WHEN DOES VERTICAL INTEGRATION MAKE SENSE?

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One of the most important aspects of strategy development is to determine the appropriate level of vertical integration. There are large risks associated with vertical integration as a strategy: complexity, significant capital commitments, difficulty to reverse course if the strategy does not work.

Transaction cost theory has been used to find the answers to numerous vertical interaction problems:

- Should components and sub-assemblies be made or bought (e.g., should a smart phone maker manufacture its products or should this be outsourced).

- Should staff be employed or contracted on a temporary basis (e.g., in the construction industry)?

- Does it make sense to own the distribution channel (e.g., should a fashion house own its retail outlets)?

- For which issues is it appropriate for a company to retain external management consultants (e.g., is it appropriate to let consultants work on strategic issues)?

- Should a company outsource functions (e.g., should banks, where information technology is mission-critical, let a third party take over management of the information)?

- What part of upstream activities should be sold off (e.g., does an oil and gas retailer have to be active in exploration and production)?

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[1] See, e.g., J. Stuckey and D. White, When and When Not to Vertically Integrate, *Sloan Management Review*, Spring: 71-83, 1993

Value of Vertical Integration

Occasionally, vertical integration creates substantial value, but the general rule is that companies should avoid vertical integration except for when it is necessary. The reason for this is that there are almost always better investment opportunities at hand, and that companies seldom gain competitive advantage from being active in multiple stages in the value chain. Vertical integration invariably leads to increased risk for the existing core business because it reduces strategic flexibility.

Theory and empirical research show that vertical integration can create shareholder value in two general situations: 1) when markets are collapsed, or 2) when there is an opportunity to increase barriers to entry.[1]

Collapsed markets. A market collapses when transactions carry a high risk, or when the contracts necessary to act in the market are too expensive (or impossible) to create and administer to be economically viable.

Characteristics of collapsed markets are (a) a small number of buyers and/or suppliers, (b) a level of uniqueness, long depreciation horizons, and high value of the assets, and (c) frequent transactions.

a) The number of accessible vendors and customers determines whether a market functions well. If there are few vendors and customers the negotiations often turn into power plays, which can make the negotiations process both costly and uncertain—short- and long term.

   It is critical to determine who the truly relevant players are, based on geography, technology, competence, etc., when assessing if a market is collapsed or not.

b) If the assets required to produce a good or service are unique, depreciate slowly, and carry a high value, the risk of market inefficiency increases dramatically.

Asset uniqueness is most often associated with either a specific geographic location (e.g., a coal mine located close to a steel mill, which uses the coal for energy), proprietary technology (e.g., a microprocessor tailor-made for a specific application), or specific knowledge (e.g., consultants' understanding of a client's business).

Under such circumstances a unidirectional or bidirectional monopoly is usually created, which makes cooperation difficult.

c) High transaction frequency also increases the risk of market collapse because the cost of creating the contracts increases when there are frequent transactions.

| | | Asset specificity | |
		Low	High
Transaction frequency	**High**	Standardized transactions (e.g., groceries)	Vertical coordination (e.g., auto components)
	Low	Specified standard contracts (e.g., office space)	Specified unique contracts (e.g., construction project)

It is usually the combination of high transaction frequency and high asset specificity, which leads to market collapse (see table above).

A special case of collapsed markets is when one player wants to protect itself against stronger suppliers or customers by integrating vertically.

For this strategy to be viable, the player has to have a cost or competence advantage compared to a potential third-party entrant. This is seldom the case and most strategies based on the notion of protecting the company from stronger suppliers or customers through integration fail.

Higher barriers to entry. Vertical integration can be an effective way to increase barriers to entry in an industry, which in turn leads to higher profitability.

The cost and complexity for a new player to enter an industry increases significantly when the established players are vertically integrated. Examples include the U.S. automotive industry[2] and the global aluminum industry.

To pursue vertical integration to build barriers to entry can be costly and is often not a solution in the long run. For example, while three vertically integrated players dominate the global aluminum industry, new players have been able to enter the industry by creating joint ventures and by targeting new markets where the dominant players have high switching costs.

The broadest and most stringent empirical analysis of vertical integration was arguably conducted by d'Aveni and Ravenscraft[3] who studied 3185 business units within 466 U.S. companies. Their research showed that those units with a higher degree of vertical integration (forward or backward) exhibited the following characteristics:

- Lower selling, marketing, and administrative costs

- Higher manufacturing costs

- Slightly higher profitability

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[2] Most observers believe that the Japanese auto makers would be even more successful in the U.S. market if the U.S. auto makers did not have such a strong control of the dealer networks.

[3] R.A. d'Aveni and D.J. Ravenscraft, Economies of Integration Versus Bureaucracy Costs: Does Vertical Integration Improve Perfomance? *Academy of Management Journal*, 5: 1167-1206, 1994

There are large differences between forward and backward integration though.[4] Forward integration generally lowers selling, marketing, and administrative costs, and profitability increases substantially for the companies in the sample.

For business units with a high degree of backward integration only small administrative cost savings were evident, but manufacturing costs increased. Backward-integrated companies exhibited lower profitability than their less integrated industry peers.

In another major study, Rumelt demonstrated that the pursuit of vertical integration as a corporate strategy was the least successful of all possible diversification strategies.[5]

Transaction Cost Theory and Vertical Integration

The starting point in transaction cost theory and its application to vertical integration problems is—as the name implies—to estimate the cost of each transaction. This cost depends on the organizational form chosen

A transaction can be performed in the market or within the firm. This may sound obvious, but the analysis embeds significant difficulties. It is, for example, impossible to measure costs associated with hypothetical transactions in the market when a company makes all its own components.

To circumvent such difficulties, it is useful to measure costs within the existing—and hence observable—organizational form. These costs are then generalized for different organizational forms using statistical methods such as censored probit analysis.

This makes it possible to estimate the transaction cost for performing the transaction in the market or within the firm.[6]

The underlying idea from transaction cost theory, that a firm chooses the organizational form for the transaction based on the total cost associated with performing the transaction, can be expressed as

$$I^* = \begin{cases} I^o & \text{if } G^o < G^m \\ I^m & \text{if } G^o \geq G^m \end{cases}$$

where I^* is the organizational form to be chosen for the transaction, I^o is vertical integration within the company, I^m represents an open market transaction, G^o and G^m are the total costs associated with the two alternatives.

This is a trivial statement. The difficult part is to measure the costs associated with each alternative. A simplification is to tie the costs G^o and G^m to observable indicators.[7] That is:

$$G^o = \alpha X + \varepsilon_1$$

$$G^m = \beta Y + \varepsilon_2$$

where X and Y are vectors with observable indicators, α and β are vectors of coefficients, and ε_1 and ε_2 are normally distributed stochastic error variables. Once X and Y have been chosen, α and β can be estimated through statistical analyses.

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[4] The degree of forward integration was measured as the share of revenue that went to another unit within the company, and the degree of backward integration was measured as the share of manufacturing costs stemming from other units within the company.

[5] R.P. Rumelt, Diversification Strategy and Profitability, *Strategic Management Journal*, 3:359-370, 1982

[6] The expected cost for each organizational form is usually expressed as a normal distribution of costs with a probability associated with one cost being higher than the other.

[7] See, e.g., S.E. Masten, J.W. Meehan and E.A. Snyder, The Cost of Organization, *Journal of Law, Economics and Organization*, 1:1-25, 1991

The **X** and **Y** indicators are, for example:

- The specificity and relative value of fixed assets.
- The degree of specific know-how and competence.
- The transaction frequency
- Price and volume uncertainty
- The importance of supply or delivery accuracy.

Applications

Transaction cost theory has been used numerous times to solve real-life vertical integration problems in most sectors of the economy. These applications show that the theoretical explanations and predictions usually are correct and that the penalty for making the wrong choices in vertical integration decisions is large.

One study of the choice of organizational form and its impact on administrative costs at a shipyard showed that the cost could vary by 70 percent depending on whether the right choice of market or internal transactions was made. Since administrative costs represented 14 percent of total costs, the choices made had a bottom-line impact of 10 percent.

The choice for each work activity was heavily dependent on how time-critical the activity was, the degree of technical expertise required, how complex the activity was, and the share of the activities cost represented by labor rather than materials.[8]

Monteverde and Teece have used transaction cost theory within the U.S. automotive industry to determine which components or sub-assemblies are most appropriately designed in-house, and which are better sourced in the external market. If the amount of development work required is high then it proves advantageous to design and manufacture the component in-house, even if manufacturing scale economies are sacrificed.[9]

Masten, Meehan and Snyder demonstrated that the degree of specific knowledge and competence embedded in the employees of a company is more important than the specificity of the fixed assets when it comes to determining whether a company should make or buy components. The reason for this is probably that it is easier to keep control over fixed assets located at a supplier than over personnel working at a supplier.[10]

A final example is a combined theoretical and empirical study of the insurance industry.[11] The study showed that insurance companies choose to work through intermediaries such as brokers, or with their own in-house sales forces depending on the characteristics of the products and services sold.

Certain products such as whole life policies make it important for the insurance company to have direct contact with customer and to own the customer database. Insurance companies who choose to distribute such products through third party sales forces are competitively disadvantaged.

On the other hand, most types of property and casualty insurance have such characteristics that

[8] S.E. Masten, J.W. Meehan and E.A. Snyder, The Cost of Organization, *Journal of Law, Economics and Organization*, 1:1-25, 1991

[9] K. Monteverde and D.J. Teece, Supplier Switching Cost and Vertical Integration in the Automobile Industry, *Bell Journal of Economics*, 1: 206-213, 1982

[10] S.E. Masten, J.W. Meehan and E.A. Snyder, Vertical Integration in the US Auto Industry, *Journal of Economic Behavior and Organization*, 12: 266-273, 1989

[11] S.J. Grossman and O.D. Hart. 1986. The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration, *Journal of Politcal Economy,* 94: 691-719

third-party sales forces carry significantly lower cost and direct selling is disadvantaged.

Importantly, it is only when the total cost for the transaction is measured that the true relative cost patterns emerge. The simplistic comparison of sales commissions for brokers versus in-house salespeople does not reveal the hidden costs such as the penalty of less contact with the market when third party distributors are used, or the cost of added bureaucracy and weaker incentives when the insurance company employs its own salespeople.

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The problem of how much vertical integration a company should have can be solved in a fact-based manner. Few executives are however familiar with the tools at hand. This paper sheds some light on how to optimize the *vertical depth* of a company.

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