Drivers of Vertical Integration

Bachelor Thesis

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**1 Introduction**

The second half of the 20th century was characterized by waves of vertical and horizontal integration that significantly changed the business landscape. A trend emerged towards ever larger companies that operate at multiple levels in the production chain to maximize their efficiency and profitability. The United States (US) Census Bureau reports that between 1998 and 2008, the number of firms with 10,000 or more employees increased by 10.7%. Over the same time period, the total number of paid employees in these firms increased by 17.2%. This shows that large businesses are not only becoming more frequent, but also grow in size over time. Vertical integration is one way for firms to expand their operations to multiple levels of the production chain. Integration is achieved commonly through either voluntary mergers between partner firms or forceful acquisitions of competitors. Since large scale mergers and acquisitions can have far reaching consequences on the competitiveness within industries, economists are trying to understand the factors that drive firms to integrate and the consequences integration has on competition and welfare. In the past, mergers between large companies have often been opposed by anti-trust authorities in fear of anti-competitive behavior by the integrator. Understanding whether the desire to create and exploit market power is a driver for integration is one of several ways in which research on integration can greatly impact policy making on mergers and acquisition laws.

In their attempts to explain the factors driving vertical integration, economists have come up with two theoretical approaches that identify different factors: the organizational and the neoclassical approach. These two approaches have substantially different assumptions on how improving efficiency and market power impacts a firm’s desire to integrate, and therefore also identify different factors theorized to drive vertical integration. Drawing on a large variety of theoretical and empirical literature, this paper aims to identify the most prominent factors identified in both theories and determine whether these factors are found to be valid in empirical research. Identifying which theoretical approach and its respective factors is most supported by empirical literature will help guide further research and better the current understanding of vertical integration.

This paper will start off by reviewing theoretical literature to identify the most frequently discussed factors that are theorized to drive vertical integration. Organizational factors are predominantly identified using the moral hazard model presented in Lafontaine and Slade (2007). Furthermore, Transaction Cost Economics theories identify multiple factors of asset specificity and Joskow (2006) discusses an alternative “Supply Security” factor. Finally, the neoclassical approach identifies three factors based on the desire to create and exploit market power. Analysis of empirical studies on these factors shows that organizational factors related to operating efficiency tend to have far greater empirical support than neoclassical factors related to market power. Empirical research especially neglects the study of the neoclassical factors of vertical and horizontal externalities. In general, empirical literature offers ample support for organizational factors, but also has limited external validity and third-factor problems with regard to the analysis of neoclassical factors.

The upcoming sections are structured as follows: section two reviews both organizational and neoclassical literature on vertical integration to identify the factors deemed most important in either approach. Section three considers a large number of empirical studies to determine whether empirical findings support the respective theory’s predictions regarding each factor. The findings on all factors and their respective literature will be summarized at the end of section three. Finally, section four will offer some concluding remarks on the robustness of the findings and how existing and future empirical studies could be improved.

**2 Review of Vertical Integration Theories**

In its attempts to determine the underlying causes for vertical integration, literature has identified several factors that can help explain why and when a firm decides to vertically integrate.[[1]](#footnote-1) In general, factors for vertical integration can be sub-divided into two fields of study: the neoclassical and the organizational approach (Joskow, 2006). Neoclassical theories predominantly focus on identifying factors in situations where firms can use integration to create and exploit market power. Neoclassical theories (also called “market-power” theories) view vertical integration as a strategic move to improve a firm’s competitive position. On the other hand, organizational theories identify moral hazard problems and contracting inefficiencies to be the primary factors driving vertical integration (Lafontaine & Slade, 2007). Arm’s-length market transactions and within-firm transactions are seen as substitutes and are chosen on grounds of efficiency rather than market power.

Before discussing empirical support for either theory, I will offer a brief overview of the theoretical factors most commonly thought to drive vertical integration under either approach. Starting with organizational theories, the predictions of the Moral-Hazard (MH) model of forward integration proposed by Lafontaine and Slade (2007) will be discussed. Next, Transaction Cost Economic (TCE) theories will be considered, including the effects of various forms of asset specificity. Finally, I will present a number of neoclassical theories on factors driving vertical integration such as vertical foreclosure, price discrimination and vertical and horizontal externalities. It should be noted that both theoretical and empirical discussions will be limited to a one-sided perspective of vertical integration. I aim to determine which factors will cause a firm to desire vertical integration regardless of its form or intensity. How and to what extent the firm will act on this desire is beyond the scope of this paper.

**2.1 Organizational Theories of Vertical Integration**

Organizational theories of vertical integration can be sub-divided into two categories: factors concerning forward integration and factors concerning backward integration. Forward integration is most frequently observed when manufacturers operate their own retail channels to minimize MH issues. Backward integration is most commonly associated with “make-or-buy” decisions (Lafontaine & Slade, 2007). As mentioned previously, Lafontaine and Slade (2007) proposes a simple MH model under asymmetric information that is used to derive a number of testable hypotheses regarding the factors driving forward integration. The authors present a two-player game in which the principal manufacturer sets the wage scheme for the agent retailer under uncertainty regarding both the agent’s effort and general market conditions.[[2]](#footnote-2) The manufacturer can choose between offering a more performance-based contract or a proportionately larger base salary (which is likened to represent vertical integration). By maximizing the principal’s and agent’s utility function, the authors are able to identify five factors that help determine the optimal wage-scheme and thereby the likelihood of integration. Before discussing these factors, it should be noted that this model is not intended to be theoretically exhaustive by any means. The authors caution that complications such as team production or production synergies are purposely disregarded since they are commonly considered to be part of the neoclassical literature. Furthermore, the factors identified are not exclusive to a “forward-integration-into-retailing” scenario. Similar factors for integration in contexts other than forward integration are discussed in Lajili, Madunic and Mahoney (2007).

The first factor identified by the MH model, “uncertainty”, is meant to capture all kinds of uncertainty affecting the agent at the downstream level. The model predicts that an increase in downstream uncertainty will increase the likelihood of forward integration by the manufacturer. Since agents are assumed to be risk averse, an increase in uncertainty regarding his payoff would result in a higher wage demanded and a decrease in manufacturer’s profit (Lazear & Gibbs, 2009). If the increase in wage costs was to outweigh the incentive benefits of using independent retailers, risk neutral manufacturers are predicted to integrate into retail distribution and assume the uncertainty themselves.

The next factors identified by the MH model are outlet size and the importance of downstream and upstream effort. Organizational theory predicts that a proportional increase in the importance of the agent’s input is associated with less integration and vice versa (Lafontaine & Slade, 2007). When the agent’s effort contributes disproportionately to the retail outlet’s success, high-powered incentive contracts should be offered to elicit maximum effort. Likewise, higher importance of manufacturer’s effort increases the likelihood for vertical integration. Outlet size is the next factor identified. Under the assumption that the size of the retail outlet interacts with the uncertainty factor, the MH model predicts that outlet size should be positively correlated with the likelihood of integration due to the agent’s risk-aversion. Larger outlets are assumed to be more capital intensive and therefore expose more investment to intrinsic uncertainty.

Finally, the MH model identifies two different types of monitoring costs predicted to influence vertical integration. Low costs of outcome monitoring are thought to decrease the likelihood of vertical integration under the assumption that information on the outcomes of a value chain reduces uncertainty. This prediction is a common feature of MH models, as Brown (1990), Baker (1992) and Drago and Heywood (1995) also argue that ambiguity regarding output (higher monitoring costs) is commonly associated with integration and fixed wage contracts. The second type of monitoring identified is behavior monitoring. Low costs of behavior monitoring will make integration less likely since high-powered incentives aren’t needed to elicit maximum effort. This prediction is further supported in Lajili, Madunic and Mahoney (2007) which argues that in the case of high task programmability, the likelihood of vertical integration increases since it is easy to measure the agent’s effort. Overall, the theory that vertical integration solves moral hazard issues that can arise in manufacturer-retailer relationships by aligning their interests with regard to effort provision and risk exposure is widely accepted (Williamson, 1971).

Apart from the MH model, Transaction Cost Economics (TCE) theories also identify factors for vertical integration.[[3]](#footnote-3) TCE theories are based on the assumptions that contracts are incomplete and parties are locked into trading relationships, which creates opportunities for disagreement on how relationship specific assets should be used. In the absence of contractual inefficiencies, “arm’s length” market transactions are always thought to be more efficient. Frequently cited examples for this theory are situations in which one party can exert more control over a relationship specific asset and uses its power to extract quasi-rents from its business partner. This is commonly referred to as a “hold up” situation (Besanko, Shanley, & Schaefer, 2010). Williamson (1981) theorizes that the possibility of “hold up” problems and opportunistic behavior due to contractual hazards has adverse effects on both ex ante investment and ex post performance in business relationships (Joskow, 2006). Vertical integration can protect against contracting hazards when significant investments into relationship specific assets are needed. The likelihood of vertical integration is predicted to increase with the amount of relationship specific assets involved in production (Whinston, 2003). By integrating the other party, a firm can avoid additional expenses such as costly contracting and potential losses of quasi-rents due to “hold ups”. Organizational literature generally identifies four categories of asset specificity.

The first category is site specificity. Site specificity refers to a situation in which two parties commit to ex ante investments in order to minimize future inventory and transportation expenses (Joskow, 2006). For example, power plants built in close proximity to a coal mine’s mouth are liable to being help up since the party controlling the mine could refuse to sell coal at the pre-determined price. This forces the power plant’s operator to pay a price above the market price as other sources of coal would be comparatively more expensive due to the now larger distance to other coal mines. The next category of asset specificity is human asset specificity. Theory states that during business relationships between two firms workers accumulate relationship specific know-how that increases their productivity in that specific context. Whichever party is more dependent on this relationship specific human capital is also more vulnerable to being held up by the part controlling it.

Physical asset specificity is an additional factor for vertical integration when parties engage in ex ante investments that are of limited value outside the business relationship. This situation is common in the electronics industry where contracted manufacturers must invest in production facilities specific to a certain client’s products. The fourth category of asset specificity, dedicated assets, contains assets that are procured in anticipation of a trade agreement or are only usable in a particular time period during the trade arrangement. Dedicated assets are frequently used in industries where even small delays in the delivery of a product can cause large economic losses (Lajili, Madunic, & Mahoney, 2007).

Next to the established organizational theories of vertical integration, Joskow (2006) proposes the alternative, less widely accepted factor of “supply security”. This factor has two dimensions. First, supply security reasons are incentives for vertical integration when markets fail to securely and consistently provide the input goods needed for downstream operation (Carlton, 1979). However, Joskow (2006) admits that such a situation could be interpreted as an issue of contractual incompleteness. The second dimension of supply security is the need for specialized inputs in infant industries. Stigler (1951) argues that during the infancy of an industry, demand for specialized inputs will be too small to support independent upstream providers and therefore downstream firms will have to internalize their input provision. The essential premise of the supply security factor is that vertical integration can negate the risk associated with upstream markets not being able to always provide the input needed for downstream operations.

**2.2 Neoclassical Theories of Vertical Integration**

Neoclassical theories of vertical integration are based on the assumptions that vertical integration is costless and that firms integrate solely for the purpose of creating and exploiting market power. In the organizational literature of the 1950s and 60s, upstream and downstream integration were regarded as unnecessary for firms to produce at minimum cost. Firm and market activities were seen as complementary rather than substitute activities (Joskow, 2006). Since vertical integration was thought to have no efficiency benefit, economists theorized that integration is a response by firms to benefit from imperfectly competitive market structures (Riordan, 2005). By integrating upstream suppliers or downstream retailers, firms can restrict access to key resources and thereby effectively “foreclose” the market to other competitors (Spiegel, 2011). Neoclassical literature identifies four different factors that can create the incentive for vertical integration: vertical foreclosure, price discrimination and horizontal and vertical externalities.

The vertical externality factor refers to inefficiencies that arise from market power in both upstream and downstream markets. For instance, if both upstream and downstream firms have full monopoly power, the upstream firm would charge a monopoly price to the downstream firm which in turn would pass on the higher input price and charge a second monopoly mark-up to the end-consumer. This will effectively result in “double-marginalization” of the product at the expense of both the final customers and the downstream monopolist (Joskow, 2006). Since the downstream firm doesn’t consider the upstream firm’s actual production costs, it ends up setting an end price higher than what would have maximized joint profits had the monopolists cooperated (Tirole, 1988).

Another form of vertical externalities can be observed when an upstream monopolist charges a monopoly mark-up, but the downstream firm substitutes for the monopolist’s products with less efficient, yet still cheaper alternative inputs. This constitutes an imperfect equilibrium since in the absence of a monopoly mark-up the use of the monopolist’s input is more efficient (Vernon & Graham, 1971) (Lafontaine & Slade, 2007).Therefore, the downstream firm could integrate the upstream monopolist to decrease its costs by regaining access to more efficient inputs. Finally, vertical integration can be used to make sure that the marginal benefits and costs of every unit sold are proportionately distributed throughout the chain. Negative vertical externalities exist when the marginal cost of selling an additional unit is higher for the downstream firm than the marginal benefit, but still lower than the combined marginal benefits for the entire chain (Joskow, 2006). As such, vertical integration is seen as a solution to various problems of vertical externalities as long as the benefits of more efficient price setting or inputs outweigh the costs of vertically integrating. It is important to note that it is not necessary for firms to have full monopoly power for vertical externalities to arise; a limited degree of market power is enough.

Horizontal externalities can be observed in the case of free-rider problems associated with the provision of sales services by competing downstream retailers. When upstream firms manufacture branded products and sales significantly depend on downstream service activities, there will underinvestment in service and marketing activities on the retailer’s behalf since he cannot appropriate the full return of his efforts. Some of the sales resulting from the service associated with the product will go to other competing retailers. Again, by integrating the retailers or using other forms of vertical constraints, an upstream firm can capture the full marginal benefit of service expenditures and thereby prevent underinvestment (Tirole, 1988). [[4]](#footnote-4)

Apart from vertical and horizontal externalities, neoclassical theories also identify opportunities for vertical foreclosure and price discrimination as further factors for vertical integration. Vertical foreclosure refers to situations in which firms integrate their upstream supplier or downstream retailer to interrupt the competition’s access to key resources. Vertical foreclosure only occurs when “bottleneck” resources exist that are both vital to the industry and not regulated by anti-trust authorities. An example of vertical foreclosure is when a manufacturer purchases a large retail network and refuses to either sell or advertise the upstream competitor’s products. As an extension to this theory, Salinger (1988) proposes that vertical mergers can also benefit an upstream integrator even when he doesn’t restrict the competition’s access to downstream resources. Instead, by selling his products at higher prices to unintegrated downstream firms, the integrator can raise the downstream competition’s costs and prices to gain some of their market share. Alternatively, the integrator can also raise his own prices and benefit from a larger profit margin (Joskow, 2006). Similar outcomes can occur when a downstream firm integrates the upstream supplier and increases the cost of inputs to its downstream competitors (Riordan, 1998).

The factor of price discrimination can be regarded as an extension to the vertical foreclosure factor. Price discrimination under vertical integration also rests on the assumption that vertical integration can increase the input prices of a firm’s competitors, but it lets the integrator use a more sophisticated pricing strategy as long as he can prohibit the resale (arbitrage) of his products (Riordan, 2005). By selling the upstream products at different prices to downstream competitors with varying elasticities of demand, the integrated firm can capture his competitor’s consumer surplus and raise its own prices at the same time. Overall, both vertical foreclosure and price discrimination can result in a price squeeze for the integrator’s competitors and thereby give an incentive for vertical integration (Joskow, 2006). Since empirical literature tends to not differentiate between the factors of market foreclosure and price discrimination they will henceforth be referred to as “monopoly benefits” and treated as a single factor in the upcoming literature review.

**2.3 Summary**

Factors theorized to determine the likelihood for vertical integration are identified in organizational and neoclassical theories. Organizational literature most commonly discusses the factors of uncertainty at the downstream level, the effect of outlet size, the cost of monitoring both outcome and behavior, and the relative importance of upstream and downstream effort. Furthermore, TCE theories identify site specificity, human capital specificity, asset specificity and the dedicated of assets as further factors that increase the likelihood of integration. The alternative factor of supply security identifies the need for a secure supply of critical inputs as a further incentive for integration. Neoclassical literature argues that vertical integration is driven by the desire to negate vertical and horizontal externalities and to take create and benefit from market power.

**3 Review of Empirical Literature**

Theoretical literature identifies eleven factors theorized to increase the likelihood for vertical integration. To determine whether factors have the same effect on integration as predicted, the following paragraphs will discuss a number of empirical studies on vertical integration which the drivers of vertical integration under different circumstances. I will begin by looking to what extent the organizational factors identified in the previous section are supported by empirical evidence. Next, I will discuss empirical evidence for the neoclassical factors. Finally, I will summarize the empirical support for each factor and state whether each factor’s predicted influence on vertical integration is supported by empirical evidence or not.

**3.1 Empirical Support for Organizational Factors**

The MH model of forward integration identifies uncertainty and outlet size to be factors that increase the likelihood of vertical integration. Analyzing these theoretical factors in real world situations is difficult because outlet size and especially uncertainty are very broad constructs. How should the term “uncertainty” be best conceptualized to capture all the different kinds of uncertainty that can influence integration decisions? Lafontaine and Slade (2006) identifies several proxies for uncertainty that are frequently used in empirical studies to measure downstream uncertainty such as variation in sales or outlet failure rates.

Empirical studies predominantly show that the effect of uncertainty at the downstream level contradicts the MH model’s predictions. Norton (1988) tests how uncertainty, measured via the “estimated demand variability from detrended percentage variation in eating and drinking retail sales in the state”, affects the likelihood of franchising (which is can be likened to using independent retailers) in a number of industries. It is found that downstream uncertainty has a significant negative effect on vertical integration in the “refreshment places” industry (from here on, results will only be considered significant at or below the 5% significance level). However, uncertainty is also found to have no influence on vertical integration in both the “restaurants and lunchrooms” and “motels and tourist courts” industries. These findings weakly refute the MH theory of uncertainty, but the author cautions that demand variability might be a poor proxy for uncertainty. Lafontaine (1992) avoids this problem by also testing for the likelihood of franchising over a large number of franchisors using two different proxies for uncertainty: the “average proportion of discontinued … outlets” and average sales variance.[[5]](#footnote-5) Again, the findings show that both proxies are positively correlated with the relative number of franchised outlets.[[6]](#footnote-6)

Further empirical support for finding that uncertainty is negatively correlated with vertical integration is provided in Martin (1988), Woodruff (2002) and Anderson and Schmittlein (1984). All studies show that an uncertainty proxy such as sales variation[[7]](#footnote-7) is significantly correlated with the probability that a retail outlet is franchised instead of company owned. Even though the studies reviewed thus far have found that uncertainty has quite an opposite effect on vertical integration likelihood than what the moral hazard model predicts, Lafontaine and Slade (2006) identifies two further studies, John and Weitz (1988) and Norton (1988), which show that uncertainty can in fact be positively correlated with vertical integration, albeit at a statistically insignificant level. Both studies use uncertainty proxies, statistical techniques and looked at industries similar to the previously discussed studies, so it does not seem as if the difference in findings is caused by the way data is collected and analyzed. Nonetheless, the MH model’s prediction that the uncertainty factor increases the likelihood for vertical integration is not supported by empirical findings. The majority of studies show that higher levels of uncertainty are associated with higher proportions of franchised outlets, which suggests the principal is more averse to uncertainty than the agent. This finding is robust over a number of different uncertainty proxies and industries, but interestingly all the studies focused on analyzing the decision of whether to own the outlet or franchise it. The robustness of these findings could therefore be further improved by running similar studies on actual “all or nothing” situations where the principal has to decide whether to operate the outlet himself or relinquish all control to the agent.

Similar to the factor of uncertainty, conceptualizing the term “outlet size” also poses a challenge when conducting empirical analysis. Again, authors seem to have agreed on a number of sensible proxies such as the average sales per retail outlet or the initial investment required by the agent to determine outlet size. As previously mentioned, Lafontaine (1992) looks at how franchising decisions depend on factors such as uncertainty or outlet size. The study uses both “capital required” and the average sales per $100K in outlet investment to proxy for outlet size. It is found that both proxies have a significant positive correlation with the proportion of outlets owned by the company. This conclusion reflects the general consensus in empirical literature that the size of the retail outlet does increase the likelihood for vertical integration as predicted by the MH model.

Surprisingly, the empirical evidence on the outlet size factor contradicts the empirical evidence on the uncertainty factor. MH theory predicts that outlet size influences vertical integration decisions because it interacts with uncertainty in the sense that larger outlets will require more capital to be exposed to the uncertainty factor (Lafontaine & Slade, 2007). However, empirical evidence has shown that unlike outlet size, uncertainty does not increase the likelihood for vertical integration even though both factors should act as deterrents for risk-averse agents to operate a retail outlet. These seemingly contradictory findings can even be found in the same study. Martin (1988) reports that demand variability decreases the likelihood for vertical integration, but also that the average sales per retail outlet are positively correlated with vertical integration. Lafontaine and Slade (2007) explains this paradox by theorizing that there is an intrinsic sorting effect amongst agents when they select their place of employment. Less risk-averse agents are thought to seek employment with more uncertainty and higher-powered incentives and thereby create demand for franchised (independent) outlets characterized by high uncertainty. Despite the seeming contradiction in empirical findings, the majority of studies on the outlet size factor support the prediction of the moral hazard model; the factor of outlet size is positively correlated with the likelihood for vertical integration.

The importances of upstream and downstream efforts are further factors predicted by the MH model to influence the vertical integration decision. Again, conducting empiric analysis is made difficult by the need for a definitive conceptualization and operationalization of each term. Ideally, each factor should be measured via a proxy that accurately shows the proportion of “value-added” by upstream or downstream effort to determine how they influence the likelihood for vertical integration. When downstream effort contributes disproportionately to value-added, theory predicts a low likelihood of vertical integration as high-powered incentives will be used to elicit maximum effort from the agent (Lafontaine & Slade, 2007). This theory has support from numerous empirical studies including Norton (1988), Caves and Murphy (1976), Shepard (1993) and Slade (1996). The effect of upstream effort is most often measured using a service dummy that identifies market segments which require more personalized service by the agent. All studies unambiguously find that in market segments where personalized service is of great importance, the likelihood that agents work directly for the company is comparatively lower. Therefore, empirical literature shows that an increase in the importance of agent effort will have a significant negative influence on the likelihood of vertical integration. The factor of downstream effort is a significant determinant for vertical integration. Empirical results to support this theory are robust across numerous industry sectors, statistical techniques and data sources.[[8]](#footnote-8)

The effect of upstream effort on vertical integration is analyzed in Lafontaine (1992), Scott (1995), Nickerson and Silverman (2003) and Lafontaine and Shaw (2005). Organizational theory states that besides agent effort, effort exerted by the upstream manufacturing firm can also affect downstream sales. In such a case, the factor of upstream effort includes all action by the manufacturer that can influence the retail outlet’s sales. Studies frequently use either the length of agent training or advertising expenditures to proxy for the amount of upstream effort exerted. If the importance of upstream effort is disproportionately large in generating sales, theory predicts an increased number of integrated retail outlets. Empirical evidence supports this theory.

Nickerson and Silverman (2003) examines the “interstate for-hire trucking” industry to see which factors determine whether a company provides its own trucks or uses independent contractors. The share of advertising expenditure of total revenue is used to proxy for the importance of upstream effort. Nickerson and Silverman (2003) finds that a one standard deviation increase in advertising expenditure corresponds to a 34.3% increase in the proportion of company owned trucks. As the authors conclude, “…the more a carrier invests in reputation, the more it relies on ownership.” (Nickerson & Silverman, 2003). Likewise, Lafontaine and Shaw (2005) looks at how the amount of advertising expenditures by the principal affects franchising decisions in the fast food industry. Again, it is found that investment in brand name is positively correlated with the proportion of company owned retail outlets. The prediction of the moral hazard model that increased importance of upstream effort is a cause for vertical integration is further supported by the previously discussed studies Lafontaine (1992) and Scott (1995). Both report that the amount of training the principal invests into the agent is positively correlated with vertical integration at a 5% significance level. Even though there is strong empirical support for the prediction of the MH model that increased importance of the upstream effort is an important factor driving vertical integration, it should be noted that all the supporting studies analyzed firms in the “retail & services” industry (Lafontaine & Slade, 2007). It is questionable whether proxies such as adverting expenditure can be used to accurately determine the impact of upstream effect on vertical integration in industries that do not depend on reputation or well-trained sales staff. Nonetheless, empirical literature finds that the importance of upstream effort is indeed an important factor for vertical integration.

The last, but arguably most important, factor identified by the MH model is the influence of monitoring cost on vertical integration. Since the model identifies different sub-types of monitoring cost, the following analysis of empirical support will be split up according to the two types of monitoring identified in Lafontaine and Slade (2007).

The first type of monitoring identified is outcome monitoring. An increase in the cost of outcome monitoring at the downstream level is predicted to increase the likelihood for vertical integration. Empirical literature tests this prediction by analyzing the difficulty of measuring the sale force’s effort in different contexts. The cost of determining the sales force’s effort is commonly measured through either the amount of products sold or an index which identifies the (subjective) measurement difficulty (Lafontaine & Slade, 2007). Anderson and Schmittlein (1984) and Anderson (1985) both use such an index to show that higher outcome measurement costs are positively correlated with vertical integration. Anderson and Schmittlein (1984) asks subjects to indicate to what extent they agree or disagree with the statement “It is very difficult to measure equitably the results of individual salespeople”. Anderson (1985) uses a more elaborate index to measure monitoring cost based on managers’ replies to a list of questions presented in a questionnaire. Both studies find that higher indications of output measurement cost cause more vertical integration at the 5% significance level. John and Weitz (1988) provides additional support for this theory by showing that the length of a sales cycle[[9]](#footnote-9) is positively correlated with the likelihood that the sales force is managed internally. Overall, empirical evidence supports the prediction of the MH model that increasing the outcome measurement cost factor will also increase the likelihood of vertical integration. However, the studies restricted their analyses to sales force personnel and subjective measurements of measurement cost. The robustness of the findings could be further improved by using more objective proxies to determine outcome measurement costs.

The second type of monitoring identified is behavioral monitoring. An increase in the cost of behavioral monitoring is predicted to decrease the likelihood for vertical integration. Empirical literature often focuses on franchising decisions to test this prediction (Lafontaine & Slade, 2007). The cost of behavioral monitoring is commonly measured using the distance between franchised outlets and company headquarters as a proxy to show how far company workers would have to travel in order to observe agent effort. Brickley and Dark (1987) and Minkler (1990) use such a proxy to show that larger distances (and therefore higher monitoring costs) result in a higher proportion of franchised outlets. Brickley and Dark (1987) finds that the average distance from “monitoring headquarters is 224 miles for the owned units, compared with 669 miles for the franchised units”. Another proxy used to determine behavioral monitoring costs is the number of states a company operates in (Lafontaine & Slade, 2007). Again, it is assumed that a greater geographical dispersion of outlets will increase monitoring costs primarily due to the costs associated with greater travel distance. Lafontaine (1992) and Mitsuhashi, Shane and Wesley (1995) both use such a proxy to show that the number of states in which retail outlets are located is negatively correlated with the likelihood for vertical integration. Specifically, Mitsuhashi *et al.* (1995) finds that the proportion of outlets franchised depends positively on geographic dispersion even in the presence of control variables such as company age and the number of already franchised outlets. Further studies on behavioral monitoring costs that use proxies other than distance are discussed in Lafontaine and Slade (2007) and Lajili *et al.* (2007). Regardless of the proxy used for monitoring cost, it is always reported that high costs have a significant negative impact on the likelihood of vertical integration. The findings of empirical literature are robust across a large number of different industries, statistical techniques and proxies for monitoring cost. In light of the empirical evidence it can be concluded that the prediction of the MH model is correct; an increase in behavioral monitoring cost has a significant negative effect on the likelihood of vertical integration.

Next to the factors predicted by the MH model, organizational literature also identifies several types of asset specificity believed to increase integration likelihood. The first type of asset specificity is site specificity. Theory states that if a relationship specific investment is site specific, the party with less control over the asset will have an incentive to integrate the controlling party in order to avoid hold up problems. This prediction is thoroughly tested in Joskow (1985) and Joskow (1987). Both studies examine how electricity plants tend to be located in close proximity to mouths of coal mines, and how this site specificity affects integration and post-contract bargaining between the power plant and coal mine operators. It is found that when plants have a “mine-mouth” location, the contracts between the parties are approximately 1.5 million tons larger than with other plants *ceteris paribus* (Joskow, 1987). Therefore, the presence of site specific assets induces the parties to write both stricter and more long-term contracts, which in the absence of efficient contracting can lead to increased vertical integration. This finding is further supported by Spiller (1985) which looks at how distance between vertically related plants in a production chain affects the likelihood for mergers. It is reported that more than 50% of mergers examined occurred when vertically related plants were located in the same state, and that closer physical proximity of vertically related plants in a merger is correlated with a significant drop in contracting risk. In light of the empirical evidence provided, it can be concluded that site specificity of assets is a significant factor increasing the likelihood of vertical integration.

The second type of asset specificity is human asset specificity. Similar to site specificity, TCE literature also identifies human asset specificity to be a factor driving vertical integration in situations where companies want to avoid being held-up in business relationships when they heavily depend on the other party’s human capital. This theory has vast empirical support from Anderson and Schmittlein (1984), John and Weitz (1988), Klein (1989), Masten, Meehan and Snyder (1989) and Monteverde (1995). The effects of human capital specificity are often tested using an index that measures the complexity of tasks important in a certain transaction. More complex tasks are assumed to be of a relationship specific nature and can only be completed by workers with relationship specific knowledge. Anderson and Schmittlein (1984) and Masten *et al.* (1989) use indexes based on specialized knowledge and a (subjective) 1-10 “know-how” scale to show that increased task complexity significantly increases the likelihood for vertical integration. Furthermore, John and Weitz (1988) and Klein (1989) also find that an increase in specific asset levels (such as the amount of firm specific training) significantly increases the probability of using direct channels compared to indirect channels. Finally, Monteverde (1995) looks at the semiconductor industry to find that “transactions whose efficient execution is most dependent upon investment specific human capital will tend to be…coordinated within firms”. The intensity of “unstructured dialog” between engineers working in the design and manufacturing processes is reported to have a significant positive effect on the integration likelihood between the firms involved in these processes. Overall, empirical literature again unanimously supports the theory that human asset specificity is a significant factor determining vertical integration.

The third form of asset specificity is physical asset specificity. Asset specificity is theorized to increase the likelihood for integration when companies invest in physical assets only usable in a specific business-relationship. Lieberman (1991) and Monteverde and Teece (1982) show that in both chemical and automobile industries vertical integration is significantly more likely when product specific investments are present. Relationship specific assets such as the presence of gas pipelines connected to chemical factories or production facilities for brand specific automobile components were most commonly found in integrated firms. Further support for the theory comes from Masten (1984) and Lyons (1995) which also find a positive correlation between asset specificity and integration in the engineering and aerospace industries, using a specificity index meant to capture various dimensions of physical asset specificity such as design and process specificity. Finally, Joskow (1985) draws on anecdotal data to argue that the positioning of power plants at the entrances to coal mines mouths has dedicated and physical asset specific properties in addition to the previously discussed site specificity. Since power plants are designed to “burn the specific types of coal located in the adjacent reserves”, they are therefore dependent on the mine’s output to operate efficiently. According to this argument, the owner of the power plant would again have an incentive to integrate the coal mine to avoid being held-up. Based on the evidence provided in empiric literature, it can be concluded that the factor of physical asset specificity follows the theoretical predictions; asset specificity is positively correlated with vertical integration in all industries examined.

The final type of asset specificity identified by organizational literature is “dedicated assets”. Dedicated assets describe investments that are undertaken in anticipation of a specific business transaction and wouldn’t be economical without it. Again, Joskow (1985) shows that dedicated assets positively influence vertical integration in cases when power plants are built in close proximity to coal mines, solely based on the expectation that the mine will efficiently provide fuel. Crocker and Masten (1988) offers additional evidence by showing that in the natural gas industry contracts are on average seven years longer when investments into drilling and extraction equipment have to be made. Likewise, Ulset (1996) shows that large sunk costs increase and a higher expected resale value (of assets) decreases the likelihood for vertical integration in the case of public R&D projects. Again the empirical results support the theory that dedicated assets characterized by high sunk costs and low resale values are a significant factor for vertical integration.

Another feature of dedicated assets is that they are frequently only usable over a specific time period during a trade arrangement. This characteristic is usually referred to as temporal specificity. Masten *et al.* (1991) shows that a task is significantly more likely to be completed internally when precise scheduling is of great importance. Additionally, the study also shows that the importance of scheduling doesn’t affect the “costs of organization”, letting the authors conclude that “the principal effect of SCHEDULE on the integration decision derives from the hazards of market exchange” (Masten, Meehan, & Snyder, 1991). Finally, Pirrong (1993) examines the consequences of temporal specificities in the bulk shipping industry to find that the likelihood of a shipment being outsourced strongly depends on how quickly a suitable contractor can be found on the spot market. Vertical integration of shipments is reported to be the dominant procedure in “thin” subcontractor markets and for hauls demanding a precise delivery schedule. Overall, empirical literature supports the theory of dedicated assets, providing a wide range of empirical evidence that shows asset dedication is a significant factor in determining the likelihood of vertical integration.

The last factor identified by organizational theory to increase the likelihood for vertical integration is the issue of supply security. Issues of supply security include both volume and technological uncertainties. Walker and Weber (1984) analyzes the effects of both dimensions of supply security by conducting a questionnaire on the make-or-buy decision in a “component division of a large US automobile manufacturer”. Engineers and sales staff were asked to estimate to what extent technological uncertainty and volume uncertainty increased the likelihood of manufacturing a component in-house on a 1 to 5 scale[[10]](#footnote-10). Analysis of the replies shows conflicting results; volume uncertainty is found to increase the likelihood of in-house production, whereas technological uncertainty increases the likelihood for outsourcing. The second result clearly contradicts the predictions of Stigler’s theory of specialized input demand.

Further empirical testing on the consequences of supply security is conducted in Barrera-Rey (1995) and Levin (1981). Both studies look for the influence of supply security reasons on the vertical integration decisions of large companies. Specifically, the 1973 oil embargo is identified as a prime example for when oil companies involved in the refinement and retailing business had to endure great losses resulting from a greatly reduced supply of crude oil. Barrera-Rey (1995) assumes that supply security is a major determinant of a company’s operational efficiency and finds that in a sample of 234 oil companies, integration significantly reduces operational efficiency. A 1% increase in integration is found to decrease efficiency by 0.25% which shows that vertical integration does not alleviate issues of supply security as theory predicts. However, Levin (1981) finds that increased “self-sufficiency” of inputs has a significantly reduces the volatility of profits in the oil industry, showing that upstream vertical integration can in fact have a favorable impact on company performance. Overall, a definite conclusion on the influence of the supply security factor on vertical integration cannot be reached. The analysis in empirical literature is limited to large industries and offers contradicting findings on the effectiveness of vertical integration to alleviate supply security concerns.

**3.2 Empirical Support for Neoclassical Factors**

Neoclassical literature on integration identifies five factors that are believed to influence whether two firms use spot market transactions or vertically integrate. The first two factors identified are vertical and horizontal externalities. Vertical externalities refer to the abuse of market power in either the up or downstream market which can result in inefficient pricing schemes such as double-marginalization. Durham (2000) uses a laboratory experiment to show that in the absence of competition, double marginalization will be present in vertical chains controlled by an upstream monopolist. Furthermore, it is found that charging a monopoly mark-up is the dominant strategy for upstream monopolists to maximize profits in the experimental context, regardless of competitiveness at the downstream level. Villas-Boas (2002) analyzes the yogurt retail industry in several urban US areas to find that double marginalization if often foregone in favor of more efficient pricing schemes when firms decide to cooperate. However, in this study the competitiveness of upstream markets varies across the different locations used to collect data. This raises the question to what extent the shift away from double marginalization reflects some form of vertical integration or merely differences in the upstream markets’ competitiveness. Finally, Park and Lee (2002) uses a different approach to analyzing vertical externalities by combining empirical evidence on double marginalization in the South Korean telecommunications market with a situation specific mathematical analysis of the possible benefits of vertical integration. The study finds that integrating the fixed network provider lets mobile carriers maximize their overall profits by lowering the prices of fixed-to-mobile calls (previously controlled by the fixed network providers). While the theory of vertical externalities seems to have some empirical support, the evidence provided is questionable at best. I consider it highly doubtful whether a small scale laboratory experiment or a mathematical analysis can provide sufficient proof for the theory that firms vertically integrate to prevent double marginalization. As Joskow (1985) notes, there are “many anecdotes but little systemic empirical analysis” of neoclassical predictions regarding horizontal externalities. As such, it cannot be concluded that the presence of vertical externalities is an empirically supported factor for vertical integration.

Empirical literature frequently tests the causes and consequences of horizontal externalities by looking for the presence of resale price maintenance (RPM) schemes between manufacturers and retailers. RPM schemes are thought to be a common alternative to “all-out” mergers or acquisitions when upstream manufacturers want to pressure downstream retailors into selling their products within a pre-determined price range. This is believed to create an incentive for retailers to compete on terms of service rather than price (Telser, 1960). Ippolito (1991) tests this theory by analyzing RPM-related litigation charges for businesses in the US to look for the presence of “special services” and additional sales effort. All these dimensions of downstream effort are assumed to be possible results of RPM. It is found that over one third of the analyzed RPM-incidences featured products that significantly benefited from the provision of “special services” to increase the product’s quality. However, the cases analyzed also show no correlation between RPM and the provision of additional sales effort. This finding is further supported in Marvel and McCafferty (1984) which finds that also in the pharmaceutical and grocery retailing industry RPM is frequently associated with a manufacturer’s desire to obtain some sort of “quality certification” for his products. By setting a resale price limit, manufacturers do not elicit more effort from existing retailers, but rather attract retailers that are already known and certified for their higher quality and service standards. RPM is also found to have a significant correlation with the concentration of retail outlets in a certain area, again suggesting that it is primarily used to avoid competing on price in potentially competitive markets.

So far the examined empirical literature shows that the presence of RPM is not associated with an increase in sales effort as neoclassical theories predict. However, Overstreet (1983) raises the objection that evidence for the theory that RPM can elicit more retailer effort is limited at best. Based on the analysis of case studies in the apparel, shoe and television industries, it is argued that RPM is most commonly used for anti-competitive purposes such as when suppliers collude to avoid price competition in the upstream market. In fact, Overstreet (1983) draws on previous RPM studies which all suggest that RPM ultimately doesn’t result in retailers providing more effort with regards to service or marketing. Similar to vertical externalities, determining the strength of empirical support for the theory of horizontal externalities is made difficult by a lack of empirical literature. Additionally, it is uncertain as to whether using RPM to measure the existence of horizontal externalities is a valid method. Even though the limited empirical literature suggests that RPM does not elicit more sales effort from the retailer, it is questionable as to what extent the presence of RPM is a reliable indicator for the presence of vertical integration. Therefore, it can only be concluded that empirical literature does not offer definite support for the theory of horizontal externalities.

The final factor identified by neoclassical theories is the desire to benefit from monopoly power. One way to create monopoly power is by vertically foreclosing the market. Theory states by integrating an upstream supplier or downstream retailer firms can restrict their competitor’s access to assets needed to efficiently compete in the industry. This enables the integrated firm to either force their competitors out of the market or raise their cost. The most common approach in empirical literature to determine the impacts of market foreclosure and price discrimination is to analyze industries in which the ownership of a single asset can grant full monopoly power to the integrator. For instance, Chipty (2001), Hazlett (2007), Shen (2011) and Waterman (1995) all look at the US cable television (TV) industry to determine the consequences vertical integration has on competition in the industry. The cable industry is especially suitable for such analysis since the physical cable connection into every household poses a crucial, bottleneck resource that is needed by content providers to sell their products. Integration of cable operators by content providers such as HBO is commonly found to reduce the accessibility to non-integrated competitors’ services. For example, Chipty (2001) finds that integration results in a significant reduction in the number of competitor’s services accessible to the viewer by approximately 20%. Shen (2011) finds that the likelihood of a specific network being carried by an integrated provider increases by approximately 40% when it belongs to the integrator. As such, empirical evidence shows that vertical integration between content providers and cable operators effectively forecloses the market for non-integrated content providers.

Empirical literature also finds evidence for monopoly benefits in other industries. Gilbert and Hastings (2001) analyzes the gasoline industry in 26 US metropolitan areas to show that average price levels of non-integrated retailers are significantly higher compared to integrated retailers. The average wholesale price non-integrated retailers have to pay for a gallon of gas is found to increase by $ 0.4 cents for every instance of upstream vertical integration. Additionally, integrated retailers’ prices are seen to rise by approximately $ 0.2 cents per gallon for every 1% increase in their overall market share (Gilbert & Hastings, 2011). The empirical results show that vertical integration between gasoline wholesalers and retailers raises both the costs of non-integrated retailers and the prices of integrated retailers, supporting both predictions of the foreclosure theory. Normann (2010) further supports the argument that vertical foreclosure can be used to raise competitor’s costs by analyzing data collected from a laboratory experiment. It is found that the presence of vertically integrated firms significantly increases the average price levels by approximately 8%. Likewise, integrated firms are also found to be least likely to charge the lowest prices compared to non-integrated firms. Again the findings support the theory that vertical integration is used to increase average price levels and therefore the integrator’s profit margin. Overall, empirical literature consistently reports that vertical integration has the same effects on price levels and competition as predicted by neoclassical theory. The desire to capture monopoly benefits is shown to positively influence the likelihood for vertical integration.

**3.3 Summary**

The following table summarizes the empirical findings on organizational factors of vertical integration:

Table 1. Summary of Empirical Literature on Organizational Factors

|  |  |  |  |
| --- | --- | --- | --- |
| Factor Name | Measurement Proxies | Effect on the Likelihood for Vertical Integration | Empirical Literature |
| Uncertainty | Demand Variability, Sales Variance, Proportion of Discontinued Outlets | Negative\* | Norton (1988), Lafontaine (1992), Martin (1988), Woodruff (2002), Anderson & Schmittlein (1984) |
| Outlet Size | Capital Investment, Sales $100K Capital, Average Sales per Retail Outlet | Positive | Lafontaine (1992), Martin (1988) |
| Importance of Downstream Effort | Service Dummy | Negative | Norton (1988), Caves & Murphy (1976), Shepard (1993), Slade (1996) |
| Importance of Upstream Effort | Advertising Expenditures, Amount of Agent Training | Positive | Lafontaine (1992), Scott (1995), Nickerson & Silverman (2003), Lafontaine & Shaw (2005) |
| Outcome Monitoring Cost | Measurement Cost Index, Length of Sales Cycle | Positive | Anderson & Schmittlein (1984), Anderson (1985), John & Weitz (1988) |
| Behavior Monitoring Cost | Distance between Outlet and Headquarters | Negative | Brickley & Dark (1987), Minkler (1990), Lafontaine (1992), Mitsuhashi *et al.* (1995), Lafontaine & Slade (2007), Lajili *et al.* (2007) |
| Site Specificity | Distance | Positive | Joskow (1985), Joskow (1987), Spiller (1985) |
| Human Asset Specificity | Specialized Knowledge Index, Amount of Firm Specific Training, Intensity of Unstructured Dialogue | Positive | Anderson & Schmittlein (1984), John & Weitz (1988), Klein (1989), Masten *et al.* (1989), Monteverde (1995) |
| Physical Asset Specificity | Presence of Production Specific Assets, Anecdotal Evidence | Positive | Liebermann (1991), Monteverde & Teece (1982), Masten (1984), Lyons (1995), Joskow (1985) |
| Dedicated Assets | Drilling Expenditures, R&D Sunk Costs, | Positive | Joskow (1985), Corcker & Masten (1988), Ulset (1996), Masten *et al.* (1991), Pirrong (1993) |
| Supply Security | Uncertainty Index, Degree of Self-Sufficiency | Ambiguous | Walker & Weber (1984), Barrera-Rey (1995), Levin (1981) |

\* This finding contradicts the MH model’s predictions.

Empirical literature shows that the factors of outlet size, outcome monitoring cost and the importance of upstream and downstream effort are all positively correlated with vertical integration. Behavior monitoring costs are negatively correlated with vertical integration. Additionally, all four types of asset specificity were found to be significant factors for integration. These findings all support the theory’s predictions and are robust across multiple industries, measurement and statistical techniques. However, empirical evidence on the influence of supply security reasons is more ambiguous due to contradicting findings and criticism of the measurement techniques. As a result of the lack of reliable empirics it cannot be concluded that empirical literature supports the predictions for the factor of supply security. Finally, downstream uncertainty was found to have the opposite effect as predict by organizational theories. Empirical literature shows that increasing downstream uncertainty is associated with lower integration likelihood.

The following table summarizes the empirical findings on neoclassical factors of vertical integration:

Table 2. Summary of Empirical Literature on Neoclassical Factors

|  |  |  |  |
| --- | --- | --- | --- |
| Factor Name | Measurement Proxies | Effect on the Likelihood for Vertical Integration | Empirical Literature |
| Vertical Externalities | Experiments, Pricing Schemes | Ambiguous | Durham (2000), Villas-Boas (2002),  Park & Lee (2002) |
| Horizontal Externalities | RPM | Positive | Ippolito (1991), Marvel & McCafferty (1984) |
| Anecdotal Evidence | Negative\* | Overstreet (1983) |
| Monopoly Benefits | Accessibility of Competitor’s Productions, Price Levels, | Positive | Chipty (2001), Hazlett (2007), Shen (2011), Waterman (1995), Normann (2010) |

\* This finding contradicts the MH model’s predictions.

The empirical evidence supports the prediction regarding the “monopoly benefits” factor: the desire to benefit from monopoly power is positively correlated with vertical integration. No definite conclusion can be reached on empirical support for the horizontal and vertical externality factors. In both cases, empirical studies on the factors use questionable measurement techniques (such as RPM) or provide contradictory findings. Empirical support for neoclassical factors of vertical integration is generally less convincing than for organizational factors. With the exception of the monopoly benefits factor, all the analyzed empirical literature is to some extent flawed. Doubts regarding the suitability of proxies used to operationalize factors or the breadth of industries analyzed didn’t allow for definite conclusions to be drawn. But perhaps most importantly, there appears to be a general lack of empirical literature analyzing the effects of neoclassical factors. As Joskow notes, there are “many anecdotes but little systemic empirical analysis” of the neoclassical factors for vertical integration (Joskow, 1985).

**4 Conclusion**

By combining theories on vertical integration with empirical findings, it was shown that empirical literature predominantly supports the predictions of organizational rather than neoclassical theories. Empirical analysis of neoclassical factors is weak for three reasons: issues regarding the operationalization of factors, a general lack of empirical literature and the possibility that confounding factors cause the correlation between the measurement proxies and vertical integration. The criticism on the operationalization of factors refers to my doubts whether certain proxies, such as the presence of RPM, can actually be used to measure their intended factors. In general, the suitability of the measurement methods used in the discussed studies on vertical and horizontal externalities remains questionable. For example, Durham (2000) tests for the effect of vertical externalities on integration by looking for the presence of double marginalization in an experiment involving 34 test subjects. Apart from the obvious concern regarding the small sample size, it is also uncertain to what extent the test subjects would have made the same integration decisions in a real-world setting. Even under the assumption that the experiment is set up in such a way as to measure exactly what it intends to measure, the idealizations made in order to make the variable of interest observable could have also influenced the test subjects’ behavior. In essence, this boils down to a question of external validity. The majority of empirical evidence on neoclassical factors is based on experimental findings and the analysis of anecdotal evidence. The validity and applicability of these findings would greatly improve if they were to be based on large-scale, statistical data sets as is done in studies on organizational factors.

Evaluating the empirical evidence on the factors of vertical and horizontal externality is also difficult due to lack of studies that focus solely on the factor in question. According to my best knowledge, no empirical studies exist which explicitly test for the influence of vertical and horizontal externalities on vertical integration. The factor of “monopoly benefits” has received significant attention in empirical literature since it is closely associated with anti-trust theories and policy making. If vertical and horizontal externalities were deemed to be of the same importance as the other factors for vertical integration, I would expect to see an increase in empiric literature on this subject that would certainly help determine whether the theories’ predictions are valid or not.

Finally, empirical analysis of neoclassical factors has to deal with the issue of differentiating between correlation and causation. Studies generally analyze vertical and horizontal externalities by looking for a correlation between these factors and vertical integration. The problem is that factors are commonly measured via variables that represent the outcome rather than the cause of vertical integration. For instance, RPM is used to determine the effect of horizontal externalities on integration. Studies look for situations in which both integration and RPM can be observed, and deduce that RPM was the outcome (and therefore also the purpose) of a firm vertically integrating. In such scenarios there could of course be a number of confounding variables that explain why a firm could have two entirely independent reasons for vertically integrating and using a RPM scheme. Instead of measuring the factor using a variable that measures the outcome of integration, studies should focus on variables that occur before the vertical integration to measure the factor’s effect. For example, if it is found that certain environmental characteristics increase the likelihood of a firm to benefit from RPM, and these firms are more likely to be involved in vertical integration activities, it would be far more plausible to assume that the anticipated benefits of RPM are at least partially causing the higher integration likelihood.

Contrary to the neoclassical factors, organizational factors have strong empirical support which shows that most factors act as predicted by their respective theory. Only empirical findings on uncertainty and supply security are not in line with the theory’s predictions. Uncertainty is found to decrease rather than increase vertical integration. This creates the opportunity for economists to determine why empirical findings contradict the predictions, and revise the theory if need be. The effect of the need for supply security on vertical integration remains ambiguous largely due to contradictory findings. Nonetheless, the fact that the large majority of organizational factors are supported by empirics makes it likely that vertical integration tends to generally be more driven by the aim to improve efficiency rather than creating and exploiting market power.

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1. This paper will not attempt to give a definition of or discuss the multiple forms vertical integration possible. In the upcoming sections, the term vertical integration will refer to situations in which one party gains decision making rights over another party’s productive assets. In reality, vertical integration often comes in the form extensive contracting and franchising rather than mergers and acquisitions. For an in-depth discussion on the various forms of vertical integration see Robertson and Langlois (1994). [↑](#footnote-ref-1)
2. For a detailed discussion of the model’s assumptions and predications see Lafontaine and Slade (2007), pp. 6-12. [↑](#footnote-ref-2)
3. In this paper Property Rights theories will not be discussed due to lack of empirical testing on this subject (Joskow, 2005). For an in-depth discussion on the differences between TCE and PR theories see Whinston (2003). [↑](#footnote-ref-3)
4. A common vertical constraint to deal with the under provision of effort is resale price maintenance. See Winter (1993) for a discussion of vertical constraints used in scenarios with horizontal externalities present. [↑](#footnote-ref-4)
5. Data was taken from the Entrepreneur Magazine’s *1986 Franchise 500* and the US Department of Commerce’s *Franchising in the Economy* (Lafontaine, 1992). [↑](#footnote-ref-5)
6. The result of the average sales variance proxy were explicitly discussed in the paper, but according to the author “all…measures lead to the same qualitative results.”. [↑](#footnote-ref-6)
7. Woodrow (2002) takes an interesting step to estimate sales volatility by measuring the frequency of changes in trends in various clothing segment industries. A large number of annual “style changes” is considered to show quickly changing demand patters and therefore sales volatility. [↑](#footnote-ref-7)
8. The studies mentioned used cross sectional regression, Tobit and Probit analyses. Data is taken from the US Department of Commerce’s publications, Lundberg Surveys Inc. publications, Oil Price Information Service or collected by the author within the city limits of Vancouver. The industry sectors analyzed in the studies include retail & services, restaurants & motels and gasoline refining & sales (Lafontaine & Slade, Vertical Integration and Firm Boundaries: The Evidence , 2007). [↑](#footnote-ref-8)
9. Longer time periods between the placement and fulfillment of orders are assumed to increase the difficulty of measured downstream performance (John & Weitz, 1988). [↑](#footnote-ref-9)
10. The authors admit that this method of collecting data is highly subjective, but they still assume the estimates to be valid due to the respondent’s “extensive experience” in their respective fields (Walker & Weber, 1984). [↑](#footnote-ref-10)