

# The Theoretical Analysis of Underground Economy

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**Abstract.** The size of underground economy has been expanding quickly during past decades due to its nature. There has been increasing theoretical and empirical research in this area, trying not only to determine the size but also the main reasons for it. This paper summarizes the main opinions in this research filed and discusses the impact on the relationship between corruption and the growth of underground economy.

## Introduction

According to the academic research, there are about 9 trillion USD undeclared transaction around the globe, mainly correlated with underground economy. Schneider and Enste (2000) [1] revealed that the underground economy of developed country account averagely for 15% of the GDP, while the value is about 1/3 for developing countries. He further pointed out that the underground economy for some transitional economy is higher than 40% of GDP, such as several former soviet countries. It should be noted that during past decade, the underground economy in almost all countries has been increased. For developing countries, it increases from 36.6% to the average of 38.6%. The situation is even worse in the transitional economy in which the share increases from 15% to 42%. The underground economy has become an international problem and it brings huge influence to the whole economy and society. As a result, there has been much research regarding the main reasons for the surging increase of the underground economy.

## Theoretical Model

By applying a labor distribution model, Johnson et.al. (2010)[2] discussed the factors influencing underground economy. They compared their model with the real data and came to the conclusion that compared with other tax regulations corruption and other political activities play the determining role in the expansion of the underground economy. It is generally believed that there are four main reasons for a specific firm to conduct underground activities: high tax rate, critical official regulation, corruption of government organization and other inappropriate administrative environment. The labor distribution model concentrates on the reason for why politicians tend to carry out a specific law against business operators from the viewpoint of political economy.

**Assumption.** By assuming that the labor supply is fixed, the labor distribution mainly focuses on the distribution of labor in two areas. It is assumed that each enterprise confronts two options: remaining in the public operation or turn into underground for operation. In one hand, if the firm is run in public under official regulation, the firm should pay official tax to the local government for employing labors, and the tax revenue will be used to finance the provision of public goods. The higher provision of public goods such as schools and infrastructures will improve the production efficiency of the local district, which in turn will make the district more attractive to business activities. On the other hand, if severe tax burden and regulation or the serious corruption prevent firms from running business and making higher potential profits, they would choose not to expand the business and at the same time search for other ways, such as making it underground. By doing this, they would not need to pay tax to the local government and no longer have access to the local public goods. Instead, they would tend to transfer revenue to private institutes. The transfer of business from official and public to unofficial and underground decreases government fiscal

revenue and as a result the government face severe budget constraint which makes running business publicly a less desirable choice since there is less and less public goods.

Although the tax levying makes firms leave public area, the it increases government revenue and enables local governments to provide better public goods for the enhancement of production efficiency. To the contrary, the regulation and corruption is not helpful for government revenue. Generally speaking, the higher is the tax collection and regulation, the more probability for the local government officers to extort bribes.

**The Model.** Based on the previous assumption and conditions, we can write the production function of a firm in the public as:

$$L_F = Q \cdot L_F \quad (1)$$

where  $T$  represents total government tax revenue which is used to finance the public goods  $Q$ . Furthermore,  $L$  denotes the total labor provision and  $L_F$  and  $L_I$  represent the labor force in official and unofficial areas, respectively. From the expression, we can tell that the production efficiency of firms in the local area are directly affected by the quantities of public goods. After that, the profit after tax is written as

$$\Pi_F = (1-t) \cdot Q \cdot L_F - L_F \quad (2)$$

And we also can obtain the tax revenue by multiplying the output level  $L_F$  by  $t: T = t \cdot Q \cdot L_F$ . By simply assuming the relationship between the provision of public goods and tax revenue as  $Q = Q(T)$ ,  $Q' > 0$ ,  $Q'' < 0$ , we have  $Q = Q \cdot (t \cdot Q \cdot L_F)$ . Since both the government and private institutes are competition each other for business operations, they tend to offer different combination of public goods and fees to attract more and more business to be run in their own region. And at the same time, all enterprises can choose to stay in public under the regulation of public government or to stay in unofficial region with the resources provided by the private institutions. However, since the latter is unofficial, the former can punish those business in the latter by administrative tools.

**Equilibrium.** The equilibrium is demonstrated in Fig. 1. As we can see from the figure, the dashed line represents the behavior curve of the firms and it demonstrates that the lower provision of the public goods in the official region, the less companies choose to stay in the underground. The arrows in the figure shows the dynamic process which leads to the equilibrium. It should be noted that there are three equilibriums in this case. The first is on the point when  $U=1$  when all resources are in the unofficial region. When this is the case, government will obtain zero income and provide no public services. In other words, even though there are few firms operating in the public region, since the revenue from those firms are so limited that it would not be able to provide enough public goods with high quality. And gradually there would be no firms left in the public region. As a result, the equilibrium is a stable equilibrium.

The second is the point when  $U=0$ . At this point, all resources are perfectly under the public control and the tax revenue of the government are so sufficient that it can provide public goods with high quality which in turn attract companies from unofficial to be official. No unofficial company would stay in the unofficial region because the private institutes fail to provide public goods. As a result, it is also a stable equilibrium.

The third case is the situation between point when  $U=0$  and point when  $U=1$ . During in this region, firm's behavior depends on the whether the government provides better public goods than the private institutions. If governments provide better public goods, then more and more business operation will turn to public and the equilibrium will more toward the case when  $U=0$ . Otherwise, it would turn to the case when  $U=1$ . For some developing countries and also for some transitional countries, the situation would be the latter case when the business operation becomes underground.

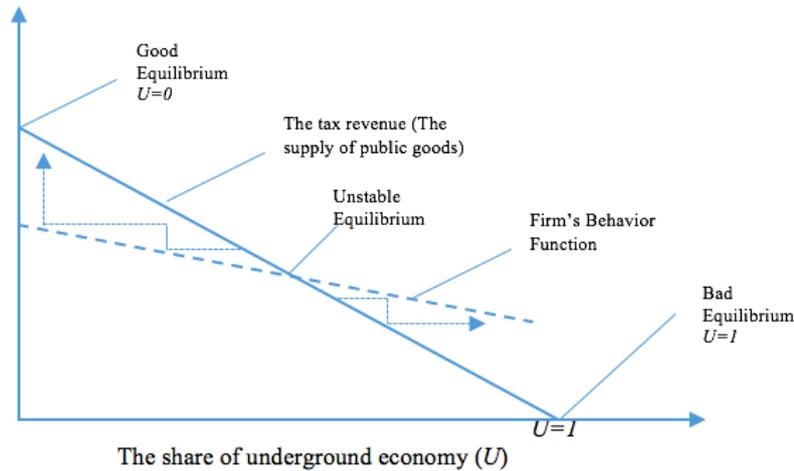


Figure 1. Dynamic equilibrium of the model

### The Empirical Research

Johnson et.al.(2010)[2] collected the economic data from 49 countries ranging from Latin American, OECD countries and other soviet countries, and their research concluded that tax rate, regulation and corruption are important exogenous variables.

**Tax Rate.** The effect of tax rate can be summarized due to the following three types. Firstly, different tax rates have different effect on the scale of underground economy. More specifically, income tax and enterprise tax is negatively correlated with the scale of underground economy while the tax on the international trade is positively correlated. Second, it is necessary to differentiate the various effect of tax rate and tax burden. It should be noted that the decision choice of firms depend critically on the tax burden, which in turn depends on the institution system of the whole tax regime. In other words, the efficiency of tax administration plays more important role than the tax regime itself on the size of underground economy. As a result, the country with high tax revenue tends to have lower percentage of underground economy.

**Regulation.** The research result on the regulation burden and government intervention shows that each variable about regulation plays statistically significant role in the development of underground economy. The more burdens the firms shoulder, the bigger size is the underground economy. Similarly, it is important to differentiate the regulation and the *burden* of regulation. The regulation burden refers to the administrative control and barriers to the market which are disadvantageous to the business operation. While to the contrary, the reasonable regulations, such as environmental protection, labor protection are not necessarily corrected to the development of unofficial economy. If conducted within reasonable range, those regulations could very possibly be helpful to improve production efficiency.

**Public Goods.** The public goods here refer to the judicial environment quality, the efficiency of property protection and the efficiency of police administration etc. Those public services can only be provided by a high quality government and administration institute, making the production activities in public regions more productive. Generally speaking, the quality of public services is measured by corruption. More corruption behavior reveals the low quality of administration level. The previous research regarding the effect of public services on the quality of public administration and the size of underground economy show that the variables of public goods ( $Q$ ) is positively correlated with higher tax revenue ( $T$ ).

In addition, different tax type has different effect on the tax revenue. The tax burden of tax that each firms confront is also related with the tax revenue. More importantly, the implement of tax regulation may play even more important role in public fiscal administration. Higher corruption and lower public fiscal efficiency are significantly correlated.

## Other Factors

**Income Inequality.** Rosser et.al.(2010)[3] further analyzed other factors regarding the development of underground economy. Their main opinion is that the income inequality is positively correlated. In addition, corruption and the macroeconomic fluctuation including the change of inflation also plays an important role through the channel of social capital. In their opinion, social capital is defined as the connection between peoples in a society, the tightening of which will lower the transaction cost.

**Contract Cost.** Based on the data collected on the employee's choice, Alexadrova (2012) [4] supported the conclusion modelled by JKS from the viewpoint of employment contract and labor costs. Their viewpoint is due to the following two reasons. The first reason is the high cost of employment costs. It should be noted that the share of employment without any type of labor contract since 2000 has been increasing by 22%. The second reason is the higher flexibility of labor employment in labor reallocation.

**Historical Factor.** The research of Alexeev and William (2013) [5] concluded that historical reason plays an important role in the development of underground economy for developing countries, especially transitional economies. They pointed out that the scale of underground economy to some degree depends on the history of each country and historical factor is not easily affected and changed by bureaucrat arrangement. As a result, the economic situation before transition is more important than the political system and political environment.

## Summary

The existence of underground economy may hamper the statistics of the economic scale of official sector and it also erodes the national revenue of tax and lower the provision of public goods of government. As a result, underground economy will make the official sector operation less attractive to business. Furthermore, alien with corruption, underground economy will decrease the social capital and social cohesive force, seducing the politicians to misuse the government power for ill-minded policy. With the deepening of opening and reform and the development of market economy, the underground economy of China has been expanding in scale. Except the conflict between supply and demand, the shortage of system is a fundamental factor. In one hand, the capitalization of public power and the marketization cause the corruption of public power, causing different kinds of rent-seeking behavior. On the other hand, due to the over-intervention of administrative power, the auto-adjustment mechanism of market is distorted, leading various kinds of underground economy. For example, the tax burden is so high that firms under huge pressure turn their operation to unofficial sectors. The loophole in tax system is misused by companies to evade tax collection. As pointed out by the model of Rosser and Ahmed, the inequality of income distribution provides strong sociological support for underground economy. As a result, it is necessary to eliminate the institutional environment of underground economy and perfect the institutional arrangement such as fiscal system and law enforcement.

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