

CHEAP FOOD POLICIES AND RURAL DISARTICULATION : A THEORETICAL NOTE

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ABSTRACT

A typical pattern in many developing countries is the under-pricing of agricultural goods. This paper alerts food policy analysts to the impacts of such cheap food policies on the rural non-farm sector. It shows that cheap food policies adversely affect the rural sector by suppressing production linkages between the farm and non-farm sectors. As such, cheap food policies contribute to a process of rural disarticulation and increased poverty.

INTRODUCTION

A common and noted feature of many developing economies is the divergence of key agricultural prices from levels that would obtain via market determination. These divergences are caused by government intervention in agricultural markets and have come under scrutiny for many years now, perhaps most notably by the Berg Report (1981) in the case of Africa. A typical pattern in many developing countries is the under-pricing of agricultural goods by governments. The political economy behind these cheap-food policies has been discussed by de Janvry (1983), Anderson (1986), Olson (1985), Streeten (1987), Reinert (1991), and Alston (1999), among others.

The purpose of this paper is to consider the role of the rural non-farm sector in the generation of effects by cheap-food policies. These effects are shown to be qualitatively significant. More specifically, cheap-food policies can contribute to a process of rural disarticulation wherein the linkages between the farm and non-farm sectors are weakened with adverse consequences on productivity in the farm sector. Due to the strong relationship between productivity and wages, cheap-food policies can exacerbate poverty

levels both on and off the farm.

The Non-Farm Sector

From the point of view of poverty alleviation, rural non-farm activities possess two important characteristics. First, the number of people who depend on non-farm activities for their primary incomes is increasing over time (Szirmai, 2005, Chapter 10). Second, non-farm activities are more important for low-income families than for high-income families (Tomich, Kilby, and Johnston, 1995, Chapter 6). Consequently, as emphasized by Ruttan (1998), "a strong nonfarm labor market is an essential prerequisite for labor productivity in agriculture and improved incomes for rural people" (p. 158).

A key component of rural development is the growth of production linkages between farm and non-farm activities. The growth of these linkages can contribute to the increased articulation of the rural economy. Agricultural production requires the use of a broad array of differentiated inputs such as: labor of different types; farm equipment of many kinds; marketing services; financial services; processing services; transportation services; and chemical and organic inputs. An expansion of these production

linkages provides external economies via the increased flow of productive knowledge within agricultural clusters. For example, Liedholm and Kilby (1989) stress the role of "idiosyncratic design adaption" in the farm equipment sector which leads to productivity increases and requires intensive knowledge exchange. Grabowski (1989) stresses the historical impact of long-term relationships in rural areas of Japan on productive success in the nonfarm sector. Park and Johnston (1995) and Tomich, Kilby, and Johnston (1995) stress the dynamic productivity gains generated by the farm equipment sector and attribute these to "knowledge spillovers" in the agricultural cluster.

In this paper, we treat the entire collection of differentiated, non-farm inputs as producer services. This is done using a constant elasticity of substitution (CES) framework. The implications of this approach are developed in the following section. We then employ the resulting model to identify a number of effects of cheap food policies including their contribution to rural disarticulation.

THE MODEL

The purpose of this section is to formalize the way that linkages between the rural farm and non-farm sectors can generate local productive gains in the form of external effects. We focus on a traded farm sector denoted E. Production in sector F is supported by a non-traded, non-farm sector denoted NE. Finally, there is a manufacturing sector denoted M. Following Jones (1971), Sectors F and M rely on specific factors in the form of land and physical capital, respectively. Sector F differs from Sector M in that it makes use of intermediate goods via a constant elasticity of substitution (CES) aggregation as developed by Ethier (1982) and Markusen (1989). Sector NF is monopolistically competitive. Although it is

characterized by increasing returns to scale, the standard large group assumption fixes the output of each individual firm. Increasing returns to scale therefore plays no role in the outcomes of the model.

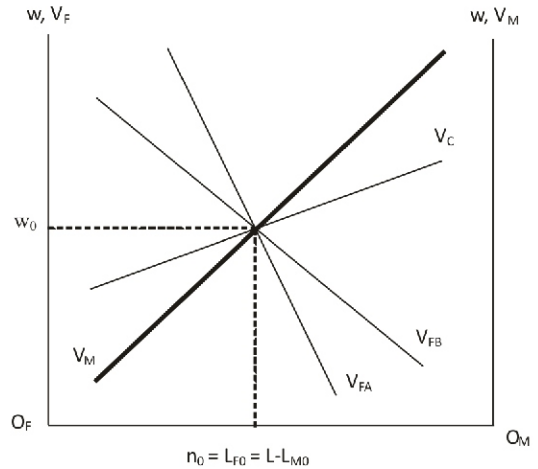


Figure 1

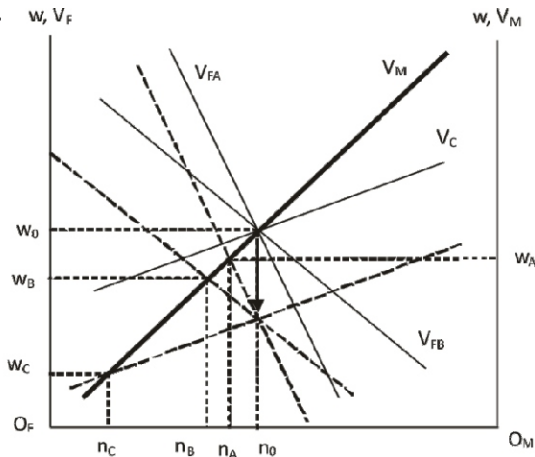
The CES aggregation of non-farm inputs has implications for the marginal value product of indirect labor in Sector E. This is depicted in the "beaker" diagram of Figure 1. Define V_M as the marginal value product of labor in the manufacturing sector. V_M is measured with respect to the origin in the lower right-hand corner of Figure 1. As shown in this diagram, V_M has the normal downward slope with increases in L_M measured to the left of O_M^3 . Next, define V_F as the marginal value product of indirect labor in the farm sector. V_F is measured with respect to the origin in the lower left-hand corner of Figure 1, and the total labor force L sets the length of the horizontal axis. Define n as the number of differentiated intermediate inputs from the non-farm sector used by the farm sector. This variable also can be thought of as the degree of rural articulation, and we can define units so that $n=L_F$. As n increases, there are possibilities for external effects

of increased rural articulation. These work against the typical declining marginal product of labor in the farm sector. Figure 1 shows three possible cases. In Case A, there are no external economies associated with using a larger number of intermediate inputs, and V_{EA} has the normal slope. In Case B, there are external economies associated with using a larger number of non-farm inputs, and V_{FB} is less steep than V_{EA} . Here, the external economies of rural articulation work against the declining marginal product of labor in the farm sector. In Case C, the external economies are strong enough to outweigh the declining marginal product of labor in the farm sector. V_{FC} is positively sloped but *less steep* than V_M^4 .

The intersection of V_F and V_M determine the initial equilibrium wage, w_0 , and the equilibrium number of non-farm inputs, n_0 . Figure 1 allows us to examine the impacts of a number of economic changes in a general equilibrium framework. We do this for cheap food policies in the following section.

CHEAP FOOD POLICIES

The impacts of cheap food policies on the manufacturing and rural sectors are examined in Figure 2.



Cheap food policies lower the domestic price of the

farm sector, shifting the V_F curves downward. These new curves are indicated with dashed lines. The new V_{EA} curve gives the standard model result for the case where there are no external effects between the farm and non-farm sectors. In this case, the degree of rural articulation (labor use in the rural sector) declines from n_0 to n_A . The nominal wage falls from w_0 to w_A . Since the fall in the nominal wage is less than proportionate to the fall in the price of the farm sector, the real wage rises in terms of the agricultural good but falls in terms of the manufactured good⁵.

The new V_{FB} curve has the same qualitative results as the new V_{EA} curve. However, this case is one in which external effects do exist between the farm and non-farm sectors. Consequently, both the disarticulation effect and the wage effect are strengthened. Here, the suppression of farm prices has effects beyond the farm sector. These effects are transmitted to the non-farm sector, and these feed back to the farm sector in the form of reduced labor productivity.

The new V_{FC} curve shows the impacts of cheap food policies in the presence of strong external effects. The qualitative results differ from cases A and B. The fall in n is much stronger than in the previous two cases. The same is true for the fall in w . In fact, the fall in the wage is more than proportionate to the fall in the price of the farm good. Consequently, the real wage declines unambiguously with respect to *both goods* F and M.

Summary and Implications

It has been commonly recognized that cheap food policies adversely impact on the rural farm sector. Indeed, this recognition goes back two decades to Peterson (1979). Little attention, however, has been given to the impact of cheap food policies on the extent of production linkages between the rural farm and non-farm sectors. The results of the previous section

suggest that cheap food policies adversely affect the rural sector by suppressing production linkages between the farm and non-farm sectors. Cheap food policies contribute to a process of rural disarticulation. They suppress the external economies between the farm and non-farm sectors and, in the process, suppress wages more than standard microeconomic analysis suggests. This tends to increase poverty.

The population of the rural areas of developing countries is now approximately three billion, and these three billion persons make up a large portion of the world's poor. Any attempts to alleviate poverty in the world must therefore be attempts to promote rural development. Cheap food policies are detrimental to rural development in that they suppress the articulation and associated external economies between the farm and non-farm sectors. While in many circumstances, it is politically difficult to avoid cheap food policies, not doing so has significant detrimental implications for the rural poor.

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¹Hazell and Haggblade (1993) summarize these important points as follows: "The welfare of the poor in most developing countries is linked closely to agriculture. Most of the poor live in rural areas, and they depend on agriculture for their incomes- directly, in the case of farmers and agricultural workers, or indirectly, in the case of self-employed persons and workers engaged in trade, services, agro-processing, and other nonfarm activities that cater largely to rural demands" (p. 190).

²Production in the farm sector takes place under constant returns to scale technology according to the function $q_F = Z^\alpha T^{1-\alpha}$ $0 < \alpha < 1$ where Z is an aggregate of a variety of differentiated non-farm inputs and T is the specific factor land. The aggregation of non-farm inputs takes on a constant elasticity of substitution (CES) form:

$$Z = \left(\sum_{i=1}^n q_{NF_i}^\beta \right)^{1/\beta} \quad 0 < \beta \leq 1 \text{ where } q_{NF_i} \text{ is the amount}$$

of non-farm intermediate input of variety i .

³To assist the reader, the V_M curves in both Figures 1 and 2 are drawn with a thicker line.

⁴It is also logically possible for V_F to be steeper than V_M . However, as shown by Panagariya (1986), this case is not dynamically stable.

⁵This is the "neoclassical ambiguity" of Ruffin and Jones (1977) that arises in specific factor models.

⁶Is such a process an empirical possibility? Consider the following report by *The Economist* (2000) from Zimbabwe: "(Agricultural) output is shrinking, and with it the industries that supply, or buy from, farmers: fertiliser wholesalers, bakeries, tractor-repair shops, and so on. Probably more than half of Zimbabwe industry depends on agriculture" (pp. 39-40).