

V

Vertical Integration

Giuseppina Gianfreda
University of Tuscia, Viterbo, Italy

Abstract

Economists have long been inquiring into the determinants of vertical integration. Theories which explain the rationale for firms' decision to expand vertically also predict different implications in terms of welfare. A body of literature traces vertical integration to the problem of the origin and the boundary of a firm and explains integration on the bases of the economization of costs related to market transactions and contract incompleteness; this literature dates back to Coase's (*Economica* 4:386–405, 1937) seminal article on the nature of the firm and has been developed within the Transaction Costs Economics framework and subsequently under the Property Right approach. Another set of contributions studies vertical integration with respect to firms' competitive environment. In this context, two main views emerge: on the one hand vertical integration has been considered as a way to exploit market power and implement (otherwise banned) price or exclusionary strategies and may thus raise antitrust concerns; on the other hand, integrating firms can cope with negative "vertical" externalities and increase efficiency. Another set of contributions, often referred to

as vertical equilibrium or dynamic models, explains vertical integration with respect to the degree of market maturity, as the Stigler model, or to demand fluctuations. Other models explain the incentive for vertical integration by factors related to uncertainty, i.e., over the supply of the input good or in the demand of the final good.

Introduction

Vertical integration refers to the organization of successive stages of production or distribution – i.e., a supplier and a retailer – within a single firm. Two aspects are relevant in the definition of vertical integration: (i) the ownership or control by the same firm over the successive stages of production or distribution process and (ii) the substitution of external with internal exchanges.

Vertical integration can be *full* or *partial*. Under the first aspect, i.e., ownership or control, integration is full (partial) if the firm acquires all (part of) the shares in a vertically related firm. Under the second aspect, i.e., the internalization of exchanges, full vertical integration means that the entire output of an upstream unit is employed in a downstream unit or the entire quantity of an intermediate input in the downstream unit is obtained from the upstream process, while partial integration means that most of the output of the upstream unit is employed as most of the input in

the downstream unit, that is to say that the stages of production are not internally self-sufficient.

Vertical integration can result from a process of *internal* growth or may be due to *external* expansion, i.e., the merging of a firm with another firm operating in a successive stage of production or distribution. Integration can take place in two directions, i.e., *upward* and *forward*; in the first case, a firm expands to get control over an upstream firm, for example a manufacturer who acquires an input supplier, while in the second case the control is on a downstream firm, for example a manufacturer who acquires a retailer.

Transaction Costs and Contract Incompleteness

Transaction Costs Economics

Under Transaction Costs Economics (TCE), different governance structures, i.e., internal organization versus market transactions, are evaluated with respect to the comparative costs of ensuring task completion.

TCE dates back to the pioneering article of Ronald Coase “The Nature of the Firm” in 1937 and has been enriched with further important contributions since the 1970s as the concept of transaction costs has been widened.

Coase’s starting point is that the distinguished mark of the firm is the suppression of the price mechanism; within a firm market transactions are eliminated and the allocation of resources is dependent on the entrepreneur-coordinator who directs production. The reason is that using the price mechanism has costs, which would be reduced or avoided by internalizing production. Coase focuses one type of costs in particular, i.e., long-term contracts, such as labor. Whenever a long-term contract for the supply of a service is preferred to several short period contracts – because in such a way some costs which are incurred in making each contract are avoided or because of the parties’ risk attitudes – the purchaser would not want to specify all details that the supplier is expected to do owing to uncertainty and difficulty of forecasting; in other words, he will not know which course of action he will want

the supplier to take. The contract will then state only the limits of the supplier action and the direction of resources will depend on the buyer. Coase defines the firm as a system of relationship which emerges when the direction of resources rests on the entrepreneur.

As firms emerge because they allow to save market transaction costs, they will expand until the cost of organizing an extra transaction within the firm will equal the costs of carrying out that transaction in the market or the cost of organizing it in another firm. Firm size is then limited by the decreasing returns to the entrepreneur function, by the difficulty in allocating inputs in the uses they value most as the internalized transactions increase, and by the increase in the input price due to the advantage of smaller firms.

If Coase explains the nature of the firm on the basis of the comparative transaction costs differences, Williamson (1971, 1975, 1985) develops further the concept of transaction specifying where those differences reside. His approach rests on two behavioral assumptions which break with the orthodox view of the maximizing man, i.e., the concept of bounded rationality and that of opportunistic behavior. The concept of bounded rationality was introduced by Herbert Simon (1955) who questioned the assumption of the “economic man” as being capable of making absolutely rational decisions; the capacity to acquire the relevant information for decision taking is limited, and so is the skill to compute and calculate among the different alternatives the course of action which leads to optimization.

In the presence of bounded rationality, economic agents can disclose misleading and distorting information in an opportunistic way; as a result, the assumption of self-interest seeking individual broadens as to encompass deceit. Under these circumstances, the neoclassical frictionless transaction paradigm may not always apply, in particular when bilateral interdependence between traders intrudes conflicts may arise which impair task completion. Alternative governance structures have then to be evaluated with respect to the comparative costs of ensuing – i.e., planning, adapting, and monitoring – task completion.

Williamson pinpoints three dimensions of transactions which are critical for TC evaluation: (i) asset specificity, (ii) frequency of transactions, and (iii) uncertainty. Asset specificity is the crucial condition for TC; it refers to the degree to which an asset can be reused in alternative ways and by alternative users without any loss of productive value. When investments are asset specific, their cost opportunity is much lower than they would be in the best alternative use or for an alternative user should the transaction not be completed; hence, the identity of the parties involved in the transaction becomes relevant as well as the continuity of the relationship. Asset specificity gives rise to bilateral interdependence.

Moreover, as the supply relation has to be adapted through time in response to disturbances, in evaluating the comparative advantage of internal organization versus market transactions, the ease of effecting intertemporal adaptations must be taken into account. On the one hand, market transactions allow production cost control more efficiently; on the other hand, in presence of asset specificity, they impede ease of adaptation. Vertical integration has the advantage of allowing the harmonization of interest, thus facilitating the sequential adaptive decision-making process.

Klein et al. (1978) focus on the possibility to appropriate quasi-rents from specialized asset – defined as the excess of asset's value over the value it would have in its next best use – by an opportunistic contractor as a reason for vertical integration. They refer in particular to the post contractual opportunistic behavior which will emerge once a specific investment is made no matter the enforceability of the contract. Even if a contract could unambiguously specify all relevant dimensions the threat of production delays should a litigation initiate may be an effective bargaining device.

Property Right Approach

Hart and Grossman (1986) observe that if TC approach helps understand integration when the costs of contracting between independent firms are higher, it fails to explain the limits to integration – if the right conditions are set and the owner of one of the firms becomes the

employee of the other firm, any two independent owners can be better off integrating. Hart and Grossman thus sharpen Williamson TC-based arguments and define integration in terms of ownership of assets. Here again the problem rests in the difficulty in writing a contract which provides for all the payments and actions under every observable state of nature. Whenever it is costly for a party to write a contract which specifies the list of rights it desires over a list of another party's assets, it may be optimal for the first party to purchase all rights except those specifically mentioned in the contract; vertical integration is then the acquisition of the residual right of control over a supplier or a purchaser.

In this framework the costs of integration stem from the symmetry of control, i.e., when residual rights are purchased by one party, they are lost by the other. Symmetry of control creates distortions because of contractual incompleteness. One problem arises because the allocation of ownership rights changes the returns of the investment and by this way the level of investment. A controlling firm can use its residual right of control to increase the share of ex post surplus, and this induces the controlled firm to underinvest; as a result integration is optimal only if one firm decision is particularly relevant as compared to another.

Hart and Moore (1990) further specify the model by interpreting ownership right over an asset as the ability to exclude others from the use of this asset. Assuming asset-specific or person-specific productivity acquisition and incomplete contracts, the model predicts how changes in ownership affect employees and manager incentives; integration is then efficient – holdup is reduced – whenever the acquiring firm investment is important or the acquiring firm is an important trading partner or in the presence of asset complementarity.

Vertical Integration and the Competitive Environment

The rationale for vertical integration has been widely debated in the literature with respect to markets' competitive structure. On the one hand,

integration can be seen as a way to achieve foreclosure or replicate otherwise banned price strategies such as price squeeze; from this perspective vertical integration may be a matter of concern for antitrust authorities. On the other hand, vertical integration can be explained as a response to “vertical externalities” (Tirole 1988); integrating firms may cope with efficiency losses due to variable proportions, double marginalization, and free riding problems, or, in the monopsony case, input rents extraction.

At the heart of those theories is the neoclassical firm assumption. In this setting integration is seen as an alternative to vertical agreements such as exclusive dealings, franchising, royalties, resale price agreements, or other price strategies. Vertical integration is then at the extreme end of the spectrum; theories on the pros and cons of vertical integration from the standpoint of competition usually apply to vertical restraints.

Integration, Foreclosure, and Price Discrimination

Hart and Tirole (1990) trace the foreclosure effect of vertical integration to a commitment problem. Suppose an upstream firm supplying two downstream firms. The upstream firm could serve the downstream firms at a price equal to half the monopoly profit; however, with the absence of the capacity to commit – for example, through exclusive dealings – the upstream producer would have the incentive to renege and increase the quantity sold to one of the downstream firms. In those circumstances, the downstream firms would anticipate renegotiation and refuse to enter the contract unless the price charged by the upstream producer is lower; by vertically integrating with one of the downstream firms, the upstream producer would lose the incentive to supply the downstream rival and restore market power. Vertical integration may then entail market foreclosure.

Vertical integration has also been analyzed as an exclusionary strategy relying on the raising of rivals’ costs. In this setting foreclosure occurs as a result of integration if nonintegrated downward competitors are not supplied with the inputs produced by the upward integrated firms or if the

nonintegrated upstream competitor is preempted from selling to the downward integrated firm. For example (Salop and Scheffman 1983, 1987), a dominant firm facing a competitive fringe may integrate upward and – as long as the upstream firm has market power – raise the input price to its rivals. The final price to consumers will increase. The upstream profits will be sacrificed; however, price squeeze allows the dominant firm to extend profits disproportionately. Several objections have been raised as to the possibility of preemption by raising rival costs; once that integration takes place, the reduction in the input demand by the downward integrated firm may limit the capacity of the upward independent suppliers to raise input prices; the integrated upward firms may find it unprofitable to refuse to deal with independent downstream firms; downward firms may find it profitable to integrate in turn. Some of these objections have been addressed in the literature; according to Ordovery et al. (1990), foreclosure emerges in equilibrium whenever the downstream firm’s revenue is increasing in the input price, as the profit squeeze for the downward independent firms is less than the increase in the upward unintegrated supplier profits.

Vertical integration can be also a way to practice implicit price discrimination when explicit price discrimination is banned. Suppose a monopolist – or a dominant firm – supplies two downstream firms with an input and the elasticity of the derived demand for that input is different for each firm; the monopolist would then maximize his profits by charging a higher price to the firm having a more rigid demand. If price discrimination was prohibited, the same effect could be achieved by integrating the elastic demand firm and increasing the input price to the independent firm. The result would be a price squeeze effect, since the integrated subsidiary would be able to lower price to final consumers. This argument was first set out by Stigler (1951) and then developed in various directions. Carlton and Perloff (1981) analyze vertical integration as a means to price discriminate in natural resource industries. Katz (1987) focuses on the threat to upward integration by a retail chain competing with local stores as a determinant of price discrimination; vertical

integration emerges only if price discrimination is banned.

Integration and Vertical Externalities

One of the traditional defenses of vertical integration is the theory of variable proportions. A firm employing a monopolistically supplied input in variable proportions with other inputs produced by a competitive industry would substitute the monopolistically produced input by the latter, thus causing efficiency losses. The monopolistic supplier would then be able to reap profits by integrating downward and correcting the input mix. The theory was first set out by McKenzie (1951) and Vernon and Graham (1971). The literature has debated the welfare implication of this analysis; on the one hand, vertical integration would solve the problem of inefficiency losses, thus increasing welfare; on the other hand, the higher monopolistic price for the product would cause countervailing effects. A major critique to this analysis is that integration is not a necessary condition for this result, which could be achieved by the monopolist through an appropriate pricing strategy.

Vertical integration may be welfare increasing when it avoids double marginalization. The model dates back to the pioneering article by Spengler (1950). When a firm with market power supplies an input to a downstream retailer also having market power, both the price charged by the upstream firm to the downstream retailer and the price charged by the downstream firm to final consumers will include a markup. As a result consumers will pay too high a price and final output will be “too much” restricted. If one markup could be eliminated, i.e., if retailer could price at marginal cost, final output would be increase so as joint profits. Integrating both firms can coordinate price strategies and increase both producers’ and consumers’ welfare. The avoidance of intermediate distortions presupposes market power both upstream and downstream; however, the same result is obtained if vertical integration occurs in a monopolistically competitive industry (Dixit 1983).

Vertical integration may also be a way to solve free riding problems when a manufacturer serves

competing retailers providing services which are not appropriable by a single seller. The setting has been first analyzed by Telser (1960) with respect to resale price maintenance (RPM). Suppose that for the selling of a product some investment in selling activity is needed, for example, in order to inform about the technical characteristics of a product. If a seller makes this effort, the buyers can benefit from his activity but may purchase the product elsewhere where it is sold at a lower price; the possibility of free riding entails under provision of the selling activity from the retailers. In this setting the manufacturer who has an interest in that consumers be informed about the features of the produce may prevent undercutting by the competing retailers by imposing a higher price to retailers (RPM) or integrating downward.

Incentives for upward integration may arise when a monopsonist faces an upstream competitive industry which produces an input at rising marginal cost (Perry 1978). In this model the incentive to integrate relies in the extraction of the suppliers’ rents; by acquiring suppliers one at a time, a monopsonist is able to expand the employment of the input produced by the integrated suppliers and to reduce his dependence from the unintegrated suppliers. In this process the price of the input decreases and so the independent suppliers’ rents, allowing the monopsonist to acquire upstream firms at a lower price. The monopsonist gains from this strategy are of two types: the internalization of the efficiency losses due to the underemployment of the input (efficiency effect) and the reduction of the rent component of the input cost (rent effect).

Stigler Market Equilibrium Model

Stigler’s (1951) theory of vertical integration focuses on the firm as a set of functions; firms’ decision to internalize certain function rather than acquire the corresponding services from other firms depends on the maturity of the industry, and the relation between maturity and integration is U shaped. Firms in young industries usually have to execute more tasks on their own, as they require new materials, overcome technical

problems, design specialized equipment, and so on; at the early stage of industry maturity, vertical integration is then a likely outcome. However, as markets grow, some functions become sufficiently important to be provided by specialized firms, so that integration tends to decrease. Internalization takes place again in declining industries as surviving firms have to assure functions which are no longer carried out at a sufficient rate to support independent firms.

More recent contributions (Perry 1984; Green 1986) analyze vertical integration as a response to demand fluctuations in the presence of competitive markets. When the intermediate markets are subjects to external fluctuations caused by the exogenous net supply of intermediate goods, on the one hand, firms can have incentives to integrate to avoid uncertainty and, on the other hand, they could enhance profits whenever they can respond to market fluctuations. The decision to integrate amplifies fluctuations in the intermediate markets which in turn affect the gains from integrating. Different equilibria may arise as a result of price flexibility.

Vertical Integration and Uncertainty

Other models concentrate on vertical integration in the presence of uncertainty. Arrow (1975) focuses on the uncertainty in the supply of the upstream good and on the consequent need for information by downstream firms; acquiring one or more upstream firms improves forecasts of the spot prices of the input and so the firm's ability to choose the level of capital.

According to Carlton (1979), vertical integration is a means of transferring risk from one sector to another. If the downstream firms' (the retailers) demand is random, a firm must make production decision before the demand can be observed; the derived demand which the upstream firm faces is also random. Because of the risk that the produced good goes unsold, the price of the input must exceed the marginal production cost and in this difference lies firm's incentive for forward integration; in addition integrating the firm copes with the risk of being rationed by the wholesaler, which

would prevent sales. However, according to the model, vertical integration implies a lower level of expected utility because downstream firms are less efficient risk absorbers with respect to upstream firms, which causes higher total input costs in market structures with vertical integration. The lower efficiency in risk absorption in turn is due to the higher number of downstream than upstream firms; for this reason the probability that a unit of factor input will be used if it is held in the upstream firms is higher.

Cross-References

- ▶ [Property Right](#)
- ▶ [Transaction Costs](#)
- ▶ [Vertical Restraints](#)

References

- Arrow KJ (1975) Vertical integration and communications. *Bell J Econ* 6(1):173–183
- Carlton DW (1979) Vertical integration in competitive market under uncertainty. *J Ind Econ* 27(3):189–209
- Carlton DW, Perloff JM (1981) Price discrimination, vertical integration and divestiture in natural resource markets. *Resour Energy* 3:1–11
- Coase R (1937) The nature of the firm. *Economica* 4:386–405
- Dixit A (1983) Vertical integration in a monopolistically competitive industry. *Int J Ind Organ* 1:63–87
- Green J (1986) Vertical integration and assurance of markets. In: Mathewson, Stiglitz (eds) *New developments in the analysis of market structure*. MIT Press, Cambridge, MA
- Grossman SJ, Hart O (1986) The costs and benefits of ownership: a theory of vertical and lateral integration. *J Polit Econ* 94:691–719
- Hart O, Moore J (1990) Property rights and the nature of the firm. *J Polit Econ* 98:1119–1158
- Hart O, Tirole J (1990) Vertical integration and market foreclosure. *Brook Pap Microecon*: 205–276
- Katz ML (1987) The welfare effects if third degree price discrimination in intermediate good markets. *Am Econ Rev* 77:154–167
- Klein B, Crawford RG, Alchian AA (1978) Vertical integration, appropriable rents, and the competitive contracting process. *J Law Econ* 21:297–326
- McKenzie LW (1951) Ideal output and the interdependence of firms. *Econ J* 61:785–803
- Ordover JA, Saloner G, Salop SC (1990) Equilibrium vertical foreclosure. *Am Econ Rev* 80:127–142

- Perry MK (1978) Vertical integration: the monopsony case. *Am Econ Rev* 68:561–570
- Perry MK (1984) Vertical equilibrium in a competitive input market. *Int J Ind Organ* 2:159–170
- Salop SC, Scheffman DT (1983) Raising rivals' costs. *Am Econ Rev* 73:267–271
- Salop SC, Scheffman DT (1987) Cost-raising strategies. *J Ind Econ* 36:19–34.
- Simon HA (1955) A behavioral model of rational choice. *Q J Econ* 69(1):99–118
- Spengler JJ (1950) Vertical integration and antitrust policy. *J Polit Econ* 53:347–352
- Stigler GJ (1951) The division of labor is limited by the extent of the market. *J Polit Econ* 59:185–193
- Telser LG (1960) Why should manufacturers want fair trade? *J Law Econ* 3:86–105
- Tirole J (1988) *The theory of industrial organization*. MIT Press, Cambridge, MA
- Vernon J, Graham D (1971) Profitability of monopolization by vertical integration. *J Polit Econ* 79:924–925
- Williamson OE (1971) The vertical integration of production: market failure considerations. *Am Econ Rev* 61:112–123
- Williamson OE (1975) *Markets and hierarchies: analysis and antitrust implications*. Free Press, New York
- Williamson (OE) (1985) *The economic institutions of capitalism*. Free Press, New York