

Quantitative Analysis of Price Fluctuation Controllability and Its Application

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Part I: Web Model and Types of Price Fluctuation Domains

The supply and demand system in web model can be described as: $S_t = f(p_{t-1})$, $D_t = g(p_t)$ and $S_t = D_t$.

Where the supply function $f(p)$ is an increasing function of price and the demand function $g(p)$ is a strictly decreasing continuous function of price. If there is a price p^* ($p^* \in \mathbb{R}^+$) such that $f(p^*) = g(p^*)$, then p^* is called the balanced price, we rule that $h(p) = g^{-1}(f(p))$, then $h(p)$ is a decreasing continuous function, and $h(p^*) = p^*$, $p_t = h(p_{t-1})$. And also we assume that there exists p_{\min} ($p_{\min} \in \mathbb{R}, p^*$), which makes the equation $f(p) = 0$ correct when $p < p_{\min}$, that is, firms will not supply products when price is lowered to a certain extent.

Under the above economical fundamental hypotheses, for the price sequence $\{p_t\}$ whose initial price is p_0 ($p_0 \in \mathbb{R}, p^*$), the sequences $\{p_{2t}\}$ and $\{p_{2t+1}\}$ are both monotone ones; If $\{p_t\}$ converges, it must converge to p^* , with $\{p_{2t}\}$ to be a monotone increasing sequence and $\{p_{2t+1}\}$ to be a monotone decreasing sequence; If there is a number $T > 0$ such that $p_{2t} < p_{\min}$ when $t > T$, then we say that the sequence $\{p_t\}$ diverges, whose initial price is p_0 .

Proposition 1: If there exists a initial price \bar{p}_0 ($\bar{p}_0 \in \mathbb{R}, p^*$) that makes its price sequence $\{\bar{p}_t\}$ converge, then there exists a domain (\bar{p}, p^*) in which the price sequence $\{p_t\}$ of free initial price p_0 ($p_0 \in (\bar{p}, p^*)$) converges. And if $\bar{p} > p_{\min}$, then \bar{p} is to be a two-cycle close point, that is, $\bar{p} = h^2(\bar{p})$.

Proposition 2: If exists the initial price \underline{p}_0 ($\underline{p}_0 \in \mathbb{R}, p_{\min}$) that makes its price sequence $\{\underline{p}_t\}$ diverge, then there exists a domain $(p_{\min}, \underline{p})$ in which the price sequence $\{p_t\}$ of free initial price p_0 ($p_0 \in \mathbb{R}, p_{\min}$) diverges. And \underline{p} is to be a two-cycle close point.

The above propositions indicate that in the fluctuation of supply and demand exist varied fluctuation domains: (I) (\bar{p}, p^*) , (II) (\bar{p}, \underline{p}) , (III) $(p_{\min}, \underline{p})$. When the initial price belongs to the domain (I), we can completely depend on the automatic adjustment of the market price to make the price balanced; When the initial price belongs to the domain (III), if we only depend on the automatic adjustment of the market price, the price will deviate the balanced price further and further. So we must take corresponding measures to guarantee the wholesome and steady development of the market. This also indicates that the control of the market price fluctuation concerns a problem of extent. Within a certain extent, we can take full advantage of the adjustment mechanism of market, while the function of macro-adjustment is how to limit the fluctuation within the extent.

Part II: The Quantitative Analysis on Controlling the Price Fluctuation of Cotton Cloth

Before 1980's, China had been practicing an economic strategy giving priority to heavy industry, and the development of light industry and agriculture had been lagging seriously. Such a strategy affected people's living level. At the beginning of 1980's, China began to reform its economic system, accordingly adjusted the economic strategy. During the whole 1980's, light industry had been developed rapidly. The output of cotton cloth and other textile products increased year by year. Per capita cotton cloth approached to 10 meters. The age that providing cotton cloth depended on the planned tickets ended completely. The capacity of cotton cloth supply is listed in table one.

A new contradiction between supply and demand appeared from the beginning of 1990's in China's cotton

cloth market, and the distinctive feature is overproduction. The cotton cloth stocks in manufacturing firms was increasing year by year. The retail price of cotton cloth began to slide from 1996. The retail price index is listed in table two. Because China's market mechanism was not sound, a good cycle was not formed in which cotton cloth manufacturing companies competed perfectly, the inferiors was compressed to die, production scale of the superiors was expanded, and techniques was improved. Therefore the fluctuation of the cotton cloth price appeared in the form of radiation, and a balanced price couldn't be formed by market mechanism itself. As a result, there had been a deficit for several years in the whole manufacturing industry of cotton cloth.

To resolve the contradiction in cotton cloth market and push the whole industry forward, the central government decided to take a series of fiscal and monetary policies to transform textile industry. On the one hand, the government has opened cotton market, and the supply of cotton textile products ranging from raw materials to end products is decided by market. On the other hand, the government began to carry out a plan in which the old hasps would be reduced while industry structure being adjusted, assets being restructured, debt and unnecessary staff being reduced, and new productive capabilities being resolutely controlled. By the end of 2000, China's whole textile industry makes up the deficits and gets surpluses. This shows that the first step to improve the textile industry has been made successfully. According to the original price we expect that the price fluctuation of cotton cloth will tend to be gentle in recent years, and the price level will tend gradually towards the balanced price.

Table 1 Output of Cotton Cloth (Unit: 100 000 000 m)

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
National	108.5	111.88	122.07	115.75	131.84	105.63	118.85	114.27	118.46	
Shandong Province	14.1179	15.2981	16.0000	6.7706	15.6194	13.4755	13.0322	9.1445	10.1706	12.8086

Table 2: Retail Price Index of Cotton Cloth (%(Preceding year = 100)

Year	1988	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
National	1217	1112	1054	1012	103.1	1309	1344	1093	1028	100.2	98.5	
Shandong Province	1248	1084	1038	1002	1053	1205	1322	1083	1021	990	987	978

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FRENCH RÉSUMÉ

Pour les trois catégories des prix fluctuants, considérant le cas de tissu coton en Chine, le papier donne les méthodes spécifiques sur les trois prix fluctuants, c'est le mécanisme du marché, ou la mise de mécanisme du marché et la macro-régularisation.