

**Evolution of Fit:
The Voyage of Vanguard**

Nicolaj Siggelkow

Management Department
Wharton School
2017 Steinberg Hall – Dietrich Hall
University of Pennsylvania
Philadelphia, PA 19104

siggelkow@wharton.upenn.edu
tel: (215) 573-7137

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Abstract:

While firms have frequently been conceptualized as configurations of choices, the evolution of configurations has not received much attention. We start to develop a typology of evolutionary patterns by describing two developmental paths. *Patch-by-patch* development is characterized by managers' sequential creation and elaboration of strategic themes, whereas *thin-to-thick* development consists of an early formulation of strategic themes and subsequent elaboration with supporting choices. A longitudinal study of The Vanguard Group illustrates a proposed approach to identifying the developmental pattern of a particular firm. Moreover, the study yields hypotheses concerning the relationship between the patterns and drivers of a firm's development.

Firms have been conceptualized as systems of highly interconnected choices in a variety of literatures (e.g., Miller, 1981; Milgrom and Roberts, 1990; Porter, 1996; Levinthal, 1997; Whittington, et al., 1999). In these analyses, firms' choices with respect to activities, policies, organizational structures, capabilities and resources are seen to form complex interdependent systems. Yet firms are generally not born with fully elaborated interconnected systems. Hence, the question arises how these systems evolve over time. The notions that firms strive to create fit between strategy and structure (Chandler, 1962) and are composed of coherent configurations of choices have long-standing traditions within the management and organization literatures (e.g., Learned, et al., 1961; Miles and Snow, 1984; Miller and Friesen, 1984). However, existing theories shed only little light on the question of how these systems of interconnected choices evolve. To take a modest step towards answering this question, we develop a typology of developmental patterns characterizing the evolution of fit at the choice level. In particular, in the first part of this paper, we develop two new theoretical constructs, describing two polar patterns of development, termed *patch-by-patch* and *thin-to-thick*.

In the second part of the paper, we illustrate a proposed research strategy to distinguish between the two patterns of development. We track the evolution of The Vanguard Group, the second-largest provider of mutual funds in the U.S., from its inception to early 1997. The focus on one organization allows us to conduct the analysis at the necessary level of detail to understand firm evolution at the individual choice level. In the spirit of grounded theory building (Glaser and Strauss, 1967), the case methodology (Yin, 1984; Eisenhardt, 1989a) has served well for gaining insight into similarly complex and longitudinal issues such as strategy formation (Mintzberg and Waters, 1982; Mintzberg and McHugh, 1985); decision making within organizations (Pettigrew, 1973; Eisenhardt and Bourgeois, 1988); strategic business exit (Burgelman, 1994); the resource allocation process (Bower, 1970); and the management of organizational and strategic changes (Pettigrew, 1985; Child and Smith, 1987; Burgelman, 1991; Siggelkow, forthcoming). The study of Vanguard not only illustrates the research methodology, but also allows us to derive a set of hypotheses relating key drivers of the evolutionary process to different types of

developmental patterns. In particular, the study suggests that the patch-by-patch and thin-to-thick developmental patterns may lead to the emergence of different types of positive feedback loops among a firm's set of choices.

THEORY

Prior Work

A large body of research has found that firms can be fruitfully described as systems of interconnected choices. Both conceptually and empirically, the work on configurations (Miller, 1981; 1986; Miller and Friesen, 1984) and strategic typologies (Porter, 1980; Hambrick, 1983; Miles and Snow, 1984) has shown the value of conceptualizing a firm's choices as forming a system. Moreover, the organizational literature has pointed out that fit within these systems is best described not by pairwise associations between variables, but by gestalts describing sets of elements and their interrelationships (Khandwalla, 1973; Drazin and Van de Ven, 1985; Van de Ven and Drazin, 1985). More recent research has formalized these notions of interaction using frameworks and tools originating from the field of complexity research (e.g., Levinthal, 1997; McKelvey, 1999; Gavetti and Levinthal, 2000; Rivkin, 2000). Parallel to these efforts, economists, as well, have become interested in the system aspects of firms' choices and have started to create mathematical frameworks that allow rigorous modeling of mutually reinforcing interactions among many choices made by firms (Milgrom and Roberts, 1990; 1995). While the concept of a configuration has been established as a useful construct, configurations have often been treated in a static manner. For instance, the analyses of Milgrom and Roberts (1995) and Porter (1996) employ a "snapshot-in-time" approach, describing firms' systems of choices only at one point in time, thus, providing no insight into the evolution of these sets of choices.

Within the organizational literature, prior work on configuration has also not addressed evolution at the level of individual choices. However, broad patterns of changes have been described. In early work, Miller and Friesen (1980) found that, during most of an organization's life, its configuration changes only incrementally. Moreover, changes tended to continue in the same direction—i.e., configurations showed

high degrees of “momentum.”¹ In subsequent work, Miller and Friesen (1982) found that firms periodically engage in quantum changes—i.e., changes in many attributes that take place in a short period of time. Similarly, Tushman and Romanelli (1985) described the developmental path of firms employing a punctuated equilibrium model of organizational evolution. Firms engage in incremental changes during most of their history, yet sporadically undergo relatively rapid and fundamental transformations (Gersick, 1991). Empirical support of this developmental pattern has been provided by Tushman, Newman, and Romanelli (1986), Pettigrew (1987), and Romanelli and Tushman (1994).

While these studies outline broad patterns of development, our analysis aims at a more fine-grained level of inquiry, focusing on a firm’s individual choices. To make the issue concrete, consider Figure 1, which depicts Vanguard’s system of choices in early 1997. The question of concern is: how did this system evolve over time? What was the pattern of how Vanguard added or changed its choices from its founding in 1974 to 1997? Existing literature does not provide much guidance on this question. Coming to a similar conclusion in a recent review of the work on configurations, Miller (1996) called for “more studies that examine the sequences of interactions that create configurations. These might reveal, for example, when and how dominant themes arise . . . [and] how elements of strategy, structure and process reinforce each other” (p. 508). Before engaging—in the second part of this paper—in a study that describes “the sequence of interactions that created a configuration,” we develop a conceptual framework that centers around “when and how dominant themes arise.” In particular, we derive two new theoretical constructs that describe two polar patterns of firm evolution, *patch-by-patch* and *thin-to-thick*. In the patch-by-patch pattern, a firm starts with one dominant or strategic theme (Porter, 1996) and elaborates on it before creating and concentrating on the next theme (a discussion of the “strategic theme” concept will follow below). Going back to Figure 1, the patch-by-patch pattern would imply that the system of choices was created in “patches.” That is, management would have started with elaborating one strategic theme (depicted by large, dark circles in Figure 1) and then focused on creating and elaborating sequentially on further strategic themes. In contrast, the thin-to-thick pattern (in its purest form) is

characterized by a firm starting out with all strategic themes present. Over time, the firm elaborates and supports its strategic themes with more and more activity, resource, and policy choices. In this case, the maps of a firm's choices at various points in time would reveal that the strategic themes remain constant over time. The system starts out relatively sparse and fills in over time—i.e., the map would first look “thin,” and later “thick,” with choices and interactions.

Two Developmental Patterns

If a complex system, like the one depicted in Figure 1, is not conceived and created in full at its inception—an unlikely scenario with boundedly rational actors (Simon, 1945)—how can such a system be built, or how does it evolve? On an abstract, general level, the question is how the complex process of creating a large, complex system can be broken down into smaller pieces? The two proposed developmental patterns, patch-by-patch and thin-to-thick, describe two possible ways of breaking down such a problem. For the purpose of exposition, it is useful to think about a firm prior to its founding as being composed of independent, or weakly interconnected, generic activity choices. With this framing, the question of development becomes: how does the firm differentiate these generic choices over time? In the patch-by-patch process, the firm starts with one strategic theme and differentiates activities associated with this theme. A theme can focus on one part of the value chain (e.g., implement and refine a direct distribution system) or can cut across different stages of the value chain (e.g., implement and refine a low-cost strategy). After the firm has elaborated on the first theme, it would create a second theme, a third, and so on. Brown and Eisenhardt (1997) have reported an empirical observation consistent with this pattern. In their study of firms in the computer industry from 1993–1995, they described how one firm, Cruising, had transformed itself from a poor performer to a good performer:

[Cruising's management] began by focusing on current projects and getting rid of their lock-step and bureaucratic processes, increasing communication, and adding project-level responsibilities. With that accomplished, they concentrated on developing their sense of the future through tactics such as futurists and alliances with leading-edge technology providers. Lastly, they turned to the transition between current and future projects, ultimately settling on a 4/8 quarter rhythm and a marketing-led transition. . . . Cruising managers did not instantly create their organization, but rather “grew” it over a period of several years. They developed and stabilized some pieces of the process, and then moved

on to the next. (pp. 30-31)

If the strategic themes are weakly interconnected, the patch-by-patch process will lead to a loosely coupled system (Weick, 1976; Orton and Weick, 1990) consisting of subsystems, which themselves are composed of individual choices that group around a particular strategic theme. In the words of Simon (1962), the overall system would be “near-decomposable.” Analyzing individual businesses within a firm, rather than individual choices, Eisenhardt and Brown (1999) and Galunic and Eisenhardt (1996) describe a similar “patching” process at a higher, corporate level.

The thin-to-thick developmental pattern displays a different dynamic. In this pattern, the firm starts out with a number of (weakly developed) strategic themes. In its purest form, all strategic themes would be set very early in the history of a firm and not be changed over time. Changes do occur, however, at the level of individual choices that implement or elaborate the strategic themes. First, over time, each strategic theme is supported by increasingly more choices. Second, individual choices might change to account for technological advancement, for example. The thin-to-thick process is, thus, characterized by important early decisions concerning strategic themes that consequently guide the developmental pattern of the firm. In the terminology of Mintzberg and Waters (1985), this developmental pattern can be described as a mixture of an “entrepreneurial” and an “umbrella” strategy. Early in a firm’s history, its founder(s) express their vision for the firm by making several key strategic and structural decisions that subsequently serve as general guidelines for behavior throughout the organization. In other words, they lay down an “organizational logic” (MacDuffie, 1995) or an “organizational blueprint” (Baron, Hannan, and Burton, 1999) that indicates preferred future direction without necessarily dictating particular practices. In the terminology of complexity research, the early choices of strategic themes serve as “natural attractors” for later choices (Ghemawat and Levinthal, 1999).

Several empirical studies have provided evidence consistent with thin-to-thick development. These studies show the long-lasting organizational imprinting effects of early decisions taken by firm founders.

For instance, Baron, Hannan and Burton (1999) observed that the founders' organizational model or "blueprint" influenced the extent of managerial intensity (i.e., reliance on managerial and administrative specialists) that developed over time. At a more fine-grained level of analysis, Sastry and Lee (1999) engaged in a longitudinal study covering 43 years of a successful non-profit organization in the financial service sector. Consistent with thin-to-thick development, they found that, despite substantial changes in both the organization's environment and its membership, the firm's internal structures relating to mission, culture, and authority structure stayed constant throughout the organization's life span.

Distinguishing between the Patterns

How can one distinguish empirically between the two developmental patterns described above? As illustrated in the subsequent study of Vanguard, we suggest the following approach:

- 1) Track the history of a firm from its founding over an extended period of time (more than ten years).
- 2) Divide the history into periods determined by key events or decisions.
- 3) For each period, conduct a value-chain-cum-interaction analysis, as described below, and map out the strategic themes, choices and interactions.

Ten years is probably the minimum time frame for such a study since profound strategic changes tend to occur very infrequently. Mintzberg and Waters (1982), in a longitudinal study of a retail chain, reported major shifts in strategic behavior roughly once every ten years. Even in a more volatile setting, Cockburn, Henderson, and Stern (1999) found that it took more than ten years for pharmaceutical companies to adopt (and implement) strategically new approaches to drug-discovery.

Maps displaying a firm's choices and the interactions among these choices can be a useful tool to analyze a firm's developmental pattern. To systematize the analysis leading to the maps and to ensure consistency over time, it is helpful to start by laying out the elements of a generic value chain of a firm in the particular industry (Porter, 1985). Then, at each point in time, the choices within each stage of the value chain can be described for the firm under study. Since a competitive advantage is more likely to

arise from distinct rather than from generic choices (Porter and Siggelkow, 2000), a particular focus is warranted for choices that differentiate a firm from its competitors. After the choices have been laid out, interactions among the choices can be identified. Two choices are said to interact if the value of one choice affects the value of the other. Choices can affect each other both positively and negatively. In the maps, the former cases are labeled “fit” or reinforcement (between the two choices), while the latter are labeled “misfits.” At each point in time, we also identify the firm’s key strategy choices. These are choices that constrain and guide subsequent choices, for instance, by outlining a particular market positioning that the firm wants to achieve. These strategy choices correspond to the boundaries within Mintzberg and Waters’ (1985) umbrella strategies. While these high-level strategy choices do not spell out the details of lower-level activity choices, they do provide general guidelines. Thus, the maps include both choices that have been undertaken at the particular point in time and policy or strategy statements that are either already supported by activity choices or that guide further action.

In addition to identifying interactions among activities, we similarly identify interactions among strategy choices. By mapping the interactions among activity and strategy choices, we can identify choices that are central to the entire system. We call these central nodes within the system “strategic themes” or “central choices.” Thus, strategic themes and central choices resemble the organizational “core” aspects described by Hannan and Freeman (1984) and Singh, House and Tucker (1986). To identify central choices, we employ Hannan, Burton, and Baron’s (1996) characterization of belonging to the core: “coreness means connectedness; elements in the core are linked in complicated webs of relations with each other and with peripheral elements” (p. 506). Formally, we treat each choice within the system of choices as a node in a network and compute centrality measures for each choice. A break in the distribution of centrality values can be used as a natural cut-off value between “central choices” and “peripheral choices.” Similarly, the use of several centrality measures and agreement among the measures concerning the choices that have always highest centrality can help us discriminate between central and peripheral choices. We consider centrality measures that take into account interactions only

between directly linked choices (degree centrality (Freeman, 1979)); centrality measures that incorporate farther-reaching interaction effects (betweenness centrality (Freeman, 1977); and information centrality (Stephenson and Zelen, 1989)) and measures that take into account the centrality of the choices a particular choice influences (power centrality (Bonacich, 1987)).

Using maps that depict strategic themes, activity choices, and interactions at various times in a firm's history, we are able to visualize the firm's evolutionary path and distinguish between the two developmental patterns. As firms grow and become older, their systems of choices tend to become more elaborated and differentiated. The question is how this process of differentiation takes place. The patch-by-patch process implies that one theme at a time becomes more differentiated and that the number of strategic themes increases over time. The thin-to-thick process implies that the number (and identity) of strategic themes remains constant and that all strategic themes become more elaborated over time. Visually, if we took the current map of choices, identified the time at which each choice was made, and then sequentially erased each choice going back in time, the patch-by-patch process would be identified by entire patches of the system of choices vanishing, while the thin-to-thick process would be identified by an increasing thinning of the map.

THE VOYAGE OF THE VANGUARD GROUP

Research Design

The research on Vanguard was based on a longitudinal case study design (Eisenhardt, 1989b). Both archival and interview data were collected to determine the sequence of activities that Vanguard engaged in. Vanguard had several features which made it a suitable setting as a starting point for inquiries into firm development conducted at a fine-grained choice level. First, its founding date in 1974 provided us with a sufficiently long history, while at the same time still allowing us to interview members of the firm, including the founder, who had experienced the entire history of the firm. Second, and even more importantly, the founder of the firm, John Bogle, who had played a pivotal role in the development of

Vanguard, had been a prolific writer, penning dozens of speeches and memos throughout his career (even before becoming the leader of Vanguard). These documents provided an excellent opportunity to gain insights into the contemporaneous thinking of Bogle at various point in Vanguard's history. Moreover, these documents served as a check to retrospective sensemaking and potentially biased memories of interviewees (Golden, 1992). Third, due to its unique organizational structure (explained below) Vanguard has always enjoyed an extensive press coverage, generating a large amount of secondary data that were used to piece together Vanguard's developmental path. In sum, Vanguard came close to a setting in which the phenomenon to be observed was "transparently observable" (Pettigrew, 1990). The research was carried out in three stages. In the first stage, we primarily relied on secondary sources and several company documents to develop a chronology of Vanguard's choices from its inception to the beginning of 1997. We then identified several key events in Vanguard's history and started to develop a first sketch of the maps of choices for the various periods. In the second stage, we engaged in a series of interviews with members of Vanguard's management team. These interviews were used to corroborate or amend the chronology and the various maps. The third stage involved in-depth interviews with John Bogle and the analysis of memorandums and speeches prepared by Bogle throughout his career.

Data Collection

Interview data. Over the period 1996-97, we conducted personal interviews with members of Vanguard's senior management team and several junior managers. Management team members interviewed included the current CEO, CFO, Senior Vice President for Information Technology, General Counsel, Principal responsible for Institutional Client Services, and Director of Portfolio Review. The interviewees' tenure at Vanguard ranged from three years to over 20 years. The interviews lasted between one and two hours and usually consisted of three parts. In the first part, managers were asked to outline key developments in Vanguard's evolution. In the second part, the maps of choices were discussed. (The maps were modified when new information became available from prior interviews.) Third, managers were asked specific questions concerning their department (e.g., information systems or

institutional services). Several shorter follow-up interviews were conducted on the telephone to clarify inconsistencies or questions that arose during the analysis. In addition, we conducted two extensive, several-hour interviews with John Bogle. These interviews differed from the interviews with the other Vanguard managers in that Bogle received the chronology and the maps of choices prior to the interviews. After the first interview, we gained access to a large number of additional memorandums and speeches prepared by Bogle. After we had analyzed and incorporated these new sources into the analysis, we conducted a second interview with Bogle, who again provided extensive comments on the chronology and the maps provided to him prior to the interview. Interviews were not recorded, but extensive notes were made during and after the interviews.

Archival Data. An extensive search on Lexis-Nexis on articles written about Vanguard in trade journals and magazines yielded approximately 500 articles which we read and analyzed to help piece together Vanguard's developmental path. Vanguard also provided company documents describing key events of its history. Critical to the analysis were two other sources. First, a document prepared by John Bogle at the very inception of Vanguard, in which he outlined "The Future Structure" of Vanguard (Bogle, 1974). Second, a series of 37 speeches that Bogle delivered over the last 30 years in front of various audiences (e.g., to Vanguard's employees, fund analysts, and industry associations). We concluded our overall data collection when a level of saturation was reached (Glaser and Strauss, 1967).

Overview

Founded in 1974 with assets of \$1.6 billion under management, The Vanguard Group has achieved remarkable success. By the end of 1996, Vanguard was ranked as the second largest mutual fund provider in the U.S., with assets of \$238 billion, consistently displaying lower costs than its competitors (see Figures 4 and 5).² The following sections describe Vanguard's development from its inception until early 1997. This description is divided into six periods, determined by key events in Vanguard's history: the origins of The Vanguard Group; 1974–1976; 1977; 1978–1981; 1982–1991; and 1992–1997.

Following the methodology outlined in the last section, we first describe the value chain of a typical fund

provider and then use this value chain as the organizing framework in each period for describing Vanguard's choices and the interactions among them. A map displaying the choices and the interactions (Figures 6–10) accompanies each period.

To understand Vanguard's unique organizational structure, it is also useful to provide a brief account of the typical organizational structure of mutual funds and of fund providers (see Figure 2): Each mutual fund (e.g., Vanguard's Index 500 Fund) consists of a board of directors and the capital paid in by fund shareholders. Very often, all mutual funds have the same directors on their boards, thus creating one Fund Board of Directors. Formally, the Fund Board of Directors hires an investment management company to run the fund. However, in practice, the investment management company (alternatively called the fund provider) decides to create a new fund, assigns a fund manager to run the fund, and then appoints a board of directors to monitor the handling of the fund's assets. The fund board consists of at least 40% outside directors, with the remaining seats filled by members of the investment management company. The investment management company itself is a publicly or privately held firm which also has a board of directors. To offer funds, a fund provider has to engage in a series of other activities besides *asset management* (see Figure 3). *Account management* activities include record-keeping services for fund shareholders, including distribution of dividends and capital gains to fund shareholders. *Selling and marketing* activities include all choices that relate to distributing fund shares to individual or institutional customers. *Information and customer service* activities provide customers with information about investment choices and after-sale services. Not all of these activities have to be conducted by the fund provider itself. For instance, some fund providers outsource the account management and distribution activities (Levinthal and Myatt, 1994). *Human resource practices* concerning activities that have been chosen to remain in-house have to be stipulated as well. Lastly, all activity and resource decisions by the fund provider are made in the context of the fund provider's *organizational structure* and of the *product portfolio* that the fund provider offers.

Vanguard's system of choices at the point in time when our study concludes (see Figure 1) provides helpful guidance to the ensuing description of Vanguard's evolutionary path. Analyzing Vanguard's set of choices in 1997 using the four network centrality measures described above, we can identify seven central choices or strategic themes. For all four centrality measures, the following choices have the highest centrality scores (more details available from the author):³

- 1) Vanguard is the only "mutual" company among all mutual fund providers with fund shareholders owning the fund provider.
- 2) Vanguard manages its funds in a very conservative manner.
- 3) Vanguard concentrates on costs rather than on returns.
- 4) Vanguard distributes its funds directly.
- 5) Vanguard emphasizes long-term performance.
- 6) Vanguard communicates very frankly the risks and the performance of its funds.
- 7) Vanguard delivers high-quality service to its customers.

Many of Vanguard's other choices support and reinforce each of these central choices, forming a complex web of choices and interactions. In the following sections, we analyze how this system evolved over time.

The Pre-Vanguard Years (1928–1973)

In December 1928, Walter L. Morgan founded the fourth open-ended mutual fund in the U.S., the "Industrial & Power Securities Corporation," which would later become known as the "Wellington Fund." This fund, based in Philadelphia, was the first "balanced" fund, carrying up to 60% high-quality government and corporate bonds. In contrast, all other mutual funds at the time held only stocks. Moreover, unlike most closed-end funds in this era of speculation, the Wellington Fund was unleveraged.⁴ Due to its conservative security structure, the Wellington Fund weathered the Great Crash and ensuing Depression much better than other funds did. Starting with \$100,000 in assets in 1929, it grew to \$500,000 by the end of 1933.

Formally, the Wellington Fund was managed by the Morgan-led Wellington Management Company (WMC), which charged the fund for its management services. In 1951, Morgan hired John Bogle—later Vanguard’s CEO—who had impressed Morgan with his undergraduate thesis on the nascent mutual fund industry. In his thesis, Bogle (1951) had concluded that “funds can make no claim to superiority over the market averages” (p. 12), that “there is some indication that the cost of management is too high” (p. 18), and that the industry’s “future growth can be maximized by concentration on a reduction of sales loads and management fees” (p. 122). All three themes would feature prominently after Vanguard was founded. In 1958, WMC opened its second fund—a pure-equity fund that became known as the “Windsor Fund.” In 1960, the Wellington Company went public, and five years later, the assets under its management crossed the \$2 billion mark. In the mid-1960s, Morgan and Bogle were looking for further growth opportunities. They considered a merger with a firm that offered a more aggressive growth fund and had additional assets under its management. In June 1966, WMC merged with Thorndike, Doran, Paine & Lewis (TDP&L), a Boston-based investment management company that managed the successful Ivest Fund, an aggressive growth fund. In 1967, after Morgan retired, Bogle became president of WMC. In 1970, Bogle succeeded Morgan as chairman of the funds. In the same year, WMC offered a further balanced fund, the Wellesley Income Fund, comprised of 60% bonds and 40% equity. In 1973, WMC started its first pure bond fund, the Westminster Bond Fund.

Analysis of the pre-1974 set of choices. Figure 6 depicts WMC’s choices as of 1973. As will be described in the next section, Vanguard would be formed in the following year as a spin-off from WMC. Comparing WMC’s system of choices with Vanguard’s 1997 system, we observe that only one of the seven strategic themes was present at WMC: the focus on conservatively managed funds, represented by offering balanced and bond funds. Otherwise, WMC was not different from other fund providers at the time. As was common in the industry, the investment management of the funds and the distribution of fund shares were divorced from the funds themselves. For distribution, WMC used brokers and dealers who charged a sales load for their services. Since brokers received a commission whenever they sold a

fund, they often preferred short-term investors who, in turn, tended to focus on high returns. The shareholder accounting activities were outsourced to third-party providers. Not many reinforcing interactions existed in WMC's system, and some misfits arose. For instance, the Ivest Fund, with its focus on returns and its aggressive investment philosophy, did not fit well into the original concept of WMC as a provider of conservatively managed funds.

Vanguard's Early Years (1974–1976)

By the end of 1973, the beginning of an equity bear market that would last six years had left its mark. Total assets under management shrank by a third. Tensions grew between the partners in Boston and Philadelphia, culminating on January 23, 1974, when the board of WMC, which was controlled by the Boston partners, fired Bogle. The day after Bogle was fired, the fund board of directors met and decided that Bogle should retain his position as chairman of the fund board and conduct a "Future Structure Study" of the Wellington Funds. In March 1974, in his report to the fund board of directors, Bogle discussed three increasingly radical options for the future relationship between WMC and the funds (Bogle, 1974):

- Option 1) WMC would continue to provide investment management and distribution services, but the funds would take over administrative services.
- Option 2) WMC would continue to provide investment management, but in addition to administrative services, the funds would take over distribution.
- Option 3) The funds would purchase WMC and thereby take over investment management, underwriting and administrative services.

For each option, the emphasis of his analysis was on the potential cost savings that the increased independence from WMC would afford: "For as the Funds perform more activities on their own behalf . . . they can save massive amounts of dollars" (Bogle, 1974, p. 8). Bogle estimated annual cost savings from \$1 million for Option 1 to up to \$3 million for Option 3.

In June 1974, the fund board decided to adopt Option 1: the funds were to take over and be responsible for all tasks involving legal compliance, financial accounting, shareholder records, share transfers, filing tax reports, filing official reports to government agencies, assuring that the funds' prices reached the newspapers on a timely basis, and balancing and auditing the books.⁵ WMC continued to provide investment management and distribution services. To account for the fact that Vanguard had taken over administrative services, Vanguard reduced the management fees it paid to WMC from \$7.4 to \$6.4 million. This reduction in fees included not only the shifted costs, but also WMC's 40% mark-up (Bogle, 1975).

In August 1974, the fund board ruled that the funds would not use the Wellington name any longer (except for the Wellington Fund) since the funds were now distinct from the Wellington Management Company. Bogle decided to name the fund complex "Vanguard," after the HMS Vanguard, Lord Nelson's flagship in the victory over the French fleet at the Battle of the Nile in 1798. In September 1974, The Vanguard Group was incorporated, with the Vanguard name serving as the new collective identifier for the funds. Vanguard was owned by the shareholders of its 11 funds and provided the administrative services to them at cost. Vanguard's staff of 59 consisted of 19 in the executive and administrative groups and 40 in the fund accounting group. To create an even greater distance between the funds and the external management company, Bogle started to write nearly all the annual reports for the mutual funds—a practice he continued till he retired in 1999. Bogle pursued an additional goal with the annual reports. He wanted to make the communication between mutual funds and individual investors more candid. As he announced at the time, "The shareholder will receive Fund reports that will 'tell it as it is,' with candor and fairness. If results are good, we will say so; and if they are not, we will be equally candid. In short, our reports will be written from the perspective of the shareholder" (Bogle, 1975). In contrast, shareholder reports of most other funds were described by an industry observer as "a sparse listings of holdings prefaced by a ghostwritten letter from the fund president. . . . Among major fund-

company executives, Bogle was the first to sweat out the details. Bogle's letters have consistently been candid . . . and clearly written" (Sanders, 1996).

In these early years, spurred by the need to explain the rationale of the very uncommon organizational structure (only one other fund provider had a similar structure and would later revert back to the traditional one), Bogle also started his very open and ample communication with the press. He frequently talked about his philosophy of what made for sound mutual funds (in his view, funds that were inexpensive to run and that focused on long-term performance), as well as his view of the organizational form mutual fund providers should adopt. Only a few months after Vanguard was founded, Bogle started to address implications for the industry: "It is easy to identify a number of perfectly valid reasons why other Fund complexes might want to consider some form of internal management; organizational pressures . . . financial pressures . . . legal pressures . . . or, most hopefully of all, an enlightened sense of self-interest about the optimal structure for the conduct of the Fund Group's activities" (Bogle, 1975). Over the years, Bogle developed a missionary zeal to restructure the industry so that fund shareholders' interests would become paramount, rather than having investment management companies be accountable to both their owners and their fund shareholders. With his enthusiasm, he created a climate at Vanguard in which many employees felt that they were actively involved in pursuing a noble goal. The resulting high *esprit de corps* enabled Vanguard to compensate its employees with more than just a monetary reward and helped to keep wage costs down (Hallowell, 1997).

On the investment side, the bear market persisted into the mid-1970s. As a result, many mutual funds' net cash flows, including Vanguard's, remained negative. Overall, Vanguard experienced 80 months of cash outflows ending in January 1978. To retain fund shareholders, the industry created a new product: money market mutual funds. High inflation coupled with Regulation Q, which limited banks to paying no more than 5.5% interest on savings accounts, led to a rapid growth of money market mutual funds. Besides offering its first money market fund in 1975, Vanguard further broadened its fund portfolio. In August 1976, Vanguard introduced the first market index fund, an idea Bogle had first expressed in the

Future Structure Study two years earlier. The fund, which tried to mirror the performance of the S&P 500 index, was initially not well received and had a difficult time finding investors. By the end of its first year, it had only attracted \$14 million in assets. Critics chided the fund as pandering to “mediocrity,” or even to be “un-American,” since the aspiration to achieve more than the average was seen as part of the American heritage. Bogle believed, however, that over the long run, a broad index fund would outperform most actively managed equity funds, largely because of its much lower operating and transaction costs (Bogle, 1977).

Analysis of the 1976 set of choices. By 1976, less than two years after the firm was born, five of the seven strategic themes of Vanguard’s 1997 system were in place (see Figure 7). Vanguard had adopted the mutual organizational structure; it focused on conservatively managed funds and on long-term performance for its funds; it started its candid communication with its fund shareholders; and it tried to keep costs as low as possible. This observation provides a first indication that Vanguard’s development resembled more a thin-to-thick process than a patch-by-patch process. Moreover, had it been only up to Bogle, Vanguard would have immediately adopted a sixth central choice, direct distribution. In the Future Structure Study of 1974, Bogle had argued that “adding ‘internal distribution’ also seems particularly appropriate now” (Bogle, 1974, p. 45). The board of directors, however, was not willing to internalize distribution—yet.⁶ The fit and reinforcements within Vanguard’s activity system also increased. For instance, a good fit existed between the products Vanguard offered and its cost-cutting efforts: low costs had the greatest (relative) performance impact on funds with intrinsically low returns, e.g., conservative bond funds, and on passively managed index funds. Since index funds of the same type hold the same securities, the performance differences between index funds are almost entirely driven by differences in cost. Thus, Vanguard’s cost advantage translated directly into a performance advantage vis-à-vis its competitors. Moreover, for funds with low volatility and relatively low returns (i.e., conservative bond funds and money market funds), cost differences created very visible performance differences. The same cost advantage was much more difficult to discern for investors in the more

volatile actively managed stock funds. While the focus on cost was already present at Vanguard (in particular through the in-sourcing of the administrative functions and the mutual structure), it had not yet been fully implemented. In particular, the management and distribution of funds were still a high-cost operation.

Internalizing Distribution: Vanguard in 1977

In February 1977, the fund board accepted Bogle's proposals to take the distribution function in-house and to market its funds as no-loads—i.e., to eliminate the sales load, which had been on the order of 8%. In other words, the fund board agreed to Option 2 that Bogle had suggested in 1974. The decision to take distribution in-house and to abolish sales fees was a major step along Vanguard's path to reducing costs for its fund shareholders. It made Vanguard, with \$1.5 billion in assets under management at the time, the second largest no-load provider after T. Rowe Price, which had \$2 billion. Moreover, having distribution in-house allowed Vanguard to negotiate contract terms with investment management companies at arm's length, in particular with WMC. Before, the threat to switch the investment management function to another firm had been fairly empty since the investment management company controlled the distribution of fund shares—a general problem for fund board directors, who, when dissatisfied with their investment management company, find that termination of the contract is usually not a workable remedy (Burgunder and Hartmann, 1988). In September 1977, Vanguard used its newly gained freedom to hire Citibank to run its new Warwick Municipal Bond Fund. This was the first time that WMC did not manage a fund for The Vanguard Group. Because Vanguard had taken over the distribution function and had more of an arm's length relationship with WMC, it was also able to cut management fees paid to WMC by \$2.9 million (39%) (Slater, 1997, p. 105). Having decided to take distribution in-house, Vanguard had to choose its distribution method. Vanguard decided against operating branch offices. Since the decision to take distribution in-house had been driven mainly by cost considerations, engaging in costly distribution using a branch network would have been counter-productive.⁷ While the internalization of distribution generated cost advantages, it posed challenges to Vanguard. First, the decision upset many brokers who

were no longer compensated for recommending investments in Vanguard funds. As a result, almost all brokers stopped advising their clients to buy Vanguard funds. Second, Vanguard had to establish its own distribution service. Third, Vanguard needed approval by the Securities and Exchange Commission (SEC) to pay for the distribution expenses directly out of the funds' assets. Even though the SEC rejected Vanguard's first proposal in 1978, in its final ruling in 1981, the SEC issued an endorsement of Vanguard's practice.

In line with its low-cost positioning, Vanguard also did not engage in much advertising. Bogle believed that advertising did not provide value to existing shareholders, who shouldered the costs. Bogle's openness to discussing Vanguard, which was the focus of frequent business reports due to its unique organizational structure, served in part as a substitute for advertising. Over time, Vanguard actually decreased its advertising as a percentage of assets by increasing its advertising expenses only slightly to about \$8 million. In comparison, Fidelity was reported to spend on the order of \$100 million annually on advertising. In similar cost-conscious fashion, Vanguard did not engage in large capital expenditures. At the time, being a leader in computer and information technology was considered unnecessary given Vanguard's product offering and low-cost strategy. (Even in 1985, Bogle still asserted that "we're not going to be a technology leader. It's too expensive" (Heins, 1985)).

With respect to its product portfolio, Vanguard started to offer municipal bond funds in 1977, after Congress passed a law making it possible to offer such funds. Paralleling the skepticism that any firm could outpace the stock market for a long period of time—which had led Vanguard to offer an equity index fund—Bogle harbored doubts that any firm could consistently forecast changes in interest rates (in Bogle, 1999). Consequently, Vanguard did not follow other fund providers in forming a "managed" municipal bond fund, in which managers tried to capitalize on their predictions of interest rates by shifting the average maturity length of the securities held in the fund. Rather, Vanguard created the first three-tiered bond fund in the industry: one fund holding solely long-term municipal bonds, a second only short-term, and a third only intermediate-term securities. This investment strategy of "defined asset-

classes” provided investors with a clear picture of what types of securities the fund would hold and, hence, what type of risk and relative performance to expect.

Analysis of the 1977 set of choices. Bogle re-affirmed his view that lower costs would be central to Vanguard’s strategy: “Vanguard’s strategy involves . . . an on-going program to reduce our costs of operations and keep them down” (Bogle, 1977). Moreover, he believed that Vanguard had to exploit the coherence among its strategic themes: “What is important for each fund group is to make sure that its marketing strategy . . . is an integrated one. That is, it should embody an internally consistent pricing policy, product line, and target markets—implemented in such a way that they reinforce one another, rather than fragment the overall marketing approach” (Bogle, 1977). As Figure 8 shows, Vanguard made strides towards a more coherent set of choices: the number of “mismatches” in Vanguard’s set of choices decreased. After having moved to a no-load, direct distribution system (its sixth central choice), the strategy of focusing on low cost had received a further implementation boost. Moreover, Vanguard’s corporate structure—its independent status from the investment management companies—provided it with leverage to negotiate reductions in fees paid to outside investment managers. At the time, the main remaining tension in the system arose from WMC’s costly managing of funds that did not require much investment management effort, notably fixed-income and money market funds.

Internalization of Shareholder Accounting and Asset Management: Vanguard in 1978–1981

In 1978, Vanguard decided to partially in-source its individual shareholder accounting system, which had been handled by the DST Service Bureau in Kansas City. In-sourced tasks included dealing with deposit checks, creating customer accounts, sending out balance statements, handling share exchanges, and answering fund shareholders’ questions. Vanguard had two motives for internalizing these services. First, DST was costly—and only one other, similarly expensive, provider existed. Second, Vanguard felt that DST provided poor quality. Particularly as a direct distributor, Vanguard felt it had to control the interface with its clients. Since it did not use brokers or a branch network, Vanguard had only few personal contacts with its customers. Most such contacts arose when customers inquired about their

accounts. When customers called (unknowingly) DST for an account question and did not receive good service, they blamed Vanguard.

On the investment side, in September 1981, the Vanguard board permitted the firm to take over asset management for the municipal bond funds from Citibank and for the money market funds from WMC. The two fund portfolios comprised \$1.5 billion, roughly one-third of the company's total assets at the time. These funds shared important characteristics that made them good targets for internalization of the asset management function. First, the funds had large economies of scale, which were only partially passed on by asset management firms, i.e., substantial cost savings were possible. Second, managing these funds required no particular industry or research experience and no relationships with industry analysts. Thus, in-sourcing asset management for these funds was not very difficult.

The effects of Vanguard's mutual structure and low-cost approach were visible in the average fees that Vanguard charged. (Since these fees are expenses from the point of view of the fund and are expressed as a percentage of assets, they are called "expense ratios.") In 1975, Vanguard's average expense ratio was at parity with that of other major fund complexes at 0.68%, and below the industry's average of 1.08%. By 1981, costs started to diverge: Vanguard charged, on average, 0.59%, major fund complexes 0.65%, and the industry as a whole 0.97%. (By 1995, the full impact of Vanguard's strategy could be seen. Its average expense ratio had dropped to 0.31%, while major fund complexes were charging, on average, 0.96%, and the industry 1.11% (see Figure 4)).

Analysis of the 1981 set of choices. With the decision to take the individual shareholder accounting system in-house, Vanguard started to build around its seventh strategic theme: a focus on high quality service. As Figure 9 shows, a new "patch" appears on its map of choices. While Vanguard had previously devoted little (explicit) attention to quality, it began to realize that investing in high-quality service could substitute for advertising and eventually lead to lower costs. Word-of-mouth referrals were a highly valuable means of attracting new clients. Moreover, satisfied customers who left their assets in

Vanguard's funds reduced the costs of managing funds and of having to attract new assets. Thus, with respect to its development, Vanguard did not follow a pure thin-to-thick process. While most of its development was thin-to-thick, a limited amount of patch-by-patch development occurred.

To raise awareness of quality issues, Bogle distributed throughout the organization monthly "Bogle Barometers," which indicated the number of shareholder complaint letters he had received that month. Moreover, he listed the kinds of problems customers were complaining about. To improve its quality, Vanguard also adopted a set of particular human resource practices. Vanguard hired primarily college graduates and rarely hired applicants from Wall Street, as their trading mentality usually made them "unfit" to Vanguard's culture, which was based on fostering long-term investing. Similarly, Vanguard rarely hired fresh MBAs since they tended not to stay long. Thus, Vanguard reached out for "broken MBAs," as the subsequent CEO Jack Brennan called them—that is, MBAs who had already "jumped ship" a couple of times and finally found out what they wanted from their jobs.⁸

The decision to internalize management of fixed-income and municipal bond funds fit well with Vanguard's strategic theme of being a low-cost provider. The management of these funds did not require much research or the expertise of sophisticated analysts. Hence, wage expenses were still held in check, while costs could be reduced. Similarly, Vanguard's location in Valley Forge, Pennsylvania—away from the high-cost areas of New York and Boston, where most other mutual fund providers were located—helped both to hold costs (and wages) down and to add a further selection effect with respect to employees. Although Vanguard would have had difficulty attracting "star" investment managers, its strategy did not require these human assets. One new misfit arose, however. While Vanguard's decision to limit its spending on information technology had been justifiable in the past because it had helped to keep costs down, the new emphasis on high-quality service started to create a misfit between the new strategic theme and the old investment policy.

The Growth of the Institutional Business: Vanguard from 1982 to 1991

Human resource practices. In 1980, Vanguard’s asset base crossed the \$3 billion mark and continued to grow rapidly throughout the decade. In 1983, \$7 billion, in 1985, \$10 billion, and in 1987, \$27 billion were under its management (Figure 5). With its decision to take the individual shareholder accounting system in-house, this asset growth also translated into rapid growth in employment (from 166 in 1980 to 1,066 by June of 1986), especially in the lower ranks of the company. Consequently, Vanguard faced an increasing challenge to communicate its core values to all its employees. To convey the ideals he harbored for Vanguard, Bogle started in the early 1980s to address Vanguard’s employees at every billion-dollar milestone of assets under management. Almost without fail, he repeated in these speeches his vision of a low-cost mutual fund provider whose highest obligation was the fiduciary duty it owed to its fund shareholders. As Bogle put it, the reasons for these speeches were “to celebrate, to communicate, and to inculcate” (Bogle, 1986).

Given Vanguard’s organizational structure, its employees did not benefit financially from the economic boom of the 1980s. No one owned stock in Vanguard or stock-options since Vanguard was owned by its fund shareholders. To provide bonus payments that aligned incentives, Vanguard initiated a “partnership plan” for its employees in 1984. Incentive pay was coupled to the “cost saved” (the difference between its expense ratio and the average industry expense ratio) and the performance of its funds relative to peer funds. The incentive component represented about 10–15% of total compensation for new employees, but could rise up to 30% for longer-term employees. To further keep the *esprit de corps* high, Vanguard started a series of other programs in the 1980s. In addition to company-wide events and an employee newsletter, the *Crew News*, Vanguard inaugurated its “Award for Excellence” Program in 1984. This quarterly award was given to employees, especially those working in the lower ranks of the organization, who had excelled in their performance. Top management treated these ceremonies very seriously and almost always attended the award presentations. In turn, Vanguard used the high morale of its “crew” to offer high-quality service to its clients, while keeping costs low. For instance, to guard against understaffing in its telephone operations in times of sharp market declines, Vanguard did not increase its

regular phone personnel, but cross-trained its existing employees. Under the name of “Swiss Army,” each employee, from clerical workers to the CEO, had to perform several hours of phone service every month in order to stay in practice. In times of high demand, these employees could be “drafted” to take client calls. Thanks to its Swiss Army operation, Vanguard was able to handle the October 1987 stock market crash without a glitch in its operations. Similarly, Vanguard solved its frequent office space constraints—due to its rapid growth—by simply halving its managers’ offices (“scrunching”), rather than by renting expensive temporary office space. Such measures were feasible in a company whose culture demanded that everyone, from the lowest ranks to the top of the organization, kept low costs in mind. Top management, with its high visibility, played an especially important role. In that vein, it was not surprising that Vanguard’s management did not fly first-class, did not have perks such as dedicated parking spots, and did not have a privileged dining area, eating instead in the company cafeteria, the “galley.” Similarly, Vanguard’s fund directors were paid rather modestly by industry standards. Vanguard’s typical independent fund director earned \$60,000 a year and served on fund boards that met 11 times annually, in contrast to common salaries in excess of \$200,000 for as few as four annual meetings (Mathisen, 1996).

Selling and marketing activities. Even though Vanguard tended not to be a technology leader, it was one of the first adopters of 1-800 phone numbers. This new technology was particularly important to Vanguard given its positioning. The toll-free number allowed a great efficiency improvement in the interactions between its clients and its service personnel. The importance of this technology would be rivaled later only by the emergence of the internet. Extensive training for Vanguard’s telephone operators, mostly college graduates, contributed to Vanguard’s high quality standards. In 1990, *Financial World* magazine conducted its first survey with respect to customer satisfaction with mutual fund providers; Vanguard was voted number one. In all subsequent surveys (1991, 1992, 1993 and 1995), Vanguard won top honors again. To keep improving its quality, Vanguard started its “Vanguard Quality Program” in 1990. Under this initiative, project improvement teams were formed to tackle particular

quality issues and recommend solutions. Finally, to gain complete control over the customer interface, Vanguard completed its in-sourcing of the individual shareholder accounting system in 1991.

Furthermore, Vanguard established its Investment Adviser Services, which provided support to independent financial advisers. As a no-load fund provider, receiving no sales support from brokers, Vanguard needed especially good relationships with financial advisers who managed individuals' investment portfolios for a percentage fee.

At first sight, Vanguard's strategic themes of "low cost" and "high-quality service" seem to be contradictory. Vanguard solved this contradiction by defining "service" in a particular way. Many services that other fund providers offered were not offered by Vanguard. For instance, Vanguard established operator hours of Monday through Friday from 8 a.m. to 9 p.m. and Saturdays from 9 a.m. to 4 p.m., reasoning that off-hours labor costs were high and demand was low. Similarly, to keep trading costs low, Vanguard did not offer telephone redemptions for its popular Index 500 fund and limited substantial "round trips" (selling and purchasing back into the fund) to no more than twice a year. To cover the fixed costs that were generated by a new account, Vanguard required a minimum initial investment of \$3,000, higher than that of two-thirds of all other funds in the industry. Yet the services that Vanguard did offer were of high quality—e.g., highly-qualified telephone operators and easy-to-read account statements.

The institutional business. With respect to its product portfolio, Vanguard's largest expansion, beginning in 1982, was its serious entry into the institutional and retirement market—i.e., the servicing of 401(k) plans and individual retirement accounts (IRAs). In 1974, federal tax laws had created the IRA, and in 1978, 401(k) plans emerged, both boosting the mutual fund industry substantially. Vanguard found that its no-load distribution, low-cost structure and its conservatively managed funds made it an attractive partner for many companies that switched from defined benefit plans to defined contribution plans. Since high-quality service was an important decision criterion for a company selecting a fund provider for its defined contribution plan, Vanguard in-sourced its institutional shareholder accounting

system in 1987. This allowed Vanguard to treat participants in retirement plans like all other investors. Vanguard gave them a 1-800 number, allowed them to switch from one fund to another, and valued their accounts daily. Other retirement providers, such as life-insurance companies and banks, had often evaluated pension accounts only quarterly or annually. To provide these services, Vanguard had to upgrade its shareholder accounting system and its customer interface. Accounts in pension plans generated a much larger amount of work than did free-standing accounts. For instance, phone support personnel had to be better trained because the operators had to be familiar with the sponsors' retirement plans. To address these needs, Vanguard became one of the first 401(k) vendors to install a sophisticated computer-linked telephone system that automatically identified the proper service representative to handle a call and that instantly relayed all relevant account information on the caller to that representative's computer screen.

In 1990, to increase its service and responsiveness to its institutional clients, Vanguard established a "Client Service" division that took on functions originally provided by the sponsor's benefits office. Vanguard hoped that by establishing a personal connection with each plan participant and by offering high service, it would retain more of plan participants' assets as retirement accounts were rolled over at the beginning of retirement. In fact, Vanguard was able to retain an average of 40% of assets in a roll-over, which compared favorably to an industry average of about 25%.

Information and customer service. Examples of Vanguard's candid communication could be found frequently in the booming 1980s and 1990s. On several occasions, Vanguard contacted investors who held shares of funds that had performed exceedingly well, warning them that their funds' performance was unlikely to continue to be this outstanding. For instance, in 1991, Bogle wrote in a letter to shareholders of Vanguard's Health Care industry fund: "It is highly unlikely that such [high] absolute returns—or even the Portfolio's relative performance advantage—will be matched in the future." Similar in purpose to offering high-quality service, Vanguard's management believed that open and clear communication would be, in the end, beneficial to the firm as well. Bogle commented: "Making

investors aware of risk is not only ethically essential, but represents wise shareholder relations, and good public relations” (Bogle, 1991). Vanguard’s openness resulted, according to an industry observer, in “a fiercely loyal, growing shareholder base. . . . Experienced Vanguard customers are often fanatics who eschew other fund companies. In a sense, they feel a personal attachment to the organization. Some of this, to be sure, owes to the company’s performance, but much also stems from the belief that Vanguard can be trusted” (Sanders, 1996). In addition to occasional warning letters, Vanguard started issuing a series of “Plain Talk” brochures, which explained in simple and open terms the risks of investing. Since Vanguard was a no-load provider, customer education and service were especially important. Customers who felt that they were not treated well or that they had invested in the wrong fund could, without cost to them, pull out their investments. In contrast, customers of load-funds bore switching costs (in the form of back-end loads or new sales loads), which made them less likely to redeem their shares quickly.

While Vanguard enjoyed rapid asset growth in its most popular equity funds, it feared that the new cash inflows could overtax its investment managers. As a result, in 1985, Vanguard took the step, virtually unprecedented at the time, of closing three of its most popular funds (Windsor, Explorer, and Qualified Dividend) to new and existing shareholders. Bogle justified the decision: “While this marketing discipline will certainly slow our growth, I hope it reflects our respect for the integrity of these Funds, and our willingness to honor the fiduciary duty that we owe to our shareholders” (Bogle, 1985).

Further extensions of the product portfolio. In 1983, Vanguard started to offer its clients brokerage services. The main function of this extension was to accommodate clients who wanted to trade part of their portfolios themselves. This service did not fit well into Vanguard’s positioning since the nature of this business was very different from the mutual fund business as pursued by Vanguard. With brokerage, money was earned on transaction volume. In contrast, in the no-load mutual fund business, costs were held down by reducing the number of trades. Vanguard justified the service as accommodating its high-net-value clients. In the 1980s, Vanguard entered another business that did not seem to fit well into its set of choices. Following the example of several competitors, in a style that Vanguard’s current CEO John

Brennan called “a worst case of emulation,” Vanguard offered real-estate funds patterned after limited partnerships.⁹ These investment vehicles were very costly to run and very illiquid. They required extensive legal expertise that was not readily available in-house. Moreover, their fee structure was akin to load-funds. At the time, Vanguard rationalized its decision to enter this market by believing it could offer these investments at a lower cost. However, after one-and-a-half years, Vanguard’s management realized that this product was inconsistent with the existing structure at Vanguard and decided to leave the business as quickly as possible. When Vanguard returned to the real-estate arena in 1995, it offered an index fund mirroring the Morgan Stanley Real-Estate Investment Trust index. For an overview of Vanguard’s set of choices as of 1991, see Figure 10.

Investing in Technology: 1992–1997

While Bogle had contended for many years that Vanguard could not afford to be a leader in technology, in 1993, Vanguard started to invest heavily in the new information technologies that became available. Up to that point, Vanguard’s technological emphasis had been internal: keeping up with the volume of transactions and guaranteeing high-quality service, such as timely and correct statements and rapid processing of incoming fund deposits. With the advent of the internet, Vanguard perceived a new opportunity to reach out and to educate and inform its customers. While, in 1991, 50% of Vanguard’s system development budget went into maintenance, 40% into back-office operations, and a mere 10% into client services, in 1995, Vanguard earmarked 40% of new systems spending for services directly related to clients, 40% for the back office, and 20% for maintenance (Rohrer, 1995). Showing its commitment to the new information medium, Vanguard was the first 401(k) vendor to establish a presence on America On Line (since January 1995) and later on the World Wide Web (Rohrer, 1995). The main functions of its extensive web-site were education and service rather than marketing and sales. In 1996, Vanguard created on its web-site a free “University” comprising ten courses, from “What is a Mutual Fund?” to “Retirement Investing: Allocating Your Retirement Assets.” Another way Vanguard exploited new technologies in its efforts to provide customer education was to develop proprietary advice

software. In 1993, it released a retirement planner, and in 1996 a retirement manager (for clients who were already retired). Even though the product had high quality (*Money* magazine rated it more highly than Intuit's program), the project was executed with a cost/performance tradeoff in mind. Rather than striving for a technologically "elegant," yet functionally useless "multimedia" CD-ROM version, the product was in the form of easy-to-use software with an accompanying book. By focusing on the value-adding features of the project, Vanguard cut development time by half and held development costs to \$500,000 rather than \$1.5 million.¹⁰

An additional aspect of investor education has been Vanguard's investment advice services, which it began offering in May 1996. For \$500, Vanguard offered private investors a one-time analysis for investment, retirement, or estate planning from certified financial-planning professionals. One rationale behind Vanguard's decision to enter this line of business was to protect its assets as retirement accounts rolled over. In addition to the fee-based, one-time investment advice service, in 1997 Vanguard initiated active (on-going) portfolio management services for individual customers with a minimum account balance of \$500,000. Its fee of 0.5%–0.65% was lower than the industry norm of 1%. Similar to its brokerage business, this service was offered mainly to keep the high-net-value customers satisfied, yet did not appear to fit well into Vanguard's existing system of choices.

On the institutional side, in 1997, Vanguard began complementing its service of defined contribution plans by offering to manage defined benefit plans. With respect to its full-bundled service for defined contribution plans, Vanguard started to take on compliance paperwork, required by the IRS and the Department of Labor, for the plan sponsors. While most of Vanguard's new fund offerings were remarkably consistent with its conservative investment philosophy, in 1995 Vanguard introduced its more aggressive fund portfolios, Horizon Funds. These funds performed poorly, though, consistent with Siggelkow's (1998) findings that performance of mutual funds generally improve with the fund provider's degree of focus on that fund's category.

On the distribution side, Vanguard made a name for itself by not accepting assets that it expected to remain in funds for only a short time. George U. Sauter, head of Vanguard's equity index funds, estimated that 5% of all big deposits were declined since the cost of buying and selling large blocks of securities would be mainly borne by existing shareholders and not by the shareholder who made the transaction (Easton, 1996). With respect to its goal of decreasing costs, Vanguard made further headway. First, Vanguard's costs as a percentage of assets decreased because of scale effects. For instance, its 20 index funds with \$56 billion of assets (as of end 1996) were completely managed by only *five* managers. Second, due to its arm's length negotiating power, Vanguard was also able to press its 18 different outside investment advisers to pass along scale effects, as well. Its average fee paid to external investment advisers fell for equity funds to 0.15% (as compared to an industry average of 0.75% for similar funds) and for bond funds to 0.028%. Vanguard, in contrast to most other fund providers, had also incorporated performance-based incentive provisions in 24 of its 38 contracts with outside advisers.

Overall, Vanguard's formula of continuously keeping costs low and focusing on long-run performance worked remarkably well. In *Barron's* 1996 ratings of five-year and ten-year performances of mutual fund families, Vanguard came out on top (Savitz, 1997). Similarly, Vanguard had outpaced a rapidly expanding industry in asset growth. Over the period 1980–1996, Vanguard's assets grew at a compounded annual rate of 31.4%, while the mutual fund industry as a whole recorded an annual growth rate of 22.6%.

DISCUSSION

To gain a clear understanding of Vanguard's evolutionary path at the choice level, we had to engage in a very detailed account of Vanguard's history. Stepping back from the detail, we can identify three main drivers behind Vanguard's development: 1) external events changing the competitive landscape; 2) Bogle's agenda; and 3) an internal dynamic among Vanguard's choices that created positive feedback effects. In the following discussion, we will elaborate on each of these drivers. Moreover, the analysis of

the third driver yields an interesting insight into the relationship between positive feedback effects and Vanguard's particular developmental path. We conclude with a more general discussion of the relationship between the emergence of positive feedback effects and the thin-to-thick and patch-by-patch developmental processes and derive several hypotheses.

Two main external events affected the mutual fund industry: high inflation coupled with regulation Q, and the creation of IRA and 401(K) plans. While both events were beneficial for all mutual fund providers, they changed the competitive landscape in a subtle manner, favoring low-cost providers. High inflation and regulation Q led to the rise of money-market mutual funds. Since all money-market funds invest in similar low-risk securities, performance differences are driven mainly by cost differences, thereby benefiting low-cost providers. As customers became used to substituting money-market funds for their checking and savings accounts, Vanguard, with its low-cost strategy, was ideally positioned to take advantage of this development. Five years after having introduced its first money-market fund, Vanguard's money-market funds had grown to \$1.6 billion, or 40% of its total assets. By 1996, they had grown to \$53 billion, making up 22% of its assets. Moreover, its money market funds outperformed 97% of all other money market funds using ten-year average returns (Perold, 1998). Similarly, as described above, Vanguard, with its conservative asset management and its low-cost strategy, was well positioned to take advantage of the rapid rise of defined contribution plans. By April 1996, Vanguard served more than 1.5 million participants in defined contribution plans. Since both high inflation and the rise of defined contribution plans were exogenous developments, one could argue—following Stinchcombe (2000)—that Vanguard was simply “lucky” to have chosen a positioning that would later be favored by these developments. Indeed, it would be difficult to argue that, with respect to these environmental developments, luck was not on Vanguard's side. However, it seems just as difficult to argue that Vanguard's entire performance was determined by exogenous events—Vanguard was also actively shaping the competitive landscape in its favor. For instance, Vanguard educated investors about the benefits of long-term investing and the importance of low cost in achieving high long-term performance.

Once investors started to appreciate the value of low-cost funds and index funds, no firm was better positioned to provide these funds than Vanguard. In 1995, Vanguard commanded a 58% market share of index funds, running seven of the ten largest index funds in the industry. In sum, while Vanguard benefited from environmental changes, it was also an active shaper of its environment. (For an insightful discussion of the need to disentangle “strategy” from “initial conditions,” see Cockburn, Henderson, and Stern (2000)).

The second driving force shaping Vanguard’s development was Bogle’s personal agenda. For instance, Bogle’s suggestion in 1974 for the funds to buy out WMC probably should be seen in the context of Bogle’s fight to regain control over the company from which his Boston partners had ousted him. It appears unlikely, though, that he was merely trying to get back at his Boston partners. In 1971, long before the situation at WMC had escalated, he proposed a mutual structure for WMC. In a speech to the partners of WMC, he had outlined his ideas for the five years following 1971:

If we believe that it is in the interest of our fund and counsel clients that our firm should be owned by its active executives and not by the public, shouldn’t we work to solve this problem in a way that is equitable to all? What a great objective to be accomplished by 1976! . . . There may be “mutualization” whereby the funds acquire the management company. . . . There may be “internalization” whereby the active executives own the management company. . . . I think a restructured Wellington Management Company may . . . enable us both better to fulfill our performance obligations and more effectively to honor our fiduciary responsibilities. (Bogle, 1971)

The third driver of Vanguard’s development is found in three endogenous positive feedback loops between the choices comprising Vanguard’s strategic themes (see Figure 11). The first feedback loop centered around the following dynamic: Vanguard’s focus on low cost generated high long-term returns for its funds. High long-term returns led to more assets under management, which, in turn, enabled Vanguard to decrease costs and increase returns even further. While this feedback loop appears generic, it worked especially well for Vanguard, given its strategic themes. For instance, a reduction in costs led to noticeably higher long-term returns particularly for the types of funds offered by Vanguard. Moreover, Vanguard’s mutual structure was critical to ensuring that the low costs were fully passed along to

customers—i.e., that low costs were actually leading to higher long-term returns. Given its mutual structure, the cost savings did not have to be split between two ownership groups, but accrued fully to fund shareholders. Similarly, Vanguard strengthened the link between high long-term performance and cash inflows into its funds by educating its investors to look at the long term and by creating a trusting relationship with its investors through its candid communication. Lastly, a larger asset base led to lower costs, again particularly for the types of funds that lay within Vanguard’s product focus: Vanguard’s fixed-income and passively managed index funds were very easily scaled up. In contrast, actively managed funds that attempted to invest in “winners” had to engage in ever-increasing efforts to find “good deals” as assets under management grew. The scale economies enjoyed by Vanguard’s funds led to lower costs that, again, were passed on to customers, leading to higher returns and eventually larger inflows, fueling the scale economies even further.

The second and third positive feedback loops involved the emphasis on high-quality service. As the cost difference between Vanguard and its competitors grew, Vanguard was able to provide high-quality service to its clients, while still keeping its costs lower than its competitors’. The high-quality service, in turn, generated new business via word-of-mouth advertising and helped Vanguard to retain assets longer than most of its competitors: Vanguard’s redemption rate was about half of the industry average. Both new business and long retention led to higher volume and to lower cost—directly via lower advertising expenditures and trading expenses, and indirectly via scale economies.

It is important to note that this third driver, endogenous positive feedback loops, was based on the presence of several strategic themes. The feedback effects within Vanguard’s set of choices could only arise (and be strong) with a number of strategic themes in place. In this context, Vanguard’s developmental pattern is intriguing. As Figures 1 and 6–10 illustrate, Vanguard’s development resembled more a thin-to-thick process than a patch-by-patch process. Very early on, five of its seven strategic themes were present. *It turns out that the first five strategic themes that were present from the beginning are precisely those that constitute the first positive feedback loop described above.* Consequently,

Vanguard enjoyed positive feedback effects among its choices right from its inception. The second and third feedback loops, which entailed high-quality service, arose later. Thus, we can identify an interesting interplay between Vanguard's developmental drivers and its pattern of development. The thin-to-thick development allowed the positive feedback dynamics to develop very early on in Vanguard's history, while the later "patching" of the high-quality theme increased the number of positive feedback loops.

More generally, the thin-to-thick and patch-by-patch processes are likely to lead to different patterns of when and what type of feedback effects can arise. Consider first a system that develops patch-by-patch. As the firm elaborates on its first strategic theme, positive reinforcements among choices that implement this theme can arise. Thus, these feedback effects are likely to be "local," in the sense that they arise among choices belonging to the same strategic theme. As the firm adds a second theme and starts to elaborate on it, again local feedback effects among choices that implement this theme can arise.

Depending on whether both strategic themes interact, feedback effects between choices from both themes may also arise. Thus, as the firm's system of choices grows, feedback effects could become more global. In contrast, in systems that develop thin-to-thick, if feedback effects arise, they are likely to be global from the start, as they involve several strategic themes. At the same time, since no strategic theme is very much elaborated on early, local feedback effects tend to be weak. These observations lead to two hypotheses:

Hypothesis 1: A thin-to-thick process allows global positive feedback dynamics to develop earlier than a patch-by-patch process does.

Hypothesis 2: A patch-by-patch process allows local positive feedback dynamics to develop earlier than a thin-to-thick process does.

If management's end-goal is to create global feedback dynamics—i.e., to create a firm-encompassing system of interconnected choices—then both processes pose different challenges. The thin-to-thick process requires management, relatively early in the history of the company, to lay down a set of coherent

strategic themes that will help guide future action. The patch-by-patch process requires management to find subsequent strategic themes that can create feedback effects with existing elaborated strategic themes. A priori, it is difficult to say which task poses the greater challenge. At the same time, firms do not have to follow either pure path. As we have seen in the case of Vanguard, firms may also develop along a hybrid path, starting out with a thin-to-thick process, which generates global feedback effects early on, and then add patches of choices later, which can generate more feedback loops with the existing activities. This hybrid path may be a helpful medium, as it requires management neither to set all strategic themes early nor to chance upon a long sequence of strategic themes that generate feedback effects.

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

To infuse the approach of analyzing firms as systems of interconnected choices with a dynamic perspective, we started to develop a typology for describing evolution of fit at the level of individual choices. In particular, we described two possible patterns of development: thin-to-thick and patch-by-patch. While we do not argue that firms follow one or the other pattern exclusively, these two polar patterns may serve as a useful starting point for future studies of the development of systems of interconnected choices.

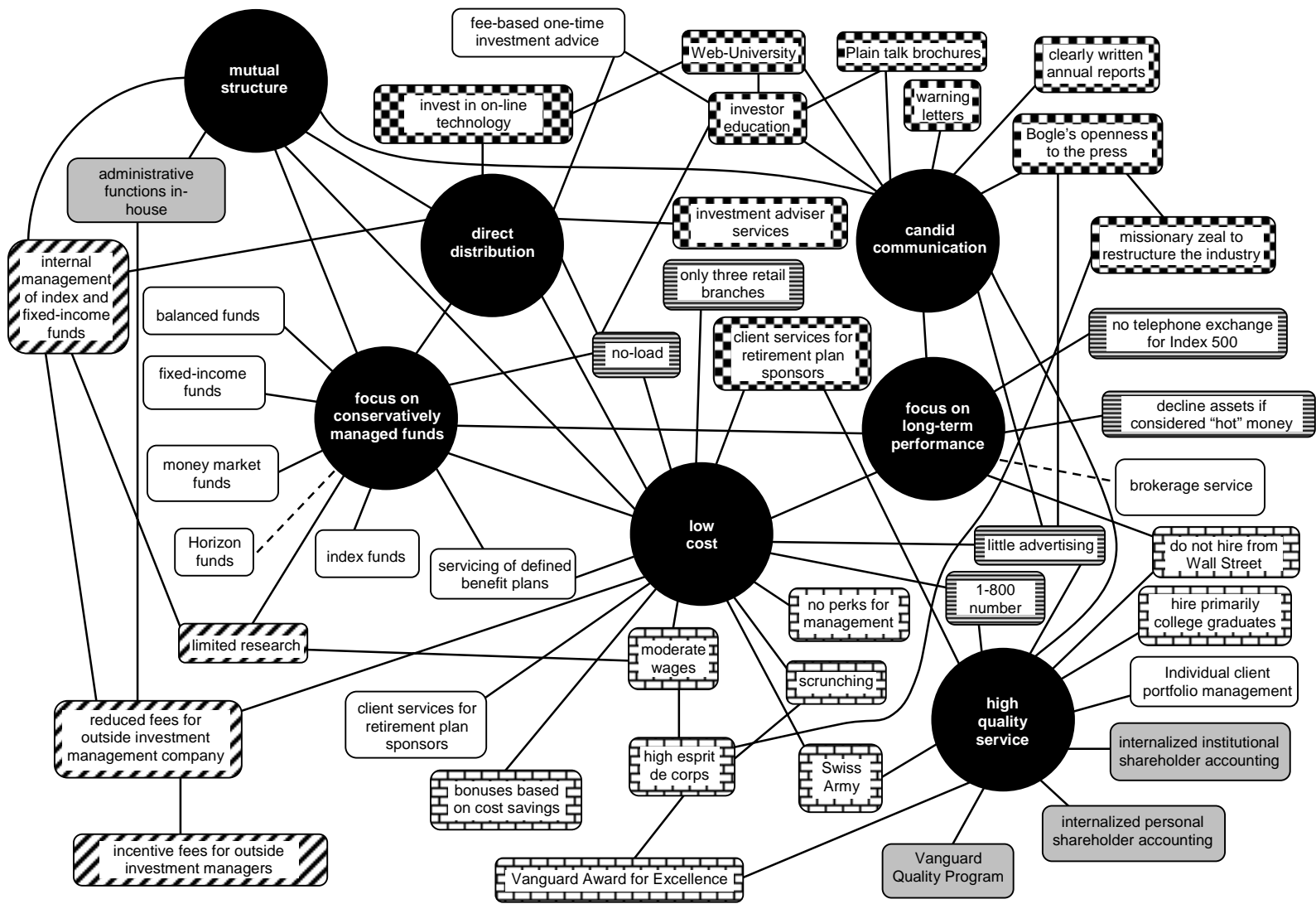
With these two developmental patterns as a backdrop, two main directions for future research open up. First, what *causes* the two developmental patterns to take place? For instance, are these developmental patterns contingent on the environmental stability that a firm encounters? On first reflection, it would appear that a thin-to-thick pattern is more likely to arise in stable environments, while a patch-by-patch pattern may be associated with more turbulent environments. Second, future research needs to elaborate on the *consequences* of having followed a particular developmental path. Systems that developed patch-by-patch are likely to be more loosely coupled (Weick, 1976)—with strong local feedback effects and weak global feedback effects—than systems that developed thin-to-thick. This qualitatively different structure may, in turn, lead to different abilities of firms to respond to environmental changes. In

addition, environmental turbulence may cause firms to reformulate their strategic themes. Will firms that have developed patch-by-patch react faster or slower than firms that have developed thin-to-thick? More generally, what effect does reformulating strategic themes have on the creation of feedback effects (and, in this context, does it make a difference whether systems developed thin-to-thick or patch-by-patch)? Given the difficulty of creating consistent behavior across time, we would venture the hypothesis that continuity at the level of strategic themes is required to develop global fit in a system of interconnected choices, but clearly more future research is needed to settle this question.

Footnotes

- ¹ These observations are consonant with formal models developed by Milgrom, Qian, and Roberts (1991) and Milgrom and Roberts (1995), who showed that an upward or downward movement of a whole system of complementary variables, once begun, tends to continue.
- ² Vanguard's success continued after 1996. By the end of 2000, Vanguard had assets of \$560 billion under management. Notably, the entire growth was generated internally and not through acquisitions.
- ³ Moreover, for betweenness, the most used centrality measure (Wasserman and Faust, 1994), a clear break in the distribution of centrality scores exists between these seven choices and the remaining choices in the system. All centrality measures were computed using UCINET IV (Borgatti, Everett, and Freeman, 1996).
- ⁴ "Open-end" mutual funds are allowed to issue an unlimited number of shares. They are obliged to redeem shares at any time at their current net asset value. In contrast, "closed-end" mutual funds sell only a limited number of shares at an initial public offering. These shares are subsequently traded on an exchange. By 1929, 677 closed-end funds existed. At that time, many closed-end funds borrowed heavily against their stock portfolios (i.e., were leveraged) to increase their security holdings and, potentially, their returns (Bogle, 1992).
- ⁵ While the funds performed the fund accounting themselves (e.g., computing fund prices), most activities tied to shareholder accounting (e.g., processing of new deposits) remained initially outsourced to a third-party provider.
- ⁶ Bogle added to his comment in 1974: "But if [internal distribution] is not accepted now, it may well be only a matter of time, perhaps within two or three years" (Bogle, 1974, p. 45). In the end, it took two years and eight months until Vanguard internalized distribution (see below).
- ⁷ Even by the end of 1996, Vanguard had only three branch offices, one at its headquarters in Valley Forge, one in downtown Philadelphia, and one in Phoenix.
- ⁸ Personal communication with John Brennan, January 24, 1997.
- ⁹ Personal communication with John Brennan, February 5, 1997.
- ¹⁰ Personal communication with Robert DiStefano, January 24, 1997.

Figure 1: Map of interactions among Vanguard's choices in 1997



Legend:

- strategic themes/ central choices
- asset management
- account management
- selling & marketing
- information & customer service
- human resource practices
- product portfolio
- fit/ reinforcement
- - - misfit

Figure 2: Typical Organization of Mutual Fund Providers

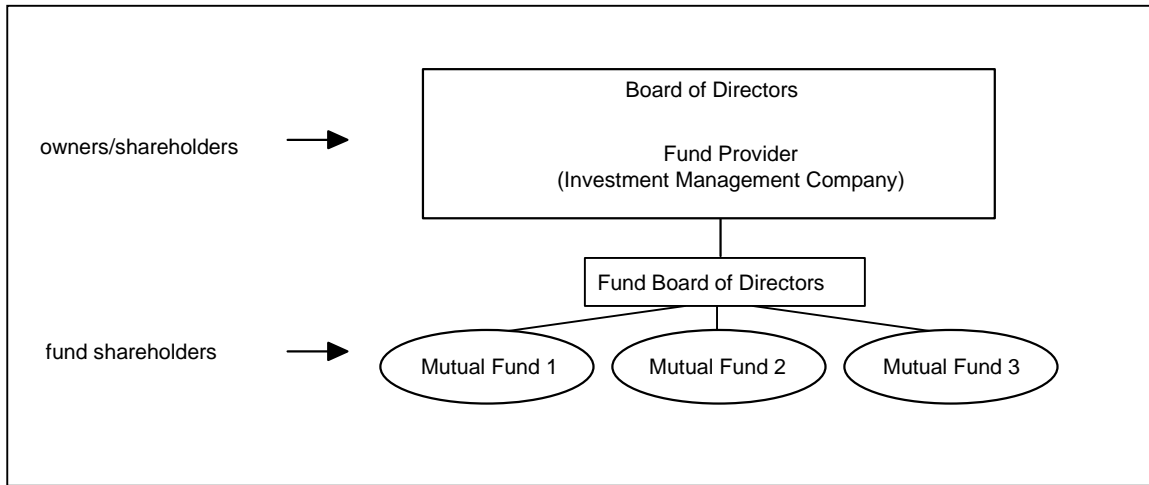


Figure 3: Value chain of a typical fund provider

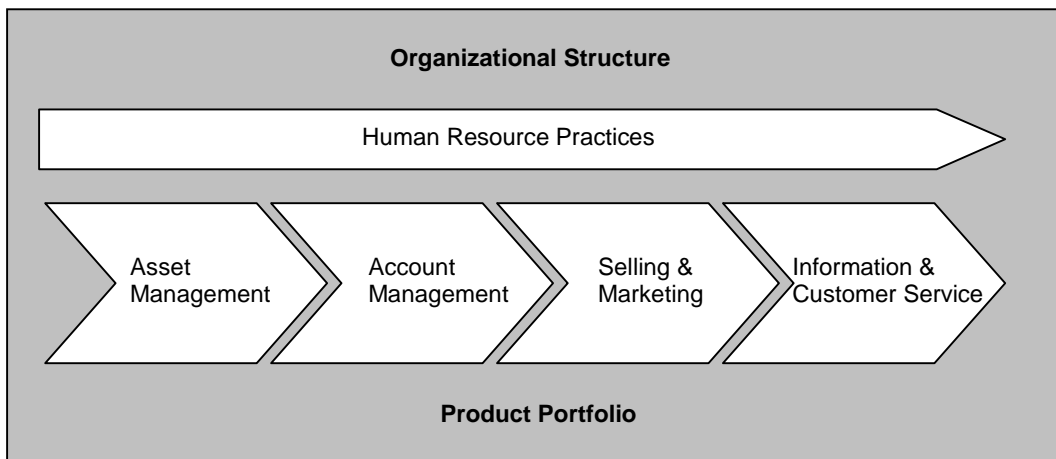
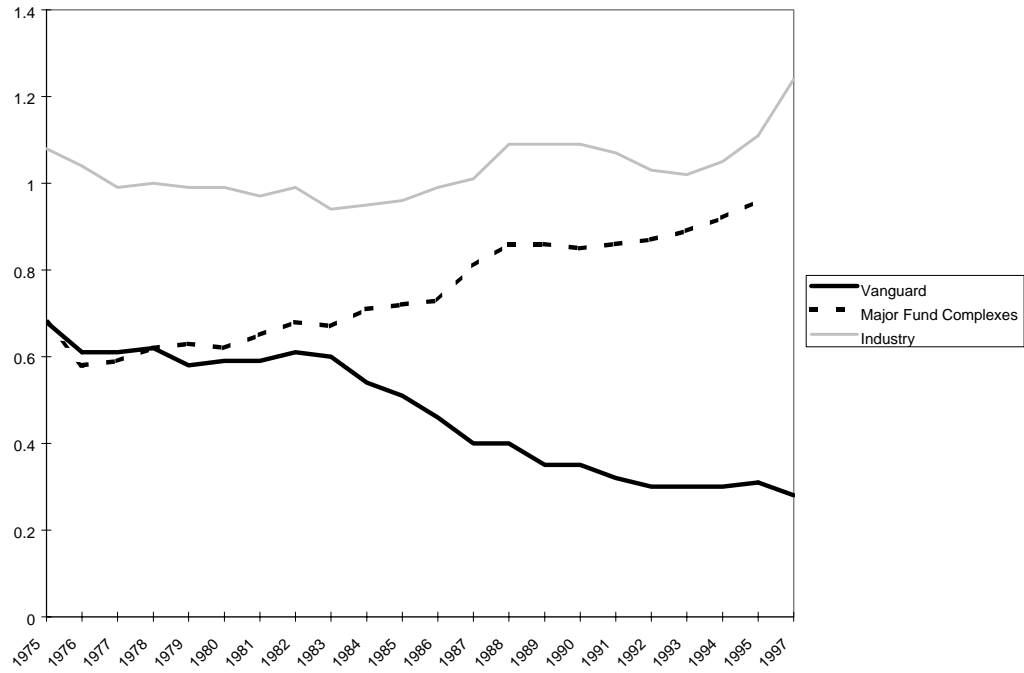


Figure 4: Vanguard's average expense ratio in comparison with the industry



source: Vanguard (1996)

Figure 5: Total assets in Vanguard's funds (in billions of dollars)

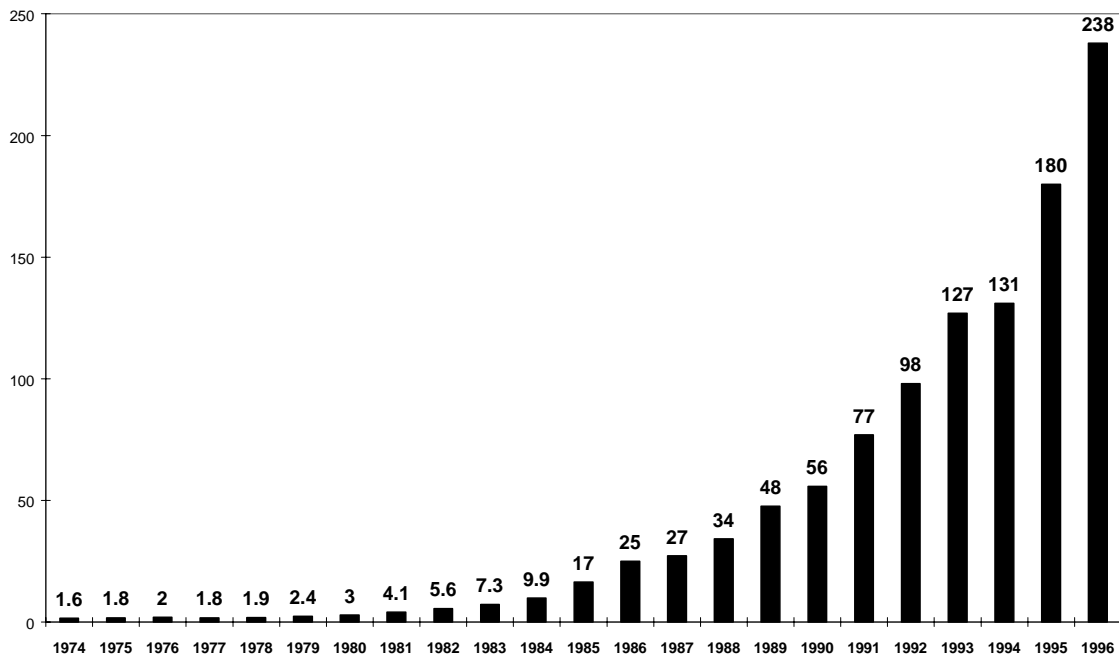


Figure 6: Map of interactions among Wellington Management Company's choices in 1973

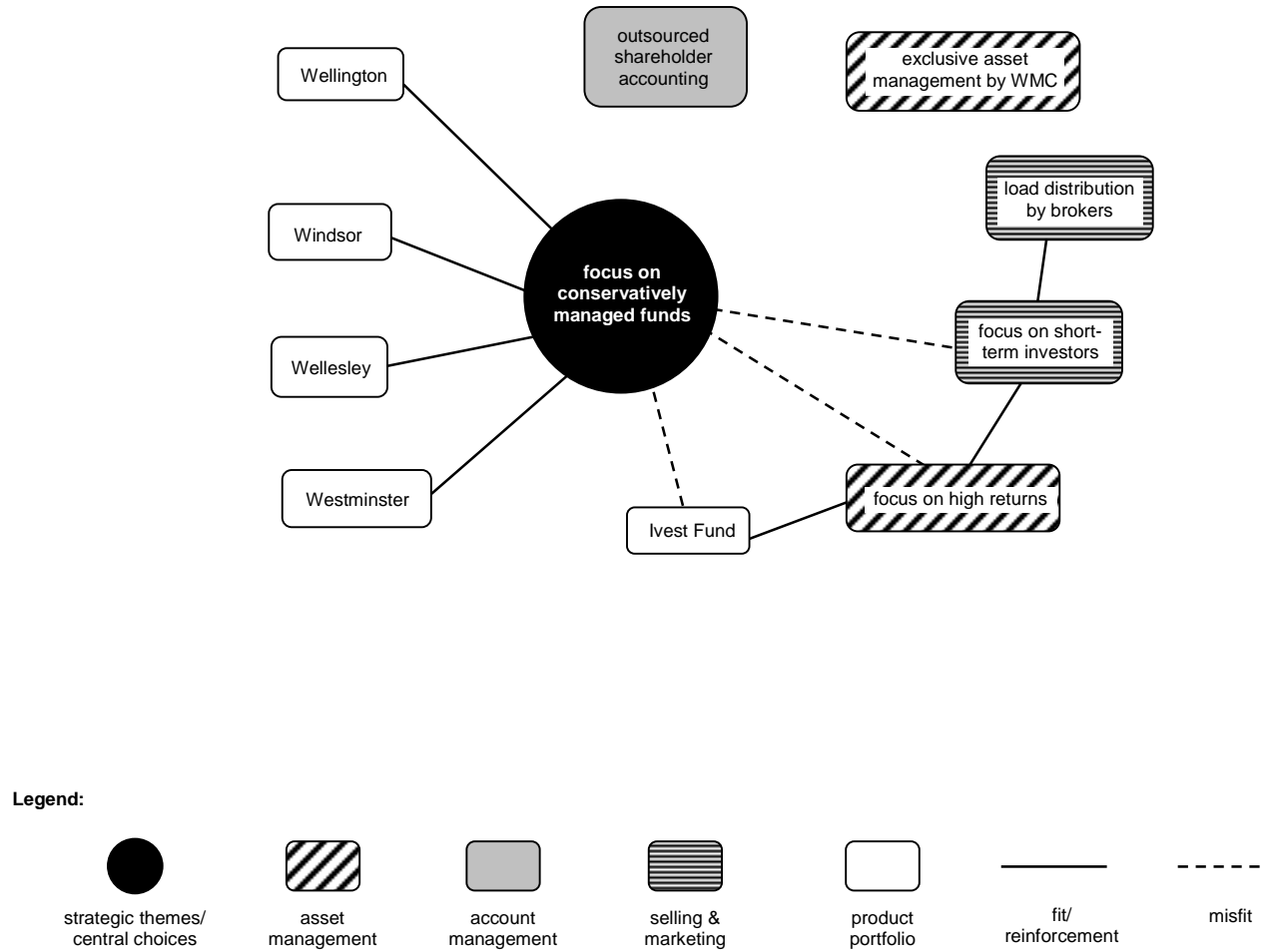
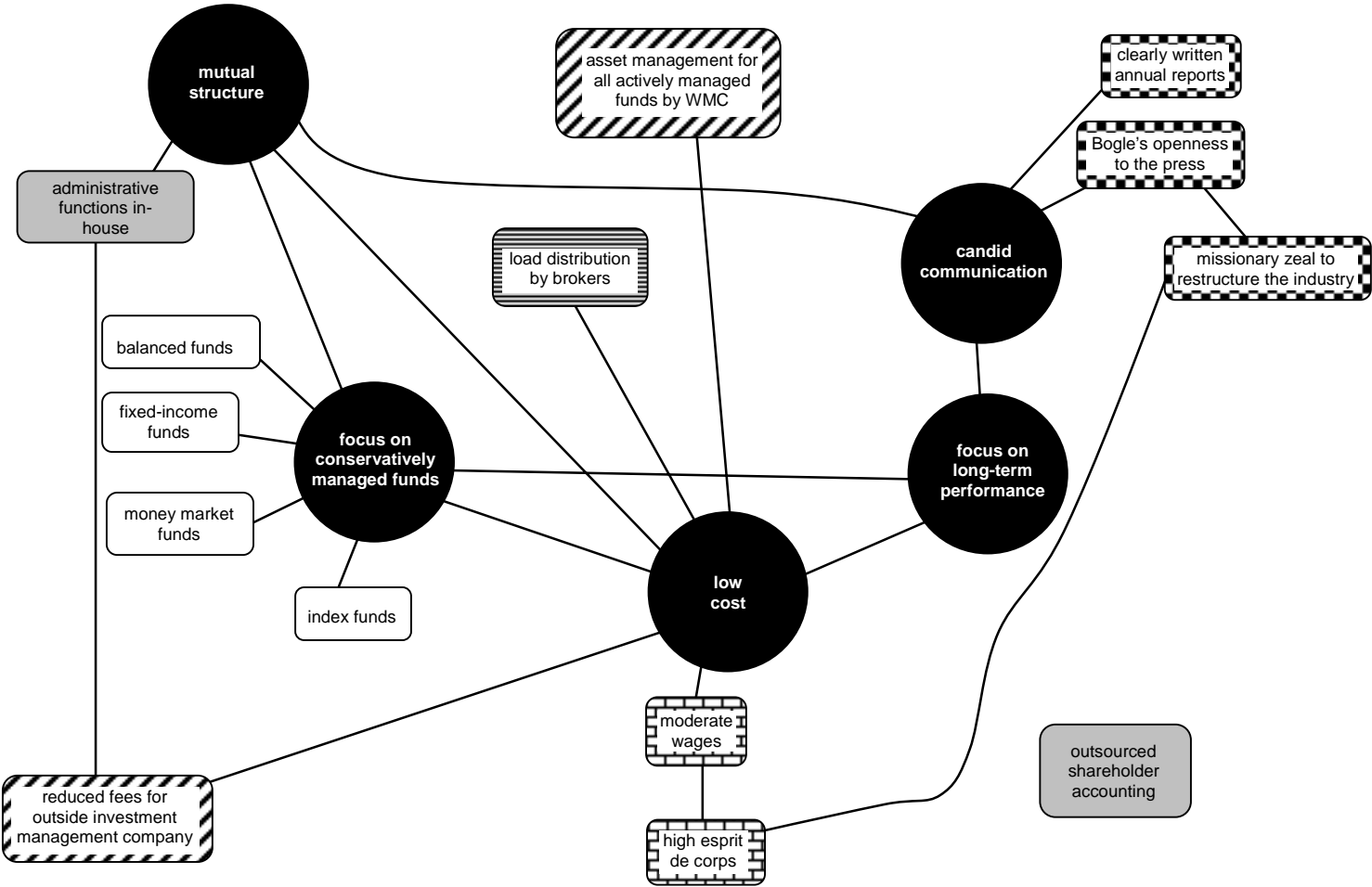


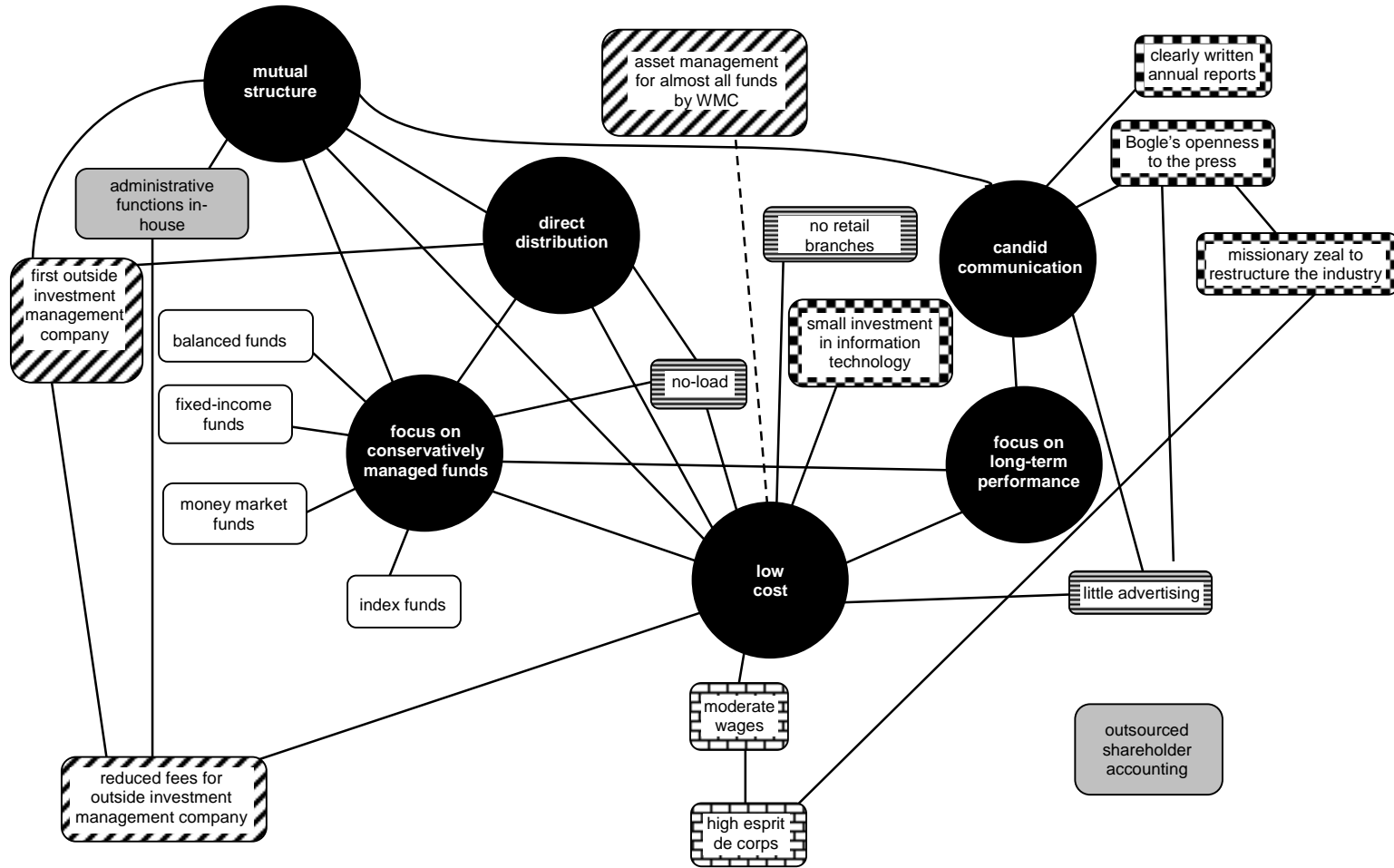
Figure 7: Map of interactions among Vanguard's choices in 1976



Legend:

- 
 strategic themes/
central choices
- 
 asset
management
- 
 account
management
- 
 selling &
marketing
- 
 information &
customer service
- 
 human resource
practices
- 
 product
portfolio
-
 fit/
reinforcement
-
 misfit

Figure 8: Map of interactions among Vanguard's choices in 1977



Legend:



- 
 strategic themes/
central choices
- 
 asset
management
- 
 account
management
- 
 selling &
marketing
- 
 information &
customer service
- 
 human resource
practices
- 
 product
portfolio
- 
 fit/
reinforcement
- 
 misfit

Figure 9: Map of interactions among Vanguard's choices in 1981

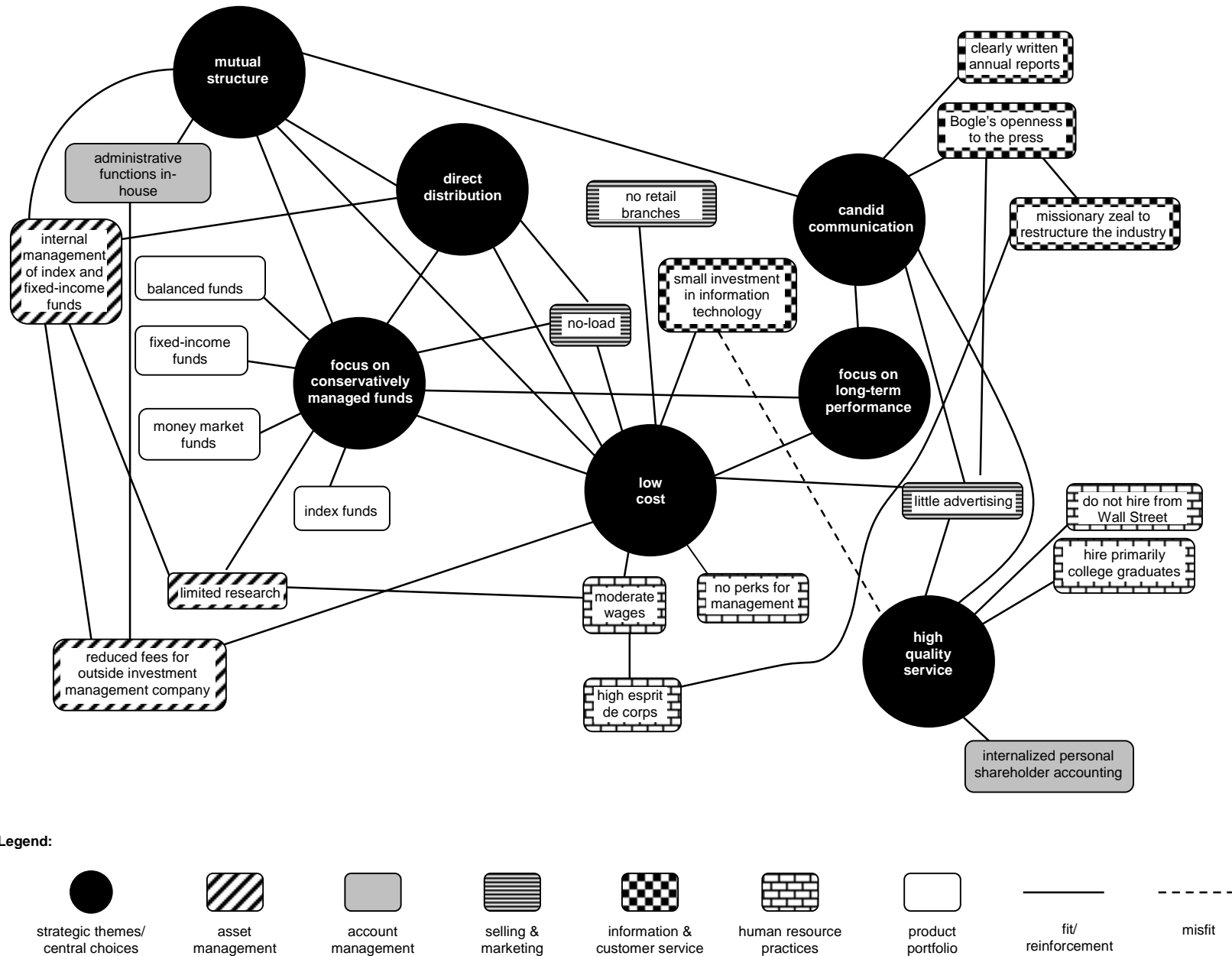


Figure 10: Map of interactions among Vanguard's choices in 1991

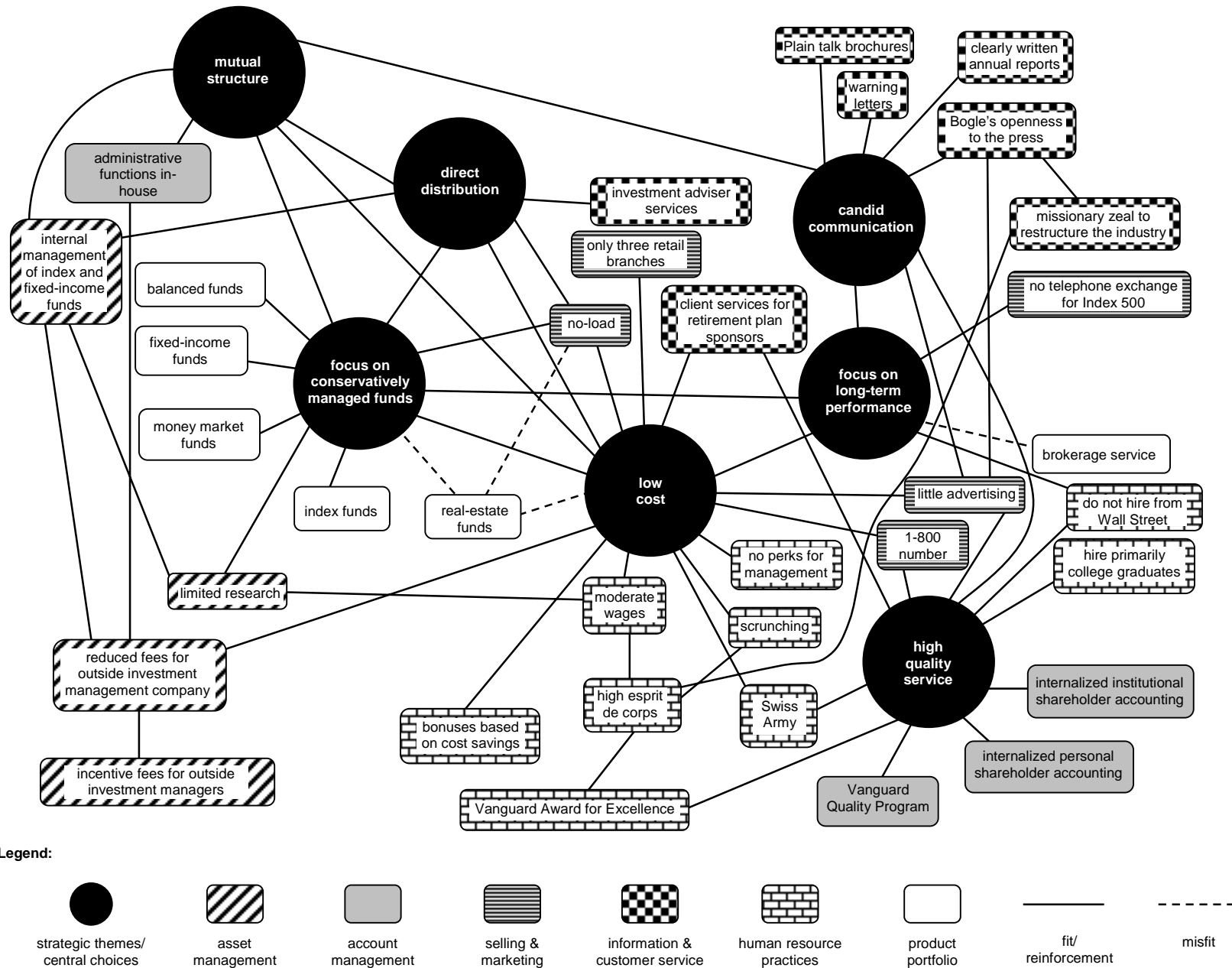
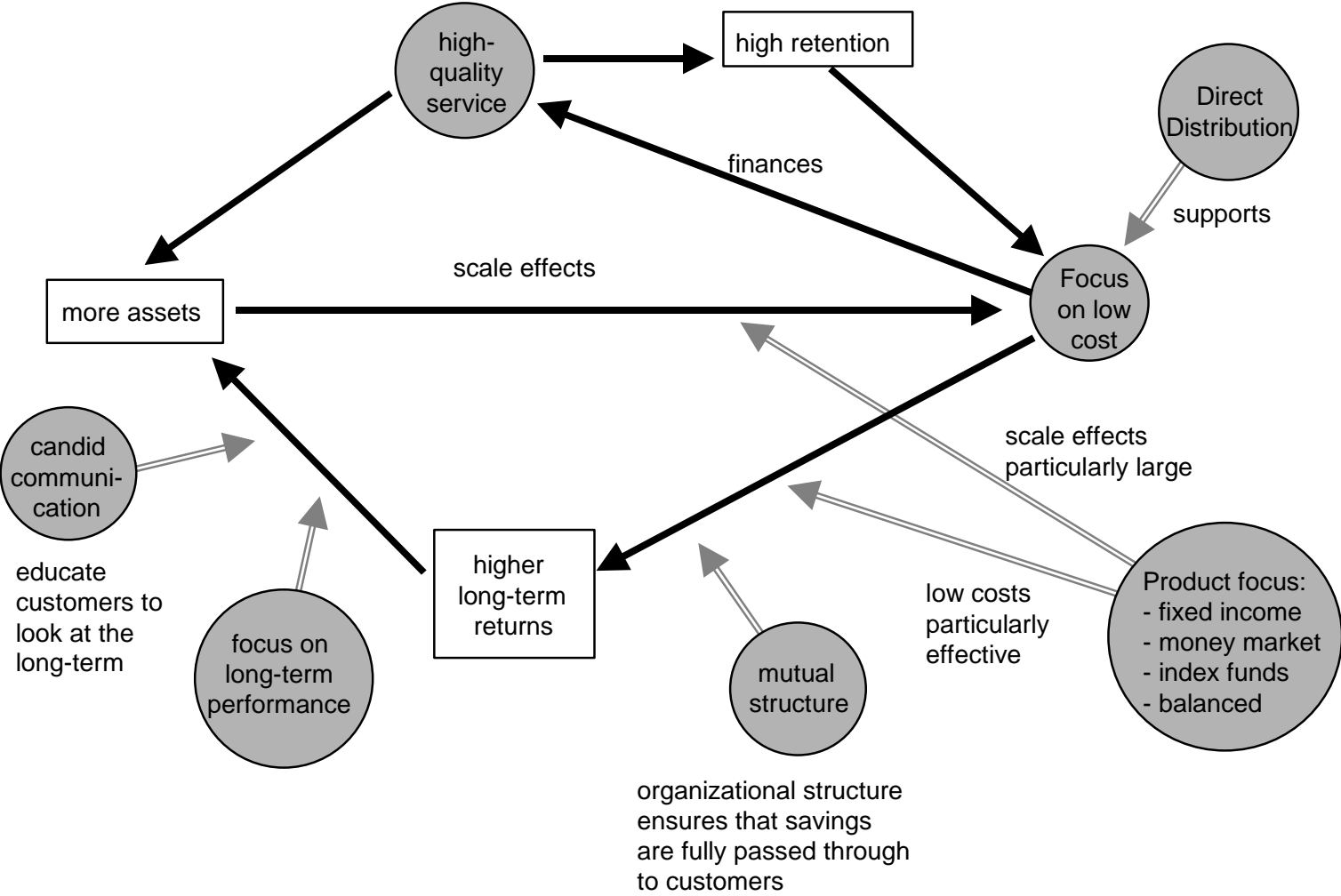


Figure 11: Positive feedback loops in Vanguard's development



References

Baron, J. N., Hannan, M. T., and Burton, M. D.

1999 "Building the iron cage: Determinants of managerial intensity in the early years of organizations." *American Sociological Review*, 64: 527–547.

Bogle, J. C.

1951 The economic role of the investment company. Honors Thesis, Princeton University, Princeton, NJ.

1971 Deliverance. Speech to Wellington Management Company Partners, September 9.

1974 The future structure of the Wellington Group of investment companies, Part 1. March 11.

1975 The winds of change: The Vanguard experiment in internalized management. Speech at the FBA–CCH Conference on Mutual Funds and Investment Management, San Diego, March 12.

1977 Marketing mutual fund shares in the 1980s. Remarks to The National Investment Company Service Association, March 10.

1985 May Day and the Vanguard experiment. Address to the Vanguard Crew, May 1.

1986 Vanguard and Victory. A Collection of Twelve Talks to the Staff of The Vanguard Group between 1980 and 1986.

1991 Daring and caring. Remarks to the Crew, December 11.

1992 Vanguard: The first century. Speech to the Newcomen Society. Newcomen Publication Number 1374.

1999 Human beings: Essential link in the service–profit chain. Remarks at Harvard Business School, December 7.

Bonacich, P.

1987 "Power and centrality: A family of measures." *American Journal of Sociology*, 92: 1170–1182.

Borgatti, S. P., Everett, M. G., and Freeman, L. C.

1996 UCINET IV, Version 1.66. Columbia: Analytic Technologies.

Bower, J. L.

1970 *Managing the Resource Allocation Process*. Boston: Harvard Business School Press.

Brown, S. L., and Eisenhardt, K. M.

1997 "The art of continuous change: Linking complexity theory and time–paced evolution in relentlessly shifting organizations." *Administrative Science Quarterly*, 42: 1–34.

Burgelman, R. A.

1991 "Intraorganizational ecology of strategy making and organizational adaptation: Theory and field research." *Organization Science*, 2: 239–262.

1994 "Fading memories: A process theory of strategic business exit in dynamic environments." *Administrative Science Quarterly*, 39: 24–56.

Burgunder, L. B., and Hartmann, K. O.

1988 "The mutual fund industry and Rule 12b–1 plans: An assessment." *Securities Regulation Law Journal*, 15: 364–420.

Chandler, A. D., Jr.

1962 *Strategy and Structure*. Cambridge, MA: MIT Press.

- Child, J., and Smith, C.
1987 "The context and process of organizational transformation – Cadbury Limited in its sector." *Journal of Management Studies*, 24: 565–593.
- Cockburn, I. M., Henderson, R. M., and Stern, S.
1999 "The diffusion of science driven drug discovery: Organizational change in pharmaceutical research." Working paper 7359, National Bureau of Economic Research, Cambridge, MA.
2000 "Untangling the origins of competitive advantage." *Strategic Management Journal*, 21: 1123–1146.
- Drazin, R., and Van de Ven, A. H.
1985 "Alternative forms of fit in contingency theory." *Administrative Science Quarterly*, 30: 514–539.
- Easton, T.
1996 "Some like it hot, some like it cheap." *Forbes*, February 12: 114–119.
- Eisenhardt, K. M.
1989a "Agency theory: An assessment and review." *Academy of Management Review*, 14: 57–74.
1989b "Building theory from case study research." *Academy of Management Review*, 14: 532–550.
- Eisenhardt, K. M., and Bourgeois, L. J., III
1988 "Politics of strategic decision making in high-velocity environments: Toward a midrange theory." *Academy of Management Journal*, 31: 737–770.
- Eisenhardt, K. M., and Brown, S. L.
1999 "Patching: Restitching business portfolios in dynamic markets." *Harvard Business Review*, 77 (May–June): 72–82.
- Freeman, L. C.
1977 "A set of measures of centrality based on betweenness." *Sociometry*, 40: 35–41.
1979 "Centrality in social networks: I. Conceptual clarification." *Social Networks*, 1: 215–239.
- Galunic, D. C., and Eisenhardt, K. M.
1996 "The evolution of intracorporate domains: Divisional charter losses in high-technology, multidivisional corporations." *Organizational Science*, 7: 255–282.
- Gavetti, G., and Levinthal, D.
2000 "Looking forward and looking backward: Cognitive and experiential search." *Administrative Science Quarterly*, 45: 113–137.
- Gersick, C. J. G.
1991 "Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm." *Academy of Management Review*, 16: 10–36.
- Ghemawat, P., and Levinthal, D.
1999 "Choice structures, business strategy and performance: A generalized NK-simulation approach." mimeo, Harvard Business School and The Wharton School.
- Glaser, B. G., and Strauss, A. L.
1967 *The Discovery of Grounded Theory*. Chicago: Aldine.

- Golden, B. R.
1992 "The past is the past – or is it? The use of retrospective accounts as indicators or past strategy." *Academy of Management Journal*, 35: 848–860.
- Hallowell, R.
1997 "Dual competitive advantage in labor–dependent services: Evidence, analysis, and implications." *Advances in Services Marketing and Management, Research and Practice*, 6.
- Hambrick, D. C.
1983 "An empirical typology of mature industry–product environments." *Academy of Management Journal*, 26: 213–230.
- Hannan, M. T., Burton, M. D., and Baron, J. N.
1996 "Inertia and change in the early years: Employment relations in young, high–technology firms." *Industrial and Corporate Change*, 5: 503–536.
- Hannan, M. T., and Freeman, J.
1984 "Structural inertia and organizational change." *American Sociological Review*, 49: 149–164.
- Heins, J.
1985 "Out of the ashes." *Forbes*, September 23: 220–221.
- Khandwalla, P. N.
1973 "Viable and effective organizational designs of firms." *Academy of Management Journal*, 16: 481–495.
- Learned, E. P., Christensen, C. R., Andrews, K. R., and Guth, W. D.
1961 *Business Policy: Text and Cases*. Homewood: Irwin.
- Levinthal, D. A.
1997 "Adaptation on rugged landscapes." *Management Science*, 43: 934–950.
- Levinthal, D. A., and Myatt, J.
1994 "Co–evolution of capabilities and industry: The evolution of mutual fund processing." *Strategic Management Journal*, 15: 45–62.
- MacDuffie, J. P.
1995 "Human resource bundles and manufacturing performance: Organizational logic and flexible production systems in the world automobile industry." *Industrial and Labor Relations Review*, 48: 197–221.
- Mathisen, T.
1996 "Bogle may have had a transplant, but he hasn't had a change of heart." *Money*, (December).
- McKelvey, B.
1999 "Avoiding complexity catastrophe in coevolutionary pockets: Strategies for rugged landscapes." *Organization Science*, 10: 294–321.
- Miles, R. E., and Snow, C. C.
1984 "Fit, failure and the hall of fame." *California Management Review*, 26 (Spring): 10–28.

- Milgrom, P. R., Qian, Y., and Roberts, J.
1991 "Complementarities, momentum, and the evolution of modern manufacturing." *American Economic Review*, 81: 84–88.
- Milgrom, P. R., and Roberts, J.
1990 "The economics of modern manufacturing: Technology, strategy, and organization." *American Economic Review*, 80: 511–528.
1995 "Complementarities and fit: Strategy, structure, and organizational change in manufacturing." *Journal of Accounting and Economics*, 19: 179–208.
- Miller, D.
1981 "Toward a new contingency perspective: The search for organizational gestalts." *Journal of Management Studies*, 18: 1–26.
1986 "Configurations of strategy and structure: Towards a synthesis." *Strategic Management Journal*, 7: 233–249.
1996 "Configurations revisited." *Strategic Management Journal*, 17: 505–512.
- Miller, D., and Friesen, P. H.
1980 "Momentum and revolution in organizational adaptation." *Academy of Management Journal*, 23: 591–614.
1982 "Structural change and performance: Quantum versus piecemeal–incremental approaches." *Academy of Management Journal*, 25: 867–892.
1984 *Organizations: A Quantum View*. Englewood Cliffs, NJ: Prentice Hall.
- Mintzberg, H., and McHugh, A.
1985 "Strategy formation in an adhocracy." *Administrative Science Quarterly*, 30: 160–197.
- Mintzberg, H., and Waters, J. A.
1982 "Tracking strategy in an entrepreneurial firm." *Academy of Management Journal*, 25: 465–499.
1985 "Of strategies, deliberate and emergent." *Strategic Management Review*, 6: 257–272.
- Orton, J. D., and Weick, K. E.
1990 "Loosely coupled systems: A reconceptualization." *Academy of Management Review*, 15: 203–223.
- Perold, A.
1998 *The Vanguard Group, Inc.* Harvard Business School Case, 9–299–002.
- Pettigrew, A. M.
1973 *The Politics of Organizational Decision Making*. London: Tavistock.
1985 *The Awakening Giant: Continuity and Change in Imperial Chemical Industries*. Oxford: Blackwell.
1987 "Context and action in the transformation of the firm." *Journal of Management Studies*, 24: 649–670.
1990 "Longitudinal field research on change." *Organization Science*, 1: 267–292.
- Porter, M. E.
1980 *Competitive Strategy*. New York: Free Press.
1985 *Competitive Advantage*. New York: Free Press.
1996 "What is strategy?" *Harvard Business Review*, 74 (6): 61–78.

- Porter, M. E., and Siggelkow, N.
2000 "Contextuality within activity systems." Academy of Management Best Paper Proceedings,: BPS F1–F6.
- Rivkin, J. W.
2000 "Imitation of complex strategies." Management Science, 46: 824–844.
- Rohrer, J.
1995 "A burst of interactivity at Vanguard." Institutional Investor, September: 171.
- Romanelli, E., and Tushman, M. L.
1994 "Organizational transformation as punctuated equilibrium: An empirical test." Academy of Management Journal, 37: 1141–1166.
- Sanders, C. V.
1996 "Dear shareholder." Morningstar Mutual Funds, April 26: S1–S2.
- Sastry, A., and Lee, F.
1999 "Pairing stability with change: Rules, operations, and structures in an enduring organization." mimeo, University of Michigan.
- Savitz, E. J.
1997 "Tortoise wins again." Barron's, January 6.
- Siggelkow, N.
1998 "Why focus? A study of intra-industry focus effects." working paper 99–13, Financial Institutions Center, University of Pennsylvania, Philadelphia.
forthcoming "Change in the presence of fit: The rise, the fall, and the renaissance of Liz Claiborne." Academy of Management Journal.
- Simon, H. A.
1945 Administrative Behavior. New York: Free Press.
1962 "The architecture of complexity." Proceedings of the American Philosophical Society, 106: 467–482.
- Singh, J. V., House, R. J., and Tucker, D. J.
1986 "Organizational change and organizational mortality." Administrative Science Quarterly, 31: 587–611.
- Slater, R.
1997 John Bogle and the Vanguard Experiment. Chicago: Irwin.
- Stephenson, K., and Zelen, M.
1989 "Rethinking centrality: Methods and applications." Social Networks, 11: 1–37.
- Stinchcombe, A. L.
2000 "On equilibrium, organizational form, and competitive strategy." Advances in Strategic Management, 17: 271–284.

- Tushman, M. L., Newman, W. H., and Romanelli, E.
1986 "Convergence and upheaval: Managing the unsteady pace of organizational evolution." *California Management Review*, 29 (1): 29–44.
- Tushman, M. L., and Romanelli, E.
1985 "Organizational evolution: A metamorphosis model of convergence and reorientation." *Research in Organizational Behavior*, 7: 171–222.
- Van de Ven, A. H., and Drazin, R.
1985 "The concept of fit in contingency theory." *Research in Organizational Behavior*, 7: 333–365.
- Vanguard
1996 *Investment Portfolios Fourth Quarter 1996*. Valley–Forge: The Vanguard Group.
- Wasserman, S., and Faust, K.
1994 *Social Network Analysis*. New York: Cambridge University Press.
- Weick, K. E.
1976 "Educational organizations as loosely coupled systems." *Administrative Science Quarterly*, 21: 1–19.
- Whittington, R., Pettigrew, A., Peck, S., Fenton, E., and Conyon, M.
1999 "Change and complementarities in the new competitive landscape: A European panel study, 1992–1996." *Organization Science*, 10: 583–600.
- Yin, R. K.
1984 *Case Study Research: Design and Methods*. Beverly Hills: Sage.