

# GBR for the metal Subsystem based on Zangxiang and Jingluo— Mathematical Reasoning of Economic Intervening Principle Based on Yin Yang Wu Xing Theory in Traditional Chinese Economics (III)

Yingshan Zhang

**Abstract**— Theory of both Zangxiang (藏象) and Jingluo (经络) is useful in understanding economic disease. By using mathematical reasoning based on Yin Yang Wu Xing Theory in Traditional Chinese Economics (TCE), this paper demonstrates the treatment principle: “Searching for the primary cause of disease in treatment, treat both the root-cause and symptoms at the same time” (治病求本, 标本兼治). It means that for the economic society, there is the mathematical structure of both Zangxiang and Jingluo as the second physiological system of steady multilateral systems. It can be used to determine both the root-cause and symptoms of the sick subsystem by using both Zangxiang and Jingluo. The first or second transfer law of economic society energies of both Zangxiang and Jingluo changes according to the different GBR (General Budget Revenue) inflation rate of economic society whether in the normal range or not. In general, for the GBR inflation rate, the normal range of theory is [8,956%,20.07%] nearly to [9%,20%], and the center is 13.705% nearly to 14%. Assume that the range of a GBR inflation rate is divided into four parts from small to large. Both second and third are for a healthy economy. The treating works are the treatment directly for a root-cause and the prevention indirectly for a more serious relation economic disease as symptoms. Both the root-cause and symptoms come from the first transfer law of economic society energies. And both first and fourth are for an unhealthy economy. The treating works are the treatment directly for a root-cause or the prevention indirectly for a more serious relation economic disease as symptoms. Both the root-cause and symptoms come from the second transfer law of economic society energies. Economic disease treatment should protect and maintain the balance of two incompatibility relations: the loving relationship and the killing relationship. As an application, the Chinese GBR inflation rate can be used for the metal subsystem how to do works based on to determine both the root-cause and symptoms of the sick subsystem of steady multilateral systems.

**Index Terms**— Traditional Chinese Economics (TCE), Yin Yang Wu Xing Theory, steady multilateral systems, incompatibility relations, side effects, medical and drug resistance problem

## I. INTRODUCTION

Theory of both Zangxiang (藏象) and Jingluo(经络) is useful in understanding disease. Zangxiang and Jingluo are two general structures. The GBR (General Budget Revenue) of both Zangxiang and Jingluo is a general parameter linking together the complexity of relations between subsystem pairs of economic social system, economic social system itself, the capabilities for intervention reaction and self-protection of the

economic social system as an economy and mind as a whole, related to the environment, food, health and personal history, air, water, earth, climate, season, etc. The GBR is as useful in understanding economic disease as the average is in statistics, or as the expected value is in probability calculation.

GBR is useful in understanding economic disease. General budget revenue, a source of revenue, and planned and organized by the national budget and included in the budget management of funds. The general budget revenue is with the original “financial budget accounting system” in the corresponding concept of “budget”.

General public budget income refers to participate in social product allocation of national revenue, is to realize the functions of national financial guarantee. Mainly includes: (1) the tax: including domestic value added tax, excise, imports value-added tax and consumption tax, value-added tax and consumption tax, export tax rebate business tax, enterprise income tax, individual income tax, resource tax, urban maintenance and construction tax, property tax, stamp tax, urban land use tax, land value-added tax, car, ship's tonnage dues, vehicle purchase tax, duties, cultivated land usage tax, deed tax, tobacco taxes, etc. (2) the non-tax revenue, including special revenue, administrative fees, confiscated income and other income. The tax revenue according to the current financial system are divided into the central level and the local level.

Through the growth rate of price index to calculate the rate of inflation, prices can be respectively by the consumer price index (CPI), the producer price index (PPI), the retail price index (RPI), the gross domestic product (GDP), the gross national product (GNP) as conversion price index, and the general budget revenue (GBR), etc. In order to examine a country's power for public facilities (include the energy of science, education, etc.), general use of GBR, its formula is as follows:

$$GBR = Q_{1t} P_{1t} r_{1t} + Q_{2t} P_{2t} r_{2t} + \dots + Q_{nt} P_{nt} r_{nt}, \quad (1)$$

where the type of digital and  $t, n$  is the number in the subscript,  $Q_{*}$  in (1) on behalf of the production of all kinds of the product,  $P_{*}$  in (1) on behalf of all kinds of the price of the product, and  $r_{*}$  in (1) on behalf of all kinds of the tax rate of the product. Both the rate of GBR inflation and the GBR are two different concepts. Calculation method of the rate of GBR inflation through the calculation of the GBR changes: The rate of GBR inflation (tax rises)

$$= \frac{\text{current tax level} - \text{base tax level}}{\text{base tax level}} \times 100\%, \quad (2)$$

where the tax rise level from low to high, to base the level of revenue for base. One of the base period is selected one tax level as a reference, so that you can put the other periods of tax level with a comparison between base level to measure the current level of inflation.

Note on the type, the rate of GBR inflation is not a tax index, which is not a tax rise, but the tax index to rise. The GBR inflation rate is the government measure of inflation one of the data. Popular speaking, the GBR is the tax of all goods and services on the market growth percentage. As an important indicator, observe the level of inflation in China, much attention has been paid to also for such an important indicator, as a new era of youth, more objective view should be observed. First of all, let the GBR be met. The GBR is to reflect the power and for public facilities (include the energy of science, education, etc.), related to all goods and services calculated tax, usually observed inflation as an important indicator.

Boskin [1] has found that there is the important relation between the GBR and the CPI. The GBR plays a key role in the CPI. So the central bank can minimize the inflation by taking certain predictive measures to keep the input prices under control. Because of the relation between the GBR and the CPI, the normal range of the GBR inflation rate can be obtained from the normal range of the CPI inflation rate. It is found that the normal range of the CPI inflation rate is from 2% to 5%. There are a lot of evidences (e.g., experimental identification for probability and real applications) to support this viewpoint, such as, Crone etc [2], Pauhofova etc [3], Funke etc [4], Formica etc [5], Fan etc [6], Adams [7], Hausman [8], Nahm [9], Moosa [10], Zhao [11], Daniel [12], Anonymous [13-14], and so on.

It is believed that the normal range of the GBR inflation rate is from 9% to 20%. It is because the GBR is more sensitive than the CPI at the low GBR inflation rate, so changes in the wider range at the low GBR inflation rate. Thus the retail business economic social system identifies an important indicator for an economic social system health: the value of GBR inflation rate, which, under normal conditions, ranges from 9% to 20%. Outside this range (low: Yin condition; high: Yang condition), economic disease appears. Almost always, when there is economic disease, the condition of inflation rate is a Yang condition, little is a Yin condition.

If the GBR rose is too large, it shows that the inflation has become the economic instability, the central bank will be a tight monetary policy and fiscal policy paying risk, resulting in the uncertain economic outlook. As a result, the index of high rise is often not welcome by the market. In the past 12 months, for example, the GBR rises 2.2%, that means, the cost of industry making rose by an average of 2.2% more than 12 months ago. When the cost of tax increase, your money value drops. That is to say, a 100-yuan notes, only can buy tax \$97.70 worth of goods and services. Generally when the GBR inflation rate  $> 9\%$ , it is called plus, is INFLATION. And when the GBR inflation rate  $> 20\%$ , it is treated as a SERIOUS plus, is a SERIOUS INFLATION.

In this paper, the rate of inflation can be considered as the tax level rises rather than the currency quantity rises from the basic concept of GBR. It is because the GBR is the direct reflection of tax standards, although the tax level increase is difficult to be controlled directly.

The GBR is a general parameter linking together the complexity of relations between subsystem pairs of economic social system, economic social system itself, the capabilities for intervention reaction and self-protection of the economic social system as an economy and mind as a whole, related to the environment, food, health and personal history, air, water, earth, climate, season, etc. GBR is as useful in understanding economic disease as the average is in statistics, or as the expected value is in probability calculation.

The economic social system as an economy begins to activate the necessary mechanisms to restore this parameter to its appropriate range. If the economic social system as an economy is unable to restore optimal GBR levels, the economic disease may become chronic and lead to dire consequences.

Zhang etc [15-23] have started a great interest and admired works for Traditional Chinese Economics (TCE), where, through mathematical reasoning, they demonstrate the presence of incompatibility relations, which are predominant in daily life, yet absent in traditional Aristotelian Western logic.

Many people as Western persons are beyond all doubt the Yin Yang Wu Xing theory is superior to the traditional true-false logic, which does not contemplate incompatibility relations, which Zhang [19] has expertly explained from a mathematical standpoint.

The work Zhang [15,16] has started, allows many people like Western person to think of a true re-foundation of mathematical language, to make it a better suited tool for the needs of mankind economic social system and the environment. Although so doing, Zhang [18] also brings to light the difficulty of establishing the values of both the intervention reaction coefficients  $\rho_1, \rho_2$  and the self-protection coefficient  $\rho_3$  as parameters with due accuracy.

In this paper, the introduction of a parameter such as a GBR inflation rate will be suggested, in order to facilitate the understanding and the calculation of the values of both the intervention reaction coefficients  $\rho_1, \rho_2$  and the self-protection coefficient  $\rho_3$ . This paper ventures to suggest this with all due to respect, because it is believed that the path Zhang [15,16] has started, in such an understandable way from the mathematical point of view, will be very useful for all mankind searching for tools to understand the mechanisms of economic social system.

The article proceeds as follows. Section 2 contains a parameter model and basic theorems, in order to explain both the intervention reaction coefficients  $\rho_1, \rho_2$  and the self-protection coefficient  $\rho_3$  through the introduction of a parameter model to study the normal range of a GBR inflation rate, while the first or second transfer law of economic society energies is demonstrated in Section 3, proved through the concept of both relation costs and a relationship analysis of steady multilateral systems. Furthermore, if the range of the GBR inflation rate is divided into four parts, for the economy in every part, the prevention or treatment method of economic diseases as the treatment principle of TCE is given in Section 4. As an application, the Chinese GBR inflation rate can be used for the metal( $K_X$ ) subsystem how to do works based on to determine both the root-cause and symptoms of the sick

subsystem of steady multilateral systems in Section 5 and conclusions are drawn in Section 6.

II. PARAMETER MODEL AND BASIC THEOREMS

The concepts and notations in Zhang etc [21] are start and still used.

Let  $\varphi = (\sqrt{5} - 1) / 2 = 0.61803399$  be the **gold number**. Denoted  $\rho_0 = 0.5897545123$  such that  $\rho_1 = \rho_3$  and  $\rho_2 = \rho_1\rho_3$  and  $1 - \rho_2\rho_3 = \rho_1 + \rho_2\rho_3$  if  $\rho_1 = \rho_0, \rho_2 = \rho_0^2$  and  $\rho_3 = \rho_0$ , namely **healthy number**.

Assuming  $\rho'_0 = 0.68232780$ , namely **unhealthy number**. It is because under a poor self-protection ability, the unhealthy number  $\rho'_0$  can make the poor healthy balance conditions hold:

$$\rho_1 - \rho_3 = \rho_3 = \rho'_0 / 2 = 0.34116390,$$

$$\rho_2 - \rho_1\rho_3 = \rho_1\rho_3 = (\rho'_0)^2 / 2 = 0.23278561$$

$$1 - \rho_2\rho_3 = \rho_1 + \rho_2\rho_3$$

if  $\rho_1 = \rho'_0, \rho_2 = (\rho'_0)^2 = 0.46557123$  and  $\rho_3 = \frac{1}{2}\rho'_0$ .

Thus  $\rho_0 < \varphi < \rho'_0$ .

A parameter model of a GBR inflation rate in a mathematical sense based on Yin Yang Wu Xing Theory of TCE is reintroduced by using the functions  $\lambda(x)$  and  $\rho(x)$  of the GBR inflation rate  $x$  described as follows.

Let  $x \in (-0.1, 0.81)$  be a GBR inflation rate, where the values  $-0.1$  and  $0.81$  are the minimum and maximum acceptable the GBR inflation rate. Denoted the value  $0.13705$  is the target as the expectation of the GBR inflation rate. Define a function  $\lambda(x)$  of the GBR inflation rate  $x$  in below:

$$\lambda(x) = \frac{|x - 0.13705|}{(0.81 - x)(x + 0.1)}, \forall x \in (-0.1, 0.81)$$

$$= \begin{cases} \frac{x - 0.13705}{(0.81 - x)(x + 0.1)}, & 0.81 > x \geq 0.13705; \\ \frac{0.13705 - x}{(0.81 - x)(x + 0.1)}, & -0.1 < x < 0.13705. \end{cases} \quad (3)$$

A parameter model is considered as

$$\rho(x) = \frac{1/2}{\lambda(x) + 1/2}, \forall x \in (-0.03, 0.65). \quad (4)$$

**Theorem 2.1** Under model (4), the following statements hold.

(1) The one that  $0 < \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1$  is equivalent to the other that

$$0 \leq \lambda(x) = \frac{1 - \rho(x)}{2\rho(x)} < +\infty,$$

where  $\lambda(x)$  is a monotone decreasing function of  $x$  if  $x \in (-0.1, 0.13705]$  or a monotone increasing function of  $x$  if  $x \in [0.13705, 0.81)$ ; and  $\rho(x)$  is a monotone decreasing function of  $\lambda(x)$  if  $\lambda(x) \in [0, +\infty)$ ; and  $\lambda(x)$  is a monotone decreasing function of  $\rho(x)$  if  $\rho(x) \in (0, 1]$ .

(2) If  $1 \geq \rho(x) \geq \rho_0$ , then

$$\lambda(x) = \frac{1 - \rho(x)}{2\rho(x)} \leq \frac{1 - \rho_0}{2\rho_0} = \rho_0^2 \leq \rho(x)^2 \leq 1;$$

$$\frac{\lambda(x)}{\rho(x)} = \frac{1 - \rho(x)}{2\rho(x)^2} \leq \frac{1 - \rho_0}{2\rho_0^2} = \rho_0 \leq \rho(x) \leq 1; \quad \text{and}$$

$$\frac{\lambda(x)}{\rho(x)^2} = \frac{1 - \rho(x)}{2\rho(x)^3} \leq \frac{1 - \rho_0}{2\rho_0^3} = 1.$$

(3) If  $0 < \rho(x) < \rho_0$ , then

$$\lambda(x) = \frac{1 - \rho(x)}{2\rho(x)} > \frac{1 - \rho_0}{2\rho_0} = \rho_0^2 > \rho(x)^2 > 0;$$

$$\frac{\lambda(x)}{\rho(x)} = \frac{1 - \rho(x)}{2\rho(x)^2} > \frac{1 - \rho_0}{2\rho_0^2} = \rho_0 > \rho(x) > 0; \quad \text{and}$$

$$\frac{\lambda(x)}{\rho(x)^2} = \frac{1 - \rho(x)}{2\rho(x)^3} > \frac{1 - \rho_0}{2\rho_0^3} = 1.$$

(4) Taking  $0 < \rho_1 = \rho(x) < \rho_0, \rho_2 = \rho(x)^2$  and  $\rho_3 = c\rho(x)$  where  $0 \leq c \leq 1$ , there are  $\rho_1 - \rho_3 = \rho(x)(1 - c) \geq 0, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1 - c) \geq 0$ , and  $(\rho_1 + \rho_2\rho_3) = \rho(x) + c\rho(x)^3 < 1 - \rho_2\rho_3 = 1 - c\rho(x)^3$ , where

$$|(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)| > 2(1 - c)\rho_0^3 = (1 - c)0.41024.$$

(5) Taking  $1 \geq \rho_1 = \rho(x) \geq \rho_0, \rho_2 = \rho(x)^2$  and  $\rho_3 = c\rho(x)$  where  $0 \leq c \leq 1$ , there are firstly,

$$\rho_1 - \rho_3 = \rho(x)(1 - c) \geq 0, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1 - c) \geq 0 \text{ and } (\rho_1 + \rho_2\rho_3) = \rho(x) + c\rho(x)^3 \geq 1 - \rho_2\rho_3 = 1 - c\rho(x)^3$$

if  $1 \geq c \geq \frac{1 - \rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \geq 0$ ;

secondly,

$$\rho_1 - \rho_3 = \rho(x)(1 - c) > \rho(x)/2, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1 - c) > \rho(x)^2/2 \text{ and } (\rho_1 + \rho_2\rho_3) = \rho(x) + c\rho(x)^3 < 1 - \rho_2\rho_3 = 1 - c\rho(x)^3$$

where  $|(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)| \leq (\rho'_0)^3 = 0.31767$  if  $0 \leq c < \frac{1 - \rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq \frac{1}{2}$  in which  $1 > \rho(x) \geq \rho'_0$ ;

thirdly,

$$\rho_1 - \rho_3 = \rho(x)(1 - c) \geq \rho(x)/2, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1 - c) \geq \rho(x)^2/2 \text{ and } (\rho_1 + \rho_2\rho_3) = \rho(x) + c\rho(x)^3 < 1 - \rho_2\rho_3 = 1 - c\rho(x)^3$$

where  $|(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)| \leq 2\rho_0^3 = 0.41024$  if  $0 \leq c \leq \frac{1}{2} < \frac{1 - \rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq 1$  in which  $\rho_0 \leq \rho(x) < \rho'_0$ ;

finally,

$$\rho_1 - \rho_3 = \rho(x)(1 - c) < \rho(x)/2, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1 - c) < \rho(x)^2/2 \text{ and } (\rho_1 + \rho_2\rho_3) = \rho(x) + c\rho(x)^3 < 1 - \rho_2\rho_3 = 1 - c\rho(x)^3$$

where  $|(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)| < (\rho'_0)^3 = 0.31767$  if  $\frac{1}{2} < c < \frac{1 - \rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq 1$  in which  $\rho_0 \leq \rho(x) < \rho'_0$ .

In particular, when  $c$  is nearly to  $1/2$ , there are  $\rho_1 - \rho_3 = \rho(x)(1 - c) \rightarrow \rho(x)/2, \rho_2 - \rho_1\rho_3 = \rho(x)^2(1 - c) \rightarrow \rho(x)^2/2$  and the following statements hold.

(a). The absolute value  $|(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)|$  is nearly to 0 if  $0 < c < \frac{1 - \rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq \frac{1}{2}$  in which  $1 > \rho(x) \geq \rho'_0$ .

(b). The value  $[(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)]$  is included in the interval  $[-\rho_0^3 = -0.20512, 0)$  if

$$0 < c \leq \frac{1}{2} < \frac{1 - \rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq 1 \text{ in which } \rho_0 \leq \rho(x) < \rho'_0.$$

(c). The value  $[(\rho_1 + \rho_2\rho_3) - (1 - \rho_2\rho_3)]$  is included in the interval  $[-\rho_0^3 = -0.20512, 0)$  if  $\frac{1}{2} < c < \frac{1 - \rho(x)}{2\rho(x)^3} = \frac{\lambda(x)}{\rho(x)^2} \leq 1$  in

which  $\rho_0 \leq \rho(x) < \rho'_0$ . #

**Corollary 2.1** Under model (4), the following statements hold.

(1) For any  $0 < d < 1$ , there is a unique solution  $u \in (-0.1, 0.13705)$  and there is also a unique solution  $v \in (0.13705, 0.81)$ , such that

$$\lambda(0.13705) = 0 \leq \lambda(x) = \frac{1 - \rho(x)}{2\rho(x)} \leq \lambda(u) = \lambda(v) = (1 - d) / (2d),$$

$$\rho(u) = \rho(v) = d \leq \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1 = \rho(0.13705).$$

(2) The condition  $x \in [0.090000, 0.200000]$  is equivalent to each of the following conditions:

$$\lambda(0.13705) = 0 \leq \lambda(x) = \frac{1 - \rho(x)}{2\rho(x)} \leq \lambda(0.090000) = \lambda(0.200000) = 0.34396,$$

$$\rho(0.090000) = \rho(0.200000) = 0.59244 \leq \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1 = \rho(0.13705).$$

(3) The condition  $x \in [0.09411, 0.19291]$  is equivalent to each of the following conditions:

$$\lambda(0.13705) = 0 \leq \lambda(x) = \frac{1 - \rho(x)}{2\rho(x)} \leq \lambda(0.09411) = \lambda(0.19291) = \frac{1 - \varphi}{2\varphi} = 0.30902,$$

$$\rho(0.09411) = \rho(0.19291) = \varphi \leq \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1 = \rho(0.13705).$$

(4) The condition  $x \in [8.956\%, 20.079\%]$  is equivalent to each of the following conditions:

$$\lambda(0.13705) = 0 \leq \lambda(x) = \frac{1 - \rho(x)}{2\rho(x)} \leq \lambda(8.956\%) = \lambda(20.079\%) = \rho_0^2 = 0.34781,$$

$$\rho(8.956\%) = \rho(20.079\%) = \rho_0 \leq \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1 = \rho(0.13705).$$

(5) The condition  $x \in [0.10358, 0.17795]$  is equivalent to each of the following conditions:

$$\lambda(0.13705) = 0 \leq \lambda(x) \leq \lambda(0.10358) = \lambda(0.17795) = (\rho'_0)^2 / 2 = 0.23279,$$

$$\rho(0.10358) = \rho(0.17795) = \rho'_0 \leq \rho(x) = \frac{1/2}{\lambda(x) + 1/2} \leq 1 = \rho(0.13705). \#$$

**Remark 1.** In west, through experiment or through practice observation, by using the relation between the GBR and the CPI, many researchers [1-14] can obtain the normal range of the GBR inflation rate as  $x \in [0.09, 0.20]$  from the normal range of the CPI as  $x \in [0.02, 0.05]$ . But in TCE, from Yin Yang Wu Xing Theory, Zhang etc [21] have already determined:  $\rho_0 \leq \rho_1 \leq 1$  for the normal range of a healthy economy. Taking  $\rho_1 = \rho(x)$ ,  $\rho_2 = \rho(x)^2$  and  $\rho_3 = c\rho(x)$  where  $0 \leq c \leq 1$  for an economic society which has the capabilities of both intervention reaction and

self-protection. From Corollary 2.1, the condition  $\rho_0 \leq \rho_1 \leq 1$  is equivalent to that  $x \in [8.956\%, 20.079\%]$ . In other words, from theory of TCE, the normal range of the GBR inflation rate is considered as  $x \in [8.956\%, 20.079\%]$ , nearly to  $x \in [9\%, 20\%]$ . Of course, little difference of the two intervals which makes the diagnosis of disease as a result, there may be no much difference as a suspect. In fact, TCE uses the rule  $\rho_0 \leq \rho_1 \leq 1$  from Yin Yang Wu Xing Theory instead of the normal range of a GBR inflation rate. The equivalence of Corollary 2.1 shows that TCE is The scientific which is from TCM (Traditional Chinese Medicine).

Zhang etc [21] have already determined: an economy is said a healthy mathematical complex system when the intervention reaction coefficient  $\rho_1$  satisfies  $1 \geq \rho_1 \geq \rho_0$ .

In logic and practice, it's reasonable that  $\rho_1 + \rho_2$  is near to 1 if the input and output in a complex system is balanced, since a mathematical output subsystem is absolutely necessary other subsystems of all consumption. In case:  $\rho_1 + \rho_2 = 1$ , all the energy for intervening mathematical complex subsystem can transmit to other mathematical complex subsystems which have neighboring relations or alternate relations with the intervening mathematical complex subsystem. The condition  $\rho_1 \geq \rho_0$  can be satisfied when

$\rho_2 = \rho_1\rho_3$  and  $\rho_3 = \rho_1$  for a mathematical complex system since  $\rho_1 + \rho_2 = 1$  implies  $\rho_1 = \varphi \approx 0.61803 \geq \rho_0$ . In this

case,  $\rho_2 = \varphi^2 \approx 0.38197$ . If this assumptions is set up, then the intervening principle: "Real disease with a healthy economy is to rush down his son and virtual disease with a healthy economy is to fill his mother" based on the Yin Yang Wu Xing theory in image mathematics [20], is quite reasonable. But, in general, the ability of self-protection often is insufficient for an usual mathematical complex system,

i.e.,  $\rho_3$  is small. A common standard is  $\rho_3 = \frac{1 - \rho_1}{2\rho_2} \approx \frac{1}{2}$

which comes from the balance condition  $(1 - \rho_2\rho_3) = (\rho_1 + \rho_2\rho_3)$  of the loving relationship if

$\rho_1 + \rho_2 \approx 1$ . In other words, there is a principle which all losses are bear in mathematical complex system. Thus the

general condition is often  $\rho_1 \approx 0.61803 \geq \rho_3 \approx 0.5 \geq \rho_2 \approx 0.38197$ . Interestingly, they are all near to the golden numbers. It is the idea to consider the

balance number  $\rho'_0 = 0.68232780$  since the poor condition of self-protection ability  $\rho_3 = \rho_1 / 2 = \rho'_0 / 2 = 0.34116390$  can make the poor healthy balance conditions hold:

$$\rho_1 - \rho_3 = \rho_3 = \rho'_0 / 2 = 0.34116390,$$

$$\rho_2 - \rho_1\rho_3 = \rho_1\rho_3 = (\rho'_0)^2 / 2 = 0.23278561$$

$$1 - \rho_2\rho_3 = \rho_1 + \rho_2\rho_3$$

$$\text{if } \rho_1 = \rho'_0 \text{ and } \rho_2 = (\rho'_0)^2 = 0.46557123.$$

By Theorem 2.1 and Corollary 2.1, the interval  $x \in [0.09, 0.2]$  implies the following condition

$$1 \geq \rho_1 = \rho(x) \geq 0.59244 = \rho(0.09) = \rho(0.2);$$



and the interval  $x \in [0.09411, 0.19291]$  implies the following condition

$$1 \geq \rho_1 = \rho(x) \geq \rho = \rho(0.09411) = \rho(0.19291);$$

and the interval  $x \in [8.956\%, 20.079\%]$  implies the following condition

$$1 \geq \rho_1 = \rho(x) \geq \rho_0 = \rho(8.956\%) = \rho(20.079\%),$$

where  $\lambda(8.956\%) = \lambda(20.079\%) = \frac{1 - \rho_0}{2\rho_0} = \rho_0^2$  since

$$(1 - \rho_0^3) = (\rho_0 + \rho_0^3);$$

and the interval  $x \in [0.10358, 0.17795]$  implies the following condition

$$1 \geq \rho_1 = \rho(x) \geq \rho'_0 = \rho(0.10358) = \rho(0.17795),$$

where  $\lambda(0.10358) = \lambda(0.17795) = \frac{1 - \rho'_0}{2\rho'_0} = \frac{(\rho'_0)^2}{2}$

since  $(\rho'_0)^3 = (1 - \rho'_0)$ .

The last interval is the healthy range under an economic society's self-protection ability poor condition. The interval range than the normal economic society health requirements is too strict. only the first three intervals can be considered as normal economic society health ranges. If keep two decimal places, then first three intervals are the same as  $x \in [9\%, 20\%]$ . This shows that range  $x \in [9\%, 20\%]$  is stable. The interval as the normal range of a GBR inflation rate may be also appropriate. To conservative estimates, one of the first three intervals is used with the largest length, i.e.,  $x \in [8.956\%, 20.079\%]$ , as our theoretical analysis of the normal range. In fact, the range  $x \in [8.956\%, 20.079\%]$  is better than the range  $x \in [9\%, 20\%]$  because  $\rho_0 = \rho(8.956\%) = \rho(20.079\%)$

and  $\lambda(8.956\%) = \lambda(20.079\%) = \frac{1 - \rho_0}{2\rho_0} = \rho_0^2$ , which

satisfy the healthy balance conditions  $\rho_1 = \rho_3, \rho_2 = \rho_1\rho_3$ , and  $(1 - \rho_2\rho_3) \leq (\rho_1 + \rho_2\rho_3)$  at the same time if  $\rho_1 = \rho_0, \rho_2 = \rho_0^2$  and  $\rho_3 = c\rho_0$  where  $c \rightarrow 1$ . In other words, the parameter  $\rho_1 = \rho(x) \geq \rho_0$  or the range  $x \in [8.956\%, 20.079\%]$  is the healthy condition of both the killing relationship and the loving relation at the same time. But neither are the others. The GBR inflation rate must be precise calculation to keep at least 6 decimal places can ensure correct because of its sensitivity to the diagnosis of economic society disease.#

**Remark 2.** Western Economics is different from TCE because the TCE has a concept of *Chi or Qi* as a form of energy. From the energy concept, that one organ or subsystem of the economic society is **not running properly** (or **disease, abnormal**), is that the energy deviation from the average of the organ is too large, the high (**real disease**) or the low (**virtual disease**). But there do not exist these concepts of both real diseases and virtual diseases in Western economics. For the normal range of a GBR inflation rate of some economic society as  $x \in [8.956\%, 20.079\%]$ , in TCE, if  $x > 20.079\%$ , the economy is considered as a real disease since the GBR inflation rate is too high; if  $x < 8.956\%$ , the economy is considered as a virtual disease since the GBR inflation rate is too low. Thus TCE identifies an important

indicator for an economic society's health: the value of GBR inflation rate, which, under normal conditions, ranges from 8.956% to 20.079%. Outside this range (too low: Yin condition; too high: Yang condition), disease appears. Almost always absolutely, when there is a virtual disease, the condition of GBR inflation rate is a Yin condition; when there is a real disease, the condition of GBR inflation rate is a Yang condition.#

**Remark 3.** Obviously, when applying the hypothesis of Theorem 2.1 and Corollary 2.1 to other fields rather than economic society's health, it is necessary to identify a global parameter in each field that is able to yield a general Yin or Yang condition in relation to the average behavior of the studied phenomenon, and that maintains the equations at a sufficiently simple level of writing and application. In fact, let  $x \in (min, max)$  where the values *min* and *max* are the minimum and maximum acceptable the index  $x$ . Denoted the value  $t_0$  is the target as the expectation of the index  $x$  such that  $\rho(t_0) = 1$ . In Eqs.(3) and (4), replace  $-0.1, 0.81, 0.13705$  by  $min, max, t_0$ , respectively. The equivalent condition of a healthy economy  $\rho_0 \leq \rho_1 = \rho(x) \leq 1$  can be obtained as  $x \in [u, v], min < u < t_0 < v < max$ , where

$$\rho(u) = \rho(v) = \rho_0 \leq \rho_1 = \rho(x)$$

$$= (1/2) / [\lambda(x) + (1/2)] \leq \rho(t_0) = 1$$

$$\text{and } \lambda(t_0) = 0 \leq \lambda(x) = (1 - \rho(x)) / (2\rho(x)) \leq \rho_0^2 = \lambda(u) = \lambda(v)$$

$$= \rho(u)^2 = \rho(v)^2 \leq \rho_2 = \rho(x)^2 \leq \rho_1 = \rho(x) \leq 1. \#$$

### III. RELATIONS OF STEADY MULTILATERAL SYSTEMS

#### 3.1 Energy Changes of a Steady Multilateral System

In order to apply the reasoning to other fields rather than society's health, Zhang etc [21] have started a steady multilateral system imitating economic society. A most basic steady multilateral system is as follows .

**Theorem 3.1** [20] For each element  $x$  in a steady multilateral system  $\mathcal{V}$  with two incompatibility relations, there exist five equivalence classes below:

$$X = \{y \in \mathcal{V} \mid y \sim x\}, X_s = \{y \in \mathcal{V} \mid x \rightarrow y\}, X_k = \{y \in \mathcal{V} \mid x \Rightarrow y\},$$

$$K_x = \{y \in \mathcal{V} \mid y \Rightarrow x\}, S_x = \{y \in \mathcal{V} \mid y \rightarrow x\},$$

which the five equivalence classes have relations in Figure 1.

# The Yin Yang Wu Xing model can be written as follows: Define

$$V_0^5 = X, V_1^5 = X_s, V_2^5 = X_k, V_3^5 = K_x, V_4^5 = S_x,$$

corresponding to wood, fire, earth, metal, water, respectively, and assume  $V^5 = V_0^5 + V_1^5 + V_2^5 + V_3^5 + V_4^5$  where

$$V_i^5 \cap V_j^5 = \emptyset, \forall i \neq j \text{ (hereinafter the same).}$$

And take  $\mathfrak{R}^5 = \{R_0^5, R_1^5, \dots, R_4^5\}$  satisfying

$$R_r^5 = \sum_{i=0}^4 V_i^5 \times V_{mod(i+r,5)}^5, \forall r \in \{0, 1, \dots, 4\}, R_i^5 * R_j^5 = R_{mod(i+j,5)}^5,$$

where  $V_i^5 \times V_j^5 = \{(x, y) : x \in V_i^5, y \in V_j^5\}$  is the Descartes product in set theory and  $R_i^5 * R_j^5 = \{(x, y) : \exists u \in V \text{ such that } (x, u) \in R_i^5, (u, y) \in R_j^5\}$  is the **multiplication relation operation**. The relation multiplication of  $*$  is isomorphic to the addition of module 5.

Then  $(V^5, \mathfrak{R}^5)$  is a steady multilateral system with one equivalent relation  $R_0^5$  and two incompatibility relations  $R_1^5 = (R_4^5)^{-1}$  and  $R_2^5 = (R_3^5)^{-1}$  where  $(R_i^5)^{-1} = \{(x, y) : (y, x) \in R_i^5\}$  is the **inverse relation operation**. The Yin and Yang means the two incompatibility relations and the Wu Xing means the collection of five disjoint classification of  $V^5 = V_0^5 + V_1^5 + V_2^5 + V_3^5 + V_4^5$ . The model is called Yin Yang Wu Xing model, denoted simply by  $V^5 = \{0, 1, 2, 3, 4\}$ .

It can be proved by Theorem 3.2 in Zhang [23] that the steady multilateral system in Theorem 3.1 is the reasoning model of Yin Yang Wu Xing in TCE if there is an energy function  $\varphi(*)$  satisfying

$$\begin{aligned} \frac{\Delta\varphi(X)}{\Delta} \rightarrow \frac{d\varphi(X)}{dX} &= (1 - \rho_2\rho_3) = (1 - c\rho(x)^2) > 0; \\ \frac{\Delta\varphi(X_s)}{\Delta} \rightarrow \frac{d\varphi(X_s)}{dX} &= (\rho_1 + \rho_2\rho_3) = \rho(x)(1 + c\rho(x)^2) > 0; \\ \frac{\Delta\varphi(X_k)}{\Delta} \rightarrow \frac{d\varphi(X_k)}{dX} &= -(\rho_1 - \rho_3) = -\rho(x)(1 - c) < 0; \\ \frac{\Delta\varphi(K_x)}{\Delta} \rightarrow \frac{d\varphi(K_x)}{dX} &= -(\rho_2 - \rho_1\rho_3) = -\rho(x)^2(1 - c) < 0; \\ \frac{\Delta\varphi(S_x)}{\Delta} \rightarrow \frac{d\varphi(S_x)}{dX} &= (\rho_2 - \rho_1\rho_3) = \rho(x)^2(1 - c) > 0, \end{aligned}$$

if increase the energy of  $X$  ( $\forall \Delta\varphi(X) = \Delta > 0$ ).

The parameter  $\rho_v = \rho_1 + \rho_2\rho_3$  is called the coefficient of the **vital** or righteousness energy. The parameter  $\rho_e = 1 - \rho_2\rho_3$  is called the coefficient of the **evil** energy. An economy is called **healthy** if the vital or righteousness coefficient  $\rho_v = \rho_1 + \rho_2\rho_3$  is greater than or equal to the evil coefficient  $\rho_e = 1 - \rho_2\rho_3$ . Otherwise, the economy is called unhealthy. For a healthy economy, the transfer law of the Yang vital or righteousness energy in the Yin Yang Wu Xing Model is

$$Wood(X) \rightarrow Fire(X_s) \rightarrow Earth(X_k) \rightarrow Metal(K_x) \rightarrow Water(S_x) \rightarrow Wood(X).$$

**Figure 1** in Theorem 3.1 is the figure of Yin Yang Wu Xing theory in Ancient China. The steady multilateral system  $V$  with two incompatibility relations is equivalent to the logic architecture of reasoning model of Yin Yang Wu Xing theory in Ancient China. What describes the general method of complex systems can be used in the economic society complex systems.

By non-authigenic logic of TCE, i.e., a logic which is similar to a group has nothing to do with the research object [20], in order to ensure the reproducibility such that the analysis conclusion can be applicable to any complex system, a logical analysis model can be chosen which has nothing to do with the object of study. The *Tao* model of Yin and Yang is a generalized one which means that two is basic. But the *Tao* model of Yin Yang is simple in which there is not incompatibility relation. The analysis conclusion of *Tao* model of Yin Yang cannot be applied to an incompatibility relation model. Thus the Yin Yang Wu Xing model with two incompatibility relations of Theorem 3.1 will be selected as the logic analysis model in this paper.

On the other hand, the steady multilateral system  $(V^2, \mathfrak{R}^2) = (V_0^2 + V_1^2, \{R_0^2, R_1^2\})$  is called the *Tao* model, denoted simply by  $V^2 = \{0, 1\}$ , if it satisfies the following conditions:

$$R_r^2 = \sum_{i=0}^1 V_i^2 \times V_{mod(i+r,2)}^2, r \in \{0, 1\}, R_i^2 * R_j^2 = R_{mod(i+r,2)}^2,$$

$$R_0^2 = \{(0, 0), (1, 1)\}, R_1^2 = \{(0, 1), (1, 0)\}.$$

The relation multiplication of  $*$  is isomorphic to the addition of module 2. The element **1**, or **0** is called a **Yang** force or a **Yin** force respectively. For a healthy economy, the transfer law of the *Tao* force in the *Tao* model is from Yang to Yin.

In TCE, any material can be found, not Yang is Yin. No matter of Yin and Yang are unable to see, known as dark matter, or nonphysical. Therefore, the *Tao* force is often exist in the physical world. Any steady multilateral system only force under the action of the *Tao*, may be to perceive.

Furthermore, the steady multilateral system

$$(V^6, \mathfrak{R}^6) = (V_1^6 + \dots + V_6^6, \{R_1^6, \dots, R_6^6\})$$

is called the *Telluric effluvium* model, denoted simply by  $V^6 = \{e, (12), (13), (23), (123), (132)\}$ ,

if it satisfies the following conditions:

$$R_r^6 = \sum_{i=1}^6 V_i^6 \times V_{i*r}^6, \forall r \in \{1, 2, \dots, 6\},$$

$$R_i^2 * R_j^2 = R_{i*r}^2,$$

$i*r$	$1=e$	$2=(12)$	$3=(13)$	$4=(23)$	$5=(123)$	$6=(132)$
$1=e$	$1=e$	$2=(12)$	$3=(13)$	$4=(23)$	$5=(123)$	$6=(132)$
$2=(12)$	$2=(12)$	$1=e$	$5=(123)$	$6=(132)$	$3=(13)$	$4=(23)$
$3=(13)$	$3=(13)$	$6=(132)$	$1=e$	$5=(123)$	$4=(23)$	$2=(12)$
$4=(23)$	$4=(23)$	$5=(123)$	$6=(132)$	$1=e$	$2=(12)$	$3=(13)$
$5=(123)$	$5=(123)$	$4=(23)$	$2=(12)$	$3=(13)$	$6=(132)$	$1=e$
$6=(132)$	$6=(132)$	$3=(13)$	$4=(23)$	$2=(12)$	$1=e$	$5=(123)$

The number **1**, or **2**, or **3**, is called the **tengen** (天元), the earth material (地元), the people ability (人元), respectively.

The set of  $\{1, 2, 3\}$  is called three types of talent or material. It is with elements,  $e, (12), (13), (23), (123), (132)$ . The each of elements,

$e, (12), (13), (23), (123), (132)$ , is called the primordial energy (元气), essence derived from food (谷气), defensive energy (卫气), essential substance circulating in the channels and blood vessels (营气), genuine energy (真气), pectoral energy (宗气), respectively. Another name is respectively

shaoyang (e) (少阳), yangming ((12)) (阳明), taiyang ((13)) (太阳), jueyin ((23)) (厥阴), shaoyin ((123)) (少阴), taiyin ((132)) (太阴).

Generally positive or Yang material, they are able to be perceived, but few can see the material itself, can only use signs. Therefore, the Yang energy symptoms of the set  $M_1 = \{e, (12), (13)\}$  is call the marrow energy (髓); The Yin energy of the set  $M_2 = \{(123)\}$  is call the blood energy (血); The Yin energy of the set  $M_3 = \{(132)\}$  is call the saliva energy (津); The Yin energy of the set  $M_4 = \{(23)\}$  is call the essence of water and grain (水谷精微).

Growth and conveyance in the six energies  $e, (12), (13), (23), (123), (132)$ , known as the **six roots** (根); As the fruit of these six energies  $e, (12), (13), (23), (123), (132)$ , known as the **six fruits** (结); Storage of these four energies  $M_1, M_2, M_3, M_4$ , known as the **four seas** (四海); Energy exchange of the four kinds of  $M_1, M_2, M_3, M_4$ , known as the **four streets** (四街). Of course, for a healthy Economy, the transfer law of each of the six energies

$e, (12), (13), (23), (123), (132)$ , is from its **root (root-causes)** (根) to its **fruit (symptoms)** (结).

Western Economy is different from TCE because the TCE has a concept of *Chi* or *Qi* (气) as a form of energy of steady multilateral systems. It is believed that this energy exists in all things of steady multilateral systems (living and non-living) including air, water, food and sunlight. *Chi* is said to be the unseen vital force that nourishes steady multilateral systems' Economy and sustains steady multilateral systems' life. It is also believed that an individual is born with an original amount of *Chi* at the beginning of steady multilateral systems' life and as a steady multilateral system grows and lives, the steady multilateral system acquires or attains *Chi* or energy from "eating" and "drinking", from "breathing" the surrounding "air" and also from living in its environment. The steady multilateral system having an energy is called **the anatomy system** or **the first physiological system**. And the first physiological system also affords *Chi* or energy for the steady multilateral system's meridian system (*Zang Xiang* (藏象) and *Jing-Luo* (经络)) which forms a parasitic system of the steady multilateral system, called **the second physiological system** of the steady multilateral system. The second physiological system of the steady multilateral system controls the first physiological system of the steady multilateral system. A steady multilateral system would become ill or dies if the *Chi* or energy in the steady multilateral system is imbalanced or exhausted, which means that  $\rho_1 = \rho(x) \rightarrow 0, \rho_2 = \rho(x)^2 \rightarrow 0$  and  $\rho_3 = c\rho(x) \rightarrow 0$ .

For example, in TCE, an economy as the first physiological system of the steady multilateral system following the Yin Yang Wu Xing theory was classified into five equivalence classes as follows:

wood( $X$ )={industry, PPI (the Producer Price Index) or RPI (Retail Price Index), liver, bravery, soul, ribs, sour, east, spring, birth};

xiang-fire( $X_S^x$ )={agriculture, AAF (the total output value of Agriculture forestry Animal husbandry and Fishery), pericardium, the triple energizer, nerve, the blood, bitter taste, the south, summer, growth};

earth( $X_K$ )={commerce, CPI (the Consumer Price Index), spleen, stomach, willing, meat, sweetness, center, long summer, combined};

metal( $X_X$ )={science-education, GBR (the General Budget Revenue), lung, large intestine, boldness, fur, spicy, west, autumn, accept};

water( $X_S$ )={army-economic, GDP (the Gross Domestic Product), kidney, bladder, ambition, bone, salty, the north, winter, hiding};

jun-fire( $X_S^j$ )={President or Governor, Finance (the right of making money), heart, small intestine, bitter taste, whole economy, throughout the year, overall growth}.

fire( $X_S$ )= xiang-fire( $X_S^x$ )  $\cup$  jun-fire( $X_S^j$ ).

There is only one of both loving and killing relations between every two classes. General close is loving, alternate is killing. In every category of internal, think that they are with an equivalent relationship, between each two of their elements there is a force of similar material accumulation of each other. It is because their pursuit of the goal is the same, i.e., follows

the same "Axiom system". It can increase the energy of the class at low cost near to zero if they accumulate together. Any nature material activity follows the principle of maximizing so energy or minimizing the cost. In general, the size of the force of similar material accumulation of each other is smaller than the size of the loving force or the killing force in a stable complex system. The stability of any complex system first needs to maintain the equilibrium of the killing force and the loving force. The key is the killing force. For a stable complex system, if the killing force is large, i.e.,

$\rho_3 = c\rho(x)$  becomes larger by Theorems 3.4 and 3.5 below, which needs positive **exercise**, then the loving force is also large such that the force of similar material accumulation of each other is also large. They can make the complex system more stable. If the killing force is small, i.e.,  $\rho_3 = c\rho(x)$  becomes smaller by Theorems 3.4 and 3.5 below, which means little **exercise**, then the loving force is also small such that the force of similar material accumulation of each other is also small. They can make the complex system becoming unstable. The *Chi* or energy is also called the food hereafter for simply. In order to get the food, by Attaining Rule in Zhang [23], the second physiological system must make the first physiological system intervened, namely **exercise**. It is because only by intervention on the first physiological system, the second physiological system can be to get food.

The second physiological system of the steady multilateral system controls the first physiological system of the steady multilateral system, abiding by the following rules.

**Definition 3.1 (Zangxiang (藏象))** Assume the Yin Yang Wu Xing model  $V^5$  is implemented by the Tao force of the Tao model  $V^2$ . Then the steady multilateral system  $V^2 \times V^5 = \{(i, j) | i \in V^2, j \in V^5\}$  is called the **Zangxiang** or the **Five Zang-organs** model of the steady multilateral system.

The Zangxiang model satisfies as follows:

$$R_{(r,r')}^{(2,5)} = \sum_{(i,i')=(0,0)}^{(1,4)} V_{(i,i')}^{(2,5)} \times V_{(\text{mod}(i+r,2), \text{mod}(i'+r',5))}^{(2,5)}, \forall (r, r') \in V^2 \times V^5,$$

$$R_{(i,i')}^{(2,5)} * R_{(j,j')}^{(2,5)} = R_{(\text{mod}(i+j,2), \text{mod}(i'+j',5))}^{(2,5)}.$$

Each of the elements,

(1, 0), (0, 0), (1, 1), (0, 1), (1, 2),  
(0, 2), (1, 3), (0, 3), (1, 4), (0, 4),

is called respectively

Jia(1,0), Yi(0,0), Bing(1,1), Ding(0,1), Wu(1,2),  
Ji(0,2), Geng(1,3), Xin(0,3), Ren(1,4), Gui(0,4),

corresponding to the Chinese words respectively:

甲(1,0), 乙(0,0), 丙(1,1), 丁(0,1), 戊(1,2),

己(0,2), 庚(1,3), 辛(0,3), 壬(1,4), 癸(0,4),

also corresponding to the notations in Theorem 3.1 respectively:

$X^+(1,0), X^-(0,0), X_S^+(1,1), X_S^-(0,1), X_K^+(1,2),$

$X_K^-(0,2), K_X^+(1,3), K_X^-(0,3), S_X^+(1,4), S_X^-(0,4).$

Here, each of the elements:  $X, X_S, X_K, K_X, S_X$  is called wood, fire, earth, metal, water, respectively, and this is  $*^+$  Yang,  $*^-$  is Yin.

In TCE, an other name of the Zangxiang system is the ten Heavenly Stems (天干). It means in the changes of energy transmission, plays a major role, is under the power of



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positive (Yang), although it is invisible, the reason of behind the sign.

In the ten heavenly stems, Yang is respectively:

Jia  $X^+(1,0)$  liking Yang wood, Bing  $X_S^+(1,1)$  liking Ynag fire,

Wu  $X_K^+(1,2)$  liking Yang earth, Geng  $K_X^+(1,3)$  liking Yang metal,

Ren  $S_X^+(1,4)$  liking Yang water;

Yin is respectively:

Yi  $X^-(0,0)$  liking Yin wood, Ding  $X_S^-(0,1)$  liking Yin fire,

Ji  $X_K^-(0,2)$  liking Yin earth, Xin  $K_X^-(0,3)$  liking Yin metal,

Gui  $S_X^-(0,4)$  liking Yin water.

Yin is in the inside (里), Yang is in the outside (表). The relationship between the inside and the outside is the liking relationship.

The laws of the Zangxiang system or the ten Heavenly Stems model are summarized in Figure 2.#

**Definition 3.2 (Jingluo)** Assume the Telluric effluvium model  $V^6$  is implemented by the Tao force of the Tao model

$V^2$ . Then the steady multilateral system  $V^2 \times V^6 = \{(i, j) | i \in V^2, j \in V^6\}$  is called the **Jingluo** or the **Six Fu-organs** model of the steady multilateral system.

The Jingluo model satisfies as follows:

$$R_{(r,r')}^{(2,6)} = \sum_{(i,i')=(0,1)}^{(1,6)} V_{(i,i')}^{(2,6)} \times V_{(mod(i+r,2),i^*r')}^{(2,6)}, \forall (r, r') \in V^2 \times V^6,$$

$$R_{(i,i')}^{(2,6)} * R_{(j,j')}^{(2,6)} = R_{(mod(i+j,2),i^*j')}^{(2,6)}.$$

Each of the elements,

(0,e) (1,e) (0,(12)) (1,(12)) (0,(13)) (1,(13))  
 (0,(23)) (1,(23)) (0,(132)) (1,(132)) (0,(123)) (1,(123))

is called respectively

Zi(0,e) Hai(1,e) Chen(0,(12)) Mao(1,(12)) Shen(0,(13)) Wei(1,(13))

Chou(0,(23)) Xu(1,(23)) Si(0,(132)) Yin(1,(132)) You(0,(123)) Wu(1,(123));

Corresponding to the Chinese words respectively:

子(0,e) 亥(1,e) 辰(0,(12)) 卯(1,(12)) 申(0,(13)) 未(1,(13))

丑(0,(23)) 戌(1,(23)) 巳(0,(132)) 寅(1,(132)) 酉(0,(123)) 午(1,(123));

Also corresponding to the notations in Theorem 3.1 as the five viscera and six entrails respectively:

$X^+(0,e)$   $X_S^{X^+}(1,e)$   $X_K^+(0,(12))$   $K_X^+(1,(12))$   $S_X^+(0,(13))$   $X_S^{j^+}(1,(13))$   
 $X^-(0,(23))$   $X_S^{X^-}(1,(23))$   $X_K^-(0,(132))$   $K_X^-(1,(132))$   $S_X^-(0,(123))$   $X_S^{j^-}(1,(123)).$

Here, each of the elements:  $X, X_S^X, X_K, K_X, S_X, X_S^j$  is called wood, xiang-fire (相火), earth, metal, water, jun-fire (君火) respectively, and this is  $*^+$  Yang,  $*^-$  is Yin.

In TCE, an other name of the Jingluo system is the twelve Earthly Branches (地支). It means in the changes of energy transmission, plays a secondly role, is under the power of negative (Yin), although it is tangible, a sign of strength can be observed directly.

In the twelve earthly branches, Yang is respectively

Zi  $X^+(0,e)$  liking Yang water, Hai  $X_S^{X^+}(1,e)$  liking Yin water,

Chen  $X_K^+(0,(12))$  liking Yang earth, Mao  $K_X^+(1,(12))$  liking Yin wood,

Shen  $S_X^+(0,(13))$  liking Yang metal, Wei  $X_S^{j^+}(1,(13))$  liking Yin earth;

Yin is respectively

Chou  $X^-(0,(23))$  liking Yin earth, Xu  $X_S^{X^-}(1,(23))$  liking Yang earth,

Si  $X_K^-(0,(132))$  liking Yin fire, Yin  $K_X^-(1,(132))$  liking Yang wood,

You  $S_X^-(0,(123))$  liking Yin metal, Wu  $X_S^{j^-}(1,(123))$  liking Yang fire.

Yin is in the inside (里), Yang is in the outside (表). The relationship between the inside and the outside is the liking relationship.

In the twelve earthly branches, other names of them are corresponding to the human body organs respectively:

Foot jueyin liver meridian (0,(23)),

Foot shaoyang galladder meridian (0,e),

Hand jueyin pericardium meridian (1,(23)),

Hand shaoyang triple energizer meridian (1,e),

Foot taiyin spleen meridian (0,(132)),

Foot yangming stomach meridian (0,(12)),

Hand taiyin lung meridian (1,(132)),

Hand yangming large intestine meridian (1,(12)),

Foot shaoyin kidney meridian (0,(123)),

Foot taiyang bladder meridian (0,(13)),

Hand shaoyin heart meridian (1,(123)),

Hand taiyang small intestine meridian (1,(13)).

Or, respectively,

足厥阴肝经(0,(23)), 足少阳胆经(0,e),

手厥阴心包经(1,(23)), 手少阳三焦经(1,e),

足太阴脾经(0,(132)), 足阳明胃经(0,(12)),

手太阴肺经(1,(132)), 手阳明大肠经(1,(12)),

足少阴肾经(0,(123)), 足太阳膀胱经(0,(13)),

手少阴心经(1,(123)), 手太阳小肠经(1,(13)).

The laws of the Jingluo system or the twelve Earthly Branches model are summarized in Figure 3.#

In TCE, the Zangxiang and Jingluo models are not the anatomy systems as the first physiological system corresponding to their steady multilateral systems, are only them the mathematical logic models. If there are the Yin Yang Wu Xing model  $V^5$ , the Telluric effluvium model  $V^6$  and the Tao model  $V^2$ , then the Zangxiang model  $V^2 \times V^5$  and the Jingluo model  $V^2 \times V^6$  must exist in logic. So they form a parasitic system of the Yin Yang Wu Xing system  $V^5$ , namely the second physiological system of the steady multilateral systems  $V^2 \times V^5$  and  $V^2 \times V^6$ .

In TCE, the Zangxiang model cannot be observed directly, so it is hidden behind the Jingluo system, namely the Zangxiang (藏象) model. Chinese word "藏" is the meaning of the hidden behind. Therefore, only the twelve meridians can be observed. Began to grow the 12 kinds of energies of each place, referred to as the basic root-causes (本). To generate the results of the 12 kinds of energies, referred to as the symptoms (标). Management of the 12 kinds of energies of each system, known as meridians or the Jingluo systems. Of course, for a healthy Economy, the transfer law of each of the 12 kinds of energies is from its basic root-causes (本) to its symptoms (标).

In spite of the ten heavenly system cannot be observed, but it can be observed according to the reasoning of the twelve earthly branches system. So the logic relation of both the ten heavenly stems system and the twelve earthly branches system must be known.



**Definition 3.3 (Logic Relation of Ten Heavenly Stems Hidden behind Twelve Earthly Branches)** Logic Relation of Ten Heavenly Stems Hidden behind Twelve Earthly Branches must follow the relationship between the growth of the ten heavenly elements.

For the ten heavenly stems, although they are hidden in the 12 earthly branches, but the existing way is not completely the same. They each have 12 kinds of growth status: rowing (长生), bathing (沐浴), crowned (冠带), officer (临官), emperor (帝旺), decay (衰退), disease (得病), death (死亡), tomb (墓), extinction (绝), child (胎), raise (养).

According to the names of Yin and Yang attribute is different, their growth way also each are not identical. Yang heavenly stems energy transmission is energy transmitted along the twelve earthly branches, and Yin heavenly stems energy transfer is against the twelve earthly branches transmission of energy transmitted sequence.

The following ten heavenly stems are hidden behind the twelve earthly branches as follows:

Zi(0,e) = {Gui(0,4)}, liking Yang water;  
Chou(0,(23)) = {Ji(0,2), Gui(0,4), Xin(0,3)}, liking Yin earth;  
Yin(1,(132)) = {Jia(1,0), Bing(1,1), Wu(1,2)}, liking Yang wood;  
Mao(1,(12)) = {Yi(0,0)}, liking Yin wood;  
Chen(0,(12)) = {Yi(0,0), Wu(1,2), Gui(0,4)}, liking Yang earth;  
Si(0,(132)) = {Bing(1,1), Geng(1,3), Wu(1,2)}, liking Yin fire;  
Wu(1,(123)) = {Ding(0,1), Ji(0,2)}, liking Yang fire;  
Wei(1,(13)) = {Ding(0,1), Ji(0,2), Yi(0,0)}, liking Yin earth;  
Shen(0,(13)) = {Geng(1,3), Ren(1,4), Wu(1,2)}, liking Yang metal;  
You(0,(123)) = {Xin(0,3)}, liking Yin metal;  
Xu(1,(23)) = {Xin(0,3), Wu(1,2), Ding(0,1)}, liking Yang earth;  
Hai(1,e) = {Ren(1,4), Jia(1,0)}, liking Yin water.

All Logic Relations of Ten Heavenly Stems Hidden behind Twelve Earthly Branches are summarized in **Figure 4**.

See **Figure 4**, and **Tables 1 and 2**, all pure Yang: Jia, Bing, Geng, Ren of Ten Heavenly Stems are hidden behind Palms corners, clockwise for growth and officer. Only Yang earth: Wu of Ten Heavenly Stems is hidden behind Palms on both sides, clockwise for the growth, crowned, officer, disease and cemeteries.

All pure Yin: Yi, Ding, Xin, Gui of Ten Heavenly Stems are hidden behind the sides of the palms, counterclockwise to raise, crowned and officer. Only Yin earth: Ji of Ten Heavenly Stems is hidden behind Palms up and down, counterclockwise for the tomb, crowned and officer. #

**Property 3.1 (Ten Heavenly Stems Grow-Strong -Die -Extinction Hidden behind Twelve Earthly Branches)** Ten heavenly stems under a number of laws, the ten heavenly stems inside the twelve earthly branches transmission rule can be gotten as follows. The five Yang heavenly stems: Jia, Bing, Wu, Geng, Ren was born by Hai, Yin, Yin, Si, Shen clockwise respectively; The five Yin heavenly stems: Yi, Ding, Ji, Xin, Gui was born by Wu, You, You, Zi, Mao counterclockwise respectively. Using mathematical language, all of these laws are summarized in **Tables 1 and 2**.#

**Property 3.2 (The rationality of the name of Twelve Earthly Branches)** The following notations in Definition 3.2 is reasonable.

$X^+$	$X_S^+$	$X_K^+$	$K_X^+$	$S_X^+$	$X_S^{j+}$
(0,e)	(1,e)	(0,(12))	(1,(12))	(0,(13))	(1,(13))
$X^-$	$X_S^-$	$X_K^-$	$K_X^-$	$S_X^-$	$X_S^{j-}$
(0,(23))	(1,(23))	(0,(132))	(1,(132))	(0,(123))	(1,(123))

It is with the correct meaning of the Yin Yang Wu Xing Model in Theorem 3.1.#

Energy concept is an important concept in Physics. Zhang etc [21] introduce this concept to the steady multilateral systems or image mathematics [20] and uses these concepts to deal with the steady multilateral system diseases (mathematical index too high or too low). In mathematics, a steady multilateral system is said to have **Energy** (or **Dynamic**) if there is a non-negative function  $\varphi(*)$  which makes every subsystem meaningful of the steady multilateral system. Similarly to Zhang etc [21], unless stated otherwise, any equivalence relation is the liking relation, any neighboring relation is the loving relation, and any alternate relation is the killing relationship.

Suppose that  $V$  is a steady multilateral system having an energy, then  $V$  in the steady multilateral system during a normal operation, its energy function for any subsystem of the steady multilateral system has an **average** (or **expected value** in Statistics), this state is called as **normal** when the energy function is nearly to the average. Normal state is the better state.

That a subsystem of the steady multilateral system is **not running properly** (or **disease, abnormal**) is that the energy deviation from the average of the subsystems is too large, the high (**real disease**) or the low (**virtual disease**).

In addition to study these real or virtual diseases, TCE is often not only considered the energy change (Attaining or Affording) of each element in the corresponding group, but also studied a kind of **relation costs**. There are three kinds of relationship between each two elements of the Zangxiang system or the Jingluo system, namely the **merged, synthesized** and **combined**.

The **merged** relationship between two the same elements  $x$  and  $y$  is the joining operation in a set, i.e.,  $\{x\} \cup \{y\} = \{z\}$ . The element  $z$  is the result of two the same elements  $x$  and  $y$  merging. The purpose of merging is in order to get the large result energy of element  $z$  through inputting two the same elements  $x$  and  $y$ .

The **synthesized** relationship between two elements  $x$  and  $y$  is the multiply operation in the corresponding group system with a multiplication  $*$ , i.e.,  $x * y = z$ . The element  $z$  is the result of two elements  $x$  and  $y$  synthesized. The purpose of synthesized is in order to get the result energy of element  $z$  through inputting two elements  $x$  and  $y$ .

The **combined** relationship between two elements  $x$  and  $y$  is the division operation in the corresponding group system with a multiplication  $*$ , i.e.,  $x^{-1} * y = z$ . The element  $z$  is the cost of two elements  $x$  and  $y$  combined. The purpose of combined is in order to maintain or strengthen the relation between  $x$  and  $y$  through inputting the cost element  $z$ .

In general, a relationship cost is low if the cost element in the corresponding group is easy to get. A relationship cost is high, on the other hand, if the cost element in the corresponding is hard to come by.

In this case, in general, the GBR inflation rate  $x \in [8.956\%, 20.079\%]$  which means  $\rho_0 \leq \rho_1 = \rho(x) \leq 1$ . This relation cost is low because this relation cost element is easy to get. The low relation cost can

make the intervention increasing the sizes of both the intervention reaction coefficients  $\rho_1, \rho_2$  and the self-protection coefficient  $\rho_3$ .

But in general, the GBR inflation rate  $x \notin [8.956\%, 20.079\%]$  which means  $0 < \rho_1 = \rho(x) < \rho_0$ . This relation cost is high because the relation cost element is hard to come by. The high relation cost can make the sizes of both the intervention reaction coefficients  $\rho_1, \rho_2$  and the self-protection coefficient  $\rho_3$  decreasing response to intervention.

The purpose of intervention is to make the steady multilateral system return to normal state. The method of intervention is to increase or decrease the energy of a subsystem.

What kind of intervening should follow the principle to treat it? Western mathematics emphasizes directly mathematical treatments on a disease subsystem after the disease of subsystem has occurred, but the indirect intervening of oriental mathematics is required before the disease of subsystem will occur. In mathematics, which is more reasonable?

Based on this idea, many issues are worth further discussion. For example, if an intervening has been implemented to a disease subsystem before the disease of subsystem will occur, what relation disease will be low cost which does not need to be intervened? what relation disease will be high cost which needs to be intervened?

### 3.2 Kinds of Relationship costs of Steady Multilateral Systems

For a steady multilateral system  $V$  with two incompatibility relations, suppose that the subsystems  $X, X_S, X_K, K_X, S_X$  are the same as those defined in Theorem 3.1. Then the relation diseases can be decomposed into the following classes:

**Definition 3.4** ( merged (合并), synthesized (合化或者合成) and combined (化合) ) Suppose that both  $x$  and  $y$  are two elements of the Zangxiang system or the Jingluo system.

The merged relationship between two the same elements  $x$  and  $y$  is the joining operation in a set, i.e.,  $\{x\} \cup \{y\} = \{z\}$ . The element  $z$  is the result of two the same elements  $x$  and  $y$  merging. The purpose of merging is in order to get the large result energy of element  $z$  through inputting two the same elements  $x$  and  $y$ .

The synthesized relationship between two elements  $x$  and  $y$  is the multiply operation in the corresponding group system with a multiplication  $*$ , i.e.,  $x * y = z$ . The element  $z$  is the result of two elements  $x$  and  $y$  synthesized. The purpose of synthesized is in order to get the result energy of element  $z$  through inputting two elements  $x$  and  $y$ .

The combined relationship between two elements  $x$  and  $y$  is the division operation in the corresponding group system with a multiplication  $*$ , i.e.,  $x^{-1} * y = z$ . The element  $z$  is the cost of two elements  $x$  and  $y$  combined. The purpose

of combined is in order to maintain or strengthen the relation between  $x$  and  $y$  through inputting the cost element  $z$ . #

**Property 3.3** Suppose that both  $x$  and  $y$  are two elements of the Zangxiang system. Then the following statements are true.

(1) The lowest cost element is

$$Yi(0,0) = Z(0,0) = X^-(0,0).$$

The second low cost is

$$Jia(1,0) = 甲(1,0) = X^+(1,0).$$

The third low cost is

$$Ding(0,1) = 丁(0,1) = X_S^-(0,1) = [S_X^-(0,4)]^{-1} = [癸(0,4)]^{-1} = [Gui(0,4)]^{-1}. \text{ The}$$

fourth low cost is

$$Bing(1,1) = 丙(1,1) = X_S^+(1,1) = [S_X^+(1,4)]^{-1} = [壬(1,4)]^{-1} = [Ren(1,4)]^{-1}.$$

(2) The highest cost element

$$Wu(1,2) = 戊(1,2) = X_K^+(1,2) = [K_X^+(1,3)]^{-1} = [庚(1,3)]^{-1} = [Geng(1,3)]^{-1}.$$

The second high cost is

$$Ji(0,2) = 己(0,2) = X_K^-(0,2) = [K_X^-(0,3)]^{-1} = [辛(0,3)]^{-1} = [Xin(0,3)]^{-1}.$$

(3) The synthesized relationships of the ten Heavenly Stems at zero costs are as follows:

The ten heavenly stems synthesized (十天干合化)

$$Jia(1,0) * Ji(0,2) = Wu(1,2) \rightarrow \text{Yang earth (甲己合化土),}$$

$$Yi(0,0) * Geng(1,3) = Geng(1,3) \rightarrow \text{Yang metal (乙庚合金),}$$

$$Bing(1,1) * Geng(0,3) = Ren(1,4) \rightarrow \text{Yang water (丙辛合化水),}$$

$$Ding(0,1) * Ren(1,4) = Jia(1,0) \rightarrow \text{Yang wood (丁壬合化木),}$$

$$Wu(1,2) * Gui(0,4) = Bing(1,1) \rightarrow \text{Yang fire (戊癸合化火).}$$

(4) The combined relationships of the ten Heavenly Stems at low costs are as follows:

$$Jia(1,0) \text{ and } Yi(0,0) \text{ like } Jia(1,0) \text{ and } Yi(0,0) \text{ (甲乙同类甲乙)}$$

$$(Jia(1,0))^{-1} * Jia(1,0) = Yi(0,0) \rightarrow \text{Yin wood (甲甲比肩),}$$

$$(Jia(1,0))^{-1} * Yi(0,0) = Jia(1,0) \rightarrow \text{Yang wood (甲乙劫财),}$$

$$(Yi(0,0))^{-1} * Jia(1,0) = Jia(1,0) \rightarrow \text{Yang wood (乙甲劫财),}$$

$$(Yi(0,0))^{-1} * Yi(0,0) = Yi(0,0) \rightarrow \text{Yin wood (乙乙比肩);}$$

$$Bing(1,1) \text{ and } Ding(0,1) \text{ like } Bing(1,1) \text{ and } Ding(0,1) \text{ (丙丁同类丙丁)}$$

$$(Bing(1,1))^{-1} * Bing(1,1) = Yi(0,0) \rightarrow \text{Yin wood (丙丙比肩),}$$

$$(Bing(1,1))^{-1} * Ding(0,1) = Jia(1,0) \rightarrow \text{Yang wood (丙丁劫财),}$$

$$(Ding(0,1))^{-1} * Bing(1,1) = Jia(1,0) \rightarrow \text{Yang wood (丁丙劫财),}$$

$$(Ding(0,1))^{-1} * Ding(0,1) = Yi(0,0) \rightarrow \text{Yin wood (丁丁比肩);}$$

$$Wu(1,2) \text{ and } Ji(0,2) \text{ like } Wu(1,2) \text{ and } Ji(0,2) \text{ (戊己同类戊己)}$$

$$(Wu(1,2))^{-1} * Wu(1,2) = Yi(0,0) \rightarrow \text{Yin wood (戊戊比肩),}$$

$$(Wu(1,2))^{-1} * Ji(0,2) = Jia(1,0) \rightarrow \text{Yang wood (戊己劫财),}$$

$$(Ji(0,2))^{-1} * Wu(1,2) = Jia(1,0) \rightarrow \text{Yang wood (己戊劫财),}$$

$$(Ji(0,2))^{-1} * Ji(0,2) = Yi(0,0) \rightarrow \text{Yin wood (己己比肩);}$$

$$Geng(1,3) \text{ and } Xin(0,3) \text{ kill } Geng(1,3) \text{ and } Xin(0,3) \text{ (庚辛同类庚辛)}$$

$$(Geng(1,3))^{-1} * Geng(1,3) = Yi(0,0) \rightarrow \text{Yin wood (庚庚比肩),}$$

$$(Geng(1,3))^{-1} * Xin(0,3) = Jia(1,0) \rightarrow \text{Yang wood (庚辛劫财),}$$

$$(Xin(0,3))^{-1} * Geng(1,3) = Jia(1,0) \rightarrow \text{Yang wood (辛庚劫财),}$$

$$(Xin(0,3))^{-1} * Xin(0,3) = Yi(0,0) \rightarrow \text{Yin wood (辛辛比肩);}$$

Ren(1,4) and Gui(0,4) like Ren(1,4) and Gui(0,4) (壬癸同类壬癸)  
 $(Ren(1,4))^{-1} * Ren(1,4) = Yi(0,0) \rightarrow$  Yin wood (壬壬比肩),  
 $(Ren(1,4))^{-1} * Gui(0,4) = Jia(1,0) \rightarrow$  Yang wood (壬癸劫财),  
 $(Gui(0,4))^{-1} * Ren(1,4) = Jia(1,0) \rightarrow$  Yang wood (癸壬劫财),  
 $(Gui(0,4))^{-1} * Gui(0,4) = Yi(0,0) \rightarrow$  Yin wood (癸癸比肩).  
 Jia(1,0) and Yi(0,0) love Bing(1,1) and Ding(0,1) (甲乙生丙丁)  
 $(Jia(1,0))^{-1} * Bing(1,1) = Ding(0,1) \rightarrow$  Yin fire (甲偏印丙),  
 $(Jia(1,0))^{-1} * Ding(0,1) = Bing(1,1) \rightarrow$  Yang fire (甲正印丁),  
 $(Yi(0,0))^{-1} * Bing(1,1) = Bing(1,1) \rightarrow$  Yang fire (乙正印丙),  
 $(Yi(0,0))^{-1} * Ding(0,1) = Ding(0,1) \rightarrow$  Yin fire (乙偏印丁);  
 Bing(1,1) and Ding(0,1) love Wu(1,2) and Ji(0,2) (丙丁生戊己)  
 $(Bing(1,1))^{-1} * Wu(1,2) = Ding(0,1) \rightarrow$  Yin fire (丙偏印戊),  
 $(Bing(1,1))^{-1} * Ji(0,2) = Bing(1,1) \rightarrow$  Yang fire (丙正印己),  
 $(Ding(0,1))^{-1} * Wu(1,2) = Bing(1,1) \rightarrow$  Yang fire (丁正印戊),  
 $(Ding(0,1))^{-1} * Ji(0,2) = Ding(0,1) \rightarrow$  Yin fire (丁偏印己);  
 Wu(1,2) and Ji(0,2) love Geng(1,3) and Xin(0,3) (戊己生庚辛)  
 $(Wu(1,2))^{-1} * Geng(1,3) = Ding(0,1) \rightarrow$  Yin fire (戊偏印庚),  
 $(Wu(1,2))^{-1} * Xin(0,3) = Bing(1,1) \rightarrow$  Yang fire (戊正印辛),  
 $(Ji(0,2))^{-1} * Geng(1,3) = Bing(1,1) \rightarrow$  Yang fire (己正印庚),  
 $(Ji(0,2))^{-1} * Xin(0,3) = Ding(0,1) \rightarrow$  Yin fire (己偏印辛);  
 Geng(1,3) and Xin(0,3) love Ren(1,4) and Gui(0,4) (庚辛生壬癸)  
 $(Geng(1,3))^{-1} * Ren(1,4) = Ding(0,1) \rightarrow$  Yin fire (庚偏印壬),  
 $(Geng(1,3))^{-1} * Gui(0,4) = Bing(1,1) \rightarrow$  Yang fire (庚正印癸),  
 $(Xin(0,3))^{-1} * Ren(1,4) = Bing(1,1) \rightarrow$  Yang fire (辛正印壬),  
 $(Xin(0,3))^{-1} * Gui(0,4) = Ding(0,1) \rightarrow$  Yin fire (辛正印癸);  
 Ren(1,4) and Gui(0,4) love Jia(1,0) and Yi(0,0) (壬癸生甲乙)  
 $(Ren(1,4))^{-1} * Jia(1,0) = Ding(0,1) \rightarrow$  Yin fire (壬偏印甲),  
 $(Ren(1,4))^{-1} * Yi(0,0) = Bing(1,1) \rightarrow$  Yang fire (壬正印乙),  
 $(Gui(0,4))^{-1} * Jia(1,0) = Bing(1,1) \rightarrow$  Yang fire (癸正印甲),  
 $(Gui(0,4))^{-1} * Yi(0,0) = Ding(0,1) \rightarrow$  Yin fire (癸偏印乙).  
**(5) The combined relationships of the ten Heavenly Stems are at highest costs as follows:**  
 Jia(1,0) and Yi(0,0) kill Wu(1,2) and Ji(0,2) (甲乙克戊己)  
 $(Jia(1,0))^{-1} * Wu(1,2) = Ji(0,2) \rightarrow$  Yin earth (甲戊偏相克),  
 $(Jia(1,0))^{-1} * Ji(0,2) = Wu(1,2) \rightarrow$  Yang earth (甲己正相克),  
 $(Yi(0,0))^{-1} * Wu(1,2) = Wu(1,2) \rightarrow$  Yang earth (乙戊正相克),  
 $(Yi(0,0))^{-1} * Ji(0,2) = Ji(0,2) \rightarrow$  Yin earth (乙己偏相克);  
 Wu(1,2) and Ji(0,2) kill Ren(1,4) and Gui(0,4) (戊己克壬癸)  
 $(Wu(1,2))^{-1} * Ren(1,4) = Xin(0,3) \rightarrow$  Yin metal (戊壬偏相克),  
 $(Wu(1,2))^{-1} * Gui(0,4) = Geng(1,3) \rightarrow$  Yin metal (戊癸正相克),  
 $(Ji(0,2))^{-1} * Ren(1,4) = Geng(1,3) \rightarrow$  Yin metal (己壬正相克),  
 $(Ji(0,2))^{-1} * Gui(0,4) = Xin(0,3) \rightarrow$  Yin metal (己癸偏相克);  
 Ren(1,4) and Gui(0,4) kill Bing(1,1) and Ding(0,1) (壬癸克丙丁)  
 $(Ren(1,4))^{-1} * Bing(1,1) = Ji(0,2) \rightarrow$  Yin earth (壬丙偏相克),  
 $(Ren(1,4))^{-1} * Ding(0,1) = Wu(1,2) \rightarrow$  Yin earth (壬丁正相克),  
 $(Gui(0,4))^{-1} * Bing(1,1) = Wu(1,2) \rightarrow$  Yin earth (癸丙正相克),  
 $(Gui(0,4))^{-1} * Ding(0,1) = Ji(0,2) \rightarrow$  Yin earth (癸丁偏相克);  
 Bing(1,1) and Ding(0,1) kill Geng(1,3) and Xin(0,3) (丙丁克庚辛)  
 $(Bing(1,1))^{-1} * Geng(1,3) = Ji(0,2) \rightarrow$  Yin earth (丙庚偏相克),  
 $(Bing(1,1))^{-1} * Xin(0,3) = Wu(1,2) \rightarrow$  Yang earth (丙辛正相克),  
 $(Ding(0,1))^{-1} * Geng(1,3) = Wu(1,2) \rightarrow$  Yang earth (丁庚正相克),  
 $(Ding(0,1))^{-1} * Xin(0,3) = Ji(0,2) \rightarrow$  Yin earth (丁辛偏相克);

Geng(1,3) and Xin(0,3) kill Jia(1,0) and Yi(0,0) (庚辛克甲乙)  
 $(Geng(1,3))^{-1} * Jia(1,0) = Ji(0,2) \rightarrow$  Yin earth (庚甲偏相克),  
 $(Geng(1,3))^{-1} * Yi(0,0) = Wu(1,2) \rightarrow$  Yang earth (庚乙正相克),  
 $(Xin(0,3))^{-1} * Jia(1,0) = Wu(1,2) \rightarrow$  Yang earth (辛甲正相克),  
 $(Xin(0,3))^{-1} * Yi(0,0) = Ji(0,2) \rightarrow$  Yin earth (辛乙偏相克).  
 The ten heavenly stems rushing (十天干相冲)  
 $(Jia(1,0))^{-1} * Geng(1,3) = Xin(0,3) \rightarrow$  Yin metal (甲庚相冲),  
 $(Yi(0,0))^{-1} * Xin(0,3) = Xin(0,3) \rightarrow$  Yin metal (乙辛相冲),  
 $(Ren(1,4))^{-1} * Bing(1,1) = Ji(0,2) \rightarrow$  Yin earth (壬丙相冲),  
 $(Gui(0,4))^{-1} * Ding(0,1) = Ji(0,2) \rightarrow$  Yin earth (癸丁相冲),  
 $(Wu(1,2))^{-1} * Ji(0,2) = Jia(1,0) \rightarrow$  Yang wood (戊己无冲).

All relation laws of the Zangxiang system or the ten Heavenly Stems model are summarized in Figure 2. It means that both the liking relation and the loving relation have the low cost, but the killing relation has high cost. #

**Property 3.4** Suppose that both  $x$  and  $y$  are two elements of the Jingluo system.

Then the following statements are true.

(1) The lowest cost elements are as follows:

$Chou(0, (23)) = 丑(0, (23)) = X(0, (23)) =$  阴营气  $\rightarrow$  liver (肝),  
 $You(0, (132)) = 巳(0, (132)) = K_x(0, (132)) =$  阴宗气  $\rightarrow$  spleen (脾),  
 $Wu(0, (123)) = 酉(0, (123)) = X_s^+(0, (123)) =$  阴真气  $\rightarrow$  kidney (肾).

The second low cost elements are as follows:

$Zi(0, e) = 子(0, e) = X(0, e) =$  阴元气  $\rightarrow$  gallbladder (胆),  
 $Chen(0, (12)) = 辰(0, (12)) = X_x(0, (12)) =$  阴谷气  $\rightarrow$  stomach (胃),  
 $Shen(0, (13)) = 申(0, (13)) = S_x(0, (13)) =$  阴卫气  $\rightarrow$  bladder (膀胱).

(2) The highest relation cost elements are as follows

$Hai(1, e) = 亥(1, e) = X_s^+(1, e) =$  阳元气  $\rightarrow$  triple energizer (三焦),  
 $Mao(1, (12)) = 卯(1, (12)) = K_x(1, (12)) =$  阳谷气  $\rightarrow$  large intestine (大肠),  
 $Wei(1, (13)) = 未(1, (13)) = S_x(1, (13)) =$  阳卫气  $\rightarrow$  small intestine (小肠).

The second high cost elements are as follows

$Xu(1, (23)) = 戌(1, (23)) = X_s^+(1, (23)) =$  阳营气  $\rightarrow$  pericardium (心包),  
 $Yin(1, (132)) = 寅(1, (132)) = K_x(1, (132)) =$  阳宗气  $\rightarrow$  lung (肺),  
 $Wu(1, (123)) = 午(1, (123)) = X_s^+(1, (123)) =$  阳真气  $\rightarrow$  heart (心).

(3) The merged and synthesized relationships of the twelve Earthly Branches at zero costs are as follows:

Number three rendezvous (地支三会局)  
 $\{Yin(1, (132)), Mao(1, (12)), Chen(0, (12))\}$   
 $\rightarrow \{Yang\ wood, Yang\ wood, Yang\ earth\}$   
 (寅卯辰三会东方木),  
 $\{Si(0, (132)), Wu(1, (123)), Wei(1, (13))\}$   
 $\rightarrow \{Yin\ fire, Yang\ fire, Yin\ earth\}$   
 (寅卯辰三会南方火),  
 $\{Shen(0, (13)), You(0, (123)), Xu(1, (23))\}$   
 $\rightarrow \{Yang\ metal, Yin\ metal, Yang\ earth\}$   
 (寅卯辰三会西方金),  
 $\{Hai(1, e), Zi(0, e), Chou(0, (23))\}$   
 $\rightarrow \{Yin\ water, Yang\ water, Yin\ earth\}$   
 (亥子丑三会北方水).

Number six synthesized (地支六合化)

$Zi(0, e) * Chou(0, (23)) = Chou(0, (23)) = 丑(0, (23))$   
 $\rightarrow$  Yin earth (子丑合化土),  
 $Yin(1, (132)) * Hai(1, e) = Si(0, (132))$   
 $Si(0, (132)) * Hai(1, e) = Yin(1, (132))$   
 $\rightarrow$  Yang wood (寅亥合化木),



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Mao(1,(12))\*Xu(1,(23))=Si(0,(132))  
 → Yin fire (卯戌合化火),  
 Chen(0,(12))\*You(0,(123))=Shen(0,(13))  
 → Yang metal (辰酉合合金),  
 Si(0,(132))\*Shen(0,(13))=Chou(0,(23))  
 Chou(0,(23))\*Chou(0,(23))=Zi(0,e)  
 → Yang water (巳申合化水),  
 Wu(1,(123))\*Wei(1,(13))=Chen(0,(12))  
 → Yang earth (未午合化土).  
 (4) *The combined relationships of the twelve Earthly Branches at low costs are as follows:*  
 Number six combined (地支三合局)  
 (Shen(0,(13)))<sup>-1</sup>\*Zi(0,e)=Shen(0,(13)),  
 (Zi(0,e))<sup>-1</sup>\*Chen(0,(12))=Chen(0,(12)),  
 (Chen(0,(12)))<sup>-1</sup>\*Shen(0,(13))=You(0,(123)),  
 Chen(0,(12))\*You(0,(123))\*Shen(0,(13))=Zi(0,e)  
 → Yang water (申子辰化合水局);  
 (Hai(1,e))<sup>-1</sup>\*Mao(1,(12))=Chen(0,(12)),  
 (Mao(1,(12)))<sup>-1</sup>\*Wei(1,(13))=You(0,(123)),  
 (Wei(1,(13)))<sup>-1</sup>\*Hai(1,e)=Shen(0,(13)),  
 Shen(0,(13))\*Chen(0,(12))\*Hai(1,e)=Yin(1,(132))  
 → Yang wood (亥卯未化合木局);  
 (Yin(1,(132)))<sup>-1</sup>\*Wu(1,(123))=Si(0,(132)),  
 (Wu(1,(123)))<sup>-1</sup>\*Xu(1,(23))=Chen(0,(12)),  
 (Xu(1,(23)))<sup>-1</sup>\*Yin(1,(132))=Shen(0,(13)),  
 Xu(1,(23))\*Chen(0,(12))=Wu(1,(123))  
 → Yang fire (寅午戌化合火局);  
 (Si(0,(132)))<sup>-1</sup>\*You(0,(123))=Si(0,(132)),  
 (You(0,(123)))<sup>-1</sup>\*Chou(0,(23))=Chen(0,(12)),  
 (Chou(0,(23)))<sup>-1</sup>\*Si(0,(132))=Shen(0,(13)),  
 Mao(0,(12))\*You(0,(123))=Shen(0,(13))  
 → Yang metal (巳酉丑化合金属局).  
 Number six combined (地支六化合)  
 [Zi(0,e)]<sup>-1</sup>\*Chou(0,(23))=Chou(0,(23))  
 → Yin earth (子丑化合土),  
 [Yin(1,(132))]<sup>-1</sup>\*Hai(1,e)=You(0,(123))  
 [You(0,(123))]<sup>-1</sup>\*Hai(1,e)=Yin(1,(132))  
 → Yang wood (寅亥化合木),  
 [Mao(1,(12))]<sup>-1</sup>\*Xu(1,(23))=Si(0,(132))  
 → Yin fire (卯戌化合火),  
 [Chen(0,(12))]<sup>-1</sup>\*You(0,(123))=Shen(0,(13))  
 → Yang metal (辰酉化合金属),  
 [Si(0,(132))]<sup>-1</sup>\*Shen(0,(13))=Chen(0,(12))  
 [Chen(0,(12))]<sup>-1</sup>\*Chen(0,(12))=Zi(0,e)  
 → Yang water (巳申化合水),  
 [Wu(1,(123))]<sup>-1</sup>\*Wei(1,(13))=Chou(0,(23))  
 → Yin earth (午未化合土).  
 (5) *The combined relationships of the twelve Earthly Branches at high costs are as follows:*

Number six evils (地支六害)  
 (Zi(0,e))<sup>-1</sup>\*Wei(1,(13))=Wei(1,(13)) → Yin earth (子未相害),  
 (Chou(0,(23)))<sup>-1</sup>\*Wu(1,(123))=Mao(1,(12)) → Yin wood (丑午相害),  
 (Yin(1,(132)))<sup>-1</sup>\*Si(0,(132))=Hai(1,e) → Yin water (寅巳相害),  
 (Mao(1,(12)))<sup>-1</sup>\*Chen(0,(12))=Hai(1,e) → Yin water (卯辰相害),  
 (Shen(0,(13)))<sup>-1</sup>\*Hai(1,e)=Wei(1,(13)) → Yin earth (申亥相害),  
 (You(0,(123)))<sup>-1</sup>\*Xu(1,(23))=Mao(1,(12)) → Yin wood (酉戌相害).  
 Number six rushed (地支六冲)  
 (Zi(0,e))<sup>-1</sup>\*Wu(1,(123))=Wu(1,(123)) → Yang fire (子午相冲),  
 (Chou(0,(23)))<sup>-1</sup>\*Wei(1,(13))=Yin(1,(132)) → Yang wood (丑未相冲),  
 (Yin(1,(132)))<sup>-1</sup>\*Shen(0,(13))=Mao(1,(12)) → Yin wood (寅申相冲),  
 (Mao(1,(12)))<sup>-1</sup>\*You(0,(123))=Wei(1,(13)) → Yin earth (卯酉相冲),  
 (Shen(0,(13)))<sup>-1</sup>\*Xu(1,(23))=Wu(1,(123)) → Yang fire (申戌相冲),  
 (Si(0,(132)))<sup>-1</sup>\*Hai(1,e)=Wu(1,(123)) → Yang fire (巳亥相冲).  
 Number three punished (地支三刑)  
 (a). Three-elements punishment (三元刑, 环刑)  
 (No punishment of kindness (无恩之刑))  
 (Yin(1,(132)))<sup>-1</sup>\*Si(0,(132))=Hai(1,e) → Yin water (寅刑巳),  
 (Si(0,(132)))<sup>-1</sup>\*Shen(0,(13))=Chen(0,(12)) → Yang earth (巳刑申),  
 (Shen(0,(13)))<sup>-1</sup>\*Yin(1,(132))=Mao(1,(12)) → Yin wood (申刑寅).  
 (b). Three-elements punishment (三元刑, 环刑)  
 (The power of punishment (持势之刑))  
 (Chou(0,(23)))<sup>-1</sup>\*Xu(1,(23))=Hai(1,e) → Yin water (丑刑戌),  
 (Xu(1,(23)))<sup>-1</sup>\*Wei(1,(13))=You(0,(132)) → Yin metal (戌刑未),  
 (Wei(1,(13)))<sup>-1</sup>\*Chou(0,(23))=Wu(1,(123)) → Yang fire (未刑丑).  
 (c). Two-elements punishment (二元刑, 对刑)  
 (A punishment of rude (无礼之刑))  
 (Zi(0,e))<sup>-1</sup>\*Mao(1,(12)) = Mao(1,(12)) → Yin wood (子刑卯),  
 (Mao(1,(12)))<sup>-1</sup>\*Zi(0,e) = Mao(1,(12)) → Yin wood (卯刑子).  
 (d). One-element punishment (一元刑, 自刑)  
 (A punishment of things very (物极之刑))  
 (Chen(0,(12)))<sup>-1</sup>\*Chen(0,(12)) = Zi(0,e) → Yang water (辰刑辰),  
 (Wu(1,(123)))<sup>-1</sup>\*Wu(1,(123)) = Zi(0,e) → Yang water (午刑午),  
 (You(0,(123)))<sup>-1</sup>\*You(0,(123)) = Zi(0,e) → Yang water (酉刑酉),  
 (Hai(1,e))<sup>-1</sup>\*Hai(1,e) = Zi(0,e) → Yang water (亥刑亥).

*All relation laws of the Jingluo system or the twelve Earthly Branches model are summarized in Figure 3. It means that the Your palm in Figure 3, all transverse relationship with low cost, but all vertical relationship with high cost. On the other hand, in the three types: {Yin,Mao}, {Wu,Wei}, {Xu,Hai} or the three types: {Chen,Si}, {Shen,You}, {Zi,Shou} for the vertices of the triangle respectively, the relationship between the cost is low. Otherwise, the relationship between the cost is high.#*

**3.3 First Transfer Laws of Economic Society Energies of Steady Multilateral Systems with a healthy Economy**

Suppose that a steady multilateral system  $V$  having energy function  $\varphi(*)$  is normal or healthy. Let  $x$  be the GBR inflation rate of  $V$ . Taking  $\rho_1 = \rho(x)$ ,  $\rho_2 = \rho(x)^2$ ,

and  $\rho_3 = c\rho(x)$  where  $0 \leq c \leq 1$  and  $\rho(x)$  is defined in Eqs.(3) and (4). The healthy economy means that the conditions  $\rho_0 \leq \rho(x) \leq 1$  and  $0 < c \leq 1$  hold. By Corollary 2.1, it is equivalent to the normal range  $x \in [8.956\%, 20.079\%]$  or the healthy condition  $\rho_1 + \rho_2\rho_3 \geq 1 - \rho_2\rho_3$ . That  $c \rightarrow 0$  implies that the economy is without the ability of self-protection, i.e.,  $\rho_3 = c\rho(x) \rightarrow 0$ . Of course, the economy cannot be healthy. It is because for any  $x \neq 0.13705$ , when  $c \rightarrow 0$ , there are

$$\rho_1 + \rho_2\rho_3 = \rho(x) + c\rho(x)^3 \rightarrow \rho(x) < 1 \leftarrow 1 - c\rho(x)^3 = 1 - \rho_2\rho_3,$$

such that the healthy condition  $\rho_1 + \rho_2\rho_3 \geq 1 - \rho_2\rho_3$  cannot hold.

By using Corollary 2.1 and Theorems 2.1 and 3.1, the following Theorems 3.2 and 3.3 can be obtained as the transfer law of occurrence and change of economic society energies with a healthy economy.

**Theorem 3.2 (The transfer law of the ten Heavenly Stems with a healthy economy)** Let the GBR inflation rate  $x \in [8.956\%, 20.079\%]$  which is equivalent to the conditions  $\rho_0 \leq \rho_1 = \rho(x) \leq 1$  and  $0 < c \leq 1$ .

The transfer law of each of the 10 kinds of energy in the the **Zangxiang** system or the **ten Heavenly Stems model** is from its **root-causes** to its **symptoms**. Furthermore, for the healthy economy, the transfer law of the **Yang** vital or righteousness energies of the ten heavenly stems is transferring **along** the loving or liking order of the ten heavenly stems as follows:

$$\begin{aligned} & \xrightarrow{\text{less}} \text{real Jia}(1,0)X^+ \xleftrightarrow{\text{less}} \text{real Yi}(0,0)X^- \\ & \xrightarrow{\text{less}} \text{real Bing}(1,1)X_S^+ \xleftrightarrow{\text{less}} \text{real Ding}(0,1)X_S^- \\ & \xrightarrow{\text{rare}} \text{virtual Wu}(1,2)X_K^+ \xleftrightarrow{\text{less}} \text{virtual Ji}(0,2)X_K^- \\ & \xrightarrow{\text{more}} \text{virtual Geng}(1,3)K_X^+ \xleftrightarrow{\text{less}} \text{virtual Xin}(0,3)K_X^- \\ & \xrightarrow{\text{rare}} \text{real Ren}(1,4)S_X^+ \xleftrightarrow{\text{less}} \text{real Gui}(0,4)S_X^- \\ & \xrightarrow{\text{less}} \text{real Jia}(1,0)X^+ \xleftrightarrow{\text{less}} \text{real Yi}(0,0)X^- \rightarrow \dots \end{aligned}$$

And the transfer law of the **Yin** vital or righteousness energies of the ten heavenly stems is transferring **against** the loving or liking order of the ten heavenly stems as follows:

$$\begin{aligned} & \dots \xleftarrow{\text{less}} \text{virtual Yi}(0,0)X^- \xleftrightarrow{\text{less}} \text{virtual Jia}(1,0)X^+ \\ & \xleftarrow{\text{less}} \text{virtual Gui}(0,4)S_X^- \xleftrightarrow{\text{less}} \text{virtual Ren}(1,4)S_X^+ \\ & \xleftarrow{\text{rare}} \text{real Xin}(0,3)K_X^- \xleftrightarrow{\text{less}} \text{real Geng}(1,3)K_X^+ \\ & \xleftarrow{\text{more}} \text{real Ji}(0,2)X_K^- \xleftrightarrow{\text{less}} \text{real Wu}(1,2)X_K^+ \\ & \xleftarrow{\text{rare}} \text{virtual Ding}(0,1)X_S^- \xleftrightarrow{\text{less}} \text{virtual Bing}(1,1)X_S^+ \\ & \xleftarrow{\text{less}} \text{virtual Yi}(0,0)X^- \xleftrightarrow{\text{less}} \text{virtual Jia}(1,0)X^+ \leftarrow \dots \end{aligned}$$

All transfer laws of the **Zangxiang** system or the **ten Heavenly Stems model for a healthy economy** are summarized in **Figure 2**. It means that only both the liking relation and the loving relation have the transfer law of the **Yang** or **Yin** vital or righteousness energies of the ten heavenly stems. **Yang** is transferring **along** the loving or liking order of the ten heavenly stems. **Yin** is transferring **against** the loving or liking order of the ten heavenly stems.#

**Theorem 3.3 (The transfer law of the twelve Earthly Branches with a healthy economy)** Let the GBR inflation

rate  $x \in [8.956\%, 20.079\%]$  which is equivalent to the conditions  $\rho_0 \leq \rho_1 = \rho(x) \leq 1$  and  $0 < c \leq 1$ . The transfer law of each of the 12 kinds of energy in the **Jingluo** system or the **twelve Earthly Branches model** is from its **root-causes** to its **symptoms**.

Furthermore, for the healthy economy, the transfer law of the **Yang** vital energies of the twelve earthly branches is transferring **along** the loving or liking order of the twelve earthly branches as follows:

$$\begin{aligned} & \xrightarrow{\text{less}} \text{virtual Mao} \quad \text{real Zi} \quad \text{real Hai} \\ & K_X^+(1,(12)) \quad X^+(0,e) \xrightarrow{\text{less}} \quad X_S^{++}(1,e) \\ & \quad \downarrow \text{less} \quad \quad \quad \downarrow \text{less} \quad \quad \quad \downarrow \text{less} \\ & \text{virtual Yin} \quad \text{real Chou} \quad \text{real Xu} \\ & K_X^-(1,(132)) \xrightarrow{\text{more}} \quad X^-(0,(23)) \quad X_S^{+-}(1,(23)) \xleftarrow{\text{rare}} \\ & \text{real Shen} \quad \text{real Wei} \quad \text{virtual Chen} \\ & S_X^+(0,(13)) \xrightarrow{\text{rare}} \quad X_S^{j+}(1,(13)) \quad X_K^+(0,(12)) \xrightarrow{\text{less}} \\ & \quad \downarrow \text{less} \quad \quad \quad \downarrow \text{less} \quad \quad \quad \downarrow \text{less} \\ & \xleftarrow{\text{rare}} \text{real You} \quad \text{real Wu} \quad \text{virtual Si} \\ & S_X^-(0,(123)) \quad X_S^{j-}(1,(123)) \xrightarrow{\text{rare}} \quad X_K^-(0,(132)) \end{aligned}$$

The transfer law of the **Yin** vital energies of the twelve earthly branches is transferring **against** the loving or liking order of the ten heavenly stems as follows:

$$\begin{aligned} & \xleftarrow{\text{rare}} \text{virtual Shen} \quad \text{virtual Hai} \quad \text{virtual Zi} \\ & S_X^+(0,(13)) \quad X_S^{++}(1,e) \xleftarrow{\text{less}} \quad X^+(0,e) \\ & \quad \downarrow \text{less} \quad \quad \quad \downarrow \text{less} \quad \quad \quad \downarrow \text{less} \\ & \text{virtual You} \quad \text{virtual Xu} \quad \text{virtual Chou} \\ & S_X^-(0,(123)) \xrightarrow{\text{rare}} \quad X_S^{+-}(1,(23)) \quad X^-(0,(23)) \xleftarrow{\text{less}} \\ & \text{real Mao} \quad \text{real Chen} \quad \text{virtual Wei} \\ & K_X^+(1,(12)) \xleftarrow{\text{more}} \quad X_K^+(0,(12)) \quad X_S^{j+}(1,(13)) \xleftarrow{\text{rare}} \\ & \quad \downarrow \text{less} \quad \quad \quad \downarrow \text{less} \quad \quad \quad \downarrow \text{less} \\ & \xleftarrow{\text{less}} \text{real Yin} \quad \text{real Si} \quad \text{virtual Wu} \\ & K_X^-(1,(132)) \quad X_K^-(0,(132)) \xleftarrow{\text{rare}} \quad X_S^{j-}(1,(123)) \end{aligned}$$

All transfer laws of the **Jingluo** system or the **twelve Earthly Branches model for a healthy economy** are summarized in **Figure 3**. It means that only both the liking relation and the adjacent relation have the transfer law of the **Yang** or **Yin** vital or righteousness energies of the twelve earthly branches. **Yang** is transferring **along** the loving or liking order of the twelve earthly branches. **Yin** is transferring **against** the loving or liking order of the twelve earthly branches.#

**Remark 4.** Theorems 3.2 and 3.3 are called the transfer law of occurrence and change of economy energies with a healthy economy, simply, **the first transfer law**.

For a **Yang** energy of  $X$  and the **Zangxiang** system or the **ten Heavenly Stems model for a healthy economy**, the first transfer law is transferring **along** the loving or liking order of the ten heavenly stems as follows:

$$\xrightarrow{\text{less}} \text{real } X^+ \xleftrightarrow{\text{less}} \text{real } X^-$$

$$\xrightarrow{\text{less}} \text{real } X_S^+ \xleftrightarrow{\text{less}} \text{real } X_S^-$$

$$\xrightarrow{\text{rare}} \text{virtual } X_K^+ \xleftrightarrow{\text{less}} \text{virtual } X_K^-$$

$$\xrightarrow{\text{more}} \text{virtual } K_X^+ \xleftrightarrow{\text{less}} \text{virtual } K_X^-$$

$$\xrightarrow{\text{rare}} \text{real } S_X^+ \xleftrightarrow{\text{less}} \text{real } S_X^-$$

$$\xrightarrow{\text{less}} \text{real } X^+ \xleftrightarrow{\text{less}} \text{real } X^-.$$

For a Yin energy of  $X$  and the Zangxiang system or the ten Heavenly Stems model for a healthy economy, the first transfer law is transferring against the loving or liking order of the ten heavenly stems as follows:

$$\text{virtual } X^- \xleftrightarrow{\text{less}} \text{virtual } X^+$$

$$\xleftarrow{\text{less}} \text{virtual } S_X^- \xleftrightarrow{\text{less}} \text{virtual } S_X^+$$

$$\xleftarrow{\text{rare}} \text{real } K_X^- \xleftrightarrow{\text{less}} \text{real } K_X^+$$

$$\xleftarrow{\text{more}} \text{real } X_K^- \xleftrightarrow{\text{less}} \text{real } X_K^+$$

$$\xleftarrow{\text{rare}} \text{virtual } X_S^- \xleftrightarrow{\text{less}} \text{virtual } X_S^+$$

$$\xleftarrow{\text{less}} \text{virtual } X^- \xleftrightarrow{\text{less}} \text{virtual } X^+.$$

For a Yang energy of  $X$  and the Jingluo system or the twelve Earthly Branches model for a healthy economy, the first transfer law is transferring along the loving or liking order of the twelve earthly branches as follows:

$$\text{real Chou } X^- \xleftrightarrow{\text{less}} \text{real Zi } X^+$$

$$\xrightarrow{\text{less}} \text{real Hai } X_S^{x+} \xleftrightarrow{\text{less}} \text{real Xu } X_S^{x-}$$

$$\xleftarrow{\text{rare}} \text{real You } S_X^- \xleftrightarrow{\text{less}} \text{real Shen } S_X^+$$

$$\xrightarrow{\text{rare}} \text{real Wei } X_S^{j+} \xleftrightarrow{\text{less}} \text{real Wu } X_S^{j-}$$

$$\xrightarrow{\text{less}} \text{virtual Si } X_K^- \xleftrightarrow{\text{less}} \text{virtual Chen } X_K^+$$

$$\xrightarrow{\text{less}} \text{virtual Mao } K_X^+ \xleftrightarrow{\text{less}} \text{virtual Yin } K_X^-$$

$$(\xrightarrow{\text{rare}} \text{real You } S_X^- \xleftrightarrow{\text{less}} \text{real Shen } S_X^+)$$

$$\xrightarrow{\text{less}} \text{real Chou } X^- \xleftrightarrow{\text{less}} \text{real Zi } X^+.$$

For a Yin energy of  $X$  and the Jingluo system or the twelve Earthly Branches model for a healthy economy, the first transfer law is transferring against the loving or liking order of the twelve earthly branches as follows

$$\xleftarrow{\text{less}} \text{virtual Zi } X^+ \xleftrightarrow{\text{less}} \text{virtual Chou } X^-$$

$$(\xleftarrow{\text{less}} \text{virtual Shen } S_X^+ \xleftrightarrow{\text{less}} \text{virtual You } S_X^-)$$

$$\xleftarrow{\text{rare}} \text{real Yin } K_X^- \xleftrightarrow{\text{less}} \text{real Mao } K_X^+$$

$$\xleftarrow{\text{more}} \text{real Chen } X_K^+ \xleftrightarrow{\text{less}} \text{real Si } X_K^-$$

$$\xleftarrow{\text{rare}} \text{virtual Wu } X_S^{j-} \xleftrightarrow{\text{less}} \text{virtual Wei } X_S^{j+}$$

$$\xleftarrow{\text{rare}} \text{virtual Shen } S_X^+ \xleftrightarrow{\text{less}} \text{virtual You } S_X^-$$

$$\xrightarrow{\text{rare}} \text{virtual Xu } X_S^{x-} \xleftrightarrow{\text{less}} \text{virtual Hai } X_S^{x+}$$

$$\xleftarrow{\text{less}} \text{virtual Zi } X^+ \xleftrightarrow{\text{less}} \text{virtual Chou } X^-.$$

Because the energy change between

$$\xleftarrow{\text{less}} \text{virtual Zi } X^+ \xleftrightarrow{\text{less}} \text{virtual Chou } X^- \text{ and } \xleftarrow{\text{less}} \text{real Yin } K_X^- \xleftrightarrow{\text{less}} \text{real Mao } K_X^+ \text{ needs}$$

to be adjusted by the energy of

$$\xleftarrow{\text{less}} \text{virtual Shen } S_X^+ \xleftrightarrow{\text{less}} \text{virtual You } S_X^- , \text{ so generally believe that}$$

the Yin energy of  $X$  begins with the Yang energy of

real Yin  $K_X^- \xleftrightarrow{\text{less}} \text{real Mao } K_X^+$ . This is in Zi to Yin (11 PM at night to the next day at half past five) need to have a rest.

The transfer relation of the first transfer law running is the loving or liking relationship, denoted by  $\rightarrow$  or  $\leftrightarrow$ . The running condition of the first transfer law is

$$\text{both } (\rho_1 + \rho_2 \rho_3) \geq (1 - \rho_2 \rho_3) \text{ and } \rho_3 = c\rho(x) > 0.$$

By Theorem 2.1 and Corollary 2.1, the running condition is nearly equivalent to both  $\rho_0 \leq \rho_1 = \rho(x) \leq 1$  and  $0 < c \leq 1$ .

The best-state condition of the first transfer law is  $\rho_3 = c\rho(x)$  where  $c \rightarrow 1$  which is the best state of  $\rho_3$  for a healthy economy. To follow or utilize the running of the first transfer law is equivalent to the following method. For doing so, it is in order to protect or maintain the loving relationship. The method can strengthen both the value  $(\rho_1 + \rho_2 \rho_3) = (\rho(x) + c\rho(x)^3)$  tending to be large and the value  $(1 - \rho_2 \rho_3) = (1 - c\rho(x)^3)$  tending to be small at the same time. In other words, the way can make all of both  $\rho(x)$  and  $c$  tending to be large. It is because the running condition of the loving or liking relationship  $(\rho_1 + \rho_2 \rho_3) \geq (1 - \rho_2 \rho_3)$  is the stronger the use, which dues to  $\rho_1 = \rho(x)$  the greater the use. In other words again, if the treatment principle of the loving relationship disease is to use continuously abiding by the first transfer law, then all of both the intervention reaction coefficients  $\rho_1 = \rho(x)$ ,  $\rho_2 = \rho(x)^2$  and the coefficient of self-protection  $\rho_3 = c\rho(x) > 0$  where  $0 < c \leq 1$  will tend to be the best state, i.e.,  $\rho(x) \rightarrow 1$  and  $0 < c \rightarrow 1$ . #

**Side effects** of medical problems were the question: in the medical process, destroyed the balance of the normal systems which are not sick or intervened subsystems. The energy change of the intervened system is not the true side effects issue. The energy change is called the pseudo or non-true side effects issue since by Attaining Rule in Zhang [23], it is just the food of the second physiological system of the steady multilateral system for a healthy economy. The best state of the self-protection coefficient  $\rho_3 = c\rho(x)$ , i.e.,

$\rho_3 = c\rho(x) \rightarrow \rho(x) = \rho_1$ , where  $c \rightarrow 1$ , implies the non-existence of any side effects issue if the treatment principle of TCE is used. Therefore any disease that causes side effects issue occurrence in the first place dues to the non-best state of self-protection ability, i.e.,  $\rho_3 = c\rho(x) < \rho(x) = \rho_1$ . To follow or utilize the running of the first transfer law can make both  $\rho(x) \rightarrow 1$  and  $0 < c \rightarrow 1$ . At this point, the paper advocates to follow or utilize the first transfer law. It is in order to avoid the side effects issue occurrence for a healthy economy. #

### 3.4 Second Transfer Laws of Economic Society Energies of Steady Multilateral Systems with an unhealthy Economy

Suppose that a steady multilateral system  $V$  having energy function  $\varphi(*)$  is abnormal or unhealthy. Let  $x$  be the GBR inflation rate of  $V$ . Taking  $\rho_1 = \rho(x)$ ,  $\rho_2 = \rho(x)^2$  and  $\rho_3 = c\rho(x)$  where  $0 \leq c \leq 1$ , and  $\rho(x)$  is



defined in Eqs.(3) and (4). The unhealthy economy means that the conditions  $\rho_0 > \rho_1 = \rho(x) > 0$  and  $0 \leq c \leq 1$  hold, which is equivalent to the abnormal range  $x \notin [8.956\%, 20.079\%]$ .

From [20] and by using Corollary 2.1 and Theorems 2.1 and 3.1, the following Theorems 3.4 and 3.5 can be obtained as the transfer law of occurrence and change of economic society energies with an unhealthy economy.

**Theorem 3.4 (The transfer law of the ten Heavenly Stems with an unhealthy economy)** Let the GBR inflation rate  $x \notin [8.956\%, 20.079\%]$  which is equivalent to the conditions  $\rho_0 > \rho_1 = \rho(x) > 0$  and  $0 \leq c \leq 1$ .

The transfer law of each of the 10 kinds of energy in the Zangxiang system or the ten Heavenly Stems model for an unhealthy economy is from its root-causes to its symptoms.

Furthermore, for the unhealthy economy, if a subsystem  $X$  of a steady multilateral system  $V$  falls a real disease, then the disease comes from the mother  $S_x$  of  $X$ . The transfer law of the Yang vital or righteousness energies of the ten heavenly stems is transferring against the killing or liking order of the ten heavenly stems as follows:

$$\begin{aligned} & \text{real Jia (1,0) } X^+ \overset{\text{less}}{\leftrightarrow} \text{real Yi (0,0) } X^- \\ & \overset{\text{rare}}{\leftarrow} \text{real Geng (1,3) } K_x^+ \overset{\text{less}}{\leftrightarrow} \text{real Xin (0,3) } K_x^- \\ & \overset{\text{rare}}{\leftarrow} \text{real Bing (1,1) } X_s^+ \overset{\text{less}}{\leftrightarrow} \text{real Ding (0,1) } X_s^- \\ & \overset{\text{rare}}{\leftarrow} \text{real Ren (1,4) } S_x^+ \overset{\text{less}}{\leftrightarrow} \text{real Gui (0,4) } S_x^- \\ & \overset{\text{more}}{\leftarrow} \text{virtual Wu (1,2) } X_k^+ \overset{\text{less}}{\leftrightarrow} \text{virtual Ji (0,2) } X_k^- \\ & \overset{\text{less}}{\leftarrow} \text{real Jia (1,0) } X^+ \overset{\text{less}}{\leftrightarrow} \text{real Yi (0,0) } X^- \end{aligned}$$

And if a subsystem  $X$  of a steady multilateral system  $V$  falls a virtual disease, then the disease comes from the son  $X_s$  of  $X$ . The transfer law of the Yin vital or righteousness energies of the ten heavenly stems is transferring along the killing or liking order of the ten heavenly stems as follows:

$$\begin{aligned} & \text{virtual Yi (0,0) } X^- \overset{\text{less}}{\leftrightarrow} \text{virtual Jia (1,0) } X^+ \\ & \overset{\text{rare}}{\Rightarrow} \text{virtual Ji (0,2) } X_k^- \overset{\text{less}}{\leftrightarrow} \text{virtual Wu (1,2) } X_k^+ \\ & \overset{\text{rare}}{\Rightarrow} \text{virtual Gui (0,4) } S_x^- \overset{\text{less}}{\leftrightarrow} \text{virtual Ren (1,4) } S_x^+ \\ & \overset{\text{rare}}{\Rightarrow} \text{virtual Ding (0,1) } X_s^- \overset{\text{less}}{\leftrightarrow} \text{virtual Bing (1,1) } X_s^+ \\ & \overset{\text{more}}{\Rightarrow} \text{real Xin (0,3) } K_x^- \overset{\text{less}}{\leftrightarrow} \text{real Geng (1,3) } K_x^+ \\ & \overset{\text{less}}{\Rightarrow} \text{virtual Yi (0,0) } X^- \overset{\text{less}}{\leftrightarrow} \text{virtual Jia (1,0) } X^+ \end{aligned}$$

All transfer laws of the Zangxiang system or the ten Heavenly Stems model for an unhealthy economy are summarized in Figure 2. It means that only both the liking relation and the killing relation have the transfer law of the Yang or Yin vital or righteousness energies of the ten heavenly stems. Yang is transferring against the killing or liking order of the ten heavenly stems. Yin is transferring along the killing or liking order of the ten heavenly stems. #

**Theorem 3.5 (The transfer law of the twelve Earthly Branches with an unhealthy )** Let the GBR inflation rate  $x \notin [8.956\%, 20.079\%]$  which is equivalent to the conditions  $\rho_0 > \rho_1 = \rho(x) > 0$  and  $0 \leq c \leq 1$ .

The transfer law of each of the 12 kinds of energy in the Jingluo system or the twelve Earthly Branches model for an unhealthy economy is from its root-causes to its symptoms.

Furthermore, for the unhealthy economy, if a subsystem  $X$  of a steady multilateral system  $V$  falls a real disease, then the disease comes from the mother  $S_x$  of  $X$ . The transfer law of the Yang vital energies of the twelve earthly branches is transferring against the killing or liking order of the twelve earthly branches as follows:

$$\begin{aligned} & \text{real Mao} & \text{real Hai} & \text{real Wei} \\ & K_x^+(1,(12)) \overset{\text{rare}}{\leftarrow} & X_s^{x+}(1,e) & X_s^{j+}(1,(13)) \overset{\text{rare}}{\leftarrow} \\ & \Downarrow \text{less} & \Downarrow \text{less} & \Downarrow \text{less} \\ & \overset{\text{rare}}{\leftarrow} \text{real Yin} & \text{real Xu} & \text{real Wu} \\ & K_x^-(1,(132)) & X_s^{x-}(1,(23)) \overset{\text{less}}{\leftrightarrow} & X_s^{j-}(1,(123)) \\ & \overset{\text{rare}}{\leftarrow} \text{real Shen} & \text{virtual Chen} & \text{real Zi} \\ & S_x^+(0,(13)) & X_k^+(0,(12)) \overset{\text{less}}{\leftarrow} & X^+(0,e) \\ & \Downarrow \text{less} & \Downarrow \text{less} & \Downarrow \text{less} \\ & \text{real You} & \text{virtual Si} & \text{real Chou} \\ & S_x^-(0,(123)) \overset{\text{more}}{\leftarrow} & X_k^-(0,(132)) & X^-(0,(23)) \overset{\text{rare}}{\leftarrow} \end{aligned}$$

For the unhealthy economy, if a subsystem  $X$  of a steady multilateral system  $V$  falls a virtual disease, then the disease comes from the son  $X_s$  of  $X$ . The transfer law of the Yin vital energies of the twelve earthly branches is transferring along the killing or liking order of the twelve earthly branches as follows:

$$\begin{aligned} & \text{real Mao} & \text{virtual Zi} & \text{virtual Chen} \\ & K_x^+(1,(12)) \overset{\text{less}}{\Rightarrow} & X^+(0,e) & X_k^+(0,(12)) \overset{\text{rare}}{\Rightarrow} \\ & \Downarrow \text{less} & \Downarrow \text{less} & \Downarrow \text{less} \\ & \overset{\text{more}}{\Rightarrow} \text{real Yin} & \text{virtual Chou} & \text{virtual Si} \\ & K_x^-(1,(132)) & X^-(0,(23)) \overset{\text{rare}}{\Rightarrow} & X_k^-(0,(132)) \\ & \overset{\text{rare}}{\Rightarrow} \text{virtual Shen} & \text{virtual Wei} & \text{virtual Hai} \\ & S_x^+(0,(13)) & X_s^{+j}(1,(13)) \overset{\text{less}}{\leftrightarrow} & X_s^{-x}(1,e) \\ & \Downarrow \text{less} & \Downarrow \text{less} & \Downarrow \text{less} \\ & \text{virtual You} & \text{virtual Wu} & \text{virtual Xu} \\ & S_x^-(0,(123)) \overset{\text{less}}{\Rightarrow} & X_s^{-j}(1,(123)) & X_s^{-x}(1,(23)) \overset{\text{more}}{\Rightarrow} \end{aligned}$$

All transfer laws of the Jingluo system or the twelve Earthly Branches model for an unhealthy economy are summarized in Figure 3. It means that only both the liking relation and the alternate relation have the transfer law of the Yang or Yin vital or righteousness energies of the twelve earthly branches. Yang is transferring against the killing or liking order of the twelve earthly branches. Yin is transferring along the killing or liking order of the twelve earthly branches. #

**Remark 5.** Theorems 3.4 and 3.5 are called the transfer law of occurrence and change of energies with an unhealthy economy, simply, the second transfer law.

For a Yin energy of  $X$  and the Zangxiang system or the ten Heavenly Stems model for an unhealthy economy, the second transfer law is transferring along the killing or liking order of the ten heavenly stems as follows:

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$$\begin{aligned}
 &\overset{\text{less}}{\Rightarrow} \text{virtual } X^- \overset{\text{less}}{\Leftrightarrow} \text{virtual } X^+ \\
 &\overset{\text{rare}}{\Rightarrow} \text{virtual } X_K^- \overset{\text{less}}{\Leftrightarrow} \text{virtual } X_K^+ \\
 &\overset{\text{rare}}{\Rightarrow} \text{virtual } S_X^- \overset{\text{less}}{\Leftrightarrow} \text{virtual } S_X^+ \\
 &\overset{\text{rare}}{\Rightarrow} \text{virtual } X_S^- \overset{\text{less}}{\Leftrightarrow} \text{virtual } X_S^+ \\
 &\overset{\text{more}}{\Rightarrow} \text{real } K_X^- \overset{\text{less}}{\Leftrightarrow} \text{real } K_X^+ \\
 &\overset{\text{less}}{\Rightarrow} \text{virtual } X^- \overset{\text{less}}{\Leftrightarrow} \text{virtual } X^+.
 \end{aligned}$$

For a Yang energy of  $X$  and the Zangxiang system or the ten Heavenly Stems model for an unhealthy economy, the second transfer law is transferring against the killing or liking order of the ten heavenly stems as follows:

$$\begin{aligned}
 &\overset{\text{less}}{\Leftarrow} \text{real } X^+ \overset{\text{less}}{\Leftrightarrow} \text{real } X^- \\
 &\overset{\text{rare}}{\Leftarrow} \text{real } K_X^+ \overset{\text{less}}{\Leftrightarrow} \text{real } K_X^- \\
 &\overset{\text{rare}}{\Leftarrow} \text{real } X_S^+ \overset{\text{less}}{\Leftrightarrow} \text{real } X_S^- \\
 &\overset{\text{rare}}{\Leftarrow} \text{real } S_X^+ \overset{\text{less}}{\Leftrightarrow} \text{real } S_X^- \\
 &\overset{\text{more}}{\Leftarrow} \text{virtual } X_K^+ \overset{\text{less}}{\Leftrightarrow} \text{virtual } X_K^- \\
 &\overset{\text{less}}{\Leftarrow} \text{real } X^+ \overset{\text{less}}{\Leftrightarrow} \text{real } X^-.
 \end{aligned}$$

For a Yin energy of  $X$  and the Jingluo system or the twelve Earthly Branches model for an unhealthy economy, the second transfer law is transferring along the killing or liking order of the twelve earthly branches as follows:

$$\begin{aligned}
 &\overset{\text{less}}{\Rightarrow} \text{virtual Zi } X^+ \overset{\text{less}}{\Leftrightarrow} \text{virtual Chou } X^- \\
 &\overset{\text{rare}}{\Rightarrow} \text{virtual Si } X_K^- \overset{\text{less}}{\Leftrightarrow} \text{virtual Chen } X_K^+ \\
 &\overset{\text{rare}}{\Rightarrow} \text{virtual Shen } S_X^+ \overset{\text{less}}{\Leftrightarrow} \text{virtual You } S_X^- \\
 &\overset{\text{rare}}{\Rightarrow} \text{virtual Wu } X_S^{j-} \overset{\text{less}}{\Leftrightarrow} \text{virtual Wei } X_S^{j+} \\
 &\overset{\text{less}}{\Leftarrow} \text{virtual Hai } X_S^{x+} \overset{\text{less}}{\Leftrightarrow} \text{virtual Xu } X_S^{x-} \\
 &\overset{\text{more}}{\Rightarrow} \text{real Yin } K_X^- \overset{\text{less}}{\Leftrightarrow} \text{real Mao } K_X^+ \\
 &\overset{\text{less}}{\Rightarrow} \text{virtual Zi } X^+ \overset{\text{less}}{\Leftrightarrow} \text{virtual Chou } X^-.
 \end{aligned}$$

For a Yang energy of  $X$  and the Jingluo system or the twelve Earthly Branches model for an unhealthy economy, the second transfer law is transferring against the killing or liking order of the twelve earthly branches as follows:

$$\begin{aligned}
 &\overset{\text{less}}{\Leftarrow} \text{real Zi } X^+ \overset{\text{less}}{\Leftrightarrow} \text{real Chou } X^- \\
 &\overset{\text{less}}{\Leftarrow} \text{real Yin } K_X^- \overset{\text{less}}{\Leftrightarrow} \text{real Mao } K_X^+ \\
 &\overset{\text{rare}}{\Leftarrow} \text{real Hai } X_S^{x+} \overset{\text{less}}{\Leftrightarrow} \text{real Xu } X_S^{x-} \\
 &\overset{\text{less}}{\Leftarrow} \text{real Wu } X_S^{j-} \overset{\text{less}}{\Leftrightarrow} \text{real Wei } X_S^{j+} \\
 &\overset{\text{rare}}{\Leftarrow} \text{real Shen } S_X^+ \overset{\text{less}}{\Leftrightarrow} \text{real You } S_X^- \\
 &\overset{\text{more}}{\Leftarrow} \text{virtual Si } X_K^- \overset{\text{less}}{\Leftrightarrow} \text{virtual Shen } X_K^+ \\
 &\overset{\text{less}}{\Leftarrow} \text{real Zi } X^+ \overset{\text{less}}{\Leftrightarrow} \text{real Chou } X^-.
 \end{aligned}$$

The transfer relationship of the second transfer law running is the killing or liking relationship, denoted by  $\Rightarrow$  or  $\Leftarrow$ . The running condition of the second transfer law is both  $(\rho_1 + \rho_2 \rho_3) < (1 - \rho_2 \rho_3)$  and  $\rho_3 = c\rho(x) \geq 0$ .

By Theorem 2.1 and Corollary 2.1, the running condition is equivalent to both  $\rho_0 > \rho_1 = \rho(x) > 0$  and  $1 \geq c \geq 0$ . That  $\rho_3 = c\rho(x) \rightarrow 0$  means the lack of capability of self-protection. Of course, it is the basis condition of running the second transfer law.

The stopping condition of the second transfer law is both  $(\rho_1 + \rho_2 \rho_3) \geq (1 - \rho_2 \rho_3)$  and  $\rho_3 = c\rho(x) > 0$ , which is the running condition of the first transfer law, or, the existence condition of capabilities of both intervention reaction and self-protection. To follow or utilize the running of the second transfer law is equivalent to the following method. For dong so, it is to protect and maintain the killing or liking relationship of the steady multilateral system. The method can strengthen all of both  $\rho_1 - \rho_3 = \rho(x)(1 - c)$  and  $\rho_2 - \rho_1 \rho_3 = \rho(x)^2(1 - c)$  tending to be small at the same time. In other words, using the method can make  $c$  tends to be large for a fixed  $\rho(x) > 0$ . It is because the transferring condition of the killing or liking relation disease  $(\rho_1 + \rho_2 \rho_3) < (1 - \rho_2 \rho_3)$  is the weaker the use, which dues to  $\rho_3 = c\rho(x)$  is the greater the use. The transferring way can make both  $\rho_1 - \rho_3 \rightarrow 0$  and  $\rho_2 - \rho_1 \rho_3 \rightarrow 0$  at the same time such that the killing or liking relation disease cannot be transferred. In other words again, if the treatment principle of the killing relationship diseases is to use continuously abiding by the second transfer law, then the coefficient of self-protection will tend to be the occurrence state, i.e.,  $\rho_3 = c\rho(x) > 0$  where  $1 \geq c \geq \frac{1 - \rho(x)}{2\rho(x)^3} \geq 0$ , and the coefficients of intervention

reaction also will tend to the healthy state, i.e.,  $\rho_0 \leq \rho_1 = \rho(x) \leq 1$ , such that  $(\rho_1 + \rho_2 \rho_3) \geq (1 - \rho_2 \rho_3)$ .#

**Medical and drug resistance problem** is that such a question, beginning more appropriate medical treatment, but is no longer valid after a period. In the state

$$\begin{aligned}
 &\rho_1 - \rho_3 = \rho(x)(1 - c) \rightarrow 0, \\
 &\rho_2 - \rho_1 \rho_3 = \rho(x)^2(1 - c) \rightarrow 0,
 \end{aligned}$$

by Theorems 3.2 and 3.3, any medical and drug resistance problem is non-existence if the treatment principle of TCE is used. But in the state

$$\begin{aligned}
 &\rho_1 - \rho_3 = \rho(x)(1 - c) \rightarrow \rho(x), \\
 &\rho_2 - \rho_1 \rho_3 = \rho(x)^2(1 - c) \rightarrow \rho(x)^2,
 \end{aligned}$$

by Theorems 3.4 and 3.5, the medical and drug resistance problem is always existence, even if the treatment principle of TCE has been used. It is because virtual  $X_K$  cannot kill real  $S_X$  if  $X$  is intervened by increasing its energy. In other words, the lack of capability of self-protection, i.e.,  $\rho_3 = c\rho(x) \rightarrow 0$ , implies the possible existence of a medical and drug resistance problem, although the treatment principle of TCE has been used. At this point, the paper advocates to follow or utilize the second transfer law in order to prevent and avoid the medical and drug resistance issue occurrence for the unhealthy economy.#

#### IV. TREATMENT PRINCIPLE OF TCE

In order to explain treatment principle of TCE, the changes in the range of GBR inflation rate is divided into four parts. From [20], Theorems 2.1, 3.1-3.5, Properties 3.1-3.4 and Corollary 2.1, it can be easily proved that the following theorem is true.

**Theorem 4.1** Suppose that the subsystem  $X$  of a steady multilateral system falls ill. Let  $X$  be the economy GBR

inflation rate of the steady multilateral system. Denoted the parameters of the normal range as follows

$$a = 8.956\%, b = 20.079\%, t_0 = 13.705\%.$$

Then the following statements are true.

(1) Suppose that  $x < a$  as **virtual**, in which  $x$  or  $x_K$  falls a virtual disease with an unhealthy economy. The subsystem  $X$  or  $x_K$  itself is the root-cause of a happened virtual disease. And the son  $x_S$  of  $x$  is the symptoms of an expected or a happened virtual disease. The primary treatment is to increase the energy of the subsystem  $X$  or  $x_K$  directly. And the secondary treatment is to increase the energy of the son  $x_K$  of  $x$ , and at the same time, to decrease the energy of the prisoner  $k_X$  of  $x_S$ .

(2) Suppose that  $x \in [a, t_0)$  as **virtual-normal**, in which  $x$  or  $s_x$  will fall a virtual disease with a healthy economy. The mother  $S_x$  of  $x$  is the root-cause of an expected virtual disease. And the subsystem  $X$  or  $s_x$  is the symptoms of an expected virtual disease. The primary treatment is to increase the energy of the mother subsystem  $S_x$  of  $X$  which is an indirect treating for  $x$ . And the secondary treatment is to increase the energy of  $X$  itself, and at the same time, to decrease the energy of the prisoner  $x_K$  of  $X$ .

(3) Suppose that  $x \in [t_0, b]$  as **real-normal**, in which  $X$  or  $x_S$  will encounter a real disease with a healthy economy. The son  $x_S$  of  $X$  is the root-cause of an expected real disease. And the subsystem  $X$  itself is the symptoms of an expected real disease. The primary treatment is to decrease the energy of the son subsystem  $x_S$  of  $X$  which is an indirect treating for  $X$ . And the secondary treatment is to decrease the energy of  $X$  itself, and at the same time, to increase the energy of the bane  $k_X$  of  $X$ .

(4) Suppose that  $x > b$  as **real**, in which  $x$  or  $k_X$  encounters a real disease with an unhealthy economy. The subsystem  $x$  or  $k_X$  itself is the root-cause of an expected or a happened real disease. And the mother  $s_x$  of  $x$  is the symptoms of an expected real disease. The primary treatment is to decrease the energy of the subsystem  $x$  or  $k_X$  directly. And the secondary treatment is to decrease the energy of the mother  $s_x$  of  $x$ , and at the same time, to increase the energy of the bane  $x_K$  of  $s_x$ . #

**Remark 6.** Treatment principle of Theorem 4.1 based on ranges of the economy GBR inflation rate is called **the treatment principle of TCE**, since it is in order to protect and maintain the balance of two incompatibility relations: the loving or liking relationship and the killing or liking relationship.

For the unhealthy economy where  $x < a$  or  $x > b$ , the treatment principle is the method for doing so in the following:

The primary treatment is to increase or decrease the energy of  $X$  directly corresponding to  $x < a$  or  $x > b$  respectively, and the secondary treatment is to increase the energy of  $x_S$  or  $x_K$  while to decrease the energy of  $k_X$  or  $s_x$ , respectively.

The primary treatment is in order to protect and maintain the loving or liking relationship, abiding by TCE's ideas "Virtual disease with an unhealthy economy is to fill itself" and "Real disease with an unhealthy economy is to rush down itself". It is because the method for doing so is not only greatly medical diseases of their own, but also provides the pseudo side effects as the food for the second physiological system. The method is to promote the first physiological system running since the second physiological system controls the first physiological system. And it is also to improve the loving or liking relationship to develop since the loving or liking relationship mainly comes from the first physiological system. The loving or liking relationship to develop can strengthen both that  $\rho_1 + \rho_2\rho_3 = \rho(x) + c\rho(x)^2$  tends to be large and that  $1 - \rho_2\rho_3 = 1 - c\rho(x)^3$  tends to be small at the same time. In other words, the way can make all of both  $\rho(x)$  and  $c$  tend to be large, at least,  $c$  greater than zero for an unhealthy economy and  $\rho_0 \leq \rho(x) \leq 1$ , such that the economy from unhealthy to healthy, or the first physiological system works, or, the occurrence of capability of self-protection, or, the running of the first transfer law, or, the stopping of the second transfer law.

The secondary treatment is in order to protect or maintain the killing or liking relationship, abiding by TCE's ideas "Don't have disease cure cure non-ill" and "Strong inhibition of the same time, support the weak". By the second transfer law in Theorems 3.4 and 3.5, the more serious relation disease is the relation disease between virtual  $x_S$  and real  $k_X$ , or between real  $s_x$  and virtual  $x_K$  respectively.

Abiding by TCE's idea "Don't have disease cure cure non-ill", it must be done to prevent or avoid the more serious relation disease between virtual  $x_S$  and real  $k_X$ , or between real  $s_x$  and virtual  $x_K$  occurrence respectively.

Abiding by TCE's idea "Strong inhibition of the same time, support the weak", it must be done to increase the energy of  $x_S$  or  $x_K$  while decrease the energy of  $k_X$  or  $s_x$  respectively.

The method for doing so can improve the killing or liking relationship to develop since real  $x_S$  or  $x_K$  can kill virtual  $k_X$  or  $s_x$  respectively. The killing or liking relationship to develop means that both  $\rho_1 - \rho_3 = \rho(x)(1-c)$  and  $\rho_2 - \rho_1\rho_3 = \rho(x)^2(1-c)$  tend to be small at the same time. In other words, the way can make, for fixed  $\rho(x)$ ,  $c$  tending to be large, at least, greater than zero for an unhealthy economy, such that the economy from unhealthy to healthy, or the first physiological system works, or, the occurrence of capability of self-protection, or, the running of the first transfer law, or, the stopping of the second transfer law.

For the healthy economy where  $x \in [a, t_0]$  or  $x \in (t_0, b]$ , the treatment principle is the method for doing so in the following:



The primary treatment is to increase or decrease the energy of  $s_x$  or  $x_s$  corresponding to  $x \in [a, t_0]$  or  $x \in (t_0, b]$  respectively, and the secondary treatment to increase the energy of  $k_x$  or  $X$  while to decrease the energy of  $X$  or  $x_k$ , respectively.

The primary treatment is in order to protect and maintain the loving or liking relationship, abiding by TCE's ideas “Virtual disease with a healthy economy is to fill mother” and “Real disease with a healthy economy is to rush down its son”. It is because the method for dong so is not only greatly medical diseases of their own, but also provides the pseudo side effects as the food for the second physiological system. The method is to promote the first physiological system running since the second physiological system controls the first physiological system. And it is also to improve the loving or liking relationship developing since the loving or liking relationship mainly comes from the first physiological system. The loving or liking relationship developing can strengthen both that  $\rho_1 + \rho_2\rho_3 = \rho(x) + c\rho(x)^2$  tends to be large and that  $1 - \rho_2\rho_3 = 1 - c\rho(x)$  tends to be small at the same time. In other words, using the way can make all of both  $\rho(x)$  and  $0 < c$  tending to be large, the best, all equal to 1 for a healthy economy, such that the capability of self-protection is in the best state, or, the non-existence of side effects issue, or, the non-existence of medical and drug resistance problem.

The secondary treatment is in order to protect or maintain the killing or liking relationship, abiding by TCE's ideas “Don't have disease cure cure non-ill” and “Strong inhibition of the same time, support the weak”. By the first transfer law, the more serious relation disease is the relation disease between real  $x$  and virtual  $k_x$  or between virtual  $x$  and real  $x_k$  corresponding to real  $x$  or virtual  $x$ , respectively.

Abiding by TCE's idea “Don't have disease cure cure non-ill”, it must be done to prevent and avoid the more serious relation disease between real  $x$  and virtual  $k_x$  or between virtual  $x$  and real  $x_k$  occurrence corresponding to real  $X$  or virtual  $x$  respectively.

Abiding by TCE's idea “Strong inhibition of the same time, support the weak”, it must be done to increase the energy of  $k_x$  or  $x$  while decrease the energy of  $x$  or  $X_k$  respectively.

The method for doing so can improve the killing or liking relationship developing since real  $k_x$  or real  $X$  can kill virtual  $x$  or virtual  $x_k$  respectively. The killing or liking relationship developing also means that both  $\rho_1 - \rho_3 = \rho(x)(1-c)$  and  $\rho_2 - \rho_3 = \rho(x)^2(1-c)$  tend to be small at the same time. In other words, using the way can make, for fixed  $\rho(x)$ ,  $0 < c$  tending to be large, the best, equal to 1 for a healthy economy, such that the capability of self-protection is in the best state, or, the non-existence of side effects, or, the non-existence of medical and drug resistance issue. #

## V. CHINESE GBR FOR THE METAL SUBSYSTEM

Suppose that  $M_2$  as issued in the circulation of money and GDP as Gross Domestic Product in Chinese from 1990 to 2014, the annual GBR and the annual GBR inflation rates can be measured in Table 3.

Also watching Table 3, the state of the GBR inflation rate is: virtual, virtual-normal, real, real-normal, real-normal, real-normal, for 1991-1996, respectively. During this period of time, large-scale goods have been made.

It means that the subsystem metal( $k_x$ ) of the economic social system with a healthy economy encounters an expected real economic disease since the GBR inflation rate belongs to “science, education, and public facilities” of metal( $k_x$ ).

But also watching Table 3, the state of the PPI inflation rate is: virtual-normal, real-normal, real, real, real, real-normal, for 1991-1996, respectively.

It means that the subsystem wood( $x$ ) of the economic social system with an unhealthy economy encounters a real economic disease since the PPI inflation rate belongs to “industry” of wood( $x$ ).

There are two subsystems wood( $x$ ) and metal( $k_x$ ) which have the killing relationship and fall a real disease or an expected real disease. By Definition 3.2 in Zhang [23], the relation economic disease is **rare** because real-normal metal( $k_x$ ) cannot kill real wood( $x$ ) which cannot destroy the balance of the killing relation from metal( $k_x$ ) to wood( $x$ ). If metal( $k_x$ ) is intervened such that it is from real to virtual, then there is a **more serious disease** to occur since virtual metal( $k_x$ ) cannot kill real wood( $x$ ). Thus the mainly root-cause is the real disease of the subsystem wood( $x$ ).

So, at present the most serious problem is to treat the subsystem wood( $x$ ) falling a real disease for an unhealthy sub-economy. It is the case in (4) of Theorem 4.1 for wood( $x$ ).

By (4) of Theorem 4.1, the subsystem wood( $X$ ) itself is the root-cause of a happened real disease. And the mother subsystem water( $s_x$ ) is the symptoms of an expected real disease.

By (4) of Theorem 4.1 again, the primary treatment is to decrease the energy of the subsystem wood( $X$ ) directly. And the secondary treatment is to decrease the energy of the mother water( $s_x$ ) of wood( $X$ ), and at the same time, to increase the energy of the bane earth( $X_k$ ) of water( $s_x$ ).

In fact, the Chinese government did just that. For 1993-1999, not only had decreased gradually the financial amounts of investment in the manufacture (to decrease the energy of the subsystem wood( $X$ ) directly), but also had decreased investment in the Army, such as, big disarmament, a freeze on a large number of military engineering, etc. (for decreasing the energy of water( $s_x$ )) while had increased little by little the workers' wages, the social security and social welfare, such as, the public accumulation fund for housing construction, pension funds, medical insurance, unemployment insurance, etc. (to increase the energy of earth( $x_k$ )).

Also watching Table 3, the state of the GBR inflation rate is: real-normal, real-normal, real-normal, real-normal, real, real-normal, real-normal, for 1997-2003, respectively. During this period of time, mass goods cannot be made. Supplies are still scarce. Rush on still appear on the market.

It means that the subsystem metal( $\kappa_X$ ) is with a healthy sub-economy and falling an expected real disease. It is because the GBR inflation rate belongs to the "science, education, public facilities" of metal( $\kappa_X$ ).

Also watching Table 3, the state of the CPI inflation rate is: virtual-normal, virtual, virtual, virtual, virtual, virtual, virtual, for 1997-2003, respectively.

It means that the subsystem earth( $X_K$ ) of the economic social system with an unhealthy economy encounters a virtual economic disease since the CPI inflation rate belongs to the "commerce" of earth( $X_K$ ).

Also watching Table 3, the state of the PPI inflation rate is virtual-normal, virtual, virtual, virtual, virtual, virtual, for 1997-2003, respectively.

It means that the subsystem wood( $X$ ) falls a virtual disease for an unhealthy economy since the PPI inflation rate belongs to the "industry" of wood( $X$ ).

There are three subsystems wood( $X$ ), metal( $\kappa_X$ ) and earth( $X_K$ ) in which both wood( $X$ ) and earth( $X_K$ ) are virtual but metal( $\kappa_X$ ) is real. By Definition 3.2 in Zhang [23], the relation disease between virtual wood( $X$ ) and virtual earth( $X_K$ ) is **rare** since virtual wood( $X$ ) cannot kill virtual earth( $X_K$ ) which cannot destroy the balance of the killing order from wood( $X$ ) to earth( $X_K$ ). But if the subsystem earth( $X_K$ ) is intervened such that it is from virtual to real, there is a **more serious relation disease** between virtual wood( $X$ ) and real earth( $X_K$ ). It is because the virtual wood( $X$ ) cannot kill the real earth( $X_K$ ) which can destroy the balance of the killing relation from wood( $X$ ) to earth( $X_K$ ).

So, at present the most serious problem is to treat the subsystem wood( $X$ ) falling a virtual disease for an unhealthy sub-economy. It is the case in (1) of Theorem 4.1 for wood( $X$ ).

By (1) of Theorem 4.1, the subsystem earth( $X_K$ ) itself is the root-cause of a happened virtual disease. And the son subsystem metal( $\kappa_X$ ) of earth( $X_K$ ) is the symptoms of an expected virtual disease.

By (1) of Theorem 4.1, the primary treatment is gotten to increase the energy of the subsystem wood( $X$ ) directly. And the secondary treatment is gotten to increase the energy of the son fire( $X_S$ ) of wood( $X$ ), and at the same time, to decrease the energy of the prisoner metal( $\kappa_X$ ) of fire( $X_S$ ).

In fact, the Chinese government did just that. For 1999-2008, not only had increased gradually the financial amounts of investment in the manufacture (e.g., to invest in real estate, to increase the energy of the subsystem wood( $X$ ) directly), but also had increased to make money, and investment in the agriculture, such as, exempt from the

agricultural taxation, increase of agricultural land expropriation compensation, etc. (to increase the energy of fire( $X_S$ ) including jun-fire( $X_S^j$ ) and xiang-fire( $X_S^x$ )) while had decreased in the science and education, such as, a small amount of teachers and researchers for a raise, schools and research institutions self-sustaining, etc. (to decrease the energy of metal( $\kappa_X$ )).

Therefore, application of nature for the treatment principle of TCE by the Chinese government had brought the sustained and rapid growth of industry economy for 1991-2008.

Also watching Table 3 again, the state of the GBR inflation rate is: real, real-normal, real, real, real-normal, virtual-normal, real, real, for 2004-2011, respectively. During this period of time, large-scale goods have been still made. But a lot of society problems begin occurring.

It means the subsystem metal( $\kappa_X$ ) is mainly with an unhealthy sub-economy and falls a real disease. It is because the GBR inflation rate belongs to the "science, education, public facilities" of metal( $\kappa_X$ ). Observation of the whole economic and social five subsystems, it can be found that there is a virtual disease state of the subsystem earth( $X_K$ ).

In fact, also watching Table 3 again, the state of the CPI inflation rate is: real-normal, virtual, virtual, real-normal, real, virtual, virtual-normal, real-normal, for 2004-2011, respectively.

It means the subsystem earth( $X_K$ ) is mainly with an unhealthy sub-economy and falls an expected virtual disease. It is because the CPI inflation rate belongs to the "commerce" of earth( $X_K$ ).

Also watching Table 3 again, the state of the PPI inflation rate is virtual-normal, virtual-normal, virtual-normal, real-normal, real-normal, virtual, virtual-normal, real-normal, for 2004-2011, respectively.

It means the subsystem wood( $X$ ) is mainly with a healthy sub-economy and falls an expected real disease. It is because the manufacture of large-scale goods or the normal PPI inflation rate belongs to "industry" of the subsystem wood( $X$ ).

There are three subsystems wood( $X$ ), metal( $\kappa_X$ ) and earth( $X_K$ ) in which both metal( $\kappa_X$ ) and wood( $X$ ) are real or real-normal but earth( $X_K$ ) is virtual. For an unhealthy economy, the key relationship is killing. By Definition 3.2 in Zhang [23], the relation disease between real wood( $X$ ) and virtual earth( $X_K$ ) is **less** since real-normal wood( $X$ ) can kill virtual earth( $X_K$ ) which cannot destroy the killing order from wood( $X$ ) to earth( $X_K$ ). Now the subsystem earth( $X_K$ ) can be intervened such that it is from virtual to real-normal.

So, at present the most serious problem is to treat the subsystem earth( $X_K$ ) falling a virtual disease. It is the case in (1) of Theorem 4.1 for earth( $X_K$ ).

By (1) of Theorem 4.1, the subsystem earth( $X_K$ ) itself is the root-cause of a happened virtual disease. And the son subsystem metal( $\kappa_X$ ) of earth( $X_K$ ) is the symptoms of an expected virtual disease.

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The  $x_K$  as  $x$  in theorem 4.1, using (1) of Theorem 4.1 again, the primary treatment is gotten to increase the energy of the subsystem earth( $x_K$ ) directly. And the secondary treatment is gotten to increase the energy of the son metal( $K_X$ ) of earth( $x_K$ ), where  $(X_K)_S = K_X$  in Figure 1, and at the same time, to decrease the energy of the bane wood( $x$ ) of earth( $x_K$ ), where  $K_{(x_K)} = x$  in Figure 1.

In fact, the Chinese government did just that. For 2004-2014, not only had increased the financial amounts of investment in commerce, such as, strengthen the support for the WTO trade, etc. (to increase the energy of the subsystem earth( $x_K$ ) directly), but also had increased investment in science, education and public facilities, such as to build high speed rail, etc. (to increase the energy of metal( $K_X$ )) while had reduced the industrial support, such as, the appreciation of the RMB, etc. (to decrease the energy of wood( $x$ )).

Therefore, again application of nature for the treatment principle of TCE by the Chinese government had brought the 2004-2014 economic taking off again.

Also watching Table 3 again and again, the state of the GBR inflation rate is: virtual-normal, virtual-normal, virtual, for 2012-2014, respectively.

It means that the subsystem metal( $K_X$ ) is mainly with a healthy economy and will fall an expected virtual disease. It is because the GBR inflation rate belongs to the “science, education, public facilities” of metal( $K_X$ ).

Also watching Table 3 again and again, the state of the GDP inflation rate is: virtual-normal, virtual-normal, virtual-normal, for 2012-2014, respectively.

It means the subsystem water( $s_X$ ) is mainly with a healthy economy and will fall an expected virtual disease. It is because the GDP inflation rate belongs to the “army-economics” of water( $s_X$ ).

Also watching Table 3 again and again, the state of the PPI inflation rate is: virtual-normal, virtual-normal, virtual-normal, for 2012-2014, respectively.

It means that the subsystem wood( $x$ ) is also an expected virtual disease for a healthy sub-economy. It is because the manufacture of large-scale goods or the PPI inflation rate belongs to the “industry” of the subsystem wood( $x$ ).

The virtual-normal disease of wood( $x$ ) is not because of its low energy, but because of its energy is too high to make producing products too much, so much so that there is no way to sell products, low profit of industrial production. In the TCE, this disease is Yang irritability turned to deficiency disease. This disease is not the current urgent problems since it cannot destroy the killing order balance of the economy.

There are three subsystems wood( $x$ ), metal( $K_X$ ) and water( $s_X$ ) in which all are virtual-normal. Both metal( $K_X$ ) and wood( $x$ ) have the killing relationship. And others are the loving relationship. For a healthy economy, the key relationship is loving. Most likely from Yang to deficiency is wood( $x$ ). But if this virtual-normal disease of wood( $x$ ) is continuously to develop such that it is from virtual-normal to

virtual, by Theorems 3.2 and 3.3, the virtual wood( $x$ ) will make its mother subsystem water( $s_X$ ) falling a virtual economic disease when it encounters an economic disease. In fact, the economic indicators of GDP which belongs to the subsystem water( $s_X$ ) is beginning to decline. Abiding by TCE's idea “Don't have economic disease cure cure non-ill”, the prevention and treatment of the current work is the need to prevent the virtual disease of the subsystem water( $s_X$ ) for a healthy sub-economy.

So, at present the most serious problem is to treat the subsystem water( $s_X$ ) falling a virtual disease with a healthy sub-economy of the subsystem water( $s_X$ ). It is the case in (2) of Theorem 4.1 for water( $s_X$ ).

By (2) of Theorem 4.1, the mother subsystem metal( $K_X$ ) of water( $s_X$ ) is the root-cause of an expected virtual disease. And the subsystem water( $s_X$ ) itself is the symptoms of an expected virtual disease.

The  $s_X$  as  $x$  in (2) of Theorem 4.1, the primary treatment is gotten to increase the energy of the mother subsystem metal( $K_X$ ) of the water( $s_X$ ), where  $S_{(s_X)} = K_X$  in Figure 1. And the secondary treatment is gotten to increase the energy of the water( $s_X$ ) itself while decrease the energy of the prisoner fire( $x_S$ ) of the water( $s_X$ ), where  $(S_X)_K = X_S$  in Figure 1.

In fact, the Chinese government also is doing just that. Since 2015, not only has increased continuously investment in science, education and public facilities, such as, One Belt and One Road, etc. (for increasing the energy of metal( $K_X$ )), but also has increased to military spending (to increase the energy of the water( $s_X$ )) while has reduced the number of making money, and reduced the agricultural support, such as, reduce the purchase price of agricultural products, etc. (to decrease the energy of fire( $x_S$ ) including jun-fire( $x_S^j$ ) and xiang-fire( $x_S^x$ )). Therefore, again and again application of nature for the treatment principle of TCE by the Chinese government will lead to economic continue to glory since 2015.#

## VI. CONCLUSIONS

This work shows how to treat the diseases of a economy by using the GBR inflation rate  $x$ . For the GBR inflation rate, the normal range of theory is [8.956%, 20.079%] nearly to [9%, 20%], and the center is 13.705% nearly to 14%. By both the Zangxiang system or the ten Heavenly Stems model and the Jingluo system or the twelve Earthly Branches model, there are the first or second transfer law of economic energies corresponding to a healthy economy or an unhealthy economy respectively. The first or second transfer law of economic energies changes according to the different economy's GBR inflation rate whether in the normal range or not. For the normal range, the first transfer law of economic energies in Theorems 3.2 and 3.3 run; For the abnormal range,



the second transfer law of economic energies in Theorems 3.4 and 3.5 run.

Assume that the range of economy's GBR inflation rate  $x$  is divided into four parts from small to large. Both second and third are for a healthy economy with a virtual or real disease respectively. In this case, the root-cause of a virtual or real disease is the mother or son of the falling-ill subsystem  $x$  respectively, and the symptoms is the subsystem  $x$  itself. Abiding by TCE's idea: "Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time" (治病求本, 标本兼治), the works are first the prevention or the treatment for the mother or son of a virtual or real disease respectively, the second the prevention or the treatment for a more serious relation disease between virtual  $x$  and real  $x_K$  or between real  $x$  and virtual  $x_K$ , respectively. Both the root-cause and the symptoms come from the first transfer law of economic energies in Theorems 3.2 and 3.3.

And both first and fourth are for an unhealthy economy with a virtual or real disease respectively. In this case, the root-cause of a virtual or real disease is the subsystem  $x$  itself and the symptoms the son or mother of the falling-ill subsystem  $x$  respectively. Abiding by TCE's idea: "Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time" (治病求本, 标本兼治), the works are first the prevention or the treatment for itself of a virtual or real disease respectively, the second are the prevention or the treatment for a more serious relation disease between virtual  $x_S$  and real  $x_K$  or between real  $x_S$  and virtual  $x_K$ , respectively. Both the root-cause and the symptoms come from the second transfer law in Theorems 3.4 and 3.5.

Economic disease treatment should protect and maintain the balance or order of two incompatibility relations: the loving or liking relationship and the killing or liking relationship. The method for doing so can make the  $\rho_3 = c\rho(x)$  tending to be large, i.e., all of both  $\rho(x)$  and  $c$  tend to be large, at least, greater than zero for an unhealthy economy; or, the best, equal to 1 for a healthy economy.

The following way can make the capabilities of both intervention reaction and self-protection become in the best state, the non-existence of side effects issue, the non-existence of medical and drug resistance problem, and so on.

(1) Suppose that  $x < a = 8.956\%$ , as **virtual**, in which  $x$  or  $x_K$  falls a virtual disease with an unhealthy economy. The subsystem  $x$  or  $x_K$  itself is the root-cause of a happened virtual disease. And the son  $x_S$  of  $x$  is the symptoms of an expected or a happened virtual disease. Abiding by TCE's idea: "Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time" (治病求本, 标本兼治), it should be done to do in the following.

In order to protect or maintain the loving relationship, abiding by TCE's idea "Virtual disease with an unhealthy economy is to fill itself" (虚则补之), increase the energy of  $x$  or  $x_K$  directly.

In order to protect or maintain the killing relationship, abiding by TCE's idea "Don't have disease cure cure non-ill" (不治已病治未病), do a preventive treatment for the more serious relation disease between virtual  $x_S$  and real  $x_K$ .

Through the intervening principle of "Strong inhibition of the same time, support the weak" (抑强扶弱), increase the energy of the son  $x_S$  of  $x$  while decrease the energy of the prisoner  $x_K$  of  $x_S$ .

(2) Suppose that  $a = 8.956\% \leq x < t_0 = 13.705\%$ , as **virtual-normal**, in which  $x$  or  $x_S$  falls a virtual disease with a healthy economy. The mother  $x_S$  of the subsystem  $x$  is the root-cause of an expected virtual disease. And the subsystem  $x$  itself is the symptoms of an expected virtual disease. Abiding by TCE's idea: "Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time" (治病求本, 标本兼治), it should be done to do in the following.

In order to protect or maintain the loving relationship, abiding by TCE's idea "Virtual disease with a healthy economy is to fill its mother" (虚则补其母), increase the energy of the mother  $x_S$  of  $x$ . The treating way is an indirect treating for  $x$ .

In order to protect or maintain the killing relationship, abiding by TCE's idea "Don't have disease cure cure non-ill" (不治已病治未病), do a preventive treatment for the more serious relation disease between virtual  $x$  and real  $x_K$ .

Through the intervening principle of "Strong inhibition of the same time, support the weak" (抑强扶弱), increase the energy of  $x$  itself while decrease the energy of the prisoner  $x_K$  of  $x$ .

(3) Suppose that  $t_0 = 13.705\% \leq x \leq b = 20.079\%$ , as **real-normal**, in which  $x$  or  $x_S$  falls a real disease with a healthy economy. The son  $x_S$  of the subsystem  $x$  is the root-cause of an expected real disease. And the subsystem  $x$  itself is the symptoms of an expected real disease. Abiding by TCE's idea: "Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time" (治病求本, 标本兼治), it should be done to do in the following.

In order to protect or maintain the loving relationship, abiding by TCE's idea "Real disease with a healthy economy is to rush down its son" (实则泄其子), decrease the energy of the son  $x_S$  of  $x$ . The treating way is an indirect treating for  $x$ .

In order to protect or maintain the killing relationship, abiding by TCE's idea "Don't have disease cure cure non-ill" (不治已病治未病), do a preventive treatment for the more serious relation disease between real  $x$  and virtual  $x_K$ .

Through the intervening principle of "Strong inhibition of the same time, support the weak" (抑强扶弱), decrease the

energy of  $X$  itself while increase the energy of the bane  $K_X$  of  $X$ .

(4) Suppose that  $x > b = 20.079\%$ , as **real**, in which  $X$  or  $K_X$  falls a real disease with an unhealthy economy. The subsystem  $X$  or  $K_X$  itself is the root-cause of a happened real disease. And the mother  $S_X$  of  $X$  is the symptoms of an expected or a happened real disease. Abiding by TCE's idea: "Searching for a root cause of disease in cure, treatment of both the root-cause and symptoms at the same time" (治病求本, 标本兼治), it should be done to do in the following.

In order to protect or maintain the loving relationship, abiding by TCE's idea "Real disease with an unhealthy economy is to rush down itself" (实则泄之), decrease the energy of  $X$  or  $K_X$  directly.

In order to protect or maintain the killing relationship, abiding by TCE's idea "Don't have disease cure cure non-ill" (不治己病治未病), do a preventive treatment for the more serious relation disease between real  $S_X$  and virtual  $X_K$ .

Through the intervening principle of "Strong inhibition of the same time, support the weak" (抑强扶弱), decrease the energy of the mother  $S_X$  of  $X$  while increase the energy of the bane  $X_K$  of  $S_X$ .

#### ACKNOWLEDGEMENTS

This article has been repeatedly invited as reports, such as People's University of China in medical meetings, Shanxi University, Liaocheng University, Xuchang College, and so on. The work was supported by Specialized Research Fund for the Doctoral Program of Higher Education of Ministry of Education of China (Grant No. 200802691021).

#### APPENDIX

**Proof of Property 3.1.** See **Figure 3.**, since the emperor prosperous place of Jia Yang wood of the ten heavenly stems is in Mao of the twelve earthly branches, so the rowing place is in Hai. It is because by **Definition 3.3**, counterclockwise to arrange, emperor as Mao, officer as Yin, crowned as Chou, bathing as Zi, rowing as Hai.

Similarly, the emperor prosperous place of Bing, Wu, Geng, Ren Yang fire, earth, metal, water of the ten heavenly stems is in Wu, Wu, You, Zi of the twelve earthly branches, so the rowing place is in Yin, Yin, Si Shen of the twelve earthly branches respectively.

See **Figure 3.** again, since the emperor prosperous place of Yi Yin wood of the ten heavenly stems is in Yin of the twelve earthly branches, so the rowing place is in Wu. It is because by **Definition 3.3**, clockwise to arrange, emperor as Yin, officer as Mao, crowned as Chen, bathing as Si, rowing as Wu.

Similarly, the emperor prosperous place of Ding, Ji, Xin, Gui Yin fire, earth, metal, water of the ten heavenly stems is in Si, Si, Chen, Hai of the twelve earthly branches, so the rowing place is in You, You, Zi, Mao of the twelve earthly branches respectively.

Therefore, the five Yang heavenly stems: Jia, Bing, Wu, Geng, Ren was born Hai, Yin, Yin, Si, Shen respectively; The

five Yin heavenly stems: Yi, Ding, Ji, Xin, Gui was born Wu, You, You, Zi, Mao respectively. It completes the proof. #

**Proof of Property 3.2.** By **Definition 3.3** and **Properties 3.3** and **3.4**, there are

$$\begin{aligned} Zi(0, e) &= \{Gui(0,4)\}, \\ Chou(0, (23)) &= \{Ji(0,2), Gui(0,4), Xin(0,3)\}, \\ \Rightarrow Ji(0,2) * Gui(0,4) * Xin(0,3) &= Gui(0, 4), \\ Gui(0,4)^{-1} * Gui(0, 4) &= Yi(0,0). \end{aligned}$$

Therefore, the synthesized and synthesized or combined relationship between two elements

$$\begin{aligned} Zi(0, e) &= \{Gui(0,4)\} && \text{and} \\ Chou(0, (23)) &= \{Ji(0, 0), Gui(0,4), Xin(0,3)\} \end{aligned}$$

is **Yi(0,0)** as **wood** ( $X$ ) in **Theorem 3.1**.

Similarly, the synthesized and combined relationship between two elements

$$\begin{aligned} Yin(1, (132)) &= \{Jia(1,0), Bing(1,1), Wu(1,2)\} && \text{and} \\ Mao(1, (12)) &= \{Yi(0, 0)\} \end{aligned}$$

is **Geng(1, 3)** as **metal** ( $K_X$ ) in **Theorem 3.1** since

$$\begin{aligned} Yin(1, (132)) &= \{Jia(1,0), Bing(1,1), Wu(1,2)\}, \\ Mao(1, (12)) &= \{Yi(0, 0)\}, \\ \Rightarrow Jia(1,0) * Bing(1,1) * Wu(1,2) &= Geng(1, 3), \\ Yi(0, 0)^{\pm 1} * Geng(1, 3) &= Geng(1, 3). \end{aligned}$$

The synthesized and synthesized relationship between two elements

$$\begin{aligned} Chen(0, (12)) &= \{Yi(0,0), Wu(1,2), Gui(0,4)\} && \text{and} \\ Si(0, (132)) &= \{Bing(1,1), Geng(1,3), Wu(1,2)\} \end{aligned}$$

is **Ji(0,2)** as **earth** ( $X_K$ ) in **Theorem 3.1** since

$$\begin{aligned} Chen(0, (12)) &= \{Yi(0,0), Wu(1,2), \\ Gui(0,4)\}, Si(0, (132)) &= \{Bing(1,1), Geng(1,3), Wu(1,2)\} \\ \Rightarrow Yi(0,0) * Wu(1,2) * Gui(0,4) &= Bing(1,1), \\ Bing(1,1) * Geng(1,3) * Wu(1,2) &= Bing(1,1), \\ Bing(1,1) * Bing(1,1) &= Ji(0,2). \end{aligned}$$

The synthesized and synthesized relationship between two elements

$$\begin{aligned} Wu(1, (123)) &= \{Ding(0,1), Ji(0,2)\} && \text{and} \\ Wei(1, (13)) &= \{Ding(0,1), Ji(0,2), Yi(0,0)\} \end{aligned}$$

is **Ding(0,1)** as **xiang-fire** ( $X_S^x$ ) (相火) in **Theorem 3.1** since

$$\begin{aligned} Wu(1, (123)) &= \{Ding(0,1), Ji(0,2)\}, \\ Wei(1, (13)) &= \{Ding(0,1), Ji(0,2), Yi(0,0)\}, \\ \Rightarrow Ding(0,1) * Ji(0,2) &= Xin(0,3), \\ Ding(0,1) * Ji(0,2) * Yi(0,0) &= Xin(0,3), \\ Xin(0,3) * Xin(0,3) &= Ding(0,1). \end{aligned}$$

The synthesized relationship between between the comprehensive energy of two elements

$$\begin{aligned} Shen(0, (13)) &= \{Geng(1,3), Ren(1,4), Wu(1,2)\} && \text{and} \\ You(0, (123)) &= \{Xin(0,3)\} \end{aligned}$$

is **Ren(1, 4)** as **water** ( $S_X$ ) in **Theorem 3.1** since

$$\begin{aligned} Shen(0, (13)) &= \{Geng(1,3), Ren(1,4), Wu(1,2)\}, \\ You(0, (123)) &= \{Xin(0,3)\}, \\ \Rightarrow Geng(1,3) * Ren(1,4) * Wu(1,2) &= Ren(1,4), \\ Xin(0,3)^{-1} * Wu(1,2) &= Ren(1,4). \end{aligned}$$

The synthesized relationship between two elements

$$\begin{aligned} Xu(1, (23)) &= \{Xin(0,3), Wu(1,2), Ding(0,1)\} && \text{and} \\ Hai(1, e) &= \{Ren(1,4), Jia(1,0)\} \end{aligned}$$

is **Bing(1,1)** as **jun-fire** ( $X_S^j$ ) (君火) in **Theorem 3.1** since

$Xu(1, (23)) = \{Xin(0, 3), Wu(1,2), Ding(0,1)\}$ ,

$Hai(1, e) = \{Ren(1,4), Jia(1,0)\}$ ,

$\Rightarrow Xin(0,3) * Wu(1,2) * Ding(0,1) = Bing(1,1)$ ,

$Ren(1,4)^{-1} * Jia(1,0) * Xin(0,3) * Wu(1,2) = Bing(1,1)$ .

Therefore, the following notations in Definition 3.2 is reasonable.

$X^+$	$X_S^{+}$	$X_K^+$	$K_X^+$	$S_X^+$	$X_S^{j+}$	It
$(0, e)$	$(1, e)$	$(0, (12))$	$(1, (12))$	$(0, (13))$	$(1, (13))$	
$X^-$	$X_S^{-}$	$X_K^-$	$K_X^-$	$S_X^-$	$X_S^{j-}$	
$(0, (23))$	$(1, (23))$	$(0, (132))$	$(1, (132))$	$(0, (123))$	$(1, (123))$	

is with the correct meaning of the Yin Yang Wu Xing Model in Theorem 3.1. #

**Proof of Property 3.3.** Consider the Zangxiang system or the ten Heavenly Stems model

$V^2 \times V^5 = \{(i, j) \mid i \in V^2, j \in V^5\}$ . Its all relations are as follows:

- $R_{(0,0)}^{(2,5)} = \{((0,0), (0,0)), ((1,0), (1,0)), ((0,1), (0,1)), ((1,1), (1,1)), ((0,2), (0,2)), ((1,2), (1,2)), ((0,3), (0,3)), ((1,3), (1,3)), ((0,4), (0,4)), ((1,4), (1,4))\}$ ,
- $R_{(1,0)}^{(2,5)} = \{((0,0), (1,0)), ((1,0), (0,0)), ((0,1), (1,1)), ((1,1), (0,1)), ((0,2), (1,2)), ((1,2), (0,2)), ((0,3), (1,3)), ((1,3), (0,3)), ((0,4), (1,4)), ((1,4), (0,4))\}$ ,
- $R_{(0,1)}^{(2,5)} = \{((0,0), (0,1)), ((1,0), (1,1)), ((0,1), (0,2)), ((1,1), (1,2)), ((0,2), (0,3)), ((1,2), (1,3)), ((0,3), (0,4)), ((1,3), (1,4)), ((0,4), (0,0)), ((1,4), (1,0))\}$ ,
- $R_{(1,1)}^{(2,5)} = \{((0,0), (1,1)), ((1,0), (0,1)), ((0,1), (1,2)), ((1,1), (0,2)), ((0,2), (1,3)), ((1,2), (0,3)), ((0,3), (1,4)), ((1,3), (0,4)), ((0,4), (1,0)), ((1,4), (0,0))\}$ ,
- $R_{(0,2)}^{(2,5)} = \{((0,0), (0,2)), ((1,0), (1,2)), ((0,1), (0,3)), ((1,1), (1,3)), ((0,2), (0,4)), ((1,2), (1,4)), ((0,3), (0,0)), ((1,3), (1,0)), ((0,1), (0,1)), ((1,1), (1,1))\}$ ,
- $R_{(1,2)}^{(2,5)} = \{((0,0), (1,2)), ((1,0), (0,2)), ((0,1), (1,3)), ((1,1), (0,3)), ((0,2), (1,4)), ((1,2), (0,4)), ((0,3), (1,0)), ((1,3), (0,0)), ((0,4), (1,1)), ((1,4), (0,1))\}$ ,
- $R_{(0,3)}^{(2,5)} = \{((0,0), (0,3)), ((1,0), (1,3)), ((0,1), (0,3)), ((1,1), (1,3)), ((0,2), (0,0)), ((1,2), (1,0)), ((0,3), (0,1)), ((1,3), (1,1)), ((0,4), (0,2)), ((1,4), (1,2))\}$ ,
- $R_{(1,3)}^{(2,5)} = \{((0,0), (1,3)), ((1,0), (0,3)), ((0,1), (1,4)), ((1,1), (0,3)), ((0,2), (1,0)), ((1,2), (0,0)), ((0,3), (1,1)), ((1,3), (0,1)), ((0,4), (1,2)), ((1,4), (0,2))\}$ ,
- $R_{(0,4)}^{(2,5)} = \{((0,0), (0,4)), ((1,0), (1,4)), ((0,1), (0,0)), ((1,1), (1,0)), ((0,2), (0,1)), ((1,2), (1,1)), ((0,3), (0,2)), ((1,3), (1,2)), ((0,4), (0,3)), ((1,4), (1,3))\}$ ,

- $R_{(1,4)}^{(2,5)} = \{((0,0), (1,4)), ((1,0), (0,4)), ((0,1), (1,0)), ((1,1), (0,0)), ((0,2), (1,1)), ((1,2), (0,1)), ((0,3), (1,2)), ((1,3), (0,2)), ((0,4), (1,3)), ((1,4), (0,3))\}$ .

Use of these relations, to calculate the cost of all the specified relationship, can be found: the loving or liking relationship with low cost, and the killing relationship with the high cost. It completes the proof.#

**Proof of Property 3.4.** Consider the Jingluo system or the twelve Earthly Branches model  $V^2 \times V^6 = \{(i, j) \mid i \in V^2, j \in V^6\}$ .

Its all relations are as follows:

- $R_{(0,e)}^{(2,6)} = \{((0, e), (0, e)), ((1, e), (1, e)), ((0, (12)), (0, (12))), ((1, (12)), (1, (12))), ((0, (13)), (0, (13))), ((1, (13)), (1, (13))), ((0, (23)), (0, (23))), ((1, (23)), (1, (23))), ((0, (123)), (0, (123))), ((1, (123)), (1, (123))), ((0, (132)), (0, (132))), ((1, (132)), (1, (132)))\}$ ,
- $R_{(1,e)}^{(2,6)} = \{((0, e), (1, e)), ((1, e), (0, e)), ((0, (12)), (1, (12))), ((1, (12)), (0, (12))), ((0, (13)), (1, (13))), ((1, (13)), (0, (13))), ((0, (23)), (1, (23))), ((1, (23)), (0, (23))), ((0, (123)), (1, (123))), ((1, (123)), (0, (123))), ((0, (132)), (1, (132))), ((1, (132)), (0, (132)))\}$ ,
- $R_{(0,(12))}^{(2,6)} = \{((0, e), (0, (12))), ((1, e), (1, (12))), ((0, (12)), (0, e)), ((1, (12)), (1, e)), ((0, (13)), (0, (132))), ((1, (132)), (1, (132))), ((0, (123)), (0, (123))), ((1, (123)), (1, (123))), ((0, (23)), (0, (23))), ((1, (23)), (1, (23))), ((0, (13)), (0, (13))), ((1, (13)), (1, (13)))\}$ ,
- $R_{(1,(12))}^{(2,6)} = \{((0, e), (1, (12))), ((1, e), (0, (12))), ((0, (12)), (1, e)), ((1, (12)), (0, e)), ((0, (13)), (1, (132))), ((1, (132)), (0, (132))), ((0, (123)), (1, (123))), ((1, (123)), (0, (123))), ((0, (23)), (1, (23))), ((1, (23)), (0, (23))), ((0, (13)), (1, (13))), ((1, (13)), (0, (13)))\}$ ,
- $R_{(0,(13))}^{(2,6)} = \{((0, e), (0, (13))), ((1, e), (1, (13))), ((0, (12)), (0, (123))), ((1, (12)), (1, (123))), ((0, (13)), (0, e)), ((1, (13)), (1, e)), ((0, (23)), (0, (123))), ((1, (23)), (1, (123))), ((0, (123)), (0, (12))), ((1, (123)), (1, (12))), ((0, (132)), (0, (23))), ((1, (132)), (1, (23)))\}$ ,
- $R_{(1,(13))}^{(2,6)} = \{((0, e), (1, (13))), ((1, e), (0, (13))), ((0, (12)), (1, (123))), ((1, (12)), (0, (123))), ((0, (13)), (1, e)), ((1, (13)), (0, e)), ((0, (23)), (1, (123))), ((1, (23)), (0, (123))), ((0, (123)), (1, (12))), ((1, (123)), (0, (12))), ((0, (132)), (1, (23))), ((1, (132)), (0, (23)))\}$ ,
- $R_{(0,(23))}^{(2,6)} = \{((0, e), (0, (23))), ((1, e), (1, (23))), ((0, (12)), (0, (132))), ((1, (12)), (1, (132))), ((0, (13)), (0, (123))), ((1, (13)), (1, (123))), ((0, (23)), (0, e)), ((1, (23)), (1, e)), ((0, (123)), (0, (13))), ((1, (123)), (1, (13))), ((0, (132)), (0, (12))), ((1, (132)), (1, (12)))\}$ ,
- $R_{(1,(23))}^{(2,6)} = \{((0, e), (1, (23))), ((1, e), (0, (23))), ((0, (12)), (1, (132))), ((1, (12)), (0, (132))), ((0, (13)), (1, (123))), ((1, (13)), (0, (123))), ((0, (23)), (1, e)), ((1, (23)), (0, e)), ((0, (123)), (1, (13))), ((1, (123)), (0, (13))), ((0, (132)), (0, (12))), ((1, (132)), (1, (12)))\}$ ,



$$\begin{aligned}
 R_{(0,(123))}^{(2,6)} &= \{((0, e), (0, (123))), ((1, e), (1, (123))), \\
 &((0, (12)), (0, (13))), ((1, (12)), (1, (13))), \\
 &((0, (13)), (0, (23))), ((1, (13)), (1, (23))), \\
 &((0, (23)), (0, (12))), ((1, (23)), (1, (12))), \\
 &((0, (123)), (0, (132))), ((1, (123)), (1, (132))), \\
 &((0, (132)), (0, e), ((1, (132)), (1, e)))\}, \\
 R_{(1,(123))}^{(2,6)} &= \{((0, e), (1, (123))), ((1, e), (0, (123))), \\
 &((0, (12)), (1, (13))), ((1, (12)), (0, (13))), \\
 &((0, (13)), (1, (23))), ((1, (13)), (0, (23))), \\
 &((0, (23)), (1, (12))), ((1, (23)), (0, (12))), \\
 &((0, (123)), (1, (132))), ((1, (123)), (0, (132))), \\
 &((0, (132)), (1, e), ((1, (132)), (0, e)))\}, \\
 R_{(0,(132))}^{(2,6)} &= \{((0, e), (0, (132))), ((1, e), (1, (132))), \\
 &((0, (12)), (0, (23))), ((1, (12)), (1, (23))), \\
 &((0, (13)), (0, (12))), ((1, (13)), (1, (12))), \\
 &((0, (23)), (0, (13))), ((1, (23)), (1, (13))), \\
 &((0, (123)), (0, e), ((1, (123)), (1, e))), \\
 &((0, (132)), (0, (123))), ((1, (132)), (1, (123)))\}, \\
 R_{(1,(132))}^{(2,6)} &= \{((0, e), (1, (132))), ((1, e), (0, (132))), \\
 &((0, (12)), (1, (23))), ((1, (12)), (0, (23))), \\
 &((0, (13)), (1, (12))), ((1, (13)), (0, (12))), \\
 &((0, (23)), (1, (13))), ((1, (23)), (0, (13))), \\
 &((0, (123)), (1, e), ((1, (123)), (0, e))), \\
 &((0, (132)), (1, (123))), ((1, (132)), (0, (123)))\}.
 \end{aligned}$$

Use of these relations, to calculate the cost of all the specified relationship, can be found: the hand phase in Figure 3, all transverse relationship with low cost, but all vertical relationship with high cost.

On the other hand, in {Yin,Mao}, {Wu,Wei}, {Xu,Hai} type or {Chen,Si}, {Shen,You}, {Zi,Shou} type for the vertices of the triangle respectively, the relationship between the cost is low. Otherwise, the relationship between the cost is high. It completes the proof.#

**Proof of Theorem 3.2.** See Figure 2., in the Zangxiang system or the ten Heavenly Stems model for a healthy economy, only both the liking relation and the loving relation have the transfer law of the Yang or Yin vital or righteousness energies. By Theorem 3.2 of Zhang [23], Yang is transferring along the order of the loving relationship. Yin is transferring against the order of the loving relationship.

By Property 3.3, the following relation cost (0,(23)) is low.

$$\begin{aligned}
 (X^+(1, 0), X^-(0, 0)), (X_S^+(1, 1), X_S^-(0, 1)), \\
 (X_K^+(1, 2), X_K^-(0, 2)), (K_X^+(1, 3), K_X^-(0, 3)), \\
 (S_X^+(1, 4), S_X^-(0, 4)) \in \\
 R_{(1,0)}^{(2,5)} = \{((0, 0), (1, 0)), ((1, 0), (0, 0)), \\
 ((0, 1), (1, 1)), ((1, 1), (0, 1)), ((0, 2), (1, 2)), \\
 ((1, 2), (0, 2)), ((0, 3), (1, 3)), ((1, 3), (0, 3)), \\
 ((0, 4), (1, 4)), ((1, 4), (0, 4))\}.
 \end{aligned}$$

It is because the element (1,0) of the ten Heavenly Stems is a Tao force, which is a low cost if the Yin Yang Wu Xing model  $V^5$  is implemented by the Tao force of the Tao model  $V^2$ . Their relations are called the liking relation.

Because the liking relationship cannot change the transfer law of the order of the loving relation, so, by Theorem 3.2 in Zhang [23], Yang is transferring along the order of the ten heavenly stems. Yin is transferring against the order of the ten heavenly stems. It completes the proof.#

**Proof of Theorem 3.3.** See Figure 3., in the Jingluo system or the twelve Earthly Branches model for a healthy economy, only both the liking relation and the adjacent relation have the transfer law of the Yang or Yin vital or righteousness energies.

By Definition 3.3, the elements of the twelve earthly branches have properties: Zi as the Yang water, Chou as the Yin earth, Yin as the Yang wood, Mao as the Yin wood, Chen as the Yang earth, Si as the Yin fire, Wu as the Yang fire, Wei as the Yin earth, Shen as the Yang metal; You as the Yin metal, Xu as the Yang earth, Hai as the Yang water. Here, earth element exists everywhere, so the energy transport order is mainly composed of wood, fire, metal and water elements.

About wood, fire, metal and water element to determine a natural transmission law of wood to fire, to metal by soil, then reach the water. That is to say: a natural Yin energy transmission rule is as follows:

$$\begin{aligned}
 \leftarrow \text{Yang wood Yin} &\leftrightarrow \text{Yin wood Mao} \\
 \leftarrow \text{Yang earth Chen} &\leftrightarrow \text{Yin fire Si} \\
 \leftarrow \text{Yang fire Wu} &\leftrightarrow \text{Yin earth Wei} \\
 \leftarrow \text{Yang metal Shen} &\leftrightarrow \text{Yin metal You} \\
 \leftarrow \text{Yang earth Xu} &\leftrightarrow \text{Yin water Hai} \\
 \leftarrow \text{Yang water Zi} &\leftrightarrow \text{Yin earth Chou} \leftarrow .
 \end{aligned}$$

Its main content is still follow the intergeneration transmission sequence of Yin Yang Wu Xing.

By Property 3.4, the following relation cost (0,(23))

$$\begin{aligned}
 (X^+(0, e), X^-(0, (23))), (X_S^{+x}(1, e), X_S^{-x}(1, (23))), \\
 (X_K^+(0, (12)), X_K^-(0, (132))), (K_X^+(1, (12)), K_X^-(1, (132))), \\
 (S_X^+(0, (13)), S_X^-(0, (123))), (X_S^{+j}(1, (123)), X_S^{-j}(1, (123))) \in \\
 R_{(0,(23))}^{(2,6)} = \{((0, e), (0, (23))), ((1, e), (1, (23))), \\
 ((0, (12)), (0, (132))), ((1, (12)), (1, (132))), \\
 ((0, (13)), (0, (123))), ((1, (13)), (1, (123))), \\
 ((0, (23)), (0, e), ((1, (23)), (1, e))), \\
 ((0, (123)), (0, (13))), ((1, (123)), (1, (13))), \\
 ((0, (132)), (0, (12))), ((1, (132)), (1, (12)))\}.
 \end{aligned}$$

It is because the element (0,(23)) of the twelve Earthly Branches is an essential substance circulating in the channels and blood vessels (营气). It is a low cost element if economy “eats”. Their relations are called the liking relation

for a healthy economy, denoted by  $\overset{\text{less}}{\leftrightarrow}$ .

Because the liking relationship cannot change the transfer law of the order of the loving relation, so, the above elements replacing transmission rule of the twelve earthly branches element, get the transmission law of the twelve earthly branches:

$$\begin{aligned}
 \overset{\text{less}}{\leftarrow} \text{virtual Zi } X^+ &\overset{\text{less}}{\leftrightarrow} \text{virtual Chou } X^- \\
 (\overset{\text{less}}{\leftarrow} \text{virtual Shen } S_X^+ &\overset{\text{less}}{\leftrightarrow} \text{virtual You } S_X^-) \\
 \overset{\text{rare}}{\leftarrow} \text{real Yin } K_X^- &\overset{\text{less}}{\leftrightarrow} \text{real Mao } K_X^+ \\
 \overset{\text{more}}{\leftarrow} \text{real Chen } X_K^+ &\overset{\text{less}}{\leftrightarrow} \text{real Si } X_K^- \\
 \overset{\text{rare}}{\leftarrow} \text{virtual Wu } X_S^{j-} &\overset{\text{less}}{\leftrightarrow} \text{virtual Wei } X_S^{j+} \\
 \overset{\text{rare}}{\leftarrow} \text{virtual Shen } S_X^+ &\overset{\text{less}}{\leftrightarrow} \text{virtual You } S_X^- \\
 \overset{\text{rare}}{\Rightarrow} \text{virtual Xu } X_S^{x-} &\overset{\text{less}}{\leftrightarrow} \text{virtual Hai } X_S^{x+} \\
 \overset{\text{less}}{\leftarrow} \text{virtual Zi } X^+ &\overset{\text{less}}{\leftrightarrow} \text{virtual Chou } X^-.
 \end{aligned}$$

The relationship

virtual Wu  $X_S^{j-}$   $\leftrightarrow$  virtual Wei  $X_S^{j+}$   
 $\leftarrow$  virtual Shen  $S_X^+$   $\leftrightarrow$  virtual You  $S_X^-$   
 $\Rightarrow$  virtual Xu  $X_S^{x-}$   $\leftrightarrow$  virtual Hai  $X_S^{x+}$   
 can be abbreviated as

virtual Wu  $X_S^{j-}$   $\leftrightarrow$  virtual Wei  $X_S^{j+}$  .  
 $\leftrightarrow$  virtual Xu  $X_S^{x-}$   $\leftrightarrow$  virtual Hai  $X_S^{x+}$

Thus

$\leftarrow$  virtual Zi  $X^+$   $\leftrightarrow$  virtual Chou  $X^-$   
 $\leftarrow$  virtual Shen  $S_X^+$   $\leftrightarrow$  virtual You  $S_X^-$   
 $\leftarrow$  real Yin  $K_X^-$   $\leftrightarrow$  real Mao  $K_X^+$   
 $\leftarrow$  real Chen  $X_K^+$   $\leftrightarrow$  real Si  $X_K^-$   
 $\leftarrow$  virtual Wu  $X_S^{j-}$   $\leftrightarrow$  virtual Wei  $X_S^{j+}$   
 $\leftrightarrow$  virtual Xu  $X_S^{x-}$   $\leftrightarrow$  virtual Hai  $X_S^{x+}$   
 $\leftarrow$  virtual Zi  $X^+$   $\leftrightarrow$  virtual Chou  $X^-$  .

Because the order

$X (\leftarrow S_X) \leftarrow K_X \leftarrow X_K \leftarrow X_S \leftarrow X (\leftarrow S_X) \leftarrow$

is transferring against the loving order of the twelve earthly branches, of course, by Theorem 3.2 in Zhang [23], it is the transfer law of the Yin vital or righteousness energies of the twelve earthly branches.

By Theorem 3.2 in Zhang [23], Yang is transferring along the order of the loving relationship. Yin is transferring against the order of the loving relationship. So, the transfer law of the Yin vital or righteousness energies of the twelve earthly branches is transferring against the order of the loving or liking relationship. It is because the liking relationship cannot change the transfer law of the order of the loving relation.

Thus, the transfer law of the Yang vital or righteousness energies of the twelve earthly branches is as follows:

real Chou  $X^-$   $\leftrightarrow$  real Zi  $X^+$   
 $\rightarrow$  real Hai  $X_S^{x+}$   $\leftrightarrow$  real Xu  $X_S^{x-}$   
 $\leftarrow$  real You  $S_X^-$   $\leftrightarrow$  real Shen  $S_X^+$   
 $\Rightarrow$  real Wei  $X_S^{j+}$   $\leftrightarrow$  real Wu  $X_S^{j-}$   
 $\rightarrow$  virtual Si  $X_K^-$   $\leftrightarrow$  virtual Chen  $X_K^+$   
 $\rightarrow$  virtual Mao  $K_X^+$   $\leftrightarrow$  virtual Yin  $K_X^-$   
 $\leftarrow$  real You  $S_X^-$   $\leftrightarrow$  real Shen  $S_X^+$   
 $\rightarrow$  real Chou  $X^-$   $\leftrightarrow$  real Zi  $X^+$  .

The relationship

real Hai  $X_S^{x+}$   $\leftrightarrow$  real Xu  $X_S^{x-}$   
 $\leftarrow$  real You  $S_X^-$   $\leftrightarrow$  real Shen  $S_X^+$   
 $\Rightarrow$  real Wei  $X_S^{j+}$   $\leftrightarrow$  real Wu  $X_S^{j-}$

can be abbreviated as

real Hai  $X_S^{x+}$   $\leftrightarrow$  real Xu  $X_S^{x-}$  .  
 $\leftrightarrow$  real Wei  $X_S^{j+}$   $\leftrightarrow$  real Wu  $X_S^{j-}$

Thus

real Chou  $X^-$   $\leftrightarrow$  real Zi  $X^+$   
 $\rightarrow$  real Hai  $X_S^{x+}$   $\leftrightarrow$  real Xu  $X_S^{x-}$

$\leftarrow$  real Wei  $X_S^{j+}$   $\leftrightarrow$  real Wu  $X_S^{j-}$   
 $\rightarrow$  virtual Si  $X_K^-$   $\leftrightarrow$  virtual Chen  $X_K^+$   
 $\rightarrow$  virtual Mao  $K_X^+$   $\leftrightarrow$  virtual Yin  $K_X^-$   
 $\leftarrow$  real You  $S_X^-$   $\leftrightarrow$  real Shen  $S_X^+$   
 $\rightarrow$  real Chou  $X^-$   $\leftrightarrow$  real Zi  $X^+$  .

Because the order

$X \rightarrow X_S \rightarrow X_K \rightarrow K_X (\rightarrow S_X) \rightarrow X \rightarrow$

is transferring along the loving order of the twelve earthly branches, of course, by Theorem 3.2 in Zhang [23], it is the transfer law of the Yang vital or righteousness energies of the twelve earthly branches.

Therefore, the transfer law of the Yang or Yin vital or righteousness energies of the twelve earthly branches is obtained as follows: Yang is transferring along the liking or loving order of the twelve earthly branches. And Yin is transferring against the liking or loving order of the twelve earthly branches. It completes the proof.#

**Proof of Theorem 3.4.** See Figure 2., in the Zangxiang system or the ten Heavenly Stems model for an unhealthy economy, only both the liking relation and the killing relation have the transfer law of the Yang or Yin vital or righteousness energies. By Theorem 3.3 of Zhang [23], Yang is transferring against the order of the killing relationship. Yin is transferring along the order of the killing relationship.

By Property 3.3, the following relation cost (1,0) is low.

$(X^+(1, 0), X^-(0, 0)), (X_S^+(1, 1), X_S^-(0, 1)),$   
 $(X_K^+(1, 2), X_K^-(0, 2)), (K_X^+(1, 3), K_X^-(0, 3)),$   
 $(S_X^+(1, 4), S_X^-(0, 4)) \in$   
 $R_{(1,0)}^{(2,5)} = \{((0, 0), (1, 0)), ((1, 0), (0, 0)),$   
 $((0, 1), (1, 1)), ((1, 1), (0, 1)), ((0, 2), (1, 2)),$   
 $((1, 2), (0, 2)), ((0, 3), (1, 3)), ((1, 3), (0, 3)),$   
 $((0, 4), (1, 4)), ((1, 4), (0, 4))\} .$

It is because the element (1,0) of the ten Heavenly Stems is a Tao force, which is a low cost if the Yin Yang Wu Xing model  $V^5$  is implemented by the Tao force of the Tao model  $V^2$ . Their relations are called the liking relation.

Because the liking relationship cannot change the transfer law of the order of the killing relation, so, by Theorem 3.3 in Zhang [23], Yang is transferring along the order of the killing or liking relation of the ten heavenly stems. Yin is transferring along the order of the killing or liking relation of the ten heavenly stems. It completes the proof.#

**Proof of Theorem 3.5.** See Figure 3., in the Jingluo system or the twelve Earthly Branches model for an unhealthy economy, only both the liking relation and the alternate relation have the transfer law of the Yang or Yin vital or righteousness energies.

By Property 3.4, the following relation cost (0,(23)) is low.

$(X^+(0, e), X^-(0, (23))), (X_S^{x+}(1, e), X_S^{x-}(1, (23))),$   
 $(X_K^+(0, (12)), X_K^-(0, (132))), (K_X^+(1, (12)), K_X^-(1, (132))),$   
 $(S_X^+(0, (13)), S_X^-(0, (123))), (X_S^{j+}(1, (123)), X_S^{j-}(1, (123))) \in$   
 $R_{(0,(23))}^{(2,6)} = \{((0, e), (0, (23))), ((1, e), (1, (23))),$   
 $((0, (12)), (0, (132))), ((1, (12)), (1, (132))),$   
 $((0, (13)), (0, (123))), ((1, (13)), (1, (123))),$   
 $((0, (23)), (0, e)), ((1, (23)), (1, e)),$   
 $((0, (123)), (0, (13))), ((1, (123)), (1, (13))),$   
 $((0, (132)), (0, (12)), ((1, (132)), (1, (12))))\} .$

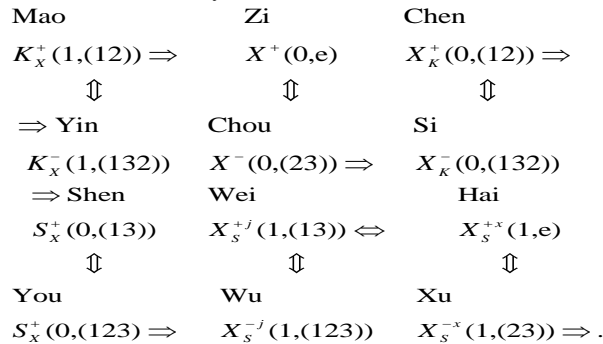
It is because the element (0,(23)) of the twelve Earthly Branches is an essential substance circulating in the channels

**GBR for the metal Subsystem based on Zangxiang and Jingluo– Mathematical Reasoning of Economic Intervening Principle Based on Yin Yang Wu Xing Theory in Traditional Chinese Economics (III)**

and blood vessels (营气). It is a low cost element if the economic society “eats”. Their relations are called the liking relation for a healthy economy, denoted by  $\Leftrightarrow$ .

By Theorem 3.3 in Zhang [23], Yang is transferring against the order of the killing relationship. Yin is transferring along the order of the killing relationship. So, the transfer law of the Yin vital or righteousness energies of the twelve earthly branches is transferring along the order of the killing or liking relationship. It is because the liking relationship cannot change the transfer law of the order of the killing or liking relation.

In mathematics, by Theorem 3.3 in Zhang [23], for the unhealthy economy, the transfer law of the Yin vital energies of the twelve earthly branches is as follows:



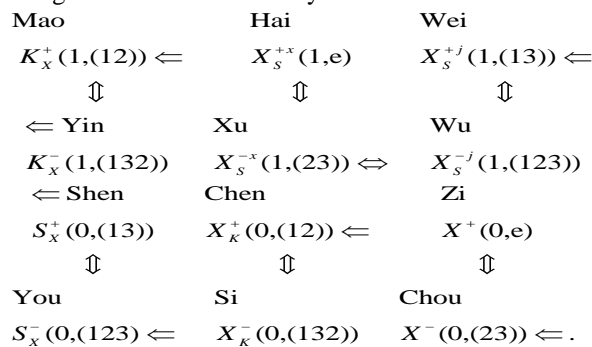
It is because the order

$$K_x \Rightarrow X \Rightarrow X_k \Rightarrow S_x \Rightarrow X_s \Rightarrow$$

is transferring along the killing order of the twelve earthly branches.

Similarly, Yang is transferring against the order of the killing or liking relationship. So, the transfer law of the Yang vital or righteousness energies of the twelve earthly branches is transferring against the order of the killing or liking relationship. It is because the liking relationship cannot change the transfer law of the order of the killing or liking relation.

In mathematics, by Theorem 3.3 in Zhang [23], for the unhealthy economy, the transfer law of the Yang vital energies of the twelve earthly branches is as follows:



It is because the order

$$K_x \Leftarrow X_s \Leftarrow S_x \Leftarrow X_k \Leftarrow X \Leftarrow$$

is transferring against the killing order of the twelve earthly branches. It completes the proof.#

**Proof of Theorem 4.1.** Let

$$a = 2.9515\%, b = 6.1002\%, t_0 = 4.2539\%.$$

(1) By the (1) of Theorem 4.1 in Zhang [23],  $x$  and  $x_k$  as continuous subsystems of occurring disease, it only need to be proved that the subsystem  $x$  itself is the root-cause of a virtual disease and that the son subsystem  $x_s$  of  $x$  is the symptoms of disease at this time.

In this case, the economy is unhealthy. The first physiological system is running hardly. The loving relationship is running hardly. Only the killing relationship run normally.

By Theorems 3.2 and 3.3, the first transfer law of economy energies is not to work. By Theorems 3.4 and 3.5, the second transfer law of economy energies is beginning to work.

By the theory of Zangxiang and Jingluo in Definition 3.1 and 3.2, the virtual disease of the subsystem  $x$  is transferring from the virtual disease of its son  $x_s$  for a good self-protection ability. Consider whether the subsystem  $x$  virtual disease, the cause of its root-cause will be able to direct the subsystem  $x$  treatment. In the following, consider the result of the subsystem  $x$  direct intervention.

From Theorem 3.2 and Corollary 3.2 in [20], the subsystem  $x$  was considered as virtual. When the capability of self-protection is nearly to the best state, i.e.,  $\rho_3 = c\rho(x)$  where  $c \rightarrow 1$ , if you increase the energy of the subsystem  $x$  directly, then its capabilities of both intervention reaction and self-protection can make the subsystems  $S_x$ ,  $K_x$  and  $X_k$  restored at the same time, but the subsystems  $x$  and  $x_s$  will increase their energies, i.e., changed by the increments

$$\Delta\varphi(X)_2 \rightarrow (1 - \rho(x)^3)\Delta > 0,$$

$$\Delta\varphi(X_s)_2 \rightarrow (\rho(x) + \rho(x)^3)\Delta > 0,$$

respectively.

Since the GBR inflation rate  $x < a$  makes  $0 \leq \rho_1 = \rho(x) < \rho_0$  such that  $(\rho(x) + \rho(x)^3) < (1 - \rho(x)^3)$ , therefore the subsystem  $x$  can obtain the large increment  $\Delta\varphi(X)_2 = (1 - \rho(x)^3)\Delta > 0$  and the subsystem  $x_s$  will get the small increment  $\Delta\varphi(X_s)_2 = (\rho(x) + \rho(x)^3)\Delta > 0$ . The later is the pseudo side effects issue, by Attaining Rule in Zhang [23], which is just the food of the second physiological system of the steady multilateral system since that the economy is unhealthy, virtual and  $x$  intervened makes that the second physiological system will attain the *Chi* or energy (Yang energy) from the son  $x_s$  of the intervened subsystem  $x$ . The

attaining way is an indirect treating for  $x$  as an unhealthy economy with a virtual disease. That means for the intervened subsystem  $x$  direct treatment effect is in accordance with the working principle of system and meridian system. So say: the subsystem  $x$  deficiency disease is why disease at this time. Thus, the subsystem  $x$  itself is the root-cause of a virtual disease. Of course, the son subsystem  $x_s$  of  $x$  is the symptoms of disease at this time. Need to use the method of the intervening principle of “Strong inhibition of the same time, support the weak” (抑强扶弱) action to treat.

(2) By the (2) of Theorem 4.1 in Zhang [23],  $x$  and  $x_s$  as continuous subsystems of occurring disease, it only need to be proved that the mother  $S_x$  of subsystem  $x$  is the root-cause of a virtual disease and the subsystem  $x$  itself is the symptoms of a virtual disease at this time.

In this case, the economy is healthy. The first physiological system is running normally. The loving relationship is running normally. The liking relationship is also running normally. By Theorems 3.2 and 3.3, the first transfer law of economy



energies is doing to work. By Theorems 3.4 and 3.5, the second transfer law of economy energies is not to work.

By the theory of Zangxiang and Jingluo in Definition 3.1 and 3.2, the virtual disease of the subsystem  $X$  is transferring from the virtual disease of its mother  $S_X$  for a good self-protection ability. Consider whether the mother  $S_X$  of the subsystem  $X$  virtual disease, the cause of its root-cause will be able to direct the mother  $S_X$  of the subsystem  $X$  treatment.

In the following, consider the result of the mother  $S_X$  of the subsystem  $X$  treatment direct intervention.

From Theorem 3.2 and Corollary 3.2 in [20], the subsystem  $X$  will be considered as virtual. First the case is studied that the capability of self-protection is in the best state, i.e.,  $\rho_3 = c\rho(x) \rightarrow \rho(x) = \rho_1 > 0$  where  $c \rightarrow 1$ . If the energy of the subsystem  $S_X$  is intervened to increase its energy, then its capabilities of intervention reaction and self-protection can make the subsystems  $K_X$ ,  $X_K$  and  $X_S$  restored at the same time, but the subsystems  $S_X$  and  $X$  will increase their energies, i.e., changed by the increments

$\Delta\varphi(S_X)_2 \rightarrow (1 - \rho(x)^3)\Delta > 0$ ,  
 $\Delta\varphi(X)_2 \rightarrow (\rho(x) + \rho(x)^3)\Delta > 0$ ,  
 respectively.

Since the GBR inflation rate  $a \leq x \leq t_0$  makes  $1 \geq \rho_1 = \rho(x) \geq \rho_0$  such that mainly  $(\rho(x) + \rho(x)^3) \geq (1 - \rho(x)^3)$ , therefore the subsystem  $X$  can obtain the large increment  $\Delta\varphi(X)_2 = (\rho(x) + \rho(x)^3)\Delta > 0$  and the subsystem  $S_X$  will get the small increment  $\Delta\varphi(S_X)_2 = (1 - \rho(x)^3)\Delta$ . The later is the pseudo side effects issue, by Attaining Rule in Zhang [23], which is just the food of the second physiological system of the steady multilateral system since that the economy is healthy, virtual and  $S_X$  intervened makes that the second physiological system will attain the *Chi* or energy from the intervened subsystem  $S_X$  directly for a healthy with a virtual disease. That means for the intervened subsystem  $S_X$  direct treatment effect is in accordance with the working principle of system and meridian system. So say: the subsystem  $S_X$  deficiency disease is why disease at this time. Thus, the mother subsystem  $S_X$  of  $X$  is the root-cause of a virtual disease. Of course, the subsystem  $X$  itself is the symptoms of a virtual disease at this time. Need to use the method of the intervening principle of "Strong inhibition of the same time, support the weak" (抑强扶弱) action to treat.

(3) By the (3) of Theorem 4.1 in Zhang [23],  $X$  and  $X_S$  as continuous subsystems of occurring disease, it only need to be proved that the son  $X_S$  of  $X$  the root-cause of a real disease and the subsystem  $X$  itself is the symptoms of a real disease at this time. In this case, the economy is healthy. The first physiological system is running normally. The loving relationship is running normally. The liking relationship is also running normally. By Theorems 3.2 and 3.3, the first transfer law of economy energies is not to work. By Theorems 3.4 and 3.5, the second transfer law of economy energies is beginning to work.

energies is doing to work. By Theorems 3.4 and 3.5, the second transfer law of economy energies is not to work.

By the theory of Zangxiang and Jingluo in Definitions 3.1 and 3.2, the virtual disease of the subsystem  $X$  is transferring from the virtual disease of its son  $X_S$  for a good self-protection ability. Consider whether the son  $X_S$  of the subsystem  $X$  virtual disease, the cause of its root-cause will be able to direct the son  $X_S$  of the subsystem  $X$  treatment. In the following, consider the result of the son  $X_S$  of the subsystem  $X$  treatment direct intervention.

From Theorem 3.2 and Corollary 3.2 in [20], the subsystem  $X$  will be considered as real. First the case is studied that the capability of self-protection is in the best state, i.e.,  $\rho_3 = c\rho(x) \rightarrow \rho(x) = \rho_1$  where  $c \rightarrow 1$ . If the energy of the subsystem  $X_S$  is intervened to decrease its energy, then its capabilities of intervention reaction and self-protection can make the subsystems  $X_K$ ,  $K_X$  and  $S_X$  restored at the same time, but the subsystems  $X$  and  $X_S$  will decrease their energies, i.e., changed by the increment

$\Delta\varphi(X)_2 \rightarrow -(\rho(x) + \rho(x)^3)\Delta > 0$ ,  
 $\Delta\varphi(X_S)_2 \rightarrow -(1 - \rho(x)^3)\Delta > 0$ ,  
 respectively.

Since the GBR inflation rate  $t_0 < x \leq b$  makes  $1 > \rho_1 = \rho(x) \geq \rho_0$  such that mainly  $(\rho(x) + \rho(x)^3) \geq (1 - \rho(x)^3)$ , therefore the subsystem  $X$  can obtain the substantial reduction  $\Delta\varphi(X)_2 = -(\rho(x) + \rho(x)^3)\Delta < 0$  and the subsystem  $X_S$  will get a modest reduction  $\Delta\varphi(X_S)_2 = -(1 - \rho(x)^3)\Delta < 0$ . The later is the pseudo side effects issue, by Attaining Rule in Zhang [23], which is just the food of the second physiological system of the steady multilateral system since that the economy is healthy, real and  $X_S$  intervened makes that the second physiological system will attain the *Chi* or energy from the intervened subsystem  $X_S$  directly for a healthy with a real disease. That means for the intervened subsystem  $X_S$  direct treatment effect is in accordance with the working principle of system and meridian system. So say: the subsystem  $X_S$  real disease is why disease at this time. Thus, the son subsystem  $X_S$  of  $X$  is the root-cause of a real disease. Of course, the subsystem  $X$  itself is the symptoms of a real disease at this time. Need to use the method of the intervening principle of "Strong inhibition of the same time, support the weak" (抑强扶弱) action to treat.

(4) By the (4) of Theorem 4.1 in Zhang [23],  $X$  and  $K_X$  as continuous subsystems of occurring disease, it only need to be proved that the subsystem  $X$  itself is the root-cause of a real disease and that the mother  $S_X$  of  $X$  is the symptoms of a real disease at this time. In this case, the economy is unhealthy. The first physiological system is running hardly. The loving relationship is running hardly. Only the killing relationship is running normally. By Theorems 3.2 and 3.3, the first transfer law of economy energies is not to work. By Theorems 3.4 and 3.5, the second transfer law of economy energies is beginning to work.

(4) By the (4) of Theorem 4.1 in Zhang [23],  $X$  and  $K_X$  as continuous subsystems of occurring disease, it only need to be proved that the subsystem  $X$  itself is the root-cause of a real disease and that the mother  $S_X$  of  $X$  is the symptoms of a real disease at this time.

In this case, the economy is unhealthy. The first physiological system is running hardly. The loving relationship is running hardly. Only the killing relationship is running normally. By Theorems 3.2 and 3.3, the first transfer law of economy energies is not to work. By Theorems 3.4 and 3.5, the second transfer law of economy energies is beginning to work.

## GBR for the metal Subsystem based on Zangxiang and Jingluo– Mathematical Reasoning of Economic Intervening Principle Based on Yin Yang Wu Xing Theory in Traditional Chinese Economics (III)

By the theory of Zangxiang and Jingluo in Definitions 3.1 and 3.2, the virtual disease of the subsystem  $X$  is transferring from the real disease of its mother  $S_X$  for a good self-protection ability. Consider whether the subsystem  $X$  virtual disease, the cause of its root-cause will be able to direct the subsystem  $X$  treatment. In the following, consider the result of the subsystem  $X$  treatment direct intervention.

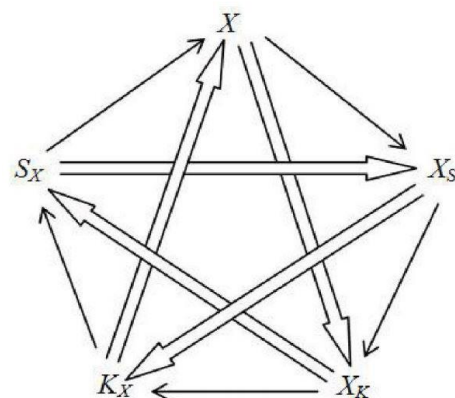
From Theorems 3.2 and Corollary 3.2 in [20], the subsystem  $X$  was considered as real. When the capability of self-protection is in the best state, i.e.,  $\rho_3 = c\rho(x) \rightarrow \rho(x) = \rho_1$  where  $c \rightarrow 1$ , if the energy of the subsystem  $X$  is intervened to decrease its energy directly, then its capabilities of intervention reaction and self-protection can make the subsystems  $X_K$ ,  $K_X$  and  $X_S$  restored at the same time, but the subsystems  $X$  and  $S_X$  will decrease their energies, i.e., changed by the increments  $\Delta\varphi(X)_2 \rightarrow -(1-\rho(x)^3)\Delta < 0$ ,  $\Delta\varphi(S_X)_2 \rightarrow -(\rho(x) + \rho(x)^3)\Delta < 0$ , respectively.

Since the GBR inflation rate  $x > b$  makes  $0 \leq \rho_1 = \rho(x) < \rho_0$  such that  $(\rho(x) + \rho(x)^3) < (1 - \rho(x)^3)$ , therefore the subsystem  $X$  can obtain the substantial reduction  $\Delta\varphi(X)_2 = -(1 - \rho(x)^3)\Delta < 0$  and the subsystem  $S_X$  will get a modest reduction  $\Delta\varphi(S_X) = -(\rho(x) + \rho(x)^3)\Delta < 0$ . The later is the pseudo side effects, by Attaining Rule in Zhang [23], which is just the food of the second physiological system of the steady multilateral system since that the economy is unhealthy, real and  $X$  intervened makes that the second physiological system will attain the *Chi* or energy from the mother  $S_X$  of the intervened subsystem  $X$ . The attaining way is an indirect treating for  $X$  as an unhealthy economy with a real disease. That means for the intervened subsystem  $X$  direct treatment effect is in accordance with the working principle of system and meridian system. So say: the subsystem  $X$  real disease is why disease at this time. Thus the subsystem  $X$  is the root-cause of a real disease. Of course, the mother  $S_X$  of  $X$  is the symptoms of a real disease at this time. Need to use the method of the intervening principle of “Strong inhibition of the same time, support the weak” (抑强扶弱) action to treat. It completes the proof.#

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**Figure 1. Finding Yin Yang Wu Xing Model**

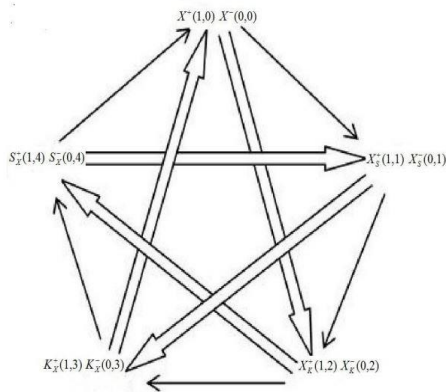


Figure 2. Relations of ten Heavenly Stems

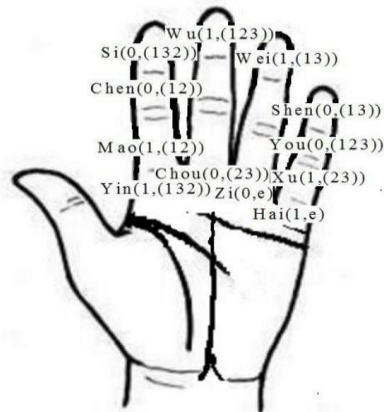


Figure 3. Relations of twelve Earthly Branches

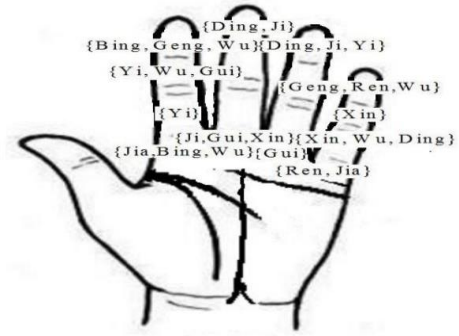


Figure 4. Ten Heavenly Stems Hidden behind Twelve Earthly Branches

Table 1. Ten Heavenly stems grow-strong-die-extinction (I)

	grow	bath	crown	officer	emperor	decay
Jia	Hai	Zi	Chou	Yin	Mao	Chen
Bing	Yin	Mao	Chen	Si	Wu	Wei
Wu	Yin	Mao	Chen	Si	Wu	Wei
Geng	Si	Wu	Wei	Shen	You	Xu
Ren	Shen	You	Xu	Hai	Zi	Chou
Yi	Wu	Si	Chen	Mao	Yin	Chou
Ding	You	Shen	Wei	Wu	Si	Chen
Ji	You	Shen	Wei	Wu	Si	Chen
Xin	Zi	Hai	Xu	You	Shen	Wei
Gui	Mao	Yin	You	Zi	Hai	Xu

Table 2. Ten Heavenly stems grow-strong-die-extinction (II)

	disease	death	tomb	extinction	child	raise
Jia	Si	Wu	Wei	Shen	You	Xu
Bing	Shen	You	Xu	Hai	Zi	Chou
Wu	Shen	You	Xu	Hai	Zi	Chou
Geng	Hai	Zi	Chou	Yin	Mao	Chen
Ren	Yin	Mao	Chen	Si	Wu	Wei
Yi	Zi	Hai	Xu	You	Shen	Wei
Ding	Mao	Yin	You	Zi	Hai	Xu
Ji	Mao	Yin	You	Zi	Hai	Xu
Xin	Wu	Si	Chen	Mao	Yin	Chou
Gui	You	Zi	Hai	Xu	You	Shen

Table 3. Inflation Rates of Finance, GDP, CPI, PPI, RPI, GBR and AAF

No.	$M_2$	rate	GDP (1978=100)	rate	Finance inflation rate	CPI (1984=100)	rate	
1990	15293.4		18774.3		0.10739	216.4		
1991	19349.9	0.26525	21895.5	0.14255	0.10216	223.8	0.03307	
1992	25402.2	0.31278	27068.3	0.19110	0.09956	238.1	0.06006	
1993	34579.8	0.36129	35524.3	0.23803	0.07106	273.1	0.12816	
1994	46923.5	0.35696	48459.6	0.26693	0.07240	339.0	0.19440	
1995	60750.5	0.29467	61129.8	0.20727	0.09310	396.9	0.14588	
1996	76094.9	0.25258	71572.3	0.14590	0.08817	429.9	0.07676	
1997	90995.3	0.19581	79429.5	0.09892	0.07906	441.9	0.02716	
1998	104498.5	0.14839	84883.7	0.06425	0.08364	438.4	-0.00798	
1999	119897.9	0.14736	90187.7	0.05881	0.02427	432.2	-0.01435	
2000	134610.3	0.12271	99776.3	0.09610	0.07381	434.0	0.00415	
2001	158301.9	0.17600	110270.4	0.09517	0.07349	437.0	0.00686	
2002	185007.0	0.16870	121002.0	0.08869	-0.01723	435.5	-0.00807	
2003	221222.8	0.19575	136564.6	0.11396	0.07343	438.7	0.01185	
2004	254107.0	0.14865	160714.4	0.15027	-0.00141	455.8	0.03752	
2005	298755.7	0.17571	185895.8	0.13546	0.03545	464.0	0.01767	
2006	345577.9	0.15672	217656.6	0.14592	0.00943	471.0	0.01486	
2007	403442.2	0.16744	268019.4	0.18791	-0.01723	493.6	0.04579	
2008	475166.6	0.17778	316751.7	0.15385	0.02074	522.7	0.05567	
2009	610224.5	0.28423	345629.2	0.08355	0.18521	519.0	-0.00713	
2010	725851.8	0.18948	408903.0	0.15474	0.03009	536.1	0.03190	
2011	851590.9	0.17323	484123.5	0.15537	0.01545	565.0	0.05115	
2012	974148.8	0.14392	534123.0	0.09361	0.04600	579.7	0.02536	
2013	1106525.0	0.13589	588018.8	0.09166	0.04052	594.8	0.02539	
2014	1228374.8	0.11012	635910.0	0.07531	0.03237	606.7	0.01961	
No.	PPI (1984=100)	rate	RPI (1984=100)	rate	GBR	rate	AAF	rate
1990	207.7		159.0		2937.10		7662.1	
1991	213.7	0.02808	168.9	0.05861	3149.48	0.07231	8157.0	0.06459
1992	225.2	0.05107	180.4	0.06375	3483.37	0.10601	9684.7	0.11373
1993	254.9	0.11652	223.7	0.19356	4348.95	0.24849	10995.5	0.21033
1994	310.2	0.17827	267.3	0.16311	5218.10	0.19985	15750.5	0.43245
1995	356.1	0.12890	307.1	0.12960	6242.20	0.19626	20340.9	0.29144
1996	377.8	0.05744	316.0	0.02816	7407.99	0.18676	22533.7	0.09895
1997	380.8	0.00788	315.0	-0.0317	8651.14	0.16781	23788.4	0.06418
1998	370.9	-0.2669	302.1	-0.04270	9875.95	0.14158	24541.9	0.03168
1999	359.8	-0.3085	294.8	-0.02476	11444.68	0.15878	24519.1	0.00093
2000	354.4	-0.1524	303.1	0.02738	13395.23	0.17049	24915.8	0.01618
2001	351.6	-0.0796	299.2	-0.01303	16386.04	0.22327	26179.6	0.05072
2002	347.0	-0.1326	292.6	-0.02256	18903.64	0.15364	27390.8	0.04627
2003	346.7	-0.00087	299.3	0.02239	21715.25	0.14873	29691.8	0.08401
2004	356.4	0.02722	317.6	0.05762	26396.47	0.21557	36239.0	0.22051
2005	359.3	0.00807	333.2	0.04682	31649.29	0.19900	39450.9	0.08863
2006	362.9	0.00992	343.2	0.02914	38760.20	0.22468	40810.8	0.03447
2007	376.7	0.03663	353.8	0.02996	51321.78	0.32408	48893.0	0.19804
2008	398.9	0.05565	378.2	0.06452	61330.35	0.19502	58002.2	0.18631
2009	394.1	-0.1218	357.8	-0.05702	68518.30	0.11720	60361.0	0.04067
2010	406.3	0.03003	377.5	0.05219	83101.51	0.21284	69319.8	0.14842
2011	426.2	0.04669	400.2	0.05672	103874.43	0.24997	81303.9	0.17288
2012	434.7	0.01955	393.4	-0.01729	117253.52	0.12880	89453.0	0.10023
2013	440.8	0.01384	385.9	-0.01944	129209.64	0.10197	96995.3	0.08432
2014	445.2	0.00988	378.6	-0.01528	140370.03	0.08637	102226.1	0.05393

Assume that  $M_2$  or  $M_2$  as issued in the circulation of generalized money, the Gross Domestic Product (GDP) as  $G$  or  $G'$ , the consumer price index (CPI) as  $C$  or  $C'$ , the Producer Price Index (PPI) as  $P$  or  $P'$ , the Retail Price Index (RPI) as  $R$  or  $R'$ , the General Budget Revenue (GBR) as  $G_b$  or  $G'_b$ , and the total output value of Agriculture forestry Animal husbandry and Fishery (AAF) as  $A$  OF  $A'$ , for today and last year respectively, the actual need of money in real terms in the circulation  $P_0 = M'_2 \times (G / G')$  for last year's price level. Then the inflation rate of  $M_2$  is  $(M_2 - M'_2) / M'_2$ , the inflation rate of GDP is  $(G - G') / G'$ , the inflation rate of CPI is  $(C - C') / C'$ , the inflation rate of PPI is  $(P - P') / P'$ , the inflation rate of RPI is  $(R - R') / R'$ , the inflation rate of GBR is  $(G_b - G'_b) / G'_b$ , the inflation rate of AAF is  $(A - A') / A'$ , respectively, and the annual Finance inflation rate can be measured by  $(M_2 - M'_2) / M'_2$ .