Supply Instability in a Double-track System

Justifications for the double-track system (雙軌制)

In the reform process of the centrally planned economies (CPEs), the double-track system has often been applied as a transition measure to facilitate the liberalization of the economy from the traditional command structure. Economic agents including farmers, enterprises and governmental units are given increasing power to make input-output as well as pricing decisions, provided that they fulfill certain remaining planned obligations and targets.

In other works, the system is double-track with regard to both the quantity and the price determination subsystems.

Although there are observable problems, the justification for such a system is that while it rationalizes production and consumption by introducing the market mechanism, it also enables the government to retain certain control on relevant price and quantity variables. The increase of planned control may sometimes be necessary and would have beneficial effects. Moreover rapid privatization---i.e. the quick jump to a "single-track" free market may bring serious problems. See Tsang, S. K., (1996), "Against Big Bang in Economic Transition: Normative and Positive Arguments", *Cambridge Journal of Economics*, 20(2):183-193.

(1) Rapid Privatization and the Lack of Objective Criteria for Assets Valuation: Lawrence Summers points to the "Achilles heel" of the rapid privatization programme: **the lack of any objective criteria for evaluating assets and distributing property rights in the transition**:

> "Essentially the fairness aspect of the privatization dilemma boils down to the following. In the current climate of massive uncertainty assets have a low ex-ante value. If after everything, things work out well, there is a

> sense that those who received assets stole them, and there will be pressure for getting at the windfalls, pressure to undercut private property rights in the process. If after everything, things do not work out well, that is not a good outcome either. The only possible resolution is to delay selling or distributing assets until valuations become clearer. This is the practice of American companies when they spin off subsidies. They do not simply assume that the market will instantly give them a fair price."

(2) Implicit contracts of socialism: Many goods and services, including necessities, housing, and transportation are heavily subsidized by the government and sold at low prices or provided at low charges. There are also many forms of "incomes in kind". In return, workers have to tolerate low money wages and salaries, given the "welfare" provided by the state. These exchanges constitute what I call the **"implicit contracts"** of socialism. If prices and charges are suddenly increased significantly without corresponding rises in pays, it would be equivalent to a **unilateral violation of the "implicit contracts"**; and worker's welfare would be severely affected. If wages and salaries are allowed to shoot up at the same time, then **inflation spiral** could become a danger.

Hence a **gradual** process of liberalisation, such a **double-track** system, might be preferred.

However, a **quantity target below the market price** may also produce **instability on the supply side** under the double track system.

Supply Instability in a Single-product Case

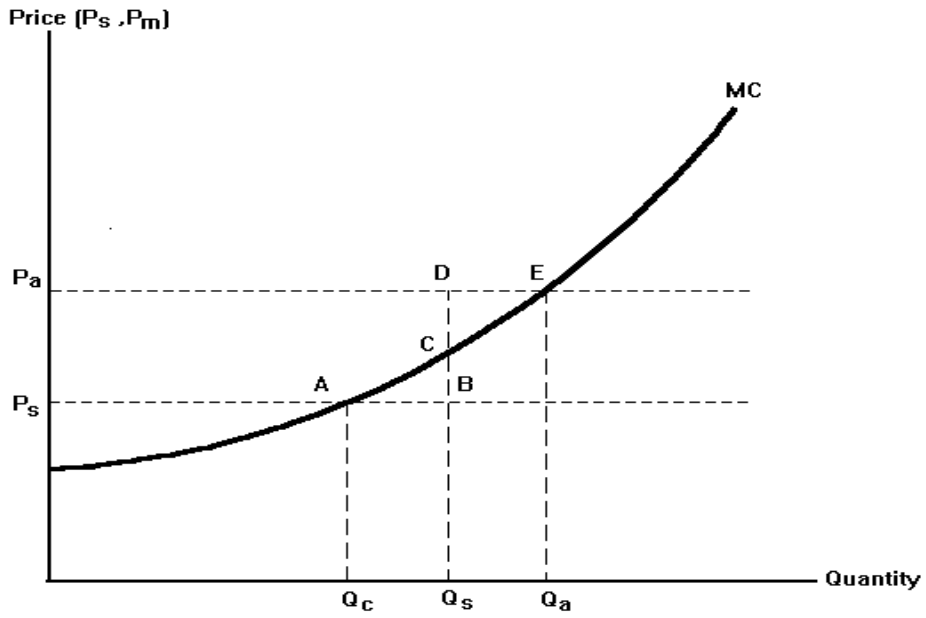
1. Plan fulfillment and producer's loss

Let us start with a simple diagram of supply under a typical double-track system of a single product, a similar version of which has been used by Jin (1990) to analyze the output response of

Chinese peasant households. The key point is a mismatch between state-controlled quantity and state-controlled price in a half-liberalised double-track system (雙軌制之下政府控制數量與政府控制價格的不相符).

Figure 1 shows the marginal cost curve (MC) of a typical supplier. Suppose that the quota and the price of the state's procurement are set at Q_s and P_s respectively. If the supplier produces Q_s, it will suffer from a producer's loss equivalent to the area of triangle ABC. Denote P_m as the market price in general and P_a the specific level of market price at which the area of triangle CDE (representing producer's surplus) happens to equal that of ABC.

Figure 1 Producer behaviour under double-track System



Seen in this framework, **general equilibrium conclusions about output being determined by the market price alone (e.g. Sicular, 1988) are appropriate only if the procurement requirement is strictly fulfilled**. In that situation, **given the loss of ABC, total output will then be determined by P_m alone** as the supplier (the peasant household in her model) tries to recoup as much of the loss from the sales to the state as possible, or even to fetch a net gain. Given P_m, the total output level will not be affected by, say, an increase in procurement price P_s. That increase will simply reduce the net loss or

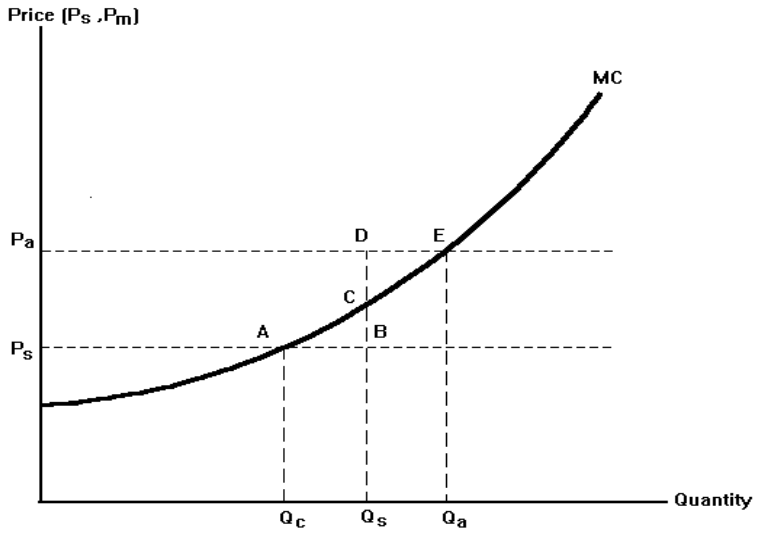
enlarge the net gain of the supplier. Likewise, a reduction of the procurement quota Q_s will change the proportion of trade with the state and in the market and enhance the welfare of the supplier, without affecting the total output level. Hence **their effects are only distributional**, as concluded by Sicular.

2. Plan evasion (違避) and supply instability

The assumption of perfect plan fulfillment is crucial to the attainment of such results, but is open to challenges for the lack of realism as far as the reform environment in the CPEs is concerned. Unless the quantity target is strictly followed, **plan evasion** of different kinds even under the double track system may occur, particularly **as the liberalised sector usually offers higher prices** compared with the controlled sector.

Plan evasion in the former Soviet Union and Eastern Europe as well as China has been widely reported and discussed. Let us, like Jin (1990), assume the prevalence of plan evasion which takes the following specific form: **the producer (peasant household) may choose to under-fulfill the quota at negligible costs, but it must fulfill the quota *first* before it can sell anything to the market**.

Figure 1 Producer behaviour under double-track System



Several possible outcomes can then be identified:

i. **If the market price P_m is below P_a, the supplier will produce at Q_c**, so that the loss of the triangle ABC can be avoided, i.e. it will

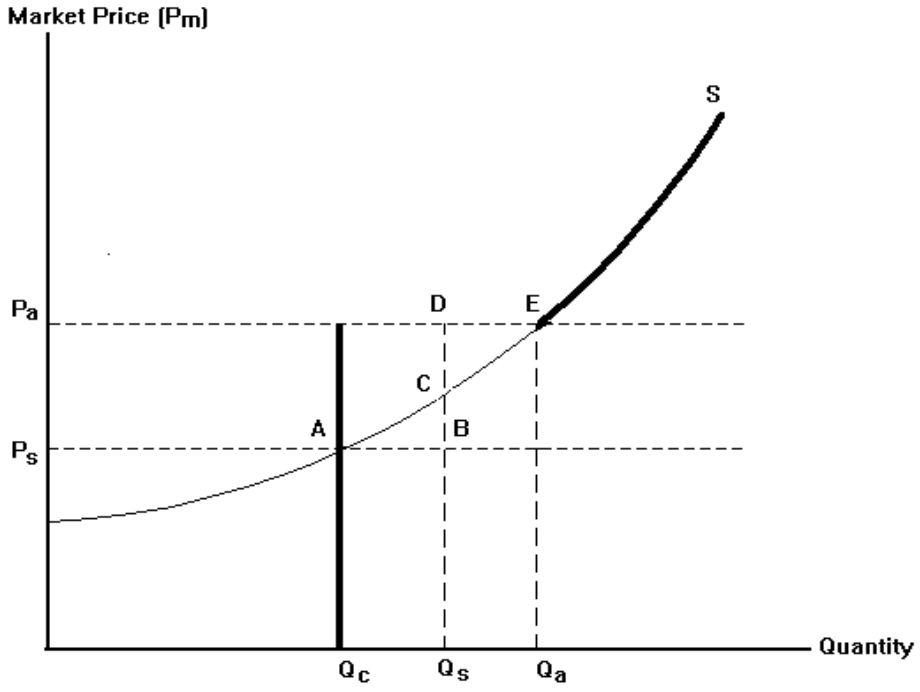
under-fulfill the quota.

ii. **If P_m is at P_a**, the surplus of triangle CDE earned from the market just compensates for the loss of ABC. The **supplier may now produce at either Q_c or Q_a**. In the latter case, the procurement quota set by the state will be fulfilled.

iii. **If P_m is above P_a**, the **total output** decision of the supplier **will be entirely guided by P_m**, although the quota Q_s will by assumption be fulfilled first.

Changes in either P_m or P_s may therefore give rise to two possible adjustment effects: first, the marginal adjustment, which refers to adjusting output quantity along MC; and second, **the quantum adjustment**, which refers to **a discrete leap or fall in the output level (between Q_c and Q_a)**.

Figure 2 Supply schedule against market price (given state-set procurement price)



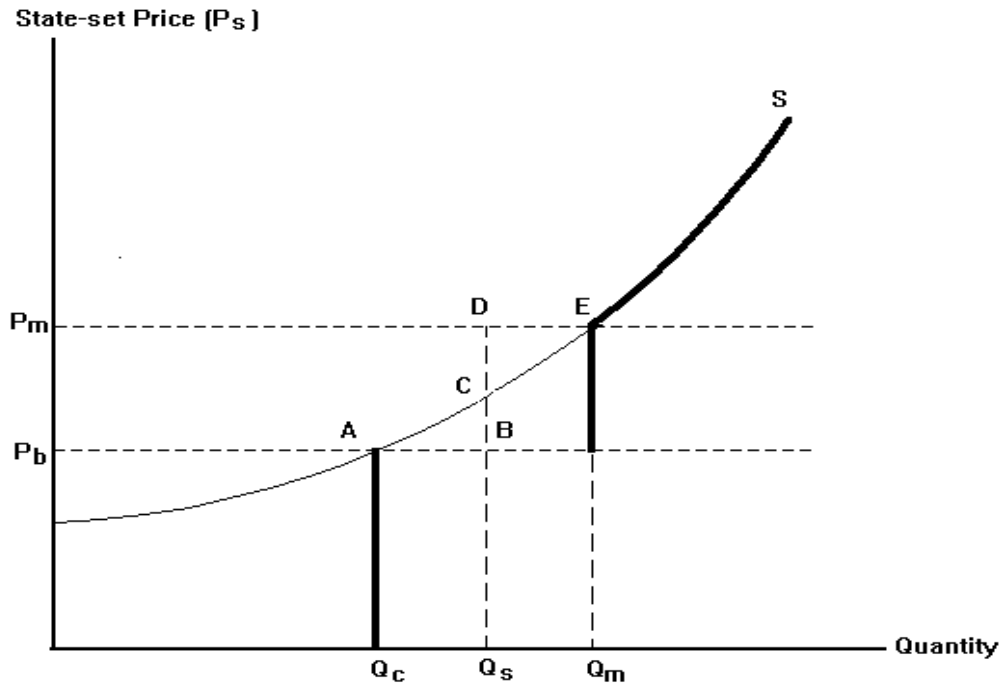
To see the supplier's output responses to a change in the market price, we draw the supply schedule against the market price for a given state-set price and procurement quota, represented by

P_s and Q_s respectively in **Figure 2**. We can see that the output level remains at Q_c until the market price rises to P_a, then jumps up to Q_a, and moves afterwards along the MC curve. The **"quantum-jump" and "marginal adjustment"** effects thus clearly show.

3. Supply instability from another angle

We may also derive the supply schedule against the state-set procurement price for a given market price, represented by P_m in **Figure 3**. As can be observed, P_b is the critical value of the procurement price such that the area of triangle ABC equals that of triangle CDE. When the state-set price (P_s) is above this level, the area of ABC will be smaller than that of CDE and thus the output quantity will jump to Q_m. As the state-set price increases, the output quantity passes through four stages: (1) a stage of "marginal adjustment" (when $P_s < P_b$), then (2) **a "quantum jump from Q_c to Q_m at P_b**; (3) a stage of constant output (for $P_b < P_s < P_m$); and (4) a stage of "marginal adjustment" again (for $P_s > P_m$).

Figure 3 Supply Schedule against State-set Procurement Price (given Market Price)



Therefore, against Sicular's (1988) general equilibrium conclusion, both the planned price and the market price have impact on the output level of individual producers. The supply curves so derived obviously have important implications. An important concern is stability. **From both Figures 2 and 3, it could be observed that a slight change in state-set or market price around the boundary point may touch off a quantum change (jump or fall) in output.** Take Figure 3 as an example, a very small reduction in the procurement price set by the state (from slightly above P_b to slightly below P_b) could result in the supply dropping from the level of Q_m to that of Q_c, a contraction that could generate very serious economic as well as political repercussions for the reforming CPE. It is like the case where the consumers in a double-track system who change their time preference or their estimates about the availability of cheap goods in the official market, or revise significantly upward their inflationary expectations. They may rush together to the free market to fetch whatever goods that they can get and unleash serious inflationary pressure in due course. **Theoretically at least, this type of phenomenon will not occur in a single-track system**, ruled entirely by the plan or the market. So, ironically, the existence of a second sector alongside the planning system could actually result in a higher degree of fluctuations in output. The efficiency property of the double-track system is in jeopardy here.

Alleviating Factors

The above model produces instability results which are ***specific*** in nature, in that instability would arise in a particular range of parametric values (price configurations). One possible solution for the policy makers in a reforming CPE is therefore taking measures that prevent such configurations from emerging. One complication is of course that the state-set price is usually announced before production, while the market price is something that no one can predict very accurately. But then production takes

time, and it is the perceived or expected market price that really matters. **The authorities should therefore ensure that their plans do not significantly conflict with the expectations of the producers.**

In any case, the actual situation in a double-track is likely to be less unstable, and more complicated, than the picture depicted by the above model. Here we will look at several considerations.

1. The first one is related with the issue of **aggregation**. As different peasant households may have different cost curves, they would be producing at different regions of their own MC curves given the same set of planned and market prices. The critical price level for the "quantum-jump" to occur may then not be the same for each household. **The aggregate supply curve could smooth out if there are sufficiently large number of households and the disjointed portions of their supply curves occur at different prices.**

2. It is conceivable that under **other forms of plan evasion and penalties**, instability would be reduced. As we said above, if plan enforcement is perfect and evasion therefore not possible, there would be no quantum jump or fall in supply, only marginal adjustments. Following Jin (1990), we assumed in the preceding two sections that plan evasion takes the specific form under which the supplier may choose to under-fulfill the quota at negligible costs, but it must fulfill the quota *first* before it can sell to the free market. Although supervision and monitoring are unlikely to be very effective in any reforming CPE, it is conceivable that under-fulfillment of the planned quota could be detected and hence some penalty be incurred. The producer then has to weigh the relative losses of production versus non-production (thus paying the penalty). **In the case where the penalty is equally severe as or more severe than the producer loss as represented by the triangle ABC in both Figures 2 and 3, then the result would be equal to perfect plan compliance.**

3. If the penalty is less than the producer loss and the market price is above the state-set price, then the producer faces **two types of possible losses** in the context of Figure 2: (1) the penalty; (2) the net loss from fulfilling the plan (thus suffering the producer loss of ABC) and selling extra amount to the market to offset his producer loss in so far as the market price allows. As long as (1) is greater than (2), the producer will choose to comply with the plan.

In general, it can be seen that the market price may be lower than P_a depicted in Figure 2 to ensure compliance. The quantum change in output would be less than Q_c-Q_a. **Penalty could therefore reduce the magnitude of supply instability.**

References

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