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Dual-Track System in Transitional Economies

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1. Introduction

In December 1991, the former Soviet Union collapsed and many socialist countries began to shift from centralized planning economies to market economies. There are many kinds of transitional processes from centralized planning economies to market economies. The former Soviet Union and East European countries adopted the "Shock Therapy" stabilization process. On the other hand, China and other Asian countries employed the guradual stabilization procedure. It seems that the economic performance of the Asian countries' transition is better than that of Russia and East European countries' transition. "The Dual-Track System" that is the double price system is one of the most important characters of the "gradualism." The dual-track system is connected with the mandatory quota system. The government orders the mandatory quota to state enterprises. The state enterprises have two kinds of prices: goods subject to quota are allocated at the official prices and above-quota products are sold at market prices.

The purpose of this paper is to show from the welfare point of view, the dual-track system is an intermediate economic system between the centralized economic system and the market economic system.

2. Koo and Obst's Analysis

Anthony Y.C. Koo and Norman P. Obst analyzed the dual-track economic system in China's price reform. They assumed that the marginal cost was constant and the state monopolistic firm sold the residual output after the mandatory quota in the monopolistic market. Then, they came to a very interesting conclusion about three economic systems, perfect competition, state monopoly and dual-track system.

They found the following relations about prices,

perfect competitive price<dual-track price<state monopolistic price.

The inequality about output in their model is,

state monopolistic output<dual-track output<perfect competitive output.

The relation to consumer surplus is,

state monopolistic system<dual-track system<perfect competitive system.

Therefore, they concluded that the dual-track system was a transitional economic system from the state monopolistic system to the perfect competitive system.

3. Economic Model

Many countries in transition, for example, China, Vietnam, Lao PDR, Myanmar, Mongolia and so on, employed the dual-track system and the mandatory quota system, on the consumer goods and the energy resources. On this paper, we employed the demand function and the cost function of Koo and Obst's model.

It is assumed that the demand function is as follows.

$$P=\frac{A}{B}-\frac{Z}{D}. \tag{1}$$

P is price, Z is demand, A and B are positive parameters. The cost function is as follows.

$$C(Z)=mZ+\frac{n}{2}Z^2+K. \tag{2}$$

C is total cost, K is constant cost, and m, n are positive parameters.

The marginal cost (MC) is,

$$MC(Z)=m+nZ. \tag{3}$$

The marginal revenue (MR) is,

$$MR(Z)=\frac{B}{A}-2\frac{Z}{B}. \tag{4}$$

This paper analyzes three economic systems: perfect competitive system, state monopolistic system and dual-track system.

(1) perfect competitive system

In the perfect competitive system, the equilibrium point is a point of intersection of the demand function and the supply function. The equilibrium price and the equilibrium output of the perfect competitive system are,

$$P_1=\frac{m+nA}{1+nB}, \tag{5}$$

$$Z_1=\frac{A-mB}{1+nB}. \tag{6}$$

(2) state monopolistic system

The state monopolistic firm maximizes it's profit, then the equilibrium condition is $MR=MC$. The equilibrium price and output are,

$$P_2=\frac{A+B(m+nA)}{B(2+nB)}, \tag{7}$$

$$Z_2=\frac{A-mB}{2+nB}. \tag{8}$$

(3) dual-track system

Many transitional economies employ the dual-track system and the mandatory quota system. It is assumed that the mandatory quota ($\bar{Z}$) is decided by the government. Then $\bar{Z}$ is a parameter.

The demend function is,

$$P=\frac{A}{B}-\frac{Z}{B}-\frac{\bar{Z}}{B}. \tag{9}$$

The marginal revenue (MR_3) is as follows.

$$MR_3(Z)=\frac{A}{B}-2\frac{Z}{B}-\frac{Z}{B}. \tag{10}$$

The marginal cost (MC_3) of this system is,

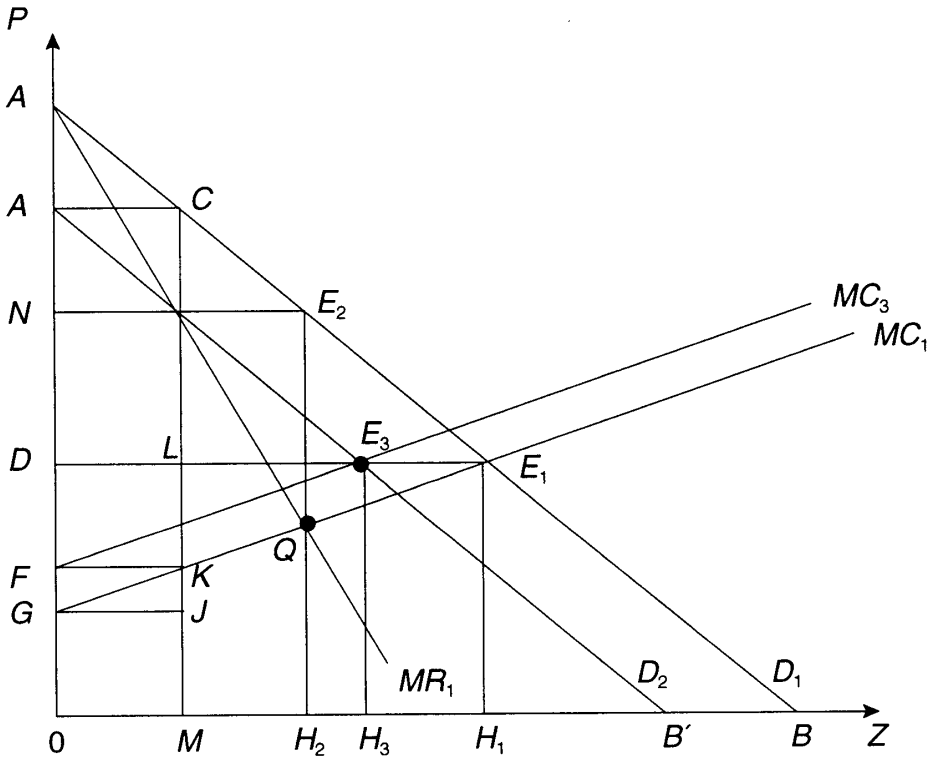
$$MC_3(Z)=m+n(Z+\bar{Z}). \tag{11}$$

After the mandatory quota $\bar{Z}$, the state enterprise wants to sell the residuary output in a free market. Therefore, after the mandatory quota $\bar{Z}$, the new equilibrium price and output are,

$$P_3=\frac{m+nA}{1+nB}, \tag{12}$$

$$Z_3=\frac{A-mB}{1+nB}-\bar{Z}. \tag{13}$$

It is assumed that the mandatory quota is sold in the state shop at the state price ($\bar{P}$) which is equall to the minimum marginal cost (m).



(Figure 1)

$$\bar{P}=m\,. \tag{14}$$

Therefore, in this case, the residual output price P_3 is coincidence with the equilibrium price in perfect competition P_1,

$$P_3=P_1\,, \tag{15}$$

and the total output in this case is equall to the equilibrium output in perfect competition,

$$Z_3=Z_1\,. \tag{16}$$

Next, we compare the three systems from the welfare point of view. In figure 1, AB is the demand function ($P=\frac{A}{B}-\frac{Z}{B}$), E_1G is the marginal cost function ($MC_1(Z)=m+nZ$), AQ is the marginal revenue function, $A'C=OM$ is the mandatory quota ($\bar{Z}$) and E_2F is the marginal function after the mandatory quota ($MC_3(Z)=m+n(Z+\bar{Z})$).

4. Conclusion

In this section, we compare the three economic systems.

(i) perfect competitive system

The equilibrium price is E_1H_1, the equilibrium output is OH_1, the consumer surplus is $\triangle AE_1D$ and the producer surplus is $\triangle DE_1G$.

(ii) state monopolistic system

The equilibrium price is E_2H_2, the equilibrium output is OH_2, the consumer surplus is $\triangle AE_2N$ and the producer surplus is $\square NE_2QG$.

(iii) dual-track system

The state price of mandatory quota is OG, the equilibrium price of residual output is E_3H_3, the equilibrium output after the mandatory quota is OH_3, the consumer surplus is $\pentagon AE_1LTG$ and the producer surplus is $\triangle LKE_1-\triangle GJK$.

These comparisons are shown in table 1. About the free market price, the following inequality is held.

perfect competitive price=dual-track price<state monopolistic price.

TABLE 1

System	Price		Output			Consumer Surplus	Producer Surplus	Tolal Surplus
	Free	MQ	Free	MQ	Total			
Perfect Competitive System	E_1H_1		OH_1		OH_1	$\triangle AE_1D$	$\triangle DE_1G$	$\triangle AE_1G$
State Monopolistic System	E_2H_2		OH_2		OH_2	$\triangle AE_2N$	$\square NE_2QG$	$\square AE_2QF$
Dual-Track System	E_3H_3 $=E_1H_1$	OG	OH_3	OM	OH_1	$\pentagon AE_1LJG$	$\triangle LKE_1$ $-\triangle GJK$	$\triangle AE_1G$

MQ…Mandatory Quota

The inequality about the output is,

perfect competitive output=dual-track output>state monopolistic output.

The inequality about the consumer surplus is,

dual-track system>perfect competitive system>state monopolistic system.

The inequality about the producer surplus is,

perfect competitive system>dual-track system.

The inequality about the total surplus is,

perfect competitive system=dual-track system>state monopolistic system.

From the welfare point of view, the total surplus of perfect competitive system is equall to the total surplus of dual-track system. Only the distribution of total surplus is different between the perfect competitive system and the dual-track system. The state monopolistic system is not better than the perfect competitive system or the dual-track system. Therefore, the dual-

track system in transitional economies is the intermediate economic system between the perfect competitive system and the state monopolistic system.

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