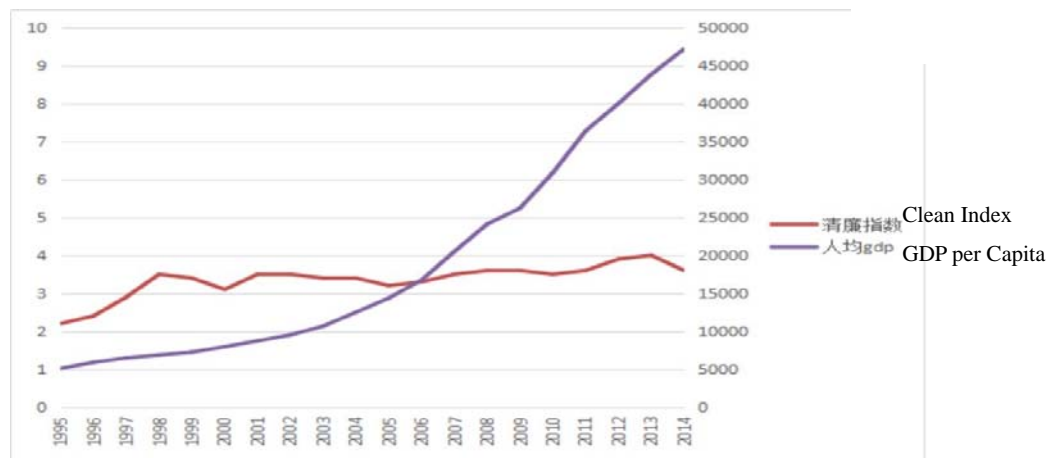

Figure 1:   China's per capita GDP and CPI index trends (1995 -2014)

According to the "Global Corruption Perceptions Index" report released from 1995 by the Transparency International organisation, in the 2001-2010 decade, China's corruption index

remained at around 3.5, the government rank was on No. 40 in 1995, and gradually decreased to 100 in 2014, showing it is more serious corruption in the country. Figure 2 depicts China's per capita GDP and CPI in recent years (i.e., the clean index, the index is out of 10, from 2012 the index is changed and out of 100 points, as for maintaining the comparability of the data, this paper rescale the 2012 index to a 10 points system). As can be seen from the figure, China's per capita GDP in recent years is in rising, exponential growth trend; and China's CPI index has been hovering at a very low level, indicating that China's corruption has not been with the economic development and effective inhibition , The adverse effects of corruption on the community has become a chronic disease

4.2 Tax Compliance in China

China's tax compliance is not optimistic in terms of the taxpayers, according to the calculation by the end of the 20th century, the average tax losing rate was over 26% (Jia Shaohua, 2002; Yang Biyun, 2003). From the point of view individual income tax declaration, since 1 January 2007, China launches high-income individuals' personal income tax declaration system for individuals with more than 120,000 annual income. Wei Lu (2008) pointed out that high-income individuals (natural persons with annual income over 120,000 who need to declare tax) have psychological factors, such as fear of choice subjective taxpayers do not take the initiative to declare the actual number.

Table 1   The investigated cases with the tax exceeding RMB 1 million in China (2005-2014)

Year	Number of case	Increase rate (%))	Tax Loss Amount (Billion RMB)	Increase rate (%)
2005	3289	na	99.24	na
2006	3406	3.56	117.16	18.06
2007	5142	50.97	177.32	51.35
2008	5227	1.65	180.15	1.60
2009	5263	0.69	229.36	27.32
2010	6425	22.08	215.96	-5.84
2011	3299	-48.65	233.49	8.12
2012	6476	96.30	276.61	18.47
2013	6498	0.34	309.68	11.96
2014	3888	-40.17	401.01	29.49
total	48913	na	2.239.98	na

Data source: China tax audit Yearbook 2005-2014

From the point of view of enterprise tax, China's 2007-2009 annual investigation on tax cases involved more than 1 million RMB covers more than 5,000 cases. These cases contributed tax evasion for more than 17 billion (see Table 1). As can be seen from Table 1, the number of over 1 million RMB cases being investigated and dealt with in China is still rising. The cases were near 6500 from year of 2012-2013.It is clear that China's non-compliance is quite serious in both

individual taxpayers and corporate taxpayers.

5. Empirical Research

5.1 Measurement of Corruption

Because of the hidden nature of corruption and the diversity of corrupt behaviour, the measure of corruption becomes a difficult problem, which makes it difficult to select or construct a proxy variable to measure the corruption accurately. There are two main methods used to evaluate corruption: one is the use of corruption indicators issued by international organisations. These indicators, such as questionnaire surveys to obtain different groups of people subjective assessment of the status quo of corruption, the larger indicators with significant influence include the Transparency International's Corruption Perceptions Index (CPI), which reflects the global perception of corruption among businessmen, academics and risk analysts around the world; the Transparency International's Bribery Index (BPI), reflecting the multinational executives for the host country, the extent of corruption and the World Bank Corruption Control Index (CC), and the World Bank's Corruption Control Index (CCB) , which consists of a policy distortions index, a judicial predictability index, civil service wages as a percentage of wages for manufacturing workers, and a recruitment index based on individual talents.

Second, the use of objective indicators such as the number of corruption cases to measure the level of corruption, the specific measurement methods include: the number of cases per capita corruption officials to measure the degree of corruption with the People's Procuratorate on an annual investigation of corruption and bribery and the number of cases of malfeasance to measure the ratio of public servants Degree of corruption. These two methods have different shortcomings: the first index of corruption by the international organizations continue to publish a certain authority, but since the data obtained through the investigation, it also has a certain degree of subjectivity; the second is due to the observation of corruption The number of cases is not consistent with the actual number of corruption and there is insufficient. In terms of the need for research and the convenience of data acquisition, Transparency International's Corruption Perceptions Index was used as a corruption indicator. The value of the index range between 0-10, the greater the value of the Government more honest, the smaller the value the more corruption the government.

5.2 Measurement of Tax Compliance

As the actual amount of tax evasion amount by taxpayers is difficult to accurately calculate, so taxpayers' tax compliance is also difficult to accurately measure. Currently, there is no uniform measurement standard and method in the measurement of tax compliance. Throughout the domestic and foreign scholars' research, the following methods are proposed to estimate the tax compliance: First, tax compliance is measured from the perspective of loss in tax. This method uses the taxation capacity method in the open economy. It is estimated by the income and expenditure difference method of the underground economy caused by the economic loss. This method has been approved by many scholars, and has been widely used in the research. Second, the index system to measure

the tax compliance, this approach from the following four aspects to measure:

(1) the difference between potential taxpayers and taxpayers registered to reflect the number of taxpayers not registered; (2) to record the difference between the registered taxpayer and the actual taxpayer to reflect the amount of undeclared taxpayers; (3) the amount of taxpayers reporting between the taxpayers and the potential tax payable under the tax laws and relevant laws and regulations (4) the difference between the taxpayer or the tax department to declare the actual tax and actual payment, so that to reflect the extent of tax arrears, this method is combined with the actual tax system data to calculate the tax compliance of taxpayers, but also have a high degree of credibility (Biyun YANG, Xingjian YI, 2006).

In this paper, the first method is to measure tax compliance, as the first method in the application of taxpayers often assumes that the taxpayers in the open economy, so the tax compliance measurement indicators can be simplified as: underground economy size / GDP, the smaller the ratio is, the higher level of the taxpayer's tax compliance is.

According to the basic principles of national economic accounting, the total income of residents and the total expenditure there is an equal relationship:

Gross Household Income = Total Household Expenditure

Then, we can decompose into:

Household recorded income + Household underground Income = Household Consumption Expenditure + Household Investment Expenditure

So:

Household underground Income = Household Consumption Expenditure + Household Investment Expenditure - Household recorded income = Household Consumption Expenditure + (Household direct investment expenditure + Household financial capital investment expenditure) - Household recorded income

Using the formula above, it is estimated that China's 2000-2014 underground economy will be shown in Table 2 below as:

Table 2   China's Underground Economy Scale (2000-2014)

Year	2000	2001	2002	2003	2004	2005	2006	2007
Underground/GDP	18.23	17.13	14.92	14.51	13.45	13.02	11.95	11.36
Year	2008	2009	2010	2011	2012	2013	2014	
Underground/GDP	10.88	10.76	10.69	9.82	9.48	9.22	8.73	

5.3 Empirical Analysis

(1) Variable description and data sources

Based on the requirement of this study, this paper regards tax compliance as the explanatory variable, corruption as the explanatory variable and economic growth rate as the control variable. The data sources are shown in Table 3 below.

Table 3   Variables Data Sources

Variables	Tax Compliance	Corruption	Economic Growth Rate
Variable symbol	Y	X1	X2
Measurement	$\dfrac{\text{Underground Economy Scale}}{\text{GDP}}$	CPI index	$\dfrac{(\text{GDP}_t - \text{GDP}_{t-1})}{\text{GDP}_{t-1}}$
Measured data sources	Measured data, see Table 2	Transparency International "Global Corruption Perceptions Index" report	China Statistical Yearbook

(2) Descriptive statistics

Descriptive statistics of each variable sample data are shown in Table 4 below. As can be seen from Table 4, the scale of China's underground economy over GDP shows an average of 12.28%, the maximum value is 18.23%, the minimum is 8.73%, the standard deviation is 2.88, indicating that China's taxpayer tax compliance changes significantly by years. China's average CPI index is 3.51, the maximum is 4.0, the minimum is 3.1, the standard deviation is 0.23, indicating that the difference of China's government corruption across the time is relatively small.

Table 4   Descriptive statistics of each variable

Variable	Tax Compliance	Corruption	Economic Growth Rate
Measures	$\dfrac{\text{Underground Economy Scale}}{\text{GDP}}$	CPI index	Natural logarithm of GDP
Average	12.28	3.51	12.21
Max	18.23	4.00	18.62
Min	8.73	3.10	7.88

Standard Deviation	2.88	0.23	3.29

(3) Regression analysis

Based on the Hypothesis of this paper, we construct the following model:

$$Y_t = C + \alpha_1 X1_t + \alpha_2 X2_t + \varepsilon_t$$

In the equation, y is the degree of tax compliance, expressed as the proportion of the underground economy in GDP. X1 denotes corruption, expressed in CPI index. X2 is the economic growth rate, measured by the growth rate of GDP.

By using Eviews 8.0 regression test, the results are shown in Table 5. From Table 5, the correlation coefficient between corruption and tax compliance is -10.03 and the probability of t-statistic is 0.0009. Therefore, the coefficient between corruption and tax compliance is significantly negative at the 1% significance level. Since the corruption is represented by the CPI index, the larger the CPI, the cleaner of the government; the tax compliance is represented by the scale of the underground economy as a percentage of GDP, the higher the ratio, the lower the tax compliance; the larger negative coefficient indicates that the degree of government corruption is lower; and compliance is higher. The probability of economic growth rate's t-statistic is 0.0427, which is less than 0.05, so under the significance level $\alpha = 0.05$, the coefficient is significantly non-zero, indicating that the higher the rate of economic growth in China, the higher tax compliance, which Reflecting the economy of the economy the more the economy, the more taxpayers can pay taxes according to law. As can be seen from the above, the hypothesis of this paper holds.

Table 5   The result of regression

Explanatory Variable	Explained Variable: y
Constant: c	52.00 *** (5.87, 0.0001)
Corruption: x1	-10.03 *** (-4.38, 0.0009)
Economic growth rate: x2	-0.37** （-2.27，0.0427
R^2	0.627
F-statistic	10.08655
F-statistic probability	0.0027

(Note: Values in parentheses are t-statistic and bilateral probability respectively; * Indicates variable is significant at the 10% level, ** indicates variable is significant at the 5% level, and *** indicates variable is significant at the 1% level.)

6. Conclusion

From the above empirical analysis, we can see that corruption and taxpayers' tax compliance has a significant negative correlation, that is, the more corruption in the government, the taxpayer's tax compliance level is lower, the more the loss of tax revenue. The policy implications of this conclusion are very concise. It shows that the government should strictly control corruption and increase the revenue of the government. Nowadays, the anti-corruption journey of our central government should be institutionalised and maintained by long-term. Taxation authority, as a main part of the government, should thoroughly combat with corruption for keeping the tax officials clean and self-love, and for establishing a good image of the government. The tax authority should go further on the journey of anti-corruption.

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