

Research on the Dissipate Structure of the System of Chinese Residents Purchasing Houses

QIN Huanmei

Business School, University of Shanghai for Science and Technology, P.R.China, 200093
qhmeihao@126.com

Abstract: The paper makes the research on the Dissipate Structure of the system of Chinese residents purchasing houses, and puts forward the conditions of the Dissipate Structure of the system when the disorder system will be changed into the new order state. It has analyzed the necessary conditions under which the Dissipate Structure of the system and has applied the method of IDEF0 to establish the model of the Dissipate Structure of the system. And it has brought forward that the system will be changed into the new order state from the initial disorder state only if the conditions of the Dissipate Structure of the system have been satisfied or realized. Especially on the great impact of the global financial crisis, the research on the Dissipate Structure of the system of Chinese residents purchasing houses is significant to the adjustment of the domestic estate market and the growth of economy.

Keywords: The Dissipate Structure, entropy, non-equilibrium state, stochastic fluctuation

1 Introduction

In 1967 I. Prigogine proposed the Dissipate Structure Theory which said that the entropy in the isolated system was increasing and the total process was changed from the disorder state to the order state; the system exchanged the material and the energy with the outside in the open system, through the absorption of negentropy from the outside, the open system may counter-balance own entropy and get the evolution from the disorder to the order from the simplicity to complex. Thus it has solved the contradiction between “the theory of heat death” and the theory of evolution. One misalign open system is far away from the equilibrium state, exchanging the material and energy with outside unceasingly, when the change of some interior parameter obtains certain marginal value, the system will produce the change which is named non-equilibrium phase change, and the original disorder state will be transformed one kind of the new ordered state in the time, the spatial or the function. The new stable macroscopic ordered structure far away from the balanced misaligning area requires exchanging material or the energy with the outside to maintain the state; therefore, it is called the Dissipate Structure. In recent years many domestic and foreign scholars have paid more attention to the research of important problems applying the theory of Dissipate Structure.

At present, the problem of Chinese residents purchasing houses is attached more attention of people, especially under the influence of the global financial crisis. How to regard of the problem of the domestic houses purchased? How to make the system of Chinese residents purchasing houses change to the new order state from the disorder state? The paper has analyzed the problems through applying the theory of Dissipate Structure, especially analyzed the conditions which are required by the Dissipate Structure of the system.

2 The Conditions of the Dissipate Structure of the system of Chinese Residents Purchasing Houses

The system of Chinese residents purchasing houses is a complicated system which contains lots of the subsystems, and the paper regards it as one whole system.

2.1 An Essential Open System required by the Dissipate Structure

The first condition of the Dissipate Structure of the system of Chinese residents purchasing houses is that the system must be an open system, and must receive the material and the energy from the outside.

Under the open condition, the increased entropy of the system has two parts, one part from the outside and another from the inside. In special situation, so long as the negative entropy flow is strong enough to not only eliminate the internal entropy of the system, but also cause the increasing entropy rate of the whole system to be negative, and the system will enter the order condition relatively. Therefore, the open system may appear the order Dissipate Structure from the disorder state through the spontaneous symmetry broken lack of the system. Here, the system of Chinese residents purchasing houses is one open system which is influenced by the outside. In the system, the entropy (ds) is made up of the two parts, one is the entropy production (dis) and the other is the entropy flow (des). That means

$$ds = dis + des$$

The variable dis expresses the entropy production of the interior system, and it is not negative, that is $dis \geq 0$. And the variable des expresses the entropy flow from the outside of the system, and it may be negative, zero, and positive.

2.1.1 The entropy flow from the domestic earthquake and the global financial crisis

Here, the entropy flow from the domestic earthquake and the global financial crisis is expressed by the variable des .

If $des < 0$ or $des > 0$, and $dis > 0$, $|des| < dis$, then

$$ds = dis + des > 0$$

And it shows that the entropy flow from the outside does not eliminate the production of entropy inside of the system, and the entropy of whole system is positive. Thus it makes the system more disorder, and the system seems more chaos. WenChuan earthquake has brought the negative entropy to the system, because it has done harm to the psychologist of residents, and it has curbed the demand of purchasing houses. The damage of the earthquake has made the residents consider the problem of purchasing of the houses carefully. Moreover, the terrific and loss of the earthquake has made the value of the entropy of the system larger, and the entropy flow which is produced by the influence of the earthquake to the system of Chinese residents purchasing houses is positive, that means

$$des > 0, dis > 0.$$

Then

$$ds = dis + des > 0$$

Furthermore, the global financial crisis has made the significant influence of Chinese residents purchasing houses. The crisis has made the growth of Chinese economy slow. And the recession of domestic economy will make the income of the residents less conspicuously. So the house price will be decreased compared with the past years. The influence of the global financial crisis has made the entropy flow positive, that means $des > 0$, and

$$des > 0, dis > 0.$$

Then

$$ds = dis + des > 0$$

It shows that the entropy flow which is from the global financial crisis is positive, and it makes the system of Chinese residents purchasing houses more disorder.

Therefore, the factors such as the earthquake and the global financial crisis from the outside of the system make the entropy flow of the system positive, and the system has become disorder.

2.1.2 The entropy flow from the government macroscopic monetary policies

Here, the entropy flow from the government macroscopic monetary policies is expressed by the variable des .

If $des < 0$, and $|des| > dis$, but $dis > 0$, then

$$ds = dis + des < 0$$

And it shows that the entropy flow from the government macroscopic monetary polices is negative, and the whole entropy of the system is negative. On the effect of the government macroscopic monetary polices, the system will be changed from the chaos state into the new order state.

If $des > 0$, and $dis > 0$, then

$$ds = dis + des > 0$$

And it shows that the entropy flow is positive and it will progress the system disorder, not make the system transfer into the new order structure.

All above shows that when the effect of the government macroscopic monetary polices is advantage and the entropy flow is negative, the system will take on the order state. When the effect is disadvantage and the entropy is positive, the system will become more disorder. Therefore, whether the system will get into the order state from the disorder state or not, the effect of the government macroscopic monetary polices has played the essential role. In reality, the effect of Chinese government macroscopic monetary polices is advantage and the entropy flow is positive. Therefore, if the government macroscopic monetary polices have the positive effect on the system and produce the negative entropy flow to eliminate the positive entropy from the earthquake and the global crisis, the system of Chinese residents purchasing houses will transform into the new order state from the initial disorder state.

2.2 Far away from the Equilibrium State of the System

The principle of minimum entropy production requires the system to maintain in the linear area where is not far away from the equilibrium state or near the equilibrium state under the non-linear condition. In the non-linear area or near the equilibrium area, the final outcome of the evolving is to achieve the minimum entropy production and the non-balanced stationary state which is similar with the equilibrium state.

The isolated system is evolved with the increase of the entropy production, until up to the equilibrium state with the minimum of the entropy. (Here, the rate of entropy production is expressed by the

variable y , and $y = \frac{ds_i}{dt} \geq 0$, the variable t expresses the time.) When the outside restrains the

system not up to the equilibrium state, the rate of entropy production is always positive in the system ($y > 0$). And the rate of entropy production is decreasing with the time, and till the stationary non-equilibrium the entropy production is the minimum. Being far away from the equilibrium state of the system is the necessary condition for the forming the Dissipate Structure of the system of Chinese residents purchasing houses. All of this makes the system approach the non-linear area until the system is possible to form the order structure. Under the condition of faring away from the equilibrium of state, the system of Chinese residents purchasing houses in the non-linear area is possible to form the new order structure.

2.3 The Misalignment Interactions among the Various Interior Factors of the System

Through the misalignment interactions among the factors of the system, and the factors or subsystems have produced the synergism and the coherent effects, thus the system will be changed into the order state from the initial disorder state. And the misalignment interactions have the inherent reason for the system to form the order structure.

The system of Chinese residents purchasing houses is a very complex system with lots of subsystems. There are many factors in each subsystem of the whole system, the factors have interactions each other, and the interactions have taken on the complex dynamics mechanism in the system. It is usually to establish the model of dynamics to show the complex interactions in the system. So the dynamics model of the system of Chinese residents purchasing houses may be constructed. If the Dissipate Structure of the system is surely existed, and the non-linear interactions must be existed, and the derivation equations are to be needed to construct to explain the problems of the system, then the evolving equations are non-linear equations. And because of the non-linear interactions in the system, so the dynamic model of the system of Chinese residents purchasing houses can be constructed and be simulated.

2.4 The Evolution from the Disorder to the Order through the Stochastic Fluctuation of the House price

The fluctuation means that the variable deviates away the mean valuation of the system and it makes the system leave the original track. When the system is in the stable state, the fluctuation is the disturbance to the system and the system will dispel the disturbance and keep the stable state. When the system is unstable, the fluctuation will make the system produce a new structure. To the system far away from the equilibrium, the fluctuation is the significant factor to cause the system to take on the new order structure.

In the system of Chinese residents purchasing houses, the fluctuation of house prices is the key factor to cause the system to become order. Therefore, the realization of the evolving of the system from the initial disorder state to the new order state is mainly dependent on the fluctuation of the house prices. In the past years, the system of Chinese residents purchasing houses is in the disorder state. However, it is to be noticed that with the decline of house price and the influence of many factors, the system will be in the new order construction price under the condition of the system far away from the equilibrium area. So the fluctuation of the house price is significant to the evolving of the system from the disorder to the new order state.

3 The IDEF0 Model of the Dissipate Structure of the System

From the above analysis, it is can be seen that the Dissipate Structure of the system of Chinese residents purchasing houses requires the four necessary and essential conditions. Here, it is further expressed the four conditions of the Dissipate Structure applying the method of IDEF0.

In the following activity of Figure 1, the box is expressed the activity, and the arrows is expressed the objections. In the IDEF0 model of the Dissipate Structure of the system of Chinese residents purchasing houses, the disorderly open system is the INPUT, the condition of far away from the equilibrium state is the CONTROL, the condition of the fluctuation of house price is the MECHANISM, the inside of the box is the misalignment interactions among the various interior factors in the system, and the new order state of the system is the OUTPUT. So, the IDEF0 Model of the Dissipate Structure of the system is manifest with the following Figure 1.

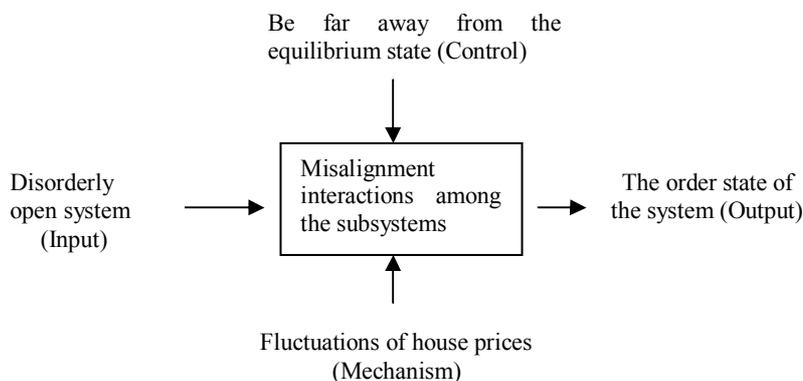


Figure 1: The model IDEF0 of the Dissipate Structure of the system

From the above Figure 1, it is clear seen that the system of Chinese residents purchasing houses is the initial input condition of disorderly open state, under the condition that the system is far away from the equilibrium state, the misalignment interactions among the subsystems inside the system, with the mechanism of the fluctuations of house prices, and finally the system is evolved in the new order state from the initial disorder state. In the IDEF0 model of the Dissipate Structure of the system, the variable INPUT is needed to be dissipated and transmitted the variable OUTPUT. That is to say, the course of the whole evolve, the system is required to far away from the equilibrium state, the subsystems of the

system has taken the misalignment interactions, and the system is mechanized by the fluctuations of the house prices. The model is expressed not only the four conditions of the Dissipate Structure of the system of Chinese residents purchasing houses, but also the inherent relationships of the conditions.

4 Conclusion

Through the above analysis, it can be seen that the system of Chinese residents purchasing houses appears the Dissipate Structure, the conditions of the Dissipate Structure should be satisfied and realized. Only the four conditions of the Dissipate Structure of the system are realized, the system of Chinese residents purchasing houses will be changed into the order state from the initial chaos state.

The four conditions of the Dissipate Structure of the system have the close relationship each other. Firstly, the open system is the prime condition of the four conditions of the Dissipate Structure of the system. And the minimum entropy production is significant to realize the condition of the open system. And the effect of the Chinese government macroscopic polices on the behaviors of domestic residents purchasing houses has decided the valuation of the whole entropy of the system, because the positive effect of the government macroscopic polices will produce the negative entropy flow which may not only dispel the entropy production of the inside of the system but also eliminate the positive entropy flow from the earthquake and the global financial crisis. Secondly, the condition of the system far away from the equilibrium state is necessary to the open system. Because the fluctuation of house prices will make the system get into the new order state. That is to say, the condition of the system far away from the equilibrium has the close relationship with the condition of the fluctuation of house prices. Thirdly, the condition of the misalignment interactions among the subsystems of the system of Chinese residents purchasing houses is the center to the other conditions. Obviously, the condition of the misalignment interactions among the subsystem has the close relationship with the condition of the fluctuation of the house prices.

Therefore, whether the system of Chinese residents purchasing houses is changed into the new order state or not, the four conditions of the Dissipate Structure of the system are decisive and essential. Only when the four conditions are satisfied or realized, the Dissipate Structure of the system will be present, and the system will take on the new order finally. Under the influence of the global financial crisis, the conditions of the Dissipate Structure of the system play the significant role to make the system form the new order state from the initial disorder state. When all of this is attached most attention and realized, the problems of the domestic residents purchasing houses will be resolved efficiently.

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