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Abstract

The dual track approach to market liberalization has been widely recognized as the key to the success of the Chinese economic reform. In this paper we study the effectiveness of this strategy in economic environments where the status quo government control is *incomplete*. We show that in a dynamic context intertemporal arbitrage will emerge, potentially resulting in efficiency losses and/or adverse distributional effects. Only when the status quo involves both price and quantity interventions by the government can dual track liberalization maintain its appeal. Our analysis thus suggests some caution as for the broader applicability of this reform mechanism.

JEL classification: H2, P2, F1
Keywords: Dual Track Liberalization, Intertemporal Arbitrage, Pareto Improving Reforms, China

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1 Introduction

Economic reforms are likely to create losers and too often the difficulties involved in identifying and compensating adversely affected individuals have made major policy changes impossible. For this reason, the dual–track approach implemented in the Chinese economic reforms should be of great interests to policy makers. As Lau, Qian, and Roland (2000) have shown, this mechanism has the potential not only to obtain an efficient allocation of resources, but more importantly to do so without creating losers. Some observers have concluded that the "dual–track approach is perhaps the most important aspect of Chinese reforms since it was, at the time, an innovative solution to the political constraints on the direction and speed of reform"(International Finance Corporation (2000)). Indeed, dual track–like reforms are being attempted in other economic environments. One interesting example is represented by the recent reform of the Italian labor market, in which older workers are kept under existing tenure contracts, while new personnel can be hired according to temporary, short term arrangements. Similarly, the proposed overhaul of the US social security system contains features of a dual–track mechanism in which current retirees are promised unchanged benefits, while younger workers would be allowed to invest in personal accounts.

There is, however, a critical institutional difference between centrally planned economies and market economies. While in the former government control completely dictates almost all economic decisions, in the latter government control is at best *incomplete*. That is, despite government interventions, economic decisions by private agents continue to play a role in determining the resource allocation. It is then natural to ask whether the welfare implications of the dual–track mechanism are the same in these different environments.

The dual–track reform strategy can improve efficiency without creating losers because it preserves all the existing rents throughout the reform process. However, in economies where government control is incomplete, the anticipation of a policy change may well induce rational agents to distort their pre-reform behaviors in order to maximize the very rents that the dual–track mechanism tries to maintain.[1] This pre-reform distortion will instead

[1]Given that the purpose of a dual–track mechanism is to 'build consensus' for a policy change, dual track–like reforms carried out in countries with a democratic tradition have been the subject of vibrant discussions. The recent debate on the reform of the social security system in the US is one obvious example. Even in China, the question of whether the price reform should proceed in a dual track fashion has been the

not arise in centrally planned economies because of complete government control. For this reason, to fully understand the impact of a dual–track mechanism in the context of a market economy, we need to consider not only how the reform affects the resource allocation after it has taken place, but also how the expectation of a future reform affects the allocation before its introduction.

To this end we extend the analysis by Lau, Qian, and Roland (2000) in two ways. First, while Lau, Qian, and Roland (2000) have implicitly assumed that in the status quo government fiat completely dictates both quantities produced and consumed as well as prices, we allow the status quo intervention to be incomplete, in the sense that in the first period either quantities or prices can be adjusted in response to the forthcoming reform.[2] Second, we move beyond their static framework by introducing a simple dynamic model involving two periods, where a dual–track reform taking place in the second period is anticipated in the first.

The basic question we address in this paper is whether, taking into account that the reform will have effects on the allocations in *both* periods, the dual–track liberalization continues to be both efficiency–enhancing and Pareto improving as compared to the status quo. This is an important issue for a policy maker eager to introduce change with 'no pain'. In particular, if the anticipation effect results in the exacerbation of the status quo distortions, then the policy maker will face a dilemma. Either he will be able to manipulate the public's expectations, so that the dual track reform will come as a 'surprise', or he will need to look for devices allowing him to make his commitment not to use a dual track reform credible. Our analysis therefore highlights some important caveats to the broader applicability of the mechanism analyzed by Lau, Qian, and Roland (2000).

The remainder of the paper is organized as follows. In section 2, we set up the model, while section 3 analyzes the second–period allocation and reproduces the central result of Lau, Qian, and Roland (2000). We study how the first period allocation responds to the anticipated reform in section 4. In section 5, we evaluate, from a dynamic perspective, the

subject of a lively debate both in the policy circle and among the general public. (See for instance 'Peking polls the masses on prices' in the *Financial Times*, August 22 1985.)

[2]Our analysis differs from Murphy, Shleifer, and Vishny (1992). They show that in a static setting a dual track reform may lead to an efficiency loss when the separation of the two tracks is not well enforced. We take instead a dynamic perspective and the potential source of additional distortions is the intertemporal arbitrage activities of the agents.

welfare effect of the anticipated dual–track liberalization. The analysis is carried out in two steps. Section 5.1 considers the case in which the status quo policy involves only one intervention, while Section 5.2 investigates the scenario where the status quo policy concerns multiple dimensions. Section 6 concludes.

2 The Model

To introduce our discussion in the simplest possible framework, we follow Lau, Qian, and Roland (2000) and use a partial equilibrium setup, in which a continuum of buyers and producers each demand and supply one and only one unit of a commodity.[3] All agents are price-takers. Differently from Lau, Qian, and Roland (2000), our model has two–periods. In the first, the market is distorted by a government policy that might involve direct price setting, quotas, taxes or subsidies. In the second the government implements a reform aimed at removing this distortion. Buyers' preferences are time separable and invariant, and producers' costs remain constant over time. Both sets of agents have a discount factor δ, and the commodity is assumed to be perishable.

To minimize potential opposition, the government introduces the reform in a dual track fashion in the second period. As a result, a "market" and a "regulated" track emerge in the second period. In the former, agents are free to enter new exchanges. In the latter, private agents are instead assigned rights and obligations derived from the first period transactions carried out under the original government policy. That is, if private agents carried out an exchange of a given quantity at a certain price in the first period, the very same transaction will be enforced in the second period. As an example, think about the case of a labor market in which, in the first period labor contracts between workers and employers are governed by a Union agreement specifying the wage rate. In the second period, the government introduces a reform, which allows newly hired workers to be paid a (lower) market wage rate, but at the same time requires employers to continue to pay the same union-set wage rate to those workers they have previously employed. In other words, a dual track approach requires contracts governing first period transactions to continue to be enforced in the second period.[4]At the same time, the reform calls for the establishment of a market track, where

[3]For a general equilibrium analysis of the dual–track mechanism, see Lau, Qian, and Roland (1997).

[4]In addition, if the original government policy involved a transfer (i.e. a tax or a subsidy) to an agent in

parties can carry out transactions at the prevailing equilibrium market price.

Key to our analysis is that private agents anticipate in the first period the implementation of the dual track reform in the second. As a result, the equilibrium resource allocation in the first period is determined not only by the original distortionary policy, but also by the anticipated second period reform. Therefore, when evaluating dual track liberalization, we need to consider its welfare implications over *both* periods. Specifically, we will compare the equilibrium allocation under dual track liberalization to the *status quo* (i.e., the no liberalization outcome). We say that the reform is efficiency–enhancing when it dominates the status quo from the point of view of social welfare, i.e. the total (discounted) surplus over the two periods is greater under the reform than under the status quo. Furthermore, dual track liberalization achieves a *Pareto improvement* over the status quo if the total (discounted) surplus of *each* private agent over the two periods is greater under dual track than under the status quo.

3 The Second Period Resource Allocation

Our analysis of the second period equilibrium reproduces that of Lau, Qian, and Roland (2000). To proceed, it is useful to distinguish between two sets of agents: those who have transacted in the first period and those who have not. Previously active agents must carry out their original transactions as required by the dual track liberalization mechanism. By doing so, the dual track mechanism ensures that in the second period no one can be worse off as compared to the status quo. As in Lau, Qian, and Roland (2000), we further assume the dual track mechanism allows agents to carry out these transactions by taking advantage of the existence of a market track *without actually producing or using the commodity.* For instance, an employer can second his former employee (whom he is obliged to hire at the union wage rate) to another employer at the market wage rate, instead of actually using him. By granting previously active agents access to the market track, the dual track mechanism enables them to arbitrage between the market price and the marginal cost (or marginal willingness to pay) of the good/service they are obliged to provide (or entitled to consume). For instance, by seconding his employee at the market wage rate, an employer avoids using

the first period, the same payment will be made in the second.

the employee whenever his marginal benefit from doing so is lower than the market wage rate. As a result, the overall quantity actually consumed in the two tracks is the result of the behavior of those buyers with a marginal willingness to pay larger than P^e. Similarly, for a given P^e, the total quantity actually produced in the two tracks will be generated only by those producers with a marginal cost lower than P^e. This implies that in equilibrium the free-market price must be at the level where the marginal cost equals the marginal willingness to pay, *independently of the original government policy.*

We summarize our observations in the following Lemma, which reproduces Proposition 1 in Lau, Qian, and Roland (2000):

Lemma 1 *Regardless of the first period government policy, dual track liberalization attains the first best allocation in the second period. Moreover, the equilibrium price in the market track is the same as the competitive equilibrium price.*

4 *Expectations* and Intertemporal Arbitrage

In a dynamic context, the first period allocation depends on the private agents' expectations about the second period reform. Translating the static discussion of Lau, Qian, and Roland (2000) to our dynamic framework, we allow the reform to be anticipated, while in their analysis the liberalization comes as a "surprise", so that the first period outcome is not affected by the ensuing liberalization. If the reform is anticipated, private agents are induced to strategically modify their behavior in the first period in order to take advantage of new arbitrage opportunities. These opportunities arise because dual track liberalization creates two tracks in the second period, and agents who have engaged in transactions in the first period are entitled to exchange in the regulated track in the second period. Since the prices prevailing in the two tracks may very well differ, agents will attempt to take advantage of such differences by modifying their first period behavior. We refer to these activities as *inter-temporal* arbitrage. For instance, if workers realize that they can lock up the Union-set wage rate in the second period by entering a labor contract in the first period, they will be more willing to supply their labor services if the Union-set wage rate is substantially higher than the market rate in the second period. And the opposite is true for employers.

Figure 1 illustrates how inter-temporal arbitrage alters the agents' first-period behavior in a closed economy. S' and D' represent the first period "strategic" supply and demand

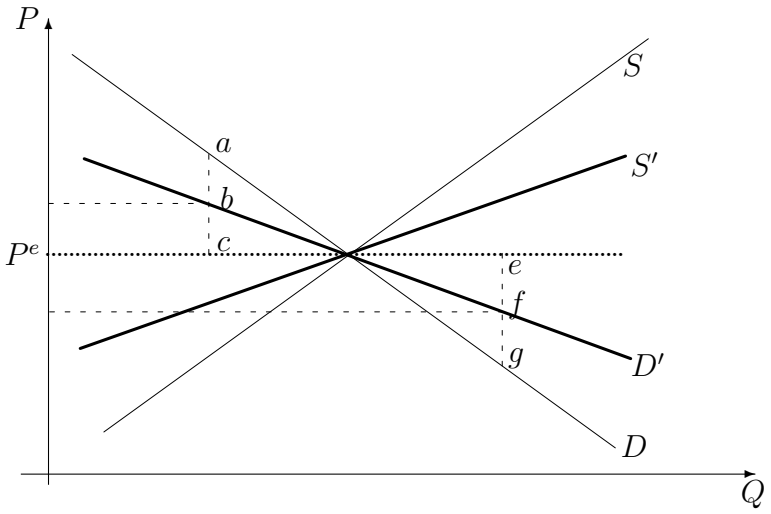

Figure 1: First period strategic demand and supply in a closed economy

derived from these inter-temporal arbitrage activities. As the figure shows, the strategic demand rotates around the (non-strategic) demand D at the second period equilibrium price in the market track which, according to Lemma 1, is equal to P^e. Similarly, the strategic supply rotates around the (non-strategic) supply S at P^e. To understand how S' and D' are derived, let us consider the buyers' decision (the problem faced by the producers is similar), starting with the case in which a buyer's marginal willingness to pay (MV) is higher than P^e. From Lemma 1, we know that he will always consume in the second period. If he enters a transaction in the first period, his total payoff for the two periods will be

$$(1+\delta)(MV - P).$$

given that he is locked into the first period price P. If he does not enter a transaction in the first period, he will be able to trade in the market track at the price P^e in the second period. Thus his total payoff will be

$$\delta(MV - P^e).$$

The buyer is indifferent about whether or not to carry out a transaction in the first period

when

$$\begin{aligned}(1+\delta)(MV-P) &= \delta(MV-P^e),\\ \text{or}\quad P &= \frac{MV+\delta P^e}{1+\delta}.\end{aligned}$$

Since each buyer is assumed to use at most one unit of the commodity, each point on D in Figure 1 represents the marginal willingness to pay for a particular buyer. Thus, when $\delta = 1$ for example, a buyer with marginal willingness equal to a will have a "strategic willingness to pay" in the first period equal to $b = \frac{a+c}{2}$.

Suppose, on the other hand, that a buyer's marginal willingness to pay is instead lower than P^e. As we have discussed earlier, such a buyer will never actually consume the product in the second period, but will instead sell the commodity back to the market track[5]. For such a buyer, transacting in the first period leads to a (positive or negative) profit $P^e - P$ in the second, since he can use the market track to fulfill his obligation. Consequently, the total payoff for such a buyer to transact in the first period is

$$MV - P + \delta(P^e - P).$$

If, on the other hand, the buyer does not engage in a transaction in the first period, he will be free from any obligation to trade in the second, and will not enter in a transaction at that time since $MC > P^e$. Consequently, a buyer with a marginal willingness to pay lower than P^e is indifferent between buying or not in the first period at the price P when

$$\begin{aligned}MV - P + \delta(P^e - P) &= 0\\ \text{or}\quad P &= \frac{MV+\delta P^e}{1+\delta}.\end{aligned}$$

In Figure 1, a buyer with the marginal willingness to pay g has a "strategic willingness to pay" $f = \frac{e+g}{2}$ when $\delta = 1$. We can summarize our previous discussion in the following

Lemma 2 *Let P be the first period price and P^e be the second period equilibrium price in the market track. The first period supply in anticipation of the dual track liberalization in*

[5]In the case of a labor market, this means that an employer, who is compelled to hire his old employees with the value of marginal product of labor lower than the market wage rate, will second these workers.

the second period is given by

$$S'^{-1}(Q) = \frac{S^{-1}(Q) + \delta P^e}{1+\delta}$$

and the corresponding first period demand is given by

$$D'^{-1}(Q) = \frac{D^{-1}(Q) + \delta P^e}{1+\delta}.$$

5 The Dynamic Welfare Implications of Dual Track Reform

We are now ready to evaluate whether, from a dynamic perspective, *anticipated* dual track liberalization is efficiency enhancing and Pareto improving as compared to the status quo. As it turns out, the answer to this question depends on whether the original government policy involves an intervention only in one or in multiple dimensions. Instead of providing an exhaustive analysis of the various possible types of government intervention, we illustrate our arguments by means of three examples. First we consider a price setting policy, and then a quantity restriction accompanied by price setting with and without involuntary participation/exclusion.[6]

5.1 Single-Dimension Intervention: Price Setting

Suppose the government fixes the price at P in the first period, and assume that this policy results in excessive demand (that is, the supply is binding). In this case, the second period market price P^e must be higher than P, as Figure 2 illustrates. In the first period, if agents do not anticipate future policy changes, the quantity exchanged will be Q_1, so that $S^{-1}(Q_1) = P$. When a dual track liberalization is instead expected, sellers have an incentive to withhold their sales in the first period, in order to avoid being locked into a contract fixing the low price P. At the same time, buyers have an additional incentive to transact in the first period so as to lock up the low price P. This implies that the first period excessive demand persists under the anticipated dual track liberalization. Let Q_1^d be the equilibrium quantity transacted in the first period under the anticipated dual track liberalization. Following

[6]For a more complete analysis, see Che and Facchini (2004).

Lemma 2, Q_1^d is given by

$$P = \frac{S^{-1}(Q_1^d) + \delta P^e}{1+\delta},$$

or

$$\begin{aligned} S^{-1}(Q_1^d) &= P + \delta(P - P^e) \\ &< P \\ &< S^{-1}(Q_1). \end{aligned}$$

In other words, *intertemporal arbitrage* exacerbates the shortage in the first period as $Q_1^d < Q_1$.

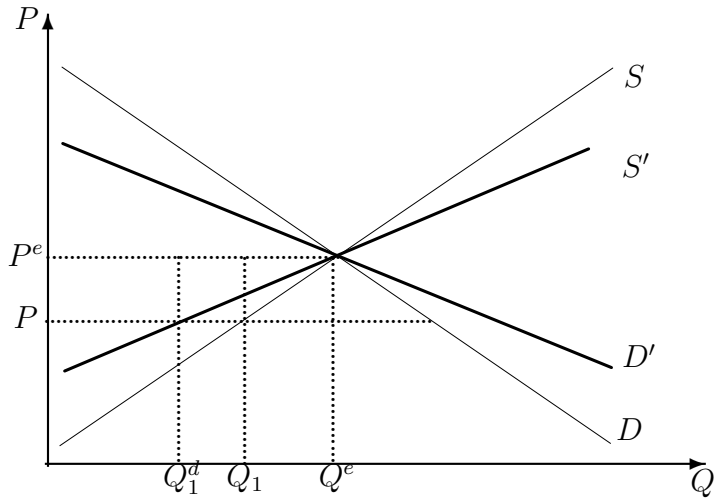

Figure 2: Price setting with binding supply

The exacerbated shortage means that, as compared to the status quo, some additional buyers are rationed out and hence become worse off in the first period. Moreover, because they are rationed out in the first period, they will have to purchase the commodity at the price $P^e > P$ in the second. Thus these users must be worse-off as compared to the status quo, even inter–temporally. Dual track liberalization can therefore not be Pareto improving in the dynamic sense.

As it exacerbates the shortage, inter-temporal arbitrage induces an additional efficiency loss in the first period as compared to the status quo. However, this loss must be weighted against the efficiency gain achieved by dual track liberalization in the second period. We

derive the following conclusion, which holds also for the case of binding demand:

Proposition 1 *Suppose that the government status quo policy is price setting. Then anticipated dual track liberalization is never Pareto improving. From the point of view of social welfare, it is dominated by the status quo if*

$$\delta(Q^e - Q_1) \leq Q_1 - Q_1^d. \tag{1}$$

Proof. We only need to prove the efficiency result since we have already shown that anticipated dual track liberalization does not lead to a Pareto improvement. Notice that the efficiency loss in the first period is bounded below by $(D^{-1}(Q_1) - S^{-1}(Q_1))(Q_1 - Q_1^d)$, whereas the efficiency gain in the second is bounded above by $(D^{-1}(Q_1) - S^{-1}(Q_1))(Q^e - Q_1)$. Therefore, the dual track is not efficiency enhancing if $\delta(Q^e - Q_1) \leq Q_1 - Q_1^d$. *QED.*

Proposition 1 states that, from a dynamic perspective, the anticipated removal of a price-setting policy in a dual–track fashion is welfare–reducing rather than welfare enhancing if condition (1) is satisfied.[7]

5.2 Dual Intervention

Our discussion so far has shown that dual track liberalization will not be both efficiency enhancing and Pareto improving in a dynamic context if the status quo policy involves an intervention on a single dimension. The appeal of dual track liberalization can be reestablished however when in the status quo the original intervention involves instead both prices and quantities.[8] As an example of this situation consider a labor market where in the status quo all employment contracts specify a union-set wage rate, and the domestic market is closed to *immigrant* workers. A dual track liberalization will then result in current employees

[7] If there is a supply shortage, condition 1 is satisfied as long as the supply is linear. To see this, substituting $P^e = S^{-1}(Q^e)$ and $P = S^{-1}(Q_1)$ into the equation $P = \frac{S^{-1}(Q_1^d) + \delta P^e}{1+\delta}$, we get $S^{-1}(Q_1) - S^{-1}(Q_1^d) = \delta(S^{-1}(Q^e) - S^{-1}(Q_1))$, which reduces to $Q_1 - Q_1^d = \delta(Q^e - Q_1)$, i.e., condition (1) when the supply is linear.

[8] This was the case in centrally planned economies like China or the former Soviet Union where almost all product markets saw the planning authority determining output targets to specific production units, as well as fixing their prices. Likewise, many developing countries used to follow import substitution development strategies, involving the exclusion of foreign competitors on the one hand and the introduction of measures such as distortionary taxes, subsidies, and price ceilings on the other.

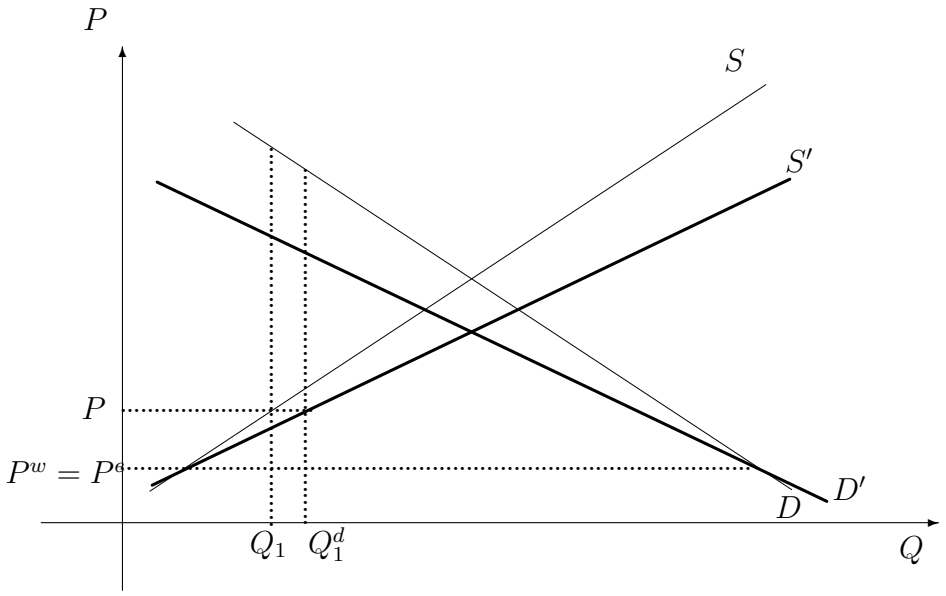

Figure 3: Domestic price control together with exclusion of foreign suppliers

being maintained at the union-set wage rate, while other workers, including migrants, will be active on a market track where wages are determined completely by supply and demand. More generally, we illustrate our argument considering a small open economy for which the status quo policy involves price setting in the domestic market, which is closed to foreign competition (i.e. no immigrants are admitted in the country in the original equilibrium). Notice that this is a special case for what we will generally refer to as involuntary exclusion/participation. Here foreign competitors are involuntarily excluded from the domestic market thanks to the status quo government policy.

Let P be the first period price, which has been set higher than the world price P^w leading to excessive demand. Figure 3 illustrates the outcome when dual track liberalization is expected to be implemented in the second period. As discussed earlier, the first period strategic demand D' rotates around the the first period actual demand D at P^e, the second period equilibrium price for the market track, and the same will happen for the first period strategic supply S'. Differently from the single intervention case, the equilibrium price in the market track will now be determined in international markets, so that $P^e = P^w$. Accordingly, in spite of the excessive demand in the first period, dual track liberalization leads to an equilibrium price in the market track lower than the first period price, i.e. $P^e < P$. As a

result, sellers are more willing to engage in a transaction in the first period, while buyers tend to demand less and this helps to *alleviate*, rather than exacerbate, the shortage created by price fixing. The analysis for the case in which $P < P^e$ and there is excessive supply in the first period is analogous, and the next proposition summarizes our discussion:

Proposition 2 *Suppose that the status quo policy is domestic price fixing, combined with an import quota. Let P be the domestic target price fixed by the government. Then,* domestic *cum* trade *liberalization is efficiency enhancing and Pareto improving if and only if one of the following two conditions holds:*

$$P^e > P \ \ and \ \ S'(P) \geq D(P) \tag{2}$$

$$P^e < P \ \ and \ \ D'(P) \geq S(P) \tag{3}$$

Proof. We first establish the sufficiency for condition (3) using Figure 3 as an illustration. Since $P^e < P$, demand decreases and supply increases because of arbitrage, and in particular $D'(P) < D(P)$. Furthermore, given that the demand is larger than the supply, i.e. $D'(P) \geq S(P)$, the supply must be binding without liberalization, i.e. $D(P) > S(P)$. Therefore

$$Q_1^d = \min\{S'(P), D'(P)\} \geq \min\{S(P), D(P)\} = Q$$

Since the price does not change and the expansion of output is voluntary for both buyers and sellers at the margin, all agents must be weakly better off. We now turn to the necessary condition. Suppose that $P^e < P$, but $D'(P) < S(P)$. Then $Q_1^d < Q_1$ and hence some buyers will be rationed out as a result of such arbitrage. The same logic applies to condition (2). *QED.*

Proposition 2 states that dual track liberalization is both efficiency enhancing and Pareto improving either when there is excessive supply in the first period but dual track liberalization leads to a price increase, or when there is excessive demand in the first period but dual track liberalization leads to a price reduction. Notice that the two scenarios are possible only because the initial policy distorts not only the price but also the quantity.

As suggested earlier, the scenario analyzed above is a specific version of involuntary exclusion/particiation. More generally, we denote by involuntary exclusion those situations in

which an agent would be willing to undertake an exchange at the prevailing price, but it is not allowed to do so *ex imperio*, i.e. as a result of a prohibition by the authorities. Common examples are import quotas or voluntary export restraints, entry barriers, politically or ideologically motivated restrictions etc. Similarly, by involuntary participation, we refer to situations where agents would not be willing to engage in a transaction given the prevailing price, but are forced to do so by government *fiat*, as was often observed in centrally planned economies. The consequence of involuntary participation/exclusion is similar to the foreclosure of the domestic market to foreign competition: excessive demand (or supply) in the first period can co-exist with the post-liberalization price reduction (or increase respectively).

Indeed, Proposition 2 can be extended to include situation in which the original government intervention involves both price setting and a general form of involuntary participation/exclusion. Let $\widetilde{S}$ and $\widetilde{D}$ respectively be the total supply and demand by agents who either involuntarily or voluntarily engage in transactions under the status quo. We illustrate these functions in Figure 4 where we assume for simplicity that all users choose voluntarily whether to transact. In Figure 4, some producers with very high marginal cost are forced to supply in the status quo. These producers are represented by the leftmost portion of $\widetilde{S}$. The rest of the producers, represented by the monotonic portion of $\widetilde{S}$, make supply decisions voluntarily. This is a typical phenomenon in a centrally planned economy, where the government may order high cost producers (such as state-owned enterprises) to deliver the commodity simply because it has no knowledge of their true marginal cost (Lau, Qian, and Roland (2000)). Lacking information on the fundamentals of the economy, the planner sets the price at an arbitrary level P which in our example happens to generate an excess supply, in the sense that $\widetilde{S}(P) > \widetilde{D}(p)$. Notice that the free-market price P^e that prevails in the market track in the second period bears no relationship with the price at which $\widetilde{S} = \widetilde{D}$. This is because an arbitrary number of producers are involuntarily forced to participate in transactions due to the original government intervention.

Since P^e and the price at which $\widetilde{D} = \widetilde{S}$ are not related, it becomes possible for $P^e > P$ while $\widetilde{S}(P) > \widetilde{D}(P)$. When $P^e > P$, *intertemporal arbitrage* implies that the supply will decrease and the demand will increase in the first period. However, because $\widetilde{S}(P) > \widetilde{D}(P)$, it is possible for the first period *voluntary* transaction to expand as a result of this arbitrage, and hence $\widetilde{Q}_1^d > \widetilde{Q}$. Since the increment in transaction is voluntary and the first period price is fixed, there must be a Pareto improvement. *A fortiori*, the anticipated dual track

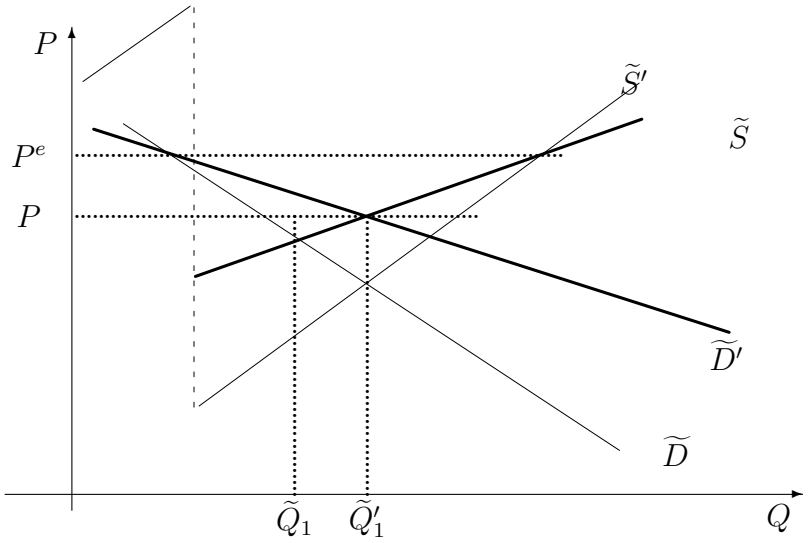

Figure 4: Price control and involuntary participation/exclusion

liberalization is also efficiency–enhancing. A similar argument can be made with respect to the case when $P^e < P$ and $\widetilde{D}(P) > \widetilde{S}(P)$. We conclude:

Proposition 3 *Suppose that the government sets the price with infra-marginal agents participating in the exchange involuntarily. Then anticipated dual track liberalization is Pareto improving if and only if one of the following holds:*

a. $P^e > P$ *and* $\widetilde{S}'(P) \geq \widetilde{D}(P)$

b. $P^e < P$ *and* $\widetilde{D}'(P) \geq \widetilde{S}(P)$

Proof. The argument is identical to the proof of Proposition 2 once we redefine D as $\widetilde{D}$, and S as $\widetilde{S}$. *QED.*

Considering Figure 4, if $\widetilde{S}'(P) < \widetilde{D}(P)$, the transaction in the first period will decrease when the liberalization is anticipated. Consequently, some additional users will be rationed out in the first period and hence made worse off. They will be made worse off in the second period as compared to the status quo because they have to pay the free-market price $P^e > P$ if they choose to transact. This means that a Pareto improvement cannot be achieved. However, the liberalization could remain efficiency enhancing, since the efficiency gains from removing involuntary participation can be arbitrarily large.

6 Conclusions

The remarkable success of China's transition from a centrally planned to a market economy raises the question of the extent to which the lessons from the Chinese experience can be applied elsewhere. In this paper, we have addressed this issue by examining the broader implementability of the dual–track approach to market liberalization. We begin our analysis with a careful definition of "elsewhere", that is economies where policy interventions do not completely dictate prices and quantities and market signals continue to play a role. In this setting we have argued that a dynamic perspective should be taken to evaluate the welfare implications of a dual–track liberalization.

Extending the static analysis carried out by Lau, Qian, and Roland (2000) to a simple two–period model, we have shown that a dual–track liberalization can remain both efficiency–enhancing and Pareto–improving from a dynamic perspective when the initial intervention involves both price–setting as well as quantity restrictions. We have also learned that, when the original policy involves a single intervention, dual track liberalization loses its appeal and might even lead to the exacerbation of the inefficiencies present in the status quo. Thus, our analysis offers some important lessons to policy makers interested in reforms without losers. A dual track approach can be effective as long as the policy change is implemented as a surprise.[9]

When this is not possible and the status quo does not involve the government's control of both prices and quantities, a policy maker will need to credibly commit himself to not implementing a dual track reform.

It is worth highlighting that our analysis does not contradict the conclusion of Lau, Qian, and Roland (2000). In fact, our discussion allows us to identify one of the key factors in the success of the Chinese reforms. That is, China began as a centrally planned economy, where the planning authority completely controlled prices and quantities, thus eliminating any possibility for agents to react to the forthcoming reform. Accounting for this response becomes instead crucial when a dual track reform is carried out in a market economy.

[9]Equivalently, the dual track approach could also be effective if the contract to be enforced is one signed in the distant past, so that agents are not able to strategically react to the announced policy change. Of course, enforcing old contracts presents additional difficulties – i.e. transactions records may not be readily available – and at the same time transactions carried out in the distant past may not reflect agents' current preferences or cost conditions.

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