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Oligopsony Distortions and Welfare Implications of Trade

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Oligopsony Distortions and Welfare Implications of Trade

Introduction: Numerous studies in the new trade theory literature have analyzed trade implications of imperfect competition in final products. Though sellers' market power has been widely prevalent in the modern economy, buyers' market power is growing in recent years. In particular, oligopsony power in raw commodity procurement in the developed countries over the last two decades is well documented. For instance, Roger and Sexton (AJAE, 1994) found evidence of buyer power by more than 50 food processing industries in the purchase of raw commodities. More recent studies provide evidence that giant corporations control raw commodity purchase and command market power over input suppliers. For example, U.S. meat packers have been consolidating and exercising greater buyer power, with the top four firms handling nearly 80 percent of the cattle slaughter and 60 percent of the hog slaughter. Oligopsony imperfection has received far less attention than oligopoly imperfection in the new trade theory literature.

Objective: This study analyzes the effects of oligopsony power in the intermediate input on output, factor rewards, factor intensities, welfare, and terms of trade.

Theoretical Model: We consider an economy with two final goods (X and Y), one intermediate good (Z), and two primary factors, labor (L) and capital (K). The final good Y (manufactured good) and the intermediate good Z (raw agricultural commodity) are produced using labor and capital. The other final good X (food product) is produced using the intermediate good and labor. Prices of Y, X, and Z are denoted by P_Y, P_X, and P_Z, respectively, and wage rate and rental rate are represented by W and R, respectively. The key difference between our model and the standard Heckscher-Ohlin trade model is that the oligopsony sector exercises market power in the purchase of both the inputs.

Full employment of primary factors for our model entails that $L_Y + L_X + L_Z = \overline{L}$ and $K_Y + K_Z = \overline{K}$. The first equation states that the sum of labor employed in all three sectors equals the total endowment of labor in the economy, and the second equation implies that the sum of capital used in the Y and Z sectors equals the total endowment of capital in the economy. Using the input-output coefficients, we can transform the above full employment equations to determine the quantity of final commodities X and Y produced in the economy. By defining a_{ij} (i=L, K, and Z, and j=X, Y, and Z) as the amount of ith input used in the production of one unit of jth good, the full employment equations are written as $a_{LY}Y + (a_{LX} + a_{LZ}a_{ZX})X = L$ and $a_{KY}Y + a_{KZ}a_{ZX}X = K$. For competitive sectors Y and Z, price equals the unit cost, entailing the zero profit or price equations: $a_{LY}W + a_{KY}R = P_Y$ and $a_{LZ}W + a_{KZ}R = P_Z$. The price equation for the X sector with the oligopsony power Φ, is $a_{LX}W + a_{ZX}(1+\Phi)P_Z = P_X$. Thus, factor payments in the oligopsonistic industry are less than the output price $(P_X - a_{ZX}\Phi P_Z)$.

Our model captures the real world phenomena prevalent in the food-processing sector. This sector exercises oligopsony power in buying bulk agricultural commodities (intermediate inputs: cattle, hogs, fresh potatoes, and logs) to produce the final goods (processed food: beef, pork, french fries, potato chips, and lumber). These firms exercise market power in the

intermediate input purchase. Thus, we model the economy in terms of the agri-food oligopsony sector versus the manufacturing competitive sector, which allows us to employ the general equilibrium framework to study the implications of market structure in one sector on the economy as a whole.

Results: We use the above model to derive the following key results.

Proposition 1. Given terms of trade, a rise in the oligopsony power in the intermediate input market (a) will increase (decrease) the output of the competitive (oligopsony) sector, the real reward to the factor that is used intensively in the competitive (oligopsony) sector, and factor intensity toward the non-intensive factor in the competitive sector only if the ranking of factor intensities is identical both in the physical and value sense as in cases 1 and 2, and (b) will increase (decrease) the output of the oligopsony (competitive) sector, the real reward to the factor that is used intensively in the oligopsony (competitive) sector, and factor intensity toward the non-intensive factor in the oligopsony sector if the ranking of factor intensities differs in the physical and value sense.

Proposition 2. For given terms of trade, an increase in oligopsony power in the intermediate input market will decrease the price of the intermediate input, irrespective of the factor intensities across the sectors.

Proposition 3. The Stolper-Samuelson theorem states that a rise in the price of a commodity will increase the real reward of the factor employed intensively in the sector and decrease the real reward of the other factor. Out results show if factor intensities differ in the physical and value sense, then Stolper-Samuelsen theorem does not hold.

Proposition 4. The Rybczynski theorem asserts that at constant commodity (and thus input) prices, an increase in the supply of one factor will cause the output of the good intensive in that factor to increase by greater proportion and will decrease the output of the other good. The Rybczynski theorem continues to hold in our study even if the factor intensities in the physical and value sense differ. It is not surprising that the Rybczynski theorem is preserved because it depends only on the relationship between physical variables (commodity outputs and factor endowments).

Proposition 5. At constant terms of trade, a rise in the oligopsony power in the intermediate input market will decrease (increase) the national welfare if factor intensities under physical and value sense do (do not) differ.