Monopolistic Competition and International Coordination of Entry Policy Revisited

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Abstract

This study develops a model of international trade under monopolistic competition with non-homothetic quadratic preferences that generate variable markups, and analyzes the effects of trade and domestic competition policies. It is shown that, among others, trade liberalization increases the long-run equilibrium varieties of differentiated goods available to consumers, but reduces welfare in the long run, and depending on the parameters of the model, the mass of firms under cooperative solution can be higher or lower than the mass of firms under noncooperative solution.

Key Words: Monopolistic competition; Variable markups; International trade; Entry policy

JEL classification: F12; L50

Extended Abstract

Since tariffs on trade have been considerably reduced as a result of GATT/WTO negotiations and/or prominent increase in regional trade agreements, domestic policy and regulation have played a significant role as non-tariff barriers in recent debate in trade negotiations. Competition policy that aims at maintaining and promoting market competition by regulating firms’ anti-competitive conduct is one of such domestic policies that can have international trade outcomes. Since a competition policy in one country can affect other countries’ output, consumption, and national welfare, harmonization of competition policies has been called for in international organizations.¹ Despite the importance of discussing the international coordination of competition policies, there have been a few theoretical studies, such as Ohyama (1997) and Yano and Honryo (2011), that examine this issue.

This paper is largely motivated by Ohyama (1997), which examines the significance and nature of international coordination of competition policy in a model of monopolistic competition. In Ohyama (1997), a representative household’s preference over differentiated goods is quadratic but it also depends on the number of firms that produce the differentiated goods so that the love for variety has a direct impact on household demand. This study

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¹For example, the European Commission lists the following behavior to be monitored (http://ec.europa.eu/competition/consumers/what_en.html): agreements between firms that restrict competition, abuse of a dominant position, mergers and other formal agreements by firms, efforts to open markets up to competition, financial support for companies from EU governments, and cooperation with national competition authorities in EU countries.

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omits this direct effect of number of firms on the household’s utility, and assume non-homothetic quadratic preferences that generate variable markups, as in the recent trade literature (e.g., Demidova, 2017).

The setup of model is described as follows. Consider an economy with horizontally differentiated goods and suppose that a representative household has the following preference over consumption goods:

\[ u(x(\omega), x_0; \omega \in \Omega) = \int_{\omega \in \Omega} x(\omega)d\omega - \frac{1-\gamma}{2} \int_{\omega \in \Omega} x(\omega)^2d\omega - \frac{\gamma}{2} \left( \int_{\omega \in \Omega} x(\omega)d\omega \right)^2 + z, \]

where \( \Omega \) is the set of all differentiated goods available to the household, \( x(\omega) \) is the consumption of a differentiated good indexed as \( \omega \), \( z \) is the consumption of a homogeneous good, which is assumed numeraire, and \( \gamma \in (0,1) \) denotes the degree of substitutability among differentiated goods. The representative household maximizes its utility subject to the budget constraint \( \int_{\omega \in \Omega} p(\omega)x(\omega)d\omega + z = I \), where \( p(\omega) \) is the price of a differentiated good indexed by \( \omega \) and \( I \) is the household’s income. The demand for each variety can be derived as follows:

\[ x(\omega) = \frac{1}{1-\gamma} \left[ 1 - p(\omega) - \frac{\gamma(N - P)}{1-\gamma + N\gamma} \right], \]

where \( N \) is the total mass of differentiated goods and \( P = \int_{\omega \in \Omega} p(\omega)d\omega \) is the price index.

All firms that produce differentiated goods are assumed to share an identical cost function \( cy(\omega) + k \), where \( y(\omega) \) is the output of a differentiated good indexed by \( \omega \), and \( c \in [0,1) \) and \( k \in \left(0, \frac{(1-\gamma)^2}{4(1-\gamma)}\right) \) are marginal and fixed costs, respectively. If the economy is under autarky, each firm maximizes its profit

\[ \pi(\omega) = [p(\omega) - c]y(\omega) - k \]

subject to \( y(\omega) = x(\omega) \) for \( \omega \in \Omega \) and \( N \) is equal to the mass of domestic firms that produce the differentiated goods. If there are two countries, Home and Foreign, that share identical economic structure except for the number of domestic firms, and if there are no costs associated with international trade (e.g., transport and communication costs, tariffs, nontrade barriers), each Home firm maximizes its profit \( \pi(\omega) \) subject to \( y(\omega) = x(\omega) + x^*(\omega) \) under free trade, where \( x(\omega) \) and \( x^*(\omega) \) are Home and Foreign households’ demand, respectively, and \( N = n + n^* \), where \( n \) and \( n^* \) are the mass of Home and Foreign firms that produces the differentiated goods.

In the short run, the mass of firms in the industry is fixed. Since all firms have identical technology, attention is focused on the symmetric equilibrium. The short-run equilibrium price, output, and consumption in each country are derived as

\[ p_S = \frac{1-\gamma + c(1-\gamma + n\gamma)}{2(1-\gamma) + n\gamma}, \quad y_S = x_S = \frac{1-c}{2(1-\gamma) + n\gamma} \]

under autarky, and

\[ \tilde{p}_S = \frac{1-\gamma + c[1-\gamma + (n + n^*)\gamma]}{2(1-\gamma) + (n + n^*)\gamma}, \quad \tilde{x}_S = \frac{1-c}{2(1-\gamma) + (n + n^*)\gamma}, \quad \tilde{y}_S = 2\tilde{x}_S \]

under free trade.

In the long run, in the absence of policy intervention on entry and exit, firms can freely enter the industry as long as they expect to earn positive profits, or exit from the industry if their profits become negative. Since all firms have identical technology, firms earn zero
profits in the long-run industry equilibrium. The long-run equilibrium price, output, and 
consumption in each country are derived as 

\[ p_L = \sqrt{(1 - \gamma)k + c}, \quad y_L = x_L = \sqrt{\frac{k}{1 - \gamma}} \]

under autarky, and 

\[ \tilde{p}_L = \sqrt{\frac{(1 - \gamma)k}{2} + c}, \quad \tilde{y}_L = \sqrt{\frac{2k}{1 - \gamma}}, \quad \tilde{x}_L = \frac{k}{2(1 - \gamma)} \]

under free trade. The equilibrium mass of firms in each country under autarky is 

\[ n_L = \frac{1}{\gamma} \left[ (1 - c)\sqrt{\frac{1 - \gamma}{k}} - 2(1 - \gamma) \right], \]

whereas the total mass of firms in the world under free trade is 

\[ \tilde{n}_L + \tilde{n}_L^* = \frac{1}{\gamma} \left[ (1 - c)\sqrt{\frac{2(1 - \gamma)}{k}} - 2(1 - \gamma) \right]. \]

Comparing the autarkic equilibrium solutions with the free-trade equilibrium solutions, 
the following results are obtained:

- Comparing the short-run equilibria,
  - trade decreases the short-run equilibrium price in each country;
  - depending on the number of firms in each country and the substitutability among
    the differentiated goods, trade can increase or decrease output levels in each
    country; and
  - trade decreases the short-run equilibrium consumption level of individual vari-
    eties.

- Comparing the long-run equilibria,
  - trade increases the varieties of differentiated goods available to consumers;
  - trade decreases the long-run equilibrium price;
  - trade increases each firm’s long-run output;
  - trade decreases the long-run equilibrium consumption level of individual varieties;
    and
  - trade decreases the long-run welfare.

The analysis proceeds to the endogenous determination of the mass of firms, which 
can be interpreted as competition policy. This study consider both noncooperative and 
cooperative entry policies. It is shown that depending on the parameters of the model, 
the mass of firms under cooperative solution can be higher or lower than the mass of firms 
under noncooperative solution.
References

