CHAPTER III

Domestic Exports and Procurement: The Rural-Urban Conflict

3.1. Introduction

In this chapter, we extend the role of government in the general context of agriculture-industry interactions discussed in the last chapter. Over and above its function in the creation of home market for industry through the provision of domestic exports government may also intervene in the food-market. Here we assume that the government interacts in the food-market through its procurement policy with multiple objectives of price and income stabilization and of utilization of procured food in generating rural non-agricultural employment. This new role of the government over and above the earlier one will be found to produce certain interesting results that have contemporary relevance.

3.1.1. Policy Debate

In the recent years the government procurement policy has become a point of sharp controversy. There is lack of unanimity regarding the policy implications among the academicians, the practitioners and also the policy makers at different levels. In the post WTO situation it has become an important political issue as well. Even though it has been a highly debated matter and has received sufficient attention in the descriptive and policy oriented literature, discussions on this issue in a macroeconomic framework are rather scanty.
We try to analyze in our work the issue of government procurement of food, its subsequent distribution and their consequences for the overall growth of the non-agricultural sectors. Certain interesting policy prescriptions and certain counter-intuitive results are derived from the following macro-theoretic analysis.

3.1.2. Popular Critic of Procurement Policy

Over and above the usual criticisms against this ‘protectionist’ policy of the third world governments raised from within a micro-theoretic framework, few criticisms are also put forward from a macro-perspective. Thus it is argued that:

(i) Government expenditure on food-procurement is competitive with that on industrial output. This is so as, given the binding budget constraint of the government if expenditure on food rises that on the latter has to fall reducing the level of demand-determined industrial output. Thus, there is argued to be a demand-side conflict between the ‘market’ expansion for agriculture through procurement and that for industrial sector through government demand.

(ii) If the government procurement activity is undertaken through new money creation it increases the budget deficit that is inflationary in general. Thus this policy of procurement not only raises the price of industrial commodity but, as a consequence, also raises that of food.

These claims will be assessed in the following sections using the general framework developed in the previous chapter.

For going into the actual analysis let us first reconstruct our model-economy (sections 2.1 and 2.2 above) with the introduction of government’s additional role as procurement agency.
3.2. Basic Features of Our Reconstructed Model-Economy and Notations

3.2.1. The Basic Features of Our Reconstructed Model-Economy are assumed as Follows:

(a) The basic features from (a) through (g) of our original model-economy delineated in section 2.1.1 remain intact with the only modification of the basic feature (e) as: over and above the income earned through the sale of food to industry farmers also earn by selling food to the government.

(b) Over and above creating home market for industry government also procures surplus food in a situation of bumper harvest in agriculture.

(c) Government employs surplus labour through the rural 'food for work' programmes in exchange of procured food.

(d) The farmers do not save. They spend their total income irrespective of its source on industrial commodities only45.

3.2.2. The Important Notations to be used in Our Reconstructed Model are as Follows:

(A) Notations from (i) through (xiv) of the section 2.1.2 and others used in section (2.2) remain intact.

45 This is rather a simplifying assumption.
(B) Few additional notations are required for the extended model, those are:

(i) \( F_p \) : The amount of food procured by the government.

(ii) \( F_o \) : The left out supply of marketable surplus of food in the open-market over and above procurement.

(iii) \( L_r \) : Total employment created through the 'food for work' programme in rural areas.

(iv) \( a_f \) : Per capita distribution of food through the 'food for work' programme.

3.3. Working of the Model

The analysis in this chapter will essentially be a continuation of the discussions that we have done in sections 2.2 and 2.3 of the last chapter. Consequently, equations (1) through (12A) and the 3 propositions discussed in those sections provide the foundations for the analysis in this chapter.

In sections 2.2 and 2.3, we have considered the complementariness between demand-side and supply-side policies required for expansion of industrial output and employment without involving distributional conflict. However, this very complementariness can generate a new conflict between rural and urban employment if in addition to domestic exports by the industrial sector to the government we consider a policy of the following type. This refers to a situation
where following a rise in agricultural productivity government fully procures the surplus food to stabilize food-price and to promote rural non-agricultural employment through food for work programmes. In such a case, there arises a new contradiction between rural non-agricultural and urban industrial employment\(^{46}\) even if the income distributional-conflict is mitigated.

3.3.1. Full-Procurement Policy
We start with an equilibrium position for the whole economy, as expressed through figure 1 and proposition I in section 2.2.

Let us now assume a bumper harvest in agriculture leading to a rise in the level of marketable surplus of food. It is also assumed that the excess supply of food is fully procured by government and that procurement expenditure is financed by additional money creation. Thus the nominal government expenditure on industry remains unchanged. Only the government budget expands in nominal terms. We assume further that government procures surplus food at the prevailing (pre-bumper harvest) open-market equilibrium price\(^{47}\). Now the procurement expenditure raises income in agriculture. Hence, under the condition of zero savings by the farmers, the additional nominal demand for industrial commodities

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\(^{46}\) We introduce a simplifying assumption in this chapter that urban employment is synonymous with industrial employment and by rural employment we mean rural-non-agricultural employment.

\(^{47}\) We do not consider here food subsidy to the farmers creating divergence between procurement price and open-market equilibrium price. Thus, the farmers are not subsidized for each and every unit of their output separately. They are subsidized for their total surplus production. Hence, government subsidy takes the form of aggregate procurement expenditure.
will be equivalent to this procurement expenditure. Consequently, urban industry experiences a demand-side expansionary thrust.

On the other hand, the procured food is utilized in food for work programmes to generate rural non-agricultural employment. In this way, surplus labour gets engaged in rural-employment generation programmes with the help of surplus food.

However, as the additional marketable surplus is fully directed to rural non-agricultural employment generation open-market supply of food remains unchanged. Thus, using equation (11) we express the level of open-market supply of food as, \( F_0 = F^0 \) (see figure 1). But, demand for food from urban industry rises as this sector experiences a demand-driven expansion. Consequently, we have excess demand for food in the open-market. As a result, there is a rise in the equilibrium food-price from \( p_f^* \) (as in figure 1) to say, \( p_f^{y*} \). Subsequently, the equilibrium price of industrial commodity also rises given the assumption of fixed terms of trade between agriculture and industry as in equation (3.2). Rise in the price of industrial commodity reduces its demand.

As \( p_i \) rises real domestic exports of industry fall given its nominal value as in equation (6). On the other hand, the rise in \( p_i \) also reduces the real value of expenditure on industrial commodity by the farmers out of their procurement

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48 Government 'imports' food against money. But this money is again fully 'exported' to industry by the food sector to 'import' industrial products. Consequently, industry registers 'export surplus' vis-à-vis agriculture. However, agriculture here operates only as an intermediary while the original source of demand for industrial commodity is still the government. Hence because of procurement, industry manages, though indirectly, an increase in real domestic exports at unchanging prices. Thus in the present case of procurement by the government with new money creation without hampering direct government expenditure on industry, essentially, industrial sector registers both the 'direct' (i.e., directly vis-à-vis the government) and the 'indirect' (i.e., via agriculture) domestic exports.
income. In fact, the prices \( (p_f \text{ and } p_o) \) rise so much so that the excess demand for industrial commodity and hence, that of food are fully mitigated, given \( F_o = F^0 \).

Consequently, the real value of 'aggregate net exports' of industry to government and agriculture together fall back to the initial equilibrium level which is equal to \( g^* \), as derived in equation (12A). This fully washes off the excess demand for food as well.

The final impact on industry is only stagnation with rise in prices and wage across the economy. Though there is increase in the nominal value of aggregate 'net exports' of industry, net supply of food to industrial sector does not at all change. Hence, there is no change in urban-employment potential even if aggregate food-supply rises, as this surplus food is fully directed to generate rural-employment.

Thus we get a new contradiction between rural non-agricultural and urban industrial sectors in terms of employment:

A rise in agricultural productivity, instead of raising the level of employment in urban industry is rather creating rural non-agricultural employment.

The effect of such a policy of 'full-procurement' can be expressed through the following diagram (figure 4) of food-market demand-supply equilibria. Essentially, figure 4 is an extension of figure 1 derived with the particular policy under consideration.
We start with the initial food-market equilibrium position $E_1$ with equilibrium food-price $p_f^*$. Now we introduce a case of full-procurement of surplus food in a situation of bumper harvest. Thus $F_p$ amount of surplus food is procured at the price $p_f^*$. Consequently, open-market supply of food remains unchanged at $F^0$. Let us also assume that the total nominal expenditure of the government is $G'$, of which $G^0$ is the nominal domestic exports of industry to government as in equation (6) and $(G' - G^0)$ is the additional nominal expenditure of the government for procurement.

Procurement expenditure of the government raises farmers' income. This, in turn, raises the level of demand for industrial commodity. Thus ultimately, the whole amount $G'$ is fully spent on industrial commodity, either directly or via agriculture. Consequently, the aggregate demand for industrial output is higher in presence of

Figure 4: Effect of full-procurement policy.
procurement than that with only domestic exports. This excess demand for industrial commodity raises the level of demand-determined industrial employment, creating excess demand for food as well. Open-market supply of food being fixed at \( F^0 \), this excess demand is mitigated only by an increase in equilibrium food-price to \( p_f^* \), corresponding to the final equilibrium position \( E_2 \) (figure 4).

Given the distributive factors \( \beta \) and \( \alpha \) from equations (3) and (3.1) respectively, this rise in equilibrium food-price subsequently raises the price of industrial commodity, \( p_i \), rises so much so that the excess demand for industrial commodity due to additional government expenditure \( (G' - G^0) \) is fully washed off. Stated otherwise, at \( E_2 \), aggregate government expenditure measure in terms of industrial output shrinks back to its pre-procurement original size derived at \( E_1 \). Thus, there is no real effect in the industrial sector.

The equilibrium level of employment in urban industry corresponding to \( E_2 \) in figure 4 is:

\[
L^* = \frac{1^0 + \beta \cdot (G' / p_f^*)}{1 - \alpha} \quad (1) \tag{49}
\]

On the other hand, the procured food is utilized in food for work programme to create rural non-agricultural employment. Hence, the volume of rural-employment could be expressed as:

\[
L_r^* = \frac{F_p}{a_f} = \frac{(G' - G^0)}{a_f \cdot p_f^*}
\]

where, \( a_f \) is the fixed amount of food per capita received by the workforce employed in the ‘food for work’ programme.

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49 \( L^* = \frac{1^0 + \beta \cdot (G^0 / p_f^*)}{1 - \alpha} \) = \( \frac{1^0 + \beta \cdot (G^0 / p_f^*)}{1 - \alpha} \), i.e., the pre-procurement level of employment is regained.
In general:
\[ a_t' < a_t^0. \]
where \( a_t^0 \) is the fixed per capita food consumption in the industrial sector.

Hence, in general, a particular amount of food can employ higher number of people in rural food for work programme than in urban industry.

Now the equilibrium level of employment in the economy as a whole is:
\[ L^* + L_r^* = \left[ \left( l^0 + \theta \cdot (G' / p_r^*) \right) / (1 - \alpha) \right] + \left[ (G' - G^0) / a_t' \cdot p_r^* \right]. \]

We can also mention another interesting point here. In this case, the farmers purchase a part of the industrial output that was earlier purchased by the government in absence of procurement. This reallocation of purchase of industrial commodity happens due to the rise in prices and wage across the board. The rise in income of the farmers due to procurement and the consequent rise in demand for industry 'crowds out' real domestic exports. Increase in farmers’ demand for industrial output in absence of any corresponding increase in food-supply triggers off price increases across the economy. Consequently, real domestic exports fall.

Thus, the farmers gain at the cost of shrinkage of government’s purchase of industrial output. We can summarise, this whole analysis in the form of the following proposition:

**Proposition IV:** In case of full-procurement of surplus food in a situation of bumper harvest only rural non-agricultural employment is created through food for work programme without any real expansion in industry. Thus we have a supply-driven trade-off between rural and urban employment.
3.4. Partial-Procurement Policy

In this section, we try to satisfy the dual objectives: an expansion of employment in the urban industrial sector and simultaneously a rise in the level of rural non-agricultural employment. This is done through a policy of 'partial-procurement' of food by the government following a rise in agricultural productivity. Moreover, we achieve these expansions without even affecting the initial prices and wage across the economy with unchanging distribution of income. In this way, we try to mitigate the above-mentioned supply-driven trade-off between rural and urban employment.

To achieve these objectives simultaneously, instead of full-procurement only a measured fraction of the increased food-supply has to be procured by the government. The consequent rise in farmers' income raises the demand for urban industrial commodity and subsequently that of food so much so that this excess demand for food is just matched at constant prices by the left out supply in the open-market. This is explained in the following analysis:

We assume: \( \Delta F (> 0) \) to be the change in marketable surplus of food due to bumper harvest, of which \( F_p \) to be the procurement amount and \( F_o \) the left out supply of food in the open-market.

Hence,

\[
\Delta F = F_o + F_p
\] ........................(i)

We also assume that \( F_p \) is procured at initial pre-harvest equilibrium food-price \( p^* \).

Next we assume that the procurement expenditure is financed by new money creation, the amount of which is:

\[
\Delta G = G' - G^0
\]
This raises the income in agriculture (R) by the amount:

\[ \Delta R = \Delta G = (G' - G^0) = p_f^* \cdot F_p \]  

\( \ldots \ldots \text{(ii)} \)

Now, under the condition of zero savings by the farmers this increased agricultural income is fully spent on industrial commodity raising its demand. Consequently, there is a demand-driven expansion of urban industrial employment. Modifying equation (8) with equation (ii) we can derive the amount of expansion of industrial employment due to this demand-expansion as:

\[ \Delta L^* = \theta \cdot [(G' - G^0) / p_r^*] / (1 - \alpha) \]  

\( \ldots \ldots \text{(iii)} \)

Consequently, the rise in the level of demand for food from urban industry is:

\[ \Delta D_f = a_r^0 \cdot [\theta \cdot (G' - G^0) / p_r^*] / (1 - \alpha) \]  

\( \ldots \ldots \text{(iii)'} \)

Now the value of \( \Delta G = (G' - G^0) \) has to be such that the corresponding rise in demand for food should just be balanced by the left out supply in the open-market, so that \( p_f^* \) remains unchanged.

To achieve such a target we need to satisfy the condition:

\[ \Delta D_f = F_o. \]

Now, using (iii)' this last condition can be rewritten as:

\[ [a_r^0 \cdot \theta \cdot ((G' - G^0) / p_r^*) / (1 - \alpha)] = F_o \]  

\( \ldots \ldots \text{(iv)} \)

We can solve for \( F_o \) and \( F_p \) by using the above equations (i), (ii) and (iv) as:

\[ F_p^* = [(\Delta F \cdot (1 - \alpha)] / [a_r^0 \cdot \theta + (1 - \alpha)] \]  

\( \ldots \ldots \text{(v)} \)

\[ F_o^* = [(\Delta F \cdot a_r^0 \cdot \theta)] / [a_r^0 \cdot \theta + (1 - \alpha)] \]  

\( \ldots \ldots \text{(vi)} \)

On the other hand, using equation (v) the equilibrium level of rural-employment generated through ‘food for work’ programme can be expressed as:

\[ L_r^* = F_p^* / a_r \]
In this case of partial-procurement we have expansion of employment in both the urban and rural sectors without affecting at all the prices and wage across the economy. For urban industry both the supply-side as well as the demand-side constraints are relaxed inducing its expansion. On the other hand, we have a rise in rural non-agricultural employment as well through ‘food for work’ programme. Thus a policy of partial-procurement satisfies the dual objectives: First, there is expansion of urban-employment at constant prices and wage. Secondly, rural-employment generation takes place through appropriate utilization of procured food.

Diagrammatically (see figure 5), using the food-market demand–supply curves we can explain the expansion in the urban industrial sector. Figure 5 is again an extension of figure 1 itself.

In a situation of bumper harvest, as a part of increased food-supply is procured, farmers’ income rise by the amount of procurement expenditure. As this increased agricultural income is fully spent on industrial output, demand for industrial commodity rises. Subsequently, the demand-driven expansion of industry creates excess demand for food as well. However, in this case of partial-procurement, such a fraction of surplus food is procured that this excess demand for food is just matched by the left out supply in open-market. Hence, there is no mismatch in demand for and supply of food clearing the food-market even at the pre-harvest equilibrium price $p_f^*$. 
Thus following the above analysis, figure 5 can be interpreted as below:

We start from the initial equilibrium position $E_1$ derived for $F = F^0$, generating $p^*_f$ as the initial equilibrium food price.

We assume that the change in the aggregate supply of food due to bumper harvest is:

$$a_f = \frac{F^0}{F^0}$$

Now the equilibrium amount of procurement is determined in such a way that the ensuing rise in demand for food is just in line with the fraction of aggregate food-supply left out for the open-market. If $F^0$ amount of food is procured the consequent excess food-demand is just matched by the open-market supply, $F^0$.

Figure 5: Effects of partial-procurement policy.
at unchanging food-price. Hence, the final equilibrium position $E_2$ will be horizontally to the right of $E_1$.

Thus we get:

$$F_p^* = F_0^0 F_{00}^1$$

Similarly, the equilibrium amount of food that should be kept for open-market transaction is expressed as:

$$F_0^* = F_0^0 F_{00}^1$$

A distinction between the full-procurement and the partial one needs to be mentioned here. In the above case, both the rural and urban sectors expand, while in the case of full-procurement only rural-employment rises without any real effect in urban industry. Moreover, under partial-procurement the prices and wage are held fixed. However, even under partial-procurement, though urban-employment has increased rural-employment has taken place essentially at the cost of the former:

Total urban-employment that could have been achieved is $(OF_{00}^0 / a_1^0)$ at unchanging distribution had the government spent only on industry without going for procurement. However, under partial-procurement urban-employment in the aggregate has increased only to $(OF_{00}^0 / a_1^0)$ from the initial level, $(OF_{00}^0 / a_1^0)$. So the loss in urban-employment is $(F_{00}^0 F_{00}^0 / a_1^0)$ which is basically due to the drain of food to rural-employment generation programme. These results could be summarised in the following proposition:

**Proposition V:** When an attempt is made to raise the level of rural non-agricultural employment through procurement a conflict between urban and rural employment
arises. However, this conflict is partially mitigated through a policy of partial-procurement. This partial relaxation of the conflict in essence occurs due to relaxation in the food-supply-constraint and appropriate allocation of this increased food-supply between rural and urban sectors through suitably designed procurement policy.

3.5. Few Important Observations

(i) First of all, if we assume that $a^f < a^d$, the loss of employment in industry due to procurement is outweighed by the gain in employment in the rural sector through food for work programme. Thus the partial-procurement of surplus food followed by a food for work policy can generate higher level of aggregate employment in the economy, as a whole, without affecting the prices.

(ii) It is always beneficial to go for the food for work programme, if under compulsion (both economic and political) the government has no other option but to go for procurement. The procured surplus food cannot be used in industry. Hence, it is immaterial from the point of view of industrial growth whether this is used in rural-employment generation or simply maintained as buffer stock. However, with rural-employment generation if the level of poverty is reduced, food that was earlier kept for self-consumption may be released to the open-market. Thus, net supply of food may rise, as the hitherto unemployed people no more have to depend on the employed ones for food. This may lead to further relaxation of the food-supply-constraint for urban industry.
(iii) Under the condition of zero savings by the farmers the money spent as procurement expenditure by the government is fully spent back on industry by the farmers. Hence, even if the government is restricted by the budget constraint and the procurement expenditure is met only by draining out money from the government expenditure on industrial products, aggregate demand for industry does not at all fall. This is so as the money taken out by the government from industrial commodity purchase is fully compensated by the farmers' increased expenditure on industrial products. Thus on the aggregate, nominal expenditure on industrial commodity remains the same.

However, if a part of agricultural income were saved, it would lead to contraction of aggregate nominal expenditure on industrial output. Still, we must admit that with unchanging level of open-market food-supply, the value of the real domestic exports remain the same and hence, the levels of industrial output and employment also do not at all change. This is a very interesting result in the sense that so long as food-supply to industry is not changed, even if a part of ‘G’ is siphoned off to meet the procurement expenses the aggregate real demand for industry remain the same. Furthermore, with such an expenditure policy of the government prices and wage in industry remain unchanged at the initial equilibrium levels even under full-procurement of surplus food.

This phenomenon could be explained in terms of figure 1 (section 2.2.). As a part of ‘G’ is redirected to procurement, $D_f$ falls and hence, the aggregate food-demand curve shifts down. But it again comes back to the initial position as the increased agricultural income received due to procurement is fully spent back on industry. Thus the initial equilibrium position $E$ is regained. The condition of urban industry
remains completely unchanged both in real as well as in nominal terms. On the other hand, we have the additional result of rural-employment generation. Furthermore, even if a part of farmers’ income is saved industrial output and employment do not change. Though, in that case, there is general deflation in the economy as a part of ‘G' is taken out to meet procurement expenses. Hence, the corresponding equilibrium position will be below E in figure 1.

(iv) Finally, we have the concluding remarks: The aggregate potential employment (both rural non-agricultural and urban industrial) in the economy as a whole is effectively determined by the aggregate food-supply-constraint. However, realization of this potential in respective sectors (urban and rural) is determined by the sectoral allocation of the aggregate real government expenditure. This division of the real government expenditure between real expenditure on industrial commodity and that on food for procurement essentially distributes the aggregate food-supply among the two sectors. This also guarantees the absorption of food in the respective sectors ensuring sectoral employment generation. However, the processes of absorption of food in the two sectors are distinctly different.