FDI and Outsourcing in a Service Industry: The Welfare Effect of Liberalizing Trade and Investment

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Abstract

FDI and outsourcing are recognized as being the most important ways to provide service in a service industry. This paper constructs a vertically related model to examine a foreign firm’s entry decision and the effect on host country’s welfare. It shows that the incentive of FDI in service is increased and the total profitability of domestic firm is not always decreased when liberalizing trade in final good. In addition, the welfare in the OS regime after liberalizing trade and investment is not necessarily greater than that under autarky. Finally, there exist some certain policy combinations of trade and investment liberalization in which the domestic firm’s profitability contradicts the host country’s social desirability when the foreign firm provides service by FDI or outsourcing respectively.

Keywords: Trade and investment liberalization; Service; FDI; Outsourcing

JEL classification: F13, F15, F21

I Introduction

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According to WTO, services have grown from 55 percent of gross domestic production to 70 percent across the world from 1977 to 2007. The added values of service industry has contributed to three-quarter GDP in 2007 among OECD countries\(^1\). In addition, FDI and outsourcing are two major kinds of entry mode of producer service\(^2\) which are recognized as being the most important ways to provide service.

A large share of the empirical literature focuses on firm’s productivity and profitability. For example, Jabbour (2010) finds outsourcing firms are more efficient than vertical integrated (FDI) firms because international outsourcing might concentrates on core activities and restricts organizational cost. Lo (2011) explains that Apple Incorporation replaced FDI with outsourcing for the reason of governance cost. Tomiura et al. (2011) conclude that outsourcing (vertical integrated) firms provide incentives to supply labor- (capital-) intensive good by sharing labor (investment) cost. Zhao and Okamura (2010) show that both Airbus and Boeing undertake FDI to reduce labor cost.

The theoretical literature is rare to discuss the trade liberalization and investment liberalization in producer-service industry. To the best acknowledge, this paper reviews the most related literature as follows. Ishikawa et al. (2010) investigate the connection between FDI in service and price competition in final goods. The trade liberalization of final good may decrease the social desirability if it does not combine the liberalization of FDI in service. Mukherjee and Suetrong (2012) devise a model of

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\(^1\) The data is originated from Francois and Hoekman (2010).

\(^2\) These four modes are the following: Mode 1, direct cross-border trade in services (OS), Mode 2, movement of the customer to the country of the provider (Consumption Abroad), Mode 3: sales of services through an offshore affiliate (FDI), Mode 4: Temporary entry of natural persons.
home-country export platform FDI to find a negative relation between trade cost and FDI. Lin and Saggi (2011) discuss the policy competition for FDI and welfare effect in a vertical related industry. Chaudhuri and Benchekroun (2012) analyze the profitability and the desirability of merger with liberalizing trade. Aronsson and Koskela (2011) study optimal income taxation under FDI and outsourcing. Choi and Choi (2013) examine FDI and outsourcing decision under conditions of wage uncertainty. Collie (2011) discovers a regional tariff jumping model in which can explain the increases in both the amount of FDI and volume of world trade. These increases are motivated by multilateral trade liberalization. Ishikawa and Horiuchi (2012) use a North-South trade model to discuss a strategic FDI in vertically related markets.

Unfortunately, recent literature focuses on the manufacturing industry and neglects to explain the relation of firm’s profitability and social desirability. Therefore, the aim of this paper was to broaden current knowledge on the service industry and the welfare effect of liberalizing trade and investment.

The remainder of the paper is organized as follows. Section 2 provides the basic model. Section 3 discusses the welfare effect of the home country. Section 4 concludes.

II The model

Firm h and firm f, which produces a homogeneous final good X, located in home and foreign country respectively. In order to enter the home market, firm f exports the final good to the home country by incurring a specific tariff t. Assume that one unit of the service is required for one unit of the final good. For simplicity, their production costs are zero without loss of generality. Because firm f wants to provide service in
the home country, firm f can choose whether FDI or outsourcing as entry mode. If firm f chooses FDI in *service*, it incurs a fixed investment cost $F$ and a unit service cost $c$. If firm f chooses outsourcing, it incurs a service price $r$ that is charged by an independent service firm s. The service cost $c$ is identical since firm h, f and s use the same source to provide service in the home country.

The game timing of this model is as follows. First stage, firm f decides FDI or outsourcing (OS). Second stage, firm s decides the service price $r$ if firm f undertakes OS. Third stage, firm h and firm f compete with quantity in the final good market. To simplify demonstration, this paper provides the following tie-breaking rules if firm f is indifferent from undertaking FDI or outsourcing. If the investment cost $F$ is relatively small, firm f undertakes FDI. In contrast, firm f undertakes OS if investment cost is relatively large.

The inverse demand function in the home country can be presented as

$$p = a - x_h - x_f,$$  \hspace{1cm} (1)

where $p$ is the price of good $X$, $x_h$ denotes the production of firm h, $x_f$ represents the production of firm f.

(i) The Cournot competition under FDI

In the third stage of FDI regime, firm h and firm f maximize their profit functions, respectively.

$$Max \pi_h = (p - c)x_h, \quad \text{and}$$ \hspace{1cm} (2)

$$Max \pi_f = (p - c - t)x_f - F.$$ \hspace{1cm} (3)

Derive the first order conditions due to profit maximization by both firms.

$$\frac{\partial \pi_h}{\partial x_h} = a - 2x_h - x_f - c, \quad \text{and}$$ \hspace{1cm} (4)
\[
\frac{\partial \pi_f}{\partial x_f} = a - 2x_f - x_h - c - t. \tag{5}
\]

It may easily verify that these equilibrium outputs are \( x_h = (a - c + t) / 3 \) and \( x_f = (a - c - 2t) \).

(ii) The OS regime

Under outsourcing, the effective marginal cost of firm \( f \) is changed from \( c \) and \( t \) to \( r \) and \( t \) respectively. Thus, the profit function and first order condition of firm \( h \) are identical to equation (2) and (4). The foreign firm’s profit function and first order condition are

\[
\text{Max } \hat{\pi}_f = (p - r - t) \hat{x}_f, \tag{6}
\]

\[
\frac{\partial \pi_f}{\partial x_f} = a - 2x_f - x_h - r - t. \tag{7}
\]

The unique equilibrium output \( \hat{x}_h(r, c, t) \) and \( \hat{x}_f(r, c, t) \) are not only a function of \( c \) and \( t \) but also the unit service price \( r \). This service price \( r \) is determined by firm \( s \) in the second stage of OS regime. It is not difficult to verify that the equilibrium outputs under OS are \( \hat{x}_h = (a - 2c + r + t) / 3 \) and \( \hat{x}_f = (a + c - 2r - 2t) \).

In the second stage of OS regime, firm \( s \) decides the service price to maximize the profit function.

\[
\text{Max } \pi_s = (r - c) \hat{x}_f(r, c, t). \tag{8}
\]

The first order condition of firm \( s \) is

\[
\frac{\partial \pi_s}{\partial r} = (r - c) \frac{\partial \hat{x}_f}{\partial r} + \hat{x}_f. \tag{9}
\]

The equilibrium service price \( r(c, t) \) is a function of \( c \) and \( t \).
\[ r = \frac{a + 3c - 2t}{4}. \]  

(10)

Differentiate \( r \) with respect \( c \) and \( t \), this paper summarizes the results as follows:

**Lemma 1.** An increase in the service cost \( c \) increases the service price \( r \). In contrast, a decrease in the tariff rate \( t \) increases the service price \( r \).

(iii) **Firm \( f \) undertakes FDI or OS**

In the first stage, firm \( f \) undertakes FDI if \( \pi_f - \hat{\pi}_f > 0 \), whereas firm \( f \) undertakes OS if \( \pi_f - \hat{\pi}_f < 0 \). In other words, firm \( f \) undertakes FDI if \( F < \bar{F} \equiv (p - c - t)x_f - (\hat{p} - r - t)\hat{x}_f \). Total differentiate the critical value \( \bar{F} \), this study obtains

\[
\frac{d\bar{F}}{dt} = \frac{d\pi_f}{dt} - \frac{d\hat{\pi}_f}{dt} = \left( \frac{\partial\pi_f}{\partial x_h} \frac{dx_h}{dt} + \frac{\partial\pi_f}{\partial t} \frac{dt}{dt} \right) - \left( \frac{\partial\hat{\pi}_f}{\partial x_h} \frac{dx_h}{dt} + \frac{\partial\hat{\pi}_f}{\partial t} \frac{dt}{dt} + \frac{\partial\hat{\pi}_f}{\partial \hat{\pi}_f} \frac{d\hat{\pi}_f}{dr} + \frac{\partial\hat{\pi}_f}{\partial \hat{\pi}_f} \frac{d\hat{\pi}_f}{\hat{r}} + \frac{\partial\hat{\pi}_f}{\partial \hat{\pi}_f} \frac{d\hat{\pi}_f}{\hat{t}} \right)
\]

\[ = - \frac{(a - c - 2t)}{3} < 0. \]  

(11)

Note lemma 1, this paper highlights the findings as lemma 2.

**Lemma 2.** The incentive of FDI in service is increased when liberalizing trade in final good.

The effective marginal cost of firm \( f \) in the FDI regime is \( (c, t) \) and in the OS regime is \( (r, t) \). Because the service price is always greater than unit service cost, the operating profit of firm \( f \) in the FDI regime is bigger than that in the OS regime. Since the effective marginal cost is low under FDI, why firm \( f \) undertakes OS while the trade barrier is high? The reason is firm \( f \) trades off the loss of sunken investment cost \( F \) and the benefit of low effective marginal cost in the FDI regime. Trade liberalization (a reduction in \( t \)) is beneficial for firm \( s \) to charge a high service price \( r \),
but the marginal cost of firm $f$ remains the same (c) in the FDI regime. When the trade barrier is high, the loss of sunken investment cost $F$ outweighs the benefit of low effective marginal cost in the FDI regime, which is why firm $f$ undertakes OS. By contrast, the benefit of low effective marginal cost outweighs the loss of sunken investment cost in the FDI regime when the trade barrier is reduced. Thus, firm $f$ undertakes FDI. As a result, the incentive of FDI in service is increased when liberalizing trade in final good.

More specifically, the first and second term $d\pi_f / dt - d\tilde{\pi}_f / dt$ in equation (11) are both negative but the first one dominates the second one. It implies that the deeper trade liberalization is, the more benefit that firm $f$ can get from undertaking FDI. It is critical to note that firm $f$ suffered two positive transmitting mechanisms through service price $r$ that are represented by two positive terms in equation (11). These two service price effects make firm $f$ more unprofitable in the OS regime.

Figure 3 1-1 and 1-2 show the intuition of foreign firm’s decision. When the investment cost $F$ is zero, the profits under FDI is always greater than that under OS except for the point A in Figure 1-1. In other words, the point A indicates that the profit of firm $f$ is indifferent between FDI and OS. Furthermore, the curve of profit under FDI shifts downward and intersects the curve of profit under OS at the point B when the investment cost becomes larger. On the locus of AB curve, firm $f$ prefers OS to FDI. On the other side, firm $f$ prefers FDI to OS on the locus of BF curve. In the situation of $F = F1$, firm $f$ prefers OS to FDI if $(a-c)/3 = t_1$, $0 < t < t_1$ = $(a-c)/2$, whereas firm $f$ prefers FDI to OS if $0 < t < t_1$. Therefore, the foreign firm’s entry decision can be depicted as bold curve ABF. Similarly, the foreign firm’s entry

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3 The quantity is measured by $(a-c)^2$ in vertical axis of all figures.
decision can be illustrated by curve ACE in the situation of $F = F_2$.

![Figure 1-1. Relationship between foreign firm’s profit and $t$](image1)

![Figure 1-2. Relationship between $F$ and $t$](image2)

This paper suggests a negative relationship between $F$ and $t$ revealed as figure 1-2. The fixed investment cost $\bar{F}$ can be characterized as AD curve. For example, firm $f$ is indifferent to choose FDI or OS at the point B while $t=t_1$ and $F=F_1$. On the contrary, the investment cost $F$ should increase from $F_1$ to $F_2$ if $t$ is reduced from $t_1=\frac{(a-c)}{3}$ to $t_2=\frac{(a-c)}{6}$. It implies that the point C is also indifferent for firm $f$ undertaking FDI or OS. As a result, firm $f$ is indifferent between FDI and OS on the locus of AD curve. If $F<\bar{F}$ or below AD curve, firm $f$ prefers FDI to OS. On the other side, firm $f$ prefers OS to FDI if $F>\bar{F}$ or above AD curve.

Conclude the foreign firm’s entry decision as follows. If firm $f$ will not incur any investment cost, firm $f$ definitely undertakes FDI since the effective marginal cost under FDI is small. When $F$ is relatively small, the benefit of trade liberalization dominates the sunken investment cost easily. When $F$ is relatively large, the sunken investment cost is difficult to overcome by the benefit of trade liberalization. Therefore, firm $f$ trades off the loss of sunken investment cost and the benefit of low
effective marginal cost under FDI.

III The domestic country’s welfare

This section considers the welfare of domestic country. The profitability of domestic firm is analyzed before the domestic country’s desirability.

(i) The profitability of domestic firm

The equilibrium profit of firm h under FDI \((a-c+t)^2/9\) is decreased with trade liberalization (see figure 2). In other words, a marginal reduction of \(t\) decreases the profitability of firm h if firm f undertakes FDI. By contrast, there are two firms, firm h and firm s, in the OS regime. The equilibrium profits of firm h and firm s under OS are \((5a-5c+2t)^2/144\) and \((a-c-2t)^2/24\), respectively. Accordingly, a marginal tariff reduction decreases the profitability of firm h but increases the profitability of firm s. Total differentiate the domestic firm’s profits under OS, this paper gets the results as follows:

\[
\frac{d(\hat{\pi}_h + \hat{\pi}_s)}{dt} = \frac{d\hat{\pi}_h}{dt} + \frac{d\hat{\pi}_s}{dt} = \left(\frac{\partial \hat{\pi}_h}{\partial \hat{x}_f} \frac{d\hat{x}_f}{dt} + \frac{\partial \hat{\pi}_s}{\partial \hat{x}_f} \frac{d\hat{x}_f}{dt}\right) + \left(\frac{\partial \hat{\pi}_h}{\partial \hat{x}_f} \frac{d\hat{x}_f}{dr} + \frac{\partial \hat{\pi}_s}{\partial \hat{x}_f} \frac{d\hat{x}_f}{dr}\right) + \left(\frac{\partial \hat{\pi}_h}{\partial \hat{x}_f} \frac{d\hat{x}_f}{dt} + \frac{\partial \hat{\pi}_s}{\partial \hat{x}_f} \frac{d\hat{x}_f}{dt}\right)
\]

\[
= \frac{-a + c + 14t}{36}
\]

This paper suggests that the domestic firm’s profitability is as follows:

Proposition 1.

(i) Trade liberalization decreases the profitability of domestic firm if firm f undertakes FDI.

(ii) For \(t_p \leq t < \bar{T}\), trade liberalization decreases the profitability of domestic firm if
firm f undertakes OS. In contrast, trade liberalization increases the profitability of domestic firm for $0 \leq t < t_p$.

Because firm f wants to produce more products in the situation of liberalizing trade, trade liberalization also increases the profitability of firm s. In contrast, trade liberalization decreases the profitability of firm h. However, the profitability of firm h dominates (is dominated by) the profitability of firm s for sufficiently large (small) tariff.

More precisely, $d\hat{\pi}_h / dt$ in equation (12) can be divided into two effects. From the viewpoint of firm h, liberalizing trade makes firm h less profitable since trade liberalization induces firm f producing more. On the other hand, the derived demand of final good is increased when liberalizing trade. Thus, firm s can charge a high service price which is beneficial for firm h since a higher service price induces firm f producing less. The former direct effect dominates the latter indirect service-price effect which is why trade liberalization decreases the profitability of firm h. From the viewpoint of firm s, the above two effects are opposite. Except for these two opposite effects, firm s directly benefits from a high service price which is induced by liberalizing trade. Consider these three effects, this paper verifies trade liberalization increases the profitability of firm s. Since firm h and firm s are involved in the OS regime, trade liberalization decreases the profitability of domestic firm if $t$ is relatively large $((a-c)/14=t_p < t < \bar{T})$. The direction of profitability is changed if $t$ is near the neighborhood of free trade ($0 < t < t_p$).
(ii) The welfare under Autarky, FDI and OS

Take the welfare of domestic country under Autarky as a benchmark case as

\[ W^A = CS^A + \pi_h^A = \frac{(a-c)^2}{8} + \frac{(a-c)^2}{4} = 0.375(a-c)^2, \quad (13) \]

where \( CS \) denotes consumer surplus.

Second, the welfare of domestic country under FDI is given by

\[ W_{FDI}^{h} = CS^{FDI} + \pi_h + tx_f = \frac{(2a-2c-t)^2 + 2(a-c+t)^2 + 6t(a-c-2t)}{18}, \quad (14) \]

where \( tx_f \) is the tariff revenue (TR). The first order condition is derived as

\[ \frac{\partial W_{FDI}^{h}}{\partial t} = -\left( \frac{\partial p}{\partial x_h} \frac{\partial x_h}{\partial t} + \frac{\partial p}{\partial x_f} \frac{\partial x_f}{\partial t} \right)x_f + (p-c) \frac{\partial x_h}{\partial t} + (x_f + t) \frac{\partial x_f}{\partial t} = \frac{a-c-3t}{3}. \quad (15) \]

The first term of equation (15) is originated from the derivation of consumer surplus. It implies trade liberalization is beneficial for consumer surplus. The second term is the marginal profit of firm \( h \) from liberalizing trade. It points toward that trade
liberalization is harmful for the profit of domestic firm. The third term is a positive tariff effect.

Third, the welfare of domestic country under OS is given by

\[
W_{b}^{OS} = CS_{b}^{OS} + \hat{\pi}_{b} + \hat{\pi}_{s} + t\hat{x}_f
\]

\[= \frac{(7a-7c-2t)^2 + 2(5a-5c+2t)^2 + 12(a-c-2t)^2 + 48t(a-c-2t)^2}{288}.
\] (16)

The first order condition is analogous to equation (14) and represented by

\[
\frac{\partial W_{b}^{OS}}{\partial t} = -[\frac{\partial \hat{p}}{\partial \hat{x}_p} \frac{\partial \hat{x}_p}{\partial t} r + \frac{\partial \hat{p}}{\partial \hat{x}_f} \frac{\partial \hat{x}_f}{\partial t} r] \hat{x}_f
\]

\[+ (\hat{p} - c) \frac{\partial \hat{x}_p}{\partial t} + [\hat{x}_f + t \frac{\partial \hat{x}_f}{\partial t}] + \frac{\partial r}{\partial t} \hat{x}_f + (r - c) \frac{\partial \hat{x}_f}{\partial t} = \frac{a-c-6t}{24}.
\] (17)

The first term of equation (17) is also originated from the derivation of consumer surplus. It means trade liberalization is *moderately* beneficial for consumer surplus since a reduction in \( t \) increases the service price. The second and third term are correspondent to equation (15), respectively. The difference of welfare between FDI and OS is emerged from the profit of firm s explained by the fourth term. The fourth term implies trade liberalization is beneficial for the profit of firm s.

(iii) Discussion and policy implication

The domestic country’s welfare is independent from the investment cost \( F \) because \( F \) is foreign firm’s investment cost. Figure 3 shows the relationship between domestic country’s welfare and \( t \). We know that firm f cannot earn any positive profit at prohibitive tariff \( \bar{T} \) (at point A). When the tariff is reduced from \( \bar{T} \) to \( t_l \), point B and B’ revealed the profits of firm f are indifferent between FDI and OS. Given the tie-breaking rule, firm f undertakes FDI because the investment cost is relative small \((F=F1)\). As a result, the domestic country maximizes their welfare at point B and the domestic country’s welfare can be depicted as bold curve AB’BD. In addition, the
domestic country maximizes their welfare at point $C$ of figure 3 if $F$ equals $F2$. Thus, the domestic country’s welfare can be presented as curve ACC’D.

Apply equation (15) and (17), this paper verifies the slopes of curve $AB’BD$ and ACC’D near point $t = \bar{t}$ is

$$\left. \frac{\partial W^F_D}{\partial t} \right|_{t=\bar{t}} = \frac{-a-c}{9} + \frac{(a-c)}{3} + \frac{-a-c}{3} = \frac{-a-c}{9} < 0,$$

and

$$\left. \frac{\partial W^O_S}{\partial t} \right|_{t=\bar{t}} = \frac{-a-c}{12} + \frac{(a-c)}{9} + \frac{-a-c}{6} = \frac{-5(a-c)}{36} < 0.$$ (18) (19)

Equation (18) and (19) shows the welfare of domestic country increases more quickly in the FDI regime than that in the OS regime when liberalizing trade near point $A$. Recall lemma 1, and note that not only the consumer surplus $-(a-c)/9$ and the tariff revenue $-(a-c)/3$ increase more quickly but also producer surplus $(a-c)/3$ decreases more quickly in the FDI regime. However, the effect on consumer surplus and tariff revenue dominate the effect on producer surplus. Thus, the welfare of domestic country increases more quickly in the FDI regime than that in the OS regime near point $A$.

Subtract equation (14) from equation (16) at point $t=t_w=5(a-c)/18$, this paper derives

$$W^F_D - W^O_S = 0 \quad \text{if} \quad t = t_w$$

$$> 0 \quad \text{if} \quad t > t_w$$

$$< 0 \quad \text{if} \quad t < t_w$$ (20)

At point $W$ of figure 3, the welfare under FDI equals the welfare under OS. The positive consumer surplus and tariff revenue, which $CS=TR=15(a-c)^2/243$, will be balanced by the negative producer surplus $-30(a-c)^2/243$ at point $t=t_w$. If $t$ is larger than $t_w$, the welfare under FDI is larger than the welfare under OS since the
positive consumer surplus and tariff revenue outweigh the negative producer surplus in the FDI regime. On the other side, the welfare under FDI is smaller than the welfare under OS because the positive consumer surplus and tariff revenue are outweighed by the negative producer surplus in the FDI regime if \( t \) is smaller than \( t_W \).

Figure 3. Relationship between domestic country’s welfare and \( t \)

Figure 4. Foreign firm’s decision and the welfare of domestic country
Figure 4 demonstrates the relationship of foreign firm’s decision and the welfare of domestic country by considering different values of \( t \) and \( F \). It is straightforward that firm \( f \) undertakes FDI beneath the AD curve since the investment cost is relatively small. In contrast, firm \( f \) undertakes OS above the AD curve. The welfare of domestic country depends on the entry mode of firm \( f \) but it is independent from investment cost \( F \). Thus, the domestic country’s welfare is indifferent from FDI or OS at vertical line of \( t = t_W \). From the above analysis, this paper summarizes that the domestic country maximizes their welfare where a domestic government can manipulate two policy parameters of liberalizing trade \( t \) and liberalizing investment \( F \) within region O1 to O5. On the other side, domestic country does not maximize their welfare within region N6 and N7.

Focus on the region from region O1 to O5 and divide the process of trade liberalization into five periods. In the beginning of trade liberalization \(( t_1 < t < t_W )\), firm \( f \) undertakes FDI where liberalizing trade decreases the profitability but increases the desirability of the entry within region O1. In period two \(( t_W < t < t_1 )\), firm \( f \) also undertakes FDI where liberalizing trade decreases both the profitability and the desirability within region O2. In period three \(( t_2 < t < t_W )\), firm \( f \) undertakes OS where trade liberalization decreases the profitability but increases the desirability within region O3. In period four \(( t_P < t < t_2 )\), firm \( f \) also undertakes OS where trade liberalization decreases both the profitability and the desirability within region O4. In the neighborhood of free trade \(( 0 < t < t_P )\), foreign firm \( f \) undertakes OS where trade liberalization increases the profitability but decrease the desirability within region O5.

It is interesting to note that a domestic country maximizes social welfare from region O1 to O5. Region O1 and O2 indicate those combinations of \( t \) and \( F \) for which firm \( f \) undertakes FDI and liberalizing trade decreases the profitability but increases
the desirability within region O1, whereas a reduction of $t$ decreases both the profitability and the desirability within region O2. Region O3 and O4 are similar to Region O1 and O2 except for firm f undertaking OS. The most striking result is that region O5 indicates those combinations of $t$ and $F$ for which firm f undertakes OS and liberalizing trade increases the profitability but decreases the desirability.

Summarize these interesting results as following proposition:

**Proposition 2.**

(i) For $t_1 < t < T$, liberalizing trade decreases the profitability but increases the desirability in the FDI regime, whereas trade liberalization also decreases the profitability but increases the desirability in the OS regime ($t_2 < t < t_w$).

(ii) For $t_w < t < t_1$, liberalizing trade decreases both the profitability and the desirability in the FDI regime, whereas trade liberalization also decreases both the profitability and the desirability in the OS regime ($t_P < t < t_2$).

(iii) For $0 < t < t_P$, trade liberalization increases the profitability but decreases the desirability in the OS regime.

This paper suggests a strong policy implication of liberalizing trade and investment in the service industry. Within region O1 or O3, the domestic government can adopt the trade liberalization policy and encourage related firms undertaking FDI or OS since liberalizing trade increases the desirability but decreases the profitability.

Within region O2, a *laissez faire* may be the best policy because liberalizing trade decreases both the desirability and the profitability, which the welfare is larger than that under Autarky. Within region O4, the domestic government cannot adopt the

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4 Auriaol and Picard (2009) find firms prefer to outsourcing when the franchise fee is larger than *laissez faire* profit.
trade liberalization and investment liberalization policy at the same time since the welfare is smaller than that under Autarky. For example, firm f changes the entry mode from OS to FDI that domestic country does not maximize social welfare if a reduction in $F$ (liberalizing investment) is sufficiently large. Moreover, domestic government also cannot adopt the liberalizing trade and liberalizing investment policy at the same time within region O5. There are many contradictions between social desirability and firm’s profitability in region O1, O3 and O5.

Summarize these interesting policy implications as follows:

**Proposition 3.**

(i) Within region 1 or 3, a domestic government can adopt the trade liberalization policy and encourage related firms undertaking FDI or OS.

(ii) Within region 4 and 5, a domestic government cannot adopt the trade liberalization and investment liberalization policy at the same time.

**IV Conclusion**

This paper not only constructs a vertically related model to examine the foreign firm’s entry decision and the effect on domestic country’s welfare but also suggests a strong policy implication of liberalizing trade and investment in the service industry. Furthermore, the welfare in the OS regime after liberalizing trade and investment is not necessarily greater than that under autarky. Finally, there exist some certain policy combinations of trade and investment liberalization in which the domestic firm’s profitability contradicts the host country’s social desirability when the foreign firm provides service by FDI or outsourcing. Future work will concentrate on the policy coordination of governments.
References


