Econ 472
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Midterm Exam II: Answer Sheet

1. *(20%) External liberalization in transition economies is complicated by the problem of industries that actually destroy value at world prices.*

   (a) *Carefully explain the meaning of negative value added at domestic prices and at world prices. How can the same industry produce value added at domestic prices but destroy value at world prices?*

   brief answer NVA^d (at domestic prices) means that the revenue from sales is less than the domestic cost of purchased inputs, which we can write at $VA_i^d \equiv p_i^d z_i - p_m^d M_i < 0$, where z_i is output of firm i, p_m^d is the domestic price of purchased inputs, and M_i is its purchases of inputs from other firms. NVA at world prices would then be defined by $VA_i^* = p_i^* z_i - p_m^* M_i < 0$, where the asterisk refers to world prices. The reason we can have $VA_i^* < 0 < VA_i^d$ is that domestic and world prices may differ. This is the essential point. In planned economies enterprises did not trade directly with the outside world – there was a foreign trade ministry. This allowed domestic and world prices to differ. If the domestic price of output is above the world price and the domestic price of purchased inputs (read resources) is below the world price then this is clearly possible, since it makes domestic value added appear larger.[1]

   (b) *Why are transition economies likely to have problems with negative value added producers? Would you expect to find this problem in market economies? Explain.*

   brief answer Under Soviet planning enterprises were not created, favored, or selected based on market prices (or profitability). Entry and exit was not determined by market conditions, and there was a soft-budget constraint. There was only the weakest

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[1]Recall that one can show this by defining the implicit and explicit tariffs. Let the explicit tariff on good i be t_i. Then $p_i = (1 + t_i)p_i^*$. In addition to tariffs on imports, the price of material inputs may be distorted. Let t_m be the implicit export tax on material inputs. Then we can write $p_m(1 + t_m) = p_m^*$. Now if we divide goods prices by material prices we get:

$$\frac{p_i}{p_m} = (1 + t_i)(1 + t_m)\frac{p_i^*}{p_m^*} \equiv (1 + \tau)\frac{p_i^*}{p_m^*} \tag{1}$$

where τ is the coefficient of protection. We can now compute value added at world prices:

$$V_i^* = p_i^* z_i - p_m^* M \tag{2}$$

and if we use the expressions for p_i^* and p_m^* in terms of the domestic price we get:

$$\begin{aligned} V_i^* &= \frac{p_i z_i - (1 + t_i)(1 + t_m)p_m M}{1 + t_i} \\ &= \frac{p_i z_i - (1 + \tau)p_m M}{1 + t_i}. \end{aligned} \tag{3}$$

It is clear from (3) that even if $V_i > 0$, V_i^* can be negative if τ is large enough. A condition for this would be that the implicit tariff on materials is too large. This is not farfetched for STE's.

mechanism for production to conform to world prices – the preferences of planners not to waste resources, but this was tempered by many factors, most important the lack of information. This explains why whole sectors could be destroying value, not just individual firms that are badly run. With prices distorted and soft-budget constraints and output targets, it is certainly possible for NVA to be a significant problem. In market economies it would be less of a problem because it requires explicit subsidies to maintain such activity. It may be that Amtrak destroys value, but it has explicit political support. If I start a foolish company pretty soon I will be bankrupt and my lossmaking firm is history. Only subsidies can allow me to persist. Without such subsidies the firm would go bankrupt. In market economies lossmakers eventually exit. But in a command economy price distortions are so pervasive that the subsidies are hidden from view. In planned economies lossmakers do not exit.

(c) *What implications, if any, does the possibility of negative value added producers imply for transition?*

brief answer Perhaps the most important is that rapid price liberalization may render some sectors and many enterprises bankrupt. This could make it politically difficult to impose hard budget constraints since closing whole sectors of the economy may be very unpopular. It may make it difficult to wait for restructuring to improve performance since that requires privatization which takes some time. It may suggest that some temporary protection may be important, though that has its own consequences. The implications for hardening budget constraints are perhaps the most significant, though the whole transition is affected by this.

(d) *What if industries also produce negative value added at domestic prices? How can this happen? Does it change your answer to part (c)? Explain.*

brief answer If industries only produced negative value added at world prices you could delay external liberalization while they adjust. Keep the tariffs, etc. This could be better if they can adjust in time. But if the sectors destroy value added at domestic prices then protection does not prevent the destruction of value. You are better off opening up quickly, even if some sectors collapse. You can import any needed goods at lower cost that producing them domestically, since you are destroying value by keeping that sector open. In the case of part (c) delayed liberalization loses some gains. In part (d) delaying liberalization means continued destruction of value.

2. *(25%) The process of structural adjustment involves the movement of resources from the state sector to the private sector. If the private sector is more productive than the state sector why is this a complex problem?*

brief answer because capital is stuck in the state sector as is most employment. It takes ownership to transfer capital.

(a) *If the process of structural adjustment were smooth and frictionless what would happen to labor productivity in the transition? What would the output path look like in this case? Explain.*

brief answer per-capita output looks like the blue line in figure 1.[2] It would have an L-shape, since productivity might initially collapse, but it would then rise continuously as labor shifts to the more productive sector.
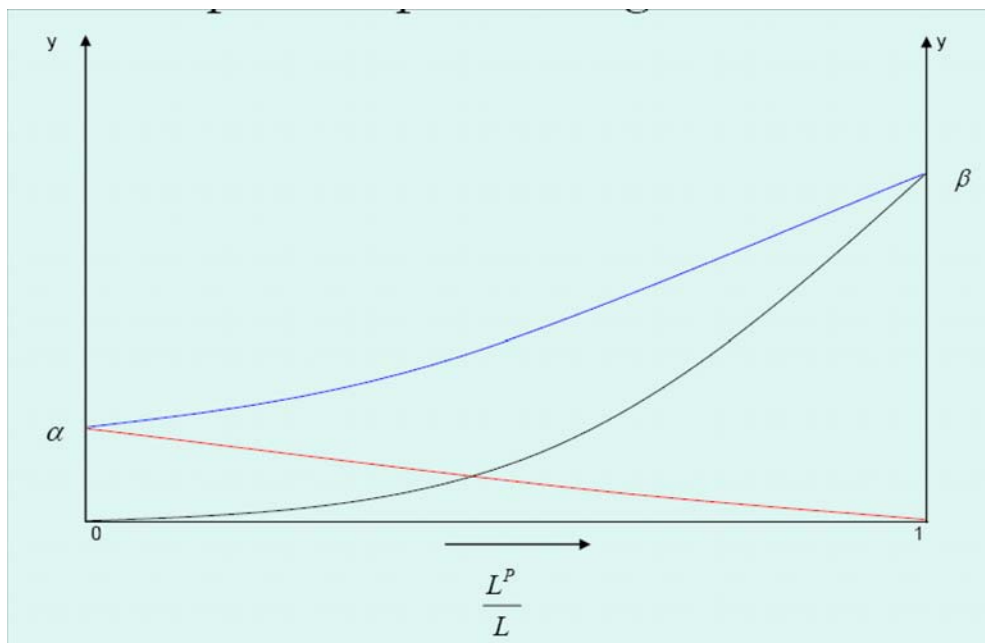

Figure 1: Adjustment

(b) *How does your answer to part (a) compare with what actually happens to labor productivity, and with output, in transition?*

brief answer labor productivity falls rather than rise. Output falls but labor stays at the state enterprises so Q/L falls. Output falls as well, and for several years, not instantaneously and then rising.

(c) *What does your answer to parts (a) and (b) suggest about the nature of structural adjustment?*

brief answer It suggests that frictions are a key part of transition. Or political constraints that prevent inefficient enterprises from being shut down. It says that it is not easy to shift resources across sectors.

3. *(25%) You must decide whether economic reforms in the transition will be gradual or be big bang (shock therapy). What are the key differences in these two programs? How would you make the decision which type of program to implement?*

brief answer one big question is how large is the current bleeding. If the patient is hemorrhaging you have to act quickly. Think of this in terms of value destruction and shortages. If the system is not imploding you may be able to take a more gradual view.

(a) *What are the relative advantages of gradual reform?*

[2]For a better version go to slide number 9 of the adjustment lecture, http://econ.la.psu.edu/~bickes/adjust.ppt

brief answer Gradual reform lets you learn about reforms before you have made all the decisions. May make it easier to implement reforms. May build a constituency for further reform. Less disruptive. Allows reforms to be reversed if they do not turn out well.

(b) *What are the relative advantages of shock therapy?*

brief answer a big bang is comprehensive. Many reforms require complementary reforms to succeed. Privatization, for example, requires price liberalization. Doing it all at once gets the pain over in the beginning, when there is a window of opportunity.

(c) *What features of the economic and political environment of a specific country, if any, might tip the balance one way or another? Explain.*

brief answer Are there external sources of support to allow subsidies to prevent enterprises from being shut down? Is domestic production destroying value, or just at world prices? Where does it get energy from? Is there political support for a long period of reform, or is it better to get the reforms done before the opposition develops.

4. *(30%) How can measured real income fall and welfare rise when prices are liberalized? Analyze this in terms of the model with excess demand and queuing.*

brief answer Excess demand means that good are rationed by queues. Agents obtain utility from consumption and leisure. Queuing time comes from leisure. Suppose nominal demand rises and output is fixed. Excess demand rises, as does the queue length. So consumption remains the same but leisure falls. Hence, welfare falls. Now suppose that prices are liberalized. Excess demand will be eliminated and queuing falls to zero. Consumption remains the same but leisure rises. So welfare must increase. So we obtain the relationship in figure 2, where S is the supply of goods and Y/P is measured real income. When $Y/P > S$ there is excess demand, and welfare is decreasing in measured output. So if prices were liberalized, Y/P falls. As $Y/P \to S$ welfare rises.

(a) *What are the distributional consequences of price liberalization?*

brief answer When there is excess demand those who have a low opportunity cost of time queue and resell output in the black market. The elderly in particular have such time. They can queue at lower personal cost than other people. When prices are liberalized they lose relative to busier people who no longer have to queue. But overall consumption is still S, so the old have lost and the younger people have won. Similarly, women gain relative to men if women are the ones who actually shop. The cost of shopping has fallen, but household consumption is the same.

(b) *In general, who gains and who loses from price liberalization? Why?*

brief answer In addition to the comments in part (a) we can add that those who have access to shortage goods lose and those who have marketable skills rise. The former could be officials and their relatives who use special access to get goods. Or people
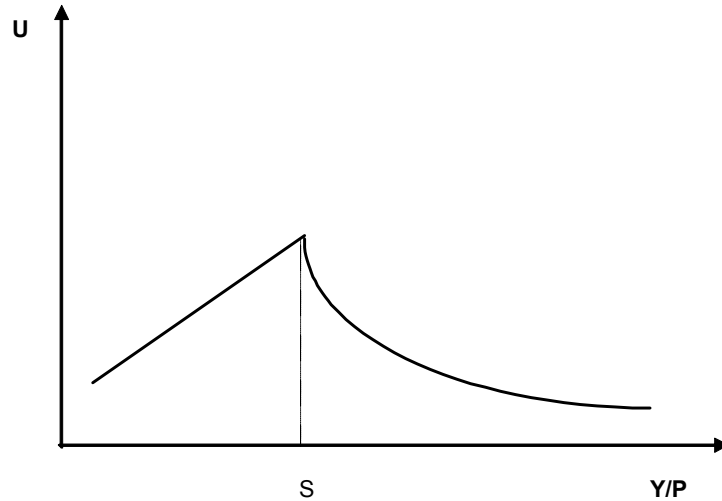
Figure 2: Measured real income, Excess demand and welfare

who work in shops and steal (divert) goods in short supply. The young may win relative to middle aged people who have learned how to cope with shortage. Overall, welfare may rise, but without compensation there still may be winners and losers.

(c) *Suppose there is no excess demand before price liberalization. Show that measured output can fall and welfare can still rise due to the Camellia effect. Explain how this works.*

brief answer The simple analytics are given in figure 3. We start at point A with planners preferences given by the red indifference curve tangent to the production frontier. Liberalization means prices of good x_2 fall relative to x_1 the good that the people (blue indifference curves) prefer. We could think of good x_2 as defence weapons and the other good as food. Because of disorganization or adjustment frictions we move to F rather than B. At point F real output measured at base-year prices (the red price lines) show a large fall in output. But the indifference curve that is tangent to the new price line at point F lays above the indifference curve that passes through point A. This implies that the public prefers bundle F to bundle A. So welfare is clearly higher. But measured output has fallen, because the production of good x_2 has fallen dramatically, and at base-year prices this was highly valued.
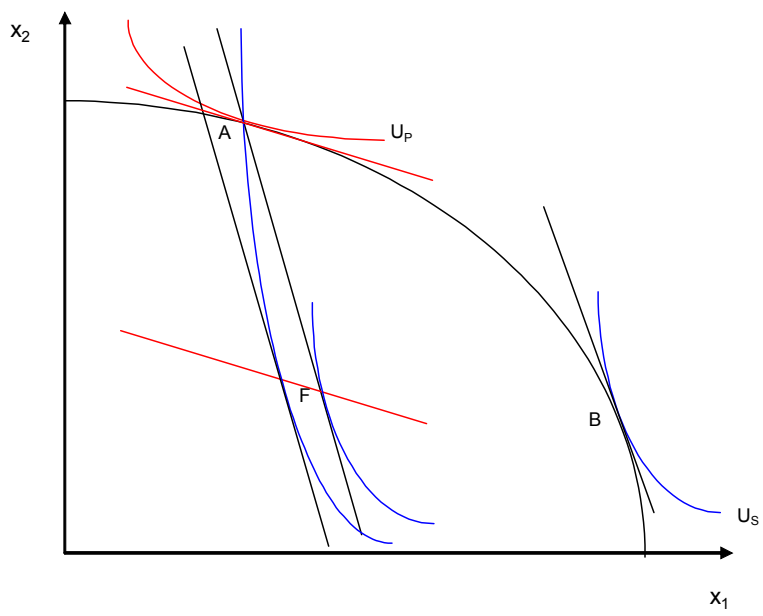
Figure 3: The Camellia Effect