APPLICATION OF MARKET ANTI-INFLATION PLANS IN THE TRANSITION TO A MARKET ECONOMY

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In 1938 Abba Lerner left Berkeley in a Model T, and drove down to Mexico City to meet Leon Trotsky and convince him of the beauty of market socialism. He spent two days with Trotsky but did not convince him of market socialism's virtues [Lerner, 1938]. He nonetheless continued to work on market socialism and to develop policies that would meet society's needs while maintaining the underlying goals of socialism. He asked "How can markets be made to serve society?" not "How can society serve markets?"

One of Lerner's most original proposals for using markets was his market anti-inflation plan (MAP).[1] This plan was designed to stop inflation and prevent future inflation. A fixed number of MAP credits would be issued to firms to raise their prices. Although the total amount of MAP credits in the economy was fixed at a level corresponding to the total amount of value added in the economy, thus stopping inflation, they could be traded, allowing individual firms to set their own prices. They only needed to be in compliance with the MAP rules.

While MAP and related market incentive plans were originally devised to solve macroeconomic problems of market economies, they can also be used by the former socialist economies as they move to a market economy. For market economies, these plans create additional markets to solve aggregate-level problems. For formerly socialist economies, these plans would allow an orderly transition to a market economy. MAP would allow governments to reestablish aggregate-level control via incentives, control that all of the former socialist economies have lost as their economies have spiraled into depression. MAP is also flexible and can be implemented in stages. Starting with resources that are currently centrally allocated, MAP can be implemented in individual sectors. Over time, the sectors can be broadened, allowing more flexibility and less central control.

Although we believe that MAP can contribute to a smoother transition from central planning to a market economy, we do not claim that MAP would solve all of the transition problems. But, under MAP economic agents can be given more freedom to establish market clearing prices without the threat of serious inflation. For this to succeed, other macroeconomic programs to control aggregate nominal demand also must be in place. Monetary overhang must be eliminated and budget deficits must be within manageable limits. But, given the monopolistic structure of industry in the former socialist economies, these macroeconomic policies alone are not enough to prevent inflation, assure a tolerable level of unemployment, or give assurance that the economic outcomes will be fair.

The next section provides an overview of the problems of transition and their relationship to market incentive plans followed by a description of how a market incentive plan for controlling prices can help solve problems currently faced by ex-socialist economies. The third section describes how a market incentive plan which constrains quantities can assist in the transition to a market system. The fourth section describes the problems caused by excess aggregate demand. The final section discusses how political and bureaucratic support can be developed for market-oriented policies.

TRANSITION PROBLEMS AND MARKET INCENTIVE POLICY SOLUTIONS

The current wave of restructuring former socialist economies in Eastern Europe, the former Soviet Union and China, has emphasized three fundamental problems in traditional command economies. First, there were widespread shortages of goods, particularly consumer goods. Second, the quality of goods has been very low. Third, relative scarcities and values of goods are unknown and cannot be determined by the system. The result is too much of some goods and too little of others. Central to these problems is the absence of a price system that informs agents about scarcities and provides appropriate incentives.

One response to the dilemmas of economic transition is to restructure the economy more swiftly. But can competition (either from foreign or domestic sources) be established quickly enough so that reasonable price signals will emerge? Perhaps firms will largely set monopoly prices, causing inflation and unemployment. Can firm managers be trained in such a short time to understand how to respond to market signals and shift resources in appropriate directions? If vestiges of the old system are still present, will prices be the most important signals that managers should follow? Where everything is changing at once, can financial markets, operated by inexperienced decision makers, be expected to allocate credit to its highest valued use?

The alternative course is to recognize that economic transitions take time and to design mechanisms that can function in this hybrid world. But free market institutions barely exist, and they take time to be created. Immediately freeing prices is highly disruptive and inflationary as recent experience has proved. For

markets to operate effectively, competitive producers must exist. Since these economies are largely composed of monopoly firms, freedom to set prices is effectively freedom to extract monopoly rents.[2] Even in more competitive environments, decision makers lack price setting experience. Prices tend to be very volatile and provide little guidance.

We propose that constrained market prices should be established first at the consumer retail level (as has largely been done now) and that similar flexibility then be granted gradually to upstream producers. The first stage may not generate efficient resource allocation. Since the underlying cost structure would still be distorted by inappropriate prices of raw materials and intermediate goods, first stage prices would not be scarcity prices. Still, there would be important gains. The end of rationing would save resources presently expended standing in lines.[3] Poor quality goods which had been warehoused will be sold at lower prices, reducing storage costs and putting these goods to use. Furthermore, this would encourage consumer good enterprises to develop marketing skills, which, as Hewett [1990] points out, must be developed through learning-by-doing.

Throughout the economies in transition, freeing consumer goods prices has unleashed substantial inflation. Here MAP can play an important role. MAP provides a market-compatible means of controlling inflation directly. It limits monopolists' ability to exploit their market power and creates incentives to increase revenues by increasing output rather than by raising price. MAP also encourages quality improvement as a way of increasing revenue (the increased inputs required for higher quality allow firms to raise prices).

MAP will work for an economy so long as it does not suffer from universal shortage. While some sectors in a post-socialist economy may be in shortage, the general experience is that most are in surplus.[4] The price *level* can be maintained if enough prices fall while others are allowed to rise. The MAP system exploits this fact. MAP keeps the *average* markup constant by controlling the level of value added, while allowing firms to adjust individual prices. Under MAP, an individual firm can raise the price of goods in short supply as long as it reduces the price of currently "unsalable" goods. Firms with unsalable products can create MAP credit rights by lowering prices. Firms with products in shortage can raise prices, as long as they buy MAP credits from firms which have lowered their prices. As the price of goods in short supply rises, the shortages should diminish, and as the price of surplus goods falls, surpluses will be reduced.[5] Meanwhile, the overall price level can be controlled. And the transfer of funds from firms increasing prices to firms lowering prices will reduce any windfall gains or losses caused by the movement to market prices. Finally, as the amount of "surplus" or wasted goods is reduced, the effective amount of output that consumers actually purchase and use will increase.

One major change from the formerly socialist enterprise rules *is* required. Enterprises must have as their objective a net surplus concept like profits or revenue minus costs of purchased intermediate goods.[6] In this initial regime, state enterprises and private firms could be placed in the same situation. It appears that most Eastern European state enterprises are now in this situation. To raise their

prices, both would be required to purchase sufficient MAP credits. Both would be faced with "hard" budget constraints. Failure to make sufficient profits would mean that the unit would not survive.[7] Bureaucratic control thus can be abandoned and replaced by the much smaller requirements of policing the MAP system.

Since MAP implementation does not depend on whether enterprises are state or privately owned, MAP can be used throughout the transition period from state ownership to private property. Under either regime, the requirement to purchase MAP credits makes it more difficult for enterprises with monopoly power to fully exploit their position.

Many doubts about market-based incentive systems in *market* economies are based on the absence of information or organizations that could operate these systems. Here the formerly socialist systems have an important advantage: the relevant information and organizations already exist. To implement a price MAP (specifically the value-added input price MAP that Lerner and Colander developed), the managers of MAP will need information on enterprise sales revenues, purchased inputs, and the values of labor and capital used in the enterprise.[8] For a quantity incentive system, planners need information on firm outputs, with fairly detailed information on the description of those outputs. Most of this information is still being collected by the government during the transition (for example, in Russia), so large changes in structure or general policy outlook would not be required.

Further reduction in bureaucratic costs is possible if MAP is required only for large enterprises, as recommended in proposals for implementing MAP in capitalist economies. Given the high concentration of industrial output in large enterprises in the former socialist economies, a MAP limited to large enterprises would be even more effective in a socialist economy than in a capitalist economy.

THE PRINCIPLES OF MARKET INCENTIVE PLANS

We shall discuss two types of market incentive plans: first, an anti-inflation incentive plan, (Lerner and Colander's MAP), and second, plans that create markets assuring a fixed level of aggregate output. This second type of plan determines the desired quantity of a general category of good. A market in rights then assures efficient output.

Markets are a method of rationing; they allocate scarce resources, goods, or rights. A market incentive plan uses markets by creating new forms of property rights to be traded by individuals. The total amount is constrained, while individuals may choose how much of the right to hold through the sale or purchase of rights. The planner chooses the desired quantity of rights, and efficient allocation is assured by the market in these rights.[9]

Under such market-based incentive systems, an overall target is chosen. The target could be a stable price level, or a particular level of overall output — the full-employment level of output for the economy, or desired output for a particular sector.

FIGURE 1
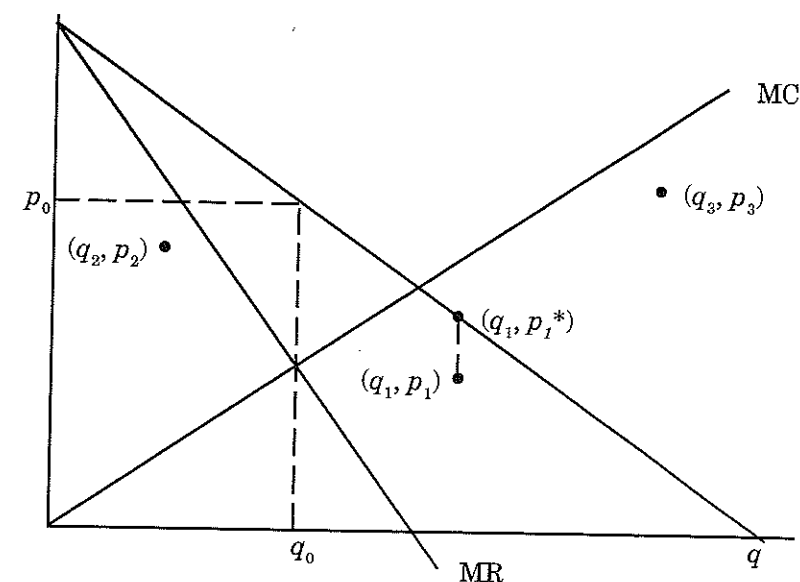
Once the overall target is determined, individual enterprises are allocated shares of that total. However, they are free to diverge from their allocation if another firm will make up the difference. This is achieved by a system of marketable allocations which can be traded among firms. Under the constant-price-level constraint, one firm can increase the price of its output if another firm will reduce the price of its output by an amount that keeps the aggregate price level constant. To assure this, price changes must be defined as the price change times quantity, net of changes in the price of inputs purchased from other firms.[10] The price at which allocations are bought and sold is a market or bargained price determined by the firms that choose to trade. When there are many firms trading identical rights, the market should be workably competitive.[11]

While MAP was designed as an economy-wide mechanism, a similar system can also be applied to a subset of the economy to keep that sector's price level constant. For example, if there are several types of television sets, a television-set price level can be maintained while allowing adjustments in the individual prices of different designs. The system can also be applied to individual multiproduct enterprises, allowing them to raise prices on goods in high demand and to lower prices on goods in low demand.[12]

The general MAP principle can be illustrated with some cases of enterprises freed from price controls. We focus first on enterprises producing consumer goods. If enterprises are profit maximizers with market power, they will face downward-sloping demand curves as in Figure 1. In the absence of controls large enterprises with monopoly positions will be able to charge monopoly prices and reap monopoly rents. Since the price and quantity established under planning is rather arbitrary,

the initial price and quantity could be anywhere in Figure 1. For instance, if the initial point is (q_1, p_1), price is below the monopoly price and output is above the monopoly output. In these circumstances an unconstrained profit-maximizing enterprise will raise price and reduce output. On the other hand, if (q_2, p_2) represents the initial price and quantity, price will still rise, but quantity will rise instead of falling. Under present arrangements, these two cases might be hard to distinguish from one another since both exhibit excess demand at centrally-planned prices. Finally, (q_0, p_0) shows monopoly pricing, which has become prevalent in the formerly socialist countries.

Another possibility is a point like (q_3, p_3) which depicts excess supply. This case represents situations in which warehouses are full of unsalable, poor quality products. Here unconstrained pricing would permit firms to lower their prices. In this instance, price and quantity would both fall in the monopoly case.

By creating a market in MAP credits, enterprises are encouraged to produce more and sell at a lower price than they would in the absence of MAP. To see this, assume we have linear demand and quadratic cost functions. Equation (1) describes demand and equation (2) describes cost.

$$(1) \qquad\qquad p = \alpha - \beta q$$

$$(2) \qquad\qquad C = (w / \delta) \, q^2$$

where q is output; w is the wage rate and δ is a constant coefficient. A profit maximizing firm will maximize the difference between revenues and costs as illustrated in Figure 1. With MAP the firm must purchase MAP credits if it wishes to increase price. On the other hand, an enterprise can gain revenue from selling MAP credits if prices are reduced. The function the enterprise will maximize is therefore

$$(3) \qquad\qquad pq - C - \phi R$$

where ϕ is the price of MAP credits established in a free trading market, and R is the number of credits the enterprise purchases or sells.
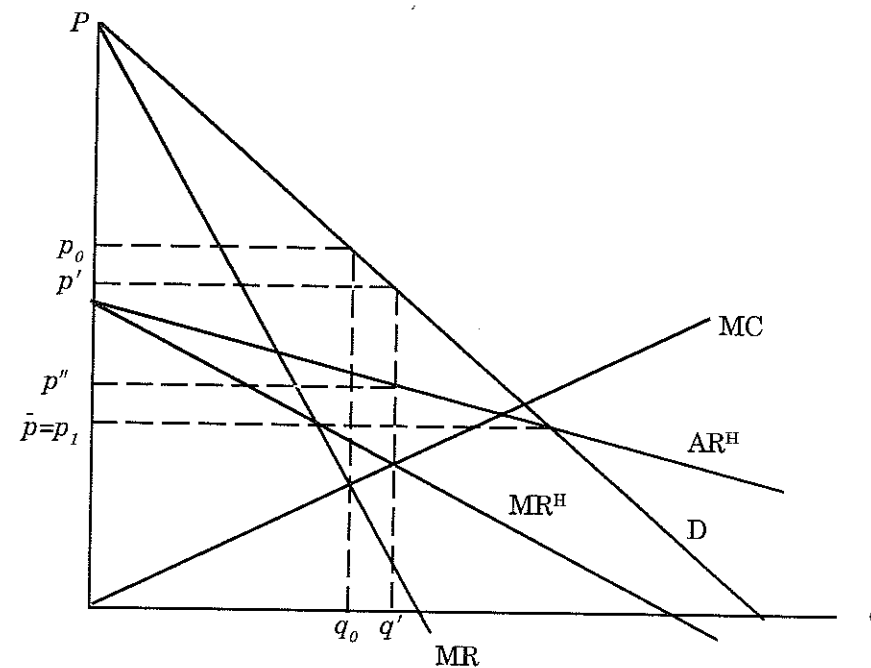
How the enterprise will respond to the imposition of MAP depends on the definition of credits. Value added is reasonably easy to measure. A close approximation of value added would be a system which defined MAP credits by

$$(4) \qquad\qquad pq - \bar{p}q$$

where $\bar{p}$ is an initial price level. Under this definition the average revenue function for the enterprise would be

$$(5) \qquad\qquad [1 - \phi] \, p + \phi \bar{p}.$$

FIGURE 2

To the enterprise this will appear as a rotation of its average revenue curve around $\bar{p}$. It will be as if the monopolist's demand curve were suddenly flatter. Figure 2 illustrates this, where $\bar{p}$ is taken to be p_1 in Figure 1. With the new average revenue curve, the enterprise will choose to produce q' and charged a price p'. But since raising the price from p_1 to p' is permitted only if the enterprise purchases $(p' - p_1)q'$ MAP credits, the average revenues collected by the enterprise will only be p''.[13]

The higher is the MAP price ϕ, the flatter the average revenue function will appear. If insufficient MAP credits are available in the system, ϕ will be driven to 1, and the system will function as if there were absolute price controls. It is important, therefore, that there be sufficient MAP credits in the system. Some of these credits will be made available from enterprises that wish to lower their prices — i.e., enterprises that start at points like (q_3, p_3) in Figure 1.[14] By monitoring the MAP credit price, central authorities can judge aggregate demand pressure. If MAP is being used to constrain prices in a limited sector of the economy, a high MAP credit price indicates that there is excess demand for products in that sector. Either more resources need to be devoted to production of goods in that sector or sector prices should be allowed to rise. By allocating more credits to enterprises, the sectoral price level can be allowed to rise and reasonable relative prices can be established without excessive inflation. If MAP is used to control the economy-wide price level, aggregate demand can be constrained by monetary and fiscal policies, or additional credits can be allocated. In this latter case the MAP price becomes a signal of monetary and fiscal tightness.

This analysis illustrates how MAP operates if enterprises are free to vary their output as well as their prices. Under central planning, enterprises were prevented from changing either. During the early stages of a transition, there should be advantages in constraining output adjustments since this will be less disruptive to the other enterprises.[15] MAP also can assist in establishing market clearing prices in a regime where output levels are fixed. An enterprise at point (q_1, p_1) in Figure 1 could raise its price to p_1^* as long as it was able to purchase enough MAP credits from such enterprises as the one at (q_3, p_3) which would reduce prices. The overall price level would not change. Society gains since queuing is reduced and resources are saved as people are no longer standing in line.[16]

Greater gains are possible if the enterprise can adjust the output mix. The relaxation of the output constraint encourages a more appropriate mix of goods even though the price level is controlled. If the enterprise is producing consumer goods and inputs can be shifted from the production of one good to another, any central allocations are not affected. Yet if the demand curves represent true valuations, the new mix of goods will be preferred by consumers.

MAP may be more important at the producer goods level than at the retail level. Because of the concentration of large enterprises at the intermediate good level in former socialist countries, the threat of higher (monopoly) prices is greater. On the other hand, implementing "hard" budget constraints is more difficult because the firms are larger and entry of new firms will be much more difficult.

Markets for producer goods are substantially different from consumer goods markets and require somewhat different treatment. Such enterprises could have great difficulty adjusting to drastic changes in input prices and could find themselves unable to operate profitably. An example can illustrate the problem. Consider an enterprise using large amounts of natural gas provided by a single natural gas pipeline. The enterprise produces a single output and makes a moderate profit. When the natural gas enterprise is allowed to adjust prices, the price to the pipeline enterprise rises substantially. The natural gas enterprise makes a high profit while the pipeline user becomes unprofitable and goes out of business. This could occur even though this enterprise would survive under a fully rational pricing system. While MAP cannot prevent inappropriate bankruptcies from occurring during the transition, more moderate adjustments of input prices should reduce the number of such events.

Another difference between consumer goods markets and producer goods markets is that producer goods markets involve much more complex contractual agreements. Developing producer's goods markets will require a very extensive set of new legal and contractual arrangements.[17] The initial experience gained by decontrolling consumer markets first should provide a basis upon which these new legal requirements can be designed.

As the economy evolves from a centrally planned system to a system of markets controlled by MAP, natural resource production will require special rules. A free market in the exploration and development of natural resources requires that private property rights to these resources be suitably defined. This may be difficult

to do at first. In addition, raw materials industries (coal, oil, minerals, electricity) fit poorly into a general MAP, since in most economies they cannot expand freely. This leads to the possibility of extremely high prices, as has occurred in Russia in 1992 [*Financial Times*, 16 July 1992, 3].[18] These industries probably should remain under government control for some time. However, their prices must be included in the overall MAP price level to assure overall price-level stability.

The real advantages of moving to a market system will appear as enterprises gain flexibility in choosing inputs and varying output. Such changes will invariably cause some disruption, and unemployment will rise as a result. But if the restructuring is carried out in stages as proposed here, the disruption will be moderated. By maintaining production in upstream enterprises that continue to be centrally planned, higher levels of employment can be sustained. Some enterprises still will be inefficient, but they will be weeded out over time as more and more of the economy is marketized.

MAP plays a central role in this process. Relative prices, critical signals to economic agents in a market system, are obscured when inflation is high or there is great price volatility. A problem in any market system, it is much more serious during this transition. Under reasonably stable production conditions enterprises make fairly modest changes in their production strategies from period to period, but during a transition, output changes are very dramatic. If inflation obscures relative price signals, seriously inappropriate allocation decisions can be made. By controlling inflation, MAP helps economic agents see the true relative prices.

Some objections to market incentive systems in *market* economies are based on the absence of information or organizations that could operate these systems. To implement a price MAP (specifically Lerner and Colander's value-added input price MAP), information on enterprise sales revenues, purchased inputs, and values of labor and capital used in the enterprise will be needed.[19] Most of this information is presently collected, so no major changes in structure or policy would be needed.

Further reductions in bureaucratic costs are possible if MAP is used only with large enterprises, as proposals for implementing MAP in capitalist economies recommend. Given the greater concentration of industrial output in large enterprises in socialist economies, a MAP limited to large enterprises would be even more effective in a socialist economy.

MAP SYSTEMS FOR QUANTITIES

Market incentive systems that allocate a fixed level of *output* also have been explored to solve the problem of output that is too low or unstable [Koford, Miller and Colander, 1988]. In general, a desired quantity of aggregate output is chosen and then enterprises can choose the preferred distribution of particular goods. (They can be combined with MAP to assure a stable price level as well.) For formerly socialist economies, these "quantity" incentive plans provide a direct route to freeing enterprises to choose the best output mix in a sector of the economy, thus extending market forces while avoiding dramatic changes in the overall output of the sector.

They could also be used for an individual enterprise, which would be required to meet a fixed aggregate output level target, and could then choose the allocation of that output level across individual goods.

Output allocation systems allow flexible adjustment of individual outputs subject to an overall quota. For example, an enterprise might be required to produce 10,000 tractors, but have the right to choose among different models. Suppose low-quality tractors sell for 5,000 rubles and high-quality tractors sell for 7,500 rubles. (These are 1991 rubles; it is hard to say what these values will be by the end of 1993.) With those prices, a high-quality tractor should be counted as 1.5 low-quality tractors in total value. If originally the enterprise had produced 8,500 low-quality and 1,000 high-quality tractors, it would now be able to meet the quota with, for example, 7,000 low-quality and 2,000 high-quality tractors. (A similar example might be a refinery's mix of heating oil and gasoline, which has been a matter of importance in Eastern Europe.)

An enterprise's adjustment toward higher quality represents a real increase in social efficiency when the output prices represent the real value of the output. However, if the output prices are arbitrarily constrained — for example, low prices for high-quality output — the enterprise's adjustment could be in an undesirable direction. Thus, the output prices should be adjustable, for example under the MAP process, before enterprises are given a full choice of outputs.

Traditional socialist planning has strong similarities to a tax-subsidy version of a quantity-setting policy. That is, enterprises faced "state orders" or fixed quantities that they were supposed to produce; if they produced more, they received a bonus, and if they produced less, a penalty.[20] Thus, a natural way to free up a socialist system is to retain overall quantity and price-level targets, but to allow enterprises to choose outputs of individual goods, and prices consistent with the overall targets. The enterprises in some moderately broad (sectoral) categories then could trade quota units among each other, depending on their relative demands, but again assuring that the overall target is achieved. Furthermore, the prices at which quota units trade would indicate overall scarcities in the production category, while the final-goods prices would indicate the relative values consumers place on alternative goods. These two types of price signals tell planners where output targets should be increased, where overall prices are too high or too low, and where increased resources should be provided.

The previous example, interpreted as two tractor enterprises, can illustrate these points. One enterprise has a quota to produce 8,500 low-quality tractors valued at 5,000 rubles, and the other enterprise has a quota to produce 1,000 high-quality tractors valued at 7,500 rubles. (We presume that society demands this proportion of tractors at these prices.) The bonus scheme gives 10 percent of the excess value for overfulfilling the quota, a 10 percent penalty for underfulfilling the quota, and a 100,000 ruble bonus for fulfilling the quota.[21] Now, suppose that the first enterprise is unable to fulfill its quota and produces only 7,000 low-quality tractors. It will pay a penalty of 1,500 * 500 + 100,000 = 850,000 rubles. But the second enterprise, we further suppose, is able to overfulfill its quota and produces

2,000 high-quality tractors, earning a bonus of 1,000 * 750 = 750,000 rubles. Under a market allocation scheme, the first enterprise could compensate the second enterprise for fulfilling the first enterprise's quota; the overall quota would be satisfied, and the 100,000 ruble bonus would be saved. A mutually agreed price might be 20 percent of the value saved, or 20,000 rubles. In addition, the combination of firms can satisfy society's demands that could not be achieved separately.

Now, consider a case in which there are separate output quotas for tractors and trucks, and markets in these allocations. If the price of allocations for trucks is 20 percent of value and for tractors is 10 percent of value, it indicates that scarcities are greater in truck production.[22] Assuming all trucks and tractors are being sold, productive resources should be increased in the truck production sector. (If not all tractors are being sold, either the allocation should be reduced or the price of tractors should be reduced, or both, until demand equals supply. If tractor plants can also produce trucks, the quota could be made broader to cover trucks and tractors.)

While most prices and quantities have been freed in all Eastern European countries and in most republics of the former Soviet Union, in practice many industrial prices and quantitites are not really freed. Enterprises often continue with the old contracts, or find themselves under pressure to uphold existing conventions. In cases where the old contracts end, a complete breakdown of production is common. A monopoly may face a monopsonist, as in a process steam plant facing a PVC plant, or payment on a long-term contract may not be possible given the absence of Western banking. Thus, quantity guidance remains an important means to keep output from collapsing in the former communist countries.

THE PROBLEM OF EXCESS AGGREGATE DEMAND

The largest problem that a MAP system could face is excess aggregate demand. Aggregate demand could exceed supply capacity if wage incomes increase too rapidly or if banks and other enterprises extend credit until there is serious excess demand for goods (as was true in the former Soviet Union [Desai, 1989], and is rumored to be occurring in Eastern Europe).[23] Such policies could push up the price of MAP credits to such high levels that the MAP system could not take the strain. Black markets would then develop as wholesale evasion of the regulations occurred. The problem is to set a reasonable level of pressure — one lower than seen under communism, but higher than seen currently in Eastern Europe.

Formerly socialist economies need tools to determine the right amount of "pressure". Market economies use monetary policy, counting indirect effects on individual agents to determine the level of aggregate real output and the efficient level of unemployment of resources. The socialist economies in transition need to develop their monetary and credit control, but a full transition is not easy, as China's experience over the past few years shows.[24] These economies must therefore use other tools, including tax and fiscal policy, privatization, and the determination of targets, to help determine aggregate demand.

Fortunately, market price incentive mechanisms can help assure the proper level of aggregate pressure or demand. The value of credits traded under the market incentive system indicates the amount of pressure on the system. (The credits would trade at a price of zero in a purely competitive market economy with no pressure.) Estimates of the proper level of pressure in a private-economy MAP system give credit values of 2-6 percent of value added [Koford, 1986]. Higher levels would be appropriate for a formerly socialist economy, since there is more monopoly power and more concern about unemployment. Increases in the prices of credits signal rising pressure, which the government would control by reducing targets, raising taxes, reducing bank credit, or reducing spending.

In a more sophisticated market incentive system (perhaps implemented at a later stage), credits could be tradeable not only in the current period, but for future periods as well — several years into the future. Thus, enterprises' expectation of excessive future pressure would be evident before it occurred. The banking and credit system, and ministries setting output targets, must be sensitive to this evidence. They could state a policy rule relaxing quantitative targets if credit prices rose excessively. Similar bank credit rules would raise interest rates and reduce credit expansion when excessive demand occurred.

CONCLUSION

In any transition program the public needs proof that the reforms are bringing real benefits. This means starting with reforms that bring immediate improvements. By starting with the consumer sector, price adjustments should increase the quantity, availability and quality of goods and services — benefitting consumers immediately and directly. If aggregate demand is adequately controlled, MAP will make it possible for this adjustment to occur without serious inflation. If the transition occurs in an orderly fashion, the unemployment associated with the transition can be reduced.

The success of any new program of such sweeping change requires cooperation by the government and the public. If bureaucrats are opposed, the rules will work poorly. Since the program threatens those bureaucrats who presently control the economic levers, a new agency to monitor the MAP system is needed. As the use of markets is expanded, the old central planning bureaucracy must be abandoned. The new MAP agency can be recruited from the old bureaucracy, but since it will be much smaller, only the best candidates can be selected. To the extent possible, the agency should draw people who have no previous association with the areas which they will monitor, reducing attempts to impede the reform.

There is a price for this more controlled movement to market arrangements. Inefficiencies will remain for long periods. However, given the serious economic problems that have been created by the reforms of recent years, visible improvements still should be apparent soon. The proposal outlined here attempts to minimize disruption. With existing institutional arrangements, time is required to adjust production capacity to meet new social objectives. The key is to move

relentlessly towards these new objectives by establishing reasonable intermediate objectives and at the same time generating informational channels that signal where further progress can be made.

NOTES

1. The original proposal is described in Lerner and Colander [1980], while Colander [1986] contains descriptions of anti-inflation incentive plans in general.
2. Frydman, Wellisz and Kolodko [1990] found this occurred in Poland after the "Big Bang" in January 1990.
3. See Weitzman [1991] for a description of other possible advantages.
4. Portes, Quandt and Yeo [1988] show that general shortage has not existed in Poland, despite many claims to the contrary. Chen asserts that in China before the reforms, there was "overstocking of many products that cannot be sold, while many other products in great demand are always in short supply" [1989, 129]. Desai [1989] claims that this was true for the Soviet Union prior to Gorbachev's budget deficits.
5. In contrast, in Poland and Bulgaria, firms increased prices dramatically but found that they were unable to sell as much as they were producing. Often this caused substantial losses for the firms.
6. "Net surplus" will only be consistent with the standard concept of net surplus — revenues minus costs — if prices represent valid social costs and benefits. Berliner [1976] discusses previous concepts of "profits" for Soviet managers. Recently, most managers of state enterprises have been turned free to make net surplus or collapse. But it is also important that firm managers be concerned with a fairly long-run time horizon.
7. This is easier to enforce for state retail outlets than most other state enterprises. If the enterprise is providing an "essential service", small private firms can enter if insufficient retail services are provided. It would be harder to create a large enterprise to replace the one which needed subsidies to survive.
   "Hard budget" constraints may be harder to create than might be supposed. If banks continue to make loans to weak enterprises, they may continue to survive when they are no longer economically viable. Good banking practices which would prevent this from happening will take many years to develop.
8. McKinnon [1989, 1991] has recommended a value added tax to solve the budget deficit problem because value added would be relatively easy to measure. Such a tax is being adopted in most of the ex-communist countries. In this case, little additional data is needed to implement MAP.
9. Montgomery [1972] proves these points in detail for a market in a pollution externality. Campbell [1987] describes and reviews the theory of such mechanisms, as part of the general theory of mechanism design.
10. This point is proved in Lerner and Colander [1980] and Koford [1987]. When firms change the level of inputs and output, there are index-number complications that are addressed in these sources.
11. Such markets are described in detail in Lerner and Colander [1980]. The problems of implementing these market rights, including defining the rights and enforcing them, are discussed in detail in several papers in Colander [1986] and Koford [in preparation].
12. In the U.S. price controls in the 1970s, this approach was used for controlling prices of large multiproduct firms.
13. For MAP to create an incentive for expansion, the base price $\bar{p}$ must be greater than marginal cost at the equilibrium output level. If present prices are this distorted, a higher $\bar{p}$ can be chosen to determine the MAP credit base line. If this is done for many firms, the price level will rise, but the increase will still be controlled.

14. MAP encourages firms that are producing poor quality products to lower their prices and sell credits. The experience in Poland suggests that this may be important. Major layoffs have occurred at companies that have been unable to sell their output.
15. The self-reenforcing collapse of output in Eastern Europe is evidence of this process.
16. The resource savings from having price rationing instead of queuing would be $(p_I - p_I^*)q_I$ [Weitzman, 1991].
17. Litwack [1989] has emphasized that a private property rights system must be established in socialist countries before market-like contractual relationships can develop.
18. Where imports are readily available, they provide an alternative source that could solve this problem. The difficulty here is that import flexibility may depend on solving international debt problems that many of these countries face. Even without large scale imports, foreign raw material prices can be a guideline for internal prices for these inputs.
19. McKinnon [1989] recommends a value added tax to solve the budget deficit problem because value added is easy to measure. If such a tax proposal were adopted, then little additional information would be required to implement MAP.
20. For any market result, there is an analogous system with tax and subsidy incentives. The difference between the two is that with a market incentive system the quantity of rights is fixed and the incentive is flexible; with a tax/subsidy incentive system the incentive is fixed and the quantity of rights is flexible. The analog to MAP is the tax incentive plan or TIP.
21. The traditional socialist schemes were close to this, and the state orders in the former Soviet Union also followed similar lines. But the scheme is also closely analogous to a market in output rights. The bonus for just-fulfilling the quota may be interpreted as a penalty for violating the output right rules.
22. If not all tractors can be sold, the price of allocations will be zero.
23. *A Study of the Soviet Economy* Vol. 1, Appendix K.6 describes the growth of financial assets held by Soviet households to 1991.
24. It seems that no former socialist economy has developed effective monetary or credit control policies to assure desired aggregate demand. Hungary's experience indicates that a "soft" financial constraint remains for political reasons even when notionally financial discipline has been established [Bartlett, 1989]. Interfirm borrowing can also vitiate the power of traditional monetary policy.

REFERENCES

Bartlett, D. Banking Reform in Hungary. Presented at the American Political Science Association Annual Meeting, Atlanta, September 1989.

Berliner, J. *The Innovation Decision in Soviet Industry*. Cambridge, MA: MIT Press, 1976.

Campbell, D. *Resource Allocation Mechanisms*. Cambridge: Cambridge University Press, 1987.

Chen, J. China's Market Reforms in Comparative Perspective, in *Market Reforms in Socialist Societies*, edited by P. Van Ness. Boulder: Lynne Rienner, 1989.

Colander, D., ed. *Incentive-Based Incomes Policies*. Cambridge, MA: Ballinger, 1986.

Desai, P. Perestroika, Prices, and the Ruble Problem. *Harriman Institute Forum*, November 1989.

Frydman, R., Wellisz, S. and Kolodko, G. Stabilization in Poland: A Progress Report. Columbia University, Department of Economics, Discussion Paper 481, May 1990.

Granick, D. *Job Rights in the Soviet Union: Their Consequences*. Cambridge: Cambridge University Press, 1987.

Hewett, E. *Reforming the Soviet Economy: Equality versus Efficiency*, Washington, D.C.: Brookings Institution Press, 1988.

_____. Comment on 'Soviet Economic Reform: The Longest Road.' *Brookings Papers on Economic Activity*, No. 1, 1990, 309-16.

International Monetary Fund, World Bank, Organization for Economic Cooperation and Development, and European Bank for Reconstruction and Development. *A Study of the Soviet Economy*. Paris: Organization for Economic Cooperation and Development, 1991.

Koford, K. Do Incentive Anti-Inflation Plans Reduce the Natural Rate of Unemployment? Unpublished work, 1986.

_____. Some Microeconomics of an Incentive Anti-Inflation Plan. *Public Finance Quarterly*, 15:2, 1987, 199-218.

_____. *Market Solutions to Internalize Macroeconomic Externalities*. In preparation.

Koford, K. and Miller, J. Incentive Anti-Inflation Policies in a Model of Market Disequilibrium, in *Incentive-Based Incomes Policies*, edited by D. Colander. Cambridge, MA: Ballinger, 1986.

Koford, K., Miller J., and Colander D. Macroeconomic Externalities: New Keynesian Theory and Policy. Econometric Society, Winter meetings, New York, December 1988.

Kornai, J. *Economics of Shortage*. New York: North-Holland, 1980.

_____. *The Road to a Free Economy, Shifting from a Socialist System: The Case of Hungary*. New York: W.W. Norton, 1990a.

_____. Comment on "Creating a Market Economy in Eastern Europe: The Case of Poland," *Brookings Papers on Economic Activity*, No. 1. 1990b, 138-42.

Lerner, A. Letter to Oskar Lange, 1938.

Lerner, A. and Colander, D. *MAP: A Market Anti-Inflation Plan*. New York: Harcourt, Brace, Jovanovich, 1980.

Lipton, D. and Sachs, J. Creating a Market Economy in Eastern Europe: The Case of Poland. *Brookings Papers on Economic Activity*, No. 1, 1990, 75-133.

_____. Privatization in Eastern Europe: The Case of Poland. *Brookings Papers on Economic Activity*, No. 2, 1990, 293-341.

Litwack, J. What Does Price Theory Suggest for Socialist Reform? Paper presented at the American Economic Association annual meetings, December 1989.

McKinnon, R. The Economics of Transition: Observations on the Soviet and Chinese Cases. Paper presented at the American Economic Association annual meetings, December 1989.

_____. *The Order of Economic Liberalization*. Baltimore: Johns Hopkins University Press, 1991.

Montgomery, W. Markets in Licenses and Efficient Pollution Control Programs. *Journal of Economic Theory*, December 1972, 395-418.

Nordhaus, W. Soviet Economic Reform: The Longest Road. *Brookings Papers on Economic Activity*, No.1, 1990, 287-309.

Portes, R., Quandt R. and Yeo, S. Tests of the Chronic Shortage Hypothesis: The Case of Poland. *Review of Economics and Statistics*, May 1988, 288-95.

Weitzman, M. Price Distortion and Shortage Deformation or What Happened to the Soap? *American Economic Review*, June 1991, 401-14.