DRAFT OF APRIL 22R, 2010

VERTICAL INTEGRATION

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Abstract: Oliver Williamson's work on transaction cost economics, and more generally on the factors that determine the boundaries between firms and markets, has provided key insights that have significantly expanded our understanding of the attributes of transactions and organizations that lead to vertical integration and vertical contractual relationships more broadly. Traditional neoclassical theories of vertical relationships generally turn on efforts of firms either to mitigate inefficiencies caused by market power at one or more levels of the vertical chain or to create or enhance market power at one of both levels. There is little empirical support for these theories. Transaction cost-based theories of vertical integration pioneered by Oliver Williamson focus on the implications of incomplete contracts, asset specificity, information imperfections, incentives for opportunistic behavior and the costs and benefits of internal organization. These theories focus on efforts by firms to mitigate transactions costs and various contractual hazards that may arise with anonymous spot market transactions by choosing among alternative organizational and contractual governance arrangements that can reduce these costs. There is substantial empirical support for these theories. Property-rights based theories were stimulated by Oliver Williamson's earlier work on transaction cost economics and are sometimes interpreted as formalizing some of his work. However, little empirical work has focused on property-rights based theories per se. Principal-agent theories of vertical integration that are distinguished from other organizational theories primarily by assumed differences in risk aversion between principals and agents and associated moral hazard problems have also been advanced. They add little to the other theories and have limited independent empirical support.

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1. Introduction

A great deal of Oliver Williamson's research has focused on understanding the factors that lead firms to choose internal organization (vertical and horizontal integration) instead of market transactions --- that it, his work has focused on the factors that determine the boundaries between firms and markets and the internal organization of firms --- as well as on the factors that lead firms to eschew simple anonymous spot market transactions in favor of more complex vertical contractual arrangements --- what I will refer to as "non-standard contractual arrangements in this paper." Williamson's work and the work of those that have built on it both theoretically and empirically have led to fundamental changes in the way we think about vertical integration and non-standard contractual arrangements between firms at different levels of the production and distribution chain. While we can point to Coase as raising the fundamental questions regarding the boundaries between firms and markets and the potential role of largely undefined transactions costs,[1] it is Williamson who re-ignited interests in this perspective, significantly moved the theory forward, and stimulated an enormous amount of empirical research on these issues. An important conceptual lesson from Williamson's work is that it is not particularly useful to think of there being a sharp dichotomy between internal organization (e.g. vertical integration) and market transactions. Rather, the appropriate conceptual framework recognizes a continuum of governance arrangements between spot market transactions and internal organization, including combinations of both (e.g. dual sourcing).

Of course, Williamson was not the first economist to address these issues. Understanding the factors that determine which types of transactions are mediated through markets and which

[1] Ronald Coase, *The Nature of the Firm*, 4 ECONOMICA 386 (1937).

within firms through vertical and horizontal integration has been an important subject of theoretical and empirical research in microeconomics for many years. Moreover, vertical integration and related no-standard contractual arrangements (sometimes referred to as "vertical restraints" in the antitrust policy arena) have historically attracted considerable attention under U.S. antitrust laws. Surprisingly, however, most intermediate microeconomics textbooks pay little if any attention to the causes and consequences of vertical integration between suppliers of intermediate goods and services ("upstream") and the purchasers of those goods and services ("downstream") and the typical undergraduate who majors in economics (and perhaps goes on the law school and later in life becomes a judge) may learn nothing about vertical integration, the transaction and organizational factors that affect the boundaries between firms and markets, and contractual alternatives to spot market transactions.

This paper reviews the theoretical and empirical work in microeconomics that examines the causes and consequences of vertical integration. I want to emphasize at the outset that there is not and will never be one unified theory of vertical integration. Moreover, while some of the literature on vertical integration continues to focus on a sharp dichotomy between the decision to "make" internally or "buy" through the market, work by Williamson and others working in the transaction cost economics tradition that he pioneered, teaches us that in reality these two governance arrangements are polar cases. A comprehensive analysis of the underlying causes and consequences of vertical integration should not only examine the determinants of the boundaries between firms and markets but also the origins of various "non-standard" contractual arrangements or "hybrid forms" that lie between simple anonymous spot market transactions and internal organization. These hybrid forms include various types of long term contracts, franchise contracts, non-linear pricing arrangements, resale price maintenance agreements, requirements contracts, joint ventures, dual

sourcing (partial vertical integration) and others. Depending on the circumstances, these alternative contractual arrangements may be perfect or imperfect substitutes for vertical integration for dealing with problems that may arise by relying only on simple repeated spot market relationships between upstream and downstream firms.

Virtually all theories of vertical integration turn in one way or another on the presence of market imperfections of some type. That is, deviations from the long list of explicit and implicit assumptions that are associated with textbook models of perfect competition and anonymous spot market transactions that are mediated through hypothetical perfectly competitive markets. Neoclassical approaches to vertical integration have tended to focus primarily (though not exclusively as I discuss further below) on vertical integration as a response to pre-existing market power problems or as a strategic action to create or enhance market power in upstream or downstream markets. While not excluding these rationales for vertical integration, organizational economics based theories (transaction cost economics, and related property rights and principal agent theories) of vertical integration start with the recognition that firms seeking to consummate transactions must confront a variety of potential transaction costs, contractual, and organizational hazards, which are related to the attributes of the transactions at issue. These transaction costs involve the direct costs of writing, monitoring and enforcing contingent contracts as well as the costs associated with the *ex ante* investment *and ex post* performance inefficiencies that may arise as a consequence of contractual hazards associated with transactions mediated through market arrangements and bureaucratic costs associated with internal organization. When the transactions costs associated with spot market transactions and non-standard bilateral contractual arrangements become large, vertical integration is a potential alternative governance structure with lower transaction costs. However, the transaction cost economics framework recognizes that vertical

integration has both costs and benefits compared to the wide array of feasible market contracts. The governance structures that are chosen, whether vertical integration, non-standard vertical contractual arrangements, or simple anonymous spot market transactions reflect efforts by the firms involved to reduce inefficiencies that might otherwise be associated with both *ex ante* investment decisions *and* the *ex post* performance of a trading relationship.

The first section of this paper reviews what I call neoclassical theories of vertical integration. The discussion covers vertical externalities, price discrimination, horizontal externalities, vertical foreclosure, and other theories. I then proceed to review transactions cost economics theories of vertical integration based on incomplete contract, transactions cost, asset specificity, internal organization cost and other considerations. Brief discussions of property rights or rights of control theories and principal agent theories of vertical integration follow. The final substantive section discusses the empirical work that has examined the various theories of vertical integration and related non-standard vertical contractual arrangements.

2. Neoclassical Approaches to Explaining Vertical Integration

The explanations of the causes and consequences of vertical integration that emerged in the field of industrial organization during the post-World War II period were heavily influenced by the sharp distinction made at that time between resource allocation mediated through markets and resource allocation that takes place within private firms and related types of hierarchical organizations (e.g public enterprises). Microeconomics in general and applied price theory in particular were concerned with the way anonymous spot markets worked to allocate resources. The factors that determined the boundaries between firms and markets were largely ignored by economists and issues associated with the internal organization of firms and the way firms allocated

resources internally were, with a few exceptions,[2] viewed as outside of the domain of economics. Firms were conceptualized as production sets that defined the *technologically* most efficient opportunities to transform inputs into outputs. They relied on anonymous spot markets to buy and sell inputs and outputs. That is, what firms did and what markets did were *complementary* activities. Coase's view that firms and markets were *substitute* governance mechanisms was not an accepted part of received wisdom until relatively recently.[3] Precisely what was in a firm's production set and what was not was, at best, rather vague and there existed no meaningful economic theory to explain where to draw the line between firms and market transactions, to explain the diverse types of "non-standard" contractual arrangements observed in the real world, or to understand the complex internal organization of firms.

Industrial organization theorists like Bain viewed the relevant firm production set rather narrowly as encompassing activities that were clearly physically related to one another.[4] Both multi-plant economies and vertical integration downstream and upstream were generally viewed as being unnecessary for a firm to produce at minimum cost in the absence of technological relationships that physically joined production between plants. Instead, the presumption was that vertical integration,

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[2] HERBERT A. SIMON, ADMINISTRATIVE BEHAVIOR (1947); RICHARD CYERT & JAMES MARCH, A BEHAVIORAL THEORY OF THE FIRM (1963); *and* KENNETH J. ARROW, THE LIMITS OF ORGANIZATION (1974).

[3] Coase *supra* note 1 *and* Ronald Coase, *Industrial Organization: A Proposal for Research*, *in* POLICY ISSUES AND RESEARCH OPPORTUNITIES IN INDUSTRIAL ORGANIZATION 59 (V.R. Fuchs ed., National Bureau of Economics Research 1972).

[4] JOE BAIN, BARRIERS TO NEW COMPETITION (1956) *and* JOE BAIN, INDUSTRIAL ORGANIZATION (1959).

and non-standard vertical contractual arrangements more broadly, reflected responses to market power that existed in upstream or downstream markets (or both) and/or reflected efforts by firms to create or exploit market power. Thus, reactions to or efforts to create market power are the fundamental bases for neoclassical theories of vertical integration.

Vertical externalities: A classical explanation for vertical integration is as a response to inefficiencies that arise when there is market power in both the upstream and downstream markets.[5] This in turn implies that market prices will be greater than the marginal cost of production in both upstream and downstream markets as firms exercise market power. The polar case is one where there is a pure monopoly upstream ("manufacturing") and another pure monopoly downstream ("retailing") and where the upstream monopoly has all of the bargaining power over the price that will be charged for goods or services sold by the upstream firm to the downstream firm. The monopoly at the upstream "manufacturing" level has a marginal production cost c and seeks to charge a monopoly input price $P_M > c$ to the downstream firm. The downstream "retail" monopoly takes the price P_M as its input cost and exercises its monopoly power by charging a retail price $P_{RM} > P_M$. The upstream monopoly has added a monopoly markup to its production costs and then the downstream monopoly has added another markup to the price it pays to the upstream firm for its inputs. This phenomenon is known as *double-marginalization*. When making its pricing decisions, the downstream monopoly ignores (because it does not see) the actual costs of production incurred by the upstream firm. This behavior of the independent monopolies results in aggregate profits that are smaller than they would be in the firms set prices so as to maximize their joint profits. It also

[5] Market power as that term is used in economic theory. Firms face downward sloping demand curves and are not pure price takers. There need not be supra-normal profits in equilibrium, however.

leads to higher prices downstream than would maximize the joint profits if the upstream and downstream firms. Tirole refers to the failure of the downstream firm to take upstream production costs into account as a *vertical externality*.[6]

If we assume that vertical integration is costless, the aggregate profits of the upstream and downstream monopolies will increase if they merge since the distortion from double marginalization will disappear. The integrated firm will set the profit maximizing downstream monopoly price properly taking into account the actual costs of production at the upstream level. Moreover, although the downstream firm sets monopoly prices, these monopoly prices are lower than they would be if the upstream firm were an independent monopoly and, as a result, consumers are made better off by vertical integration. This is the classic example of the maxim that a single monopoly is better than a chain of monopolies.

This approach treats vertical integration itself as being "costless" compared to alternative institutional arrangements That is, no internal organizational costs are recognized, but only any costs created by distortions in market prices, quantities, or the factor proportions used to produce output from a neoclassical production function. Accordingly, it identifies the potential benefits of vertical integration to the firms, but not any associated costs that firms may bear when they enter additional lines of business and expand the size and scope of activities undertaken internally by the firm. "Costless" vertical integration here is effectively being used as a benchmark against which alternative "costless" contractual arrangements could be compared. In this context, distortions arising in one way or another as a consequence of double marginalization can be "solved" as well with alternative (assumed costless) contractual arrangements --- simple linear transfer prices, two-part tariffs, maximum retail price maintenance, quantity forcing contracts, requirements contracts,

[6] JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION Chapter 4 (1988).

etc.[7] Thus, vertical integration and a menu of non-standard vertical contractual arrangements are all substitute mechanisms for solving the same double marginalization problem. Absent transactions costs of some type associated with internal organization and/or alternative contractual arrangements, vertical integration and a set of alternative contractual arrangements are all equally attractive mechanisms for responding to double marginalization. In situations where double marginalization is a problem, however, it may be that relying on two-part tariffs or retail price maintenance or some other non-standard contractual arrangement may give superior or inferior results once organizational and contracting costs are properly taken into account.

Note that the double marginalization problem does not arise here if the downstream market is perfectly competitive. In that case the downstream retail firms are price takers and simply pass along the manufacturer's monopoly price P_M. There is now only one monopoly distortion. However, introducing uncertainty about the downstream firms' costs and demand by the upstream firm and risk aversion by downstream firms has the effect of making non-standard vertical contractual arrangements more attractive than simple (linear) monopoly pricing and, ignoring organization costs, makes vertical integration potentially profitable as well.[8]

Regardless of the competitive structure of the downstream market, if the downstream firms have production functions that allow for some substitution between an input they purchase from an upstream monopoly and an input they can buy in a competitive market, then by charging a price above its marginal cost, an upstream monopoly will induce the downstream firm inefficiently to

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[7] TIROLE, *supra* note 6, at Chapter 4.

[8] Patrick Rey & Jean Tirole, *The Logic of Vertical Restaints*, 76(5) AM. ECON. REV. 921 (1986) 1986.

substitute away from the monopoly priced input and use more of the competitively priced.[9] Vertical integration in this case can restore an efficient utilization of inputs used in the production of the downstream good or service and increase aggregate profits for the firms. However, a tying contract that ties sales of the competitively supplied input and the monopoly supplied input together in a way that reflects the inputs' relatively marginal production costs can have the same effect. If the downstream market is characterized by monopoly, absent vertical integration, resale price maintenance (RPM) specifying a maximum retail price would have to be added as well to the tying contract in order to mitigate the downstream price (as well as input utilization) effects of double marginalization. In that case, a franchise fee or two part tariff ($T = A + cq$) structured so that the marginal price is the manufacturer's marginal cost of production will also restore the right input utilization incentives and correct the downstream price distortion resulting from double marginalization. The overall welfare effects of vertical integration or these substitute non-standard vertical contracts when there is market power upstream and input substitution possibilities downstream are positive although the effect on consumer prices is ambiguous when the downstream market is competitive.[10] Again, all of these results assume implicitly that there are no transaction costs associated with either vertical integration or substitute non-standard contractual arrangements.

Of course monopoly upstream and downstream or monopoly upstream and perfect competition downstream are both extreme cases. More realistic cases will involve imperfect

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[9] J.M. Vernon & D. Graham, *Profitability of Monopolization by Vertical Integration*, J. POL. ECON. (1971); Richard Schmalensee, *A Note on the Theory of Vertical Integration*, 81(2) J. POL. ECON. 442 (1973); *and* F. Warren-Boulton, *Vertical Control with Variable Proportions*, 82 (July-August) J. POL. ECON., 783 (1974).

[10] Schmalensee, *supra* note 9 *and* Warren-Boulton, *supra* note 9.

competition both upstream and downstream. The double marginal problem will still arise if firms at both levels of the production chain have some market power as they will mark up their prices above their actual or perceived marginal cost in qualitatively (though not quantitatively) the same way as in the standard chain of monopolies case. The opportunity to eliminate or reduce this double marginalization problem still creates incentive for vertical integration or reliance on the types of alternative non-standard vertical contractual arrangements that I have discussed. However, when there is imperfect competition upstream and downstream rather than pure monopolies at both levels ex ante, vertical integration may also have effects on the intensity of competition upstream and or downstream and associated price-cost margins and profits. This will in turn affect the incentives to vertically integrate, the distribution of profits between firms resulting from vertical integration, and consumer prices. Moreover, the social welfare effects of vertical integration are now more likely to be ambiguous, depending on the assumptions made about the nature of competition upstream and downstream and how the intensity of competition is affected by vertical integration.[11]

Introducing service and product quality dimensions further enriches the analysis. Let us return to the chain of monopolies case but assume that the downstream firm can provide service that is valuable to retail consumers. The more service the retailer provides the greater is the demand for the upstream manufacturer's product. However, the downstream retailer incurs costs to provide this service. In making the decision about how much service to provide the retailer will compare the incremental cost of service against the *retail margin* ($P_{RM} - P_M$) earned from each unit of additional sales. However, this underestimates the true aggregate incremental profit resulting from incremental

[11] Kai-Uwe Kuhn & Xavier Vives, *Excess Entry, Vertical Integration and Welfare*, 30 RAND J. ECON. 575 (1999) *and* Michael Riordan, *Anticompetitive Vertical Integration by a Dominant Firm*, 88 AM. ECON. REV. 1232 (1998).

sales for the entire vertical chain by ($P_M - c$). It also underestimates the incremental consumer welfare from increased service. Vertical integration would internalize this externality, reduce retail prices, and lead to greater expenditures on retail service. Here, neither franchise fees not maximum resale price maintenance (RPM) are perfect substitutes for vertical integration since they cannot remedy the externality associated with the mispricing of the incremental value of expenditures on retail service. A quantity forcing contract in which the retailer must sell a minimum quantity of the manufacturer's goods could effectively force it to promote the product efficiently.[12] Again, these results hold in a world where we assume that there are no transaction costs associated with vertical integration and substitute contractual arrangements.

This chain of monopolies model with downstream service provision by a retail monopoly can be extended to the case where there are identical (perfectly) competing downstream firms selling a monopoly manufacturer's goods and where the provision of retail service by each downstream firm expands the demand for the manufacturer's product. This is a case of *intra-brand competition.* Similar distortions in expenditures on retail service are realized in the unintegrated situation as discussed above. The vertically integrated solution fully internalizes the retail service expenditure and demand effects. However, as is well known, a downstream monopoly (the result of vertical integration here) that makes choices about both prices and service quality will consider marginal consumer surplus while the competitive (and efficient) result maximizes average consumer surplus.[13] Vertical integration may be profitable but the welfare consequences are therefore ambiguous because of the replacement of competition with monopoly in the downstream market.[14]

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[12] TIROLE, *supra* note 6, *at* Chapter 4.

[13] M. Spence, *Monopoly, Quality and Regulation*, 6(2) BELL J. ECON. 417 (1975).

[14] TIROLE, *supra* note 6, *at* 182.

The analysis can be enhanced further by allowing the downstream market to be monopolistically competitive rather than perfectly competitive. The manufacturer now may seek to vertically integrate to control retail prices, the provision of retail services *and* the number of outlets (or product variety). The welfare effects of vertical integration are now even more ambiguous. Moreover, none of the non-standard vertical contractual arrangements (e.g. franchise fees, RPM, etc.) individually is sufficient to restore a fully efficient allocation even assuming perfect information, though combinations of these instruments may be.[15] These models also raise horizontal externality issues that I will turn to presently. And again, these models ignore transaction costs that may be associated with internal organization and substitute non-standard contractual arrangements.

Price discrimination: Opportunities to engage in price discrimination in the sale of an intermediate good or service to downstream firms in different industries arises when the elasticity of the derived demand for the intermediate goods varies from one industry to the other. Differences in the elasticity of derived demand creates the opportunity for the upstream monopoly profitably to engage in third-degree price discrimination by charging a higher price to firms in the downstream industry with the less elastic derived demand and a lower price to downstream firms in the industry with the more elastic derived demand. However, the upstream monopoly must confront the challenge of blocking the firms in the industry that are paying lower prices from profitably reselling the intermediate good to firms in the downstream industry that are being charged higher prices, effectively defeating the third-degree price discrimination strategy.

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[15] Frank Mathewson & Ralph Winter, *The Economics of Vertical Restraints in Distribution*, *in* NEW DEVELOPMENTS ANALYSIS MARKET STRUCTURES 27 (Frank Mathewson & Joseph Stiglitz eds., 1986) *and* Ralph Winter, *Vertical Control and Price vs. Non-price Competition*, 108 Q. J. ECON. 61 (1993).

Blocking resale is always a problem faced by a firm that seeks to engage in third degree price discrimination. One way effectively to block resale is for the upstream monopoly to vertically integrate forward into the industry with the more elastic derived demand for the intermediate good.[16] The vertically integrated firm then only sells the intermediate good to "external" buyers at the higher profit maximizing price that reflects the lower demand elasticity in the other downstream industry. In this case, the vertically integrated firm effectively charges itself a lower price for the downstream output it now produces as a vertically integrated firm than it charges to other "external" buyers (effectively because it knows its own marginal cost of producing the intermediate good and sets the profit maximizing price for the product it now sells in the downstream industry taking account of that industry's (higher) demand elasticity).

Unintegrated downstream firms competing in the industry into which the upstream monopoly has integrated forward now can only buy the intermediate good at the higher "external" price designed to capture monopoly rents from firms in the other industry with the smaller demand elasticity. Unless these firms are otherwise more efficient as producers of products in the downstream market into which the upstream firm has integrated forward, the consequence of this pricing strategy will be that the incumbent downstream firms in this market will be unable to compete with the vertically integrated firm because their costs will be too high due to the high price they must now pay for the intermediate good. This is a classical *price squeeze*. Despite the fact that the upstream firm has extended its monopoly into one of the downstream markets, downstream prices may fall compared to what they would have been if the upstream firm had stayed independent and charged a uniform monopoly price to downstream firms in both industries. Similarly, the

[16] Martin Perry, *Price Discrimination and Vertical Integration*, 9 (Spring) BELL J. ECON. 209 (1978).

downstream price in the low demand elasticity industry into which the upstream firm has not integrated will rise. As with third degree price discrimination generally, the welfare effects of this price discrimination strategy are ambiguous. Of course, the upstream monopoly could accomplish the same price discrimination result if it could sign contracts that could credibly restrict resale. With such contracts there would also be no price squeeze as the firms in each downstream industry would now face the same industry-specific price for the input sold by the upstream monopoly. As with other neoclassical models that create incentives for vertical integration, transaction costs associated with vertical integration and/or alternative contractual arrangements are implicitly assumed to be zero.

Horizontal Externalities: Another potential source of incentives for vertical integration is the *free rider* problem associated with the provision of pre-sale information and post-sale service by competing downstream retailers.[17] Here upstream firms manufacture branded or differentiated products so that they face a downward sloping demand for each product. Moreover, the demand for the upstream firm's product is affected by downstream retail sales and service activity and associated expenditures that are made by downstream retailers of their products. If retailers cannot fully appropriate for themselves the benefits of retail service expenditures but instead see some of the benefits accrue to their downstream retail competitors, this "horizontal externality"[18] will lead downstream retailers to under-invest in retail service from the perspective of the manufacturer.

Vertical integration is one potential solution to this problem. It would allow the upstream manufacturer to internalize the value of expenditures on sales and service at the retail/downstream

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[17] Lester G. Telser, *Why Should Manufacturers Want Fair Trade?* 3 J. L. & ECON. 86 (1960) 190 *and* Mathewson & Winter, *supra* note 15.

[18] TIROLE, *supra* note 6, *at* Chapter 4.

level. So too are various combinations of exclusive territorial agreements, minimum resale price maintenance, profit pass-over contracts and other vertical contractual mechanisms. As usual, absent the consideration of the transactional and organizational costs, the unanswered question is how to choose among the alternative institutional arrangements in a systematic way.

Vertical Foreclosure: Vertical integration (and long term vertical contracts) can be used strategically to "soften" competition in the short run by raising rivals' costs or in the long run by increasing the costs of entry to foreclose rivals that might otherwise enter the market.[19] Here it is important to distinguish between a naive view of "market foreclosure" that is sometimes associated with vertical integration and the issues that arise as a result of the strategic use of vertical integration to soften competition in order to raise prices in the upstream market, the downstream market, or both. Whenever a firm vertically integrates and self-supplies itself with some input, other potential suppliers are in some sense "foreclosed" from providing those input supplies to the vertically integrated firm since the vertically integrated firm substitute self-supply for purchases that it would otherwise make in the market. By this definition all vertical integration "forecloses competition." This is not a useful or sensible notion of anticompetitive vertical foreclosure.

The classic case of potentially anticompetitive vertical foreclosure arises when there is a monopoly over the supply of some "essential facility" or "bottleneck resource" input that competing or potentially competing firms need access to at comparable terms and conditions in order to

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[19] Steven Salop & David Scheffman, *Raising Rivals' Costs*, 73 AM. ECON. REV. 267 (1983); Philippe Aghion & Patrick Bolton, *Contracts as a Barrier to Entry*, 77 AM. ECON. REV. 388 (1987); Janusz Ordover, Steven Salop & Garth Saloner, *Equilibrium Vertical Foreclosure*, 80 AM. ECON. REV. 127 (1990); Oliver Hart & Jean Tirole, *Vertical Integration and Market Foreclosure*, Special Issue BROOKINGS PAPERS ON ECON. ACTIVITY 205 (1990); *and* Riordan, *supra* note 11.

compete in a downstream market. A high voltage electric power transmission network is an example of an essentially facility in this sense because electricity generating firms must have access to the transmission network to produce and sell their output efficiently to wholesale marketing intermediaries or directly to retail consumers. A firm that controls the essential facility and also competes in the downstream market may find it profitable to deny access to that facility or charge a high price to third parties seeking to use the facility it in order to sustain its monopoly in the downstream market.

The classic response to this argument is that there is "only one monopoly profit" to be had here and that by charging a monopoly price for access to the essential facility the firm that controls it can extract all of the monopoly rents that are potentially available. The firm that controls the essential facility does not need to restrict access to the facility nor can it extend its monopoly into a downstream market in a way that further disadvantages consumers. This argument breaks down in a number of cases. When the price for access to the essential facility is regulated, the firm that controls it may find it attractive to restrict access to it in order to restrict entry into other *unregulated* markets in which the owner of the essential facility is also a competing supplier.[20] Vertical foreclosure arguments often arise as *regulated* vertically integrated monopolies are subject to public policies that open up opportunities for competitors to enter one or more lines of business served by the vertically integrated firm. So, for example, the development of competitive wholesale markets for electric power requires competing generators and their customers to have access to an electric transmission network which has natural monopoly characteristics.[21] A firm that both controls the transmission

[20] Randolph Beard, David Kasserman & Jon Mayo, *Regulation Vertical Integration and Sabotage*, 49 J. INDUS. ECON. 319 (2001)

[21] Paul L. Joskow, *Restructuring, Competition and Regulatory Reform in the U.S. Electricity*

network and is also a competitor in the power market that relies on this transmission network may have the incentive and ability to use the terms and conditions of access to that network to reduce competition in the competitive power market. Continuing price regulation, and in particular cross subsidies that attract inefficient competitive entry, creates additional complexities regarding the incentives to enter a market and the consequences of foreclosure strategies, but I will not pursue those issues here.

Potential opportunities for anticompetitive use of vertical integration or vertical restraints do not require that there be a monopoly either upstream or downstream or an essential facility or input to which downstream suppliers require access. Ordover, Salop and Saloner analyze a model where there is a duopoly made up of two identical firms that produce a *homogeneous* input upstream and engage in Bertrand competition (effectively perfect competition here) and a duopoly downstream where the firms sell *differentiated* products and also compete in prices (Bertrand competition).[22] Absent vertical integration the upstream firms sell inputs to the downstream firms at a price equal to their marginal production cost. The downstream firms take this input price into account and maximize profits given the demand elasticities they face for the products they each produce, yielding a classic Bertrand equilibrium with differentiated products downstream. The assumption of Bertrand competition downstream means that prices are strategic complements and will be at a level above marginal cost in equilibrium. If one firm selling a differentiated product raises its price then the competing firm will also find it profitable to raise its price. Each firm's price in turn depends on the price it pays for inputs. If one downstream firm can somehow induce the input price paid by the

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Sector, 11 J. ECON. PERSP. 119 (1997) *and* Paul L. Joskow, *Lessons Learned from Electricity Market Liberalization*, Special Issue in Honor of David Newbery ENERGY J. 9 (2008b).

[22] Ordover, Salop and Saloner, *supra* note 19.

other downstream firm to rise, while its own input costs do not rise, downstream prices will rise in equilibrium and the profits of the firm that induces its rivals' costs to rise will rise as well. This is the basic mechanism through which a "raising rivals' cost" strategy operates.

How could one downstream firm induce the input prices paid by its competing downstream firm to rise without increasing its own input costs? If one downstream firm vertically integrates with one upstream input supplier and can commit not to sell inputs to the other downstream firm, the remaining independent upstream input supplier now becomes the monopoly supplier to the remaining downstream firm. Accordingly, it will have the ability to raise the price it charges for the inputs it sells to the remaining unintegrated downstream firm. The unintegrated downstream firm will respond to higher input prices by raising its own prices and the other (now vertically integrated) downstream firm will respond by raising its prices in response. Downstream prices rise as do the profits of the vertically integrated firm and the unintegrated upstream firm. This strategy cannot be sustained if the vertically integrated firm cannot commit to withhold input supplies from the market or if it is profitable for the remaining independent upstream and downstream firms to merge as well, effectively recreating the original duopoly situation. Riordan examines a situation where there is a downstream dominant firm plus a competitive fringe and shows how backward vertical integration can lead to higher prices upstream and downstream as well.[23]

Other Neoclassical Theories: Dennis Carlton has shown how the combination of uncertain demand for inputs and the failure of markets to be cleared by spot prices under some contingencies can create a private incentive for downstream firms to integrate backwards partially or fully for "supply security" reasons.[24] "The strong incentives for vertical integration arise because the

[23] Riordan, *supra* note 11.

[24] Dennis Carlton, *Vertical Integration in Competitive Markets under Uncertainty*, 27 J. INDUS.

vertically integrated firm is able to satisfy high probability demand by itself, and pass on the low probability demand to some other firm."[25] However, Williamson points out that "…arguments favorable to vertical integration that turn on 'supply reliability' considerations commonly reduce to the contractual incompleteness issue (footnote omitted)."[26] Moreover, it is not clear that the market imperfections that create the incentive to vertically integrate here could not be equally well (or even better) mitigated by downstream firms by arranging a portfolio of fixed price and spot market contracts.

George Stigler proposed a theory of vertical integration[27] based upon Adam Smith's famous maxim that "the division of labor is limited by the extent of the market." Stigler advanced a dynamic or life-cycle theory of vertical integration. He argued that in an infant industry producing a new downstream product, vertical integration would be more likely to occur because the demand for specialized inputs would be too small to support independent firms supplying intermediate goods.

ECON. , 189 (1979); *cf.* H.B. Malmgren, *Information, Expectations and the Theory of the Firm*, 75 Q. J. ECON. 399 (1961); Kenneth J. Arrow, *Vertical Integration and Communication*, 6(1) BELL J. ECON. , 173 (1975); Jerry Green, *Vertical Integration and Assurance of Markets, in* NEW DEVELOPMENTS ANALYSIS MARKET STRUCTURE (F.G. Mathewson and J.E. Stiglitz eds., 1986); *and* Patrick Bolton & Michael Whinston, *Incomplete Contracts, Vertical Integration, and Supply Assurance*, 60 REV. ECON. STUD. 121 (1993).

[25] Carlton, *supra* note 24, at 207.

[26] Oliver Williamson, *The Vertical Integration of Production: Market Failure Considerations*, 61 AM. ECON. REV. 112, 117 (1971).

[27] George Stigler, *The Division of Labor is Limited by the Extent of the Market*, 59 J. POL. ECON. 185 (1951).

As the demand for the new product grows, intermediate good suppliers whose production is characterized by increasing returns would be spun off as independent firms supplying inputs to multiple competing downstream suppliers. Stigler's theory turns primarily on economies and diseconomies of scale and the implicit assumption that suppliers of new products require specialized inputs. It ignores transactions costs associated with both internal organization and market contracting.

Acemoglu, Johnson and Mitton propose a theory in which imperfections in capital markets, regulation, and/or contracting costs create incentives for vertical integration though its ability to overcome these market imperfections by moving transactions from imperfect markets into less costly hierarchical allocation structures.[28] This theory provides a bridge between the traditional neoclassical theories of vertical integration and substitute vertical contractual restraints that arise either as responses to market power or efforts to create or enhance market power and those theories that focus more on the comparative costs of internal organization and an array of market-based contractual alternatives to internal organization.

There is clearly no shortage of neoclassical theories identifying potential incentives for and consequences of vertical integration. This should not be surprising. As long as it is assumed that there are no additional costs associated with internal organization, almost any market imperfection necessarily becomes a candidate for creating private incentives for vertical integration. Since few markets are perfectly competitive, if internal organization were really costless, vertical integration would be the norm rather than the exception.

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[28] Daron Acemoglu, Simon Johnson & Todd Mitton, *Determinants of Vertical Integration: Finance, Contracts and Regulations*, 64 J. FIN. 1251 (2009).

3. Transaction Cost Theories

Transaction cost economics theories pioneered by Oliver Williamson and associated empirical research looks at vertical integration from a broader organizational cost/benefit perspective.[29] The foundation of transaction cost economics theories is the recognition that contracts are incomplete and that contractual incompleteness potentially leads to contractual hazards that adversely affect *ex ante* investment incentives and the efficiency of *ex post* performance. Contractual incompleteness, and its interaction with the attributes of different types of transactional attributes including asset specificity, complexity, uncertainty, and other attributes play a central role in the evaluation of the relative costs of governance through market-based bilateral contracts versus governance through vertical integration. The bureaucratic and incentive costs associated with internal organization are the other side of the cost/benefit calculus.

When transactions are mediated through market-based contracts, circumstances may arise where the buyer and seller have conflicting interests. Consider the situation where transacting parties are locked-in to a bilateral trading relationship, in the sense that the potential aggregate value of continuing the bilateral relationship is higher than terminating it and turning to alternative buyers or sellers. In this situation one or both parties to the contractual relationship may have the incentive and ability to behave "opportunistically" to serve their own interests – e.g. seeking to extract a larger share of the quasi rents resulting from the continuing relationship. The resulting bargaining over the

[29] OLIVER WILLIAMSON, MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS (1975); Oliver Williamson, *Credible Commitments: Using Hostages to Support Exchange*, 73 AM. ECON. REV. 519 (1983); *and* OLIVER WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM (1985).

terms and conditions of trade will affect both the distribution of the rents associated with this particular bilateral trading relationship and potentially the efficiency (quantities and production cost distortions) of the trades that are consummated *ex post* as well (reducing the rents about which the parties can argue as well as the aggregate value of the trading relationship *ex ante* and *ex post*). The potential advantage of vertical integration in this case is that internal organizational allocation mechanisms are likely to better harmonize these conflicting interests and provide for a smoother and less costly adaptation process under these circumstances, facilitating more efficient *ex ante* investment in the relationship *and* more efficient adaptation to changing supply and demand conditions over time. As Williamson observed many years ago:

> "…The contractual dilemma is this: On the one hand, it may be prohibitively costly, if not infeasible, to specify contractually the full range of contingencies and stipulate appropriate responses between stages. On the other hand, if the contract is seriously incomplete in these respects but, once the original negotiations are settled, the contracting parties are locked into a bilateral exchange, the divergent interests between the parties will predictably lead to individually opportunistic behavior and joint losses. The advantages of integration thus are not that technological (flow process) economies are unavailable to non-integrated firms, but that integration harmonizes interests (or reconciles differences, often by fiat) and permits an efficient (adaptive, sequential) decision process to be utilized…."[30]

Incomplete contracts *per se* do not necessarily lead to market inefficiencies. It is the interaction between contractual incompleteness and certain other attributes of transactions that can lead the parties to a trading relationship to become "locked-in" to the relationship once the

[30] Oliver Williamson, *supra* note 26.

relationship is consummated. This in turn can lead to adaptation problems that adversely affect *ex ante* investment incentives and the *ex post* efficiency of the trading relationship. As this literature has developed, *relationship specific investments* of various kinds, when they are required to support an efficient trading relationship, have come to play a central, though not exclusive, role in making bilateral trading relationships susceptible to *ex post* bargaining and contractual performance problems. Relationship-specific investments are investments which, once made, have a value in alternative uses that is less than the value in the use originally intended to support a specific trading relationship. Once specific investments have been made a potential "hold up" or "opportunism" situation is created if the parties can bargain over the appropriable *ex post* quasi rents (the difference in asset values between the intended use in the relationship and the next best use if the relationship is terminated[31]) created by specific investments or must bargain or "haggle" to adapt to changing circumstances as the relationship proceeds over time.

Asset specificity that is directly relevant to vertical integration is thought to arise in a number of different contexts.[32]

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[31] Benjamin Klein, Robert Crawford & Armen Alchian, *Vertical Integration, Appropriable Rents, and the Competitive Contracting Process*, 21 J. L. & ECON. 297 (1978); Oliver Williamson, *Transaction-cost Economics: The Governance of Contractual Relations*, 22 J. L. & ECON. 3 (1979); *and* OLIVER WILLIAMSON, THE MECHANISMS OF GOVERNANCE (1996).

[32] Williamson (1983), *supra* note 29 *and* Williamson (1996), *supra* note 31, at Chapter 4. Masten, Meehan and Snyder identify "temporal asset specificity" as a sixth category (Scott Masten, James Meehan & Edward Snyder, *The Costs or Organization*, 7 J. L. ECON. & ORG. 1 (1991).) Williamson argues that this is a form of site specificity and I agree with his assessment (Williamson (1996) *supra* at 106).

1. *site specificity*: The buyer and the seller are in a "cheek-by-jowl" relationship with one another, reflecting *ex ante* decisions to minimize inventory and transportation expenses. Once sited the assets in question are highly immobile. A mine mouth coal plant[33] or a bauxite processing plant and the associated mines[34] are examples of site specificity.

2. *physical asset specificity*: When one or both parties to the transaction make investments in equipment and machinery that involve design characteristics specific to the transaction which have lower values in alternative uses. A boiler that has been designed to burn a particular type of coal[35] and investments in tools and dies to produce parts that can be used in a specific downstream manufacturer's products[36] have this characteristic.

3. *human asset specificity*: When, as a consequence of learning by doing, workers accumulate relationship specific human capital that makes it possible for them to produce goods and services more efficiently than can otherwise equivalent workers who do not have this firm specific human capital. Such human capital is of particular value to the suppliers and customers that benefit from it, and is of lower value to the workers (or the firms they work for) if not utilized to support the

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[33] Paul L. Joskow, *Vertical Integration and Long Term Contracts: The Case of Coal-burning Electric Generating Stations*, 1 J. L. ECON. & ORG. 33 (1985) *and* Paul L. Joskow, *Contract Duration and Relationship Specific Investments*, 77 AM. ECON. REV. 168 (1987).

[34] JOHN STUKEY, VERTICAL INTEGRATION AND JOINT VENTURES IN THE ALUMINUM INDUSTRY (1983).

[35] Joskow (1985), *supra* note 33.

[36] Klein, Crawford & Alchian, *supra* note 31 *and* Benjamin Klein, *Vertical Integration as Organized Ownership: The Fisher Body-General Motors Relationship Revisited*, 4 J. L. ECON. & ORG. 199 (1988).

specific relationship within which it accumulated. Design engineers who have developed special skills in designing a particular type of aircraft or automotive components are examples of human asset specificity.[37]

4. *dedicated assets*: General investment by a supplier that would not otherwise be made but for the prospect of selling a significant amount of product to a particular customer. If the relationship is terminated prematurely, it would leave the supplier with significant excess capacity and a lower price to support the investment would be realized *ex post* than had been ancticipated *ex ante*. The development of a large natural resource deposit in a remote location to supply a large upstream user is an example of dedicated assets.[38]

5. *intangible assets*: Although specific investments are most frequently conceptualized as either physical investments or relationship specific human capital, intangible capital such as brand name loyalty can have relationship specific attributes. For example, McDonalds has significant brand name value which has accumulated over time through investments in product quality, advertising and promotion. The value of these investments is tied completely to the McDonalds brand name. In order to sell its products, however, McDonalds must convey the use of its valuable brand name to its distribution outlets, some of which it owns (vertical integration) and some of which are independent franchisees. (Lafontaine and Slade conceptualize this kind of situation as a principal agent problem (and which they refer to a "moral hazard" problem)[39] and I will turn to

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[37] Kirk Monteverde & David Teece, *Supplier Switching Costs and Vertical Integration in the Automobile Industry*, 13 BELL J. ECON. 206 (1982) *and* Masten, Meehan & Snyder, *supra* note 32.

[38] Joskow (1985), *supra* note 33.

[39] Francine Lafontaine & Margaret Slade, *Vertical Integration and Firm Boundaries: The Evidence*, XLV J. ECON. LITERATURE 629 (2007).

principal agent model explanations for vertical integration presently.

Vertical integration is favored when the benefits of mitigating opportunism problems that may arise as a consequence of specific investments are greater than the costs of other sources of static and dynamic inefficiency that may be associated with resource allocation within bureaucratic organizations that may emerge as a consequence of vertical integration.

Even in the face of significant contractual hazards resulting from specific investments and incomplete contracts, firms may still find it advantageous to continue to rely on arms-length market transactions for all or a fraction of their input or distribution requirements rather than turning to complete vertical integration. This choice may be made to provide management with external information that it can use to assess the performance of its internal divisions and to counteract the costs of various types of internal organizational inefficiencies. Competitive market prices convey a tremendous amount of information that is difficult to reproduce using internal accounting cost and auditing information. Moreover, this information is updated very quickly as supply and demand conditions change if a firm is in the market repeatedly. As organizations get larger the volume of auditing information that must be processed by management grows non-linearly with the size and scope of the firm[40] and becomes more difficult to use to control costs and quality effectively and to adapt to changing market conditions. The potential shirking problems resulting from low powered compensation incentives within organizations are also likely to become more significant as monitoring becomes more difficult in large organizations.

Accordingly, the transaction cost economics literature adopts the perspective that there are benefits and costs of vertical (or horizontal or lateral) integration. Market transactions incur transactions costs associated with writing and enforcing contingent contracts and the inefficiencies

[40] Williamson, *supra* note 26.

ex ante and *ex post* resulting from opportunistic behavior that exploits specific investments. Internal bureaucratic allocation mechanisms that may be used in conjunction with vertical integration can help to mitigate these types of transactions costs but incur other types of transactions or organization costs. The costs of internal organization are associated with the relatively inferior adaptive properties of bureaucratic hierarchies to rapidly changing outside opportunities over the longer term and the difficulty of designing compensation mechanisms to give managers and employees appropriate incentives to control costs and product quality. No governance structure is free from at least some transactions costs. The decision whether or not to vertically integrate then becomes a tradeoff between the costs of alternative governance arrangements. Governance arrangements are selected which represent the best that can be accomplished from a set of imperfect governance alternatives. As Williamson observes:

> "A complete treatment of vertical integration requires that the limits as well as the powers of internal organization be assessed. As the frictions associated with the powers of administrative coordination become progressively more severe, recourse to market exchange becomes more attractive, *ceteris paribus*… it is simply asserted [in this essay] that, mainly on account of bounded rationality and greater confidence in the objectivity of market exchange in comparison with bureaucratic process market intermediation is generally to be preferred over internal supply in circumstances in which markets may be said to 'work well." (footnote omitted)
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> "The properties of the firm that commend internal organization as a market substitute … fall into three categories: incentives, controls, and what may be referred to broadly as 'inherent structural advantages.' In an incentive sense, internal organization attenuates the aggressive advocacy that epitomizes arm's length bargaining. Interests, if not perfectly

harmonized, are at least free of representations of narrowly opportunistic sort… In circumstances…where protracted bargaining between independent parties to a transaction can be reasonably anticipated, internalization becomes attractive." (footnote omitted)

"… when conflicts develop, the firm possesses a comparatively efficient conflict resolution machinery… fiat is frequently a more efficient way to settle minor conflicts (say differences in interpretation) than is haggling or litigations."[41]

4. Other Organizational Theories

4.1 Property Rights Based Theories

An important difference between internal organization and market contracting is the nature of the delegation of authority to make decisions when contingencies arise which could not otherwise be contracted on effectively through bilateral contracts. The property rights approach focuses on ownership and control of physical and intangible assets (but not human capital that accrues to individual workers) where ownership carries with it the authority to determine how these assets will be used.[42] As with transaction cost economics theories, the primary distinguishing characteristics from neoclassical theories are incomplete contracts, asset specificity, and opportunism problems. Ownership of specific investments (e.g. through vertical integration) gives the owner the residual authority to use the assets to further the owner's objective function. While negotiations between

[41]Williamson, *supra* note 26.

[42] Sanford Grossman & Oliver Hart, *The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration*, 94 J. POL. ECON. 69 (1986); Oliver Hart & John Moore, *Property Rights and the Nature of the Firm*, 98 J. POL. ECON. 1119 (1990); *and* OLIVER HART, FIRMS CONTRACTS AND FINANCIAL STRUCTURE (1995).

managers within a firm may arise, the firm establishes clear lines of authority to resolve them. Ownership and the rights of control that go along with it change the status quo bargaining point within the firm and the ultimate allocation of the rents over which the bargaining takes place. That is, when specific investments are involved, ownership of the specific assets allocates the residual rights of control to the party that makes the specific investment. The owner then has the authority over the *ex post* trading decision and any internal transfer prices that may be relevant. Hart shows how various combinations of specific physical and human capital can affect the allocation of resources under alternative ownership arrangements.[43] The residual rights of control that are conveyed by ownership affect the *ex post* distribution of surplus which in turn affects the *ex ante* incentives to invest. Baker and Hubbard provide empirical support in the context of their analysis of the choice between ownership of trucks used for transporting freight and contracting with independent truckers for these services.[44]

The property rights approach offers many insights based on clear and precise theoretical modeling. However, the property rights approach strips the firm of most of its organizational features and focuses on how ownership and the associated residual rights of control affect the bargaining power of otherwise self-interested economic agents engaged in bilateral trade. This approach does not allow for any other changes in incentives and behavior of the transacting parties when the relationship is brought from the market to inside of the firm (vertical integration). Thus, it

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[43] HART (1995) *supra* note 42.

[44] George P. Baker & Thomas N. Hubbard, *Make Versus Buy in Trucking: Asset Ownership, Job Design and Information*, 93(3) AM. ECON. REV. 551 (2003) *and* George P. Baker & Thomas N. Hubbard, *Contractibility and Asset Ownership: On-board Computers and Governance in U.S. Trucking*, 119(4) Q. J. ECON. 1443 (2004).

largely ignores important differences between market transactions and internal organization other than simply a change in relative bargaining power between self-interested managers.[45] However, the objective functions possessed by managers and the incentive and payoff structure that they face are different for managers within a firm as compared to managers in separate firms. One of the key tasks of management is to develop monitoring and financial incentive arrangements within the firm that induce the managers and employees to pursue the interests of the firm rather than the interests of a hypothetical independent division of the firm producing for its own account.[46] These incentive arrangements include compensation contracts that partially tie compensation to overall firm performance and the effects of employee behavior on promotion opportunities and continued employment. In short, other things equal, the incentive and ability of a manager within a firm to exploit specific investments to hold up another division is different from what it would be if the managers were managing two independent firms.

Monitoring behavior and the costs and distribution of information are also likely to be different within a firm than between independent firms.[47] Employees within a firm have different incentives and obligations to reveal information to senior management from those of employees of an independent firm and can be subject to swifter and different penalties for hiding information (e.g. termination). Moreover, senior management has authority to use a variety of monitoring and

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[45] WILLIAMSON (1996), *supra* note 31, at Chapter 4.

[46] WILLIAMSON (1985), *supra* note 29, at Chapter 6; Bengt Holmstrom & Paul Milgrom, *The Firm as Incentive System*, AM. ECON. REV. (Sept. 1994); *and* Oliver E. Williamson, Michael L. Wachter & Jeffrey E. Harris, *Understanding the Employment Relation: The Analysis of Idiosyncratic Exchange*, VI BELL J. ECON. (1975).

[47] WILLIAMSON (1975), *supra* note 29; Arrow, *supra* note 24; *and* HART (1995) *supra* note 42.

information gathering mechanisms that can be matched quickly to problems as they arise without adhering to formal (incomplete) auditing contracts. The internal auditing departments of large firms have substantial authority to range far and wide in identifying behavior that is inconsistent with the firm's objectives. Accordingly, internal organization is likely to be better at obtaining those types of information that are directly relevant to monitoring, and controlling the opportunistic behavior by the firm's managers that would otherwise arise from the combination of asset specificity and incomplete contracts if the transactions took place between independent firms.

Internal organization can also rely on more informal and less time consuming procedures to resolve conflicts inside the firm than would independent agents bound by formal contracts. As Williamson observes, the internal "contract law" within a firm is quite different from the arbitration and litigation procedures to which independent economic agents would have to turn if they could not resolve disputes.[48] The latter can be a costly and time consuming process that typically involves a third party decision maker that must become informed about the issues de novo. The internal decision maker, whether the CEO or the relevant division manager, can utilize simpler and faster internal procedures for resolving conflicts between divisions and also is likely to come to the problem with much more information of relevance than would a third party arbitrator.

If hierarchical organizations have these attractive properties, why don't we see more economic activity taking place within very large organizations rather than through markets? The answer is that internal organization is good at some things, but not at others. Williamson observes that when we look at the bigger dynamic picture, internal organization is a last resort that we turn to only in the presence of significant market contracting hazards and associated transactions costs.[49]

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[48] WILLIAMSON (1996), *supra* note 31, at Chapter 4.

[49] WILLIAMSON (1996), *supra* note 31, at Chapter 4.

This is because, opportunistic behavior associated with specific investments aside, decentralized market arrangements have superior adaptive properties to internal organization in many *other* important dimensions. Differences in the information structure between market and hierarchical governance structures which help to mitigate opportunism problems associated with specific investments may lead to inefficiencies in other dimensions.[50] For example, employees may be less willing to reveal information that adversely affects their promotion possibilities or continuing employment. The kinds of low-powered incentives that characterize internal compensation arrangements may also mute incentives to exert the optimal amount of worker effort.[51] In addition, while internal organization is likely to be better at removing certain kinds of internal information asymmetries in the short run, it may be an inferior structure for obtaining, processing and using external information about prices, costs, quality, and technological change in the long run compared to repeated market transactions. For example, when a firm vertically integrates (or enters into a very long term full requirements contract) it is likely to lose some of the benefits associated with continually examining and accessing outside opportunities through repeated contracting. These opportunities include information about the "least cost" prices of the goods and services that the firm is producing internally and the availability of new technologies and production methods. While there is nothing that prohibits a vertically integrated firm continuing to look to outside opportunities to benchmark its performance, an internal division in competition with outside sources may have strong incentives to hide or misrepresent outside opportunities in order to protect itself from external competition. This type of organizational opportunism is different from the kinds of hold-up problems created by specific investments, but may be even more costly in the long run.

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[50] HART (1995), *supra* note 42, at 71-72.

[51] WILLIAMSON (1985), *supra* note 29, at Chapter 6 *and* Holmstrom & Milgrom, *supra* note 46.

For these reasons, even in the face of significant contractual hazards associated with bilateral market contracts involving specific investments and incomplete contracts, firms may still find it advantageous to continue to rely on arms-length market transactions for all or a fraction of their input or distribution requirements (dual sourcing) involving specific investments rather than turning to complete vertical integration. This choice may be made to provide management with external information that it can use to assess the performance of its internal divisions and to counteract the costs of various types of internal organizational inefficiencies. Competitive market prices convey a tremendous amount of information that is difficult to reproduce using internal accounting cost and auditing information. Moreover, this information is updated very quickly as supply and demand conditions change if a firm is in the market repeatedly. As organizations get larger the volume of auditing information that must be processed by management grows non-linearly with the size and scope of the firm[52] and becomes more difficult to use to control costs and quality effectively and to adapt to changing market conditions. The potential shirking problems resulting from low power internal compensation incentives are also likely to become more significant as monitoring becomes more difficult in large organizations.

There are other dynamic considerations that may make the relative attractiveness of alternative governance arrangements in a particular industry or transactional setting change over time.[53] As revealed by the extensive analysis of the GM-Fisher Body relationship,[54] a detailed long

[52] WILLIAMSON (1975), *supra* note 29.

[53] Ricard Langlois & Paul L. Robertson, *Explaining Vertical Integration: Lessons from the American Automobile Industry*, 69 J. ECON. HIST. 361 (1989).

[54] Klein, Crawford & Alchian, *supra* note 31; Klein *supra* note 36; Benjamin Klein, *Fisher-General Motors and the Nature of the Firm*, 43 J. L. & ECON. 105 (2000); *and* Benjamin Klein, *The*

term contract involving a transaction with significant relationship specific investment may work satisfactorily for some period of time. However, when external circumstances change, the existing contractual arrangements can lead to significant adaptation problems and increase the costs of that lead to significant adaptation problems and associated performance inefficiencies. These adaptation problems were less likely to have emerged if the production of car bodies had been governed through internal organization rather than a rigid contract that did not anticipate a big increase in demand and the conflicts that emerged over plant location decisions. Changes in technology or government regulations may also change the relative attractiveness of alternative governance arrangements. For example, with specific reference to my work on coal contracts, changes in environmental laws in the U.S. have independently made it attractive to invest in fuel-flexibility capabilities in coal burning power plants. This flexibility in turn makes coal users less dependent on specific coal suppliers or coal supply locations, reducing the value of long term contracts. Accordingly, one would anticipate seeing a shift to shorter term more flexible contracts as the *net* costs of fuel-flexibility to mitigate potential hold-up problems declines as a consequence of environmental regulations that increase the value of such flexibility.

The bottom line is that there are benefits and costs of internal organization. Market transactions incur transactions costs associated with writing and enforcing contingent contracts and the inefficiencies *ex ante* and *ex post* resulting from opportunistic behavior that exploits specific investments. Internal bureaucratic allocation mechanisms can help to mitigate these types of transactions costs but incur other types of transactions or organization costs. The costs of internal organization are associated with the relatively inferior adaptive properties of bureaucratic hierarchies to rapidly changing outside opportunities over the longer term and the difficulty of designing

compensation mechanisms to give managers and employees appropriate incentives to control costs and product quality. No governance structure is free from at least some transactions costs. The decision whether or not to vertically integrate then becomes a tradeoff between the costs of alternative governance arrangements. Governance arrangements are selected which represent the best that can be accomplished from a set of imperfect governance alternatives. Understanding the tradeoffs between governance alternatives and how they are affect by the attributes of products, production processes, inputs, legal, political and regulatory institutions is what the comparative governance approach is all about.

Despite these observations, however, I think that it is fair to say that the transaction cost economics literature on vertical integration, especially the empirical literature, has focused much more on the inefficiencies of market transactions than it has on the strengths and weaknesses of internal organization. Indeed, this may be one of the reasons why Gibbons argues that there is a lot of confusion about the similarities and differences between the transaction cost economics approach attributed to Williamson, Klein and others and the property rights or rights of control approach attributed to Grossman and Hart and Hart and Moore.[55] Transaction cost economics emphasizes (verbally) *ex post* adaptation issues and the associated bargaining and performance costs, recognizing that these costs also affect *ex ante* investment incentives. The property rights literature assumes that *ex post* bargaining is efficient and emphasizes the effects of *ex post* rent expropriation on *ex ante* investment. However, both literatures have emphasized incomplete contracts, specific investments, and opportunism. As we shall see, much of the empirical literature relates variations in the costs of governance structure to variables measuring asset specificity of various kinds, rather

[55] Robert S. Gibbons, *Four Formal(izable) Theories of the Firm*, 58 J. ECON. BEHAV. & ORG. 202 (2005); Grossman & Hart, *supra* note 42 *and* Hart & Moore, *supra* note 42.

than on direct measures of *ex post* adaptation costs (which could be argued would be off the equilibrium path anyway), good proxies for their expected magnitude, or variables measuring variations in the costs of internal organization. The full implementation of a comparative governance framework requires that the costs of alternative market governance arrangements and the costs of internal organizations with different attributes be given equal treatment.

4.2 Principal-Agent Theories

The previous discussion leads directly to principal-agent theories[56] of the nature of contractual relationships between a principal (e.g. a franchisor with a product or service with a brand name) and her agent (e.g. a franchisee) and the decision by the principle to integrate instead with the agent (e.g. to own rather than contract with the retail outlet or to hire rather than contract with an independent contractor). Indeed, Lafontaine and Slade treat principal-agent theories (or what they refer to as "moral hazard" theories) as if they are the primary accepted theories of vertical integration, especially for explaining vertical integration forward into retailing from manufacturing (or whatever one calls the production stage above retailing) with particular focus on franchisor-franchisee relationships, and devote considerable attention to the principal agent theoretical framework.[57] However, these models were not originally developed to examine the choice between market transactions and vertical integration, but rather to understand the factors that lead to different contractual arrangements between independent principals (e.g. a downstream firm) and independent agents (e.g. an input supplier to the downstream firm). Accordingly, the theory of internal organization on which they are based is naïve, incomplete, and inconsistent with more robust

[56] Bengt Holmstrom & John Roberts, *The Boundaries of the Firm Revisited*, 12(4) J. ECON. PERSP. 73 (1998).

[57] Lafontaine & Slade, *supra* note 39.

theories and empirical analyses of vertical integration.

The starting point of principal-agent models is the assumption that the principal is risk neutral and the agent is risk averse. In this situation, the agent will prefer a contract that shares the risk of uncertainty about costs, revenues and profits with the principal over a contract that makes the agent the residual claimant on the surplus from the transaction (e.g. a fixed fee) and forces the agent to bear all of the risk associated with uncertainty about costs, revenues and profits. However, profit-sharing type contracts distort incentives to minimize costs --- or creates moral hazard problems --- as they reduce the agent's incentives to exert the optimal amount of effort. The optimal contract involves a tradeoff between risk-bearing costs and incentives, subject to a participation constraint imposed by the agent. Although it is not emphasized in the literature, the contracts at issue here have this feature because there is asymmetric information about effort and, as a result, the contracts under consideration are effectively incomplete. This type of principal agent framework has also been used in other contexts where there is a natural separation between the principle (e.g. a regulatory agency acting on behalf of consumers) and an agent (e.g. a regulated firm). Accordingly a second-best incentive contract between them must be designed where vertical integration is not an option (state ownership may be viewed as a sort of vertical integration, however, and thinking about state ownership as an option brings interesting organizational and political economy considerations and associated costs and benefits into the picture). For example, in Laffont and Tirole, the focus is on the design of regulatory mechanisms for monopolies where the tradeoff if between rent extraction and incentives to minimize costs in a world where there is asymmetric information about the firm's true cost opportunities.[58] Risk aversion is not an issue.

[58] JEAN-JACQUES LAFFONT & JEAN TIROLE, A THEORY OF INCENTIVES IN PROCUREMENT AND REGULATION (1993).

How does one turn what evolved as a theoretical framework for understanding the structure and imperfections of incentive contracts in a world with asymmetric information and incomplete contracts into a theory of vertical integration? One can assume, for example, that there are costs associated with monitoring incentive contracts that would not be incurred with vertical integration and that the incentive problems and risk-bearing costs can be reduced by bringing the agent inside the firm. However, this theoretical framework is subject to many of the same problems as is the property rights theory of vertical integration. It does not incorporate a good theory of internal organization. Indeed, the only thing "new" introduced by relying on a principal agent theory approach is the role of assumed differences in risk aversion and risk-bearing costs between the principal and the agent. Incomplete contracts, moral hazard problems, monitoring costs inside and outside of firms are central to either transaction cost theories or property rights theories or both. Indeed, we can go back to Williamson's earliest work on transaction costs[59] and find discussions of moral hazard problems, incomplete contracts, information asymmetries (information impactedness), opportunism issues associated with *both* contracts and internal organization . It is true that his and others' later writing in the transaction cost economics tradition have focused on specific investments and associated *ex ante* and *ex post* opportunism problems. However, what are effectively opportunism problems created by specific investments to create a good brand name and associated reputational considerations appear in both the transaction cost economics literature[60] and Lafontaine and Slade's characterization of the principal agent framework. Other attributes sometimes attributed to a principal agent perspective, like outlet size, I view as being very ad hoc. In my view, whether the principal-agent theories provide significant new insights into the factors that influence the

[59] WILLIAMSON (1975), *supra* note 29.

[60] Lafontaine & Slade, *supra* note 39.

boundaries of the firm beyond the transaction cost economics and property rights frameworks depends upon whether the allocation of risk-bearing costs plays an important role in the choice between contracts and internal organization.

5. Empirical Evidence

5.1 Neoclassical Theories

There is surprisingly little comprehensive empirical analysis that has examined what I have referred to as neoclassical theories of vertical integration and related vertical contractual mechanisms. There are many anecdotes and antitrust cases but little systematic empirical analysis. On the other hand, there is an extensive empirical literature that has focused on transaction cost economics related theories of vertical integration as well as more limited empirical analysis motivated by principal agent models.[61] In all cases the challenge is to use the theoretical work to formulate testable hypotheses and then to find data that are suitable to test these hypotheses. Developing suitable data sets is often especially challenging.

Most of the empirical literature that examines neoclassical theories of vertical integration focuses on whether vertical integration leads to higher or lower prices, on whether there is evidence of exclusion of competing suppliers from the market, and/or on whether there is evidence of changes in consumer welfare resulting from, for example, changes in product variety. The empirical work effectively reduced these theories into “efficiency” theories of vertical integration that have consequences that are "good" for consumers and anticompetitive “foreclosure” theories of vertical integration that have consequences that are "bad" for consumers.

Chipty examines the effects of vertical integration between programming and distribution in

[61] Lafontaine & Slade, *supra* note 39.

the cable television industry.[62] Cable television is an industry in which there are likely to be both vertical externality issues (market power upstream and downstream) that may motivate vertical integration and opportunities for exclusionary behavior by cable distribution networks which often have local distribution monopolies.[63] Chipty finds that vertically integrated cable distributors are more likely to exclude rival cable programming networks and favor their affiliated networks than are unintegrated distributors. Overall, however, consumers are not harmed by this behavior since the resulting changes in prices and product variety appear either not to harm or to benefit consumers overall. Waterman and Weiss examine the same issues for cable television and find extensive evidence of exclusionary behavior by vertically integrated firms.[64] They find little evidence of any downstream price effects but do find that sales (penetration) are higher for affiliated programming services carried by vertically integrated firms than for unintegrated firms. This suggests that vertical integration leads to increased downstream sales effort associated with distributor-owned programming services. Waterman and Wise conclude that the results are consistent with either a foreclosure theory or an efficiency theory of vertical integration.

Vita examines the effects of government regulations that restrict vertical integration between

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[62] Tasneem Chipty, *Vertical Integration, Market Foreclosure, and Consumer Welfare in the Cable Television Industry*, 91 AM. ECON. REV. 428 (2001).

[63] Though the expansion of direct broadcast satellite service and the entry of wireline telephone companies into video distribution have introduced an important element of competition in recent years.

[64] David Waterman & Andrew Weiss. *The Effects of Vertical Integration Between Cable Television Systems and Pay Cable Networks*, 72 J. ECONOMETRICS 357 (1996).

gasoline refiners (upstream) and gasoline retailers (downstream).[65] He recognizes that vertical integration could soften competition (foreclosure theory) and lead to higher retail prices or that it could be motivated by efficiency considerations (e.g. double marginalization) in which case vertical integration would lead to lower prices, other things equal. He finds that so-called "divorcement" regulations that restrict vertical integration lead to higher retail gasoline prices --- an average increase of 2.6¢ per gallon. This result is consistent with an efficiency theory of vertical integration. On the other hand, Hastings and Gilbert examine the effects of vertical integration between gasoline retailers and refiners in the Western U.S.[66] They find that vertical integration leads to higher wholesale market prices, other things equal. They argue that this is consistent with an anticompetitive raising rivals' cost theory of vertical integration. However, they do not examine effects on retail prices directly. Rosengren and Meehan use an event study approach that examines the effects on the equity stock prices of rivals at the time vertical mergers are announced for a sample of vertical mergers.[67] If the vertical mergers reflect an effort to soften competition (foreclosure) then they expect to find positive abnormal returns for the stocks of rival unintegrated firms. They find no evidence to support the foreclosure theory.

Experimental economics techniques have also been used to test foreclosure theories of vertical integration. Martin, Norman and Snyder find evidence that vertical integration increases the

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[65] Michael Vita, *Regulatory Restrictions on Vertical Integration and Control: The Competitive Impact of Gasoline Divorcement Policies*, 18 J. REG. ECON. 217 (2000).

[66] Justine Hastings & Richard J. Gilbert, *Market Power, Vertical Integration and the Wholesale Price of Gasoline*, LIII(4) J. INDUS. ECON. 469 (2005).

[67] Eric Rosengren & James Meehan, *Empirical Evidence of Vertical Foreclosure*, 32 ECON. INQUIRY 303 (1994).

ability of the upstream firm to withhold output and increase prices consistent with some of the theoretical analysis in Ordover, Salop and Saloner.[68] However, Mason and Philips find the vertical integration leads to an expansion of output and increased consumer welfare in a similar experimental setting.[69]

Turning finally to the other theories noted in Section 2, there is abundant support in the business history literature for Carlton's theory that supply security considerations provide a motivation for vertical integration.[70] The empirical prediction of Stigler's theory is that as industries grow the extent of vertical integration should decline and as industries contract vertical integration should increase. The theory has found some limited empirical support.[71] Acemoglu, Johnson and Mitton find evidence that in countries with less developed capital market institutions, industries that are more human capital or technology intensive are more likely to be vertically integrated.[72]

5.2 Transaction Cost Economics and Other Organizational Theories

The transaction cost economics framework has stimulated much more empirical work than either the neoclassical theories of vertical integration outlined above or than other related

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[68] Stephen Martin, Hans-Theo Norman & Christopher Snyder, *Vertical Foreclosure in Experimental Markets*, 19 RAND J. ECON. 219 (2002) *and* Ordover, Salop & Saloner, *supra* note 19.

[69] Charles F. Mason & Owen R. Phillips, *Vertical Integration and Collusive Incentives: An Experimental Analysis*, 18 INT'L. J. INDUS. ORG. 471 (2000).

[70] ALFRED CHANDLER, STRATEGY AND STRUCTURE: CHAPTERS IN THE HISTORY OF AMERICAN INDUS. EXPERIENCE 84 (1964).

[71] D.T. Levy, *Testing Stigler's Interpretation of "Division of Labor is Limited by the Extent of the Market"*, 32 J. INDUS. ECON. 377 (1984).

[72] Acemoglu, Johnson & Mitton, *supra* note 28.

organizational theories of vertical integration, with agency theories being the leading "alternative" that has motivated empirical analyses. This empirical work has focused on decisions to vertically integrate, the design of non-standard contractual arrangements and the performance of both vertical integration and non-standard contractual arrangements over time as supply and demand conditions change. This work has included both detailed case studies of particular firms or types of contractual and organizational arrangements as well as econometric analyses based on large numbers of observations on the governance arrangements chosen for transactions with different attributes. Moreover, in the case of transaction cost economics related research, the empirical results are much more consistently supportive of the relevant theory than is the case with the neoclassical and other theories of vertical integration that I have just discussed.

There have been at least 500 published papers (in a recent personal communication, Oliver Williamson indicated to me that a more accurate current number is 1000) that have examined various aspects of comparative institutional choice from a transaction cost economics perspective. A significant fraction of these studies have examined the vertical integration or "make or buy" decision. There have also been several survey articles that have reviewed the empirical literature stimulated by transaction costs economics theories (as well as other theories), including many related to vertical integration and non-standard vertical contracting arrangements.[73]

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[73] *See* Paul L. Joskow, Asset *Specificity and the Structure of Vertical Relationships: Empirical Evidence*, 4 J. L. ECON. & ORG. 95 (1988a); Howard Shelanski & Peter Klein, *Empirical Research in Transaction Cost Economics: A Review and Assessment*, 11 J. L. ECON. & ORG. 335 (1995); SIMON, *supra* note 2; Keith Crocker & Scott Masten, *Regulation and Administered Contracts Revisited: Lessons from Transaction-Cost Economics for Public Utility Regulation*, 9 J. REG. ECON. 5 (1996); Régis Coeurderoy & Bertrand Quélin, *Transaction Cost Theory: A Survey on Empirical Studies on*

These studies tend to follow a similar empirical methodology. They generally focus on a particular good or service that is used as an input to produce or distribute a specific class of products: automobile components;[74] coal;[75] aerospace systems;[76] aluminum;[77] chemicals;[78] forestry;[79]

Vertical Integration [in French], 107 REVUE ECONOMIE POLITIQUE 146 (1997); Davide Vannoni, *Empirical Studies of Vertical Integration: The Transaction Cost Orthodoxy*, 49 INT'L. REV. ECON. & BUS. 113 (2002); *and* Lafontaine & Slade, *supra* note 39.

[74] *See* Klein, Crawford & Alchian, *supra* note 31; Benjamin Klein, *Fisher-General Motors and the Nature of the Firm*, 43 J. L. & ECON. 105 (2000); Klein (2002) *supra* note 54; Monteverde & Teece, *supra* note 37; Gordon Walker & David Weber, *A Transactions Cost Approach to Make or Buy Decisions*, 29 ADMIN. SCI. Q. 373, (1984); *and* Langlois & Robertson, *supra* note 53.

[75] Joskow (1985), *supra* note 33; Joskow (1987), *supra* note 33; Joskow (2008b), *supra* note 21; Paul L. Joskow, *Price Adjustment in Long Term Contracts: Further Evidence from Coal Markets*, 21 RAND J. ECON. 251 (1990); *and* Joe Kerkvliet, *Efficiency and Vertical Integration: The Case of Mine-mouth Electric Generating Plants*, 39 J. INDUS. ECON. 467 (1991).

[76] Scott Masten, *The Organization of Production: Evidence From the Aerospace Industry*, 27 J. L. & ECON. 403 (1984).

[77] Stukey, *supra* note 34.

[78] Marvin Lieberman, *Determinants of Vertical Integration: An Empirical Test*, 39 J. INDUS. ECON. 451 (1991) *and* Joseph Fan, *Price Uncertainty and Vertical Integration: An Examination of Petrochemical Firms*, 6 J. CORP. FIN. 345 (2000).

[79] Steven Globerman & Richard Schwindt, *The Organization of Vertically Integrated Transactions in the Canadian Forest Products Industry*, 7 J. ECON. BEHAV. & ORG. 199 (1986).

carbonated beverages;[80] pulp and paper;[81] property-liability insurance.[82] Other studies focus on a set of products that can be distributed through a similar set of alternative distribution modes.[83] The sale of these goods and services is mediated by several different governance structures (e.g. vertical integration, franchise agreements, long term contracts, spot market sales) and the governance choices are observable.

The empirical analysis examines whether the incidence of vertical integration or substitute non-standard vertical contractual arrangements observed in practice can be explained by variations in the transactional characteristics of the goods and services whose governance structures are being investigated, in particular by the importance of asset specificity, holding other transactional attributes constant (or assuming that any associated missing variables are uncorrelated with the measures of asset specificity). The overwhelmingly conclusion of this large number of empirical studies is that specific investments and other attributes that affect transaction costs are both statistically and economically important causal factors influencing the decision to vertically

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[80] Timothy Muris, J. David Scheffman & Pablo Spiller, *Strategy and Transactions Costs: The Organization of Distribution in the Carbonated Soft Drink Industry*, 1 J. ECON. & MGMT. STRATEGY 83 (1992).

[81] Nancy Kane Ohanian, *Vertical Integration in the U.S. Pulp and Paper Industry, 1900-1940*, 76 REV. ECON. & STATISTICS 202 (1994).

[82] Laureen Regan, *Vertical Integration in the Property-Liability Insurance Industry: A Transaction Cost Approach*, 64 J. RISK & INS. 41 (1997).

[83] Erin Anderson & David Schmittlein, *Integration of the Sales Force: An Empirical Examination*, 15 RAND J. ECON. 385 (1984) *and* Luisa Affuso, *An Empirical Study of Contractual Heterogeneity with the Firm: The Vertical Integration-Franchise Contract Mix*, 31 APPLIED ECON. 931 (2002).

integrate. Indeed, it is hard to find many other areas in industrial organization where there is such an abundance of empirical work supporting a theory of firm or market structure.

There has been relatively little empirical work that appears to be directly motivated by the property rights or rights of control framework. However, as noted above, Baker and Hubbard are excellent examples of a limited empirical literature motivated by property rights theories.[84] Empirical work to date has not focused on trying to distinguish between transaction cost economics and property rights theories of vertical integration and there has been little effort to test property rights theories directly. Whinston argues that the empirical work in this area does not do a good job distinguishing between transaction cost economics based theories and property rights based theories of vertical integration and provides suggestions for how the predictions of property rights theories might be tested and its distinct predictions.[85]

Lafontaine and Slade review the empirical work motivated by all three organizational theoretical frameworks, starting with what they refer to as "moral hazard" theories and what I refer to as principal-agent theories.[86] As noted above, the distinguishing characteristic of principal-agent theories should be the role of differences in risk bearing costs between principals and agents. All of these theories rely on incomplete contracts, incentive effects, and tradeoffs between incentive effects and other performance attributes. I do not find the empirical evidence that differences in risk bearing costs play an important role in the choice between incentive contracts and vertical integration to be particularly compelling. There is a failure to distinguish between the kinds of risk

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[84] Baker & Hubbard (2003), *supra* note 44 *and* Baker & Hubbard (2004), *supra* note 44.

[85] Michael Whinston, *On the Transaction Cost Determinants of Vertical Integration*, 19 J. L. ECON. & ORG. 1 (2003).

[86] Lafontaine & Slade, *supra* note 39.

contemplated in principal agent models and the kind of uncertainty contemplated in transaction cost economics models. Both are often measured in an ad hoc fashion and I interpret the results as, at best, mixed. Moreover, a number of the papers cited by Lafontaine and Slade[87] in support of the principal-agent framework are clearly instead motivated either by transactions cost economics theories[88] or property rights or rights of control theories.[89] Overall, the principal-agent framework is a good one for understanding the structure of incentive contracts in a variety of settings, but adds little to other organizational theories of vertical integration.

6. Conclusions

Let me conclude where I began. There is no single unified theory of vertical integration that exists today or is likely to exist in the future. There are many types of market imperfection that could theoretically lead transacting parties to turn to vertical integration as an alternative governance arrangement to anonymous spot market transactions, recognizing that vertical integration is one of many governance alternatives to relying on anonymous spot market contracting. Our understanding of vertical integration has been advanced considerably by Oliver Williamson's work on transaction cost economics and more generally on the development of organizational theories of vertical integration and non-standard contracts that focus on the costs and benefits of non-standard

[87] Lafontaine & Slade, *supra* note 39.

[88] *E.g.* Erin Anderson, *The Salesperson as Outside Agent or Employee: A Transaction Cost Analysis*, 4(3) MARKETING SCI. 234 (1985); Anderson & Schmittlein, *supra* note 83; G. John & B. Weitz, *Forward Integration into Distribution: Empirical Test of Transaction Cost Analysis*, 4 J. L. ECON. & ORG. 121 (1988); *and* Muris, Sheffman & Spiller *supra* note 80.

[89] *E.g.* Baker & Hubbard (2003), *supra* note 44 *and* Baker & Hubbard (2004), *supra* note 44.

contractual arrangements and internal organization. This work was stimulated by Williamson's pioneering research on these issues. There is substantial support in the empirical literature for transactions cost and related organization theories of vertical integration. There is minimal empirical support for theories that turn on efforts by firms to respond to market power problems or anticompetitive foreclosure motivations. This implies as well that there is little empirical support for the antitrust law's traditional suspicion of and hostility toward vertical integration and related non-standard vertical contractual arrangements[90] except under extreme conditions where firms controlling bottleneck monopoly facilities have the incentive and ability to exercise an anticompetitive foreclosure strategy. There is very substantial empirical support for transaction cost economics theories of vertical integration and non-standard contracts, but much less support for other organization economics theories. By enriching our understanding of vertical integration and non-standard vertical contractual arrangements Williamson's work has and will continue to influence competition policy.

[90] Paul L. Joskow, *Transaction Cost Economics, Antitrust Rules and Remedies*, 18 J. L. ECON. & ORG. 95 (2002).