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# *Reform Without Losers: An Interpretation of China's Dual-Track Approach to Transition*

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# Reform without Losers:

# An Interpretation of China's Dual-Track Approach to Transition*

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Abstract

We develop a simple model to analyze the "dual-track" approach to transition to a market economy as a mechanism for implementing efficient Pareto-improving economic reform, that is, reform achieving efficiency without creating losers. The approach, based on the continued enforcement of the existing plan while simultaneously liberalizing the market, can be understood as a method for making implicit lumpsum transfers to compensate potential losers of the reform. The model highlights the critical role of enforcement of the plan and full liberalization of the market track. We examine how the dual-track approach has worked in product and labor markets in China's economic reform in practice.

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## 1. Introduction

Efficiency-enhancing economic reform should potentially allow winners to compensate losers, thereby making the reform Pareto-improving, that is, with no one being made worse off. However, in reality, many reforms fail precisely because they cannot compensate all or most of the losers. In some cases, the compensation schemes may be too costly to implement (due, for example, to imperfect information); and in other cases, such schemes may lack the credibility of implementation. Even when reform succeeds, it is rare that all losers are compensated, and still rarer that the compensations fully offset the losses. It seems very difficult to make economic reform Pareto-improving in practice, and even more difficult for economic reform to be simultaneously Pareto-improving and efficient.[1]

We demonstrate, in this paper, that a simple mechanism of a "dual-track" approach, consisting of a plan track and a market track, can be used to implement efficient Pareto-improving economic reform, that is, reform achieving efficiency without creating losers, under certain conditions. The basic principle of the dual-track approach is as follows. Under the plan track, economic agents are assigned rights to and obligations for fixed quantities of commodities at fixed plan prices as specified in the pre-existing plan. In addition, a market track is introduced, under which economic agents are granted autonomy as well as incentives to participate in the market at market prices, provided that they fulfill their obligations under the pre-existing plan. The plan price and the market price for a good are not necessarily the same.

Two types of market liberalization need to be distinguished in this context. We refer to as "limited liberalization of the market track" or "limited market liberalization" if market resales of plan-

[1] As is well known, Pareto-improvement may not necessarily be perceived as ethically desirable and may create political opposition due to equity considerations.

allocated goods by either enterprises or households and market purchases by planned suppliers for fulfilling plan-mandated delivery quotas are not permitted. Thus, under limited market liberalization, planned suppliers have to physically produce all the plan-mandated output deliveries and physically use all the plan-allocated inputs themselves even though it might have been cheaper for them to sell the inputs on the market track and purchase the same output from the market track for redelivery. This is the sense of dual-track liberalization used by Byrd (1989) and others. In contrast, we refer to as "full liberalization of the market track" or "full market liberalization" if market resales and market purchases for redelivery are all allowed by a planned supplier or a rationed user, as long as the rights and obligations under the plan are all fulfilled.

Within the conventional supply and demand framework, we analyze various distributional and efficiency aspects of the dual-track approach under alternative assumptions on the initial conditions concerning supply and demand. It is possible, for some goods, that the fully liberalized market equilibrium quantity turns out to be lower than the plan quantity. However, we show that, regardless of whether this is the case, as long as the initial plan is feasible and continues to be enforced appropriately, the introduction of the dual track is always Pareto-improving under either limited or full market liberalization. In addition, it achieves efficiency under full market liberalization.

The idea that the dual-track approach can provide a concrete mechanism for the implementation of efficient Pareto-improving reform is both simple and subtle. Basically, the introduction of the market track provides the opportunity for economic agents who participate in it to be better off, whereas the maintenance of the plan track provides implicit lumpsum transfers[2] to compensate potential losers from the market liberalization by protecting the status quo rents under the pre-existing plan. Thus, the dual-track approach is, by design, Pareto-improving. As the compensatory transfers are lumpsum in nature, the dual-track approach can be efficient too. One desirable feature of the dual-track approach is its

[2] The term "lumpsum transfers" as used here simply means that the transfers are independent of the actions of the individual economic agents. The values of such transfers may depend on market prices.

minimal additional informational and institutional requirements: It utilizes the existing information contained in the original plan and can enforce the original plan through existing institutions (e.g., the state planning commission). No new information and no new institutions (e.g., a national revenue service, or a social welfare agency) are needed.

Therefore, a major difference between the dual-track full market liberalization and the "single-track" full market liberalization, under which the pre-existing plan is abolished and all transactions take place on the fully liberalized market, is about the preservation of the pre-existing rents.[3] While the single-track liberalization will lead to full economic efficiency under the usual conditions,[4] Pareto-improvement cannot, in general, be assured. In contrast, the dual-track approach may provide a useful way to implement a reform without creating losers. In transition economies under both democratic and non-democratic systems, there is a need to "buy off" bureaucrats, government employees, workers, and consumers used to receiving implicit subsidies. Similarly, there is also a need for assuring irreversibility of economic reform in order to prevent coalitions hurt by the reform to push for a reversal of the reform (Roland, 1994). Due to its Pareto-improving property, the dual-track approach may minimize political opposition to reform *ex ante* and maximize political opposition to reversal of reform *ex post*.

We view this model of dual-track liberalization as a useful benchmark, which yields the general result of the dual-track mechanism being both efficient and Pareto-improving. It enables us to understand the precise conditions under which the dual-track mechanism works. The combination of feasibility of the original plan, continued enforcement of the plan track, profit and utility maximization, and full liberalization of the market track turns out to be crucial conditions for achieving simultaneously Pareto-improvement and efficiency. Our analysis highlights, in particular, the role of continued enforcement of the plan track by the state to preserve the rents arising from the rights and obligations of the economic agents under the pre-existing plan. We note that an effective government is needed here not to

[3] Single-track liberalization as defined here is sometimes also referred to as "big-bang" liberalization.
[4] See, e.g., Lau, Qian and Roland (1997) for a discussion of such conditions.

implement an unpopular reform, but to carry out a popular reform--reform that creates no losers, only winners. However, the validity of these conditions depends on many factors that may vary from market to market and from country to country.

We interpret China's actual practice of the dual-track approach in its transition to market since 1979. An implicit guiding principle underlying China's transition strategy has been that reform should proceed without creating losers, and an important mechanism has been precisely the dual-track approach.[5] The dual-track approach was implemented in China in many markets and in different ways. It has led to remarkable successes in some areas and less so in others. We examine how the dual-track approach has worked with examples from the Chinese product and labor markets.

We note that the two-tier wage system that is sometimes used in some enterprises or industries in some market economies (e.g., in the U.S. airline industry) has a resemblance to the dual-track approach. The two-tiered wage system basically provides for two classes of employees who are paid different wages rates for essentially the same work. For example, the pre-existing pilots and flight attendants of an airline may continue to be paid at the higher pre-existing wage rates and are therefore said to be "grandfathered"; the new pilots and flight attendants are paid the lower market wage rates.

The rest of the paper is organized as follows. We use a simple model of supply and demand to analyze dual-track liberalization in section 2. In section 3, we discuss the conditions necessary for the success of the dual-track approach, in particular, continued enforcement of the plan track by the state and full liberalization of the market track. In section 4, we examine whether these conditions are fulfilled during the Chinese economy's transition to market. In section 5, we provide examples of Chinese practice of the dual-track approach from its product and labor markets. We make brief concluding

[5] The principle of reform without losers has been perceived as common wisdom in the Chinese economics literature. Although economists inside China (e.g., Wu and Zhao (1987), Lin, Cai, and Li (1995), and Zhang and Yi (1995)) and experts on the Chinese economy outside China (e.g., McMillan and Naughton (1992), Naughton (1995)) have made informal discussions on the issue, they have not presented formal analysis and systematic evidence. The only exceptions are Byrd (1989) and Sicular (1988), who analyzed the dual-track pricing in China's industrial and agricultural reforms respectively.

remarks in section 6.

## 2. The Theoretical Analysis

In order to understand fully the mechanism of the dual-track approach, we consider a variety of market situations concerning demand and supply. Since the plan price and quantity are fixed by the state, they need bear no particular relationship to the market equilibrium price and quantity under either limited or full market liberalization, and they can be either below or above the market price and quantity respectively. The plan prices of most normal producer and consumer goods are likely to be below the market prices; however, the pre-existing total compensation (wages plus housing, health and pension benefits) of workers in state-owned enterprises (SOEs) under the plan may well be above the market wage rate. Similarly, while high-quality goods are often in short supply under the plan, the plan production of tanks and other low-quality unwanted goods may be greater than the total demand under full market liberalization. Furthermore, there is no reason in general to believe that the planned output is allocated to users with the highest willingness to pay (efficient rationing) or that the planned supply is delivered by suppliers with the lowest marginal costs (efficient planned supply).

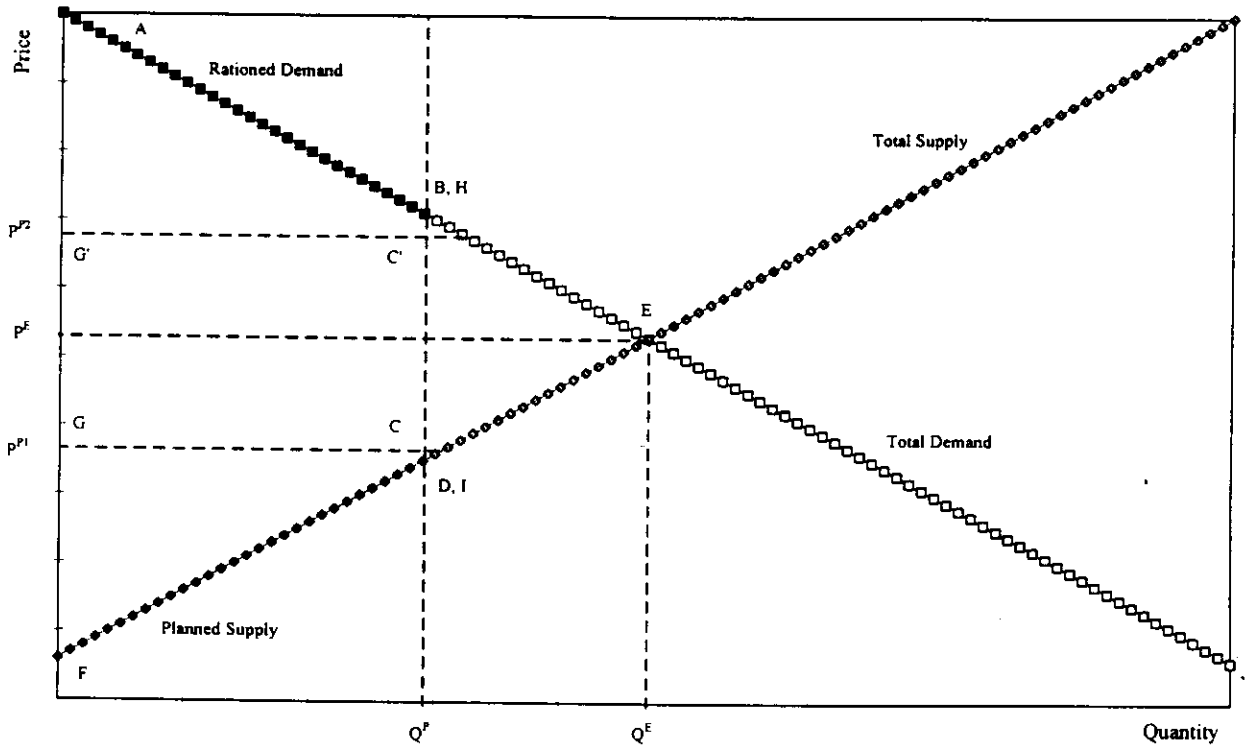
We shall analyze the generic case of inefficient rationed demand and inefficient planned supply (which includes efficient rationed demand or efficient planned supply as special cases) under the following assumptions: (1) feasibility of the original plan; (2) continued enforcement of the plan track; and (3) profit and utility maximization on the part of the economic agents, subject to the appropriate constraints.[6] In what follows, we denote by $P^M$ and $P^E$ (respectively, $Q^M$ and $Q^E$) as market equilibrium prices (respectively, quantities) under limited and full market liberalization. We use $Q^P$ to denote plan quantity and $P^P_i$ (i=1,2) to denote possible plan prices with $P^P_1$ below $P^E$ and $P^P_2$ above $P^E$.[7]

[6] In addition, an implicit assumption is that the economy is closed.
[7] See Lau, Qian, and Roland (1997) for a general equilibrium analysis.

2.1. The Plan Quantity Is Less Than the Market Equilibrium Quantity

We begin with the special case of efficient rationed demand and efficient planned supply. The rationed demand curve and the planned supply curve are therefore the top and bottom segments of the total demand and supply curves respectively (see Figure 1). Dual-track liberalization means that $Q^P$ continues to be delivered at plan price $P^P_i$ but that any additional quantity can be bought and sold freely in the market. It is clear that the market track will provide an additional supply ($Q^E$ - $Q^P$) at price $P^E$. The allocative outcome under dual-track liberalization is just as efficient as that under single-track liberalization. The difference between the two is entirely distributional.

**Figure 1: Efficient Rationed Demand and Efficient Planned Supply**




Suppose first the plan price is $P^P_1$, below $P^E$. Under the plan, the rationed users have a surplus given by the area bounded by ABCG; the planned suppliers have a planned profit/loss equal to the area bounded by GCDF. With the introduction of the dual tracks, the surpluses of the rationed users and the planned suppliers remain exactly the same, by design. Compared to the outcome of the single-track

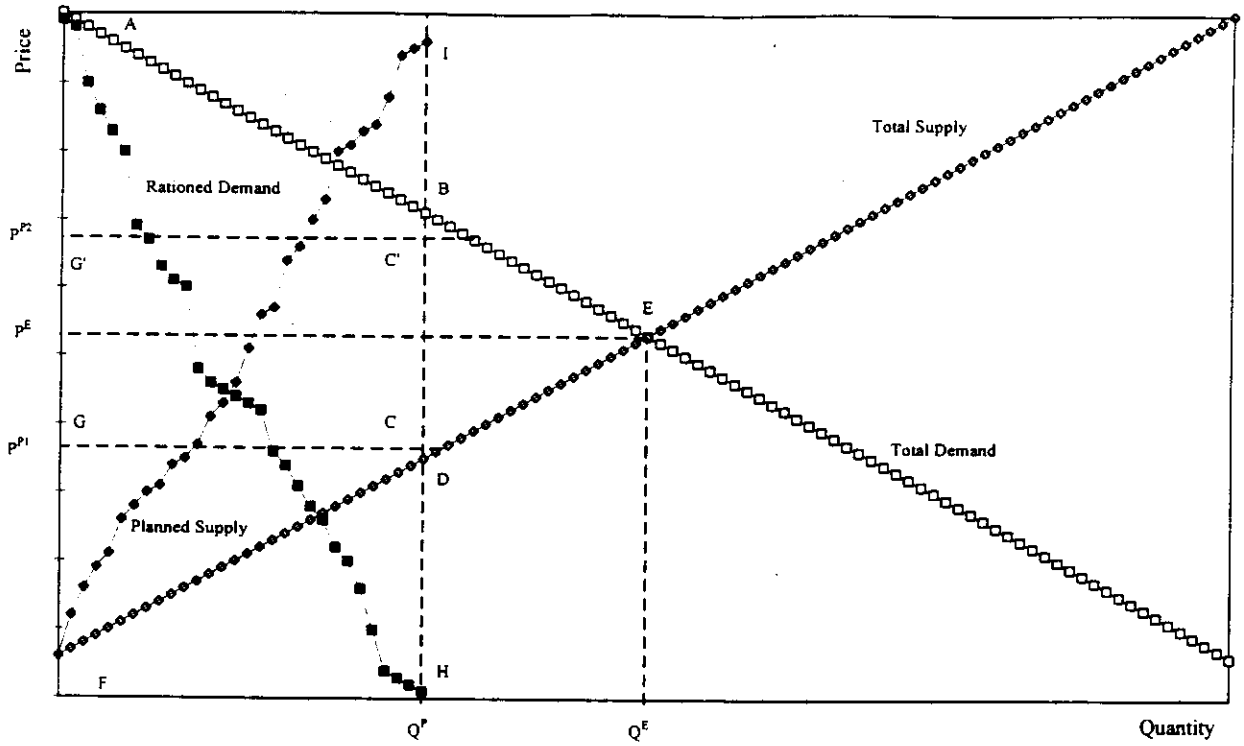
liberalization, there is an implicit lumpsum transfer equal to the rectangle $(P^E - P^P_1).Q^P$ from the planned suppliers to the rationed users so that the rationed users and the planned suppliers are both no worse off than before. However, the new users and suppliers outside the plan are together better off by the area of the triangle BED.

Next suppose the plan price is $P^P_2$, above $P^E$ (This situation may be applicable to a labor market with $P^P_2$ interpreted as the wage rate). Under the plan, the rationed users have a surplus given by the area bounded by ABC'G'; the planned suppliers have a planned profit/loss equal to the area bounded by G'C'DF. With the introduction of the dual tracks, the surpluses of the rationed users and the planned suppliers remain exactly the same, by design. Compared to the outcome of the single-track liberalization, there is an implicit lumpsum transfer equal to the rectangle $(P^P_2 - P^E).Q^P$ from the rationed users to the planned suppliers, so that the rationed users and the planned suppliers are both no worse off than before. The new users and suppliers together are again better off by the area of the triangle BED.

We note that, in this special case, the introduction of the market track achieves efficiency even without market resales of rationed goods by rationed users and market purchases for redelivery by planned suppliers. This is because the most deserving users and the most efficient suppliers are already under the plan track and they would have been the first users and suppliers in a fully liberalized market in any case. Hence, the plan track can be totally segregated or segmented from the market track without affecting the efficiency of the resulting market equilibrium. For this special case, limited and full liberalization of the market track result in identical efficient outcomes.

We now consider the general case in which the plan quantity $Q^P$ is not necessarily allocated to users with the highest willingness to pay and some of the planned suppliers may have higher marginal costs than other potential suppliers. In Figure 2, we represent the demand curve of the rationed users by a generic rationed demand curve AH, consisting of users arbitrarily chosen from the total demand curve, and the planned supply curve by a generic planned supply curve FI, consisting of suppliers arbitrarily chosen from the total supply curve.

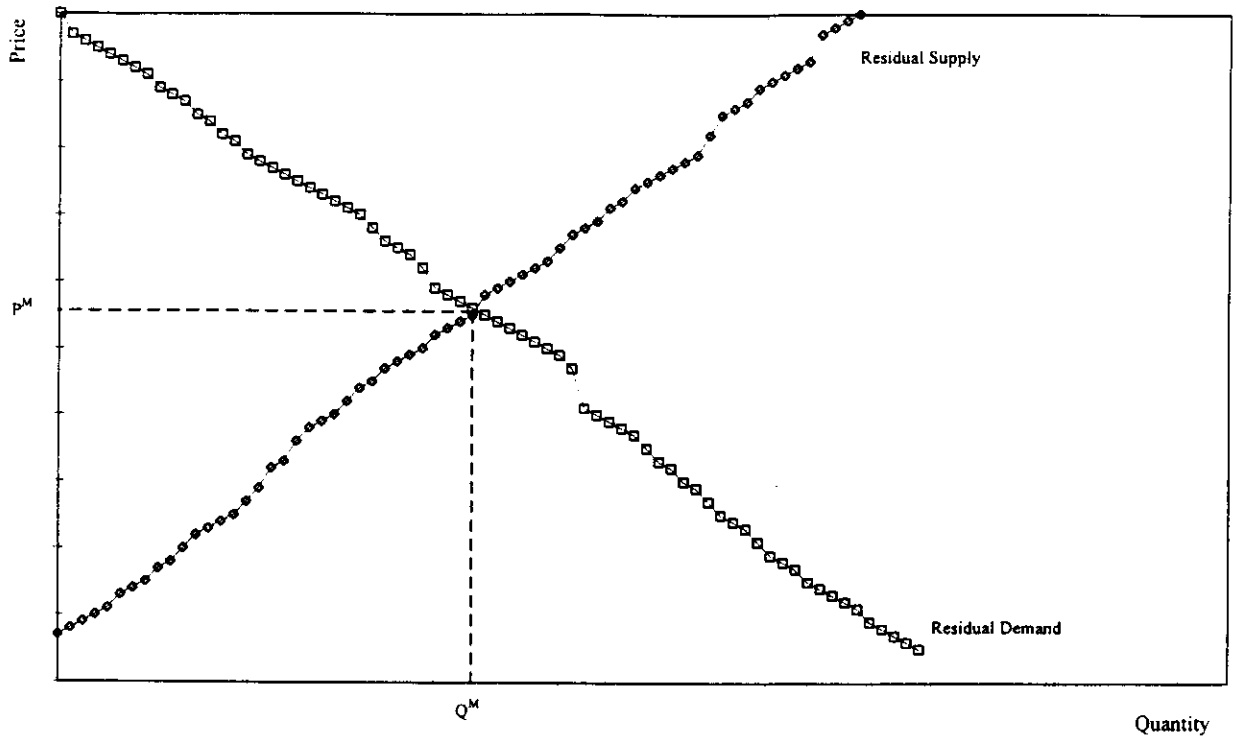
**Figure 2: Inefficient Rationed Demand and Inefficient Planned Supply**




Unlike the special case of efficient rationed demand and efficient rationed supply, the allocative outcome of dual-track liberalization of the general case depends on whether there is limited or full liberalization of the market track. Under limited liberalization, the rationed users are not allowed to resell rationed goods (e.g., SOEs allocated with "redundant labor" at wage rates higher than their marginal product must continue to employ these workers), and the planned suppliers are not allowed to purchase in the market for redelivery (in the labor market, some workers with high reservation wages are required to continue to work and are not allowed to find substitutes). Because the plan track and the market track are completely segregated, the market track consists of only the residual demand and supply, that is, total demand and supply reduced respectively by the rationed demand and planned supply, presented in Figure 3. Their intersection represents the limited market liberalization equilibrium. In general, $P^M$ needs to bear no relationship to the plan price $P^P_i$. We shall show that it is always the case that $Q^P + Q^M \geq Q^E$. Furthermore, we show that $P^M \geq P^E$ under efficient planned supply and $P^M \leq P^E$ under

efficient rationed demand.

**Figure 3: Residual Demand and Supply:**
**Inefficient Rationed Demand and Inefficient Planned Supply**




First, suppose the limited market track is at equilibrium with quantity $Q^M > 0$ and price $P^M$. If $P^M \leq P^E$, then every potential user with a willingness to pay greater than or equal to $P^E$ will be an actual user; moreover, since rationing is not necessarily efficient, there may also be actual users whose willingness to pay is below $P^E$. Thus, total actual demand, $Q^P + Q^M$, must be greater than or equal to $Q^E$. If $P^M \geq P^E$, then every potential supplier with a marginal cost less than or equal to $P^E$ will be an actual supplier; moreover, since supply planning is not necessarily efficient, there may also be one or more actual suppliers whose marginal costs are above $P^E$. Thus, total actual supply, $Q^P + Q^M$, must also be greater than or equal to $Q^E$. We conclude that $Q^P + Q^M \geq Q^E$.

Second, if there is efficient supply planning (so that the most efficient suppliers are already in the plan track), the residual supply curve is the top segment of the total supply curve. Then, $Q^P + Q^M \geq Q^E$

implies that $P^M \geq P^E$ by virtue of the fact that the total supply curve is monotonically increasing. Similarly, if there is efficient rationing (so that the users with the highest willingness to pay are already in the plan track), the residual demand curve is the top segment of the total demand curve. Then, $Q^P + Q^M \geq Q^E$ implies $P^M \leq P^E$ by virtue of the fact that the total demand curve is monotonically decreasing.

Proposition 1: If the plan quantity is less than the fully liberalized market equilibrium quantity, then:
(1) the combined output of the plan and market tracks under limited liberalization of the market track is greater than or equal to the fully liberalized market equilibrium quantity; and
(2) the market equilibrium price under limited liberalization is greater (respectively, less) than or equal to the market equilibrium price under full liberalization of the market track if planned supply (respectively, rationed demand) is efficient.

By design, under limited liberalization of the market track, the rationed users and the planned suppliers are no worse off post reform. However, the participants in the market track consisting of the residual demand and supply are clearly better off. Thus, even under limited liberalization, the dual-track approach is Pareto-improving. Nevertheless, limited liberalization of the market track cannot, in general, achieve full efficiency (see also Byrd (1989)), because one cannot rule out the possibility that a rationed user may have a willingness to pay below $P^E$, or a planned supplier may have its marginal cost above $P^E$, which violates efficiency. We conclude that limited liberalization of the market track generically leads to inefficiency, which is always manifested in the form of over-production relative to the fully liberalized market equilibrium. A special situation under which full efficiency obtains even with limited liberalization of the market track is when the rationed users and planned suppliers, while not efficiently chosen, all have their willingness to pay and marginal costs respectively above and below $P^E$.

We next analyze full liberalization of the market track. Now, the rationed users are allowed to

resell rationed goods (or labor) in the market as long as the plan quantity $Q^P$ is delivered at plan price $P^P_1$, and the planned suppliers are allowed to purchase the goods in the market for redelivery at plan price $P^P_1$. Thus, the market consists of the total demand and supply.

Suppose the plan price $P^P_1$ below $P^E$. Under the plan, the rationed users have a surplus given by the area under the rationed demand curve AH less the rectangle $P^P_1$ times $Q^P$; the planned suppliers have a planned profit/loss equal to the difference between the rectangle $P^P_1$ times $Q^P$ and the area under the planned supply curve FI. Compared to the outcome of the single-track liberalization, the dual-track liberalization entails an implicit lumpsum transfer equal to the rectangle $(P^E - P^P_1).Q^P$ from the planned suppliers to the rationed users. As a result, a rationed user whose willingness to pay is greater than or equal to $P^E$ and a planned supplier whose marginal cost is less than or equal to $P^E$ will have their pre-reform rents unchanged. A rationed user whose willingness to pay is less than $P^E$ will still accept delivery from planned suppliers at the plan price, but will re-sell the plan-allocated inputs on the market at price $P^E$, thereby obtaining a surplus equal to the difference between $P^E$ and $P^P_1$. This corresponds to the common practice of "resale" of rationed goods. A planned supplier whose marginal cost is above $P^E$ will still deliver to its rationed users their plan-mandated supplies at the plan price, but will try to purchase them on the market at price $P^E$ for redelivery, thereby limiting its planned loss to only the difference between $P^E$ and $P^P_1$. This corresponds to the common practice of "subcontracting" by inefficient planned suppliers to other, more efficient, suppliers. Clearly, the rationed users and the planned suppliers are no worse off than before; and at least some of them are better off. The new users and suppliers are together better off by at least the area of the triangle BED. Thus, Pareto improvement and efficiency are simultaneously attained.

A similar argument shows that Pareto improvement and efficiency are simultaneously attained also for the situation of $P^P_2$ being above $P^E$, as, for example, in the context of a labor market. Under the dual-track approach, an enterprise whose marginal product of labor exceeds or equals $P^E$ will also have its pre-reform rents unchanged. An enterprise whose marginal product of labor is below $P^E$ will still pay

the plan wage, but will "re-sell" its labor on the market for $P^E$, thereby limiting its loss to the difference between $P^P_2$ and $P^E$. This corresponds to the common practice of "labor reallocation" with compensation such as housing. The reallocated workers preserve their pre-existing rents because they essentially continue to receive the plan wage rate rather than the market wage rate. Similarly, those workers whose reservation wages are less than or equal to $P^E$ will also have their pre-reform rents unchanged. Those workers whose reservation wages are above $P^E$ will receive $P^P_2 - P^E$ and be replaced by workers whose reservation wage is below or equal to $P^E$ at market wage $P^E$. This corresponds to the common practice of "labor substitution," which can take different forms. For example, a worker may be persuaded to take an early retirement package, or a worker may resign in exchange for a job for his or her child or relative who may have a lower reservation wage. The rents received by existing workers under the plan are preserved in the form of (implicit) lumpsum transfers from the state-own enterprises to the existing workers.

An alternative but instructive way to think about the generic case of inefficient rationed demand and inefficient planned supply is the following. If we start with inefficient rationed demand under the plan, then as long as market resales are permitted, the resulting actual users at the final fully liberalized market equilibrium must be those with the highest willingness to pay. It is then as if we have started with efficient rationed demand in the first place. Similarly, if we start with inefficient planned supply under the plan, then as long as market purchases for redelivery are permitted, the resulting actual suppliers at the final fully liberalized market equilibrium must be those with the lowest marginal costs. It is then as if we have started with efficient planned supply in the first place. Thus, if we are only interested in full liberalization of the market track, we can simply appeal to the above argument and need to consider only the special case of efficient rationed demand and efficient planned supply.

Proposition 2: If the plan quantity is less than the fully liberalized market equilibrium quantity, then, independently of the initial conditions concerning the plan price and the degree of efficiency of rationed demand and planned supply:

(1) the dual-track approach with either limited or full liberalization of the market track is Pareto-improving; and

(2) the dual-track approach with full liberalization of the market track achieves full economic efficiency.

It is useful to compare our results with those of Murphy, Shleifer, and Vishny (1992). They study a partial reform scheme in a similar partial equilibrium model under which (1) suppliers are free to sell to all users (no quota delivery enforcement), and (2) private firms (which are not covered by the state plan) can freely purchase inputs at any price but state-owned firms (which are covered by the plan) are not allowed to purchase inputs at higher than the plan price. They show that such a partial reform leads to supply diversion and to possible reduction in social welfare. They emphasize the inefficiency of such partial reform which they contrast to the efficiency of single-track liberalization. Our definition of dual-track liberalization differs from that of their "partial reform" in two important respects: not only are plan delivery quotas enforced under our dual-track approach, but also state-owned firms, like private firms, are allowed to buy and sell any inputs (and outputs) freely at the market price at the margin. Our definition of dual-track liberalization is closer to the actual practice of Chinese economic reform.

In the model of Murphy, Shleifer, and Vishny (1992), there is no assurance that the partial reform is Pareto-improving, since suppliers are free to sell to all potential users. In our model, dual-track liberalization is not only efficiency-enhancing, but also Pareto-improving. In their model, quota enforcement exists to prevent resource diversion. By contrast, in our model, enforcement of the plan assures the Pareto-improvement property. In their model, inefficiency of the plan (e.g., inefficient planned supply) may persist under "partial reform." But in our model, the dual-track with full liberalization of the market track achieves full efficiency even if the original plan is inefficient.

It is also useful to compare our results with those of Sachs and Woo (1994). They observe that, in Eastern Europe and the former Soviet Union, employees of SOEs receive too high a wage rate, implicitly subsidized by the state, which prevents them from moving from the inefficient SOEs to the

more efficient non-SOEs which pay the market, and hence lower, rate of total compensation. Therefore, they argue, it is necessary to cut subsidies and close down state enterprises in order to achieve an efficient labor reallocation. This is the situation of inefficient rationing in the labor market with the plan wage rate above the fully liberalized market equilibrium. Our results show that the dual-track approach with full liberalization of the plan track can provide a mechanism for achieving an efficient labor reallocation in a Pareto-improving way. For example, workers who benefit from subsidized wages in inefficient state enterprises can be allowed to keep the housing provided by their enterprise while taking a new job in the more efficient but lower-paying non-state sector. Under this scheme, workers should have the incentive to leave the SOEs and accept the lower market wage rate, because they would not be worse off.

### 2.2. The Plan Quantity Is Greater Than the Market Equilibrium Quantity

The case of the plan quantity being greater than the fully liberalized market equilibrium quantity has applicability to the over-production of tanks and other low-quality unwanted goods or the over-employment of labor.[8] If the plan quantity of output is physically produced and delivered according to the plan, the outcome is clearly inefficient. The main issue here concerns how the excess supply can be eliminated in a Pareto-improving way. We shall show that, even in this case, the dual-track approach with limited market liberalization is still Pareto-improving but cannot achieve full efficiency, as in the previous subsection. Moreover, the dual-track approach with full market liberalization can achieve simultaneous Pareto-improvement and efficiency, provided that the rights and obligations of the economic agents under the plan are enforced in terms of the rents they generate rather than the physical output targets.

The generic rationed demand and planned supply curves, not necessarily efficient, are depicted in

[8] Sachs and Woo (1994) characterize the situation in Eastern Europe and the former Soviet Union at the beginning of transition as one of "full employment."

Figure 4 and the residual demand and supply curves are depicted in Figure 5. Under limited market liberalization, the plan track and the market track are completely segregated. By assumption, $Q^P \geq Q^E$. What is notable is that, generically, there is still positive demand and supply in the market track, because among the residual users and suppliers there are still those with high willingness to pay and low marginal costs. Thus, once again, $Q^P + Q^M \geq Q^E$. Under efficient planned supply, $P^M \geq P^E$ by virtue of the fact that the total supply curve is monotonically increasing. Under efficient demand rationing, $P^M \leq P^E$ by virtue of the fact that the total demand curve is monotonically decreasing. Clearly, the dual-track approach is Pareto-improving but cannot achieve full efficiency since the total quantity for the entire economy is greater than $Q^E$, the efficient quantity. The Pareto-improvement and efficiency enhancement occur here because of the inefficiency in demand rationing and supply planning. Under efficient rationed demand and efficient planned supply, the limited market track would have an equilibrium $Q^M$ equal to zero.

**Figure 4: Inefficient Rationed Demand and Inefficient Planned Supply: The Case of Plan Quantity Greater Than Market Equilibrium Quantity**

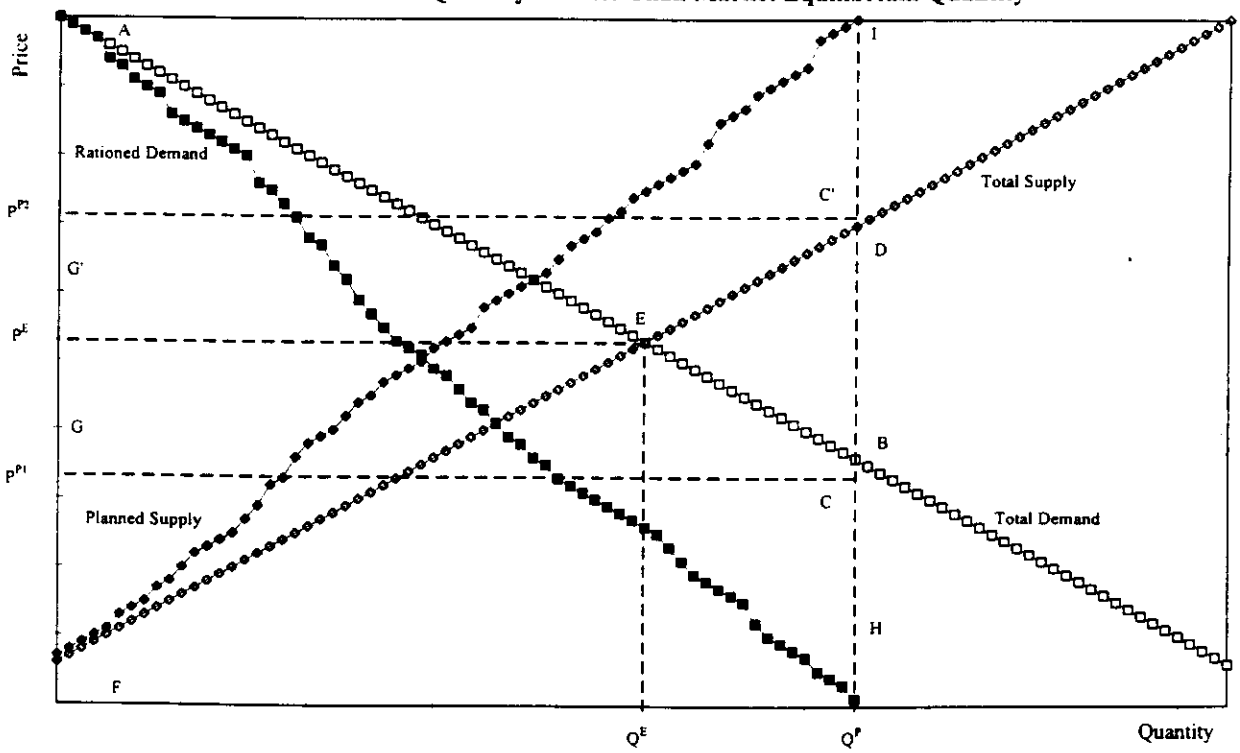
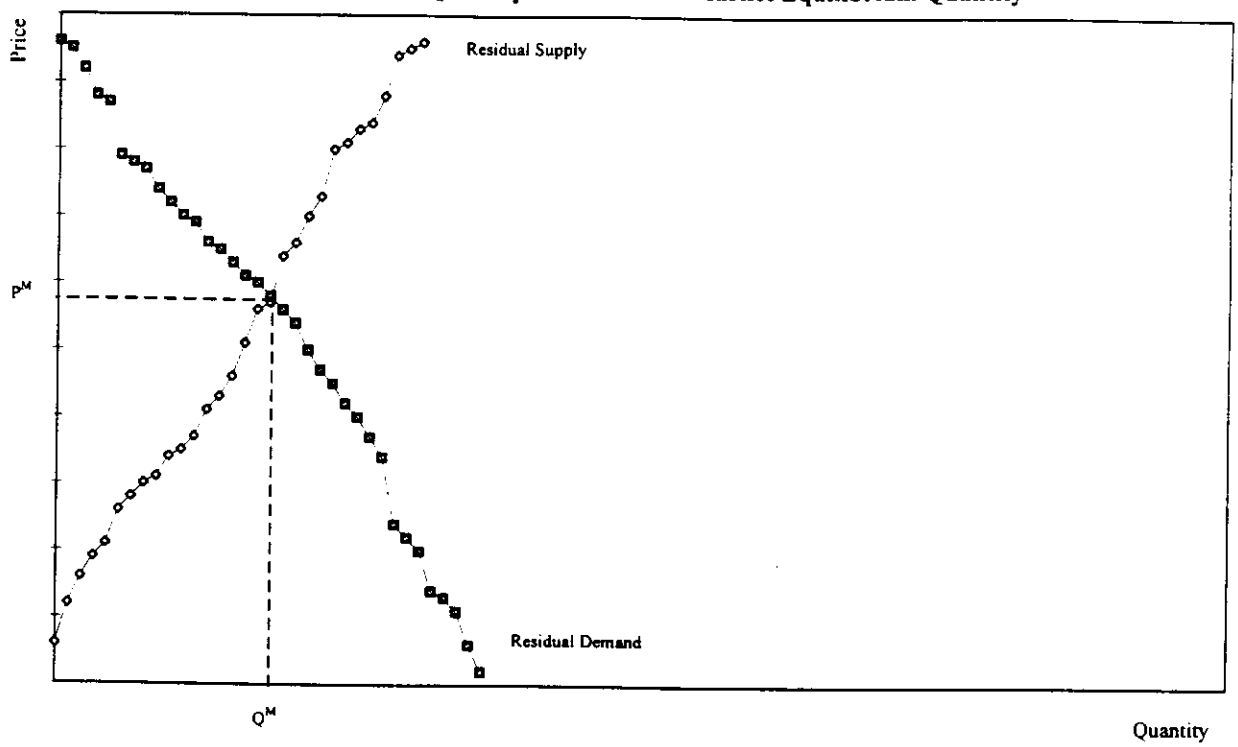


**Figure 5: Residual Demand and Supply:**
**The Case of Plan Quantity Greater Than Market Equilibrium Quantity**




With full liberalization, the market consists of the total demand and supply. Suppose the plan price is $P^P_1$, below $P^E$. Under the plan, the rationed users have a surplus given by the area under the rationed demand curve AH less the rectangle $P^P_1$ times $Q^P$; the planned suppliers have a planned profit/loss equal to the difference between the rectangle $P^P_1$ times $Q^P$ and the area under the planned supply curve FI. With the introduction of a fully liberalized market track, a rationed user whose willingness to pay is greater than or equal to $P^E$ and a planned supplier whose marginal cost is less than or equal to $P^E$ will also have their pre-reform rents unchanged. A rationed user whose willingness to pay is less than $P^E$ will still accept delivery from planned suppliers at the plan price, but will re-sell the plan-allocated inputs on the market at price $P^E$, thereby earning a surplus equal to the difference between $P^E$ and $P^P_1$. A planned supplier whose marginal cost is above $P^E$ will still deliver to its rationed users their plan-mandated supplies at the plan price, but, instead of producing the goods itself, will purchase them on the market at price $P^E$ for redelivery, thereby limiting its planned loss to only the difference between

$P^E$ and $P^P_1$. In equilibrium, this latter group of planned suppliers will produce zero net output; similarly, rationed users with willingness to pay below $P^E$ will have zero net consumption. Total economy-wide output therefore consists of the outputs of those and only those suppliers (planned and unplanned) with marginal cost less than or equal to $P^E$, and hence is equal to $Q^E$. Under dual tracks, there is an implicit lumpsum transfer equal to the rectangle $(P^E - P^P_1).Q^P$ from the planned suppliers to the rationed users. Thus, the rationed users and the planned suppliers are no worse off than before; and at least some of them are better off. The new users and suppliers are together better off by at least the area of the triangle BED. We conclude that Pareto improvement and efficiency are simultaneously attained.

The important difference of this case from the case of the plan quantity being less than the fully liberalized market equilibrium quantity is that the physical fulfillment of the plan production target is incompatible with efficiency. However, it is possible to achieve Pareto-improvement and efficiency if the enforcement of the plan is in terms of the rents that it generates rather than the physical output targets. With $P^P_1 < P^E$, a planned supplier can buy back from the market, at equilibrium, delivery obligations (which may be interpreted as "call options" exercisable at $P^P_1$, held by the rationed users) in the good that it is supposed to deliver under the plan, at $P^E - P^P_1$, thus reducing or even eliminating the necessity of making physical deliveries (and actual production). A rationed user should be indifferent between accepting physical delivery or selling his delivery rights ("call options"), at $P^E - P^P_1$, since it is always possible to buy at the market price $P^E$. Profitable market exchanges of rights and obligations are possible because of the inefficiencies caused by the plan. Under this scenario, the net output of the good will be equal to $Q^E$; and yet there will be no complaints about the non-fulfillment of plan obligations from anyone because the planned suppliers and rationed users have all received or given value for their rights and obligations under the plan and in fact are at their optimized levels of profits and utilities. Hence, we conclude that even when the plan quantity is greater than the market equilibrium quantity, the dual-track approach with full market liberalization still results in the simultaneous attainment of Pareto-improvement and efficiency as long as plan enforcement is in terms of the rents that they generate but not

in terms of physical production.[9]

The case of $P^P_2$ above $P^E$, which in practice may be the more likely case when the plan quantity is greater than the market equilibrium quantity, can be similarly analyzed. For the product markets, with $P^P_2 > P^E$, a rationed user can buy back from the market, at equilibrium, acceptance obligations (which may be interpreted as "put options" exercisable at $P^P_2$, held by the planned suppliers) in the good that it is supposed to receive under the plan, at $P^P_2 - P^E$. Thus, the rationed user is able to reduce or even eliminate the necessity of accepting physical deliveries (and relieve the planned suppliers from actual production). For the labor market, under full market liberalization, enterprises allocated labor under the plan will "re-sell" the labor at a loss of $P^P_2 - P^E$ per unit, if its marginal product of labor falls below $P^E$. This is equivalent to a subsidy scheme at the rate of $P^P_2 - P^E$ provided by the enterprise. Workers within the plan whose reservation wage is higher than $P^E$ accept the subsidy and quit the job. Thus, all enterprises will actually employ labor up to the point at which the value of the marginal product is equal to $P^E$ and any worker with a reservation wage below or equal to $P^E$ will be actually employed. Thus efficiency is achieved. Moreover, the allocation is Pareto-improving. Before the reform, the workers within the plan have a surplus equal to the area of the rectangle $P^P_2.Q^P$ less the area under the reservation wage curve FI.

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[9] Another way to look at this case is to take into account the possibility of "recycling" of goods through the market. If the plan period, say a year, is subdivided into a sufficiently large number of sub-periods, say 365, then in each sub-period a planned supplier should produce $Q^P_i/365$ as planned output and be required to deliver $Q^P_i/365$ to rationed users. The planned supplier can meet his physical delivery obligations as follows. He produces and physically delivers $Q^P_i/365$ for the first sub-period at the plan price and then simultaneously repurchases from the market any available quantity at the market price $P^E$, from rationed users whose willingness to pay are below $P^E$. In the second sub-period, the planned supplier produces to the point his marginal cost is equal to $P^E$, say $Q^*_i/365$, which he delivers together with his market purchases made in the previous sub-period, and just sufficient additional new current production if necessary so that his physical delivery obligations of $Q^P_i/365$ are fulfilled. ($Q^*_i$ can be zero.) But simultaneously he repurchases again from the market a quantity equal to $(Q^P_i-Q^*_i)/365$ at the market price $P^E$, from rationed users whose willingness to pay are below $P^E$. In the third sub-period, he produces $Q^*_i/365$, delivers $Q^P_i/365$, and purchases $(Q^P_i-Q^*_i)/365$ from the market at the market price $P^E$. He continues this pattern of partial production cum purchases and resales until the end of the year. He would have produced approximately $Q^*_i$ which can be significantly less than the planned supply of $Q^P_i$, but he would have physically delivered exactly $Q^P_i$, as required by the plan. Thus, total net production under full market liberalization will not exceed $Q^E$, but physical delivery is "fulfilled".

The enterprises within the plan have a surplus equal to the area under the curve AH less the area of the rectangle $P^P_2.Q^P$. Workers and enterprises outside the plan have no surplus. After the reform, all workers within the plan with a reservation wage above $P^E$ are clearly better off, since they no longer have to work at $P^E$ and in addition receive a subsidy $P^P_2 - P^E$; all enterprises with values of marginal products of labor below $P^E$ are also clearly better off, since they only have to overpay their plan-allocated workers by at most $P^P_2 - P^E$. The remaining workers and enterprises within the plan are no worse off than before. Workers outside the plan with a reservation wage below $P^E$ are now employed and are clearly better off; so are the enterprises, within plan or otherwise, with newly hired workers at $P^E$.

The following Proposition summarizes the above discussions:

Proposition 3: If the plan quantity is greater than the fully liberalized market equilibrium quantity, then independently of the initial conditions concerning the plan prices and the degree of efficiency of rationed demand and planned supply:

(1) the dual-track approach with limited or full liberalization is always Pareto-improving; and

(2) the dual-track approach with full liberalization achieves efficiency if the rights and obligations under the plan are enforced in terms of the rents.

## 3. Conditions for Simultaneous Pareto-Improvement and Efficiency

The theoretical analysis in section 2 yields the general result of the dual-track approach being both efficient and Pareto-improving, which can be viewed as a useful benchmark. This enables us to understand the precise conditions under which the dual-track mechanism works. The crucial conditions for the dual-track approach to achieve simultaneously Pareto-improvement and efficiency are our original three assumptions: (1) feasibility of the original plan; (2) continued enforcement of the plan track; and (3) profit and utility maximization, plus an additional one: (4) full liberalization of the market track. The roles of continued enforcement of the plan track by the state and full market liberalization are particularly

important for the Pareto-improving property and efficiency respectively.

Feasibility of the Original Plan

One assumption about the plan track is that the original plan must be feasible, that is: (1) The production plan for each producer is feasible; (2) The consumption plan for each consumer is feasible; (3) Material balance holds for the economy as a whole; and (4) The consumption plan for each consumer is affordable at the plan prices. In the partial equilibrium single-market context, feasibility of the original plan simply implies that, conditional on the receipt of plan-allocated inputs, the planned suppliers will be able to produce the plan quantities of output to satisfy the rationed users under the plan. If the original plan itself is not feasible, then it cannot provide the reference allocation from which Pareto-improvement or lack thereof is to be evaluated.

Continued Enforcement of the Plan Track

Enforcement of the rights and obligations under the plan track is crucial to the protection of the pre-existing rents of consumers and/or producers. If the plan track collapses, these rents cannot be protected any more, and Pareto-improvement cannot be guaranteed even, perhaps especially, as markets emerge. Below we discuss both the possibility and difficulty of the enforcement of the plan track.

There are several reasons that make enforcement of the plan track possible. First, even if incentives to evade quotas may be stronger under reform than under central planning, these incentives would be the same in regard to the fulfillment of ex post unprofitable contracts in a conventional market economy. In either case, the government will have the responsibility for contract enforcement. For enterprises at least, enforcement of the plan track is similar to contract enforcement in a market economy. Moreover, such enforcement can be implemented, in a previously centrally planned economy, by utilizing the existing institutions, e.g., the state planning commission, and no new institutions need to be created.

Second, considering the information requirement, enforcing the pre-existing plan is much less demanding for the government than drawing up a new plan. Under central planning, each year the planner needs to formulate a comprehensive plan. Because the market is not used, the information requirement is huge. This is not the case in enforcing a pre-existing plan. In fact, what the government needs to do is to simply take the plan and enforce it. One advantage of the dual-track approach is its minimal additional informational requirement as compared with other possible compensation schemes that may be used with other approaches to reform: It utilizes the existing information contained in the original plan, no new information is needed.

Third, as soon as enterprises are granted the autonomy to participate in the market, under either limited or full market liberalization, the focus of enforcement of the plan must by necessity shift to the plan-mandated inter-enterprise deliveries as opposed to total enterprise productions. Under central planning, if an enterprise fulfills the production target, it will most likely also fulfill the plan-mandated deliveries because there is no real incentive to do otherwise in the absence of a market track. In contrast, under the dual-track approach, an enterprise can fulfill its production target and yet at the same time fail to make any planned deliveries (e.g. by selling the entire production on the market track). Therefore, the focus of enforcement must be shifted from physical production to deliveries, with the consequence that complaints from planned delivery recipients, i.e., the rationed users, will become the most important source of information on plan compliance. Typically, enforcement actions will be undertaken only in response to complaints from the plan-mandated recipients of the planned output deliveries.

Fourth, it turns out that the rents of the economic agents under the pre-existing plan can be protected without the enforcement of physical deliveries.[10] Indeed, enforcement of physical delivery will result in inefficiency if the fully liberalized market equilibrium quantity is less than the plan

[10] For example, an enterprise which is entitled to receive 100 tons of steel at the plan price of 500 yuan a ton (when the market price is 2,000 yuan a ton) should be indifferent between the receipt of physical delivery of 100 tons of steel at the plan price or funds equivalent to the price differential between the market price and the plan price, that is, 100 times 1,500 yuan, or 150,000 yuan.

quantity. Physical deliveries are also difficult to enforce, unless the state actively monitors the inter-enterprise material flows of the plan individually, as opposed to passively reacting when delivery disputes arise, especially in cases when it may be in the interests of both the planned suppliers and the rationed users to evade the plan. In practice, the enforcement of the rights and obligations under the plan by the state is likely to be in terms of the transfers of the market values of the quota deliveries, that is, in terms of the rents that they generate. For example, at a dual-track equilibrium, it is possible for a planned supplier to fulfill its obligation by simply paying the rationed users of its quota output an amount equal to $(P^E - P^P_1)$ times the number of units of the output to be delivered under the plan, without necessarily physically delivering the goods. In principle, the rationed users can then purchase the goods in the market at price $P^E$ (the rationed users are also obligated to pay $P^P_1$ per unit for the quota deliveries). It is also possible for the planned supplier to purchase all or part of its delivery obligations from the market at $P^E$ and then re-deliver the goods to the rationed users at $P^P_1$. Thus, the plan-allocated delivery quotas can be viewed as the combination of a (put) option on the part of the planned suppliers to sell at price $P^P_1$ to the rationed users and a (call) option on the part of the rationed users to buy from the planned suppliers also at price $P^P_1$. Of course, the two options, since they are exercisable at the same price, cannot simultaneously have positive value.[11] Under full market liberalization, enforcement of the rights and obligations under the plan by the state amounts to enforcement of these options.

However, there are also reasons that may make enforcement of the plan track difficult. First, it is difficult, if not impossible, to enforce the allocation of consumer goods, especially when the plan price is greater than the market equilibrium price. For example, low-quality consumer goods may become unwanted once the market is open to non-planned suppliers. According to the logic of the dual-track approach, the rationed users who no longer purchase planned quantities at the plan price must compensate the planned suppliers to maintain the latter's rents. This is clearly more difficult to enforce

[11] The values of these options are precisely the "lumpsum transfers".

if the rationed users are consumers rather than producers. Enforcement is less of a problem if it concerns producer goods.

Second, compliance with the plan by economic agents depends on their expectations of the credibility of state enforcement. If state enforcement is not credible, then the economic agents will have no incentive to fulfill their obligations under the pre-existing plan. If anyone thinks that the plan-mandated deliveries at plan prices are not going to be received by him or her, he or she will not make the plan-mandated sales at the fixed plan prices either. Thus, if the overall belief or expectation is that there will not be effective enforcement, no one will comply, and dual-track liberalization reduces to single-track liberalization. Perceived credibility affects the behavior of both enterprises and households, and in particular their compliance with the pre-existing plan, post reform. If economic agents do not fulfill their obligations under the pre-existing plan, then it is no longer possible to assure that there are no losers.[12]

In general, multiple equilibria (outcomes) are possible under a dual-track approach, depending on the expectations of the credibility of state enforcement. If everyone thinks that the state will be able to enforce effectively, everyone will comply, then reform without losers can be achieved. If everyone does not expect that there will be credible state enforcement, the dual-track approach will degenerate into the single-track approach. Thus, there can be multiple "rational expectations" (self-fulfilling) equilibria.

Profit and Utility Maximization

Our supply and demand curves are assumed to reflect the marginal costs of suppliers and the willingness to pay of users. Behind these supply and demand curves, the enterprises are assumed, implicitly, to be profit-maximizing, and the households are assumed, implicitly, to be utility-maximizing. In particular, enterprises and households must be given autonomy as well as incentives so that they do

[12] It has often been argued that a strong state is necessary in transition economies, on the grounds that since reform is necessarily unpopular, only a strong government can push it through. But in our model, the government must be effective enough here not so much to push through unpopular reform, but to carry out popular reform--reform that creates no losers, only winners.

maximize profits or utility, at least at the margin. Profit and utility maximization ensures, under full market liberalization, that the actual suppliers have the lowest marginal costs and the actual users have the highest willingness to pay. If profit and utility maximization does not hold, then efficiency cannot be guaranteed.

Full Liberalization of the Market Track

An important difference between our work and those of Byrd (1989) and others on the dual-track liberalization is our distinction between limited and full market liberalization and our emphasis on the latter. Under limited market liberalization, market resales of plan-allocated goods, subcontracting of plan-mandated deliveries, and market purchases for redeliveries under the plan are not permitted. This prohibition effectively segregates the plan track from the market track. Thus, some inefficient suppliers will be forced to continue delivery and not all goods will be used by users with the highest willingness to pay. Hence, full economic efficiency cannot in general be achieved under limited market liberalization. Only under full market liberalization where market resales, subcontracting, and market purchases for redelivery are all allowed, does full economic efficiency obtain.[13] In such a case, in our partial equilibrium framework, the equilibrium is not distinguishable from single-track liberalization; only the distribution of rents is different.[14]

Nevertheless, a dual-track approach with limited market liberalization is itself Pareto-improving and efficiency-enhancing, even though it does not in general achieve full economic efficiency. A question may be raised as to whether one can preserve the property of simultaneous Pareto-improvement

[13] Full liberalization may not be desirable from an efficiency point of view if SOEs have soft budget constraints. On the basis of standard second-best arguments, some restrictions on the participation of the SOEs in the market track may be beneficial. However, soft budget constraints have the greatest impact on decisions concerning new investments, which are not considered in our model.

[14] However, in a general equilibrium framework, an equilibrium under a fully liberalized dual-track approach is generally not the same as that under a single-track approach because of differences in the distribution of income (see Lau, Qian, and Roland (1997)).

and efficiency by liberalizing sequentially: the first stage implements limited market liberalization, and then the second stage implements full market liberalization. The answer is in general no. In the first stage going from a centrally planned economy to dual tracks with a limited market track, Pareto-improvement is clearly attained, but full economic efficiency cannot be guaranteed. In the second stage when full liberalization is introduced, compared with the terminal point of the first stage, the reform is still Pareto-improving for agents within the plan, but is not necessarily Pareto-improving for agents outside the plan, although efficiency is attained.[15] Nevertheless, it is also clear that at the end of this sequential process, no one is worse off and someone is better off than he or she is under the centrally planned economy, that is, there are no losers relative to the status quo before the reform.

## 4. Applicability of the Model to the Chinese Economy

The applicability of our theoretical model depends on many factors that may vary from market to market and from country to country. In this section we examine whether the conditions for the applicability of our model are fulfilled by China during its transition to market.[16]

First, in China, the ex ante feasibility of the original plan has never been an issue.

Second, the credibility of continued enforcement of the rights and obligations under the plan also seems not an issue in China.[17] Evidence of the credibility of continued enforcement is provided by the actual volume of transactions at plan prices, which, as we shall show in section 5, remains large in absolute terms after a decade of reform. Moreover, it is also clear that until recently, SOEs in China

[15] By the same argument, if there are black marketeers before the reform, they are likely to be made worse off by full market liberalization.

[16] The closed economy condition is satisfied by China for the following reasons. The Chinese economy was gradually opened to the rest of the world in ways that minimize the disruptions to its pre-existing plan through many "insulation" methods: the establishment of new special economic zones; promotion of materials processing, and export requirements on foreign direct investment.

[17] In contrast, the collapse of the Council for Mutual Economic Assistance (CMEA) and the breakup of the Soviet Union made the cross-country planned deliveries in Eastern Europe and the former Soviet Union under the original plans unenforceable, even if they were feasible.

cannot lay off their pre-existing workers, nor can their pre-existing workers leave the enterprises without permission, which provides an example of the effective enforcement of the plan.

With regard to consumer goods in the plan, it turns out that for China, almost all of them (cloth, grain, meat, oil, housing, etc.) were in excess demand at the beginning of the reform, thus they were not subject to the problem of the fully liberalized market price being less than the plan price. This may be due, in part, to the relatively simple and undifferentiated consumer demand, reflecting the low level of real income of the Chinese consumers at the time.

Third, the dual-track approach in China was introduced simultaneously with the "contract responsibility system," which provides first farm households (in 1979) and then urban enterprises and households (in 1984) with both autonomy and incentives to participate in the market track. Essentially, the "contract responsibility system" permits the enterprises and households to retain all profits on the margin subject to fulfilling their responsibilities under the plan.

Finally, the Chinese experience in the product market is close to the case of full market liberalization because resales, sub-contracting, and purchases for redelivery were not prohibited. For example, farm households have been permitted to purchase grain or other output on the market to be redelivered to the state procurement agencies in fulfillment of their planned delivery quota since 1979. But China's experience in the non-famr labor market is different. In the 1980s, there was only limited liberalization of the market track in the labor market. Employers with plan-allocated workers were obligated to retain them at their pre-existing wage rates, and the market track applied only to new employment with the market wage rate set by the equilibrium of the residual labor supply and demand. It is only in the mid-1990s that China has begun to deal with the problems of labor reallocation and layoffs on a significant scale.

## 5. The Chinese Experience with Dual-Track Liberalization

In this section we examine the Chinese experience with dual-track liberalization in the product and labor markets. One implication from our analysis of the dual-track approach is that the quantity of a good delivered at the plan price by existing enterprises should not increase over time, similarly, the employment under the plan should be more or less stationary. But, at the same time, the total quantity and employment will rise due to the expansion of the market track, and thus the proportion of transactions at plan prices should decline over time and that the proportion of transactions at market prices should rise over time. On the other hand, the proportion of transactions at plan prices should not be zero either, because that would imply the disappearance of the plan track altogether—that in effect there has only been single-track, rather than dual-track, liberalization. These features can be seen from our data to be presented below.

### 5.1. Dual-Track Liberalization in Product Markets

#### Agricultural Goods

The agricultural reform undertaken in China in 1979 may be regarded as the first successful application of the dual-track approach. Under the reform, the commune is assigned the responsibility to (1) sell a fixed quantity of grain (or other) output to the state procurement agency as previously mandated under the plan at predetermined plan prices; (2) to receive a fixed quantity of inputs, principally chemical fertilizers, from state-owned suppliers, again at predetermined plan prices; and (3) to deliver a fixed quantity of grain (or other) output to the state as taxes. Subject to fulfilling these conditions, the commune is free to do whatever it wishes, e.g., it can produce whatever it considers more profitable, and sell any excess output on the free market, and retain any profit; in particular, it can purchase from the market for resale to the state grain (or other) output in fulfillment of its responsibility. As part of the reform, the commune then reassigns the collective responsibilities and rights to the individual farm

households, allocating to them their shares of the commune's land and capital and chemical fertilizers, and making them individually and directly responsible for the fulfillment of their shares of the delivery quota and taxes. Thus, there is both a plan track and a free market track, each with different prices for agricultural goods; however, the quantities of outputs and inputs under the plan track, as well as the plan prices for the outputs and inputs, are fixed.

Under the dual-track approach, neither the commune (and its members) nor the state can be worse off than before. The commune and its members are clearly no worse off because their obligations and rights are the same as under the plan, and they gain from the new autonomy. As long as the same plan quantities of grain and other outputs continue to be delivered to the state at plan prices, the state will continue to be able to supply the urban consumers with food grains and industries with agricultural raw materials at plan prices. The state is therefore no worse off, and the urban consumers and industrial enterprises are no worse off as a result of the dual-track agricultural reform. Thus, the impact of the liberalization at the margin is Pareto-improving for all parties.

In Table 1, we present data on the state procurement of domestically produced grains. It is clear that the grain procurement by the state (or planned supply by the farm households) has remained essentially fixed over time, despite an almost one-third increase in grain output over the decade 1978-1988. (The years 1983 and 1984 were anomalies as there were bumper harvests and the state made additional purchases over and above the mandatory delivery quotas, partly because the market price was below the plan procurement price). The data also demonstrate sufficiently effective enforcement by the state of the planned delivery obligations and the absence of any "ratcheting" of the plan quantities.

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Industrial Goods

The first use of dual prices in industry was introduced for crude oil in 1981, when the government allowed the export of above-quota crude oil at a higher price (p.58, *China Reform and Development Report, 1992-1993*). The dual-track system was extended to the entire industrial sector in 1984.[19] This reform represents, in part, an attempt to extend the successful agricultural experience to the state-owned industrial sector. Under the reform, the mandatory delivery quotas as well as the quantities of plan-allocated inputs for each enterprise were frozen at their then-existing levels, and the enterprises are free to produce whatever they deem profitable and sell their output on the free market and retain any profit as long as they fulfill their delivery quota (through market purchases for redelivery if necessary). At the same time, parallel free markets for the above-quota outputs of enterprises were introduced, while the within-quota outputs continued to be sold at the generally lower plan prices to authorized users. New enterprises not previously covered by the plan, e.g., township and village enterprises, are also permitted to participate in the market track.

Before the reform, 100% of industrial goods covered by the plan were bought and sold at plan prices. By 1990, the share of transactions at plan prices had fallen to approximately 45% (Table 3),[20] providing evidence of the relative decline of the planned supply versus market supply but also of the relatively effective enforcement by the state of the plan delivery obligations.

Table 3. The Dual Tracks in Industrial Goods Markets
(% of output value)

| | 1978 | 1985 | 1990 |
|---|---|---|---|
| Transactions at plan prices | 100.0 | 64.0 | 44.6 |
| Transactions at market prices | 0.0 | 36.0 | 55.4 |

Source: *China Reform and Development Report (1992-93)*, p.54, except data of 1985 from Xu Qingfei, *China's Economic System Reform*, p.292.

[19] There have been many studies on the dual-track price system in the Chinese industries (see, e.g., Byrd (1987), Wu and Zhao (1987), and Naughton (1995)).

[20] Unfortunately, the absolute values of these transactions are not given in the publications.

Consumer Goods

Prior to the economic reform of 1979, most essential consumer goods and services, such as grain, cooking oil, meat, electricity, housing, and monthly pass for mass transit, were rationed with ration coupons in the urban areas at lower than what would have been free market prices. With the introduction of dual-track full market liberalization, urban residents continued to be able to purchase grain, meat, electricity (lifeline rates), and housing (for those who had it) at the same pre-reform prices within the limits of the pre-reform rationed quantities, at the same time that they were able to purchase freely any quantity of any good at free market prices. They were thus no worse off than before. The state was also no worse off because the quantities of goods that it would be obligated to supply at the plan prices remained essentially the same. Because we do not have data on the total retail sales of goods covered by the plan, we present in Table 4 available data on the share of transactions at plan prices in such retail sales. It shows that the proportion of transactions at plan prices declined from 97% in 1978 to only 30% in 1990. It has continued to decline since 1990.

Table 4. The Dual Tracks in Retail Sales (% of sales)

| | 1978 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|
| Transactions at plan prices | 97.0 | 47.0 | 35.0 | 33.7 | 28.9 | 31.3 | 30.0 |
| Transactions at market prices | 3.0 | 53.0 | 65.0 | 66.3 | 71.1 | 69.7 | 70.0 |

Source: *China Reform and Development Report (1992-93)*, p.54.

5.2. Dual-Track Liberalization in the Labor Market

New Employment

China's labor market started with limited market liberalization since the beginning of the reform.

China's high saving (investment) rate provides the potential for the rapid creation of new jobs in the market track (i.e., the non-state sector) without privatization of the SOEs.[21] From Table 5 below, we find that, between 1978 and 1994, employment in the non-state sector increased by 318.8% (with the urban non-state sector increasing by 171.4% and the rural non-state sector by 426.4%), while employment in the state sector (including civil servants in government agencies and non-profit organizations) increased by only 50.5%.

Within the state sector, there are two tracks for its employees. Beginning in 1980, while pre-existing employees maintained their permanent employment status, most new hires in the state sector were made under the more flexible contract system (and often at lower wage rates through for example lower grades and absence of state-provided housing). A typical contract lasts for three years. One may consider these contract employees as being in the market track because they are paid close to market wage rates. Then employment in the plan track has been virtually stationary -- it went from 87.14 million in 1983, the eve of the introduction of economic reform in industry, to 83.61 million in 1994 (Table 5).[22]

Table 5. The Dual Tracks in Non-Farm Employment in the State and Non-state Sectors (million employees)

| | 1978 | 1983 | 1985 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|---|---|
| State | 74.51 | 87.71 | 89.90 | 99.84 | 101.08 | 103.46 | 106.64 | 108.89 | 109.20 | 112.14 |
| Permanent | 74.51 | 87.14 | 86.58 | 89.76 | 89.18 | 89.74 | 90.75 | 88.31 | 85.24 | 83.61 |
| Contract | 0.00 | 0.57 | 3.32 | 10.08 | 11.90 | 13.72 | 15.89 | 20.58 | 23.96 | 28.53 |
| Non-State | 48.90 | 62.10 | 107.97 | 138.28 | 136.49 | 152.53 | 159.49 | 172.28 | 195.87 | 204.85 |
| Urban | 20.63 | 29.75 | 38.18 | 42.83 | 42.82 | 43.84 | 46.04 | 47.41 | 50.45 | 56.01 |
| Rural | 28.27 | 32.35 | 69.79 | 95.45 | 93.67 | 108.69 | 113.45 | 124.87 | 145.42 | 148.84 |
| State Permanent/Total | 0.60 | 0.58 | 0.44 | 0.38 | 0.38 | 0.35 | 0.34 | 0.31 | 0.28 | 0.26 |

Source: *China Statistical Yearbook*, 1994 and 1995, pp. 84-85, 99.

[21] The experience in Taiwan and South Korea showed a similar pattern (Lau and Song (1992)).
[22] If, in addition, we exclude civil servants in government agencies, employment in the plan track would not have risen at all.

A similar dual-track scheme is applied to senior government bureaucrats. In the early 1980s, the old revolutionaries who joined the government in 1949 were allowed to keep their benefits and ranks and were not forced to retire. But for all new appointments in the government, there have been strict age limits--65 for ministers or provincial governors, 60 for vice ministers or vice provincial governors, and 55 for bureau directors. There are also term limits as well--two 3- or 5-year terms. Mandatory retirement has also been imposed.

Labor Reallocation and Layoffs

Mass labor furloughing and reallocation by SOEs, which are essential for full market liberalization, have become a major nationwide phenomenon since 1994. The director of the State Statistical Bureau reported in April of 1997 that approximately 10 million factory workers lost their jobs in 1996 (*China Daily*, April 5, 1997). But these furloughed workers are compensated. There are two basic schemes to protect the pre-existing rents of the furloughed workers, known as *xiagang* ("stepping down from one's post") and *zaijiuye* ("reemployment").

*Xiagang* workers are individuals "who left enterprises for home due to poor performance of enterprises but still maintained some nominal relationship with their enterprises,"—and they continue to receive a partial salary, housing, health care, and other benefits from their enterprises as before (Song, 1997). In practice, the most valuable compensation is the housing provided by the enterprises. Therefore, *xiagang* is an important mechanism to preserve the pre-existing rents of the furloughed workers of the SOEs. The total number of *xiagang* workers at the end of 1996 was estimated as 8.91 million (Song, 1997).

Second, the government also established many projects for *zaijiuye* to train furloughed and laid-off workers and help them find new jobs in the non-state sector. Shanghai, for example, established two "reemployment service centers" in 1996 for the *xiagang* workers in the textile and measurement instrument industries respectively. These two centers are responsible for re-training these workers. A

total of approximately 115,000 laid-off workers joined the two centers, out of which approximately 58,000 found jobs by the end of 1996 (Shi, 1997). At the national level, by the end of 1996, out of the 8.91 million *xiagang* workers, 3.57 million had found jobs, 2.34 million had decided to stay home and were not looking for jobs, and 3 million were still looking for jobs (Song, 1997).

The origin of these schemes can be traced back to small-scale experiments on labor reallocation in 1980s. During that period, a small number of state employees left the SOEs for employment in special economic zones or foreign companies under a variety of schemes such as "stopping the salary and keeping the position" (*tingxin liuzhi*). These schemes allowed them to continue to enjoy partial benefits from the state sector, and/or preserve the option of returning to it later. These schemes reduced, for employees of the SOEs, the costs of joining the riskier non-state sector and thus enabled some efficiency-enhancing labor reallocation, at a time when the compensation in the state sector was higher than the free market.

Although the interests of furloughed and laid-off workers in the SOEs are protected, workers outside the state sector, say, migrant workers from rural areas, may suffer as a result of fully liberalizing the market track because the market equilibrium wage rate is lowered.

## 6. Concluding Remarks

With the plan track protecting the pre-existing rents, the dual-track approach achieves Pareto-improvement under either limited or full market liberalization. Moreover, it achieves efficiency under full market liberalization. Thus, the dual-track approach can preserve political and social stability at the same time it fosters economic reform, provided the set of conditions for its success, identified in the paper, are met. In practice, the dual-track approach to transition has played an important role in Chinese economic reform, and we have illustrated it with examples from Chinese product and labor markets.

In closing, we raise some questions for future research. Our tables in section 5 show the gradually declining trend of the plan track throughout the 1980s, providing evidence that, ex post, there is

no "ratcheting up" of the plan. Moreover, recent data reveal that the plan track in product markets has been largely "phased out" between 1990 and 1996. By 1996, the plan track was reduced to 16.6% in agricultural goods, 14.7% in industrial producer goods, and only 7.2% in total retail sales of consumer goods (People's Daily, August 22, 1997). However, this phasing-out of the plan track was generally accompanied by compensation. In practice, two principal methods were used for compensation during a phase-out. The first method is "monetization", such as in the case of most consumer goods. For example, when grain ration coupons for urban residents were abolished in the 1990s, they were compensated by a certain amount of cash for a specified number of years. The second method is "capitalization", such as selling state-provided housing at a deep discount to existing occupants who are beneficiaries of the existing low plan rental rates.

These observations raise issues concerning why the implicit commitment on the part of the state of no policy change that may adversely affect the interests of the enterprises and households, for example, in the forms of no ratcheting-up or no phasing-out without compensation, is credible. If the commitment is not credible, either the property of Pareto-improvement is lost, and/or the economic agents would have diminished incentives to participate the market, resulting possibly in inefficiency. In China, industrial enterprises may have found the no ratcheting-up credible through the earlier successful experience of dual-track reform in agriculture. Also, in China, rapid economic growth, by diminishing the relative importance of the plan track, which is fixed in terms of quantities, may have facilitated the eventual phasing-out of the plan track (Naughton (1995), for example, has emphasized "growing out of the plan"). With rapid growth, the plan track becomes, in no time, a matter of little consequence to most potential losers, which in turn reduces the cost required for compensating them. These questions are beyond the scope of our current paper because our model is essentially static and does not address the issues of investment and capacity expansion both within and outside of the plan. They will be pursued in our future research.

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