ECON 564 - Paper Summary: Spengler (1950), "*Vertical Integration and Antitrust Policy*"

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1 The Main Idea

This paper argues that while horizontal integration often results in higher prices and lower quality of products, nevertheless, vertical integration does not always lead to such impacts, furthermore, it could lead to the opposite effects. If there is an imperfect horizontal competition in the market, a sufficiently elastic demand and some other conditions, vertical integration does not necessary suppress the degree of competition. Vertical integration allows firm to evade monopolistic rents and transaction costs from transfers of output at each stage of production, and thus enables vertically integrated firms to sell a higher quantity of output with lower price. This result leads to a higher profit along with a higher consumer surplus, and eventually, a better allocation of resources

The paper was written as a response to a landmark decision by the Untied State Supreme Court, *United States v. Paramount Pictures, inc.*, in 1948. This decision prohibited vertical integration in film production and distribution, specifically, the film production company owning movie theaters (distributors), seeing that such practice violates antitrust law as in horizontal integration practices. Spengler urged the supreme court should make clear distinctions between horizontal and vertical integration because of the results aforementioned. The excessively prohibitive law on vertical integration will result in an obstruction of improvement in resource allocations and social welfare.

2 The Model

This paper employs a simple model, may be considered as an example, to illustrate how vertical integration leads to a better result to society. The model assumes three successive stages of production: A (raw material), B (intermediate product), and C (final product). We focus on a representative firm for each stage of production denoted a, b, and c,.
For simplicity, assume and donate the followings:

- Each firm has a constant marginal cost of production in stage i, M_i, and thus variable cost of production for firm i is $V_i = M_i$.

- Each firm faces demand for product at stage i, D_i.
- Each firm sells its product at price P_i.

In order to see the impact of vertical integration, there are three settings to be analyzed;

2.1 Vertical Separation, Perfectly Competitive Market

In this setting, the market is perfectly competitive, and firms face perfectly elastic demand. The firm at each stage of production is completely independent of others, "vertical separation". Consider the case that all the firms produce Q (equal) unit of goods at their stage, it must be that price equals marginal cost;

$$\begin{aligned} P_a &= C_a = V_a \\ P_b &= C_b = P_a + V_b = V_a + V_b \\ P_c &= C_c = P_b + V_c = V_a + V_b + V_c \end{aligned}$$

Where C_i is total accumulated marginal cost for firm i
In this case, none of firms obtain margins from trading in each stage, and thus there is no incentive to integrate vertically.

2.2 Vertical Separation, Market with Imperfect Competition

Under this setting, assume that vertically separated firms face downward sloping demand curve, and has a marginal revenue curve steeper than the demand curve. For simplicity, to have equal quantity of product for each stage, Q, assume demand such that firm's marginal revenue curve intersects marginal cost curve at $Q^* = Q$, and firm's profit-maximizing price is P_i. As firm maximizes profit and choose price in each stage, it must be that;

$$\begin{aligned} C_a &= V_a + R_a \\ C_b &= P_a + V_b = (V_a + V_b) + R_a \\ C_c &= P_b + V_c = (V_a + V_b + V_c) + (R_a + R_b) \end{aligned}$$

Where R_i is profit per unit for firm i which can be viewed as a monopolistic rent or surcharge.

2.3 Vertical Integration, Market with Imperfect Competition

With this setting, firms in all stages of production (firms in 2.2) integrate, and thus the integrated firm set final price equals P'_c and quantity of final product Q'. It is assumed that interdepartmental price is set equal to cost of production for each stage so that the total cost of producing one unit of final good is $V_a + V_b + V_c$. So the price of final good is;

$$C'_c = V_a + V_b + V_c \tag{1}$$

In order to gauge the impact of vertical integration, we would like to compare (P'_c , Q') to (P_c , Q) in setting 2.2, respectively.

3 Formal Results

The paper utilizes numerical and graphical example to analyze the impact of vertical integration (by comparing the setting 2.2 and 2.3) on price, quantity, and profit of the firm. With graphical analysis, we show that in figure 1 (attached in the appendix), $P'_c < P_c$ and $Q' > Q$. However, to make analysis clearer, compare the first order conditions, assuming both face the same demand;

For vertically separated structure,

$$MR(P_c) = C_c = (V_a + V_b + V_c) + (R_a + R_b + R_c) \tag{2}$$

For vertically integrated structure,

$$MR(P'_c) = C'_c = V_a + V_b + V_c \tag{3}$$

Since $C_c > C'_c$, and $MR(P)$ is decreasing in P, it must be that $MR(P_c) > MR(P'_c)$ and $P'_c < P_c$. Each firm then faces sufficiently elastic demand, and hence $Q' > Q$.

Aggregate consumer surplus is then increase as a result of vertical integration under imperfect horizontal competition condition by

$$Q(P_c)(P_c - P'_c) + \frac{1}{2}[(Q'(P'_c) - Q(P_c))(P_c - P'_c)] > 0 \tag{4}$$

With linear demand, and under condition assumed, profit of the integrated firm is greater than the sum of non-integrated firms by

$$Q'(P'_c)(P'_c - V) - Q(P_c)(P_c - V) > 0 \tag{5}$$

where $V = V_a + V_b + V_c$

In summary, under the condition that demand for final product is sufficiently elastic and there exists some degree of imperfect competition, vertical integration can lead to price deduction, more quantity sold, higher profit, and higher consumer surplus.

Moreover, a degree of price deduction from vertical integration is positively associated with:

- level of monopolistic surcharges
- elasticity of demand facing latter-stage firm

4 Intuition behind Results

This paper basically deals with "double marginalization" problem as the vertical structure is separated, and thus each stage of production obtain its own margin. Let assume the extreme case where firms are a monopoly in their stage of production, each firm will try to maximize its margin and this margin becomes a cost of firm in latter stage of production. As the final product arrives consumer, the margins piles up, and given monopoly market, such margins pass to consumer via a much higher price. Now consider vertical integration, as there is one and only monopoly, there is only one margin. Due to the fact that margins occur at the transfer of product ownership, vertical integration eliminates such transfers and reduce the margin. Furthermore, if the transfer of ownership associates with taxes (e.g. Value-added Tax), vertical integration will help eliminate such taxes.

In reality, this explain why generic-branded product (e.g., Target or Harris Teeter house brand) is much cheaper than the branded names, even though, the products are essentially the same. However, the production chain for house brand is vertically integrated because the distributor markets and distributes the product by itself while for brand names, this is vertical separation because the producer markets the product while distributor sells them. This works in price deduction because both producer and distributor have market power as competition in this market is imperfect. The followings are intuitions behind the determinants of cost deduction.

4.1 Level of Monopolistic Surcharges

The higher the monopolistic surcharges, the higher degree of price reduction can be achieved. The surcharges from production in each stage end up in marginal cost of final good producer, and thus pressure final price upward. To get a clearer picture, let assume to the opposite; that is, perfect competition for all markets, so in this case no producer has power to obtain monopolistic charge. Therefore, vertical integration under this circumstance, will not help save any costs for final product producer, and thus no price deduction. On the other hand, if the producers in first and second stage have full power to gain the surcharges, vertical integration will help reduce substantial amount of them, as a result, higher degree of price deduction. Hence, consider price deduction, vertical integration works well if the competition is imperfect, but does not work under perfect competition.

Back to the example of house-branded again, there are some products that price of house brand products are substantially cheaper than of brand names. This is because brand name firm tends to have large market power, and therefore, is able to charge large amount of margin (high wholesale price) so that the product becomes much more expensive on shelf.

4.2 Elasticity of Demand Facing Latter-stage Firm

The higher the elasticity of demand (but not perfectly elastic) facing final product producing firm, the higher degree of price reduction can be achieved. This is because firm will have incentive to

decrease price given that its total marginal cost reduced because there will be more quantity sold results in higher profit. Consider the extreme case where demand is perfectly inelastic, in this case, lowering the price does not increase quantity sole, so there is no price deduction given vertical integration.

For example, if we consider in-house research for pharmaceutical company as a vertical integration of R&D and production process, the fact that some drugs have patent, and that demand of them is inelastic. With these conditions, we do not see much decrease in drug price despite increasingly in-house R&D.

5 Paper's Weaknesses

In my assumption from reading this paper, it mainly intended to inform policymakers and people in legal profession, and hence, the paper is short and does not invoke formal mathematical proofs. Furthermore, it further makes the content more accessible by using graphical analysis and providing numerical examples to make abstract matters more concrete. Therefore, in this critic, I will not proceed on a lack of formal proofs and quantitative aspect of the model but will pursue other aspects instead.

The paper illustrates how vertical integration would benefit the society given some conditions by providing concrete example. Because there are large amount of assumptions invoked under this example, the paper can be clearer on what are to be assumed by at least stated the important ones in the footnote. The paper does state all assumptions along the content but this may not make reader realized, and may provide wrong impression for the readers outside field of economics that the subject is simple while in fact, there have to be much more analysis before reaching the conclusion.

The model itself is simple but provides somewhat powerful result as an argument to make against the court case. However, the paper would be more complete if the caveats of this example is discussed, for example, what are the conditions or settings that such model will not work, and how sensitive is the result when minor assumptions are altered. Moreover, the paper can be more specific about what conditions are required for this model to work, for example, how elastic demand has to be in order to be considered "sufficiently elastic", or in what degree imperfect competition has to be to make vertical integration benefits society.

References

[1] Joseph J. Spengler. Vertical Integration and Antitrust Policy. *Journal of Political Economy, 58*(4), 347-352.

6 Appendix

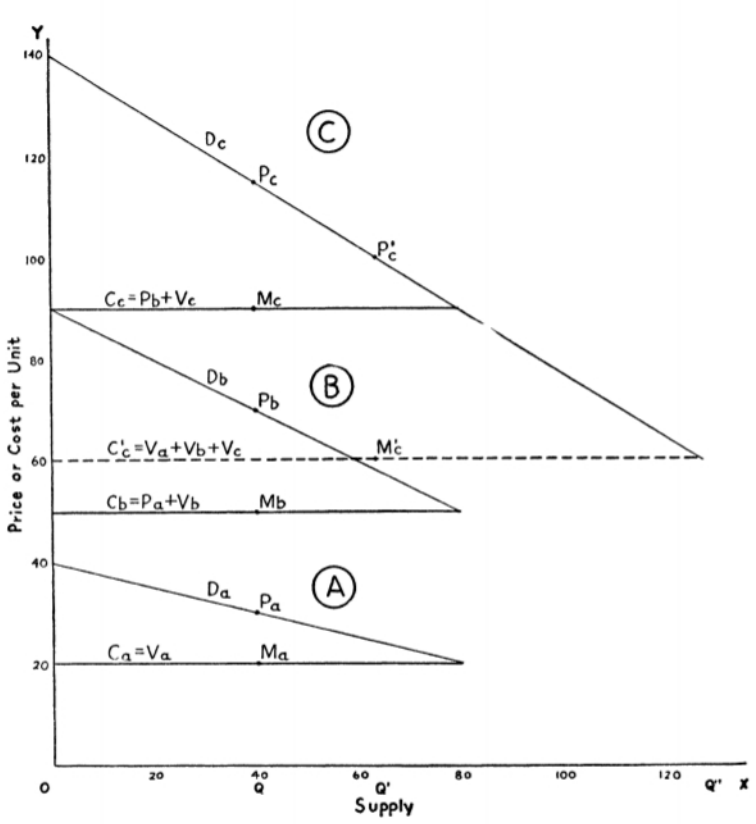

Figure 1: Spengler (1950)