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The economic theory of quasi-exclusive territory

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This paper introduces the economic theory of "quasi-exclusive territory." We consider vertical dealings with two upstream firms and four downstream firms that compete in two separate markets. Under quasi-exclusive territory, downstream firms are bound to pay additional charges when selling goods beyond their territorial areas. We find that with respect to the two-part tariffs comprising a marginal price and a fixed fee, quasi-exclusive territory is more beneficial for upstream firms and more harmful for consumers than conventional exclusive territory. Moreover, we note that quasi-exclusive territory is in practice in various vertical dealings and that its regulation is a difficult task.

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1. Introduction

Exclusive territory (hereafter, ET) is one of measures used to enforce vertical restraints. By imposing ET, upstream firms can eliminate the intrabrand competition among downstream firms. Many authors have explored the economic theory of ET and have shown interesting results (e.g., Mathewson and Winter (1984, 1994), Rey and Tirole (1986), Dutta, et al. (1994), Nault and Dexter (1994), Alexander and Reiffen (1995), Rey and Stiglitz (1995), Boyd (1996), and Mycielski, et al. (2000)).

On the other hand, it is well known that in the US competition policy, ET is practiced under the rule of reason. The policy suggests that firms may be prohibited from imposing ET even when it is very beneficial for them to do so.[1] Moreover, as Suzuki and Nariu (2004) indicated, ET may be rather costly for firms to enforce. Unfortunately, theoretical works about ET have not focused extensively on these facts.

In this paper, we introduce the economic theory of "quasi-exclusive territory." Let us consider that one upstream firm sells intermediate goods to two downstream firms that are located in separate markets. Further, we suppose that the upstream firm imposes an additional charge on the downstream firms when the latter sell their goods beyond their respective markets.

For example, some automobile dealers in Japan contract with manufactures to pay additional charges when selling automobiles beyond their territorial areas.[2] This means that while the dealers are not prohibited from selling cars outside their territorial areas, they clearly face considerable difficulty in doing so. Therefore, as Mishima (1993) indicated, manufactures can obtain an effect that is practically similar to that obtained with ET.[3] We term this "quasi-exclusive territory" (hereafter, QET).[4] Note that it is difficult for antitrust authorities to regulate such vertical control because the manufactures insist that the additional charge be included in the expense account for maintenance services.

We show that QET is more beneficial for upstream firms and more harmful for consumers as compared with conventional ET. The model employed here is based on Matsumura (2003). The major difference between Matsumura's model and ours is that the former considers only one upstream firm and two downstream firms. In contrast, we consider two upstream firms and four downstream firms.[5] Our model, therefore, considers competition at the upstream level. Such settings are perhaps more plausible

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1 In the EU and Japan as well, ET is allowed only when it is beneficial for consumers.

2 See, for example, Song (2003), pp.141－145.

3 See Mishima (1993), pp. 229－231.

4 For another example, consider that certain remodeling contractors in Japan have established a system wherein customers can get repairs done only from the retail shop where they purchased their service. Due to such a system, retailers find it difficulty to get customers living far from their outlets.

5 Matsumura (2003) uses the circular-city spatial model; on the other hand, we consider two separate markets. However, this difference is not significant. In the appendix, we show that Matsumura's result can also be obtained in our model.

in the real world.

The rest of the paper is organized as follows: the next section describes our model, section 3 analyzes it, section 4 concludes our results, and the appendix presents Matsumura's result obtained using our model.

2. The Model

We consider two upstream firms (firms A and B) and four downstream firms (firms 1, 2, 3, and 4). Let us assume that firm A sells intermediate goods to firms 1 and 2 and that firm B sells to firms 3 and 4. We consider two separate markets (markets 1 and 2); firms 1 and 3 are located in market 1, and firms 2 and 4 are located in market 2. Firms A and B impose a two-part tariff on each downstream firm. Thus if a downstream firm buys a quantity Q, it must pay $F+Qw$, where F is the franchise fee and w is the wholesale price. We suppose a constant marginal production cost for firms A and B and normalize it to zero. Therefore, since each upstream firm has two down stream firms, the profit of each upstream firm is $2F+Qw$, when selling quantity Q. These settings are the same as those of Matsumura (2003).

The downstream firms must purchase one intermediate good to produce one final good and they compete in the Cournot fashion in markets 1 and 2. We assume a linear demand function $P(Q)=a-q$ where a is a positive constant and q is the total sales at the market, which is the same in both markets. Without loss of generality, we assume that the production cost of the downstream firms only comprises the payment made to the upstream firm. Furthermore, we assume that the final goods produced by the downstream firms are homogeneous.

The game which we consider proceeds as follows. In the first stage, the upstream firms determine their wholesale price; in the second stage, the upstream firms determine their franchise fee; and in the third stage, the downstream firms compete in the Cournot fashion in each market.

3. Analysis

3.1. Exclusive territory

First, we consider conventional ET. In this case, firms 1 and 3 sell their final goods only in market 1 and firms 2 and 4 sell only in market 2. Each upstream firm's profit function is $\Pi_A = w_A(q_1^1 + q_2^2) + 2F_A$ and $\Pi_B = w_B(q_3^1 + q_4^2) + 2F_B$, where w_i is the wholesale price imposed by firm i, q_i^j is the quantity sold to the downstream firm i

in market j, F_i is the franchise fee imposed by firm i, and the superscripts (subscripts) of the variables indicate the markets (firms).

The downstream firms' profits are $\pi_1 = (P^1 - w_A)q_1^1 - F_A$, $\pi_2 = (P^2 - w_A)q_2^2 - F_A$, $\pi_3 = (P^1 - w_B)q_3^1 - F_B$, and $\pi_4 = (P^2 - w_B)q_4^2 - F_B$; where π_i is the profit of firm i and P^j is the price in market j. Then, quantity competition yields the equilibrium outputs as $q_1^1 = q_2^2 = (a - 2w_A + w_B)/3$ and $q_3^1 = q_4^2 = (a - 2w_B + w_A)/3$. Thus, the price and profits are obtained as a function of the wholesale prices and franchise fees:

$$P^1 = P^2 = \frac{a + w_A + w_B}{3} \tag{1}$$

$$\pi_1 = \pi_2 = \left(\frac{a - 2w_A + w_B}{3}\right)^2 - F_A \tag{2}$$

$$\pi_3 = \pi_4 = \left(\frac{a - 2w_B + w_A}{3}\right)^2 - F_B. \tag{3}$$

Following Matsumura (2003), we consider that firm A (firm B) chooses such F_A (F_B) that $\pi_1 = \pi_2 = 0$ ($\pi_3 = \pi_4 = 0$).[6] Therefore, we get

$$F_i = \left(\frac{a - 2w_i + w_j}{3}\right)^2, \left(for\ i, j = A, B, and\ i \neq j\right). \tag{4}$$

Substituting (4) into firm A and firm B's profits, we get

$$\Pi_i = 2w_i\left(\frac{a + 2w_i - w_j}{3}\right) + 2\left(\frac{a - 2w_i + w_j}{3}\right)^2, \left(for\ i, j = A, B, and\ i \neq j\right). \tag{5}$$

Differentiating (5) with respect to w_i, we have

$$w_i = -\frac{a}{4} - \frac{w_j}{4}, \left(for\ i, j = A, B, and\ i \neq j\right). \tag{6}$$

(6) suggests that an increase in the wholesale price leads to a decrease in the rival's 631
wholesale price. The logic is as follows: a rise in the wholesale price decreases the sales

6 We assume that firms 1 and 2 (firms 3 and 4) can contract only with firm A (firm B).

of the corresponding downstream firms, and the rival downstream firms, which compete in the Cournot fashion, attempt to increase their sales. Therefore, an increase in the wholesale price leads to a decrease in the rival's wholesale price.[7]

Then, from (6), we obtain the optimal wholesale price:

$$w_A = w_B = -\frac{a}{5}. \tag{7}$$

(7) suggests that upstream firms set the wholesale price lower than the production costs. Although this may appear strange, in our model, the upstream firms can completely siphon off the profits of the downstream firms.[8] Therefore, the optimal strategy is for upstream firms to allow downstream firms to sell more final goods and subsequently extract the profits by imposing a franchise fee.

Furthermore, substituting (7) into (1) and (5), we get

$$P^1 = P^2 = \frac{a}{5}\left(\equiv P^E\right) \tag{8}$$

$$\Pi_A = \Pi_B = \frac{4}{25}a^2\left(\equiv \Pi^E\right). \tag{9}$$

3.2. Quasi-exclusive territory

Next, we consider that the four downstream firms face Cournot competition with quasi-exclusive territory. Under QET, downstream firms are not prohibited from selling beyond their markets. By paying an additional charge "t," downstream firms are allowed to sell beyond their markets.[9] Thus, the two upstream firms' profits are

$$\Pi_A = w_A(q_1^1 + q_1^2 + q_2^1 + q_2^2) + 2F_A$$

$$\Pi_B = w_B(q_3^1 + q_3^2 + q_4^1 + q_4^2) + 2F_B$$

and the four downstream firms' profits are

$$\pi_i = (P^1 - w_A)q_i^1 - (P^2 - w_A - t)q_i^2 - F_A, \left(for\ i = 1,2\right)$$

$$\pi_j = (P^1 - w_B)q_j^1 - (P^2 - w_B - t)q_j^2 - F_B, \left(for\ \ j = 3,4\right).$$

As a result of Cournot competition, the outputs of firms 1 and 2 are

$$q_i^i = \frac{a - 3w_A + 2w_B + 2t}{5}, q_i^j = \frac{a - 3w_A + 2w_B - 3t}{5}, \left(for\ i, j = 1,2, and\ i \neq j\right). \tag{10}$$

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[7] That is, the upstream firm's competition emerges only in the downstream firms' Cournot competition.

[8] In an upstream monopoly case such as Matsumura (2003), the optimal wholesale price with exclusive territory is zero, as seen in the appendix.

[9] In our model, no one obtains t. It is true that if upstream firms can obtain t, they gain more; however, the main results in this paper do not vary with internalization of t.

Since we assume a symmetric economy, the outputs of firms 3 and 4 are obtained in the same manner. Thus, the price of the final goods and the downstream firms' profits are obtained as a function of the wholesale prices and franchise fees:

$$P^1 = P^2 = \frac{a + 2w_A + 2w_B + 2t}{5} \tag{11}$$

$$\pi_i = \left(\frac{a - 3w_A + 2w_B + 2t}{5}\right)^2 + \left(\frac{a - 3w_A + 2w_B - 3t}{5}\right)^2 - F_A, (for\ i = 1,2) \tag{12}$$

$$\pi_j = \left(\frac{a - 3w_B + 2w_A - 3t}{5}\right)^2 + \left(\frac{a - 3w_B + 2w_A + 2t}{5}\right)^2 - F_B, (for\ j = 3,4). \tag{13}$$

Upstream firms decide such F_A (F_B) that $\pi_1 = \pi_2 = 0$ ($\pi_3 = \pi_4 = 0$). Therefore, we have

$$F_i = \left(\frac{a - 3w_i + 2w_j + 2t}{5}\right)^2 + \left(\frac{a - 3w_i + 2w_j - 3t}{5}\right)^2, (for\ i, j = A, B, and\ i \neq j). \tag{14}$$

Then, the profits of each upstream firm are

$$\Pi_i = w_i\left(\frac{4a - 12w_i + 8w_j - 2t}{5}\right) + 2\left(\left(\frac{a - 3w_i + 2w_j + 2t}{5}\right)^2 + \left(\frac{a + 2w_i - 3w_j - 3t}{5}\right)^2\right), (for\ i, j = A, B, and\ i \neq j). \tag{15}$$

Differentiating (15) with respect to w_i, we have

$$w_i = -\frac{a}{12} - \frac{w_j}{6} + \frac{t}{24}, (for\ i, j = A, B, and\ i \neq j). \tag{16}$$

Therefore we obtain

$$w_A = w_B = \frac{-2a + t}{28}. \tag{17}$$

Note that t is $0 < t \leq 6a/17$ because $t \geq 6a/17$ makes $q_1^2 = q_2^1 = q_3^2 = q_4^1 = 0$. (17) suggests that the wholesale price is rising with t. This is because a rise in t can soften competition.[10]

Furthermore, substituting (17) into (11) and (15), we obtain

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[10] Such a competition-reducing effect is not seen in Matsumura (2003) since there is no competition at the upstream level in his model.

$$P^1 = P^2 = \frac{a}{7} + \frac{3t}{7}\left(\equiv P^Q\right) \tag{18}$$

$$\Pi_A = \Pi_B = \frac{12a^2 - 12at + 101t^2}{98}\left(\equiv \Pi^Q\right). \tag{19}$$

3.3. Exclusive territory vs. quasi-exclusive territory

Let us present the main results. First, we compare the price of the final goods under QET with that under ET. From (8) and (18), we get

$$P^E - P^Q = \frac{2a}{35} - \frac{3t}{7}. \tag{20}$$

From (20), we find that the sign of $P^E - P^Q$ depends on t. Figure 1 indicates this relationship. Perhaps surprisingly, when $t > 2a/15$, QET fetches a higher price than ET although it is more competitive than ET. Therefore, consumers suffer larger losses under QET than under ET.

The logic is as follows. QET provides greater competition-enhancing effects than ET; therefore, the price under Cournot competition by the four downstream firms in each market is lower than that under ET, provided that t is sufficiently small. However, a large t offsets the competition-enhancing effects on price.[11] Consequently, the effective QET leads to a higher price.

Next, we compare the upstream firms' profits under QET with those under ET. From (9) and (19), we obtain

$$\Pi^E - \Pi^Q = \frac{92a^2 + 12at - 2525t^2}{2450}. \tag{21}$$

(21) suggests that $\Pi^E > \Pi^Q$ is realized only when $0 < t < 0.26a$. Therefore, upstream firms can extract more profits by conducting effective QET.[12]

Figures 1 and 2 show the relationship between t and the profits of the upstream firms. This result correlates with that of Lahiri and Ono (1988). They showed that domestic welfare was improved by reducing the outputs of rather inferior firms. Clearly, an increase in t leads to such effects. Therefore, it is beneficial for upstream firms to impose t.

Why does QET have more profit-enhancing effects than ET? From (7) and (17), we know that the wholesale price under QET is higher than that under ET. This is because

[11] Such a competition-enhancing effect is not seen in Matsumura (2003) since his model does not include competition at the upstream level.
[12] If the upstream firm is a monopolist, both consumer and producer surplus benefit from ET as long as $t>0$. See appendix and Matsumura (2003).

the upstream firms prefer to avoid selling large quantities at the downstream level. In comparison with ET, the Cournot competition among the four downstream firms in each market is very competitive for the upstream firms.

However, by imposing t, the upstream firms can soften the competition while maintaining a high wholesale price. Therefore, QET is more beneficial for upstream firms than conventional ET.

4. Concluding remarks

It is a well-known fact that ET may be beneficial for both producers and consumers because it may reform the distribution system or enhance the effect of advertising. QET also displays such effects. However, we have shown in this paper that QET is more beneficial for producers and more harmful for consumers as compared with ET. Therefore, ET and not QET should be used in terms of consumer surplus.

Furthermore, as mentioned in the introduction, it may be difficult for the antitrust authorities to take action in the case of QET. However, we can state that the authorities should take action against producers if they impose upon retailers obviously unnecessary additional charges in lieu of permission to sell beyond their markets. Such additional charges are very harmful for consumers.

Appendix

Matsumura (2003) argues that ET may enhance both consumer and producer surplus. In this appendix, we discuss the case of Matsumura (2003), i.e., there is one upstream firm (firm A) and two downstream firms (firms 1 and 2). The upstream firm is a monopolist and sells intermediate goods to both the downstream firms. The other assumptions and notations are the same as those in the text.

First, we consider that the upstream firm imposes ET: firm 1 sells only in market 1 and firm 2 sells only in market 2. Therefore, each downstream firm is a monopolist in its own market. Consequently, the profit functions of both downstream firms are $\pi_i = (a - q_i^i - w_A)q_i^i - F_A \ (for\ i = 1,2)$. As a result of profit maximization for output, the downstream firms select $q_i^i = (a - w_A)/2 \quad (for\ i = 1,2)$. Thus, the price and profits are

$$P^1 = P^2 = \frac{(a + w_A)}{2} \tag{A-1}$$

$$\pi_1 = \pi_2 = \left(\frac{a - w_A}{2}\right)^2 - F_A . \tag{A-2}$$

Firm A chooses the franchise fee and wholesale price. The profit of firm A is

$$\Pi_A = w_A(q_1^1 + q_2^2) + 2F_A = w_A(a - w_A) + 2F_A\,. \qquad \text{(A-3)}$$

From (A-2), we have $F_A = (a - w_A)^2/4$. Substituting this equation into (A-3), we obtain

$$\Pi_A = w_A(a - w_A) + \frac{(a - w_A)^2}{2}\,. \qquad \text{(A-4)}$$

From the first order condition of (A-4), we obtain

$$w_A = 0\,. \qquad \text{(A-5)}$$

(A-5) shows that firm A does not impose a wholesale price in order to avoid double marginalization; it then extracts monopoly profit through the franchise fee. This result is the same as that of Matsumura (2003).

Substituting (A-5) into (A-1) and (A-3), we obtain

$$P^1 = P^2 = \frac{a}{2}\left(\equiv P^E\right) \qquad \text{(A-6)}$$

$$\Pi_A = \frac{a^2}{2}\left(\equiv \Pi^E\right). \qquad \text{(A-7)}$$

Next, I consider the case of Cournot competition, i.e., firms 1 and 2 sell final goods in both markets and each downstream firm pays additional charges (or transportation cost) t in order to access another market. Consequently, the profits of firms 1 and 2 in each market are, respectively, $\pi_1^1 = (a - q_1^1 - q_2^1 - w_A)q_1^1$, $\pi_2^1 = (a - q_1^1 - q_2^1 - w_A - t)q_2^1$, $\pi_1^2 = (a - q_1^2 - q_2^2 - w_A - t)q_1^2$, and $\pi_2^2 = (a - q_1^2 - q_2^2 - w_A)q_2^2$. Then Cournot competition yields $q_1^1 = q_2^2 = (a - w_A + t)/3$ and $q_2^1 = q_1^2 = (a - w_A - 2t)/3$, and the price and profits are

$$P^1 = P^2 = \frac{a + 2w_A + t}{3} \qquad \text{(A-8)}$$

$$\pi_1 = \pi_2 = \left(\frac{a - w_A + t}{3}\right)^2 + \left(\frac{a - w_A - 2t}{3}\right)^2 - F_A\,. \qquad \text{(A-9)}$$

Then, the profit of firm A is

$$\Pi_A = \left(\frac{4a - 4w_A - 2t}{3}\right) + 2F_A\,. \qquad \text{(A-10)}$$

From (A-9) and (A-10), we get

$$\Pi_A = \left(\frac{4a - 4w_A - 2t}{3}\right) + 2\left[\left(\frac{a - w_A + t}{3}\right)^2 + \left(\frac{a - w_A - 2t}{3}\right)^2\right]. \quad \text{(A-11)}$$

From the first order condition of (A-11), we obtain

$$w_A = \frac{a}{4} - \frac{t}{8}. \quad \text{(A-12)}$$

Substituting (A-12) into (A-8) and (A-11), we obtain

$$P^1 = P^2 = \frac{a}{2} + \frac{t}{4}\left(\equiv P^C\right) \quad \text{(A-13)}$$

$$\Pi_A = \frac{a^2}{2} - \frac{at}{2} + \frac{9t^2}{8}\left(\equiv \Pi^C\right). \quad \text{(A-14)}$$

Finally, we compare the results under ET with those under Cournot competition. From (A-6) and (A-13), we have

$$P^C - P^E = \frac{t}{4} \geq 0. \quad \text{(A-15)}$$

(A-15) suggests that the price under ET is lower than the Cournot price, if and only if $t > 0$. Furthermore, from (A-7) and (A-14), we obtain

$$\Pi^E - \Pi^C = \frac{t}{8}\left(a - \frac{9t}{8}\right) \geq 0. \quad \text{(A-16)}$$

From (A-16), we find that $\Pi^E > \Pi^C$ as long as $t > 0$. These results suggest that when the upstream firm is a monopolist, both consumer and producer surplus benefit from ET as long as $t > 0$. This is quite consistent with the result of Matsumura (2003), who considered a circular-city spatial model. For the logic of this appendix, refer to Matsumura (2003).

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REFERENCES

Alexander, C. R. and D. Reiffen (1995) "Vertical contracts as strategic commitments: how are they enforced? ", *Journal of Economics & Management Strategy*, Vol. 4, pp. 623-649.

Boyd, D. (1996) "Resale price maintenance or dealer exclusive territories? Toward a theory of product distribution", *American Economist*, Vol. 40, pp. 86-94.

Dutta, S., Bergen, M. and G. John (1994) "The governance of exclusive territories when dealers can bootleg", *Marketing Science*, Vol. 13, pp. 83-99.

Lahiri, S. and Y. Ono (1988) "Helping minor firms reduces welfare", *Economic Journal*, Vol. 98, pp. 1199-1202.

Mathewson, G. F. and R. A. Winter (1984) "An economic theory of vertical restraints", *Rand Journal of Economics*, Vol. 15, pp. 27-38.

——— , and ——— (1994) "Territorial restrictions in franchise contracts", *Economic Inquiry*, Vol. 32, pp. 181-192.

Matsumura, T. (2003) "Consumer-benefiting exclusive territories", *Canadian Journal of Economics*, Vol. 36, pp. 1007-1025.

Mishima, M. (1993) "Ryutsu keiretsuka no riron", in K. Ariga, ed., *Nihonteki ryutsu no keizaigaku*: Nihon Keizai Shinbunsha.

Mycielski, J., Riyanto, Y. E. and F. Wuyts (2000) "Inter-and intrabrand competition and the manufacture-retailer relationship", *Journal of Institutional and Theoretical Economics*, Vol. 156, pp. 599-624.

Nault, B. and A. Dexter (1994) "Adoption, transfers, and incentives in a franchise network with positive externalities", *Marketing Science*, Vol. 13, pp.412-423.

Rey, P. and J. Stiglitz (1995) "The role of exclusive territories in producers' competition", *Rand Journal of Economics*, Vol. 26, pp. 431-451.

Rey, P. and J. Tirole (1986) "The logic of vertical restraints", *American Economic Review*, Vol. 76, pp. 921-939.

Song, H. (2003) *Jidosha dealer system no kokusai hikaku*: Koyoshobo.

Suzuki, H. and T. Nariu (2004) "Maximum price stipulations and economic welfare", *Kokumin Keizai Zasshi*, Vol. 188, No. 1, pp. 27-48.

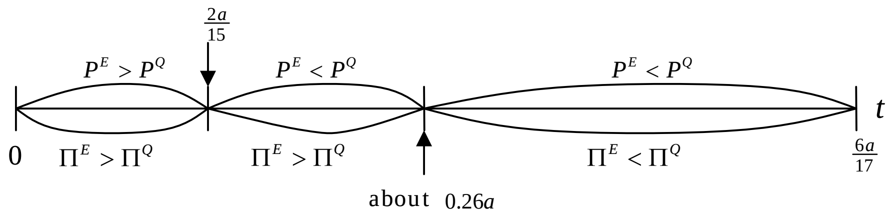

Fig. 1: Relationship between t and the price (profit)

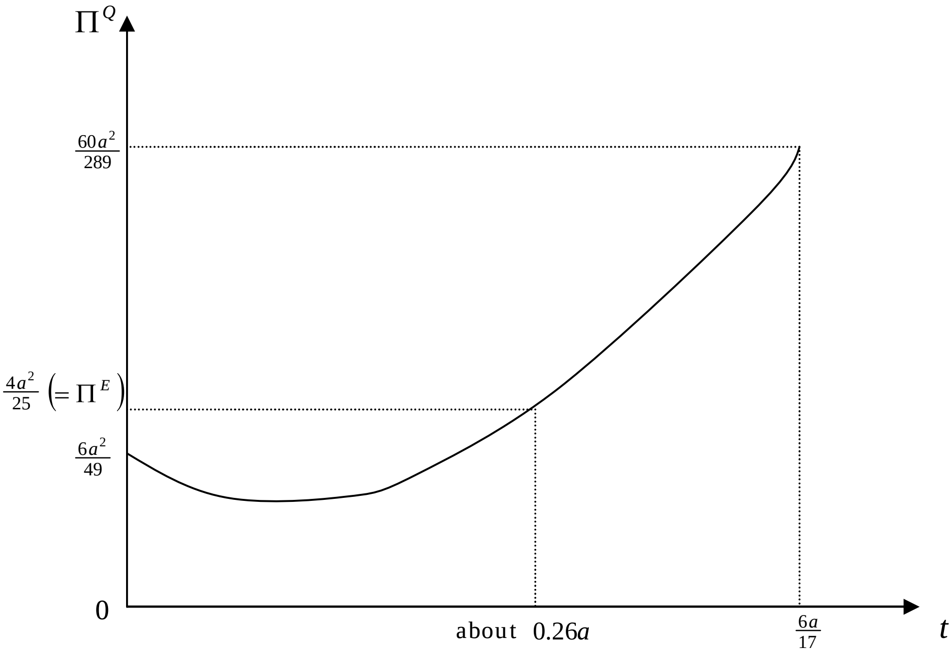

Fig. 2: Relationship between t and the profit