Calling Spirits from the Deep:
Competing for and through Sophisticated Customers

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Abstract

This thesis explores why professional services industries stratify into hierarchies and how firms change their positions in those hierarchies over time. Essay one is entitled “Reinforcing feedback between market position and firm capabilities” and asks why Merrill Lynch succeed in building a leading investment-banking practice while rival brokerage firm PaineWebber tried and failed. The two firms’ experiences and previous research are used to specify a model of competition among professional services firms. Reinforcing feedback between the nature of a firm’s client work and its capabilities and intendedly rational policies lead to a hierarchy of industry competitors. Analysis of the model highlights two key elements differentiating Merrill Lynch’s and PaineWebber’s efforts to improve: speed in developing capabilities and discipline in accepting and rejecting client work.

Essay two is entitled “You are whom you serve.” It explores why hierarchies develop in professional-services industries where some firms develop stronger capabilities and execute more sophisticated client work than their rivals do. The paper develops and analyzes a game-theoretic model based on competition in the investment-banking industry. One outcome of the model is an asymmetric competitive structure where firms serve different kinds of customers, charge different prices, and earn different economic returns. That outcome is analyzed over a range of cost structures and client preferences to derive implications for firm size and economic welfare.

Essay three is entitled simply “Merrill Lynch and PaineWebber.” Sustained differences in profitability are evident among firms within the securities industry. Two firms, Merrill Lynch and PaineWebber, are studied to identify structural and managerial reasons why one succeeded in developing the market position and firm capabilities both sought while the other failed. The paper draws on interviews with current and former employees of the two firms and other industry experts. Interview data are checked and complemented with three decades of underwriting and two decades of merger and acquisition transaction data, annual reports, and data and commentary appearing in the industry press and academic press as well as industry association publications.

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To Lauren
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Glendower: “I can call Spirits from the vastie Deepe.”

Hotspur: “Why so can I, or so can any man: But will they come when you doe call for them?”

– Henry IV, part 1
Introduction and overview

An intended customer plays a central role in most if not all business strategies. This should not be surprising. Specifying the customers a firm intends to serve helps define the products and services that need to be provided and the appropriate means of providing them.

There is a large difference, however, between intending to serve a specific type of customer and actually winning a customer’s business. While managers often speak as if they select their customers, ultimately it is the customers who choose the firm and not the other way around. When multiple firms pursue a similar group of customers, these statements of intent can be as technically accurate but operationally hollow as Glendower’s brag in Henry IV that he can call spirits from the deep. A firm’s strategy can call for specific kinds of customers, but will those customers come when called?

Gaining and maintaining the right customers is particularly important because a firm’s customers help to create and define the firm. Porter (1990) identified demanding local markets as critical to the development of superior firm capabilities when compared to international rivals. Von Hippel (1986) found that companies supplying lead users of scientific instruments gain valuable advantages in future product innovation. Leavitt (1975) and more recently Christensen and Rosenbloom (1995) proposed and documented the opposite effect; the loss of technological leadership and collapse of leading firms when they failed to identify and serve the needs of a new breed of leading customers.

Managers in professional services industries are generally very aware of how important their clients are to the development of their firms. An advertisement by Goldman Sachs in the January 24th, 2000 edition of Fortune Magazine illustrates this awareness. Two-thirds of the full page ad said only, “Any Wall Street expert who would rather talk than listen has forgotten what made him an expert in the first place.” Investment banks and consulting firms rely on challenging client engagements to attract and train new staff members, to compensate and stimulate current staff members, and to provide a flow of ideas for new products and services.

Managers of professional firms also recognize that the influence of customers is a blessing for some firms and a curse for others. Firms that have a solid base of sophisticated customers, and
take the steps necessary to identify and maintain those customers, benefit from reinforcing feedback. Challenging assignments sustain these firms’ capabilities and in turn their capabilities provide an advantage in landing sophisticated customers. Firms lacking a history of serving sophisticated customers suffer from the same reinforcing feedback. They find it difficult to develop the capabilities needed to attract and serve sophisticated customers without the benefit of having served these customers in the past.

The effects of customer-capability feedback were explored in this research project using three methods: dynamic behavioral modeling, case-study development, and game-theoretic modeling. The three methods were used to complement one another in an iterative manner during the research and to provide a stronger end product that is both analytically rigorous and managerially relevant.

The case study tracks the actions taken at Merrill Lynch, a company where managers dramatically upgraded the firms’ capabilities and its market position among sophisticated customers. It contrasts this success with the experience of PaineWebber, a rival firm following a similar strategy where managerial actions led to an equally dramatic failure to improve.

The case study established a link between theoretical modeling and the rich real world phenomena facing managers. The many viewpoints encountered in the case-study process remind us that our understanding of a situation (captured in a model, described in prose, or simply held in our thoughts) will always be a simplified interpretation of a much more complex competitive environment. This encourages us to search out insights that are generalizable across many real-world settings and to be wary of results that are mere artifacts of our simplifying assumptions.

The dynamic behavioral model draws on the case study and previous research to specify the equations. In the model I attempt to capture the key structural elements of the industry and the corresponding strategic challenge both firms faced. As the case study progressed it provided insight into the scope and form of the model and into the types of policies that should be tested. As the model was developed and tested it provided insight into the types of data that would prove useful in understanding and interpreting the two firms’ experiences. The joint effort exposed
flaws in a number of early case-study hypotheses and shortcomings in model conception thereby increasing confidence in the surviving conclusions and structures. The behavioral model then provided a means to test for the importance and efficacy of conditions and actions that are potentially of interest but not observed in the field setting.

The game-theoretic analysis developed along with the other two methods. It initially provided a test of the rationality of the behavioral pricing rules specified for the dynamic behavioral model. The game-theory model confirmed that the pricing behavior of self-interested managers acting optimally to maximize profits would lead to a hierarchy of firms as seen in the behavioral model. Similar results from the two methods – each working from very different assumptions about rationality – increases our confidence in the robustness of the results of both models. It quickly became apparent that the game-theory model provided interesting new explanations for variation in the size-profitability relationships among firms across industries. Several of these explanations could not have been revealed by the behavioral model and were not picked up during the case-study research.
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Essay One. Reinforcing feedback between market position and firm capabilities

1. Introduction

In the 1970s Donald Regan and James Davant, the CEOs of Merrill Lynch and PaineWebber, set out to build elite investment banking practices within their firms. Both firms had extensive retail-brokerage operations and a large fraction of their income already came from underwriting work. However, their investment banking departments were generally populated by less-ambitious investment bankers working on simpler issues for smaller firms or in supporting roles behind more prominent banks. The bankers at Merrill Lynch and PaineWebber generally relied on their firms’ brokerage contacts, or the ability of their brokerage networks to sell new securities, to bring in new work. As a result they were rarely given the opportunity to handle the more difficult, and generally far more lucrative, equity underwriting and advisory roles the elite firms filled for large corporate clients.

Both firms spent several hundred million dollars over the following years in pursuit of this goal. They hired respected equity research analysts and prominent investment bankers, acquired entire research firms and bought established investment banks. Much of the groundwork for their assault on investment banking was accomplished during the 1970s. The two firms went public within a year of one another in July of 1971 and May of 1972, both rose to be among the five most respected institutional research firms in the early 1970s, and in 1978 and 1979 both acquired small but elite investment banks.

Despite similar actions in the 1970s the performance of the two firms increasingly diverged during the 1980s. Merrill Lynch’s share of sophisticated transactions for large clients rose while PaineWebber’s share fell (figure 1a). Merrill Lynch’s emphasis on these transactions climbed while PaineWebber’s emphasis shifted away (figure 1b). By the late 1990s Merrill Lynch stood alongside Morgan Stanley and Goldman Sachs as part of a triad of dominant investment banking firms increasingly viewed as separate from the other leading firms. It had transformed itself from a firm doing a disproportionately large volume of business for smaller and less sophisticated clients to a real competitor for the sensitive equity transactions of Fortune 500 clients. In
contrast, PaineWebber's investment banking practice ended the 1990s weaker than it had been in the 1970s.

Figures 1a,b: Share and mix of sophisticated transactions

The development of these particular two firms provides a striking contrast. However, Merrill Lynch's and PaineWebber's goals were hardly unusual. Securities firms are constantly struggling to upgrade their capabilities and the sophistication of their client work. Large investments in personnel and client-development are frequently accompanied by statements that a firm will substantially upgrade its investment-banking practice over the next several years. Judging by the stability and concentration of industry leadership in investment banking, very few of these efforts have succeeded in upsetting the status quo.1

1.1 Is stratification a choice or a competitive outcome?

Why is there a hierarchy of firms to challenge at all? Several theorists have argued that industry stratification is the result of profit-maximizing managerial decisions. Some firms willingly adopt lower-quality standards for their services, and attract less demanding clients, in order to mitigate price competition and increase potential profits for all industry participants.2 This logic of rational quality choice is compelling in many competitive settings but does not explain why firms

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1 Likewise, and perhaps ironically, managers at many of the largest consulting practices have struggled with the same issue. These firms have long sought to develop the skill sets and access to top executives and corporate boards (and accompanying impressive fees) enjoyed by leading firms such as McKinsey & Company and the Boston Consulting Group.

challenge the status quo in established markets. More importantly from a manager’s standpoint, it does nothing to explain why managers encounter so much difficulty when they attempt to upgrade their firms’ capabilities and market positions.

In investment banking the hierarchy of firms is evident in the sophistication of client work. Not all client work is equally demanding or rewarding. The skill required to perform investment-banking tasks generally rises with the size of the client, the extent to which future cash flows and risks are not well defined, and the rarity of similar transactions. Standard investment-grade fixed-income securities, for example, are among the easiest to assign a value. The payment stream is set and credit-rating agencies provide thorough research that clarifies the risk of non-payment. Evaluating merger and acquisition candidates, pricing new equity issues, and structuring high-yield debt on the other hand requires an investment banker to develop far greater insight into the prospects of an industry and an individual business. These services also allow an investment banker to charge higher fees.

Merrill Lynch’s and PaineWebber’s experiences suggest that managers in several industries cannot choose a firm’s quality level directly. A professional service firm’s capability level is heavily influenced by the sophistication of its client work. Personnel at firms serving demanding clients and assignments have the opportunity to use and develop knowledge and skills that would not be called upon in the context of less demanding assignments. This individual learning is one of several ways in which sophisticated client work contributes to capability development at the level of the firm. Sophisticated client work tends to improve retention of skilled staff by providing greater financial rewards and intellectual stimulation. Sophisticated client work also improves recruiting at entry and senior level positions. Potential recruits know they will be provided with exposure to interesting work. They also know that if they stay the potential pay scales tend to be higher at firms with more sophisticated client work and if they choose to leave they will be recruited more aggressively.

3 For similar findings in manufacturing see Von Hippel, E. (1986).
The origins of stratification and the difficulties facing managers become clearer when we recognize the reinforcing relationships linking market activity and capability development. As a firm’s capabilities increase it will become more attractive to clients, particularly to sophisticated clients and for sophisticated tasks where stronger capabilities are needed. Managers can use the increased interest to upgrade their firm’s market position by being selective in the clients and assignments they accept. Increases in client and task sophistication then reinforce and extend the firm’s capabilities through better learning opportunities and improved hiring and retention of the best people (figure 2).

![Diagram](image)

**Figure 2: Reinforcing feedback between capabilities and market position**

This reinforcing feedback process linking market position and firm capabilities leads to and sustains industry stratification because it runs through a limited, and therefore rival, industry resource. As some firms win an increasingly large proportion of the most sophisticated client work they not only enhance their own skills they also deprive rivals of similar opportunities. This sends firms off in different directions causing stratification to emerge. It also puts managers in a classical Catch-22 situation. The less capable firms need sophisticated client work if they

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4 Of course this requires managers of leading firms to accurately identify the most sophisticated customers. Failure to do so has been linked to changes in industry leadership. See Christensen, C. M. and R. S. Rosenbloom (1995).
want build up their capabilities, but they also need those capabilities in place in order to win sophisticated client work away from rivals.

1.2 Overcoming stratification

In this reinforcing feedback scenario we can begin to understand the split that developed between the success of Merrill Lynch's efforts and the failure of PaineWebber's efforts. Both firms had initial success in establishing strong equity research departments in the early 1970s. These departments helped the firms to win brokerage commissions from large institutional investors. More importantly, however, they signaled to potential investment banking personnel and corporate clients that these two firms had the industry knowledge and investor contacts required to be leading investment banks.5

The future of the firms diverged following the 1978 and 1979 acquisitions of small but established investment banks. Merrill Lynch acquired White Weld and PaineWebber acquired Blyth Eastman Dillon. The many skilled White Weld bankers and corporate client contacts that stayed with Merrill Lynch provided an umbrella under which Merrill Lynch could develop and expand its investment banking practice at a very high level.

PaineWebber's acquisition, however, began to fall apart almost immediately. Many of the Blyth Eastman bankers had been buying back stock from parent company INA in anticipation of re-establishing an independent partnership and were angry at the outcome.6 The problem was intensified when PaineWebber proved unable to handle the back office pressures of integrating the two firms' trading systems. Not only did this limit the attention management could give to personnel retention, it created serious doubts about the financial survival of the firm. Within two or three years very few of the active Blyth Eastman bankers remained. PaineWebber continued

5 The NYSE deregulated commissions over a several year period starting in the early 1970s and culminating on “May Day” May 1st, 1975. As commissions on large institutional trades plummeted in the early 1970s the independent institutional-brokers that had dominated the market gave way to investment banks that saw institutional trading as a means of supporting underwriting rather than as a substantial profit maker.
to hire bankers aggressively well into the 1980s but it was never able to put together a strong
cadre of capable people or clients.7

This paper describes an attempt to rigorously deduce the competitive implications of feedback
between a firm’s market position and capabilities. It draws on previous theory and empirical
research to specify equations that capture the effect that a firm’s market position has on its
capabilities and that its capabilities have on its market position in as general a form as possible
(Section 2). These equations then form the basis for simulation experiments tracking the
development of firm capabilities and market positions in an industry setting with competing
firms (Section 3). The model provides a setting in which to explore the potential effects of
technological shifts, market changes, and managerial policies on firm performance in the
presence of feedback under a variety of industry conditions (Section 4).

2. A formal model to investigate the effects of feedback

This paper draws on a modeling approach with roots in the social sciences reaching back at least
to the 1950s. Early and influential models have examined the organizational processes by which
firms actually determine prices (Cyert and March 1963), identified common managerial policies
that lead to costly fluctuations in manufacturing production (Forrester 1961) and explored
industry evolution when firms’ choice-sets are not well defined (Nelson and Winter 1982).
Common to all these models is an attempt to capture the dynamics that arise from the interplay of
physical structures and human behavior. These simulation methods are used because they
capture the dynamic feedback processes described in the theory, are flexible enough to represent
a variety of industry settings and assumptions about firm and customer behavior, and can be used
to analyze dynamic disequilibrium behavior arising from managerial strategies and structural
shocks.

Four basic structures are specified to capture the interaction of market position and firm
capabilities. The two main structures capture how market position influences firm capabilities
(Section 2.1) and how firm capabilities influence market position (Section 2.2). The process of

modeling these links revealed two additional structures necessary for a complete statement of the theory. The first additional structure describes the form of customer heterogeneity (also described in Section 2.1) while the second additional structure describes firm pricing behavior (Section 2.3). The specification of each of these equations draws heavily on previous empirical findings and theoretical arguments.

The fully integrated model is used to derive implications for competition. The first set of tests confirms that the structures in the theory are logically capable of causing stratification to emerge in an industry under a broad set of conditions (section 3). Next we ask what sort of policies would successfully invert an established industry hierarchy (section 4). Specifically, how could a less successful firm displace the industry leader? These questions are explored with the model adjusted to represent an industry like investment banking, and parallels are drawn to the experiences of Merrill Lynch and PaineWebber.

2.1 Market position influences firm capabilities

Capabilities refer to any tangible or intangible resource, routine, process, skill, or body of knowledge that allows the firm to lower its costs or increase the value it provides to customers (Teece and Pisano 1994). Given this broad definition, managers clearly have a number of levers with which they can directly influence a firm’s capabilities. They can offer higher salaries to attract and retain skilled people, reorganize and change a firm’s activities, increase research and development expenditures, relocate production to areas of low-cost or high-skilled labor and so on.

Some determinants of a firm’s capabilities are not, however, within a manager’s direct control to set by decree or force of will. These external influences on capabilities link a firm’s market position to its capabilities.

A firm’s market position is generally defined quite broadly to include the kinds of customers served, the product and service variants provided, and how those products and services are produced, distributed, sold and supported (Markides 1999). Given the many dimensions of market position, there are many avenues through which market position may influence a firm’s
capabilities. Rather than enumerating the possibilities (see e.g., Sterman 2000 ch.10) this paper will attempt to treat with some depth how one aspect of market position, the kinds of customers served, influences a firm’s capabilities.

Customers influence firm capabilities because customers are active participants in the design and production of goods and services. Joint product and process development, and transfer of information between buyers and sellers, have long been the norm in markets where user needs vary. These active exchanges are frequently required to align production with the characteristics and the quantity desired by customers at any given point in time (Richardson 1972). Through these interactions customers direct a firm’s attention and focus its efforts on their own specific needs. Since a firm’s customers are often not representative of the overall market, the needs they present to the firm will often not be representative of overall market needs.

In some cases the direction of attention allows a firm to develop skills ahead of competitors and superior to those of competitors. Interaction with lead users—customers who value the most sophisticated products and latest advances—increase a supplier firm’s ability to find innovative new modifications to and uses for its products (Von Hippel 1986). Firms serving demanding local markets develop capabilities superior to international rivals facing less intense demands (Porter 1990).

In other cases attention directed by customers can be extremely detrimental. Firms are often fatally slow to recognize or invest in emerging technologies that do not immediately serve the needs of their established customers (Levitt 1975; Christensen and Bower 1996). These findings are consistent with behavioral decision theory arguments that information that is more prevalent or salient, as the particular needs of a firm’s regular customers are likely to be, is more likely to be acted upon (Ploss 1993). While we often think of firms gathering information through scientific sampling and similar marketing efforts, firms are themselves information processing
systems (Arrow 1974) and a great deal of the information collected will come from the process of serving customers and hence will inevitably be corrupted by selection bias.8

Interaction with customers not only affects capabilities by influencing what a firm's people think about, it also affects capabilities by influencing how other people think about the firm. Customers provide a highly intangible resource to their suppliers in the form of status. Connections to high status customers increase a firm's status in the eyes of other potential customers (Beniot-Smullyan 1944). Status allows a firm to provide real and psychological benefits, including status transfer, to future customers. A high status firm can use these benefits to increase its prices and to attract customers at a lower cost (Podolny 1993).

Finally, interactions with customers influence capabilities through day to day operations. Customers send larger orders with greater advance notice to preferred suppliers as a reward for previous service and because they know these suppliers will handle them well. These practices are often formalized through supplier certification programs such as Ford's Q1 program, which creates a hierarchy among suppliers with top performers given priority on orders. First choice of orders allows firms to schedule production more smoothly and reduce the costs and quality problems associated with demand fluctuation and frequent product changeover (Risch et al. 1993). The most skilled manufacturing firms even provide operational knowledge to suppliers of intermediate goods. As internal improvement efforts produce diminishing returns downstream, these firms seek improvement in the quality of their incoming components and raw materials (Keating 1997).

How do we formally model the influence of customers on a firm's capabilities? First, we need a way of modeling the different kinds of customers in the market. Second, we need to determine a way of relating the kinds of customers that a firm serves to the strength of the capabilities that a firm develops.

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8 For example, GE spends 10 million dollars annually to handle about 3 million service calls. These calls provide opportunities to identify quality problems specific to the firm's products and to the uses and expectations of their customer base as a by-product of normal expenditure (Duncan and Moriarty 1998).
Different kinds of customers are modeled along a single dimension that will be called customer sophistication. Sophistication is an intentionally general term chosen to represent different concepts depending on the specific industry context to be analyzed. Sophistication reflects the extent to which customers are lead users of a product or service, are demanding along dimensions such as product reliability and quality, or are in high status social positions. Customer sophistication varies in degree.

Customer sophistication ($S_j$), therefore, ranges from very unsophisticated (i.e., $S_j = 0$) to highly sophisticated (i.e., $S_j = 1$). The distribution of customers is modeled with $N$ discrete market segments ($M_j$, $j = 1...N$) of equal size. All customers within a market segment have the same level of sophistication. The sophistication of customers across market segments, however, increases in equal amounts from ($S_j = 0$) to ($S_j = 1$) as we move from segment $M_1$ to $M_N$.

Having determined a way to model the different kinds of customers, we still need a way to model their effect on the firm's capabilities. Previous descriptions and theoretical research strongly suggest treating capabilities as a stock that accumulates or decays over time (Dierickx and Cool, 1989). Modeling a stock requires an explicit logic for the rate at which the stock changes in response to other elements of a system. These are commonly referred to as rate or flow equations since they govern the rate of flow into or out of the stocks.

To the extent that firms learn from their customers, gain ideas from their customers, have operations that can be disrupted or improved by customers, etc., firms' capabilities will change in response to changes in the sophistication of their customer bases. The formulation adopted below implicitly assumes that capability development is influenced equally by all the clients a firm serves across the sophistication spectrum. This assumption will be most appropriate in settings such as high-contact services where many organizational capabilities rely on individual capabilities and a great deal of capability development is based on individual learning on the job. As individuals or teams work on client issues more sophisticated then their current

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9 Formulations weighted more toward a firm's most sophisticated customers are warranted when representing firms that have been highly successful in capturing cutting-edge ideas and diffusing them throughout the organization or
capabilities they develop new skills and new knowledge. However, when individuals or teams work on client issues less sophisticated than their current capability levels their capabilities atrophy or become outdated and new capabilities (e.g., structuring and pricing and executing of the latest security innovation) are not developed to replace them.\textsuperscript{10}

Consistent with these broad assumptions about capability development, when the average sophistication of a firm \(i\)'s customers at a given point in time \((S_{j,t,i})\) exceeds the firm's current capabilities at a given point in time \((C_{i,t})\), the firm's capabilities will rise to meet them (i.e., a positive flow that increases the stock of capabilities). Alternatively, when a firm serves customers whose average sophistication is less than its capabilities those capabilities will wither (i.e., a negative flow that decreases the stock of capabilities). Both client sophistication and firm capabilities are measured in units of skill that is either needed or can be provided.

The fractional rate at which capabilities adjust \((\chi)\) will depend on the nature of the capabilities and the industry environment (eq. 1).\textsuperscript{11} The adjustment may be rapid in some markets for some types of capabilities (e.g., status in a closely watched industry) and slow for others (e.g., product quality in an industry with long lead-times for product design and factory tooling).

\begin{equation}
\frac{dC_{i,t}}{dt} = \chi(S_{j,t,i} - C_{i,t})
\end{equation}

### 2.2 Firm capabilities influence market position

A firm’s market position is generally defined by the customers it serves, how it serves them, and the characteristics of the products and services it provides to them. Managers do have direct identifying their most advanced users and designing products around their needs. The difficulty of either of these types of efforts suggests that all customers have some weight in determining firm capabilities.

\textsuperscript{10} This assumes, \textit{a fortiori}, that the capabilities of the individual are close enough to the capabilities required by sophisticated clients that learning can take place. The staff at McDonald’s might be completely baffled by, and unable to learn from, an influx of very sophisticated diners who normally eat at LeCirque. At best the structure and market strategy of McDonalds’ would limit the feasibility of learning from such an influx of customers and at worst capabilities might fall if the staff tried unsuccessfully to understand and accommodate their needs.
levers to influence a firm's market position. Managers can instruct the sales force to call on different customers, request that product designers and the manufacturing department produce different types of goods, relocate stores and service locations, redirect advertising expenditures and so on. Ultimately, however, it is customers who decide whether or not a firm successfully changes its market position and managers cannot dictate customer choices.

To understand market position, therefore, we need a model of customer choice. As a first approximation to the heuristics used to guide choice, we can assume that customers evaluate firms' offerings and choose the one that provides the greatest benefit net of the price (utility) given their needs. To the extent that firm capabilities influence that benefit, by allowing a firm to offer unique products and services or common products and services at a lower cost, they will influence a firm's market position.

The utility \( U_{j,i,t} \) that a customer \( j \) perceives from the offering of a firm \( i \) is allowed to vary over time \( t \) in response to five characteristics specific to the firm, customer, and industry (eq. 2a). Weights \( (\alpha, \beta, \gamma) \) are added to the equation to allow it to represent a range of industries that differ in the relative influence these factors have on utility. Utility is treated as a dollar value for a unit of the product or service (e.g., a machine tool or an investment banking transaction) with the weights acting to map the benefits from capabilities and sophistication onto dollar values.\(^{12}\)

\[
2a. \quad U_{j,i,t} = A + \alpha C_{i,t} + \beta S_j + \gamma S_j C_{i,t} - P_{i,t} + \epsilon_{i,j,t}
\]

The first element of utility \( (A) \) is a benefit common to all customers who might buy from any firm. This represents the value of fulfilling the most basic needs with a basic product.

The second element of utility \( (\alpha C_{i,t}) \) is a direct benefit of a firm's capabilities valued equally by all customers. Capabilities provide value in many forms, some of which may be valued equally by all customers alike. For example, highly capable consulting firms may be able to provide a

\(^{11}\) Both capabilities and customer sophistication are measured in skill units.

\(^{12}\) \( \alpha, \beta \) are measured in dollars per skill per unit while \( \gamma \) is in dollars per skill unit squared per unit.
service more rapidly. Clients with simple issues and those with complex issues may place an equal value on having insight provided quickly.

In some settings the sophistication level of a customer may increase the benefit that he or she can extract from a product or service. A direct additive influence of customer sophistication on utility ($\beta S_j$) will exist when sophisticated users are able to apply the same product more often, more effectively, or to more important issues than less sophisticated users have the opportunity to do. For example, professional athletes may be able to use high-quality equipment more often and push its features harder than weekend warriors.

The capabilities and sophistication level of the customers may also interact ($\gamma S_j C_{i,t}$) in determining utility so that stronger capabilities are more highly prized by more sophisticated users. This is particularly true whenever capabilities allow a firm to provide a greater variety of services or more exacting services that meet the needs of a sophisticated user but exceed the needs of an unsophisticated user. In these cases the value derived from capabilities is greater when the customer is also more sophisticated. For example, a death row inmate is likely to place a much higher value on a law firm’s capabilities than someone facing a speeding ticket.

Finally, the utility that customers perceive from a firm’s products or services decreases as the firm’s price increases ($P_{i,t}$) and increases or falls temporarily in response to chance occurrences ($e_{i,j,t}$). Many chance occurrences that influence a firm’s value as perceived by a specific customer—a glowing reference given by a current client to a potential client, a fortuitous friendship struck between an executive and a potential client, a misplaced message and a phone call not returned—are not explicitly modeled. Since these events do occur, and can have a

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13 Multiplying the two terms insures that a customer with highly sophisticated needs cannot get extra benefits from a firm with little or no capabilities to serve those needs, and likewise that a firm with great capabilities cannot provide additional utility to a customer with only the most basic needs. In between those two extremes, the implication is that more sophisticated customers derive greater value from a firm’s capabilities than less sophisticated customers derive (i.e., $\frac{\partial (S_j * C_{i,t})}{\partial S_j} > 0$).
material effect on potential client decisions, the model allows for stochastic shocks in the utility customers perceive from a given firm at a given time.\textsuperscript{14}

The random shocks are modeled in a way that recognizes that chance occurrences in the real world have some persistence. A positive reference from one client to another is often considered valid for a long time, friendships can be lasting, and a perceived slight may not be immediately forgiven. Since these occurrences persist they are not well represented by a white noise sequence where the shock in one period is completely independent of those in prior periods (Sterman, 2000). A “pink noise” sequence (first-order autocorrelated noise) is used to model shocks that accumulate and decay gradually over time (eq. 2b).

\begin{equation}
\frac{d\epsilon_{i,j,t}}{dt} = \xi(\epsilon_{i,j,t} - \nu_{i,j,t}) \quad \text{where } \nu_{i,j,t} = N(0, 0.1)
\end{equation}

The smoothing process causes each shock to retain some of the positive or negative effects of previous shocks. Different shocks are introduced to each firm’s attractiveness in each market segment since many chance occurrences influence one customer or a small group of similar customers.

\begin{equation}
\frac{dM_{i,j,t}}{dt} = \theta(M_{i,j,t}^{*} - M_{i,j,t})
\end{equation}

\begin{equation}
M_{i,j,t}^{*} = \frac{\exp(\rho U_{i,j,t})}{\sum_{i} \exp(\rho U_{i,j,t})}
\end{equation}

Since a firm’s capability level is assumed to derive from the overall sophistication of its customers, we need to track each firm’s share of each market segment \(M_{i,j,t}\). A firm’s actual market share in each customer segment is assumed to adjust at some fractional rate \(\theta\) toward

\textsuperscript{14} Random events can, for example, help to sustain industry cycles that would otherwise die out over time and can make it difficult for firms to maintain competitive positions that rely on exacting relationships across firms. While not important to all issues, incorporating random events into a model increases the likelihood that a model will behave similarly to its real-world counterpart.
the long-run market share \( M_{i,j,t}^* \) indicated by the utility it offers to each segment at any given time. Market shares shift gradually as customers become aware of changes in the relative attractiveness of firms' offerings, complete ongoing transactions and contracts, and establish new contractual agreements and relationships.

The indicated long-run market share \( M_{i,j,t}^* \) of a firm in a given segment is modeled using a variant on the traditional logit form. The logit formulation recognizes that there are specific and unmodeled influences on the utility offered by each firm as perceived by each type of customer that do not vary with time.\(^{15}\) As a result a small advantage in utility along measured factors will not convince all consumers in a given segment to prefer the same firm. As Harold Hotelling pointed out in 1929, "Many customers will still prefer to trade with him [the seller with an apparently less attractive offering] because they live nearer to his store than to the others, or because he is a relative or a fellow Elk or Baptist, or for a combination of reasons."

The one modification of the standard logit formulation is the addition of a parameter \( \rho \) that adjusts the relative importance of modeled utility factors in relation to the importance of unmodeled factors. For example, a value of zero would imply that customers choose suppliers without any regard for differences across firms in the utility factors modeled. In this case each firm would receive an equal fraction of the market regardless of its price or capability level. Large values of \( \rho \) imply that customers care solely about the utility factors modeled and are perfectly informed about their values. In this case the firm with the highest utility, no matter how slight an advantage, would attract all customers in a market segment. By varying \( \rho \) we can explore the implications of industry settings where prices, customer sophistication, and customer-derived capabilities are more or less important to customer utility and where information about prices and capabilities is more or less easily available and accurate.

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\(^{15}\) The unmodeled influences accounted for by the logit formulation differ from the random component explicitly introduced to the utility equation in two ways. First, they do not change over time. Second, they represent variation in utility at an individual customer level rather than at an entire market segment level.
2.3 Pricing behavior

A pricing rule is needed to complete the standard utility function used to model customer choice. Simply assuming that all firms choose the same price would be inappropriate given the model purpose. When firms serve different markets, and offer different qualities of goods and services based on different strength capabilities, prices can and do vary.

One means of modeling pricing behavior is to assume that managers select optimal prices that maximize the expected present value of the stream of profits over time. This assumption, however, implies that managers have perfect foresight of all possible outcomes of competition, unlimited and unbiased access to all relevant information, and unfettered ability to process that information (Simon, 1957). In an evolving and uncertain market it is far more behaviorally plausible to assume that managers do not have the resources, time, information or knowledge required to develop optimal policies. Instead managers are likely to follow heuristics that are intendedly rational in that they make sense given available information and the manager’s understanding of the situation. Later we can explore how managers might use prices strategically (section 4) given the outcomes achieved with these base policies.

\[ \frac{dP_{i,t}}{dt} = \phi \left( P_{i,t}^* - P_{i,t} \right) \]

4. where \( P_{i,t}^* = P_t^* \cdot g(V_{i,t}, \bar{V}) \cdot h(C_{i,t}, \bar{C}_t) \)

and \( g(V_{i,t}, \bar{V}) = \left( \frac{V_{i,t}}{\bar{V}} \right)^\mu \), \( h(C_{i,t}, \bar{C}_t) = \left( \frac{C_{i,t}}{\bar{C}_t} \right)^\chi \)

Clearly managers want to determine a price \( P_{i,t}^* \) that will provide the greatest profit for their firm (eq. 4). To do so managers consider a wide variety of factors that are beyond the scope of the competitive interactions treated in the model. These factors include forces that affect costs (e.g., input prices, technology, capital needs), industry demand (e.g., the availability of substitute goods and services, the cost of doing without) and the potential for entry and exit of rivals. These factors are captured in an overall industry price level \( P_t^* \) that reflects the influence of these factors on average market price.
Other factors that go into determining price arise from the competitive process and lead to differences in price across competing firms. Each firm's price may need to be responsive to competitors' prices, promotional expenses, and product or service quality. However, it is often difficult to gather information about the extent of many of these competitor attributes and even harder to quantify their effect. In these cases managers often rely on an outcome measure such as volume to capture the combined effect of these unobserved or ambiguous factors.

Competition in the model is based on prices and capabilities. Firms are assumed to be able to measure their own and their rival's capabilities through careful observation of the work each firm performs and knowledge of each firm's internal operations including who their employees are and what technology they employ. Price information, however, is obscured by a host of hard to quantify "off invoice" price increases and concessions. These include performing additional unreimbursed work, providing financial and physical resources at no cost or below market cost, and taking payment in stock options or other untraditional forms.

To compensate for a lack of direct price information, firms monitor their volume as an indicator of changes in competitor prices. Firms then adjust their prices based on the available information about relative capabilities and relative volume. When a firm's volume is considerably lower (higher) than competitors the managers infer that competitors are taking strong (weak) unobserved actions that require it to lower its price. Similarly, when a firm's capabilities are above (below) those of competitors, managers raise (lower) prices to capture (compensate for) the difference in attractiveness to clients. The strength of those adjustments \((\mu, \chi)\) depends on the importance of volume, the value of capabilities, and the influence of price in the particular market context.

Since it takes time for firms to perceive and react to changes in volume and customer utility, and time before existing contracts at previous price levels are completed, price \((P_t)\) adjusts toward the desired price over time at some fractional rate \((\phi)\).
3. **Emergence of stratification from customer-capabilities relationship**

Can the reinforcing relationship between a firm's capabilities and the sophistication of its client work explain stratification in professional services industries? Model behavior is first described based on a set of parameters selected with an investment banking industry scenario in mind. Model behavior is then evaluated over a broad range of possible parameter values. This second round of analysis tests the sensitivity of model behavior to uncertainty about parameters for an investment banking setting and establishes limits on the generalizability of those results to other settings.

3.1 **Competition in a professional services context**

The model has eleven parameters representing characteristics that vary across industries. Three of these are time constants: how rapidly customers switch suppliers in response to changes in potential utility ($\theta$), how quickly capabilities develop and decay ($\chi$), and how rapidly firms respond to changes in volume and capabilities ($\phi$). Three relate to pricing behavior: the reference price ($P_r$), the importance of volume ($\mu$), and the importance of capabilities ($\chi$). Four relate to the role of customer sophistication and firm capabilities in utility ($A, \alpha, \beta, \gamma$). And finally one ($\rho$) relates to the importance of utility factors modeled in comparison to those utility factors left outside of the analysis (e.g., location, social connections, and habit).

The parameters will first be set with a professional services setting such as investment banking in mind. After an investigation of model behavior given the chosen parameters, the analysis will be expanded to consider behavior under a broader range parameter values. The sensitivity analysis plays a critical role given that the parameters are not estimated from industry data and due to the broader goal of understanding how the results might vary across industry settings.
The adjustment time for prices is set to six months, for customer switching twelve months, and for capability development two years.\textsuperscript{16} Approximately sixty-three percent of the eventual adjustment takes place within the first adjustment time period (i.e., three, six, and twelve months respectively), eighty-six percent within two time periods, and virtually all (ninety-eight percent) of the adjustment is complete after four adjustment periods have passed.

Economic theorists have argued that firms adjust their prices gradually to minimize the loss of customer goodwill. Econometric studies have estimated that manufacturing firms may adjust their prices in response to changes in costs in as little as one month and that the average firm in the economy may take two to three months to incorporate cost changes into their prices.\textsuperscript{17}

The delay for professional services firms to adjust their prices is most likely longer than these estimates. These studies evaluated the speed of price to respond to changes in costs. The price adjustments considered here are based on changes in capabilities and volume. Changes in capabilities and volume are likely to require a longer period than costs to recognize and longer to incorporate into prices. Longer estimation delays come from the firm specificity of capabilities and inherent volatility of volume estimates. Longer lags in incorporating these factors into prices arise from the need to reach agreement, internally and with customers, that changes have occurred and from the relative infrequency of deals (as in e.g. real estate).

Customer switching is likely to take considerably longer than price adjustments. While individual assignments can be quite brief in investment banking, the specific knowledge and relationship building investments that customers and firms make in order to execute them take time to develop and depreciate over a longer period. Unfortunately, the actual rate of customer switching within the industry is not a good indicator of the potential switching rate since there may be little need for switching for long periods of time. The need to complete existing deals and build confidence in alternative relationships suggests that a reasonable estimate of customer switching times should not be shorter than one year.

\textsuperscript{16} The fractional adjustment rates
\begin{align*}
\theta &= \frac{1}{12} \\
\chi &= \frac{1}{24} \\
\phi &= \frac{1}{6}
\end{align*}

are determined by inverting those time spans.
Capability development rates are set at two years based on the promotion systems that operate within most professional firms. It is usually assumed that individuals have had adequate time to develop a command of the skills required for their current role within two or three years, at which time they are considered for advancement to a role requiring a substantial additional set of skills.

The pricing parameters are set with a reference price \( (P_r) \) of 0.6 million dollars per unit, the importance of market share \( (\mu) \) of 0.25, and the importance of relative capabilities \( (\chi) \) of 0.5.\(^{18}\) The reference price is chosen to represent relatively average fees (where utility is measured in millions of dollars) in the investment banking industry. The price response to volume and capabilities are chosen so that pricing is a concave function of volume and capabilities \( (\mu, \chi < 1) \) reflecting a strong price response to a weak position and a relatively conservative approach to raising prices. The market share coefficient is relatively weak (e.g., a firm with fifty-percent less share than average will only cut prices about fifteen percent) since a wide variety of firm sizes coexist in the industry. The capabilities effect is chosen to be relatively strong (e.g., a firm that is only half as capable as the average rival will cut prices about thirty percent) reflecting the amount of money that is put at risk in transactions.

The utility parameters \( (A, \alpha, \beta, \gamma) \) are set to reflect a high basic value of services being rendered of $2 million per unit. By comparison the direct value that clients receive from a very capable firm \( (C_i = 1) \), regardless of the sophistication of their needs, is relatively modest at $200 thousand. The extra value that a highly sophisticated client \( (S_j = 1) \) derives from a basic service, over that derived by an unsophisticated client \( (S_j = 0) \), is also $200 thousand. Finally, the interaction effect is relatively strong so that a highly sophisticated client \( (S_j = 1) \) would derive an additional $1 million in value from working with a highly capable firm \( (C_i = 1) \) due to services rendered in meeting the client's more demanding needs.\(^{19}\)

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18 The adjustment parameters \( (\mu, \chi) \) are dimensionless.
19 In model terms \( (A = 2, \alpha = 0.2, \beta = .2, \gamma = 1) \).
3.2 Stratification arises out of an undifferentiated industry

The analysis begins with an undifferentiated industry where both firms charge the same prices, have the same level of capabilities, and have equal shares of all market segments. Additionally, all stocks (prices, capabilities, and market shares) for both firms are set to their equilibrium values \( M_{i,j} = M_{i,j}^* \), \( P_i = P_i^* \), \( C_i = C_i^* \). The starting point, therefore, is not only undifferentiated but in equilibrium.

The model is simulated for the first twenty months with no random component to the utility perceived by customers (i.e., \( \epsilon_{i,j,t} = 0 \), \( \forall i, j, t \)). Running the model for a period with no outside influences provides visual reminder that the model has been started in equilibrium (figure 4a,b). The small random effects are introduced to utility as perceived by clients over a four-month period beginning twenty months into the simulation. Figures 3a and 3b show the value of the shocks over time for each firm (A, B) in each market (1 through 5).²⁰

![Utility Shocks Firm B](image)

![Utility Shocks Firm A](image)

**Figures 3a,b: Random effects**

In response to even this slight and temporary period of uncertainty the capability levels of the two firms begin to diverge. The divergence continues well after the noise is removed until the capabilities of the two firms reach very different but stable levels (figure 4a). The more capable firm charges a higher price (figure 4b), has a dominant share of the more sophisticated market

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²⁰ The random inputs are stopped four months later to allow for a clearer illustration of model behavior.
segments (lines 3, 4, 5 in figure 5), and a smaller share of the less sophisticated segments (lines 1, 2 in figure 5).

![Firm Capabilities](image)

**Firm Capabilities**

![Firm Prices](image)

**Firm Prices**

**Figures 4a,b: Capabilities and prices diverging**

![Firm A's Fractional Market Share](image)

**Firm A's Fractional Market Share**

**Figure 5: Market share of leading firm by segment**

Why do these small and temporary random effects lead to substantial and sustained differences in capabilities and market shares across the two firms? The key is the reinforcing relationship between a firm’s capabilities and the average sophistication of its customers. The random influences slightly skew one firm’s share (labeled firm A) toward the more sophisticated segments (figures 6a, b). This in turn leads to an increase in that firm’s capabilities and a drop in the capabilities of its rival (figure 7).
Figures 6a,b: Early development of market share and customer sophistication

Figure 7: Early development of firm capabilities

The early pattern of relative price, volume, and capability changes vary from experiment to experiment depending on the precise series of random events. Ultimately, and usually quickly, capability differences become magnified until subsequent small shocks are unable to redirect competition. One firm’s temporary advantage with sophisticated customers provides a small capability advantage. If sophisticated customers value the capabilities more than unsophisticated

21 For example, since it takes time for capabilities to develop or decay, a lead among sophisticated customers by one firm can be reversed if quickly followed by unusually long and sustained series of shocks favorable to its rival. As another example, a firm may have its share skewed toward less sophisticated segments while winning more volume overall. This can cause the firm to raise prices based on the high volume resulting in a temporary period where the less-capable firm is also the high-priced firm.
customers (i.e., $\gamma > 0$) the capability advantage will draw a greater portion of sophisticated customers, as illustrated by the *customer influence* loop in figure 8a.

![Figure 8a: Skewing share toward sophisticated customers](image)

The effect of capability differences on customer choices is then magnified by the pricing decisions firms make. With stronger relative capabilities and rising volume the leading firm has incentive to raise its prices to capture more of the value it provides to customers. If unsophisticated customers value the capabilities less than sophisticated customers (i.e., $\gamma > 0$) the price increases will primarily shed unsophisticated customers (figure 8a *capturing value* and *pricing out* loops) and skew share further toward sophisticated customers. The result is that small capability advantages, arising from small shifts in market share, increase over time.\(^{22}\)

Perhaps most importantly, the model test shown illustrates the potential importance and verifies the internal consistency of the claim that reinforcing feedback between capabilities and market position has the potential to create performance gaps among competing firms. Gaps open among firm capabilities because market position is rival. Rivalry ensures that increases in customer sophistication not only are amplified for one firm (as shown in figure 8a) but that they set in

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\(^{22}\) In the model capabilities adjust toward customer sophistication without firm expenditures. If firms have to spend money to raise their capabilities (e.g., hiring, training, etc.) then higher prices have a direct positive effect on capabilities by providing the firm with cash without the expense and effort of tapping the capital market. This adds another reinforcing process to figure 8a.
motion and amplify a reinforcing decline in the market position and capabilities of that firm’s competitors (figure 8b).

![Diagram](image)

**Figure 8b: Capability development and rivalry for customers**

![Diagram](image)

**Figure 9: Exogenous forces model**

By starting the model in equilibrium then introducing small shocks the test reveals that the feedback structure amplifies even the slightest chance events indicating that a homogeneous industry structure is unlikely to be sustained over time. Why is it important that feedback between capabilities and market position can cause an undifferentiated industry to be unstable? Most of the strategy literature focuses on how a differentiated industry is sustained. This focus has led to a search for exogenous mobility barriers to maintain heterogeneity in market position and a separate search for exogenous limits on capability equalization to maintain heterogeneity in firm capabilities (figure 9).\(^{23}\)

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The instability created by reinforcing feedback suggests that differentiation is self-supporting. Some of the factors that sustain differences across firms, while commonly assumed to be exogenous structural factors, actually arise out of competition. Feedback between market position and capabilities in a competitive context has the potential to create a set of endogenous mobility barriers and limits on capability equalization. Specifically, the less capable firm’s weakness becomes a mobility barrier that makes it costly or impossible to adopt the market position of more capable firms, and its poor market position limits its ability to develop the strong capabilities of its rival (figure 10). By making these structures endogenous, firm differences are recast as a natural product of the competitive process rather than a result of external impediments to competition.

![Figure 10: Reinforcing feedback model](image)

### 3.3 Generality of results

How general is the behavior illustrated in the simulation experiment described above? Does the behavior depend on the specific parameter values chosen to represent an investment-banking context? How would the findings change if firms followed somewhat different pricing policies or if several of the influences on consumer utility were more or less important? Would

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stratification still emerge and how large would the differences be across competitors in any resulting hierarchy?

Pricing policies

The degree to which firms adjust their prices in response to capability differences and volume changes are likely to vary widely across industries. Managers in industries facing high fixed costs and low variable costs (e.g., cement, software, power generation, and airlines) are likely to adjust prices substantially in response to volume changes. Managers in industries where capability reputations are well established and thought to have a heavy influence on potential clients’ selection of a provider (e.g., management consulting, investment banking, information technology hardware and software) are likely to try to capture significant price premiums for capability advantages.

Figures 11a,b: Influence of pricing policies on competition

Two interesting points emerge from figures 11a and 11b. These figures report the capability levels and volume of the leading firm after ten years of simulated time for a range of weights placed on volume and capabilities in price adjustment. As might be expected, in industries where firms weigh capabilities heavily in setting prices but give little attention to volume the leading firm becomes a highly capable niche player.

24 Note that the left-hand axes of the two graphs are reversed to allow clearer viewing of the surfaces.
The second point may be more theoretical than practical. The capabilities of both firms remain at the original levels when firms adjust their prices dramatically to maintain volume. In other words the market does not stratify. As figure 12 shows, stratification is held at bay at the cost of dramatically fluctuating prices. Firms raise and lower their prices aggressively as their volume rises or falls. By the time customers have responded to the changes in prices, however, the firms have already set their prices too high or low relative to competitors. This leads to an over-response in volume that precipitates a price change in the opposite direction.\textsuperscript{25}

![Price of Leading Firm](chart.png)

**Figure 12: Aggressive price response leading to instability**

Stratification never arises because customers from all market segments are constantly switching allegiance across firms in response to the swings in price. It is hard to imagine a firm or an industry, however, that could maintain customer loyalty and attract new customers and investors while being so profoundly inconsistent in pricing over time.

\textsuperscript{25} In addition, if firms could determine the exact amount of value created by capabilities for each consumer they might try to entirely capture it (or compensate for it) in their pricing. If so they could cut short the reinforcing processes leading to differences by making consumers indifferent as to whom they bought from. The game theoretic analysis in the following essay suggests that even if this were possible it would not be in the best interest of any firm.
Buying the best or buying what you need

In some areas consumers are well aware of the extent of their needs or can upgrade quickly later and derive little or no status advantage out of connections with better goods and services. For these products and services (e.g., household cleaning products) consumers are unwilling to pay a premium for goods and services that exceed their needs. In other words they buy what they need.

In other economic activities consumers may be willing to pay more for the products or services of a more capable firm regardless of the sophistication of their needs. Customers’ willingness to pay more to a more capable supplier independent of their needs ($\alpha C_i$) may originate from uncertainty about the current or future extent of those needs. Stronger supplier capabilities may be valued as an option on expanding the sophistication of the user (e.g., personal computer buyers) or as insurance against high costs of underestimating needs (e.g., corporate computer buyers, defendants in criminal cases, executives and directors purchasing consulting or financial advisory services). Customers may value suppliers’ capabilities as a potential signal of their own ability and sophistication or of their wealth and social power (e.g., buying the latest sporting equipment or technical gadgetry, having high-powered firms handle even mundane legal issues).²⁶

One of the first things that stands out when examining the competitive effect of consumer utility decisions is that it doesn’t matter how much more the sophisticated buyer can extract from the basic good ($\beta S_i$). When sophisticated customers derive greater value from the basic product than less sophisticated customers derive, the increase in utility is uniform across competitors. Therefore ($\beta S_i$) has no effect on the relative value that customers attribute to the product or

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²⁶ The term ($\alpha C_i$) reflects value placed on capabilities completely independent of a customer’s true needs. Future refinements to capture the option value might add a term based solely on the amount to which supplier capabilities exceed customer sophistication.
service offerings of rival firms, no effect on market share in each segment, and no effect on capability development or pricing.\(^{27}\)

The strength of the direct effect of capabilities (\(\alpha\)) and the interaction between capabilities and customer sophistication (\(\gamma\)) can substantially affect industry structure. The market only stratifies if the interaction effect is relatively strong (figure 13a). The interaction effect is critical in that it causes differences in capabilities to skew share across the segments. With no interaction effect an increase in one firm’s capabilities simply attracts customers equally from all market segments. Only when these capability gains are disproportionately valued by more sophisticated customers will a small advantage be reinforced by shifts in market position.\(^{28}\) Specifically, a firm with slightly greater capabilities must attract a significantly higher portion of the more sophisticated customers or else any temporary capability advantage diminishes over time instead of being amplified.

Imagine a market where sophisticated customers care more about capabilities than unsophisticated customers care about capabilities (i.e., \(\gamma > 0\)). Assume, however, that the difference in how much sophisticated and unsophisticated customers value capabilities is small relative to how much all customers care about an unrelated issue like the geographic proximity of their supplier. If one supplier gains a slight lead on capabilities it would persuade only a very small additional fraction of the more sophisticated customers to travel the extra distance to receive better service. If this fraction is small enough then the change in that firm’s customer base will be too small to support and much too small to amplify the chance capability advantages. As a result any chance advantage will simply die out over time.

\[ M'_{i,j,t} = \frac{\exp(\rho U_{i,j,t})}{\sum_i \exp(\rho U_{i,j,t})} \frac{\exp(\rho[A + \beta S_j]) \exp(\rho[\alpha C_{i,t} + \gamma S_j C_{i,t} - P_{i,t} + \epsilon_{i,j,t}])}{\exp(\rho[A + \beta S_j]) \sum_i \exp(\rho[\alpha C_{i,t} + \gamma S_j C_{i,t} - P_{i,t} + \epsilon_{i,j,t}])} \]

\(^{27}\) In fact the market share equation can be simplified so that \(A\) and \(\beta S_j\) clearly drop out of the equation.

\(^{28}\) This skewing of share was, not coincidentally, the basis for explaining the rise of differentiation at the start of this section.
Figures 13a,b: Utility drivers and competitive outcomes

A direct effect of capabilities on utility ($\beta$) increases the volume of the more capable firm (figure 13b). When consumers value capabilities independent of their own needs the leading firm’s capability advantage attracts unsophisticated as well as sophisticated customers despite a higher price. If the unsophisticated consumers valued capabilities only in line with their needs then the leading firm’s high price would lead to a very small share among unsophisticated customers. As such, a direct value placed on capabilities may explain why industry leaders dominate the volume in markets such as investment banking. The clients (i.e., firms’ directors and top managers) may be uncertain of their needs and certainly have reason to be highly risk-averse given the potential for losses and shareholder lawsuits, encouraging even less sophisticated clients to pay the premium charged by the most capable firms.

What drives buying behavior?

In some industries the utility offered by firms may be relatively unimportant to the buying decision while in others it may be critical. For example, for expensive durable goods like cars there is a wealth of comparative information on product quality and functionality provided by Consumer Reports and other rating agencies. Given the high cost of purchase and potentially high operating costs of a poor match between needs and vehicle capabilities, consumers will generally make a significant effort to comparison shop before making a purchase. This implies a high value of the modeled utility factors and therefore a high value of the parameter ($\rho$).

In other industries, the objective qualities of the product or service may be secondary to other considerations such as physical proximity of the company to home or a well-traveled route, social
ties with the company’s owners, or chance personal associations with the product set a long time ago. This implies a relatively low importance of the modeled utility factors and a low value of the parameter ($\rho$).

![Capabilities of Leading Firm](image)

**Figure 14: Modeled and unmodeled utility drivers**

How do we interpret the value of $\rho$? If one firm offered a utility of one hundred thousand dollars per transaction and the other a utility of two hundred thousand dollars and $\rho = 0.5$ the higher utility firm would eventually win sixty-two percent of the market. Separation doesn’t occur in this model for values of $\rho$ less than ten (figure 14) whereby a firm offering $100,000 more in utility to a market segment would eventually gain slightly more than seventy-three percent of that segment.

These findings fit well with intuition. Sustained differentiation requires that initial capability differences drive enough of a shift in market position to amplify and eventually sustain the capability differences. The more emphasis customers place on capabilities and prices when choosing suppliers relative to other considerations the more likely it is that differences in capabilities will be amplified over time. In investment banking $\rho$ is likely to be high. Investment banking activities carry both high financial stakes and large costs for companies and their managers so clients pay careful attention to capabilities and fees.
4. **Implications for the turnover of market leaders**

Armed with a formal model to deduce the implications of feedback between market position and firm capabilities, we can explore the implications of strong feedback for turnover in industry leadership. Even in highly stable industries the leading firms of one period, those with the strongest capabilities and market positions, are often replaced by new entrants or the following firms of a previous period (Caves 1998).

The absence of turnover in the model tests so far is not surprising since the analysis has only examined industry response to the normal noise of everyday business. No tests have been run that mimic technological breakthroughs that render existing capabilities obsolete, market shifts that cause a change in which customers have the most sophisticated demands, or managerial actions that improve a lagging firm's performance or push it into new market segments.

Section 4.1 examines the effect of technological breakthroughs and market shifts and derives implications for whether the following (less-capable) firm is likely to displace the leading (more-capable) firm. Comparisons are drawn to previous research on the relative performance of industry incumbents and new entrants in response to similar structural changes. Section 4.2 examines how managerial actions may influence turnover in industry leadership, drawing comparisons to turnover in the investment banking industry.

4.1 **Turnover resulting from market and technological changes**

Previous research has explored the relative performance of incumbent and new entrant firms after technological and market shifts. Tripsas (1997) studied situations in which a new technology made the incumbent firm's capabilities obsolete. She found that incumbents retain their lead when they hold strong complementary capabilities that were not made obsolete by the new technology. However, in the absence of these capabilities entrants with a lead on the new technology displaced the incumbents. Christensen and Bower (1996) studied situations in which a new technology arose that gradually progressed until it made existing capabilities obsolete and where the lead-users for the new technology were the least demanding users along key attributes
of the old technology. They found that entrant firms overtook incumbents when market segments effectively reversed in sophistication.

The battle between incumbents and new entrants is similar enough to the battle among leading and following incumbents that model behavior vastly different from established stylized facts in the former area would call the validity of the feedback theory of competition into question. Two of the critical differences between incumbents and new entrants are that new entrants lack the range of established capabilities and that they lack the market contacts of incumbents. Similarly, the capabilities and market positions of following firms (the less capable incumbents) are weaker than those of the leading firms (the more capable incumbents).

The model is first simulated under conditions where a technological breakthrough makes old capabilities obsolete and the following firm has a lead in the new capabilities. Thirty years into the simulation the capabilities of the leading firm (firm A) are set to zero as if the technology on which those capabilities were founded is rendered obsolete. The capabilities of the following firm (firm B) are cut in half - leaving it with about ten percent of the maximum potential capability level - mimicking a small lead for the following firm with the newly important capabilities. When the model is simulated using the settings for the investment banking industry the leading firm re-establishes a lead despite its initial disadvantage in capabilities (figure 15a).

![Firm Capabilities](image1)

![Firm A's Fractional Market Share](image2)

**Figures 15a,b: Technological change without turnover**

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29 This is a very great simplification of Christensen and Bower’s findings justified only by its use as a potential source of disconfirming evidence.
The historical follower initially parleys its capability advantage to attract sophisticated customers from the previous leader and sheds unsophisticated customers (figure 15b). This gives the firm the chance to build on those capabilities and they rise. However, since it takes time to evaluate and shift suppliers the firm that had historically led continues to command a greater share of the more sophisticated customers. Working with these customers the previous leader has the opportunity to develop the new capabilities at a faster rate and to a higher degree than the historical follower and overtakes that rival before customers completely switch suppliers. As the historical leader surpasses the upstart in capabilities it wins back its sophisticated customers. This deprives the historical follower of ongoing contact with sophisticated customers and its capabilities fall.

![Firm Capabilities Diagram](image)

**Figure 16: Technological change leading to turnover**

When customers switch faster than we have assumed for the investment banking industry, and when capability development rates are significantly slower, turnover does occur in leadership. The same test is run except that the time required for customers to switch suppliers is reduced to only two months. Under these conditions the historical follower is able to hang onto its new
slight lead in capabilities. The lead attracts sophisticated customers rapidly enough that the previous leader does not have the opportunity to catch up (figure 16). 30

A second set of tests is conducted to mimic a market shift that changes the relative sophistication of customers. This is seen as capturing a small piece of the complex phenomena studied by Christensen and Bower. One of the interesting points in the study by Christensen and Bower is that the leading companies actually had made technological discoveries that effectively gave them a lead in the nascent capabilities as well as the established ones. The situation is modeled by inverting the relative sophistication of the market segments. At that time the least sophisticated customers become the most sophisticated and vice versa. The change is introduced thirty years into the simulation.

![Firm Capabilities Graphs](image)

**Figures 17a,b: Market changes with and without turnover**

When the parameters are set to mimic investment banking no turnover occurs in industry leadership (figure 17a). Capabilities develop too slowly, and customers switch too rapidly, for the following firm to take adequate advantage of its position with sophisticated customers. 31 Initially, the following firm's capabilities rise, and the leading firm's capabilities fall as a result of continued work with their historical customer bases. However, the newly sophisticated customers quickly switch to the established firm and reverse the process. If, however,

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30 In order to achieve a reversal when customer-switching times are only one month the capability development time must be approximately fifteen months. Capability development times then must rise about five months for every additional month it takes for customers to switch or else no reversal of leadership occurs.
capabilities develop rapidly relative to switching times turnover does occur. This is illustrated when the model is simulated with capabilities requiring only two months to develop (figure 17b).

Conclusions

The logical deductions from the theory are generally consistent with expectations drawn from previous studies. The model extends those predictions by suggesting that both the rate at which customers change suppliers and the rate at which capabilities develop influence the incidence of turnover. Firms are at risk of losing leadership positions when the identity of leading customers changes as Christensen and Bower describe and when new capabilities become important as Tripsas describes. The preceding analyses indicate that turnover is more likely in the first scenario (market changes) when customer switching is rapid relative to capability development and turnover is more likely in the second scenario (capability changes) when customer switching is slow relative to capability development.

These implications are somewhat more complex than the standard logic that capabilities that grow or decay slowly provide a sounder base for sustained firm profitability. The primary reason the implications differ is that the standard logic assumes an unchanging market where the same capabilities and customers continue to be important. In changing environments, however, a firm’s continued advantage may rely on rapid turnover of customers (e.g., when there are market changes) or on rapidly developing capabilities (e.g., when the critical capabilities change over time).

4.2 Turnover resulting from managerial actions

Technological shifts and market changes are not the only means by which leadership shifts in an industry. Managers at follower firms often attempt to boost their firms’ capabilities and market positions and leading firms make mistakes or fail to respond with sufficient strength to the aggressive actions of following firms. This section explores two types of actions that managers

31 In the case studied by Christensen and Rosenbloom the leading firm made a clear administrative mistake. The firm never produced a product based on these capabilities so the switching effect never occurred.
might take to improve their firm’s performance; cutting prices and building capabilities. This section also explores how customer selectivity might allow the firms to defend against or strengthen these actions.

Competing on Price

Price competition is one of the easiest policies for managers to implement. Price cutting strategies are implemented in the model by adding a new term \((\sigma_{i,t})\) to the pricing policy.

\[ P_{i,t}^* = P_r * g(V_{i,t}, \bar{V}) * h(C_{i,t}, \bar{C}_t) * \sigma_{i,t} \]

By giving this term a value of less than one for the following firm after the original stratification has occurred we can test the effect of aggressive pricing on capabilities in the industry (eq. 4b).

Figure 18: Modest capability improvement through price competition

One test run with a fifty-percent price cut \((\sigma_{i,t} = 0.5 \forall t > 600, i = B)\) implemented midway through the run suggests that price competition is largely ineffective in an investment banking setting. The price cut does lead to an increase in the capabilities of the following firm, but it also upgrades the capabilities of the leading firm (figure 18). The cause of both capability increases can be seen in figure 19 for the test run with a ten-percent price cut. The following firm gains
share mainly among the least sophisticated clients \((M_j = 3)\) of the leading firm. While this causes the capabilities of the following firm to rise, it also pushes the leading firm’s capabilities upward.

![Following Firm's Fractional Market Share](image)

**Figure 19: Price competition takes market share at the margin**

Why does the following firm gain share primarily among the leading firm’s least sophisticated clients? After all, price has an equal absolute effect on the utility offered across all segments. The answer is that there are a great many customers in the marginal segment \((M_j = 3)\) who see relatively little difference in the value provided by these two firms before the price cut.\(^{32}\) The price cut, therefore, causes a large portion of the nearly indifferent customers to shift suppliers and only small changes in the share of customers with strong prior preferences. If the goal is to cut prices temporarily in order to challenge for the leading position, a broad-based aggressive pricing policy actually works against the firm’s interests. Repeating the experiment for a wide range of price cutting aggressiveness from a ten percent cut \((\sigma_{i,t} = 0.9 \forall t > 600, i = B)\) to giving

\(^{32}\) Specifically, the logistic equation assumes that the random preferences that customers in each market segment associate with each firm are normally distributed with mean zero. Changes in the modeled components of utility, therefore, will have a large effect on share when the delineation between firms falls in the dense center of the distribution (i.e., when share is nearly evenly split) and a small effect on share when the delineation falls in the sparsely populated tails of the distribution (i.e., when one firm has a dominant share).
products away for free \((\sigma_{i,t} = 0 \ \forall t > 600, i = B)\) confirms that the policy is uniformly ineffective (figures 20a,b).

**Figures 20a,b: Pricing aggressiveness and capability changes**

**Competing on Capabilities**

This paper has focused on capabilities that are developed through working with customers. In the investment banking industry the most common means of gaining these capabilities directly is to imitate the practices and hire people away from leading competitors.

Attempts by a following firm to improve in this manner can be modeled as closing a gap between the firm's own capabilities (denoted b) and the capabilities of the leading firm (denoted a). The fractional rate at which the following firm closes the capability gap \(\kappa\) is assumed to be zero if no intended policy is implemented. Once a policy is implemented the fractional rate becomes a positive number whose value depends on the rate at which the firm can hire away the leading firm's employees and integrate their knowledge into the firm's wider operations (eq.1b).

\[
1b. \quad \frac{dC_{b,t}}{dt} = \chi(S_{j,t} - C_{b,t}) + \kappa(C_{a,t} - C_{b,t})
\]

The firm must be able to develop these skills rapidly (i.e., \(\frac{1}{\kappa}\) small) or else the potential for closing the gap in capabilities drops dramatically (figure 21).
Figure 21: Speed of capability development and competitive standing

Capability development is a more effective competitive tool than prices because higher capabilities are particularly attractive to the more sophisticated clients and therefore at least partially self-supporting. However, the speed of new capability development proves to be of critical importance because a rising firm’s capabilities are subject to downward pressure from the gap between the capabilities acquired and the capabilities reinforced through existing work with customers.

When the firm adopts a gradual process of imitation, adjusting capabilities over 24 months, it finds the capabilities it develops are overwhelmed by the capability influence from client work. The result is a reduced but persistent gap between the capabilities of the leading and following firm (figure 22). In an investment banking setting, and professional services in general, this often takes place as experienced recruits and high-potential new hires leave in frustration at the rift between the types of work they are capable of executing and the prevailing mix of business at

\[ \frac{1}{\kappa} \]

is the adjustment time in months.

34 The capability development process of the following firm has been modeled as an imitation process with no direct deleterious effect on the capabilities of the leading firm. If the process had a direct effect on the leader (e.g., hiring away key employees) the effectiveness would have been even stronger.
the firm. Eventually the efforts to close the performance gap would likely be abandoned at which time the capability gap would revert to its original level.

![Firm Capabilities Graph](image)

**Figure 22: Slow capability development and sustained leadership**

![Firm Capabilities and Firm A's Fractional Market Share Graphs](image)

**Figure 23a,b: Rapid capability development and turnover in leadership**

When the firm mimics the leading rival rapidly, adjusting over 12 months, it wins market share at the higher sophistication levels and thus is able to support its new higher capabilities. The effect not only increases the capabilities of the following firm it also dilutes the capabilities of the leading firm that takes on customers across the sophistication spectrum. If we allow for random occurrences throughout the simulation run, and the following firm is persistent in building
capabilities, it not only draws even but eventually gains the lead due to the chance occurrences (figure 23a). These chance occurrences will eventually tip competition in favor the following firm as long as the following firm's capability development efforts systematically offset chance occurrences favoring the leader.

How might the leading firm respond? Are some reasonable actions capable of halting the following firm's rise or at least raising the complexity of the challenge?

Leading investment banks constantly have to decide to accept or reject offers of less sophisticated and lower margin client work. The leading firm in the previous run not only lost sophisticated clients it also gained share among less sophisticated clients (figure 23b). The leading firm, however, can choose not to accept work from these clients. If the leading firm refused to take on a larger share of less sophisticated client work, its capabilities would not fall as they did in the previous simulation experiment and it might not be displaced.

A firm's willingness to accept clients in each segment is modeled by adding a term \( W_{i,j,t} \) to the market share equation (eq. 3b). The value of the term determines the fraction of customers interested in buying from the firm that it agrees to serve in each market segment.\(^{37}\)

\[
3b. \quad M_{i,j,t}^* = \frac{\exp(\rho U_{i,j,t})}{\sum_i \exp(\rho U_{i,j,t})} \cdot W_{i,j,t}
\]

---

35 The noise sequence runs throughout the simulation obscuring the graphic. As noted in the text, the noise sequence plays a key role in leading to the reversal by giving the challenging firm opportunities to overtake the leader.

36 The leading firm attracted more of the less sophisticated customers as a combined effect of its rival's and its own actions. As the follower firm became more capable it raised its price to capture some of the value it could provide to clients and to offset its increasing overall volume. The price increase made the follower less attractive to unsophisticated clients. At the same time the leading firm dropped its price to maintain volume and share among the sophisticated customers, making it more attractive to unsophisticated customers.

37 Rejected customers are assumed to find an alternative means of satisfying their needs outside of the services of the two firms. This assumption provides consistency with later tests in which both firms refuse customers. The assumption that customers do not merely shift suppliers is conservative in that it may underestimate the effect of the policy. If the rival agreed to serve the rejected customers, the leading firm's selectivity policy would have the additional effect of reducing the average sophistication of the follower's customer base.
The term is set so that when the following firm begins its capability push the leading firm refuses to take clients from the two least sophisticated segments \( W_{i,j,t} = 0 \forall i = A, j = 1 \& 2, t > 600 \) and the test is then repeated. The policy is actually quite painless from the perspective of the leading firm. It sacrifices very few customers since it has few unsophisticated customers to begin with (figure 24).

![Firm A's Fractional Market Share](image)

**Figure 24: Discipline over assignments and market share**

![Firm Capabilities](image)

**Figure 25: Discipline over assignments and sustained leadership**

Without the leading firm’s capabilities being diluted, the following firm confronts the same problem it had when it brought on capabilities too slowly. It continues to bring in stronger capabilities but it now has farther to rise before it meets its rival. As a result the follower reaches
a point where the downward pull of unsophisticated client work offsets the inflow of capable people despite its relatively rapid capability development effort (figure 25).

Of course the following firm can match these actions. It too can refuse to work on less sophisticated client work. When the test is repeated with both firms adopting this policy \( W_{i,j,t} = 0 \forall i = A & B, j = 1 & 2, t > 600 \) differentiation does not rise within the remaining three market segments. Instead, both firms are locked in a continued battle (figure 26).\(^{38}\)

![Figure 26: Perfect discipline over assignments](image)

As shown earlier, differentiation relies on a strong interaction term \( \gamma \) that reinforces small capability differences by skewing firms’ market shares across segments. But \( \gamma \) is not the only determinant of the potential power of the skewing effect. The potential strength of the entire interaction effect \( \gamma S_j C_{i,j} \) also falls as the potential spread of sophistication \( S_j \) and capabilities \( C_{i,j} \) fall. When firms systematically refuse to serve one end of the market they reduce the potential spread of both customer sophistication and firm capabilities and weaken the reinforcing process.

\(^{38}\) The following firm takes a far greater revenue loss early on since most of its customers are in these two segments.
The preceding analysis, however, assumes that the leading and following firms can perfectly identify and weed out less sophisticated client work. In practice it may be hard to implement or enforce such a policy when professionals are being rewarded for finding deals and the sophistication of those deals is difficult to evaluate from a distance. The simulation is repeated but both firms are only able to block eighty percent \( W_{i,j,d} = 0.2 \forall i = A, j = 1 & 2, t > 600 \) of the business received from customers in the three least sophisticated market segments.

![Firm Capabilities](image)

**Figure 27: Imperfect discipline over assignments**

Once again the following firm displaces the leading firm (figure 27). When the leading firm first institutes the selectivity policy its capabilities rise slightly. However, as the following firm rapidly develops and offers capabilities and prices similar to those of the leading firm the leading firm begins to take on some of the less sophisticated customers it fails to screen out. Its capabilities fall and the following firm begins to take away customers at the most sophisticated levels. This switching reaches a point where the two capability levels begin to draw even.

At this point the industry is once again undifferentiated. Both firms have identical capabilities, serve an identical mix of customers, and charge identical prices. The only difference from the start of the simulation is that they serve a smaller market that is more sophisticated on average and their equilibrium capabilities are higher. Just as at the start of the simulation, chance
advantages from small random events become magnified over time until the industry is
differentiated once again.

Unlike the start of the simulation, however, the former follower still has a policy of trying to
close any capability advantage its rival develops. Therefore, random events that favor the former
leader are offset by the actions of the former follower. As a result, only chance events that favor
the former follower will grow and that firm emerges as the new leader.

Merrill Lynch and PaineWebber

The model tests so far have indicated several conditions for successful challenges to industry
leadership in an investment-banking setting. The following firm is far more likely to succeed by
improving its capabilities than by cutting prices. Speed is a critical component of bringing in
new capabilities since prolonged client work at odds with (i.e., less sophisticated than) the
capabilities being developed will blunt the efforts. Finally, leading firms can protect their
position by refusing to take on less sophisticated customers. However, an imperfect screening
process leaves them open to attack if the following firm is also willing to screen customers and is
diligent in continuing its assault until chance turns in its favor.

Merrill Lynch and PaineWebber both first attempted to build their investment banking
capabilities slowly over time through individual hires. Merrill Lynch found in the 1970s and
PaineWebber found in the 1980s that it was hard to hire and even harder to retain people whose
skills were well above those of the organization and overall client work. With the acquisition of
White Weld, Merrill Lynch rapidly brought on a group of investment bankers whose skills were
competitive with the very best in the industry and it began to win more and more sophisticated
clients (see figure 1a). PaineWebber’s failed acquisition of Blyth Eastman Dillon put it back in
the position of trying to build a practice slowly and in pieces over time.
Merrill Lynch exercised restraint in the volume of less sophisticated clients it served. While the firm eventually increased its overall volume of underwriting, its early growth took place entirely at the upper end of the sophistication scale, leading to an average increase in the percent of work it completed for sophisticated clients (see figures 28 and 1b). This stands in sharp contrast to PaineWebber’s experience following its acquisition of Blyth Eastman Dillon (BED). PaineWebber was unable to retain the more active and able bankers at BED and found itself struggling to build a practice piecemeal in their absence. The spike in PaineWebber’s share of the overall market in the 1980s confirms that they took business where they could find it (figure 28).

5. Summary and conclusions

Persistent differences in firm profitability have been attributed to differences in the market positions and capabilities of firms. Strategy research has identified factors that would sustain differences in capabilities or differences in market positions, and by extension account for differences in profitability. Despite the tendency of researchers to treat the explanations independently and in static terms, interest is growing in the interactions between market position and capabilities and their dynamic implications. There is certainly room to extend our understanding of strategy beyond the notion that capabilities and market position must achieve fit
at some given point in time. A great deal remains to be learned about how capabilities and market positions interact over time to develop and constrain one another.

This paper has formalized one class of these interactions and explored their potential to create and sustain differences among competing firms under a broad range of industry conditions. The modeling effort confirmed that feedback between firms' market positions and capabilities is logically capable of creating and sustaining persistent profitability differences under a broad range of conditions.

Classical mobility barriers (e.g., scale economies, switching costs, etc.) and limits on capability equalization (causal ambiguity, time-diseconomies, etc.) certainly exist. Rather than rejecting these explanations the analysis has provided an additional set of theoretically sufficient conditions for long-run firm diversity. Reinforcing feedback between market position and firm capabilities creates a tendency away from homogeneity of competing firms and a reason for differentiation to be sustained when it arises.

Analysis of the formal model placed two intuitively appealing bounds on the conditions necessary for feedback to lead to industry stratification. Customers must place a high value on the capabilities that develop from client interaction relative to other features that differ across firms' offerings. More sophisticated customers must derive greater value from strong capabilities than less sophisticated customers derive from them. Further analysis suggested that the relative size of the more capable firm increases when all customers value capabilities independent of their own sophistication and when competitors place little emphasis on using price to control volume or capture the value created by their capabilities.

The formal model was then used to explore turnover in industry leadership in a setting resembling investment banking. Analysis of the dynamic model has provided several tentative but testable predictions for the dynamics of turnover in firm leadership in response to market and technological shifts. Leaders are more likely to survive technological shifts when capabilities develop rapidly relative to the rate at which customers switch suppliers. Leaders are more likely to survive changes in the composition of market demand when capabilities develop slowly relative to the rate at which customers switch suppliers.
Finally, the modeling effort allowed for new perspective on the experiences of Merrill Lynch and PaineWebber. Even in situations where the tendency toward stratification is strong, good managers can be creative in applying foresight, discipline, and capitalizing on luck to bring about changes in market leadership. The results of model-based experiments highlight the importance of Merrill Lynch’s rapid development of capabilities - through its successful acquisition of an entire respected firm - and its discipline in focusing expansion efforts on more sophisticated client work in succeeding where PaineWebber failed.
Appendix 1: Full equation listing

The following is a complete listing of the model equations as implemented using Vensim DSS™ software. Equation dimensions are given in { }.

**Primary Equations: Capabilities, Market Share, Price, Utility**

1) Firm Capabilities[Firm] = INTEG (Accumulating Capabilities[Firm] - Capability Obsolescence or External Boost[Firm], Initial capabilities) {Tasks}

   Accumulating Capabilities[Firm] = (Average Customer Sophistication[Firm] - Firm Capabilities[Firm]) / Time for Capabilities to Adjust {Tasks/Month}


   Initial capabilities = 0.5 {Tasks}


   Normalized Market Sophistication[Market] = (Unscaled Market Sophistication[Market] / (Number of markets-1)) {Tasks}

   Maximum Market Sophistication = VMAX(Normalized Market Sophistication[Market!]) {Tasks}


   Capability Push Magnitude[f1] = Max(0,Firm Capabilities[f2] - Firm Capabilities[f1]) {Tasks}

   Capability Push Magnitude[f2] = Max(0,Firm Capabilities[f1] - Firm Capabilities[f2]) {Tasks}

2) Market Share[Firm,Market] = Smooth(Indicated Market Share[Firm,Market], Switching Time) * IF THEN ELSE(Time > Test start time , Willingness to Take Share[Firm,Market], 1) {dimensionless}
Indicated Market Share\([Firm, Market]\) = Exponential Utility\([Firm, Market]\) / SUM(Exponential Utility\([Firm!, Market]\)) \{ dimensionless \}
Exponential Utility\([Firm, Market]\) = EXP(Relative Importance of Modeled Utility Factors * Utility\([Firm, Market]\)) \{ dimensionless \}

3) Price Charged\([Firm]\) = Smooth3(Indicated Price\([Firm]\), Time to adjust price, Reference Price) \{ Dollars \}
Indicated Price\([Firm]\) = Reference Price * Effect of Market Share on Price\([Firm]\) * Effect of Relative Capabilities on Price\([Firm]\) * IF THEN ELSE(Time>600, Price Cutting\([Firm]\), 1) \{ Dollars \}
Effect of Relative Capabilities on Price\([Firm]\) = (Max(Firm Capabilities\([Firm]\), 0.001) / Max(Average Capabilities, 0.001))^\{Pricing Responsiveness to Capabilities \{ dimensionless \}
Average Capabilities = SUM(Firm Capabilities\([Firm!]\)) / Number of Firms \{ Tasks \}
Effect of Market Share on Price\([Firm]\) = (Volume\([Firm]\) / (SUM(Volume\([Firm!]\)) / Number of Firms))^{Pricing Responsiveness to Market Share} \{ dimensionless \}
Volume\([Firm]\) = SUM(Market Share\([Firm, Market!]\)) \{ dimensionless \}

Utility shock\([Firm, Market]\) = IF THEN ELSE(Time>Noise Start Time :AND: Time<Noise End Time, EXP(Pink Noise\([Firm, Market]\)) - 1 ,0) \{ Dollars \}

Array Settings
Firm : (f1-f2)
Market : (M0-M4)
Number of Firms = 2 \{ dimensionless \}
Number of markets = 5 \{ dimensionless \}
Unscaled Market Sophistication\([M4]\) = 4 \{ Tasks \}
Unscaled Market Sophistication\([M3]\) = 3 \{ Tasks \}
Unscaled Market Sophistication\([M2]\) = 2 \{ Tasks \}
Unscaled Market Sophistication\([M1]\) = 1 \{ Tasks \}
Unscaled Market Sophistication\([M0]\) = 0 \{ Tasks \}

Industry Parameters
Base Utility = 10 \{ Dollars \}
Direct Value of Sophistication = 0 \{ Dollars/Tasks \}
Direct Value of Capabilities = 0 \{ Dollars/Tasks \}
Interaction Value of Needs and Capabilities=1 \{ Dollars/(Tasks*Tasks) \}
Pricing Responsiveness to Capabilities = 0.25 \{ dimensionless \}

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Pricing Responsiveness to Market Share = 0.25 {dimensionless}
Reference Price = 0.6 {Dollars}
Relative Importance of Modeled Utility Factors = 35 {1/Dollars}
Switching Time = 2 {Month}
Time to Adjust Price = 3 {Month}
Time for Capabilities to Adjust = 12 {Month}
Time to Develop New Capabilities = 2 {Month}

Simulation Control Parameters

Final Time = 240 {Month}
Initial Time = 0 {Month}
Saveper = 10 * Time Step {Month}
Time Step = 0.125 {Month}

Noise Inputs

Demand Shock Intensity[Market] = 0.1 {dimensionless}
Noise Seed = 135 {dimensionless}
Noise End Time = 24 {Month}
Noise Start Time = 12 {Month}
Normal Noise[Firm,Market] = RANDOM NORMAL(-1,1,0,1,0)*Demand Shock Intensity[Market] {dimensionless}
Smoothing Time = 5 {Month}

Test Input Parameters and related equations

Capability Push End Time = 252 {Month}
Capability Push Switch[Firm] = 0 {dimensionless}
Market Switch = 1 {dimensionless}
Price Cutting[Firm] = 1 {dimensionless}
Reset Fraction[Firm] = 1 {dimensionless}
Segment Sophistication Switch = IF THEN ELSE(Time>Test start time, Market Switch,1) {dimensionless}
Switch for Capabilities Resetting[Firm] = 0 {dimensionless}
Test start time = 360 {Month}
Willingness to Take Share[Firm,Market] = 1 {dimensionless}
Appendix 2: Model specifications for tests described in the text

The following changes were made to the model in order to implement the changes described in the text.

**Values used in simulations representing investment banking**

Base Utility = 2  
Demand Shock Intensity[Market]=0.1  
Direct Value of Capabilities = .2  
Direct Value of Sophistication = .2  
Final Time=600  
Interaction Value of Needs and Capabilities = 1.0  
Noise End Time=24  
Noise seed=7  
Noise Start Time=20  
Switch for Capabilities Resetting[firm]=0  
Switching Time=12  
Time to adjust price=6  
Time for Capabilities to Adjust=24  
Relative Importance of Modeled Utility Factors = 20  
Pricing Responsiveness to Capabilities = .5

**Additional Changes used in figures 15**

Switch for Capabilities Resetting[firm]=1  
Switch for Capabilities Resetting[Firm]=1  
Reset Fraction[f1]=.5  
Reset Fraction[f2]=1  
Test start time = 360

**Additional Changes used in figure 16**

Switching Time=2  
Switch for Capabilities Resetting[firm]=1  
Switch for Capabilities Resetting[Firm]=1  
Reset Fraction[f1]=.5  
Reset Fraction[f2]=1  
Test start time = 360

**Additional Changes used in figure 17a**

Market Switch = 0  
Test start time = 360
Additional Changes used in figure 17b*
Market Switch = 0
Test start time = 360
Time for Capabilities to Adjust = 2

Additional Changes used in figures 18 & 20*
Price Cutting[f1] = .5
Final Time = 1200

Additional Changes used in figure 22*
Capability Push End Time = 1200
Capability Push Switch[f1] = 0
Capability Push Switch[f2] = 1
Final Time = 1200
Noise End Time = 1200
Test start time = 600
Time to Develop New Capabilities = 24

Additional Changes used in figure 23*
Capability Push End Time = 1200
Capability Push Switch[f1] = 0
Capability Push Switch[f2] = 1
Final Time = 1200
Noise End Time = 1200
Test start time = 600
Time to Develop New Capabilities = 12

Additional Changes used in figure 24 & 25*
Capability Push End Time = 1200
Capability Push Switch[f1] = 0
Capability Push Switch[f2] = 1
Final Time = 1200
Noise End Time = 1200
Test start time = 600
Time to Develop New Capabilities = 12
Willingness to Take Share[f1,M0] = 0
Willingness to Take Share[f1,M1] = 0

Additional Changes used in figure 26*
Capability Push End Time = 1200
Capability Push Switch[f1] = 0
Capability Push Switch[f2] = 1
Final Time = 1200
Noise End Time = 1200
Test start time = 600
Time to Develop New Capabilities = 12
Willingness to Take Share[f2,M0] = 0
Willingness to Take Share[f2,M1] = 0
Willingness to Take Share[f1,M0] = 0
Willingness to Take Share[f1,M1] = 0

**Additional Changes used in figure 27**

Capability Push End Time = 1200
Capability Push Switch[f1] = 0
Capability Push Switch[f2] = 1
Final Time = 1200
Noise End Time = 1200
Test start time = 600
Time to Develop New Capabilities = 12
Willingness to Take Share[f2,M0] = .2
Willingness to Take Share[f2,M1] = .2
Willingness to Take Share[f1,M0] = .2
Willingness to Take Share[f1,M1] = .2

* Changes made are in addition to or in partial replacement of those marked "Values used in simulations representing investment banking"
References


Essay Two. You are whom you serve

1. Introduction

In the 1970s Donald Regan and James Davant, the CEOs of Merrill Lynch and PaineWebber, set out to build elite investment banking practices within their firms. Both firms had extensive retail-brokerage operations and a large fraction of their income already came from underwriting work. However, their investment banking departments were generally populated by less-ambitious investment bankers working on simpler issues for smaller firms or in supporting roles behind more prominent banks. The bankers at Merrill Lynch and PaineWebber generally relied on their firms’ brokerage contacts, or the ability of their brokerage networks to sell new securities, to bring in new work. As a result they were rarely given the opportunity to handle the more difficult, and generally far more lucrative, equity underwriting and advisory roles the elite firms filled for large corporate clients.

Both firms spent several hundred million dollars over the following years in pursuit of this goal. They hired respected equity research analysts and prominent investment bankers, acquired entire research firms and bought established investment banks. The two firms took similar steps in the 1970s to lay the groundwork for a solid push into investment banking. Both went public within a year of one another in July of 1971 and May of 1972, both rose to be among the top five most respected institutional research firms in the early 1970s, and in 1978 and 1979 both acquired small but elite investment banks.

Throughout the 1980s, however, the results of the two firms increasingly diverged. Merrill Lynch’s share of sophisticated transactions for large clients rose while PaineWebber’s share fell (figure 1a). Merrill Lynch’s emphasis on these transactions climbed while PaineWebber’s emphasis shifted away (figure 1b). By the late 1990s Merrill Lynch stood alongside Morgan Stanley and Goldman Sachs as part of a triad of dominant investment banking firms increasingly viewed as separate from the other leading firms. It had transformed itself from a firm doing a disproportionately large volume of business for smaller and less sophisticated clients to a real competitor for the sensitive equity transactions of Fortune 500 clients. In contrast,
PaineWebber's investment banking practice ended the 1990s weaker than it had been in the 1970s.

**Figures 1a,b: Share and mix of sophisticated transactions**

The development of these particular two firms provides a striking contrast. However, Merrill Lynch's and PaineWebber's goals were hardly unusual. Securities firms are constantly struggling to upgrade their capabilities and the sophistication of their client work. Large investments in personnel and client-development are frequently accompanied by statements that a firm will substantially upgrade its investment-banking practice over the next several years. Judging by the stability and concentration of industry leadership in investment banking, very few of these efforts have succeeded in upsetting the status quo.  

### 1.1 Is stratification a choice or a competitive outcome?

Why is there a hierarchy of firms to challenge at all? Several theorists have argued that industry stratification is the result of profit-maximizing managerial decisions. Some firms willingly adopt lower-quality standards for their services, and attract less demanding clients, in order to mitigate price competition and increase potential profits for all industry participants. While this logic of rational quality choice is compelling in many competitive settings, it does not explain why firms

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39 Likewise, and perhaps ironically, managers at many of the largest consulting practices have struggled with the same issue. These firms have long sought to develop the skill sets and access to top executives and corporate boards (and accompanying impressive fees) enjoyed by leading firms such as McKinsey & Company and the Boston Consulting Group.

challenge the status quo in established markets. More importantly from a manager’s standpoint, it does nothing to explain why managers encounter so much difficulty when they attempt to upgrade their firms’ capabilities and market positions.

In investment banking the hierarchy of firms is evident in the sophistication of client work. Not all client work is equally demanding or rewarding. The skill required to perform investment-banking tasks generally rises with the size of the client, the extent to which future cash flows and risks are not well defined, and the rarity of similar transactions. Standard investment-grade fixed-income securities, for example, are among the easiest to assign a value. The payment stream is set and credit-rating agencies provide thorough research that clarifies the risk of non-payment. Evaluating merger and acquisition candidates, pricing new equity issues, and structuring high-yield debt on the other hand requires an investment banker to develop far greater insight into the prospects of an industry and an individual business. These services also allow an investment banker to charge higher fees.

Merrill Lynch’s and PaineWebber’s experiences suggest that managers in several industries cannot choose a firm’s quality level directly. A professional service firm’s capability level is heavily influenced by the sophistication of its client work. Personnel at firms serving demanding clients and assignments have the opportunity to use and develop knowledge and skills that would not be called upon in the context of less demanding assignments. This individual learning is one of several ways in which sophisticated client work contributes to capability development at the level of the firm. Sophisticated client work tends to improve retention of skilled staff by providing greater financial rewards and intellectual stimulation. Sophisticated client work also improves recruiting at entry and senior level positions. Potential recruits know they will be provided with exposure to interesting work. They also know that if they stay the potential pay scales tend to be higher at firms with more sophisticated client work and if they choose to leave they will be recruited more aggressively.

41 For similar findings in manufacturing see Von Hippel, E. (1986).
The origins of stratification and the difficulties facing managers become clearer when we recognize the reinforcing relationships linking market activity and capability development. As a firm’s capabilities increase it will become more attractive to clients, particularly to sophisticated clients and for sophisticated tasks where stronger capabilities are needed. Managers can use the increased interest to upgrade their firm’s market position by being selective in the clients and assignments they accept. Increases in client and task sophistication then reinforce and extend the firm’s capabilities through better learning opportunities and improved hiring and retention of the best people (figure 2).

![Diagram](image)

**Figure 2: Reinforcing feedback between capabilities and market position**

This reinforcing feedback process linking market position and firm capabilities leads to and sustains industry stratification because it runs through a limited, and therefore rival, industry resource. As some firms win an increasingly large proportion of the most sophisticated client work they not only enhance their own skills they also deprive rivals of similar opportunities. This sends firms off in different directions causing stratification to emerge. It also puts managers in a classical Catch-22 situation. The less capable firms need sophisticated client work if they

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42 Of course this requires managers of leading firms to accurately identify the most sophisticated customers. Failure to do so has been linked to changes in industry leadership. See Christensen, C. M. and R. S. Rosenbloom (1995).
want build up their capabilities, but they also need those capabilities in place in order to win sophisticated client work away from rivals.

1.2 Overcoming stratification

In this reinforcing feedback scenario we can begin to understand the split that developed between the success of Merrill Lynch’s efforts and the failure of PaineWebber’s efforts. Both firms had initial success in establishing strong equity research departments in the early 1970s. These departments helped the firms to win brokerage commissions from large institutional investors. More importantly, however, they signaled to potential investment banking personnel and corporate clients that these two firms had the industry knowledge and investor contacts required to be leading investment banks.43

The future of the firms diverged following the 1978 and 1979 acquisitions of small but established investment banks. Merrill Lynch acquired White Weld and PaineWebber acquired Blyth Eastman Dillon. The many skilled White Weld bankers and corporate client contacts that stayed with Merrill Lynch provided an umbrella under which Merrill Lynch could develop and expand its investment banking practice at a very high level.

PaineWebber’s acquisition, however, began to fall apart almost immediately. Many of the Blyth Eastman bankers had been buying back stock from parent company INA in anticipation of re-establishing an independent partnership and were angry at the outcome.44 The problem was intensified when PaineWebber proved unable to handle the back office pressures of integrating the two firms’ trading systems. Not only did this limit the attention management could give to personnel retention, it created serious doubts about the financial survival of the firm. Within two or three years very few of the active Blyth Eastman bankers remained. PaineWebber continued

43 The NYSE deregulated commissions over a several year period starting in the early 1970s and culminating on “May Day” May 1st, 1975. As commissions on large institutional trades plummeted in the early 1970s the independent institutional brokers that had dominated the market gave way to investment banks that saw institutional trading as a means of supporting underwriting rather than as a substantial profit maker.

to hire bankers aggressively well into the 1980s but it was never able to put together a strong cadre of capable people or clients.\textsuperscript{45}

2. Model structure

The following model captures the argument that a professional firm’s market position and capabilities are connected in a reinforcing feedback loop. Leading customers select firms with particularly high capabilities then provide those firms with learning and operational advantages that reinforce those superior capabilities and cause them to choose the same firms again. The formal model is developed to test the internal consistency of the argument and to explore pricing, market share, and welfare implications.

2.1 Customer choice

Customers select the firm that offers them the greatest utility (eq. 1). While all customers may place an equal value on some components of the offerings made by firms, more sophisticated customers may derive greater value from the products or services offered. Greater value may accrue to sophisticated customers by virtue of their more complicated needs or their ability to use the products and services more fully, effectively, or frequently. Customer sophistication \( v_j \) is modeled with a uniform distribution over the interval \([0,1]\).

\begin{equation}
U(v_j, p_i) = A + \alpha C_i + \beta v_j + \gamma_j C_i - p_i
\end{equation}

The first two and final components of utility \( (A, \alpha C_i, p_i) \) capture value that accrues equally across all customers independent of their sophistication. A product from any producer purchased by any customer is assumed to provide enough value, \( A \), by satisfying basic and common needs that all consumers will buy one unit of a good at any price determined by competition. A firm’s capabilities \( (C_i) \) provide additional utility at some rate \( \alpha \) through better product performance or

\textsuperscript{45} See Newport, J. P. J. (1985).
service (e.g., reduced confusion or waiting time) of a kind that all customers value equally. Finally, all customers face the same price $p_i$.

The two middle terms reflect utility that rises with customer sophistication. More sophisticated customers may derive greater value ($\beta$ large) from the basic product or service by using it more effectively or more frequently. For example, large multinational firms have skilled internal finance groups that can direct their use of financial service firms and professional athletes use durable equipment more often than weekend warriors. Similarly, more sophisticated customers may derive greater value from a supplier’s capabilities ($\gamma$ large) whenever advanced capabilities satisfy needs that are specific to more sophisticated customers. For example, a highly skilled tax lawyer will be able to provide more value to an individual with complicated business interests than to someone who files Form 1040EZ.

2.2 Firm capabilities

A firm’s capabilities are assumed to depend on the sophistication of its clients. In professional services settings firm-level capabilities are highly dependent on individual capabilities that are largely developed through client work. All client work, sophisticated and unsophisticated, therefore is likely to effect the firm’s capabilities by providing or denying learning opportunities. The distribution of those effects will depend on the extent to which firms are able to identify key learning opportunities and capture and disseminate those lessons. For simplicity, a firm’s capabilities are assumed to conform to the average sophistication of its clients $\bar{V}$, implicitly assuming no transfer of learning within or across firms.\footnote{This assumption will be relaxed in subsequent research.}

2.3 Firm profitability

Firm profits are determined by the firm’s price $p_i$, marginal cost $c$, quantity $q_i$, and fixed costs $f$ assuming unit industry demand (eq. 2).
(2) \( \pi_i = (p_i - c)q_i - f \)

2.4 Two-stage game

The model is solved as a two-stage game with two firms. In the first stage both firms simultaneously advertise prices \( p_i \). In the second stage, customers observe prices and then choose a supplier.

The model is solved by backward induction. First, optimal customer choices between firms in the second stage are established for any given set of prices in the first stage. These customer choices are used to determine optimal pricing strategies for the firms in the first stage.

3. Industry structure

The industry structure may be symmetric (with equally capable firms charging identical prices) or asymmetric (with firms that differ in customers, capabilities, prices and profits). I first explore the nature of a symmetric outcome then solve for an asymmetric equilibrium.

3.1 Symmetric industry structure

A symmetric structure by definition occurs when both firms announce the same prices and develop the same capabilities. The only possible symmetric capability outcome when all customers are served in the second stage is \( C_i = 0.5 \). With homogenous offerings in the second stage, announcements in the first stage follow the logic of Bertrand competition driving prices to marginal cost.

There are an infinite number of customer distributions in the second stage that lead to equal capability levels. The most plausible is perfect mixing based on random selection among equal offers by customers. More complex possibilities include having an equal fraction of the top and bottom of the distribution choose one firm while those in the middle select the other firm and any combination of that pattern and perfect mixing. These outcomes, however, require complicated
bases for selection that appear unlikely given that customers are otherwise indifferent as to which firm they select.

3.2 Asymmetric industry structure

In an asymmetric outcome where prices and capabilities differ across firms both firms can have a positive share only if the more capable firm charges a higher price. In this case the marginal customer \( v^* \) will be the one who is indifferent between the two firms’ offerings. All \( v_j > v^* \) choose to pay a higher price for the more capable firm and all \( v_j < v^* \) will choose the lower price offered by the less capable firm. The utility of the offering from the high-price firm \( U_{j,a} \) and the utility of the offering from the low-price firm \( U_{j,b} \), to a given customer type \( v_j \) are given in equation 3.

\[
U_{j,a} = A + \alpha \frac{(v^* + 1)}{2} + \beta v_j + \frac{v_j (v^* + 1)}{2} - p_a \\
U_{j,b} = A + \alpha \frac{v^*}{2} + \beta v_j + \frac{v_j v^*}{2} - p_b
\]

where \( v^* = \{ v_j | U_{j,a} = U_{j,b} \} \)

Equating the two identifies the marginal customer as a function of the firms’ prices (eq. 4).

\[
v^* = \frac{2(p_a - p_b) - \alpha}{\gamma}
\]

Given these customer selections in the second stage, we can determine the profit functions and hence the equilibrium prices for the two firms (eq. 5).

\[
\pi_a = (p_a - c)(1 - v^*) - f \\
\pi_b = (p_b - c)(v^*) - f
\]

Taking the first derivative of each profit function and then solving for optimal prices produces the following best-response curves (eq. 6).
\[ p_a^* = \frac{2p_b + 2c + \alpha + \gamma}{4} \]

\[ p_b^* = \frac{2p_a + 2c - \alpha}{4} \]

These curves are represented in figure 2 based on the assumption that only sophisticated clients value strong capabilities (e.g., \( \alpha = 0, \gamma = 1 \)). The best-response functions show that a firm has an incentive to unilaterally deviate from the symmetric equilibrium by raising prices, thereby capturing the more sophisticated end of the market. This change is represented by the arrow leading upward from point (c,c) to the best-response curve \( p_a^* \). At that price level the firm serving the less sophisticated clients is able to profitably raise its own prices as signified by the arrow from \( p_a^* \) to \( p_b^* \) and so on. The asymmetric equilibrium, therefore, would be achieved if firms followed a simple myopic set of price adjustments over time where they chose price to optimize profits given the competitor’s current price.

**Figure 2: Best-Response curves**
Solving simultaneously we find prices, market shares, capability levels, and profits for all potential utility formulations (eq. 7). The equations are defined only when the interaction effect $\gamma$ of capabilities and customer sophistication is positive. With no interaction effect all customers perceive the utility from each firm in the same way $\left( \frac{\partial U_{i,j}}{\partial v_i} = 0 \right)$ eliminating the self-selection mechanism that segments the market into sophisticated and unsophisticated customers across competitors. As the interaction effect grows stronger the firm attracting sophisticated customers raises its price $p_a^*$ twice as fast as its rival raises its price $p_b^*$ and its volume $q_a^*$ falls

$$\left( \frac{\partial q_a^*}{\partial \gamma} = -\alpha \frac{1}{\gamma^2} \right).$$

$$p_a^* = \frac{2\gamma + \alpha}{6} + c, \quad p_b^* = \frac{\gamma - \alpha}{6} + c$$

$$q_a^* = \frac{2}{3} + \frac{\alpha}{\gamma}, \quad q_b^* = \frac{1}{3} - \frac{\alpha}{\gamma}$$

$$C_a = \frac{2}{3} - \frac{\alpha}{2\gamma}, \quad C_b = \frac{1}{6} - \frac{\alpha}{2\gamma}$$

$$\pi_a = \frac{4\gamma^2 + 8\gamma\alpha + 3\alpha^2}{18\gamma} - f, \quad \pi_b = \frac{\gamma^2 - 4\gamma\alpha + 3\alpha^2}{18\gamma} - f$$

(7)

The equations for a differentiated market hold only so long as the direct effect of capabilities on utility $\alpha$ is weaker than the interaction effect $\gamma$. If the direct effect is even one-third as large as the indirect effect the low-priced firm is entirely driven from the market. Unlike the interaction effect whereby capabilities sway only sophisticated customers, a direct effect of capabilities influences all customers. The high-priced firm’s capabilities, therefore, more than offset the price premium even at low levels for the direct effect.

In this equilibrium the two firms serve different customers and have different capabilities. Most notably the more capable firm earns greater profits since both firms incur the same costs while the more capable firm is able to charge a higher price. In an interesting twist the sophisticated customers are paying more for the capabilities that they impart to the more capable firm. This
profitability result is robust to the possibility that working with sophisticated customers increases firm costs (see section 5).

4. Customer and social welfare

Given that firms benefit from the asymmetric outcome, and that firms will migrate toward this outcome even myopically, we can assume that the asymmetric outcome is more likely than the symmetric outcome. What kind of customer, if any, is better off when an asymmetric equilibrium arises? Will the customers themselves, or some group of them, have an incentive to organize to break down the asymmetry proposed by firms in the first stage?

Clearly customers served by the less capable firm are worse off than they would be in a symmetric outcome. These customers pay a higher price to receive less sophisticated service than they would in a symmetric outcome.

It is easy to verify that customers of the more sophisticated firm would also be better off if served by symmetric competitors. This is done by establishing that no $\varepsilon \in (0,1-\nu^*)$ exists whereby customer $\nu^*+\varepsilon$ derives greater utility in the asymmetric market than in the symmetric market (9). Customers strictly prefer the symmetric outcome but create asymmetry.

$$U_{\nu^*+\varepsilon, \text{symmetric}} > U_{\nu^*+\varepsilon, \text{asymmetric}}$$

$$\frac{\alpha}{2} + \gamma(\nu^*+\varepsilon)\frac{1}{2} - c > \alpha C_a + \gamma(\nu^*+\varepsilon)C_a - \frac{2\gamma+\alpha}{6} - c$$

(9) $\forall \varepsilon < \frac{6\alpha + 5\gamma}{3(\gamma - 3\alpha)}$

given $\nu^* = \frac{1}{3} - \frac{\alpha}{\gamma}, C_a = \frac{2}{3} \cdot \frac{\alpha}{2\gamma}$

47 Note that we are concerned with the range where $\gamma > 0$ and $0 \leq \alpha < \frac{\gamma}{3}$. Over this range $\frac{6\alpha + 5\gamma}{3(\gamma - 3\alpha)}$ is never less than $\frac{5}{3}$, therefore, all sophisticated customers are better off in an undifferentiated market.
The overall welfare implications of the asymmetric market are, however, positive if we compare the benefits created from capabilities in the asymmetric equilibrium $U_a$ to those created in the symmetric $U_s$ equilibrium (10). The utility loss to customers is, by implication, more than made up in a profit gain by firms.

$$U_a = \int_0^{v^*} \left( \frac{\alpha}{2} v_j + \frac{v^*}{2} \right) dv_j + \int_{v^*}^{1} \left( \frac{\alpha (1 + v^*)}{2} + v_j \frac{1 + v^*}{2} \right) dv_j = \frac{5\alpha}{12} - \frac{\alpha^2}{4\gamma} + \frac{11\gamma}{36}$$

$$U_s = \int_0^{1} \left( \frac{\alpha}{2} + v_j \frac{1}{2} \right) dv_j = \frac{\alpha}{4} + \frac{\gamma}{4}$$

(10)

where $v^* = \frac{1}{3} - \frac{\alpha}{\gamma}$

$$U_a - U_s = \frac{\gamma}{18} - \frac{\alpha}{12} - \frac{\alpha^2}{4\gamma} \geq 0 \forall \alpha \leq \frac{\gamma}{3}$$

The modeling process so far has explicitly assumed that individual customers are small and price-takers. Given these welfare findings we would expect large, sophisticated customers (e.g., Walmart or Nike), or well organized groups of sophisticated customers, to act to change the situation. If these customers could demonstrate the value they bring to suppliers ex ante or verify it ex post they might choose to focus their business on a few suppliers rather than spread it widely and internalize at least a portion of the benefits they provide to suppliers through contractual price concessions.

5. Market structure when capabilities are costly to maintain or employ

Industries vary widely as to whether the most profitable firms are also the largest or smallest firms (Porter 1979). The differentiation literature has tended to conclude that for the most profitable firms to hold relatively small market shares “...we need to assume that consumer incomes (tastes) are highly skewed” (Sutton 1986 p.395).

Incomes in the U.S. are highly skewed in a direction that could lead the most profitable firms to adopt small market shares but there is only one distribution for the economy. The income distribution cannot, therefore, explain why industries vary as to whether the higher profit firms
(which are always the higher quality firms in the vertical differentiation literature and more capable firms here) are the high or low share holders.\textsuperscript{48}

The lack of a uniform share-profitability relationship across industries can be explained when we recognize that capability may influence different kinds of costs in different industries. While this chapter has focused on capability differences that arise from serving customers rather than those that arise from firm choices, the focus allows for the possibility that capability differences may have cost implications.

In some industries variable costs rise with capabilities as firms need to employ higher quality labor inputs (e.g., more and more experienced people with better credentials), use more expensive raw materials, or increase fabrication costs to maintain or use high capabilities. In other settings fixed costs rise with capabilities when more extensive research and product design efforts are required or greater effort is needed to protect intellectual property and patent rights. To capture these costs the profit function is expanded to reflect a variable cost component $\chi$ or a fixed cost $F$ that rises with capabilities (eq. 11).

\begin{equation}
\pi_i = \left(p_i - c - \chi C_i\right) V_i - f - FC_i
\end{equation}

Following the same procedure used earlier to determine the asymmetric equilibrium without capability-related costs, I derive an equation for the prices of the two firms given either variable costs of capabilities or fixed costs of capabilities (eq. 12).\textsuperscript{49} The relation between the high-capability firm's share and capability costs can be determined by evaluating the slope of the share equation with respect to variable or fixed costs. The slopes of the share equations reveal that variable costs that rise with capabilities have no influence on relative share whereas fixed costs that rise with capabilities actually increase the more capable firm's share (13).

\textsuperscript{48} It is also possible that individual tastes for quality vary widely across product categories. For example, some people care a lot about the performance of their cars and others care a great deal about the taste of their wine. However, it remains unclear why the aggregate distribution of tastes would vary across categories.

\textsuperscript{49} One result not shown is that the more capable firm remains the more profitable of the two no matter how large the variable component $\chi$ or fixed component $F$ of capability related costs.
\[ p_a = c + \frac{2\chi - F + \alpha + 2\gamma}{6} - \frac{2\chi(2F + \alpha)}{6\gamma}, \quad p_b = c + \frac{2\chi + F - \alpha + \gamma}{6} - \frac{2\chi(2F + \alpha)}{6\gamma} \]

\[
\frac{dq_a}{dF} = \frac{2}{3\gamma}, \quad \frac{dq_a}{d\chi} = 0
\]

When variable costs rise with quality both firms pass some of these costs on to consumers at the same rate so no change occurs in the relative attractiveness of their offerings. Share changes occur when fixed costs rise with quality, however, because of the asymmetric effect that share changes have on the two firms. Gaining share allows the firms to spread their fixed costs more broadly. This provides both firms with an incentive to lower prices. Increased share also changes the average customer sophistication and overall level of fixed costs for the two firms. When the less capable firm gains share the average sophistication of its customers rises, and so do fixed costs, which provides an incentive for the less capable firm to raise prices and restrict its market share. In contrast, when the more capable firm gains share the average sophistication of its customers falls, and so do fixed costs, which provides an incentive for the more capable firm to lower prices and expand market share further.

6. Conclusions

Firms have found that their market position and capabilities are interdependent and difficult to change piecemeal. The paper evaluated the outcomes of competition using a set of equations that capture these interdependencies.

Analysis of the model shows that links between position and capabilities in a competitive market provide a sufficient explanation for sustained heterogeneity in market position, firm capabilities, and firm profitability. The interdependencies in a competitive context, therefore, may help explain persistent differences in profitability in the absence of or out of proportion to other types of mobility barriers and limits on capability equalization. The resulting heterogeneity enhances social welfare and leads to the redistribution of welfare from consumers to firms.

Differentiation in markets due to these interdependencies requires that more sophisticated customers value capabilities more highly than less sophisticated customers value them. The
more that the overall population values capabilities regardless of their sophistication, the larger the market share will be for the more-profitable and more-capable firm. This latter effect may explain why a few highly-capable investment banks and consulting firms hold dominant shares of their industries. Clients generally have little personally to lose from paying for skills not needed, gain personally through association with capable firms, and have a great deal at risk if strategic or M&A advice is poor. As a result they may seek out the most capable firms even when their needs do not justify paying a premium price. However, if this effect is too strong it becomes impossible for a less capable firm to survive alongside a more capable rival and diversity would be eliminated.

When the model is extended to include fixed costs of sustaining and using capabilities it provides a second potential explanation for the observation that the relative sizes of the most profitable firms varies across industries. Both high and low capability firms have an incentive to reduce prices to spread fixed costs over a larger customer base. However, reducing price raises the fixed costs incurred by one firm and lowers it for the other. When the more capable firm reduces its price it picks up more customers at the low end and offers a lower quality of service requiring less total fixed costs. When the less capable firm lowers price, however, it picks up more customers at the high end and therefore offers a higher quality of service incurring greater total fixed costs.

The difference in incentives facing the two firms leads to pricing reactions that cause the more capable firm to claim a larger market share when fixed costs rise more rapidly with capabilities. This effect may be recognizable in the dominance of a variety of products that are fixed cost intensive (e.g., semiconductors, software, branded "lifestyle" products such as soft drinks) and for which higher capability levels require extending fixed costs (e.g., more exacting fabrication controls and equipment, additional coding costs, more extensive advertising and product placement).
References


Essay Three. Merrill Lynch and PaineWebber

Over the last three decades Merrill Lynch and PaineWebber devoted hundreds of millions of shareholder dollars to upgrading their investment banking practices. Today surveys of corporate managers and institutional investors consistently rank Merrill Lynch as one of three elite U.S. investment banks whose capabilities stand out in breadth and depth above all major rivals. PaineWebber rarely places among the top ten firms in the same surveys and performs very few of the large high-margin investment banking assignments that both firms have sought and Merrill Lynch now nearly dominates. Why was one firm able to upgrade its capabilities and market position in investment banking while the other firm failed to gain ground?

Why a firm succeeds or fails in executing its chosen strategy is not well treated by modern strategy research. Execution generally takes a back seat to questions about choice. Which customers and needs should the firm seek to serve and which should it leave to rivals? How should the firm organize internally to serve the chosen customer needs? What activities should the firm perform and what activities should it source from others? What capabilities must it develop to profitably execute those activities and satisfy customer needs?

The emphasis on choice in strategy research is matched by an emphasis on identifying reasons why the chosen strategies may be protected from inroads by competitors. Managers, however, need guidance in carrying out strategies as much as they need guidance in creating strategies that will be defensible over time. The firms who need strategic help most of all, those that are struggling competitively, must often find that strategy research provides the same advice one might get when asking for directions to a far-off location. “Well, if I was going there I wouldn’t start from here.”

The advice a struggling firm does receive tends to be to look for a strategy attuned to the firm’s strengths and that relatively few firms are pursuing. Differentiating a firm from competitors certainly promises to provide a great deal of help in many situations. However, few firms have a niche all to themselves and most face some degree of head-on competition from rivals with similar designs.
Merrill Lynch's and PaineWebber's experiences reveal a great deal about how firms can execute changes in strategy and succeed in upgrading their capabilities and winning the customers and assignments they desire. In order to set the stage for their efforts, this paper first presents a broad historical overview of the securities industry. The industry-level perspective helps to distinguish between the contributions that fundamental differences in intended strategy and differences in execution of strategy make in determining profitability and sets the stage for understanding Merrill Lynch's and PaineWebber's transformations (sections 1 to 4). The focus then shifts to a detailed examination of Merrill Lynch and PaineWebber whose capabilities, market positions, and economic returns have differed widely even as the firms pursued similar strategies. The firms' forays into investment banking activities are identified as a key area where a large gap exists between the capabilities and market positions the two firms succeeded in developing (sections 5 to 9).

1. Research methods

The case study research design was primarily explorative rather than hypothesis testing. The research was also longitudinal in nature. Industry and firm level information was gathered from a variety of sources in order to cover the breadth of potentially important factors and provide a check on human memory when investigating events that occurred several decades ago.

Interviews were conducted with current and past investment bankers and managers at Merrill Lynch and PaineWebber, current and former employees of rival investment banking firms, and with industry specialist consultants. Interviews followed a semi-structured protocol. They began with open-ended questions about the internal operations of securities firms, the nature of competition across firms, and the history of the two firms. These were followed by questions about key points in the development of the two firms' investment banking practices, the nature and importance of different kinds of clients and client transactions, and the development of the firms' capabilities.

Raw transaction data for mergers and acquisitions from 1980 to 1999 and underwriting assignments from 1970 to 1999 were downloaded from the Securities Data Corporation through a license with MIT. The data included information on the lead investment bank, the name of the
client, the size and date of the transaction, and the type of security underwritten. An additional data field was created using the client name and Fortune magazine’s annual listing of the five hundred largest industrial corporations. The data allowed for the development of time-series graphs of the volume of business, the kinds of clients, and the nature of transactions that each major securities firm handled.

The two major industry press journals (Institutional Investor and Investment Dealer’s Digest) were searched for articles pertaining to Merrill Lynch and PaineWebber. These stories largely corroborated interviewees’ accounts of the firms’ experiences and added information that did not come up during interviews.\textsuperscript{50}

Several additional data sources were used to complement the analysis. Financial data was obtained from annual reports and from Compustat. Staffing information and self-reported transaction data came from various publications of the Securities Industry Association. Greenwich Associates generously compiled and provided historical information from surveys tracking client perceptions of relative firm capabilities.

2. Profitability in the securities industry

Financial records reveal substantial and sustained profitability differences across firms in the securities industry. Figure 1 presents the average return on equity for the largest publicly owned securities firms, plotted against the variability in those returns, over a nine-year period. The period begins shortly after the New York Stock Exchange first approved public ownership of member firms (March 26\textsuperscript{th} 1970) leading to a rush of initial public offerings.\textsuperscript{51} The period ends

\textsuperscript{50} Consistency between the industry press reports and interviews is only partially reassuring. In some cases the people interviewed are likely to have read those reports and in other cases the people interviewed for this study were interviewed for those reports.

\textsuperscript{51} The official date is reported in the NYSE handbook. Hayes and Hubbard (1990 page 106) report that several firms actually defied NYSE rules and went public a few years earlier to gain access to a larger and more permanent capital base.
when a spate of acquisitions aimed at increasing the financial backing of the firms subsumed many of the major public firms into larger companies. 52

One striking element of the figure is that the average return on equity differs by more than a factor of five. Compounded over time this discrepancy has a huge effect on shareholder wealth. Equity growing for nine years at the rate of return earned by A.G. Edwards increases by more than four hundred percent. Equity growing for nine years at the rate earned by DLJ increases by less than fifty percent.

![Diagram: Securities Industry Profitability](image)

**Figure 1: Profitability Differences within the Securities Industry**

Another striking element of the figure is that the standard economic rationale for profitability differences is not apparent. There is no evidence of a positive relationship between risk, here

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52 Private ownership and changes in control of the firms in the industry limit the possibility of fair comparisons across large industry players over long period of time. The time period selected allowed for the largest number of leading firms to be compared on equal footing. For a more recent comparison see figure A1 in Appendix 1. The nine firms in the figure are all among the twenty largest securities firms, and include seven of the ten largest, when measured by capital in the final year of the sample. The displayed firms’ capital ranks are (1) Merrill (2) Shearson (3) E.F. Hutton (4) Salomon (5) Dean Witter (6) Bache Halsey Stuart Shields (7) PaineWebber (8) Goldman, Sachs (9) First Boston (10) Lehman Brothers and (17) A.G. Edwards (18) Donaldson, Lufkin and Jenrette. Source: SIA Securities Industry Yearbook 1981
measured by the variability in returns to equity, and profitability. In fact the firms with higher returns have, on average, somewhat greater earnings stability.

This is not unique to financial services. Similar sustained differences in firm profitability, and negative relationships between risk and profitability also exist in broad samples of manufacturing (Mueller 1986). If higher returns are not a reward for risk-taking, then why are some firms more profitable than their rivals are?

3. Three competitive models in the securities industry

Differences in intended strategy provide one reason for differences in firm profitability. This industry overview looks back to the early 1970s to understand the firms’ historical bases and the transformation that they and the industry have undergone over the last three decades. This long time frame is necessary in order to make meaningful profit comparisons, to see the co-evolution of firms’ capabilities and their market positions, and to understand just how dramatic some of these changes have been.

Firms in the securities industry differ widely in terms of the services they provide and the clients they serve. Securities firms generally fall into one of three broad competitive models: investment banking, retail brokerage, and institutional brokerage. Clarifying these competitive models is a key first step in separating intended strategy differences from differences in execution.

Investment banking firms focus on providing corporations and governments access to capital at the lowest cost. In this role investment banks advise clients on adjusting their capital structure, create and issue new securities to make those adjustments, and help clients execute mergers and acquisitions. Morgan Stanley, Dillon Read, Kuhn Loeb, and First Boston were among the most prominent of the investment banking firms from the early 1900s until the 1960s (table 1, column 3).

The retail and institutional brokerage firms focus on buying and selling existing securities for individual and institutional investors. The brokerages also provide investment research to guide investors as they adjust the size and composition of their portfolios.
The oldest brokerage firms focused on providing retail brokerage services to individuals. These firms included Prudential Bache, Merrill Lynch, PaineWebber, and A.G. Edwards. Many of these firms were well established by the late 1800s and grew to employ thousands of individual brokers (table 1, column 2).\textsuperscript{53}

A second group of brokerage firms appeared in the late 1950s and early 1960s to serve the growing institutional brokerage needs of insurance fund, pension fund, and mutual fund managers (table 1, column 1). While individual investors held almost one hundred percent of equity securities in the 1940s this changed rapidly over the next several decades. By 1965 institutions held about twenty percent of all equity securities. By 1995 institutions had surpassed individuals as the primary investors in corporate equity (Brennan 1995).

Institutions trade more aggressively than most individuals and account for a stream of brokerage commissions disproportionate to their share of overall equity holdings. Specialist firms including Donaldson, Lufkin and Jenrette and Mitchell Hutchins built a prosperous business around providing professional investors with detailed research and investment analysis in exchange for brokerage commissions.

Securities firms have not limited themselves to these activities. Many have expanded into additional lines of business including insurance, real estate, asset management, financial speculation, and merchant banking. These activities are, or have been at one time, considered complementary to the services firms provide to clients. The activities have also provided opportunities to leverage client networks and existing investment research and trading functions and to weather swings in other lines of business.

\textsuperscript{53} The traditional name, broker, is maintained throughout this paper for brevity and consistency. However, many firms have expanded the role of the broker over time to include providing broader financial advice and financial planning to clients. The expanded role has led to the introduction of new job titles such as account executive and financial advisor.
<table>
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<tbody>
<tr>
<td>1. Goldman Sachs (2*)</td>
<td>1. Merrill Lynch (8,258)</td>
<td>1. First Boston $4.7 (57)</td>
</tr>
<tr>
<td>2. Oppenheimer (2*)</td>
<td>2. Dean Witter (3,940)</td>
<td>2. Morgan Stanley 3.7 (61)</td>
</tr>
<tr>
<td>4. Mitchell Hutchins (4)</td>
<td>4. Shearson Loeb Rhoades (3,465)</td>
<td>4. Lehman Brothers 2.5 (89)</td>
</tr>
<tr>
<td>5. Salomon Brothers (3)</td>
<td>5. Paine Webber (3,250)</td>
<td>5. Goldman Sachs 1.7 (91)</td>
</tr>
<tr>
<td>7. Morgan Stanley (NR)</td>
<td>7. Thomson McKinnon (1,494)</td>
<td>7. Blyth 1.7 (48 w/Eastman Dillon)</td>
</tr>
<tr>
<td>8. H.C. Wainwright (5)</td>
<td>8. A.G. Edwards (1,322)</td>
<td>8. Salomon Brothers 1.6 (11)</td>
</tr>
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</table>

* Denotes a tie
NR = not ranked among top 15 in prior year


Table 1. Competitors in the Three Primary Market Areas

4. **Profits across and within competitive models**

Once the competitive model a firm follows is clear some of the differences in profitability shown in figure 1 may be easy to explain. For example, A.G. Edwards appears at the top of the figure. It has averaged a nineteen percent after-tax ROE over the past three decades making it one the most profitable public firms in the securities industry. A.G. Edwards achieved this distinction without glamour or flash by traditional Wall Street standards. The firm's focus from the 1970s through the 1990s has been the needs of individual investors. Its operations are run from headquarters in the mid-West rather than New York, and it relies almost exclusively on other firms to create the securities and other investment vehicles it sells to its customers.

In contrast, Donaldson, Lufkin & Jenrette (DLJ) appears at the bottom of the figure. During the 1970s the firm focused almost exclusively on the brokerage needs of large institutional investors. Institutions were very difficult clients to serve profitably in the 1970s. In the 1970s the New
York Stock Exchange phased out a system that had maintained high commissions for all brokerage transactions completing the process on May 1st, 1975 known as "May Day". The small retail customers A.G. Edwards served continued to pay commissions near historical levels but commission rates paid by institutional investors plummeted.\textsuperscript{54} In the aftermath of deregulated commission rates many of the institutional brokerages closed their doors or sold out to securities firms focused on retail or investment banking.

A great deal of profit variation, however, exists among firms pursuing the same competitive model. E.F. Hutton and Shearson focused on retail brokerage and earned returns nearly as high as A.G. Edwards'. But Merrill Lynch, PaineWebber, Dean Witter, and even Bache were also primarily retail operations during the seventies and into the eighties. Why did these latter firms' profits lag so far behind when they were pursuing an apparently similar set of customers and customer needs?

An extended longitudinal analysis of profitability differences is limited by the fact that five of the firms in figure 1 disappeared, at least temporarily, into larger corporations. Dean Witter Reynolds, Bache Halsey Stuart, and Shearson Loeb Rhodes had all been acquired (by Sears, Prudential, and American Express, respectively) by 1982. DLJ became part of The Equitable in 1984, First Boston merged into Credit Suisse in 1988, and E.F. Hutton disappeared into Shearson in 1988.\textsuperscript{55}

Only three of these firms (A.G. Edwards, Merrill Lynch, and PaineWebber) have remained independent, thereby allowing for a fair comparison of profits relative to equity allocated to supporting operations. Of these three A.G. Edwards has been the most profitable. Its nineteen percent after-tax return on equity from 1973 to 1999 is more than a third higher than Merrill Lynch's fourteen percent and nearly twice as great as PaineWebber's eleven percent average (table 2).

\textsuperscript{54} See Securities and Exchange Commission, Survey of Commission Charges on Brokerage Transactions.
\textsuperscript{55} While each of these firms continued to have their own identity and in some cases their own financial reporting, the acquisitions were mainly justified by the ability of the parent company making any return-on-equity calculation suspect.
<table>
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</thead>
<tbody>
<tr>
<td>A.G Edwards</td>
<td>19.4% - .056</td>
<td>20.3% - .070</td>
<td>19.1% - .062</td>
<td>17.6% - .024</td>
</tr>
<tr>
<td>Merrill Lynch</td>
<td>14.1% - .089</td>
<td>12.8% - .054</td>
<td>10.5% - .079</td>
<td>19.7% - .038</td>
</tr>
<tr>
<td>PaineWebber</td>
<td>11.1% - .071</td>
<td>8.5% - .091</td>
<td>9.2% - .095</td>
<td>15.5% - .073</td>
</tr>
</tbody>
</table>

Table 2. Return on Equity: Average - Standard Deviation

At a time when Merrill Lynch and PaineWebber were pouring money into building institutional brokerage operations and upgrading their investment banking operations, A.G. Edwards continued to focus on the retail customer. As Merrill Lynch and PaineWebber added staff to create additional products and services to sell to their retail customers, from mutual funds to insurance and real estate, A.G. Edwards maintained a lean organization that limited itself to reselling financial products created by others. A.G. Edwards' focus kept overhead and expenses low and allowed it to remain profitable during economic downturns and make money from low-volume customers that the integrated companies avoided (Stern 1984).

A leaner and focused retail operation does not, however, explain why Merrill Lynch been so much more profitable than PaineWebber. In fact if a focus on retail brokerage was the key to profitability then Merrill Lynch should have fared worse then PaineWebber. While commissions accounted for sixty-eight percent of A.G. Edwards' revenues net of interest from 1974 to 1990 and PaineWebber collected fifty-four percent from commissions, Merrill Lynch brought in less than forty-two percent of net revenues from commissions.

Perhaps Merrill Lynch had a scale advantage. Merrill Lynch ranged from four to five times as large as PaineWebber in annual revenues over the past three decades and fielded two to three times as many retail brokers. However, Shearson and Hutton had about the same number of retail brokers as PaineWebber, and A.G. Edwards less than half as many, suggesting that all these firms are much larger than any scale drivers influencing profitability in retail brokerage (table 1).

Unlike A.G. Edwards, both Merrill Lynch and PaineWebber are headquartered in Manhattan and both have diversified their operations into investment banking, institutional brokerage, and a broad array of additional products and services. From 1979 to 1996 both firms had about five
percent of their registered representatives (brokers) assigned to institutional clients while A.G. Edwards rarely had more than one percent of brokers assigned to institutional clients.

Given that Merrill Lynch and PaineWebber have both been aggressive in moving beyond their traditional role as retail brokers the key difference between the two firms appears to lie not in their choice of strategy, but in how successful they have been in executing that strategy. In evaluating the execution of their strategies the performance differences between the two firms becomes easier to understand. The following section explains the links between investment banking, institutional brokerage and retail brokerage in order to understand the intentions of the two firms.

5. **Overlap and interdependence across competitive models**

A close examination of securities firms reveals that the three competitive models are tightly linked and that the distinctions between investment banks and retail and institutional brokerages are differences in degree rather than differences in kind. The retail brokers served many smaller institutional clients and the institutional brokers served many wealthy individuals. The investment banks maintained ties to retail and institutional investors for whom they provided limited brokerage services, and the brokerage firms acted as investment bankers for smaller corporate and municipal clients. The overlap is apparent in table 1 where many firms rank among the top fifteen firms in two or more categories. This consolidation has only increased over time through mergers, acquisitions, and internal expansion by securities firms.

One driver of increasing overlap is the process of underwriting. The underwriting business system directly links firms across the three competitive models (figure 2). The underwriting process begins with varying amounts of advisory services where a client’s financial needs are determined. New securities are then created to meet the client’s needs. The securities then need to be distributed to investors. Once issued, these securities require ongoing research support and trading activity in the secondary market so that investors can confidently invest in new securities.
### Classical activities, revenues, and clients by kind of security firm

<table>
<thead>
<tr>
<th>Investment Banking</th>
<th>Brokerage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advisory Services</strong></td>
<td><strong>Security Creation (Origination)</strong></td>
</tr>
<tr>
<td>Advisory Fees</td>
<td>Management Fees</td>
</tr>
<tr>
<td>Large Industrials</td>
<td>Large Industrials</td>
</tr>
<tr>
<td>Retail Brokerage</td>
<td>Municipalities</td>
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<tr>
<td>Small Companies</td>
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</tr>
<tr>
<td>Institutional Brokerage</td>
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**Figure 2: Underwriting Business System**

The elite investment banking firms traditionally worked for large industrial corporate clients. They focused on the upstream end of the securities industry activities moving downward into security distribution and trading tentatively over time and only as needed to support their upstream activities. In order to distribute the securities they created, and share the capital risk involved in underwriting them, they arranged syndicates of other leading investment banks and large institutional and retail brokerage firms. The syndicate members purchased and resold a portion of the new securities issues to their brokerage and institutional clients.

This division of labor down the securities business system continues to create competitive tension. The originator (also known as the book manager) of a new security receives a hefty management fee, traditionally twenty to twenty-five percent of the total amount paid by the client for the underwriting. The rest of the money is divided among the firms who participate in the syndicate. Each participating firm’s compensation is based on the portion of the total underwritten shares the firm buys and resells. While distribution takes the largest portion of the underwriting fees, the labor and financial risk involved in the distribution end of the business generally provides the downstream distribution and trading activities with a slimmer margin than the upstream advisory and origination activities.
The competitive tension is heightened by the fact that the brokerage firms also act as advisors to corporations and as originators of new securities. Classic retail brokerage clients are smaller firms and municipalities that the leading investment banks overlook. These smaller corporate clients are often owned or managed by retail brokerage clients. These retail clients funnel advisory and underwriting assignments to the brokerage through relationships with their brokers. Since fees tend to rely heavily on the amount of money raised, the elite investment banks considered these middle-market firms too small to be attractive clients. Competing with the leading investment banks, therefore, promised an upward movement in the sophistication and profitability of the brokerages’ investment banking assignments.

As Hayes (1979) has noted, competing with the elite investment banks for advisory assignments and underwriting management roles looked profitable to the brokerages, but offending the stronger originating firms could put distribution roles in jeopardy. Despite the slim margins involved in participating in an underwriting, the distributing firms were still concerned about maintaining adequate volume to spread the high fixed costs of their brokerage networks. The power balance between the brokers and investment banks influenced how aggressive the brokers could be. The power balance shifted over time as imbalances arose between investor interest in new issues and corporate needs for capital. Low investor interest in the early 1970s, for example, put distribution strength at a premium allowing brokerage firms to compete more aggressively with traditional underwriters unconcerned that they might be cut off from the flow of new issues.

6. **Merrill Lynch and PaineWebber extend beyond brokerage**

Merrill Lynch and PaineWebber trace their lineage back to retail brokerage firms founded in the last two decades of the 19th century. Both grew through acquisition and internal development into networks of branch offices spanning the United States and employing thousands of brokers. After spending nearly a century as privately held firms, Merrill Lynch went public in June of 1970 and PaineWebber followed less than a year later in May of 1971.

By the time they went public both firms were full-service investment banks combining retail brokerage, institutional brokerage, and underwriting capabilities. Despite the scale of their underwriting and institutional brokerage, however, neither firm was considered a skilled player
outside of retail brokerage. Small assignments constituted the bulk of their managed underwriting. In 1970 sixty-three percent of Merrill Lynch’s managed underwriting assignments and ninety percent of PaineWebber’s managed underwriting assignments raised less than $50 million compared to less than thirty percent of Morgan Stanley’s underwriting assignments.

As A.G. Edwards demonstrated, it was quite possible for a securities firm to be highly profitable while remaining a focused retail broker. Neither Merrill Lynch nor PaineWebber chose that path. Both firms diversified into areas that they hoped would complement their offerings to retail customers (e.g., insurance and real-estate), leverage their securities research capabilities (e.g., asset management and the creation of investment vehicles such as mutual funds) and provide revenue flow during downturns in retail brokerage activity.

At a broad level Merrill Lynch and PaineWebber maintained parallel mixes of business from 1970 right through the end of the 1990s. Figures 3 and 4 show the average breakdown of the two firm’s revenue streams, by line of business, from 1970 through 1999. Commissions account the largest portion of Merrill Lynch and PaineWebber’s revenues excluding interest (41 and 51 percent respectively on average). After that principal trading is the second largest (23 and 22 percent), investment banking the third (16 and 17 percent) asset management (8 and 6 percent) and other activities including real estate and insurance account for the remainder (12 and 4 percent).

Both firms saw their commissions slip relative to other lines of business as competition intensified, and both expanded into additional activities. The two most notable differences are that Merrill Lynch diversified more strongly in the 1980s into other lines of business including real estate and insurance, and that Merrill Lynch entered the asset management field six years earlier than PaineWebber with its industry leading cash management (CMA) account (1981 vs. 1987).

Merrill Lynch’s asset management activities have been very successful. Its foray into real estate and insurance, however, neither improved nor stabilized the firm’s earnings (Carroll 1996). During the 1980s when these insurance and real estate activities were at their height the gap in returns between the two firms was the smallest it has been over the past three decades. Merrill
Lynch managers formally recognized this fact and divested most of these marginal activities in the late 1980s.

**Figure 3: Merrill Lynch Lines of Business**

**Figure 4: PaineWebber Lines of Business**
The broad similarities hide fundamental changes at both firms. In the 1970s and 1980s Merrill Lynch and PaineWebber made extensive and expensive commitments to building their institutional brokerage and investment banking businesses. If successful these efforts would lead to an increased volume of the traditionally lucrative upstream end of the securities business and secure a flow of new issues to distribute to retail customers.

Given the dramatic downturns in brokerage volume, falling security prices, and widespread industry losses experienced in the early 1970s it is hard to fault either firm for attempting to reduce their exposure to the volatility of the retail business. The two firms’ have had very different experiences with this strategy, however, over the past three decades (table 2). Merrill Lynch has averaged more than fourteen percent ROE after-tax from 1972 to 1999. PaineWebber has had a lower, and considerably more volatile, profitability record with an eleven percent ROE after-tax. Compounded over 28 years the difference in returns means that a dollar of equity at Merrill Lynch has increased in value nearly twice as much as a dollar of equity at PaineWebber.

![Investment Banking Penetration](image)

*Figure 5: Scale in investment banking*

7. **Investment banking at Merrill Lynch and PaineWebber**

Merrill Lynch began the 1970s with a considerable underwriting volume advantage over PaineWebber (see table 1). This advantage had been built in the preceding decade during which
Merrill Lynch had moved to be among the five largest managers of underwriting when measured by dollar volume managed. Though PaineWebber lagged far behind Merrill Lynch, its volume position was improving and the firm was on a trajectory to be among the top five investment banking firms by the early 1990s (figure 5).

Dollar volume of securities managed is, however, a crude measure of an investment banks market position. All investment-banking assignments are not equally challenging or equally rewarding. The skills required to successfully underwrite an issue, and the compensation received, depend on the sophistication of the client (section 6.1), the role the investment bank plays in the assignment (section 6.2), and the sophistication of the investment banking task (section 6.3).

7.1 Client Sophistication

Underwriting work for large industrial corporations generally involves a substantial component of lucrative advisory services for balance sheet restructuring and merger and acquisition activity. The largest brick-and-mortar industrial clients, comprising the members of the Fortune 500 annual listing, tend to have a steady stream of advisory and underwriting needs requiring highly skilled advisors.

![Morgan Stanley's Dominance of Large Industrial Clients in the 1970s](Figure 6: Morgan Stanley's Dominance of Large Industrial Clients in the 1970s)
As late as the 1960s or 1970s many of these companies used one investment bank for all their advisory and underwriting needs and that firm was likely to be Morgan Stanley or Goldman Sachs. Together these firms managed about half of all the Fortune 500 underwriting transactions and almost all of the issues by the fifty largest firms (figures 6&7).

![Goldman Sachs chart](image)

**Figure 7: Goldman Sach’s Strong Second Position in the 1970s**

Over time, however, most of the Fortune 500 clients have broadened their approach to include strong relationships with four or five investment banks. This change in client practice and the competitive inroads of Merrill Lynch and Salomon Brothers have caused Morgan and Goldman’s dominance in these markets to fall over time.

![Merrill Lynch chart](image)

**Figure 8: Merrill Lynch’s Rise with Large Industrials**
Despite their changing practices Fortune 500 clients have not lost their appeal to investment bankers. Most corporations still treat one of their investment bankers as a special or “lead” relationship. The lead bank traditionally pulls in over half the total underwriting fees and an even greater percentage of the advisory fees each year. The corporations are also valued as clients because most of the work is negotiated, allowing for higher fees and greater creativity, whereas municipalities and other government agencies almost exclusively select underwriters through competitive bidding.

![PaineWebber](image)

**Figure 9: PaineWebber’s Foray with Large Industrials**

Merrill Lynch with its larger size was in a stronger position than PaineWebber among these sophisticated clients in the 1970s but was still far behind the leading investment banks (figures 8&9). Since the 1970s the direction the two firms have gone over time is strikingly different. Merrill Lynch’s share with these clients has approximately tripled to the point that by sheer volume it is the industry leader, while PaineWebber increased its share in the 1980s but now commands as little share of these clients’ transactions as it did in the 1970s.

### 7.2 Role sophistication

Until the mid-1980s both Merrill Lynch and PaineWebber were more likely to be co-managers than book managers in underwriting assignments. In 1975 Merrill Lynch co-managed almost twice as large a volume as it book managed and PaineWebber co-managed about eight times as
much volume as it book managed. Established rivals such as Morgan Stanley and First Boston book-managed almost as much or more volume than they comanaged (figure 10).  

![Underwriting Role Graph](image)

**Figure 10: Role in Underwriting Assignments**

The book manager performs the advisory role in an underwriting. The book manager determines the appropriate type of security, size of issue, and pricing of the issue. In return, as mentioned earlier, the book manager generally earns twenty to twenty-five percent of the total underwriting fees.

A comanager occasionally is involved in some of the activities associated with book managing. Generally, however, the designation of comanager simply recognizes a higher level of effort from a firm’s analysts and brokers in selling the securities. In return for this higher effort the comanager takes a portion, usually a small portion, of the management fee that otherwise would be paid to the book manager.

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56 Until the 1980s Morgan Stanley had a policy of acting only as sole manager, accepting no comangers and accepting comanager roles only with the open threat of taking a new client away from its lead manager (Morgan Stanley's race against itself 1980). This policy is evident in the fact that their book-managed volume is almost 100 percent of all managed volume. This policy began to break down after they began losing clients, most notably IBM, who wanted a comanager on their underwritings.
By 1985 both Merrill Lynch and PaineWebber were as focused on book managing as any of the leading firms. Over the next ten years, however, Merrill Lynch continued to focus on the top role while PaineWebber became more and more likely to appear as a comanager.

7.3 Task sophistication

Investment banking work can be generally divided into advisory services, equity underwriting, fixed-income (debt), and merchant banking. Advisory services and equity underwriting involve close relationships at the CEO level and are considered the most challenging and profitable activities. In these situations the corporation, and its top managers, are relying on the skill and experience of the investment banker to determine the value of often ill-defined prospects where shareholder value can be dramatically affected. 57

![Position in Sophisticated Transactions](image-url)

**Figure 11: Merrill Lynch’s rising and PaineWebber’s falling positions**

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57 High-yield fixed income work (AKA “junk” bonds rated below investment grade) and merchant banking are also lucrative, but require the firm to put its own capital at substantial risk. The least challenging, and generally least profitable, of all corporate issues are investment-grade fixed income securities. The same holds true of issues for governments and municipalities. While these are always fixed-income instruments those structured as Revenue Bonds require greater skill to value, and offer higher margins, than General Obligation bonds. Revenue Bonds are backed by the prospects of a specific business venture that must be analyzed, rather than the taxation power of the municipality that is routinely evaluated by credit rating agencies.
When it came to the most sensitive and sophisticated transactions, new equity or equity-related issues, neither firm held more than five percent market share among the Fortune 500 (figure 11). In the late seventies and early eighties, however, the situation began to change dramatically. Both Merrill Lynch’s and PaineWebber’s shares of equity transactions for Fortune 500 clients climbed upward. Merrill Lynch’s share, however, increased dramatically, and rose again in the 1990s. PaineWebber’s modest gains in the early 1980s were almost entirely gone by the late 1980s and by the 1990s its share had deteriorated below that which it held in the 1970s.

8. Merrill Lynch’s and PaineWebber’s capabilities

What accounts for the differences in the trajectories of the two firms’ positions with these more sophisticated clients, roles, and tasks? Greenwich Associates, a consulting firm specializing in financial services, conducts annual surveys of corporate officers and asks them about the capabilities of investment banks on a variety of dimensions. These surveys extend back for seven years in the current format providing insight into the relative skills PaineWebber and Merrill Lynch developed by the 1990s.

Greenwich Associates structures these surveys to disentangle the quality of an investment bank from the investment bank’s scale. Greenwich Associates’ point system reported in the following graphs is based only on responses from corporate officers who have worked with a firm. The responses are transformed into a point score with 100 points for each response of excellent, 50 points for above average, 25 points for average, 12.5 points for below average, and 0 points for poor.

An important overall measure of a firm’s capabilities is the quality of its relationship managers. These are the professionals who work directly and constantly with a client calling on specialists within the firm as needed. Each year corporate officers are asked to rate the investment banks on the “capability of the senior corporate finance relationship manager covering your account for equity, advisory, and long-term debt underwriting business.”
Figure 12: Relationship Manager Capabilities

By 1993 Merrill Lynch’s capabilities were strong even among the premier investment banks while PaineWebber’s capabilities lagged behind even the average investment bank in the second tier (figure 12). A 1994 survey of CFOs conducted by a separate research group produced similar findings. Fifty-nine percent rated Merrill Lynch’s investment banking capabilities as excellent while only fourteen percent said the same of PaineWebber’s capabilities (What CFOs Really Think about Investment Bankers, 1995).

Merrill Lynch also rates highly among the very best firms in terms of fixed-income (debt) underwriting. On this, the least sophisticated of the types of transactions, PaineWebber is considered better than the pack but still not nearly as strong as Merrill Lynch (figure 13).
In a number of the more sophisticated areas only about ten firms received sufficient survey responses to determine a reliable point score and PaineWebber does not appear as a result. One such category is overall equity underwriting capability where Merrill Lynch took first place from 1994 to 1996 then tied with Goldman Sachs in 1997 and took a close second to Goldman Sachs in 1998 and 1999 (figure 14). From 1994 to 1999 Merrill Lynch ranked third behind Morgan
Stanley and Goldman Sachs in mergers and acquisitions capability with First Boston scoring as high as Merrill Lynch in two of those six years (figure 15).

![Effectiveness in Executing M&A](image)

**Figure 15: Mergers and Acquisitions Capabilities**

Credibility with CEO and Board

![Credibility with CEO and Board](image)

**Figure 16: Firm Credibility at the Most Senior Level**

A firm’s credibility with managers at the highest level within firms may serve as a reasonable summary measure of perceptions of firm capabilities. Here it is clear that Merrill Lynch is one of
the most respected firms while PaineWebber tends to lag even in the second tier of firms (figure 16).

9. Merrill Lynch rising and PaineWebber struggling

How did Merrill Lynch improve its share of the most sophisticated transactions and build industry-leading capabilities? Why was PaineWebber so much less successful in achieving these same goals?

Merrill Lynch's considerably larger volume and experience in less sophisticated activities may have provided an advantage in building upward in task sophistication. A close look at the two firms' experiences as they attempted to leverage these skills into more sophisticated tasks and roles, however, suggests that less sophisticated experiences and transactions are hard to translate into gains at a higher level (section 9.1). Both firms felt it necessary to build institutional ties and acquire elite firms as platforms to compete from the top of the sophistication scale downward (section 9.2). How they executed these acquisitions and how focused they remained on upgrading the average sophistication of the firms' mix of business appear to have had a significant influence on their success (section 9.3).

9.1 Competing from below

When choosing financial advisors and book managers for equity securities corporate CEOs traditionally looked for corporate-finance skills defined as the ability to determine how a corporation should be financed and the ability to design and price securities to meet those needs. The firms best known for these strengths in the 1960s—Dillon Read, First Boston, Kuhn Loeb, and Morgan Stanley—had developed their skills and reputations over decades of client work. These firms dominated the relationships at the top of the largest U.S. corporations, whose managers generally remained loyal to a single firm.

A shift in philosophy among many corporate managers in the 1970s and 1980s encouraged rival firms. While most corporations continue to recognize one lead investment banking relationship they began to develop additional relationships with a total of four or five investment banks (see
Appendix 3). The lead investment bank receives the bulk of the underwriting assignments and almost all the advisory and equity work, but the other firms regularly receive comanager and occasionally book manager roles on other transactions. By opening up relationships these clients provided investment banks with a chance to prove themselves and develop relationships with the clients of established rivals.

Firms trying to take advantage of these developments, however, found that the easiest tasks to win from clients, often by promising to buy the deal before investors were lined up, were the least sophisticated. As the head of one of Merrill Lynch's investment banking units put it:

It's easiest to buy debt. The price isn't moving around as much as with equity so there's less finesse and the down side is less...Marginal players start off and stay here. Equity shares moving against you are a very big problem. It's hard to buy equity.

PaineWebber, Merrill Lynch, and other firms repeatedly performed less sophisticated roles and transactions in order to establish relationships with a corporation that might lead to more sophisticated transactions. A relationship manager at Merrill Lynch pointed out:

You start with lower-margin higher-volume activities to build competencies. You start with fixed-income, then equity, then advisory. In 1998 Merrill was number one in debt, equity, and M&A. We migrated from a focus on fixed income to a focus on equity and M&A.

As this relationship manager and others later pointed out, the transition is not and was not that smooth or simple even for Merrill Lynch. Relationships are made with people and not with companies. CEOs tend to oversee equity offerings and M&A assignments while less sophisticated transactions are often managed by CFOs, Treasurers, or Assistant Treasurers. The stratification within firms limits the degree to which less unsophisticated transactions can open the door to more sophisticated transactions. The same relationship manager explained, "If you start with the CFO it is tough to move up in the organization. The CFO is likely to be offended if he feels you are just trying to go through him to a higher level." In retrospect one manager at Merrill Lynch remembered:

For a long time we took losses on the fixed-income business in order to gain entrée to the lower level hoping to build up the relationship for higher margin business. Clearly as we were gaining market share it wasn't affecting their [Goldman's] higher margin business.
As an investment bank builds up from below it still faces the problem that it must eventually displace an entrenched competitor situated as the lead manager. A firm can take more and more deals at a lower level but is consigned to a supporting role as long as the incumbent has greater experience in the most sophisticated elements of a business (equity and advisory) and maintains strong relationships with top managers.

9.2 Competing from the top down

An alternative to building up through a client relationship was to break in at the top. Merrill Lynch and PaineWebber had two strategies they could use to move straight into more sophisticated roles and transactions. First, they could offer capabilities that didn’t depend on years of sophisticated corporate finance experience. Second, they could hire people away from the established investment banks thereby augmenting their own capabilities while at the same time reducing the capabilities and relationships of the existing investment banks.

Leveraging retail and institutional distribution capabilities

In the 1960s and early 1970s the elite investment banking firms were hesitant to expand their companies far beyond a cadre of corporate finance specialists. They viewed their strengths as providing creative solutions for financial needs and coordinating syndicates of less skilled firms to place those issues with individual and institutional investors. The elite firms avoided developing the equity research groups, trading departments, and institutional and retail sales networks that were needed for distribution until the middle to late 1970s.

The elite investment banks viewed these activities as low margin at best and loss leaders in many cases. The activities required substantial management effort, large amounts of capital, and incurred heavy fixed operating costs (Connelly, 1979; Morgan Stanley’s Race Against Itself, 1980). With the exception of First Boston that went public in the late 1960s, these banks wanted to remain partnerships focused on high-margin activities. The partnership structure limited the firms’ financial resources and tended to mix managerial responsibilities with production thus making it difficult to expand into capital and people intensive areas. As long as these firms could sub-contract the distribution of new issues, and rely on their reputations to give these issues
credibility in the market, they chose to stay in the higher-margin and lower-risk end of the business.

Avoiding these activities made even the most sophisticated assignments vulnerable to competitors who could offer services to potential clients that the elite investment banks could not or would not match. One such service was to provide distribution strength through institutional ties, retail networks, or the reputation of a research analyst. In many cases firms offered to put their own capital at risk by providing a bridge loan or taking an equity stake in order to facilitate a deal. Finally they could promise a lower price for services or a higher price for the securities which meant risking a loss on the underwriting.

During the early and middle 1970s Merrill Lynch and PaineWebber both had strong retail distribution capabilities to offer but little institutional strength. Both moved aggressively to upgrade their institutional brokerage presence. This buildup was, in part, a late response to the growing share of brokerage produced by institutional investors. The expansion of institutional business was also a critical step in expanding investment banking.

As mentioned earlier, the fixed commission scheme of the NYSE came to an end in the 1970s causing institutional commissions to plummet while retail commissions remained near historic levels. It quickly became clear that commissions alone would not profitably support the research effort that was needed to win institutional business. The firms that stepped into this business either had investment banking interests to protect or had designs on expanding their investment banking activity.

Historically the leading investment banks had maintained links to institutions that allowed them to structure, price, and distribute large portions of their corporate underwriting. Most of the leading investment banks in the early 1970s built up their research capabilities and institutional brokerage departments to maintain these institutional ties and expand their distribution capabilities (Morgan Stanley’s Great Leap into Research, 1974). Morgan Stanley moved from outside the top-ten rated research firms in 1974 to the second highest in 1975. First Boston moved more slowly but was also among the top ten by the late seventies and among the top five
by the mid-1980s. Dillon Read and Kuhn Loeb were the most reluctant and later merged into other companies with distribution capabilities.

At Merrill Lynch one veteran remembers that the anticipated linkages were built right into the organization structure:

In the mid-70s Don Regan said that the firm would be both institutional and retail. That was a bold statement. We had poor research capability and were a very small investment bank primarily configured to serve retail customers...In 1975 or 76 Bill Schreyer was named as an executive vice president to pull together trading, institutional sales, and investment banking into one department.

In addition to building institutional ties, research makes a major contribution to winning work with corporate clients at the most senior level. Corporate managers want to know that a firm has an analyst in their industry to provide insight into potential merger and acquisition candidates as well as help sell new securities to institutional investors. Corporate managers and others look to an annual survey of institutional money managers conducted by Institutional Investor magazine to identify the most influential analysts (“All-America Research Team” or “II Team” members) covering their industry. As an analyst with four decades of experience at several leading securities firms put it:

Research is more and more incorporated into corporate finance. Analysts focus research on companies that may need financing. Corporate finance picks up a major part of analyst budgets. In the old days analysts worked primarily for retail or institutional brokerage. Now it’s more about underwriting and advisory business. Corporate finance uses the ranking and reputations of its research teams to sell business. What they want is II team analysts.

Although he felt that the institutional push at PaineWebber was made prior to the decision to build up investment banking, a former PaineWebber finance professional admitted that “First [PaineWebber] needed an institutional brokerage. You can’t get investment bankers in the door if don’t have an institutional brokerage.” And given the compensation structure for analysts the same appears to be true in reverse. The same analyst quoted above outlined the compensation structure:

[Today compensation is] three million dollars total for a top analyst, right into the seven figures…. [When I worked at Dean Witter] they’d get a two hundred thousand dollar
base, eight hundred [thousand dollar] bonus, most of that bonus from underwriting. At Dean Witter we were given two bonus checks each year, one check was brought down by the head of corporate finance, he would walk around the research department handing out the checks making it very obvious who had been helpful and who had not. It was like having Santa Claus walking around research departments.

Maintaining a top ranked institutional research team currently costs around one to two hundred million dollars annually. The costs extend beyond simply paying the analyst’s compensation. The II Team rankings are based on a survey of institutional money managers. Swaying these judges generally involves a large research budget, a team of supporting analysts, and a lavish industry seminar in an exotic location.

![Research Prominence](image)

**Figure 17: Research prominence with institutional investors**

PaineWebber acquired institutional brokerage firm Mitchell Hutchins in 1977. The acquisition transformed the firm from an also-ran in 1976, whom institutions did not even rate among the top-15 research providers, into the highest ranking research firm in 1977 and 1978 (figure 17). Merrill Lynch boosted its research ratings through less dramatic steps including hiring star analysts away from other firms and quickly rose from outside the top fifteen ranked research firms in 1974 to the third highest by 1977.

Merrill Lynch and PaineWebber have clearly shouldered a large cost to achieve prominence in institutional quality research. The analysts at Merrill Lynch accounted for about ten to fifteen percent of all II team members from 1975 to 1999 and the analysts at PaineWebber accounted for five to ten percent of the team (figure 18). From 1974 to 1999 Merrill Lynch placed a total of
1,071 analysts on Institutional Investor's annual All-America Research team and PaineWebber placed 614 analysts on the team. A.G. Edwards did not place a single analyst on the team in any year, nor did it ever rank among the top research firms in any Financial World survey.

![Equity Research Analysts](image)

**Figure 18: Recognized equity analysts**

Even after all these expenses, however, an aspiring investment bank could find their distribution capabilities co-opted by the entrenched competitors. A former Merrill Lynch executive remembered,

> Goldman's strength was in advisory roles and Merrill's was in retail distribution. Goldman actually used our retail strength against us beautifully. They told clients that they could get our retail distribution strength by adding us on as a co-manager so why make Merrill the book manager.

**Raiding and acquiring leading investment banks**

In addition to trying to take top roles by leveraging capabilities other than corporate-finance skills, aspiring investment banking firms often hired corporate finance specialists away from established rivals. Firms hoped that these people would bring both their relationships and corporate finance skills to their new employer. This strategy has proven difficult to execute successfully. A Merrill Lynch veteran with twenty-five years experience recalled,
From 1978-1980 I was head of recruiting for Merrill. We had a recruiter hired to bring in industrial bankers and M&A bankers. He was having a very hard time. The industrial bankers would say that we had such a weak advisory business that they wouldn't come to Merrill. The M&A bankers said that our industrial bankers were so weak that they wouldn't get the relationships they needed to be effective.

Top corporate-finance and M&A specialists are wary about transferring to a less-established firm. As Merrill Lynch’s recruiting experience highlighted, industrial bankers brought basic corporate finance skills that maintained relationships with corporations. These relationships help attract specialists in mergers and acquisitions whose assignments are too sporadic to be the basis for maintaining relationships. These specialists, in turn, increase the value of the relationship making a firm far more attractive to industrial bankers (figure 19). The need to leverage these relationships made it difficult to acquire skilled professionals in a piecemeal manner.

![Diagram: Leveraging Relationships](image)

**Figure 19: Leveraging Relationships**

Investment bankers tend to treat the stronger firms as a place to develop their skills, contacts, and reputation as well as potentially become very wealthy if they are successful. The less established firms, therefore, tend to get the people who are not as successful or those who are ready to “cash-out” and take a large payment in return for cutting off their career development. Even when less established firms do get top people it is often hard for those people to be effective with lower caliber support and less experienced colleagues. Except at the very most senior level they are
often also hampered by clients’ suspicions that leaving signals an individual’s weakness relative to colleagues at their previous employer.

Individual hires appear to have created similar challenges at PaineWebber. Though several of the people hired have received praise from interviewees, they were usually singled out as exceptions. A former PaineWebber employee remarked “PaineWebber hired a lot of second-rate talent, paid them a lot of money, and charged off on a path to do big deals.”

Merrill Lynch and PaineWebber also attempted to leap into the more sophisticated tasks by acquiring entire investment banking firms. Top managers at both firms determined that building up an investment banking presence internally would be expensive, time consuming, and difficult if at all possible. A former PaineWebber manager, who headed a finance division at PaineWebber in the 1970s and 1980s, put it, “Since it takes a lot of time, money, perseverance to build up a presence it seemed they [Paine Webber, Jackson & Curtis] could get way ahead if they could buy an established firm. The logic was right.”

Merrill Lynch moved first by announcing in April 1978 that it would acquire White Weld. PaineWebber followed quickly closing a deal with Blyth Eastman Dillon in 1979.

How great an advantage did the acquisitions provide each firm? One way to answer this is to look at the history of the two acquired firms. In this regard Blyth Eastman Dillon (BED) was a more substantial acquisition. From 1970 to 1977 BED and its predecessor Blyth underwrote 122 equity-related issues for the U.S. public market, nine of those issues for Fortune 500 clients. During the same period White Weld underwrote 128 equity-related issues, but only five of them were for Fortune 500 clients suggesting a weaker overall client base. In overall underwriting volume BED held a substantial lead over White Weld (see table 1).

During an acquisition many of the most capable corporate finance professionals are often drawn away to rival firms. The most appropriate way to address the significance of the acquisitions, therefore, may be to ask how many of the acquired firms’ relationships were retained.

In this regard Merrill Lynch appears to have made the strongest direct gain from its acquisition. From 1981 to 1990 Merrill Lynch underwrote fifty-one equity-related issues for forty different
Fortune 500 clients. These included all five of the former White Weld equity clients. All the clients retained were in or near the upper half of the Fortune 500 (American Cynamid ranking 108th; International Minerals & Chemicals, 224th; Penzoil, 190th; Wang Laboratories Inc., 161st; and West Point-Pepperell Inc., 276th). From 1981 to 1990 PaineWebber underwrote nine equity-related issues for seven different Fortune 500 clients. These included only two of the nine clients that had done equity deals with BED or its predecessor Blyth and only one those clients (Georgia Pacific, 68th) ranked among the Fortune 300.

Those within Merrill Lynch view the acquisition as a critical turning point in corporate finance skill. A Merrill Lynch relationship manager put it “I don’t see how we could have lead [book] managed before White-Weld.” Retail investors, however, were still the dominant investors in equity as late as the 1970s. The relationship manager pointed out that Merrill Lynch’s volume prior to that acquisition likely came from distributional strength not corporate finance skill, “If it was equity, then as a wirehouse [retail broker] our retail strength might have accounted for [book manager roles].”

In many ways the acquisition promised a larger step for PaineWebber than for Merrill Lynch. From 1970 to 1977 Merrill Lynch had underwritten 275 equity-related issues, more than double that of White Weld, and twelve of those had been for Fortune 500 companies compared to only five for its new acquisition. PaineWebber’s 65 previous equity underwritings on the other hand were only half as many as BED’s, and only three of PaineWebber’s transactions were for Fortune 500 clients compared to nine for its new acquisition.

Why Merrill Lynch was able to keep more of White Weld’s customers is not entirely clear. Perhaps Merrill Lynch’s stronger initial position helped. Most people, however, attribute the success to better management. A Merrill Lynch alumnus remembers that part of the recipe was to give White Weld professionals positions of influence in Merrill Lynch and high pay for the people they knew they wanted.

This group of professionals formed a critical mass that helped Merrill Lynch overcome the hiring challenges that had bedeviled them in the past. A former Merrill Lynch executive remembers:
During that time it was hard to hire people because everyone was looking to see who else is coming to Merrill Lynch. You need interlocking strength in many areas... The watershed was in 1978. The White-Weld acquisition allowed us to bring on and retain some very capable people in several areas. We got Jerry Kenney who is now the head of corporate strategy and was the head of research at White-Weld.

Former PaineWebber bankers credit Merrill Lynch with planning and managing the acquisition and integration with far greater care than occurred at PaineWebber. That, however, may not have been hard to achieve. BED brought with it a substantial brokerage operation as did White Weld. As a result of increased brokerage volume, however, PaineWebber’s back office systems were unable to process transactions properly for almost a year.

The back-office problems led to a SEC investigation that imposed limits on expanding PaineWebber’s activity and the firm lost money in a year when rivals were highly profitable. The problems also put former Blyth partners at a disadvantage with their existing corporate relationships. The same CEOs who were providing corporate finance work were also retail customers.

The back-office problems diverted management’s attention from the merger and concerns rose that PaineWebber might not survive the crisis. A former investment banker at PaineWebber recalled:

Managers allowed the firm to almost go under in the aftermath of the acquisition. And they didn’t pay attention to the key investment bankers, who were the main reason to do the merger. They allowed them one-by-one to drift out the door to competition.

The outflow of corporate finance specialists shows up in PaineWebber’s reports to the Securities Industry Association (SIA). In January 1978 before the merger BED had 81 domestic corporate finance specialists and PaineWebber had 65. Their combined 146 almost exactly matches the 145 reported by the merged groups of Merrill Lynch and White Weld (Hayes 1979). By 1980 both merged firms (Blyth Eastman PaineWebber and Merrill Lynch White Weld Capital) were reporting an increased total of 165 corporate finance specialists. That number dropped sharply to 121 and then recovered only slightly to 129 at PaineWebber over the next two years. In contrast,
the corporate finance professional staff at Merrill Lynch nearly doubled in size in the same time period, growing to 266 members by 1982.\textsuperscript{58}

According to interviewees, PaineWebber made a strong recruiting push at the entry level and the senior level over the following years. Stepped up recruiting drives in 1982 and 1983 at the entry level yielded very few MBA candidates from the top schools, with most new hires coming from second-tier institutions. Between 1983 and 1987 PaineWebber managers tried to build into the new boom areas for investment banks: merchant banking, leveraged buy-outs, advisory services, and high-yield debt. Former staff members describe a situation where senior hires were brought in from other firms with impressive pay packages but few proved able to close deals and few stayed. One interviewee pointed out that “people hire people” and the top managers at PaineWebber didn’t know enough about investment banking to select the right people or convey confidence to those who could have helped most.

The late hiring also had a very different character from the original investment banking push. The clients for the work differed at both ends of the deal. The high-yield bonds to be underwritten for targeted LBO work were not strong candidates for distribution to retail clients and the merchant banking and LBO deals rarely involved Fortune 500 clients. Instead the main appeal was to corporate raiders like T. Boone Pickens.

Over the following years the firm built up a cadre of people and promoted them to vice-president after five years of hard work. According to one source many of these vice-presidents had never been involved in closing a successful deal and another reports that junior bankers’ careers at the firm were cut short. At a time when his peers at more successful banks were receiving large bonuses, one junior banker at PaineWebber who had worked on a number of deals that had not been completed found himself fired instead of receiving the large bonus he expected.

In contrast, Merrill Lynch was able to hold onto its top people and give junior people a chance to develop their skills. One Merrill Lynch investment banker pointed out that investment-banking

\textsuperscript{58} Figures for 1979 on are reported in the Securities Industry Yearbook published by the Securities Industry Association. The figures submitted by Merrill Lynch to the SIA in 1981 are broken out in a way that is not comparable to previous or subsequent years.
skills depend not only on the number of deals a banker has worked on but the specific kinds of deals as well:

There are two types of skills. There are generic skills: thinking, selling, writing. These get refined through doing deals. Then there is experience from doing deals, deal knowledge. This includes structuring, have you seen something like this before and therefore know what the other side is thinking and what they will do because you’ve been there before. You also gain specific industry knowledge. There’s a steep curve of learning at first [hand waving out an exponential growth curve] that slows down but never really tops out.

These experiences then provided the basis for winning assignments of similar complexity. After recounting success on a sophisticated cross-border merger the same banker pointed out “In addition to pricing the deal you have all these specific issues. You need to be able to explain to management [of a potential client] how they work… Once we’ve done that type of deal once the next one is a layup.”

9.3 Competing on a pound for pound basis

Moving beyond these support roles required not only external positioning but internal changes as well. These internal changes were needed because a firm that is attractive to highly skilled individuals and capable of doing highly sophisticated tasks is also attractive to less skilled individuals and capable of doing less sophisticated tasks.

Upgrading professionals and assignments

A former Merrill Lynch executive recounted how executive recruiters in the 1980s told him, “if you were a B player at Merrill you stayed because you were not going to be hired by Morgan or Goldman who only wanted A bankers. You stayed at Merrill because the retail franchise was more important to getting underwriting than the bankers.” And these bankers continued to leverage distribution to win less sophisticated roles. According to the same former Merrill Lynch executive:

Bankers at Merrill were satisfied with getting on the right-hand-side [as comangers] of deals. They were making less, a couple hundred thousand [dollars] a year, but you could
get by on that. Bankers had no where else to go as C or B players where they could make as much. Nowhere else could they leverage retail distribution to get business.

Those internal changes include looking hard at the kinds of assignments a firm will accept. Clients often expect their lead banker to help them with transactions that are not particularly challenging or rewarding. Failing to take on these assignments opens the relationship to rival firms who will use them both to prove their capabilities and to extract promises from clients that they will be given roles on future assignments that the lead investment banker does want. However, tackling these assignments can also create problems. As the head of one of the largest investment banking units at Merrill Lynch put it:

Remember our main asset is people. If we let them get misallocated we’ve got a problem. We talk about [which deals to take] all the time...If Frank gets stuck on the smaller deals that we take he’s dealing with less sophisticated issues but issues still pop up...[and] it still takes as long. Then Frank gets frustrated and quits. [Even if he stays] he’s kinda out of it for six months. There are the collateral costs in terms of the other work that he could have been able to do and Frank loses the opportunity to be involved in and learning about other issues.

![Diagram](image)

**Figure 20: Focus matters**

Figure 20 captures this challenge. As a firm’s capabilities rise it becomes more attractive to the large industrial clients. This allows staff to work at the forefront of practice, reinforcing their capabilities through learning opportunities and high fees that boost compensation and staff retention. The capabilities also make the firm more attractive to smaller clients and for less
sophisticated work. Taking on this type of work, however, puts individuals into a conceptual backwater where they are learning and earning less and defect with their skills.

Balance in upgrading

Firms cannot entirely ignore the less interesting work. A partner at consulting firm Greenwich Associates, a leading research and consulting firm for investment banking, says:

It is important to do the vanilla [unsophisticated] business. The guys doing this business are the ones showing up at the door every week and every year. Eventually they can tell the client that they've earned a shot at the higher-margin more episodic business.

Still, the firm does not need to do all things for all clients. The same partner says “It's critical though to have an understanding of what certain organizations want. The one-stop-shop is really more a factor for the middle-market [smaller] clients. With the Fortune 300 the question is 'what do you have to do to earn my business.'” And from an elite banker's perspective, the less sophisticated work is done primarily as a service for important clients. One of Merrill Lynch's top investment bankers notes;

Smaller deals are the ones you don’t want to do. We say that they are below our radar screen. We will do them for big and important clients but there is a danger because they are self-perpetuating. If you do the last deal of this type you end up doing the next, so you want to have done the last big deal.

PaineWebber may have attempted to upgrade its people’s assignments too rapidly as it built up its advisory business. One former employee remembered that PaineWebber had a steady and profitable flow of M&A work coming from retail brokerage connections prior to the BED merger. During the booming 1980s as PaineWebber built up its M&A and merchant banking practices however he remembers, “Everyone was trying to do the big deals, nobody wanted to pay attention to [deals flowing from] the retail part...they were hiring too many people too quickly and ignoring existing franchises.” During the 1980’s the average proceeds of PaineWebber’s completed merger and acquisition deals fell well behind the average proceeds of all deals (figure 21) suggesting that junior bankers who avoided roles on smaller deals were not getting solid learning experiences at either level of sophistication.
Figure 21: Merger and acquisition advisory assignments

Figure 22: Sophistication of Client Mix

One of the most striking differences between Merrill Lynch and PaineWebber is in how they shifted their mix of business over time. Merrill Lynch not only increased the amount of business it performed for Fortune 500 clients, it also shifted its mix of business toward Fortune 500...
clients. In contrast, PaineWebber actually saw its proportion of work for more sophisticated clients fall as it attempted to build up its underwriting practice (figure 22).\footnote{The graphic understates the activity of Fortune 500 clients in the 1990s. See the “note on the use of transaction data” in the appendix.}

One explanation for the different trajectories might be simply that Merrill Lynch already had a huge share of all public transactions and any increase could only come at the top end. Figure 18 confirms that Merrill Lynch did have a much larger share of all underwritings during the 1970s and 1980s than PaineWebber. It is notable, however, that Merrill Lynch’s broad market share remains constant even as the firm builds up its investment banking practice in more sophisticated areas. Only after Merrill Lynch’s client base was as sophisticated as the overall market did its overall market share rise. Merrill Lynch’s success in nearly doubling its share of the overall market at that time suggests that there was room for expansion earlier if Merrill Lynch had pursued it.

![Broad Market Share Graph](image)

**Figure 23: Overall Market Penetration**

PaineWebber, however, led its investment banking push by increasing its overall share transactions by as much as a factor of three following the BED merger (figure 23). As PaineWebber took on a large volume of less sophisticated clients its mix of business shifted
downward with the overall market (figure 22) even as its penetration of Fortune 500 clients rose (see figure 9).

10. Discussion

The choice of intended clients and activities that together I have termed the competitive model can be a significant source of variation in profitability across firms. As the financial performance of firms pursuing similar competitive models attest, however, there are substantial differences in profitability that remain unexplained by these choices.

Merrill Lynch’s superior execution of the same strategy that it and PaineWebber pursued has contributed to a substantial and sustained profitability advantage over a long period of time. Both firms carry large costs to field a team of outstanding research analysts, but only one firm has built the scale in investment banking needed to cover those expenses.

PaineWebber had less distribution capability to offer potential clients. PaineWebber’s retail network has never been more than half as large as Merrill Lynch’s. Furthermore, PaineWebber’s relative strength in equity research faded before PaineWebber acquired BOD and hired other senior investment bankers who might have been in a position to leverage this strength.

Merrill Lynch’s distribution capability, however, was not a tool that would automatically move the firm into the upper ranks of investment banking. As long as Merrill Lynch was willing to be taken on as a co-manager this ability provided very little leverage, and potential clients could muster a similar amount of distribution strength by taking on any two of the next five largest retail brokerages as co-managers.

In fact, distribution strength had the potential to be as much a threat to advancement as an asset. Distribution strength compensated for less skilled investment bankers, providing Merrill Lynch with a solid flow of less sophisticated assignments. Without strong intervention, these assignments could have maintained Merrill Lynch’s position as a haven for second-string corporate finance professionals.
Merrill Lynch managers overcame this role by successfully acquiring and retaining top-level individuals from White Weld. The capabilities and relationships that these individuals brought to the firm supplied ongoing opportunities for Merrill Lynch personnel to gain experience in sophisticated corporate finance tasks and provided leadership for additional expansion. PaineWebber’s disastrous merger with BED and later attempts at senior hires never provided a stable ground for developing the skills of junior professionals or teamwork among senior professionals.

Without this advantage, PaineWebber was unable to gain as quickly at the top of the sophistication spectrum as it allowed itself to gain at the bottom. This dilution of experience and effort helped keep PaineWebber at the margins of the business. As Merrill Lynch built its investment banking practice it successfully shifted its focus toward more challenging and profitable clients and assignments. This provided an environment where professionals could count on working on projects that would develop their skills and justify their compensation. These professionals, in turn, won the assignments and clients that identify Merrill Lynch as an elite investment bank.
Afterword

On July 14th 2000 PaineWebber announced plans to sell itself to UBS. The acquisition follows four years of near record profitability at PaineWebber during which its after-tax return on equity averaged almost twenty percent. During this period, 1996 to 1999, PaineWebber was nearly as profitable as Merrill Lynch and slightly more profitable than A.G. Edwards.

The $10.8 billion purchase represents forty-seven percent premium over PaineWebber’s closing price on July 11th, 2000. One press release cites expected 45% of synergies to come in the form of cost reduction and 55% through revenue enhancement.60 In documents produced for investors and the media the two firms highlight the potential for UBS product sales through PaineWebber’s productive retail sales force to its unusually affluent retail customer base.61 The firms’ managers also note, though to a lesser extent, that PaineWebber provides strong institutional research and distribution strengths.

Notably absent from the materials is any claim that PaineWebber brings a strong practice with corporate (investment banking) clients. Of the five key business leaders cited in the main pre-merger press release not one mentioned PaineWebber’s investment banking strength while four of the five mentioned retail strength. PaineWebber’s investment banking operations are conspicuously absent in Markus Granziol’s - the Chairman and CEO of UBS Warburg - quote: "PaineWebber's powerful retail distribution, research and institutional capabilities in the US will significantly strengthen UBS Warburg's position. Combined with our institutional and corporate client franchises, we see significant opportunities for accelerating growth."62

Over the last several years analysts repeatedly pointed to PaineWebber’s links to wealthy individual brokerage clients and strong growth in asset management activity as the drivers of its rebounding profits. In addition, PaineWebber scaled back on the expenses it carried in order to

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60 “UBS to merge with PaineWebber” an electronic document labeled as a press release made available on the UBS web site at the time of and following the merger.
61 See for example “PaineWebber and UBS: Combining two premier firms serving private and institutional clients globally” an electronic document made available on the UBS web site at the time of and following the merger.
compete for investment banking transactions. PaineWebber continues to perform institutional brokerage and is no lightweight in research. However, it has consistently reduced the number of dedicated institutional sales people reported to the SIA from a high of 550 people in 1990 to zero by 1995. Its II team analysts dropped from a high of thirty-six in 1990 to only nineteen by 1999 whereas Merrill Lynch increased its number of team members from forty-four to fifty-six.

If Merrill Lynch had not succeeded in developing an investment banking practice, a classic strategy analysis of PaineWebber might suggest that it was “caught in the middle” (Porter 1980). It had made the mistake of trying to straddle two business models, become saddled with costs, and lost its focus. Viewed from PaineWebber’s experience it would be logical to conclude that problem was that the combination did not make sense.

Merrill Lynch’s experience has shown, however, that a combination of the two sets of activities can be profitable and that PaineWebber’s profits did not suffer primarily because it chose a strategy that did not make sense. PaineWebber’s profits suffered because it failed to execute the chosen strategy. In the 1990s PaineWebber retrenched into a focused brokerage strategy that it has since executed increasingly well.
Appendix 1: Figure A1 - Recent profitability in the securities industry

![Securities Industry Profitability](image)

Average Return on Equity (1986 to 1996)

Bear Stearns  Morgan Stanley
A.G. Edwards  Alex Brown
Merrill Lynch  PaineWebber

Source: Compustat and Annual Reports

Risk (σ ROE)
Appendix 2: Note on the use of transaction data

A great deal of the analysis in this paper has relied on underwriting and advisory transaction records. These records were downloaded from the Securities Data Corporation (SDC) database under agreement with MIT. The SDC serves as the main source of transaction information to industry publications and firms in the securities industry.

Where possible, significant findings based on the SDC data were checked against transaction information reported by other sources. Unresolved discrepancies between Merrill Lynch's volume of private placement transactions as reported by the SDC and other information sources led to a focus on public transactions as indicators of a firm's market activity. The bulk of these discrepancies are believed to stem from how private placements are defined. By their nature, however, private placements are more prone to error in recording.

The data used for the analysis is based on a sample of firms. The sample was selected to include all firms that appeared among the top-ten underwriters - ranked by dollar volume of book-managed transactions – during any year in the 1970s and in the 1990s. Due to the structure of the SDC database this meant that transactions book managed by any firm merged into the firms selected were also included in the analysis. As a result the vast majority of transactions and all firms of significant size are represented. However, the figures given for market share are biased slightly upward given that some transactions by smaller firms are not represented in the sample.

Identifying transactions for Fortune 500 companies required additional data entry. The SDC database includes fields for Fortune, Forbes, and Business Week rankings of client firms. These fields, however, proved to be unreliable as downloaded. Many records had multiple conflicting rankings and the predominant Fortune 500 ranking proved to be the 1998 ranking of the firm regardless of the year in which the transaction took place. In order to assign rankings I broke the data into five-year periods (1970 to 1972, 1973 to 1977, 1978 to 1983 etc.) and created a file listing all client names during that period. I then used the Fortune 500 listings from the middle year (1970, 1975, 1980 etc.) to assign a rank for each Fortune 500 client appearing on that list.
The Fortune 500 criteria shifted, however, following the 1990 listing. Instead of listing the 500 largest industrial firms the listing included firms in retail, finance, and other industries. Firms in these industries confuse the analysis in two respects. First, they are not as good a proxy for sophisticated clients. Unlike the classic industrials, many of these firms have less complicated funding needs. Second, many captive clients and many of the securities firms themselves appear in the new Fortune 500 listing. For this reason Fortune 500 status after 1990 was entirely based on the 1990 listing. This means that large industrials that grew significantly after 1990 are underrepresented in the analysis and industrials that failed to grow are over represented. It is likely that this bias accounts for a large portion, if not all, of the decline in overall underwriting share reported for Fortune 500 clients after 1990 (figure 22).
Appendix 3: Book managers for General Motors transactions

General Motors (GM) provides an example of the shift in focus. The figures detail the number of transactions that GM and its subsidiaries conducted with each investment bank as a book manager. From 1970 until 1982 Morgan Stanley was the book manager for all of GM’s transactions. Morgan Stanley continued to play a key role in many of GM’s transactions thereafter. GMs vast capital needs have allowed it to spread a considerable amount of business more widely than most companies and the corporation appears to have changed allegiances several times in the ensuing years. The bulk of the underwriting assignments, however, have always been apportioned among the elite firms and eleven of GM’s equity related securities issues have been book managed by one of the elite firms.

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Figure A3.1 All General Motors Transactions

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Figure A3.2 All General Motors Equity-Related Transactions

Source: Analysis of Securities Data Corporation transaction database.
References


Conclusion

The research in this paper was motivated by two questions. Why do hierarchies arise in professional-services industries? How do firms upgrade their capabilities and client work relative to competitors?

At the outset it was clear that insight into these questions would be useful for managers of professional services firms. More generally, it was hoped that the research would help to unify two central concepts in strategy research: firm capabilities and market positions. While these concepts are known to interact in practice they are still usually treated separately in research or as if one was causal and the other merely an effect. Unifying these theories in a manner that gives appropriate respect to their individual importance and co-evolutionary nature should lead to a sharper and richer understanding of competitive dynamics.

The research combined an empirical inductive logic based on case study research with a theoretical deductive logic based on past theory and mathematical models. The two approaches were used iteratively throughout the research process to identify hypotheses, guide data collection, and evaluate tentative explanations. The mathematical analysis of developing theoretical structures sharpened the focus for interviews, data collection, and library research. The empirical findings led to constant revision of the developing theory and identified policies and hypotheses that the mathematical model of that theory could be used to evaluate.

The investment banking industry was chosen as an empirical setting because detailed public records of client work have been maintained for several decades for all major and most minor firms. In addition, a rich industry press reports on the investment-banking industry. These sources of information were critical given the need to evaluate firm development over long periods of time. Contemporary reports and numerical data provide a check on the recollections of managers as they kindly attempt to accurately recall processes and events that have taken several decades to play out.
Interviews pointed to key structural elements of the industry. The capabilities of a firm’s people depend on the client work they do. Highly capable individuals asked to work on unsophisticated assignments lose opportunities to work on issues that will hone their skills and keep their knowledge up to date. As a result the firm loses capabilities relative to those it would have had, and tends to lose additional capabilities as personnel become frustrated and leave the firm or the industry to find more satisfying challenges. Highly capable people are hard to recruit to and retain at firms that do not already have a base of sophisticated client work and client relationships. Similarly the sophistication of a firm’s client work depends on the capabilities it can bring to client assignments. There is a continuum of sophistication required to execute assignments ranging from the very low (e.g., investment-grade bonds) to the very high (e.g., large equity issues). Clients with sophisticated assignments seek out highly capable firms — whom they are confident can execute these transactions — rather than low prices.

The picture that emerged from numerical data, press reports, and management interviews clearly pointed to one key turning point in the history of the two firms. Neither firm had been able to put together a highly capable investment banking practice serving sophisticated clients prior to the late 1970s even though at least one of them had been trying very hard to hire very capable people. The firm that successfully integrated an entire elite investment bank saw its share of sophisticated client work rise rapidly over time until it commanded a leading position among sophisticated clients and a leading reputation for its capabilities. The firm that was unsuccessful in retaining the personnel of the elite investment bank it acquired saw its sophisticated client work fall over time. Even though it tried to hire very capable individuals after that failure, its efforts were largely unsuccessful resulting in a very weak position in sophisticated client work and low respect for its capabilities.

Why were these acquisitions such a critical turning point? Analysis of the dynamic behavioral model suggests that it is very difficult to develop capabilities slowly. The inflow of capabilities is quickly offset by an outflow of people and lost skill-development opportunities until the sophistication of the client work rises substantially. A successful acquisition by Merrill Lynch sped capability development and overcame the gravitational pull of the existing unsophisticated customer base. Furthermore, analysis of the model suggests that a firm can speed capability
development by showing restraint in the kinds of client work accepted. Following its successful acquisition, the transaction data confirm that Merrill Lynch showed restraint and thereby upgraded its client work. On the heels of an expensive acquisition and lacking the capabilities needed to develop business with sophisticated clients it must have been very hard for PaineWebber’s managers to exercise similar restraint explaining why the firm’s transaction data show a boom in unsophisticated client work.

The behavioral and game-theoretic models were developed around an investment-banking context. The analytical results, however, are logically if tentatively generalizable to other settings. The same implications appear to hold wherever the sophistication of client work has a strong effect on capability development, where sophisticated clients value capabilities more highly than unsophisticated clients value them, and where firms’ capabilities have a substantial influence on a client’s choice of product or service provider. When these conditions are met, we can expect to see markets stratifying into hierarchies with firms at the top of those hierarchies earning high-returns as they charge for the capabilities they develop through client work. In these cases, we should also expect to see the leading firms taking a dominant share of their industry when fixed-costs rise with capabilities and when customers place a high value on capabilities regardless of the sophistication of their own needs.