Vertical Integration

Michael H. Riordan
Columbia University

[for *The New Palgrave: A Dictionary of Economics*, 2nd edition, forthcoming]

January 2007

Abstract: Modern economics takes a two-way approach to vertical integration. The theory of the firm approach focuses on how the unified control of successive production and distribution processes changes investment incentives, while the industrial organization approach studies how vertical integration affects the exercise of market power.

1. Introduction

Vertical integration is the unified ownership and operation of successive production and distribution processes by a single firm. Backward integration occurs when a manufacturer controls the production of inputs, and forward integration occurs when the manufacturer controls distribution. The alternative (market exchange) is to procure inputs and distribution services from independent suppliers. Vertical integration is a matter of degree, as firms often are only partially integrated in one direction or the other.

Vertical integration raises issues for business strategy and public policy. A major theme in the theory of the firm literature is that vertical integration remedies underinvestment in relationship-specific assets due to opportunistic bargaining when contracts are incomplete. Accordingly, vertical integration enhances operational efficiency by improving investment incentives and reducing bargaining costs. Major themes of the industrial organization literature are that vertical integration reduces a firm's procurement or distribution costs, or raises those of its rivals. Accordingly, vertical integration is a strategy for competitive advantage. Policy issues concern whether the prevention or regulation of vertical integration improves consumer and social welfare.

2. Theory of the firm approach

The neoclassical theory of the firm assumes managers choose inputs and outputs to maximize profits subject to a production function, on the assumption that the governance of transactions is costless. The modern theory, in contrast, focuses explicitly on transaction costs, including efficiency losses, arising within and between firms.

The transaction-cost approach views vertical integration as a response to difficulties negotiating and executing market contracts (Coase, 1937; Klein, Crawford and Alchian, 1978; Williamson, 1975; 1985; 1996). The transaction-cost advantages of vertical integration over market exchange are most pronounced when contracts are incomplete, and uncertain future transactions require prior investments in relationship-specific assets for operational efficiency. In these circumstances, market exchange runs afoul of the hold-up problem. Relationship-specific assets by definition are strictly more valuable in a particular transactional relationship than in alternative uses; the difference in use value is called a quasi-rent. Thus asset specificity locks investors into bilateral relationships, while contractual incompleteness exposes them to costly bargaining over quasi-rents. Bargaining costs include failures to adapt transactions efficiently to unfolding circumstances and the direct costs of dispute resolution. Vertical integration improves operational efficiency by replacing dysfunctional bargaining with centralized authority over transactions, but adds bureaucratic costs, including efficiency losses from low-powered managerial incentives. A key hypothesis is that bargaining costs of market exchange rise with asset specificity faster than the bureaucratic costs of vertical integration, leading to two propositions: first, vertical integration is more likely the more important asset specificity is for efficiency; second, vertical integration supports more investment in relationship-specific assets than market exchange (Riordan and Williamson, 1985). Empirical research generally bears out the implied positive correlation between vertical integration and the level of asset specificity (Shelanski and Klein, 1995).

The more formal property-rights approach studies how *ex post* bargaining when contracts are incomplete distorts *ex ante* relationship-specific investments (Grossman and Hart, 1986; Hart and Moore, 1990; Hart, 1995). Ownership confers control rights over the use of non-human assets used in production. While some specific control rights may be contracted away, the residual rights are held by the owners. Furthermore, managers make non-contractable relationship-specific investments to increase the value of these assets. The hold-up problem is manifest because *ex post* bargaining distributes the returns from these investments. Owner-managers who control the non-human assets of a firm undertake relationship-specific investments to the extent that the hold-up problem does not discourage them. Employee-managers, however, have less incentive because owners of the complementary non-human assets appropriate much of the investment returns. Thus vertical integration has mixed effects on managerial incentives. By eliminating the hold-up problem of market exchange, vertical integration improves investment incentives of owner-managers, while converting owner-managers into employees diminishes their incentives. Accordingly, the direction of vertical integration matters. Backward integration enhances investment incentives of downstream managers and degrades managerial incentives upstream, while forward integration has opposite effects. Optimal vertical integration depends on the importance of relationship-specific investments by managers at each stage of production and distribution. For example, forward integration is predicted when upstream managerial effort is particularly important for operational efficiency. Predictions of the property-rights approach depend sensitively on managers' investment opportunities to improve efficiency, and are difficult to test empirically (Whinston, 2003).

Vertical integration also improves efficiency by reducing information imperfections at the root of bargaining costs (Arrow, 1975; Riordan, 1990). At the same time, the changed information structure diminishes investment incentives of employee-managers by aggravating the hold-up problem. This perspective reconciles with the property-rights approach by interpreting business information as an asset for which the owner has control rights. An open question is how the change in information structure derives from primitive conditions (Hart, 1995).

Vertical integration might be motivated by the pursuit of greater bargaining leverage, rather than just greater efficiency (Bolton and Whinston, 1993). A vertically integrated supplier with scarce capacity over-invests in its downstream unit in order to negotiate better terms from independent customers. The unfortunate effect is to discourage independents' investments in relationship-specific assets. Consequently, vertical integration tends to be excessive from a social welfare perspective.

3. Industrial organization approach

While the theory of the firm deals mainly with the reasons for vertical integration, industrial organization is more concerned with its effects on competition. Building on the neoclassical theory of the firm, industrial organization studies how market power distorts transactions. Much of this literature presupposes that transactions are governed by uniform prices for inputs and outputs. In this context, the Chicago School approach identifies efficiencies of vertical integration arising from a more profitable exercise of market power, including output expansion resulting from the elimination of 'double markups' when vertically related firms each exercise market power, the correction of

'variable proportions distortions' when independent downstream firms substitute towards more competitively supplied inputs, and the prevention of free-riding on point-of-sale services (Perry, 1989).

The post-Chicago approach, by contrast, studies how foreclosure resulting from vertical integration reduces competition and raises rivals' costs (Ordover, Saloner and Salop, 1990; Riordan, 1998; Salinger, 1988; Salop and Scheffman, 1987). Foreclosure might drive up procurement costs or deny scale economies. Accordingly, an appropriate policy analysis weighs efficiencies against possible anti-competitive effects of vertical integration (Riordan and Salop, 1995). The post-Chicago approach demonstrates conditions for anti-competitive foreclosure more rigorously than the traditional foreclosure doctrine attacked by the Chicago School (Bork, 1978).

Another recent approach to vertical foreclosure studies the commitment problem of a supplier with market power who deals with customers bilaterally (Hart and Tirole, 1990; Rey and Tirole, 2007). Multilateral contracts involving a supplier and several downstream rival customers might be prevented by antitrust policy, or be unenforceable due to monitoring problems. Allowing more sophisticated contracting than just uniform pricing, the privacy of bilateral vertical contracts nevertheless fosters opportunism. A supplier has an adverse incentive to negotiate individual contracts that disadvantage other rival customers. Consequently, equilibrium supply contracts with favourable terms result in more downstream competition than would maximize total profits. Vertical integration restores monopoly power because the vertically integrated supplier is loath to set terms that hurt its own downstream division. The vertically integrated supplier offers less favourable terms to downstream rivals, raising their variable costs and causing higher

downstream prices. Enforceable contracts with multilateral elements, such as exclusive dealing, also improve profits. Moreover, a vertically integrated firm has a greater incentive to enter into exclusive supply deals that foreclose upstream competitors and effectively cartelize a downstream industry (Chen and Riordan, 2006). Such non-efficiency motives for vertical integration sometimes are contrary to consumer and social welfare, but are inconsequential if market power is absent.

Bibliography

Arrow, K.J. 1975. Vertical integration and communication. *Bell Journal of Economics* 6, 173–83.

Bolton, P. and Whinston, M.D. 1993. Incomplete contracts, vertical integration, and supply assurance. *Review of Economic Studies* 60, 121–48.

Bork, R.H. 1978. *The Antitrust Paradox: A Policy at War with Itself*. New York: Basic Books.

Chen, Y. and Riordan, M.H. 2006. Vertical integration, exclusive dealing, and *Ex Post* cartelization. *RAND Journal of Economics* (forthcoming).

Coase, R.H. 1937. The nature of the firm. *Economica* 4, 386–405.

Grossman, S.J. and Hart, O.D. 1986. The costs and benefits of ownership: a theory of vertical and lateral integration. *Journal of Political Economy* 94, 691–719.

Hart, O. 1995. *Firms, Contracts and Financial Structure*. New York: Oxford University Press.

Hart, O. and Moore, J. 1990. Property rights and the nature of the firm. *Journal of Political Economy* 98, 1119–58.

Hart, O. and Tirole, J. 1990. Vertical integration and market foreclosure. *Brookings Papers on Economic Activity: Microeconomics*, 205–76.

Klein, B., Crawford, R.A. and Alchian, A.A. 1978. Vertical integration, appropriable rents, and the competitive contracting process. *Journal of Law and Economics* 21, 297–326.

Ordover, J.A., Saloner, G. and Salop, S.C. 1990. Equilibrium vertical foreclosure. *American Economic Review* 80, 127–42.

Perry, M.K. 1989. Vertical integration: determinants and effects. In *Handbook of Industrial Organization*, vol. 1, ed. R. Schmalensee and R. Willig. Amstersdam: North-Holland.

Rey, P. and Tirole, J. 2007. A primer on foreclosure. In *Handbook of Industrial Organization*, vol. 3, ed. M. Armstrong and R.H. Porter. Amsterdam: North-Holland.

Riordan, M.H. 1990. What is vertical integration? In *The Firm as a Nexus of Treaties*, ed. M. Aoki, B. Gustafsson and O.E. Williamson. London: Sage.

Riordan, M.H. 1998. Anticompetitive vertical integration by a dominant firm. *American Economic Review* 88, 1232–48.

Riordan, M.H. and Salop, S.C. 1995. Evaluating vertical mergers: a post-Chicago approach. *Antitrust Law Journal* 63, 513–68.

Riordan, M.H. and Williamson, O.E. 1985. Asset specificity and economic organization. *International Journal of Industrial Organization* 3, 365–78.

Salinger, M.A. 1988. Vertical mergers and market foreclosure. *Quarterly Journal of Economics* 103, 345–56.

Salop, S.C. and Scheffman, D.T. 1987. Cost-raising strategies. *Journal of Industrial Economics* 36, 19–34.

Shelanski, H.A. and Klein, P.G. 1995. Empirical research in transaction cost economics: review and assessment. *Journal of Law, Economics, and Organization* 11, 335–61.

Whinston, M.D. 2003. Transaction cost determinants of vertical integration. *Journal of Law, Economics, and Organization* 19, 1–23.

Williamson, O.E. 1975. *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: Free Press.

Williamson, O.E. 1985. *The Economic Institutions of Capital*. New York: Free Press.

Williamson, O.E. 1996. *The Mechanisms of Governance*. New York: Oxford University Press.