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The Origin and Evolution of New Businesses

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PREFACE

This effort to demystify and organize our thinking about entrepreneurs through systematic research has practical roots. I undertook the research that has led to this book in order to address a problem in business education. Courses in entrepreneurship have gained great popularity, as increasing numbers of students want to start and build their own businesses. In 1979, the year I graduated from the MBA program at Harvard Business School, a solitary course in starting new ventures attracted fewer than 100 students. In 1996, nine courses filled over 1400 student seats. Similarly, Stanford's business school reports that over 90 percent of its MBA students now elect at least one course in entrepreneurship. We still lack, however, a solid base of ideas for such courses. Over the last half-century, business schools have devoted considerable resources to studying the entrepreneurial activities of large companies – how Merck develops new drugs and Intel new microprocessors, how Disney produces and markets the *Jungle Book* and McDonald's introduces Big Macs in China. Little effort has been devoted to systematic research about starting and growing new businesses.

Researchers have focused on the initiatives of large corporations for several reasons. As business schools and research in the United States came of age in the 1950s and 1960s, large corporations dominated the economic landscape. According to the historian Alfred Chandler, a "new form of capitalism", the "large managerial business enterprise", appeared in the last half of the nineteenth century.[1] This new form, which was controlled by a hierarchy of salaried executives rather than the owners, "dominated the core industries in the United States"[2] by the end of World War I and by the 1960s, it became ubiquitous. In 1967 Galbraith observed that the five hundred largest corporations produced nearly half the goods and services annually available in the United States. Galbraith wrote: "Seventy years ago the corporation was still confined to those industries—railroading, steamboating, steel-making, petroleum recovery and refining, some mining—where, it seemed, production had to be on a large scale. Now it also sells groceries, mills grain, publishes newspapers, and provides public entertainment, all activities that were once the province of the individual proprietor or the insignificant firm."[3]

Large corporations represented as dynamic an economic force as the individual entrepreneurs who had initially founded them. The economist Josef Schumpeter had regarded the rise of the large corporations as inevitable and forecast that such a development would doom capitalism by stifling the "innovative energy" of the individual entrepreneur. "The perfectly bureaucratized giant industrial unit," Schumpeter wrote, "not only ousts the small- or medium-sized firm and "expropriates" its owners, but in the end it also ousts the entrepreneur and expropriates the bourgeoisie as a class which in the process stands to lose not only its income but also what is infinitely more important, its function."[4] Schumpeter's contemporary, the economist Frank Knight, also believed that managers who did not own a significant share of the enterprise would be much more conservative and risk-averse than the founding entrepreneurs.

In fact, large corporations undertook entrepreneurial functions remarkably well. They introduced jet engines, television sets, plastics, pharmaceuticals, mainframe computers, and a host of new products to market. Domestic companies ventured overseas and became multinational. They also experimented with and adopted new forms of decentralized organizations to accommodate their increasing size and scope. Schumpeter's "perfectly bureaucratized giant industrial units," to use Chandler's words, "provided a fundamental dynamic or force for change in the capitalist economies"—a transformation "which brought the most rapid economic growth in the history of mankind."[5]

The growth and dynamism of large corporations seemed to reduce the relevance of the individual entrepreneur. At the turn of the last century, Galbraith wrote in 1967, "the corporation was the instrument of its owners and a projection of their personalities. The names of these principals—Carnegie, Rockefeller, Harriman, Mellon, Guggenheim, Ford—were known across the land."[6] By the time of Galbraith's writing, the heads of the great corporations were unknown ("Not for a generation have people outside Detroit and the automobile industry known the name of the current head of General Motors"[7]) and owned no appreciable share of the enterprise. The importance of these 'organization men' and the corporations they controlled made the individual entrepreneur a less compelling subject of inquiry.

The increasingly *routinized* nature of corporate initiatives suited the norms and aspirations of business scholars. Starting a new venture, the economist Frank Knight wrote in 1921, involved "an intuitive judgment." How entrepreneurs reach a decision, he wrote, was a "scientifically unfathomable mystery. We must simply fall back upon a 'capacity' in the intelligent animal to form a more or less correct judgment about things, an intuitive sense of values."[8] The modern corporation sought to make the process less mysterious. Innovation, Schumpeter wrote in 1942, "is being reduced to routine. Technological progress is increasingly becoming the work of trained specialists who turn out what is required to make it work in predictable ways."[9] Compared to what Baumol calls the "untidy decision processes"[10] of the individual entrepreneur, routinized corporate initiatives provided greater opportunities for systematic inquiry.

Some researchers built a symbiotic relationship with their subjects. The large corporation's approach to new initiatives could be documented and evaluated by scholars in finance, marketing, strategy, and other such business disciplines. Conversely, scholars developed and refined tools for corporate decision-makers. For example, finance professors helped propagate the use of Net Present Value analysis. As scholars developed even more sophisticated tools such as option analysis, companies like Merck would use them to manage their portfolio of R&D investments.

Scholars found reliable data on large companies more readily available. Startups number in the hundreds of thousands annually and are prone to disappear soon after they are launched. Their financial records are private and often poorly maintained. Large companies are much less numerous and more stable. Audited, standardized, and public accounting data allow researchers to test hypotheses through inter-company and historical comparisons. Stock market prices provide another objective yardstick for

testing theories. A researcher like Rumelt for instance, could make a case against unrelated diversification by examining extensive data on the diversification strategies of 100 of the largest 500 industrial corporations in the United States.[11]

The economics of studying large corporations were more attractive. The rise of the large corporation created a significant demand for trained professional managers. This was met by a manyfold increase in the capacity and number of MBA and other business programs. For example, in 1956, 138 institutions in the United States granted 4,266 Master's degrees in business. In 1990, 668 institutions granted 77,203 Master's degrees.[12] During the same period, the number of bachelor's degrees in business rose from approximately 50,000 a year to about 250,000. The curricula for such programs, and the underlying research, was naturally orientated to the problems and practices of large companies.

Management consulting firms, whose research budgets now rival those of the leading business schools, also found it more rewarding to serve large companies, where the same effort yielded higher fees and more prestige. When Marvin Bower and his two partners launched the management consulting firm, McKinsey & Co, in 1939, they initially served small companies but then quickly cultivated larger clients who could pay higher fees. The higher fees allowed McKinsey to recruit high quality consultants and invest in intellectual capital, which in turn helped secure more large clients. McKinsey is now a high-profile recruiter at the top business schools, spends over $50 million a year on building knowledge, has a world-wide roster of prestigious clients—and continues to avoid the startups and small companies who cannot pay its fees.

Entrepreneurs have now recaptured the popular imagination. Increasingly, ambitious young men and women dream of starting their own businesses rather than rising through the corporate ranks. Politicians look to startups for jobs and economic growth. The renewed interest has generated a significant demand for systematic knowledge about the distinctive features of individual entrepreneurship. The supply of systematic knowledge about new business has not, however, matched the increased demand.

Their resurgence of the entrepreneurs derives in part from the tempering of the unrealistic beliefs about large corporations. Managerial capitalism, to use the historian Alfred Chandler's terms, did not eliminate entrepreneurial capitalism. Owner managed companies, which receded to the background after the Second World War, still did account for nearly half of economic activity. The new products and markets developed by Ken Olsen's Digital and Edwin Land's Polaroid were on par with those developed by the professionally managed IBM and Kodak. Startups created new industries, such as xerography and cable television. Harvard Business School, known as the West Point of capitalism, produced at least as many entrepreneurs as captains of big business enterprises. Howard Stevenson's survey of MBAs shows that over a third of HBS alumni, from classes as far back as 1942, were self-employed. About half worked in businesses with fewer than 500 employees, while only 6% worked in companies with more than 100,000 employees.[13]

Although the school celebrated graduates such as Robert McNamara, President of the Ford Motor Company, students were more ambivalent about careers in large corporations. Charles Orth's 1963 book, *Social Structure and learning climate: the first year at the Harvard Business School* noted a conflict between the goals of HBS and the aspirations of matriculating students. The students' image of success according to Orth reflected "the promoter/entrepreneur archetype" rather than the "administrator/manger image implied by the professional standards the School has generated. The financial genius, the tax law manipulator, the "wheeler-dealer," and the supersalesman images are as much or more the admired stereotypes to some students as …[the] managers on whose training the School has concentrated." Through a questionnaire Orth administered to incoming students, he found only 55% indicated a commitment to "an administrative career"; the others were "interested in entrepreneurial opportunities" or unsure what they wanted to do after graduation.[14]

Events in the 1970s shook common beliefs about the omnipotence of large corporations. "The big corporations," Galbraith once wrote, "do not lose money." In the recession of 1957 he noted, "not one of the largest U.S. Corporations failed to turn a profit. Only one of the largest 200 finished the year in the red." Subsequently, however, large firms were no longer immune to losses. Penn Central filed for bankruptcy; Lockheed and Chrysler were spared this fate by federal bailouts. In the recession of 1982, eight of the top 100 industrial companies and 21 of the largest 200 ended the year with a deficit. Employment in large companies topped out as well. In 1979, David Birch published a study which claimed that small firms generated 66% of all new jobs created in the U.S whereas "middle sized and large firms, on balance, provided relatively few new jobs."[15]

With the 1980s, startups and entrepreneurs became fashionable again. Bernard Goldhirsh launced *Inc.*, "the magazine for growing companies" in 1979; by 1996, *Inc.* had reached a circulation of 659,263 in North American compared to 893,945 for *BusinessWeek*; 804,754 for *Fortune*; and 783,456 for *Forbes*.[16] *Inc.*'s growth attracted competitors such as *Entrepreneur* and *Success*. Interest in entrepreneurship soared on business school campuses. According to data compiled by Jerome Katz a couple dozen accredited business schools in the United States offered some coursework in entrepreneurship. In 1998 120 offered it as a major. "Driven by student and alumni demand" Ethan Bronner wrote in the New York Time in 1998, "no field is hotter today in business studies than that of entrepreneurship."[17]

The obstacles to serious research on entrepreneurs however remain. On the practical side, it is still difficult to get reliable data. The financial rewards for developing expertise on new and growing businesses remain low—large companies continue to have a greater capacity to pay for expert advice than small companies. The conceptual problem is just as serious. Long neglect has left the field with few well-framed hypotheses that researchers can confirm or modify.

Indeed, many believe that the critical aspects of entrepreneurship lie beyond the scope of scholarly inquiry. Baumol suggests that "there is a sort of Heisenberg principle that holds for

entrepreneurial acts." If reported in detail, "such an act is no longer entrepreneurial."[18] Others argue that the performance of new businesses depends on factors that cannot be studied and taught systematically. Philip Thurston remarked in a colloquium on teaching entrepreneurship that, after a decade of teaching in the field, he had found that "education in business administration [was], at best, a minor factor in successful business start-ups."[19] At the same colloquium, another veteran teacher, Arch Dooley, expressed the conviction that the academic profession did not know "whether any educational activities can in any direct sense aid significantly in the development of the crucial ingredients of entrepreneurial success." Dooley had interviewed successful entrepreneurs to identify the factors they believed had contributed most decisively to their success. Their answers, which pertained to timing, guts, determination, luck and so on, did not parallel the subject matter typically encountered in academic programs.[20]

Business schools now have alumni, according to Bronner, "donating truckloads of dollars to set up centers and chairs in entrepreneurship, yet there are no scholars to fill them." The number of entrepreneurship chairs has grown from 18 in 1980 to more than 200, but dozens remain empty, because business schools cannot easily find candidates with the academic credentials they consider necessary to fill them. As of September 1998, New York University's business school had four endowed chairs in entrepreneurship, of which two were unfilled. The school's dean, George Daly, told Bronner that he saw "entrepreneurship as a word in search of a meaning in the academic sense."[21]

The growing demand for entrepreneurship courses is often met by hiring adjunct or part-time faculty. Compared to other disciplines, the number of new researchers being trained is small. Jerry Katz, of St. Louis University, has compiled a list of universities in North America and Europe that have a doctoral program or doctoral students in fields such as entrepreneurship, small business, family business and small and medium sized enterprise studies. In 1998, according to Katz, only five schools—Wharton, Georgia, Calgary, the European Doctoral Program in Entrepreneurship, and the Joenkoeping International Business School in Sweden—offered formal doctoral programs in entrepreneurship. Another two dozen schools offered doctorates in a conventional area but provided "support through research, classes, faculty or infrastructure for students to specialize their research and teaching in entrepreneurship."[22] The combined total of 29 schools compares to 132 accredited schools with doctoral programs. Also noteworthy is the number of top-ranking schools that do not have doctoral programs or students in entrepreneurship. Of the top 20 business schools in U.S. News and World Report'' 1998 rankings, only five—Harvard, NYU, North Carolina, UCLA and Wharton—were on Katz's list.

The study of venture capital (VC) and VC-backed companies represents one exception to the general neglect of new business by academics. The topic is well suited to the norms of scholarly inquiry. VC-backed startups represent an intriguing combination of individual enterprise and professional management. The VC backed model involves market research, business plans, experienced founders, and professional venture capitalists who provide advice, oversight, and significant financing. Compaq Computer provides an example of a start-up that successfully followed this model. Compaq's founders,

Rod Canion, Jim Harris, and Bill Murto, had all been senior managers at Texas Instruments, and they had a well-formulated plan to take on IBM with a technologically superior product. Seasoned investor Ben Rosen helped Canion raise $20 million in start-up capital—funds that allowed the new business to behave like a large, sophisticated company from the start. Canion could attract experienced managers by offering them generous salaries and participation in a stock option plan. Compaq also had a national dealer network established within a year of exhibiting its first prototype. Sales totaled more than $100 million in the first year.

Startups like Compaq bear a close relationship to the large modern corporation. In many ways, the VC phenomenon represents a variant of managerial capitalism, and its study a logical extension of business research. Like the decision-makers in large companies, venture capitalists try to use systematic procedures and criteria for making investments and provide capital under well-specified terms. They back experienced entrepreneurs like who bring to their ventures the professional management practices of large corporations. Modern theories of finance, organization behavior, strategy and so on provide convenient frameworks for analyzing the capital structures, contracts and investments in VC backed firms. Researchers can secure and analyze data about the VC industry. Like large companies, venture capitalists comprise a finite, identifiable universe. They try to develop systematic routines and objective criteria for making investments and use well documented contracts. Venture Economics and other organizations publish data on their investments and rates of return.

But whereas studying venture capital fits the existing norms and styles of academic research, it provides limited insights about the typical entrepreneur and startup. As we will see, venture capitalists invest in exceptional entrepreneurs and ventures. Very few startups qualify for VC funding. Out of the nearly million new businesses formed each year in the U.S, VCs fund only a few hundred. Compaq represents the exception rather than the rule for startups. Most businesses as exemplified by HP, Dell Computers and Gateway (who now compete head to head against Compaq in the PC market), start out with limited funds, professional management and planning. And, in this crucial area of the under-capitalized and improvised new business we have little systematic knowledge.

I began studying new businesses in 1988 when I joined the HBS faculty to teach a course in entrepreneurship. I had little background in the field. Apart from two unsuccessful attempts to start a venture, I was mainly steeped in the corporate approach to business. I had received my MBA at Harvard in 1979 before startups became fashionable. The logic and rationality of the corporate paradigm entranced me. I then worked for five years at McKinsey & Co. where I tried to apply and refine the theories I had learned at business school. A doctorate in business administration followed wherein I researched hostile takeovers of large diversified corporations. Now I confronted the task of teaching students about starting and growing their own, usually small, businesses.

I had some clues that suggested that the business school approach required significant modification for the world of startups. At McKinsey I had discovered that business school theories that

were based on studies of large industrial companies did not easily transfer to the free-wheeling world of finance and investment banking. The traditional model of competitive strategy called for companies to seek sustainable advantages over competitors by preemptively investing in assets such as proprietary technologies, brand names, or high volume plants. As described in my article, "Hustle as Strategy",[23] the ease of imitation and fungibility of resources in many financial businesses prevent firms from establishing sustainable advantages. Profitability is more a function of tactical and operational ability ("hustle") than of superior long-term strategy in the traditional sense. Casual observation suggested that execution might be of greater importance than strategy in startups as well.

My doctoral dissertation, too, had shown clear differences between takeovers undertaken by individuals—the so-called "raiders" of the 1980s—and corporate mergers. CEOs of large corporations rarely made hostile tender offers and claimed their mergers would provide strategic or synergistic benefits. Hostile transactions were typically undertaken by entrepreneurs who sought quick returns, usually through the sale of unrelated assets, in order to raise financing for their deals; synergies or long-term business strategy did not interest them.

In the following decade, I tried to make a contribution to entrepreneurship education by systematically identifying the differences between how individuals and large companies undertake new initiatives. I published course notes, case studies and Harvard Business Review articles, all with a pedagogical or prescriptive bent. My purpose here is to integrate ideas initially developed to help individuals start and grow their own businesses, to provide a coherent explanation, based on systematic observation, of an important phenomena. This synthesis, which pulls together the concrete experiences of the several hundred entrepreneurs, deliberately excludes explicit 'how tos' in order to focus attention on what entrepreneurs do and to put their role into a broader economic context. Those who read between the lines to infer practical advice should do so in conjunction with my earlier writings.

This inquiry, which looks at entrepreneurs mainly from an economic point of view represents an effort to complement rather than challenge existing economic theories. I address questions of economic import which lie outside the traditional boundaries of the discipline. In order to do so, I rely on theories and constructs drawn from a variety of fields, ranging from agency theory to experimental psychology. Few of us, however, have a deep understanding of all these theories and can relate easily to their specialized terminology. I have, therefore, sought to work with just the landmark, well-accepted ideas from these fields and to use sparingly their specialized terms. I have also grappled with colloquial explanations of entrepreneurial success based on terms such as determination and persistence. Rather than ignore such seemingly ambiguous ideas, I have tried to give them precise meanings in the context of the specific tasks and functions that entrepreneurs perform. Hopefully, the effort will be regarded not as a

melange of the naïve and the arcane but as an effort to use the best ideas available today* to explain an important and complex phenomenon.

Finally I should note that this book provides provisional maps rather than a definitive work on new businesses. After many years of exploring the territory, I cannot claim to have identified all the principal features let alone all the details. I offer plausible conjectures drawn from my research rather than firm conclusions. Others should challenge and modify the conjecturers or formulate their own. Research in this important arena has been held back by a chicken and egg problem: scholars avoid the field because it doesn't have a well-defined theory, but such a theory cannot spontaneously emerge without their efforts. I hope the frameworks and hypothesis suggested here will help break the deadlock and stimulate the careful scholarship the topic deserves.

* I hope to give back a little to the fields that I have borrowed ideas from. For instance, 'behavioral' economists who study deviations from rational behavior and decision making, often these deviations with undesirable consequences such as excessively volatile financial markets, overinvestment, and even the formation of cults. This research suggests novel ways in which the 'coginitive mistakes' identified by the behavioral economists play an important role in a socially valuable activity. Similarly my analysis of improvised startups adds a different perspective to the problem of financial contracting. Existing theory emphasizes the problems that information asymmetries cause in contracts between the users and suppliers of capital. Here we will see that irreducible uncertainty due to the absence of critical information represents the main constraint in financing many startups.

CHAPTER 1: INTRODUCTION

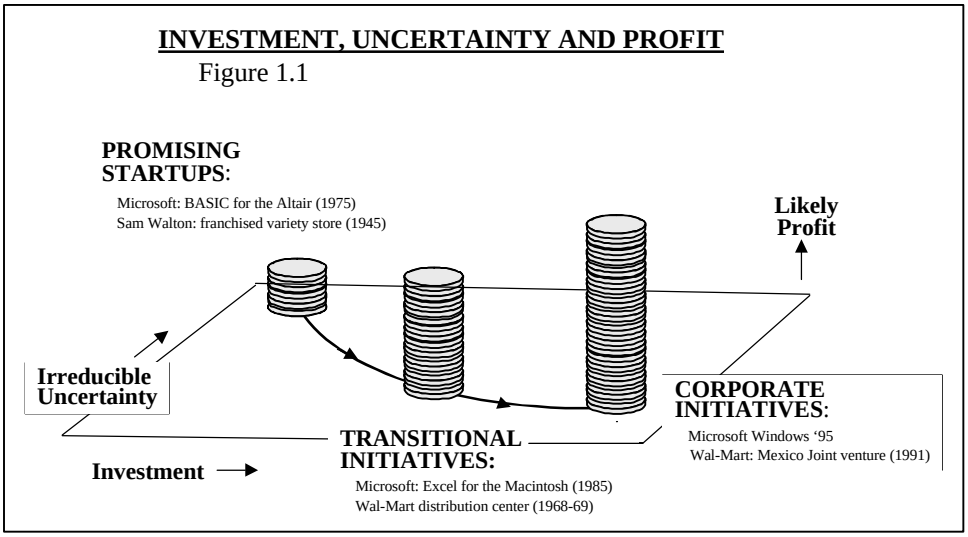
Entrepreneurs who start and build new businesses are more celebrated than studied. They embody, in the popular imagination and in the eyes of some scholars, the virtues of "boldness, ingenuity, leadership, persistence and determination."[24] Policy makers see them as a crucial source of employment and productivity growth. Yet our systematic knowledge of how entrepreneurs start and grow their businesses is limited. The activity does not occupy a prominent place in the study of business and economics. Cliché and anecdote—or laments about the ineffable nature of entrepreneurship—dominate the discourse about new and fledgling businesses.

This book examines the nature of the opportunities that entrepreneurs pursue, the problems and tasks they face, the traits and skills they require and the social and economic contribution they make. It identifies the special features of the poorly mapped terrain of new and growing businesses by comparing it to the more systematically researched world of large companies. The great variety we find among new businesses makes it difficult to go beyond trite generalizations. Their common features stand out when placed against initiatives undertaken by established companies, such as the development of new products, processes and markets.

The investment-uncertainty-profit diagram (see **Figure 1.1**) illustrates the main propositions explored in this book. We will see that new businesses (such as Microsoft in 1975), evolving or transitional businesses (Microsoft in the mid-1980s) and large well-established corporations (Microsoft in the 1990s) pursue opportunities with different levels of irreducible uncertainty, investment requirements

INVESTMENT, UNCERTAINTY AND PROFIT

Figure 1.1



and likely profit. At the startup stage, entrepreneurs like Bill Gates and Paul Allen, the co-founders of Microsoft pursue highly uncertain projects that do not require much up-front investment and which are unlikely to generate large profits. In order to grow, entrepreneurs invest in larger and somewhat less uncertain projects. When companies like Microsoft eventually reach maturity, they focus on initiatives which

require significant up-front investment – with commensurately large expected profits –and relatively low uncertainty.

Changes in the nature of opportunities lead to changes in the problems entrepreneurs face and the tasks they must perform. The founders of new businesses, who face significant capital constraints and great uncertainty, rely on opportunistic adaptation to unexpected events. As businesses grow and commit more resources to less uncertain initiatives (that is, with more defined risks and returns), the opportunism gives way to systematic attempts to anticipate and plan for the long-term. New tasks entail changes in the necessary traits and skills. In the beginning, a high tolerance for ambiguity and capacity for adaptation are crucial; the subsequent evolution of a business turns on the entrepreneurs' ability to formulate and implement a long term strategy; and, in the large mature corporation, the success of new initiatives depends on a diffused organizational capability rather than the talents of the top decision makers.

The tendency of businesses of different sizes and maturity to specialize in different – and often complementary – initiatives has important implications for the social good. It affects the development of new technologies and markets and how they interact with the existing economic structures.

This thumbnail sketch raises questions about the lineage and supporting evidence for of my propositions: What relationship do these ideas bear to the existing literature? What research are they based on? The remainder of this introduction addresses these questions and provides an overview of the chapters that follow.

1. ECONOMIC THEORY

This book examines the birth and evolution of firms primarily from an economic point of view and relies extensively on terms and findings drawn from the economic literature. Economic theory does not however provide its basic frame of reference. As we will see, there is a considerable disjoint between the concrete efforts of entrepreneurs to start and build businesses and the central concerns of contemporary economic research. Many of the variables studied in this book lie outside the domain of modern economics.

Entrepreneurs do not play a prominent role in modern economic theory. The economist, William Baumol, observes that entrepreneurs made "frequent but shadowy" appearances in the writings of classical economists but have now "virtually disappeared from the theoretical literature."[25] References to entrepreneurs in formal economic theory are "scanty or more often totally absent." The theory assumes "entrepreneurless" firms with a management group that "reacts mechanically to changes imposed on it by fortuitous external developments."[26] It "offers no promise of being able to deal effectively with the description and analysis of the entrepreneurial function."[27]

Baumol and some other economists have provided roughly similar explanations for why the theory found in standard college economic texts excludes the entrepreneur. The insert, 'The 'Disappearance' of the Entrepreneur' summarizes Humberto Barreto's argument that the roles classical economists used attribute to entrepreneurs "simply cannot exist within the framework of orthodox

economic theory." According to Barreto, the critical assumptions required to make the theory work, such as perfectly informed and rational decision makers leave no room for the classical entrepreneurial functions of coordination, arbitrage, innovation and uncertainty bearing.

The 'Disappearance' of the Entrepreneur

Barreto classifies the roles played by the entrepreneur in the history of economic thought into the four categories of coordination, arbitrage, innovation and uncertainty bearing. The entrepreneur as *coordinator* dates back to Jean-Baptiste Say, a French political economist of the early nineteenth century. According to Say, the entrepreneur hires and combines factors of production (such as land, capital and labor), and serves as "the link of communication" between the "various classes of producers" and between the "producer and the consumer." The entrepreneur therefore is "the center of many bearings and relations."[28]

Some economists from the so called "Austrian" school attribute the role of *arbitrage* to entrepreneurs. According to Israel Kirzner, "the "pure" entrepreneur observes the opportunity to sell something at a higher price than that at which he can buy it."[29] By recognizing and acting on opportunities for arbitrage profit, the entrepreneur moves markets toward equilibrium.

Other "Austrians" treat the entrepreneur as an *innovator* who disrupts the existing order and market equilibrium. According to Joseph Schumpeter, who popularized this view, entrepreneurs undertake "new combinations of productive means," creating new products, methods of production, markets, supply sources, or forms of organization. The new combinations lead to the "creative destruction" of the old order and bring about economic change and growth. Schumpeter's entrepreneurs do not, however, bear the risks of their innovations: "Risk obviously always falls on the owner of the means of production or of the money-capital which was paid for them, hence never on the entrepreneur as such."[30]

The entrepreneur's *uncertainty-bearing* role may be traced back to Richard Cantillon, an eighteenth century French economist. Cantillon suggested that entrepreneurs performed the vital economic function of committing to buy inputs without knowing how much customers would pay for their end products. For example, farmers paid fixed sums for their inputs, with the hope of realizing prices in excess of their costs; 'carriers' bought the farmers' produce which they would 'carry' to the city for sale at an uncertain price to wholesalers; wholesalers then faced uncertain prices in their transactions with retailers and retailers with their customers. This chain of speculation and risk bearing (rather than arbitrage) was the key to the market system. Frank Knight refined the risk-bearing idea to argue that profit represents the entrepreneur's reward for assuming responsibility for unmeasurable and unquantifiable risk, which he called "uncertainty."[31]

These varied theories, according to Barreto, shared one "fundamental characteristic," namely, "the central portion granted to the entrepreneurial function." In all the theories, "the disappearance of the entrepreneur would bring the market system to a halt."[32] Moreover, Barreto's analysis suggests that all four entrepreneurial functions were incorporated, at least to some degree, in the development of microeconomic theory in the early neoclassical era (between 1870 and 1914). For instance, Leon Walras (whom Barreto calls "the father of neoclassical economics"[33]) incorporated functions of coordination and arbitrage in his theories. Alfred Marshall's theories were "eclectic:" his entrepreneurs were coordinators, arbitrageurs, innovators, and uncertainty bearers, "depending on the matter at

hand."[34] Irving Fisher analyzed the entrepreneur's uncertainty bearing role and for John Bates Clark, "the entrepreneur as arbitrageur was an indispensable element in a progressive dynamic economy."[35]

In the mature neoclassical era (from 1914 to the early 1930s), according to Barreto, "two of the greatest authors on entrepreneurship—Joseph Schumpeter and Frank Knight—gained broad recognition and acceptance."[36] Neoclassical theory, which became "orthodox economic theory" during this period, retained the entrepreneur as "a key agent"[37] in explaining the market system. But, in the modern microeconomic era which began in the early 1930s, the entrepreneur suddenly and rapidly 'disappeared.' "Entrepreneurial considerations," Barreto writes, "no longer played a fundamental role in the orthodox theoretical explanation of the market system…the word 'entrepreneur' was sometimes used, but it lost any special meaning…the fruitful theories of "innovation, uncertainty bearing, coordination and arbitrage were downplayed or totally neglected."[38]

The rapid evolution of modern microeconomics led to "the ultimate fulfillment, in economics of a perfectly interlocking, self-contained model;"[39] prior neo-classical theories had inconsistent elements. But, the core assumptions of the refined model—of a 'production' function that precisely defined the output that would result from a set of inputs, of perfect information, and of rational choice—preclude incorporation of any of the traditional entrepreneurial roles. Coordination, arbitrage, innovation, and uncertainty-bearing have no place in a world populated with perfectly informed, perfectly rational agents.[40] Any relaxation of the core assumptions destroys the integrated consistent nature of the models; as Barreto puts it, the choice between a model whose pieces "fit perfectly together to form a grand, unified whole" and entrepreneurial functions is "an 'either-or' proposition; there is no marginal adjustment, no happy medium." It is due to this stark choice that "the entrepreneur has been removed from the orthodox explanatory scheme."[41]

Basic microeconomic theory involves a tradeoff. It specifies precisely the equilibrium leads to an optimal allocation of society's resources. The familiar price and quantity model tells us that the point at which the demand curve intersects with the supply curve represents the most socially desirable equilibrium. And, it predicts that with many, rational and informed buyers and sellers the market will reach this equilibrium. The theory does not attempt to explain however how an equilibrium changes. The innovative activity of entrepreneurs analyzed by Schumpeter that moves supply and demand curves lies outside the model.

Advanced theories – of the sort that students encounter in graduate economic programs rather than core college courses – do modify the assumptions that, according to Barreto, preclude entrepreneurial functions. Agency theory, 'behavioral' economics, Industrial Organization (IO) and other such sub-fields analyze the consequences of incomplete or asymmetric information, decision makers who are only 'boundedly' rational and oligopolistic industry structures. But, assumptions that allow for entrepreneurial activity do not necessarily lead to its inclusion. Many of the theories share the equilibrium orientation of standard microeconomics, albeit with a twist: they predict the misallocation rather than the optimal use of resources. The models suggest that markets with asymmetric information (as in second hand cars, when buyers are better informed than sellers) do not clear at optimal prices. Irrational investors who 'over' or

'under'-react to information engender excessive volatility in stock prices. Oligopolies with market power restrict supply and charge prices that are higher than the socially optimal ones we would find under perfect competition.

As with the basic microeconomics they seek to extend, many of the advanced theories do not focus on changes in the fundamental determinants of market outcomes.* Standard Industrial Organization (IO) models assume that that number and size of competitors in an industry (like the demand and supply curves of basic microeconomics) are largely determined by the available technology and consumer tastes.[42] The models can predict what happens when technologies and tastes change but not why such changes take place. Only a subset of the advanced theories focus on the purposive development of new technologies and wants. And, compared to Schumpeter and Knight who analyzed the psyche and motivations of entrepreneurs, the modern theories of economic change take a more stylized approach to the individuals and businesses that undertake new initiatives. Differences in entrepreneurial drive and ability do not lead to differences in the outcomes predicted by these theories.

In pointing out the variables that economists usually leave out of their theories (or treat as exogenous factors) I do not mean to attack modern economic research. All theory involves simplification and starts with some exogenous factors or givens. Any predictive model relies on the unexplained state of its independent variables to forecast the value of its dependent variable. Economists choose their independent and dependent variables in order to address problems that they consider important and which they can study with techniques that conform to the norms of their discipline. This book seeks to use and complement their theories, not to challenge their predictions. It combines the ideas from classical works about entrepreneurial functions and the modern literature with the type of case-studies that economists do not typically use. The concrete activities of entrepreneurs that it examines have considerable economic significance but lie outside the domain of normal economic analysis.

2. BUSINESS RESEARCH

Whereas economic theory provides many of the specific tools we will use to study the subject, the organizing framework of this book derives from business or management research. As we will see, the 'entrepreneurial' functions of innovation, risk-bearing and so on represent a central concern of business or management research. And although we cannot directly apply its findings—which deals mainly with

* Apparently, the advanced models trade off more realistic assumptions for less certain predictions. For instance, the basic model tells us exactly what to expect under conditions of perfect competition. According to the economist Fisher, models of imperfect or oligopolistic competition lead us to conclude only that: "A great many outcomes are known to be possible—with outcomes depending on what variables the oligopolists use and how they form conjectures about each other".(Fisher (1989) p. 117). The theory generates, Fisher continues, "a large number of stories, each one an anecdote describing what might happen in some particular situation" rather than "a full, coherent formal theory of what must happen or a theory that tells us how what happens depends on well defined measurable variables." (Fisher (1989) p. 118)

initiatives undertaken by large companies—to businesses started by individual entrepreneurs, the research provides a crucial backdrop.

The research of business has become a noteworthy form of economic inquiry in the last few decades. Business schools (and some consulting firms) now devote at least as much effort to the study of economic phenomena as do departments of economics. The research staff and budgets of the economics faculties at Berkeley, Chicago, Harvard, MIT, Northwestern, Pennsylvania, Stanford and Yale are matched or exceeded by those of their business schools. Among the 20 universities that house the most prestigious economics departments in the United States, as ranked by the 1997 Gourman report, only Princeton does not have a business school.[43] The leading management-consulting firms also now have research budgets comparable to those of the leading business schools.

Although it is not so labeled, the distinctive feature of virtually all the research and instruction in business schools is its emphasis on entrepreneurial functions. Outsiders do not always appreciate the pervasive interest in entrepreneurial functions. According to the economist Baumol, business schools which would like to provide training in entrepreneurship "usually succeed in imparting only the skills of the manager."[44] Baumol defines the manager as "the individual who oversees the ongoing efficiency of continuing processes"[45] in contrast to the entrepreneur who undertakes novel or non-routine activities. In fact, although they grant degrees in the humdrum sounding activity of administration, business schools have little interest in maintaining existing equilibria. Business schools do not secure their clientele by offering instruction on how to keep things they way they are. Rather, like Schumpeterian entrepreneurs, they focus on the innovative activities businesses undertake to increase their profits.

The curricula and research of business schools focus on the development of new products, processes and forms of organizations, on the management of the attendant risks and in the coordination of several functions and inputs—activities which line up with classical definitions of entrepreneurial functions. The entrepreneurial orientation goes beyond obvious research of technology and R&D. It permeates all business disciplines. Research in the field of marketing, for instance, investigates the development of new products or forms of distribution. Finance studies how companies evaluate and fund risky new activities. Even cost accounting and transfer pricing, seemingly remote from matters entrepreneurial, typically derive their importance from changes in a company's product mix and the coordination of multiple organizational units.

The focus on entrepreneurial functions often makes business research less precise and internally consistent than mainstream economic research. We encounter many theories with diverse origins and which use different terms and may offer conflicting prescriptions. They can lack the "well defined, measurable variables"[46] that the economist Fisher demands of good theory.* (Michael Porter for instance suggests that 'differentiated' and 'cost-leadership' strategies dominate a 'stuck-in-the-middle' approach)

* We should note however that some basic constructs in economic theory, such as the demand curve, also cannot be directly observed or measured.

Although it is sometimes tempting, we should not attribute the imprecision of the constructs found business theories to the gullibility of their consumers or the intellectual sloppiness of their producers. As the consumers seem to instinctively appreciate, some ambiguity is unavoidable in theories concerned with new sources of profit rather than with the analysis of equilibrium conditions. A reliable, precisely defined formula for making a profit is a logical impossibility. Nor can we expect what Fisher calls a "generalizing theory" that "proceeds from wide assumptions to inevitable consequences."[47] Business school theories are necessarily, in Fisher's terms, "exemplifying theories" that "suggestively reveal the possibility of certain phenomena"[48]—that is, they describe what can happen rather than what must happen.

The perception that business schools focus on maintaining the existing order probably derives from their interest in the *routinized* initiatives undertaken by large corporations rather than on new businesses started by entrepreneurs. Large companies, Baumol wrote in 1993, have transformed innovation into a "routine and predictable process" that "lends itself to the humdrum talents of capable managers."[49] In a number of industries, Baumol observes, managers do not rely on "the fortuitous appearance of new ideas." Rather, they "treat the generation of new techniques and, even more, of new products as a *routine*, albeit critical, element of their operations, one that is built into the company's organization and budgeted like any of its other activities."[50]

Companies often prepare "a menu of possible inventions from which the proposed developments are selected by another process that has also been made routine." Baumol cites the example of Eastman Kodak which uses computers to generate "pseudo photographs" with variation in contrasts, brightness, balance of colors and so on. Kodak then polls panels of consumers and professional photographers to decide "which of the computer generated pseudo photographs promise to be the most saleable, and the company laboratories are assigned the task of inventing a film that will yield the desired results."[51]

The focus on routinized initiatives limits the direct applicability of much of business research to individual entrepreneurs who usually start their ventures in a much more ad-hoc way. To illustrate, let us go back to 1938 to visit two young engineers in Palo Alto, California who have pooled $538 to start their own business. They attempt to craft several electronic products in a rented garage, including a bowling alley foot-fault indicator and a harmonica tuner. Eventually they build an audio oscillator which, without any market research, they price at $54.40, because according to one of the founders, it reminds them of "$54^{0}40'$ or Fight!" the 1844 slogan used in the campaign to establish the United States border in the Pacific Northwest. They soon discover that they cannot afford to build the machines at $54.40. Luckily their nearest competitor is a $400 oscillator which gives them room to raise prices.[52] Half a century later their business has grown to a worldwide enterprise with over $10 billion in revenues, called Hewlett-Packard (HP). HP continues its founders' interest in developing new products and lines of business. But, in contrast to William Hewlett and David Packard's early efforts, executives at HP now undertake initiatives methodically: the features, prices, and marketing of new products is now tied to systematic analyses of customer needs, competitive offerings, long-term strategies, financial returns, and so on.[53]

Although the research about the decisions faced by executives like Lewis Platt, the current chairman and CEO of HP, does not tell us much about how individuals like Hewlett and Packard start and grow their businesses it can be of considerable indirect help. The knowledge we have accumulated about large-scale enterprise provides reassurance about what a study of individual entrepreneurs could achieve. In contrast to many economic models that treat changes in technology and demand as exogenous random events, business research suggests that we can analyze purposive change. Profitable initiatives aren't always based on chance discoveries. Even when chance provides the starting point for an initiative, it usually takes considerable purposive effort to turn it into a profitable enterprise. We cannot expect (per Baumol's 'Heisenberg' principle) to derive a fool-proof formula or "complete" description for starting a profitable business; but, our accumulated knowledge of initiatives undertaken by large companies indicates a considerable gap between what we now know and what we could learn.

Knowledge developed about large companies provides an invaluable reference point for an empirical study of new businesses. Researchers cannot 'just observe': they need a theory to guide the selection of significant facts. In lieu of a well-developed theory, we can start with the hypothesis that businesses started by individual entrepreneurs are just like the initiatives undertaken by large companies. The differences we actually observe can help us formulate more refined propositions. The comparative analysis leads us to examine the relationship between the improvised approach of individual entrepreneurs and the nature of the opportunities they pursue. It allows us to confront issues of luck and personality head on. We can ask whether and why luck plays a more important role in start-ups than in the initiatives undertaken by large corporations. We can examine the relevance of the innate traits that popularly attributed to entrepreneurs: what distinctive problems and tasks make decisiveness, perseverance, willingness to take risk and so on more important for the entrepreneur than for the large-company executive? Such questions can take us a long way towards demystifying the phenomena.

Besides illuminating an important hidden part of the economy, a comparative analysis provides a fresh perspective on the whole. We gain a broader understanding of the advantages and constraints of companies like IBM and Proctor and Gamble by comparing them to new and fledgling businesses than we might from just studying a sample of large companies. We can analyze the initiatives they specialize in and the degree to which they can – or should – adopt the freewheeling approach of the individual entrepreneur. And, by examining the distinctive roles of new, transitional and mature businesses, we can develop new insights about the process of economic change.

3. STUDIES CONDUCTED

As mentioned in the preface, I undertook a study of start-ups to help define the contents of a Harvard Business School elective course on new ventures. I sought to identify issues that the largest possible proportion of MBA entrepreneurs would find useful. I could not, however, use *a priori* logic or a few in-depth case studies to select such issues. Ventures started by business school alumni are found in fields as diverse as dairy farming and launching satellites, and they range in size from niche "lifestyle"

businesses to billion-dollar global companies like Intuit. A large sample study was therefore necessary to systematically identify the issues most universally important to this heterogeneous set. But issues derived from the entire population of new ventures or small businesses might not hold much interest for my target audience.

Most startups derive from individuals seeking self-employment rather than the conduct of an entrepreneurial effort to develop new products, markets, technologies, and so on. In 1992, for example, about 21 million businesses filed tax returns in the United States. Seventy-one percent of these returns were from sole proprietors and only 4% reported revenues of more than $1 million. The typical business apparently starts small and stays small. Although two-thirds of net new jobs in the private sector have originated among small firms in the past 25 years, only a few rapidly growing companies have created these jobs. Duncan and Handler found that only 24% of companies that started in 1985 and surviving in 1994 reported **any** increase in employment. Birch and Medoff estimate that between 1988 and 1992, 4% of all firms—about 350,000 so called "gazelles"—generated 60% of all the new jobs in the United States economy.[54] Thus we may infer that a random sample drawn from the 700,000 or so businesses started each year would be swamped by hairdressers, laundries, and other such marginal businesses. It would not generate useful models for students with high opportunity costs who wanted to start companies. Nor would it advance our understanding of individual entrepreneurs.

Although Birch and others had gathered statistical data on gazelles, there was little reliable research on the hows and whys of their success. In pursuit of breadth (compared to the individual case study approach) and depth (as compared to an analysis of census or survey data), I undertook a far-reaching field study of start-ups. With the help of research associates Kevin Hinton and Laura Pochop, I interviewed founders of 100 companies from the 1989 *Inc*. "500" list, a compilation of the fastest growing privately held companies in the United States. The average company on this list of 500 companies had 1988 revenues of about $15 million, 135 employees, and a five-year sales growth of 1,407%. (**Appendix 1** contains further details including the list of companies and descriptive statistic of the sample.)

I narrowed my list of prospective interviewees to companies founded in the previous eight years, on the ground that the start-up history of older companies would be more difficult to obtain. The *Inc*. list's requirement of a five-year track record of rapid growth helped eliminate marginal ventures whose stories I believed would not contribute much to my objectives. At the same time, by sampling from a population of 500 companies, I avoided drawing inferences from a few billion dollar "outliers" like Microsoft or Federal Express whose success might be attributed to the extraordinary talent or luck of the founders. The companies I studied—Software 2000, Gammalink and Modular Instruments, to mention just a few—were successes but not household names.

The research was time-consuming. To get start-ups' stories in all their complexity, I conducted face-to-face interviews. Start-ups are characterized by close relationships among financing, marketing strategies, hiring, and control systems that would be hard to capture through a structured mail survey.

Also, since executives of successful companies are inundated with mail surveys, response rates are generally low. Although we had some difficulty in contacting entrepreneurs and scheduling appointments, only a few declined to be interviewed. Each interview lasted from one to three hours. Usually two researchers took handwritten notes, which were then compiled into a single transcript and returned to the interviewees for review.

To my knowledge, this is one of the broadest, most in-depth studies start-ups ever conducted. Whereas other field studies have focused on limited geographic regions or industries, we visited over 20 cities and towns in a dozen states to interview entrepreneurs in a wide range of businesses. Researchers who have undertaken similarly broad samples have relied on mail surveys.

I decided against trying to study an equivalent number of unsuccessful startups. I was, by design, comparing good apples and good oranges—using the "known" attributes of large, well-established corporations to tease out the distinguishing features of what I will call *promising* new businesses. I had to study successful cases because I could not know how to define a promising start-up until I had done the research. As we will see there are important differences between the origins of the *Inc.* companies and the common 'marginal' startup that I had to discover in the course of my study. I was not, it should be noted, trying to explain variations in a predefined population of, say, high-technology start-ups or venture capital backed start-ups.

Moreover, although I do not discuss it in this book, my research also had a prescriptive purpose—I wanted to derive practical lessons about starting new businesses. To the extent that starting a business involves skills that are difficult to codify, I felt that in the first stage of developing a model of good practice, I ought to pay more attention to the "winners." A similar focus on successful practitioners, it may be noted, informs studies of art, music, statecraft, surgery, and other fields involving a high level of skill. Eric Erikson's analysis of leadership, for instance, is derived from studying the lives of statesmen like Gandhi, not of ward bosses.[55] When tennis players seek to improve their games, they turn to videos and observation of champions, not of weekend hackers. Of course, some knowledge of poor practice helps provide a cognitive backdrop for observing good practice. So although I could not identify in advance a suitable control group of failures, I did study and write cases on unsuccessful ventures. Indeed the case studies in the course I taught had almost as many failures as successes.

I am aware that the research approach I have used can only generate plausible hypothesis. As mentioned, this is an exploratory work intended to provide propositions for modification or refutation through more research. My observations and analysis also reflect the theories with which I had prior familiarity. A researcher with different training, say a sociologist, would likely have asked the *Inc.* company founders different questions and seen dimensions of the phenomena that I did not. Here too I hope that this work will encourage a broader inquiry that produces a more complete explanation.

After completing my *Inc.* company interviews I tested the findings, albeit crudely, through some other efforts. I conducted a mail survey of 100 self-employed alumni of the Harvard Business School to

see whether the problems faced by the *Inc*. founders would be germane to MBA entrepreneurs. One could reasonably infer that given their opportunity costs, the respondents would not pursue marginal ventures. In contrast to my *Inc*. sample, I did not select subjects on the basis of objective criteria for success. Nevertheless, as described in my note, "The Road Well Traveled,"[56] the experiences of the respondents to our survey turned out to be quite similar to those of the *Inc*. founders. Over several years I also had my students write over 200 papers on successful entrepreneurs. Instead of an examination, the students were required to write a "critical history" of a venture they considered successful: they had to describe the basic story and evaluate the strategies employed and the results obtained. Students were encouraged to interview their subjects rather than rely on secondary data sources; those who did (the great majority) were then required to have the entrepreneurs certify the accuracy of the narrative sections of their paper. Predictably, the papers covered more celebrities (Jan Wenner of Rolling Stone, Scott Cook of Intuit, and Calvin Klein) than I had found in the *Inc*. and HBS alumni lists. (See Appendix 2). The experiences of this group, however, were remarkably similar to the other entrepreneurs I had studied and thus helped corroborate the findings of my interviews and mail surveys.

4. CONTRASTS AND QUESTIONS

My research suggests that like Hewlett-Packard, most noteworthy businesses have unremarkable origins. Their founders face significant capital constraints. More than 80% of the *Inc*. founders I studied bootstrapped their ventures with modest funds derived from personal savings, credit cards, second mortgages, and so on; the median start-up capital was about $10,000. Only 5% raised their initial equity from professional venture capitalists. Their ventures were improvised—most *Inc*. company founders, like William Hewlett and David Packard, did not spend much time searching for opportunities, doing market research, or writing business plans; they merely replicated or modified an idea they encountered through previous employment or by accident. Lacking a strategy, and sometimes even the goal, for building a long-lived business, they adapted to unexpected opportunities and problems: many stumbles and detours characterized the evolution of their businesses. The *Inc*. companies did not have seasoned professional managers at their helm. Rather they had enthusiastic but somewhat inexperienced founders who personally undertook most of the crucial functions of the business and recruited whomever they could for tasks they were too stretched to perform themselves.

The student papers on successful entrepreneurs and the mail survey of HBS alumni corroborated the widespread prevalence of bootstrapped, improvised start-ups. The founders of now celebrated companies like *Rolling Stone*, Calvin Klein, Waste Management, and Wal-Mart started without much capital, research, industry experience, or top-notch employees. Their ventures did not attain success overnight – it took these companies decades to develop the assets and organizations that eventually made them the leading players in their fields.

New businesses financed by professional venture capitalists represent an exception to the general pattern of gradual evolution. As mentioned in the preface, VC backed start-ups such as Compaq represent

an out of the ordinary phenomenon. VCs provide capital to an elite group of entrepreneurs only after careful due-diligence and research. The funds, counsel and connections provided by the VCs, the quality and depth of the founding team, and a unique technology or concept allow these businesses to start out in the place that others take years to reach. They leapfrog into the middle of the investment-uncertainty-profit diagram (**Figure 1.1**). Sam Walton built a distribution center in 1969, more than two decades after opening his first store. The VC backed office products retailer, Staples, invested in such a facility in its second year. Microsoft took nine years to reach $50 million in annual revenues; the VC backed Lotus Development Corporation shipped $53 million of its 1-2-3 spreadsheet its first year.

The VC backed start-up model does dominate in some fields, such as biotechnology and supercomputers, where start-ups have to invest significant capital before they realize any revenues. But in most other fields, the well-funded and carefully planned start-up represents the exception. Even the founders of companies like Cisco Systems, who eventually turn to venture capitalists to secure the funds and managerial expertise they need to grow, start out on credit cards and sweat equity.

These findings raise several questions. Why do most entrepreneurs face such severe capital constraints? Does the small number of VC-backed start-ups indicate some kind of capital market failure? Why do decision-makers in large companies analyze initiatives much more extensively than do most individual entrepreneurs? Does the limited effort devoted by many entrepreneurs indicate an irrational "overconfidence" or, conversely, does the large corporation systematically overinvest in analysis? What distinctive problems does the improvised model entail, and to what degree are boldness, imagination, perseverance and other such qualities important in solving them?

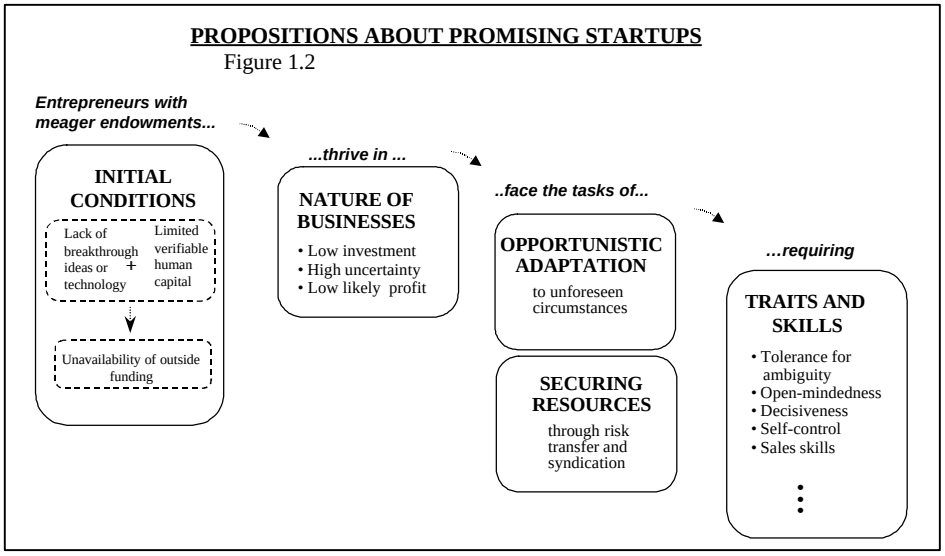
A second set of questions relates to the evolution of improvised start-ups. The transformation of successful VC-backed startups like Compaq into large, established corporations involves relatively few discontinuities; their structures, strategies and personnel have an in built capacity for scaling up. The sharper contrasts between early efforts of entrepreneurs like a Hewlett and Packard, Michael Dell, Bill Gates and Paul Allen and the "mature," multi-billion dollar HP, Dell Computers and Microsoft suggests that the transformation of the improvised start-up into an established company involves more radical and comprehensive changes. What are the underlying factors and mechanisms of this change? What distinctive problems do entrepreneurs face building and growing their businesses that they don't in the start-up phase? Do a different set of skills and traits come into play?

A third set of questions relates to the social consequences and precursors. How is the economic effect of the improvised start-up different from that of the well-planned large company initiative? What environmental conditions influence the relative distribution of start-up and large company activity? Similarly, what are the distinctive economic consequences of the transition from start-up to mature corporation, and what are the factors that facilitate such changes?

5. OVERVIEW

The three parts of this book correspond to the three sets of questions mentioned above.

Part 1 examines the origins of new businesses. It discusses the following propositions (illustrated in **Figure 1.2**) about promising start-ups:



Initial Conditions ('Endowments'). Most entrepreneurs start their businesses by copying or slightly modifying someone else's idea. They also usually don't have deep managerial or industry experience. This lack of proprietary ideas and 'verifiable' human capital* (rather than the shortsightedness of investors or an 'imperfection' of the financial market) precludes most entrepreneurs from raising much outside funding and forces them to "bootstrap" their start-ups with modest personal funds. The number of VC-backed start-ups is relatively small, I suggest, because of the limited supply of individuals who want to start their own businesses and have the ideas and experiences needed to secure outside funding.

Nature of Businesses. Successful new ventures (like the *Inc.* 500 companies) started by entrepreneurs without novel ideas and significant tend to cluster in the upper left-hand region of the uncertainty-investment-profit diagram. (**Figure 1.1**). They cannot pursue make the up-front investment usually required to undertake projects that hold the promise of large total returns. And, although it may seem counter-intuitive for some readers, high uncertainty (arising from technological change or deregulation, for instance) helps entrepreneurs who start businesses with limited endowments. Although their most likely profit is low, the unusually resourceful, hardworking or lucky entrepreneurs who start businesses in an uncertain field have a small chance of securing a large payoff. And if they don't succeed, bootstrapped entrepreneurs have little to lose financially. In contrast, the founders of businesses with low uncertainty (in lawn mowing or hairdressing for instance) all face a distribution of returns that is tightly clustered around a mediocre average.

* I limit the use of 'human capital' here and in subsequent discussions to the skills, knowledge, reputations and so on that an individual acquires and demonstrates through experience and education. I do not include the latent or innate talents for which there is no ex-ante objective evidence.

Opportunistic Adaptation. Entrepreneurs who start uncertain businesses with limited funds have little reason to devote much effort to prior planning and research. They cannot afford to spend much time or money on the research; the modest likely profit doesn't merit much; and, the high uncertainty of the business limits its value.

Sketchy planning and high uncertainty requires entrepreneurs to adapt to many unanticipated problems and opportunities. One entrepreneur likens the process of starting a new business to jumping from rock to rock up a stream rather than constructing the Golden Gate Bridge from a detailed blueprint. Often, to borrow a term from Elster's[57] discussion of biological evolution, entrepreneurs adapt to unexpected circumstances in an "opportunistic" fashion: their response derives from a spur of the moment calculation made with the intention of maximizing immediate cash-flow. Capital-constrained entrepreneurs cannot afford to sacrifice short term cash for long term profits. They have to play rapid-fire pinball rather than a strategic game of chess.

Securing resources. Entrepreneurs face a difficult problem in convincing customers, employees, credit, and other such resource providers to take a chance on their startups. They have no track record, and without a capital base, they cannot underwrite others' risks. Bootstrapped entrepreneurs cannot, for instance, offer credible money back guarantees to customers, employment contracts to recruits, or collateral to banks. Instead, they syndicate or transfer risks to others. They undertake an extensive search for parties whose interests, values, and decision-making processes predispose them to taking a chance on a startup. They offer special deals to their first resource providers to compensate them for the risk of being the guinea pig. They frame the trade-offs—usually through face-to-face selling—persuasively, by accentuating the positives and downplaying the risks others face.

Traits and Skills. Starting an uncertain business requires an high *tolerance for ambiguity*. Entrepreneurs have to confront fluid, rapidly changing situations where they cannot anticipate the nature of the outcomes, let alone assess their probability distributions. A high tolerance for financial loss does not however significantly influence the propensity to start ventures where entrepreneurs do not invest much capital or face high opportunity costs for their time.

Chance events and serendipity naturally play an important role in uncertain, improvised startups, but so does the entrepreneur's capacity to overcome the challenges such ventures entail. Entrepreneurs who effectively adapt to unexpected problems and opportunities and persuade resource providers to take a chance on their startups can influence their luck. In businesses that lack differentiating technologies or concepts, personal traits such as open-mindedness, the willingness to make decisions quickly, the ability to cope with setbacks and rejection, and skill in face to face selling help differentiate the winners from the also-rans. Overall, the reality of bootstrapped businesses does not bear out the popular image of an entrepreneur as an irrational, overconfident, risk-seeker. Quite the contrary. Entrepreneurs can pursue 'heads-I-win, tails-I-don't lose' opportunities because they are less prone than average to irrational ambiguity aversion and they have a talent for exploiting the cognitive biases and defects of other

individuals. They require exceptional self-control; they may have to tolerate difficult customers with unreasonable demands and focus on winning orders rather than arguments.

Large companies undertake different kinds of initiatives and follow a more systematic approach. Employees who initiate new projects have access to significant funds but are subject to extensive scrutiny by internal control systems. Initiatives whose payoffs are too small to cover the costs of evaluation and monitoring therefore get screened out. Advocates of new initiatives conduct extensive research and formulate detailed plans in order to secure approval. This creates a bias against projects whose uncertain nature makes it difficult to research the risks and returns. And, prior planning and relatively low uncertainty reduces the need for opportunistic adaptation after the project has been launched.

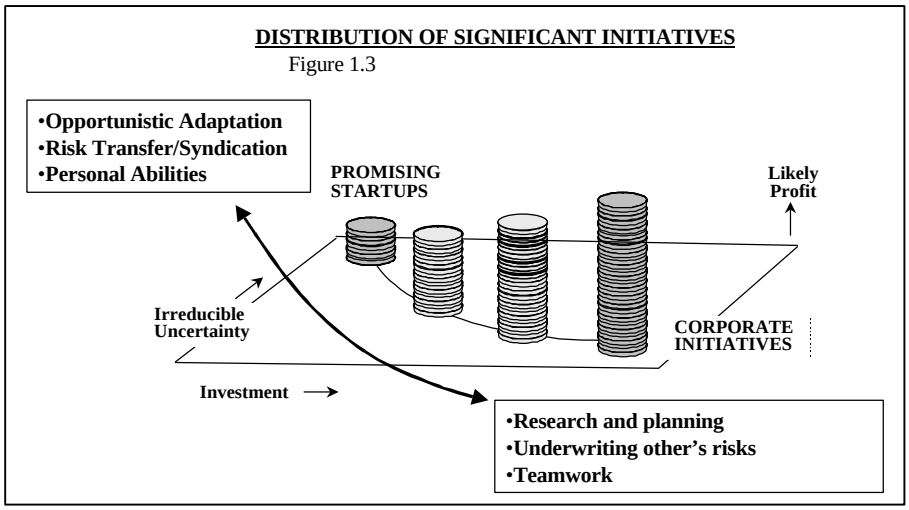
Large companies can leverage their capital and reputations to secure customers, employees and other resources for their initiatives. They can underwrite others' risks and they can signal their commitment to the initiative by putting their capital their reputations on the line.

Unlike the bootstrapped startups whose success depends on the innate skills and capabilities of one or two individuals, the success of an initiative undertaken by a large company turns on the joint efforts of many individuals and functions. The soundness of the initial idea also plays an important role; after the fact adaptation cannot make up for basic initial flaws.

PROMISING STARTUPS VS. INITIATIVES OF LARGE CORPORATIONS

Table 1.1:

	PROMISING STARTUPS	**CORPORATE INITIATIVES**
Endowments and Constraints	Lack of Novel Ideas and Experience → Severe Capital Constraints	Ample capital but subject to extensive checks and balances
Nature of Opportunities	Low investment and likely profit; high uncertainty	High investment and likely profit; low uncertainty
Reliance on Adaptation	Extensive adaptation, limited prior planning and research	Extensive prior planning and research, limited adaptation
Securing Resources	Entrepreneur transfers or syndicates risk to resource providers	Firm (i.e. shareholders) underwrite risks, signal commitment
Differentiating Factors	Entrepreneur's personal capacity to adapt, persuade resource providers	Joint effort of many personnel and functions; soundness of initial concept



The improvised startups of the capital constrained individual and the carefully planned investments of companies like IBM that run into hundreds of millions of dollars represent the bookends of entrepreneurial initiatives (see **Table 1.1**). Other firms and individuals have an in-between evaluation process and access to capital. As indicated in **Figure 1.3**, they usually fall along the diagonal space in the investment-uncertainty-profit diagram. Few individuals or companies have access to the resources needed to undertake projects, in the upper right region of the diagram, that are both large and highly uncertain. Projects in the bottom left hand region, which are small and uncertain, have marginal returns and little economic significance.

Part 2 examines why only some new businesses grow into large long-lived corporations. According to some models (for instance, in Nelson and Winter's theory) luck plays a central role in the evolution of firms—from many startups in an industry, the field gets successively narrowed to a few survivors through a more or less random process. Another theory, popular in the entrepreneurship field, seems to suggest that startups naturally pass through successive stages of growth, provided the entrepreneur is willing to delegate authority to subordinates.

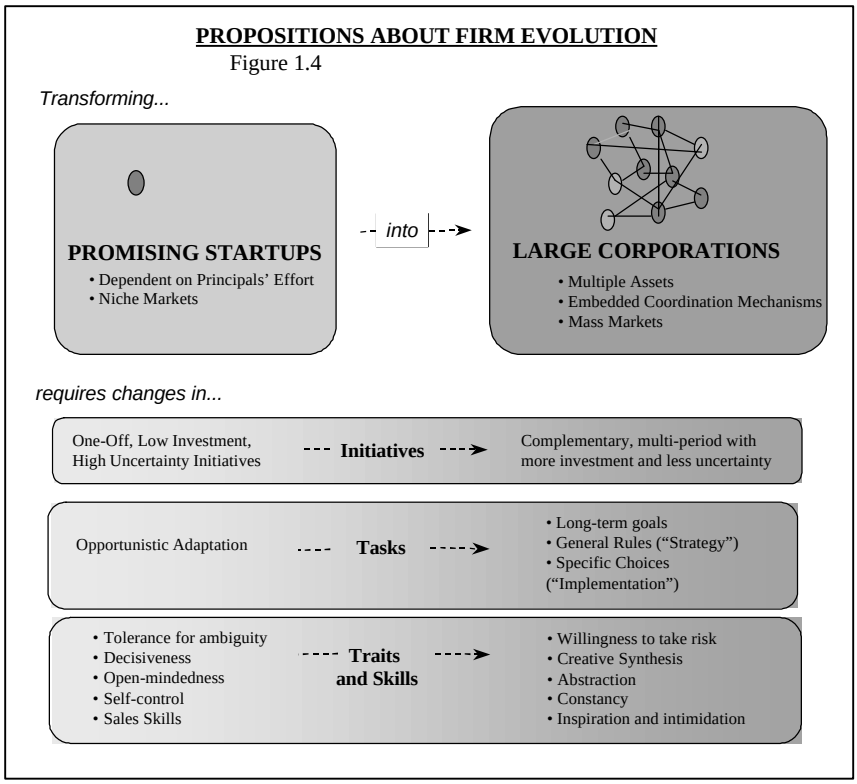
Both explanations seem inadequate in view of the substantial differences between a typical start-up into a large corporation. Large companies derive their profits from many tangible and intangible assets such as their patents, know how, production facilities, brand names, customer relationships and access to distribution channels. They have deeply embedded mechanisms to coordinate their many assets and activities. They serve large markets. The profitability of many new businesses in contrast depends on the personal efforts of the entrepreneur or sometimes, one or two products. The relatively narrow range of assets and activities limits the need for coordination mechanisms in startups. And they serve small, niche markets.

Bridging the gap between the fledgling enterprise and the large corporation requires more than just chance or the willingness to delegate tasks. As illustrated in **Figure 1.4**, entrepreneurs who build

large and long-lived businesses, make substantial changes in the types of initiatives they pursue and the tasks they perform. The small, heads-I-win-tails-I-don't-lose opportunities used to launch the business give way to a multi-faceted, multi-period program to develop a portfolio of assets and coordination mechanisms and to enter larger markets. In other words, entrepreneurs migrate the initiatives they undertake from the upper left hand corner of the uncertainty- investment-profit diagram, towards the lower right hand corner.

The effectiveness of a program of initiatives to build a large business depends on the degree to which the individual initiatives complement each other. In order to realize 'complementarity' or 'synergy' of investment and effort, entrepreneurs adopt a strategic approach instead of relying on opportunistic adaptation. They have to define and articulate ambitious long-term goals. They formulate general rules (a 'strategy') to guide their firm's investments and efforts. And they translate the general rules into specific choices.

An entrepreneur's willingness and capacity to follow a strategic approach turns on a broader set of skills and traits than are necessary in the start-up stage. For instance, as previously mentioned, entrepreneurs usually have little to lose when they start a business; the willingness to bear personal risk often becomes a significant factor, however, in building and growing one. The small number of entrepreneurs who have this broader set of qualities and the desire to undertake a different set of tasks limits the number of start-ups that evolve into large corporations.



Part 3 places the evolution of new business in its broader economic and social context. I discuss the economic significance of startups and the factors that determine the supply and demand for individual entrepreneurship. In the popular view, startups (or fast-growing owner-managed companies) and large corporations represent competing forms of economic organization. I argue that entrepreneurs and large companies have a symbiotic relationship; in pursuing different kinds of opportunities for themselves, they play distinct and often complementary social roles. I also discuss the factors that determine the level of startup activity. The recent popularity of individual entrepreneurship derives in part from a belated recognition of their role—they have always accounted for about half of economic activity. These changing perceptions aside, individual entrepreneurs have also increased their actual share of economic activity, as large corporations have withdrawn from activities they were unsuited to perform. They have also benefited from changes in technology, public policies, and the social climate. We should, however, avoid making the error Schumpeter and Galbraith made of assuming that the current trajectory will continue forever. Small, virtual corporations aren't going to take over the world, causing the Justice Department to lay off its anti-trust lawyers—witness Microsoft. Moreover, large corporations will eventually complete their retrenchment and the underlying trends favoring startups may reverse themselves.

I conclude with a discussion of unanswered questions. My work has been, of necessity, exploratory. Although we are surrounded by entrepreneurs, their world remains a terra incognita. I have tried to provide rudimentary maps and outlines for this largely unexplored territory. Considerable refinement and detail needs to be added to make our knowledge of individual entrepreneurs comparable to that of the world of large companies. Such an enterprise, I will suggest, requires realistic expectations about the evidence that can be marshaled to address the critical questions about starting and building new businesses and a careful synthesis of the analytical tools and knowledge derived from many disciplines.

PART 1

THE NATURE OF PROMISING STARTUPS

The following chapters contrast 'promising' startups, exemplified by the *Inc.* 500 companies, with the following types of ventures: *corporate* initiatives, undertaken by large, public companies, such as new product launches or entry into new markets; *marginal* startups—the many small proprietorships which have little prospect of attaining significant size or profitability; *VC backed* startups—businesses like Compaq and Intel launched with funding from professional venture capitalists; and, 'revolutionary' ventures which incorporate a significant large scale innovation like the launch of Federal Express and Motorola's Iridium project.

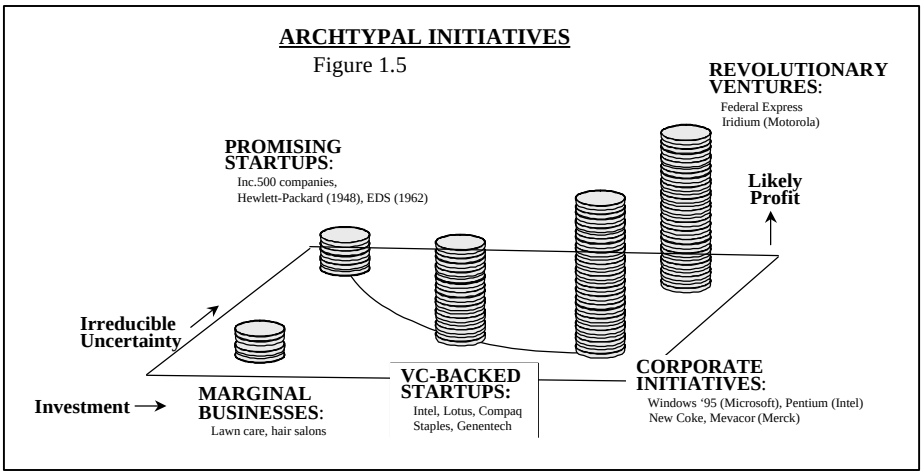
The categories represent noteworthy archetypes rather than a comprehensive taxonomy. They exclude, for instance, startups funded by ad-hoc syndicates of wealthy individuals (the so-called 'angel' investors), the initiatives undertaken by 'transitional' businesses (sometimes with VC funding), or by large privately held companies. I have chosen the archetypes with two goals in mind. Comparing promising start-ups to some clearly different types of initiatives highlights the attributes that distinguish an otherwise heterogeneous population of new businesses. The comparison also helps us build a comprehensive map of the 'normal' features of entrepreneurial activity. For instance, the extraordinary features of revolutionary startups like Federal Express—and the poor returns of marginal businesses – suggest (see **Figure 1.5**) an inverse relationship between the initial investment and irreducible uncertainty of most economically noteworthy initiatives. Similarly a comparison of promising, VC-backed and corporate initiatives indicates why prior planning increases and reliance on opportunistic adaptation decreases along the uncertainty-investment curve.

Terms and Assumptions

Following common usage, I call individuals who start their own businesses as *entrepreneurs* as. Theorists attribute a variety of functions to entrepreneurs such as coordination, risk-taking, innovation and arbitrage. I will examine whether and how their risk taking, innovation, coordination and so on actually affects their starting and nurturing businesses. I refrain from debating which of these roles are truly 'entrepreneurial'.

For brevity, I frequently refer to large, well-established companies, as *corporations*, even if from a legal point of view a corporation may have only one employee and no fixed assets. To distinguish the decision makers in corporations from entrepreneurs I refer to them as *executives* or *managers*, even though they play an important entrepreneurial role.

New *initiatives* refer to conscious efforts undertaken to generate new sources of profit that may or may not succeed. They do not include accidental discoveries of new technologies, oil deposits or other



such valuable assets.

My use of the terms in the investment-uncertainty-profit diagram involves the following nuances whose significance will become clear through concrete examples in subsequent chapters.

Initial or up-front *investment* refers to the irreversible commitment of funds, time, reputation, or other resources that the individual or firm undertaking the initiative makes with the expectation of earning a return.

Uncertainty refers, per Frank Knight's 1921 definition, to unmeasurable and unquantifiable risk. Uncertainty, which may be contrasted with the precisely quantifiable risks of betting on a coin toss or roulette wheel, bears a close relationship to 'ambiguity' and 'fuzzy probabilities' discussed by Camerer in 1995.[58] Entrepreneurs who undertake uncertain initiatives face a wide spread between desirable and undesirable outcomes, but they cannot quantify the odds they face or even fully anticipate the possible results.* And, the uncertainty is *irreducible* to the degree it cannot be resolved without actually undertaking the initiative by prior testing or research

Uncertain initiatives do not necessarily involve novel or pioneering efforts. NASA's meticulously planned Apollo 11 mission in 1969 which first put a man on the moon, had less uncertainty for instance than a hitchhiker's journey from New York to San Francisco. Similarly, the potential loss depends more on the initial investment in an initiative than on its uncertainty; we can have a large spread between good and bad outcomes, without the 'worst' outcome involving significant financial loss.

Likely *profit* refers to an objective 'best-guess' of the value of the cash flows expected from undertaking an initiative. The construct has three noteworthy features. It is not a 'probability weighted' estimate and excludes feasible but unlikely outcomes. Bill Gates and Paul Allen may have been convinced

* George Wu suggests that "a decision under uncertainty is a situation in which many experts arrive at different subjective probability estimates of the outcomes." Ghemawat offers a similar definition for 'ambiguity'. (Ghemawat (1991) p. 129-130)

that writing a BASIC for the Altair in 1975 was a stepping stone to a multi-billion dollar software enterprise; but, although this outcome was possible, an informed, objective observer would not have identified this as the most likely case.

Likely profit excludes the investment made; a project to develop an oil field in the North Sea may have large total expected cash flows but a very small 'net' present value, after capital outlays are taken into account. And, it refers only to the value derived from undertaking the initiative. For instance, if an oil company owns reserves which it could sell for $X, but chooses to develop the field itself, with the expectation of generating $Y then we would attribute only $Y -$X to the development effort.

I will assume (following Knight's analysis) that profitable initiatives (in contrast to lucky discoveries) involve at least some irreducible uncertainty and that large likely profits also require large investments. Bootstrapped entrepreneurs, for instance, cannot objectively expect to make the billions of dollars that flow from mega-oil field or blockbuster drug after commensurately large prior outlays. So references to 'large' or 'small' opportunities, include the initial investment as well as the likely profit.

Structure

Chapters 2 through 5 focus on promising ventures. Chapter 2 describes how the founders of promising ventures usually start with meager endowments and face significant capital constraints and draws the link between these unpromising initial conditions and the nature of the opportunities they can profitably pursue. In Chapter 3, we will see how and why entrepreneurs usually do not devote much effort to planning and instead rely on opportunistic adaptation. Chapter 4 explores the problem of securing resources (that is, customers and inputs). Chapter 5 discusses the qualities and skills that attract certain individuals to promising businesses and help differentiate the winners from the losers. Chapter 6 contrasts promising start-ups with corporate initiatives in terms of the nature of opportunities pursued, prior planning, approaches to securing resources and the key success factors. Chapters 7 and 8 extend this contrast to VC-backed start-ups and to revolutionary ventures.

CHAPTER 2: ENDOWMENTS AND OPPORTUNITIES

This chapter discusses the nature of the opportunities that entrepreneurs with meager endowments who start promising tend to exploit. Section 1 describes how entrepreneurs usually launch businesses with mundane ideas and often without much managerial or industry experience. In Section 2, we will see how this lack of valuable intellectual property or human capital leads to severe capital constraints. Sections 3 to 5 discuss the types of opportunities that entrepreneurs with limited capital and undifferentiated concepts can expect to profit from—the market niches most hospitable to start-ups.

Most new businesses lack any ideas or assets that differentiates them from their competitors. They don't really earn a profit; they merely provide a wage to their proprietors that is set by a competitive market for the proprietors' labor. For many individuals, this wage turns out to be lower than what they could make working for someone else, so they have a powerful incentive to shut down.

Many founders of 'promising' start-ups, such as the *Inc*. 500 companies, also start without novel ideas or scarce assets. Nevertheless, they earn attractive returns: most of the entrepreneurs we interviewed said their businesses had generated a positive cash flow within months of launch. The profitability of their businesses is difficult to estimate—small firms often keep inaccurate financial records and commingle company and personal expenditures. But the capacity of the *Inc*. companies to finance high rates of growth through internally generated funds* suggest that their profit margins were significantly positive.

How do the Inc. companies, about 90% of whom don't offer a unique product or service, grow so profitably and quickly when most other start-ups struggle to survive? The unusual profitability of the Inc. companies, I will suggest, derives, to a significant degree, from the hospitable nature of the markets they compete in. On the surface, they seem broadly scattered across the economy. The Inc. 500 companies I studied operated in a variety of fields such as pizza chains, trucking, software, SAT preparation, graphic arts, and selling second hand copiers. But a comparison with the overall population of start-ups suggests some fields contain more Inc. companies than others. For instance, the County Data Corporation compiles a list of the twenty most popular fields for start-ups which account for about a quarter of all new businesses formed in the United States.[11] We find little overlap between these popular fields, shown in

* Companies on the 1989 *Inc.* "500" list grew their sales, on average, at 169% *per year* from 1983 to 1988. The growth was financed primarily through retained earnings: not only had most of the entrepreneurs I interviewed bootstrapped their ventures with modest personal funds, fewer than a fifth had raised follow-on equity financing in the five to eight years they had been in business. About half had raised bank financing but, reflecting the poor creditworthiness of most start-ups, this had usually been in the modest amounts that could be collateralized by the firm's assets three or more years after start-up. We may reasonably infer that if our interviewees hadn't reached profitability quickly they wouldn't have achieved the growth rates needed to make the *Inc.* lists.

Table 2.1 below, and Inc. 500 businesses. None of the 100 Inc. founders we interviewed (and only two of the several hundred successful entrepreneurs my students wrote papers on) started ventures in cleaning services, beauty salons, arts and crafts, painting, lawn maintenance, and landscape contracting—businesses which all belong to the list of top 20 start-ups. Conversely, the top 20 list excludes computer software, which accounted for about 10% of the Inc. companies I studied.

MOST POPULAR START-UPS, 1996

Table 2.1

Type of business	Number of start-ups
Construction	24,787
Restaurant	22,781
Retail Store	21,081
Cleaning services (residential, commercial)	19,642
Real Estate	17,549
Automotive Services and Repair	16,158
Consultant	13,835
Beauty Salon	11,762
Computer Service and Repair	11,111
Designer	10,676
Management and Business Consulting	9,665
Arts and Crafts	9, 412
Painter	9,156
Lawn Maintenance	8,498
Marketing Programs and Services	8,314
Landscape Contractor	8,268
Investment Broker	8,206
General Contractor	8,137
Communications Consultant	8,022
Building Contractor (remodeling, repairing)	7,998

Source: County Data Corporation

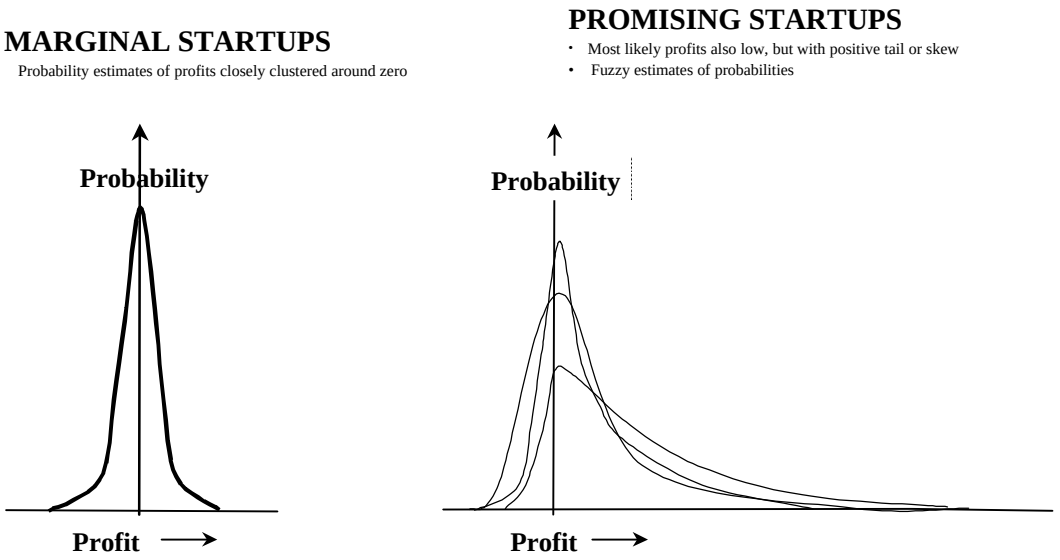
Their limited overlap with popular businesses appears to be a recurring feature of *Inc.* 500 lists, and not just the sample I happened to study. For instance, from the time that Inc. began compiling its lists in 1982, a quarter or more of the companies on the Inc. 500 lists have been in computer related fields—a considerably greater proportion than found in the universe of start-ups. Apparently, start-ups can more easily turn a profit in some fields than in others.

One obvious feature of promising businesses is the low scale needed for their profitable operation. The more subtle factor–and the one which most sharply distinguishes promising ventures from marginal ventures–is that of uncertainty. In particular, we will see, opportunities characterized by two types of uncertainty–deriving from market their and from their dependence on their principals' effort –allow

entrepreneurs who don't have novel ideas, exceptional training and qualifications, or access to significant funds, a chance to make a profit. The objective, best guess payoff from starting a promising business typically has the same low value as the payoff from starting a marginal business. But, uncertainty introduces a skew into the distribution of profits and creates a small chance that the entrepreneur will earn a large return. (See **Figure 2.1**)[59]

ESTIMATED DISTRIBUTION OF PROFITS

Figure 2.1



1. CONCEPTS AND PRIOR EXPERIENCE

Promising start-ups bear a remarkable resemblance to the popular new businesses listed in **Table 2.1** both in the ordinariness of their concepts, and in the limited experience and credentials of their founders. As we might expect, the many new businesses started every year in cleaning services, real estate brokerage, lawn maintenance and so on, do not involve any material innovations. The human capital needed to start such businesses is also limited. Starting a beauty salon or acquiring a real estate broker's license may require a modest amount of prior training or apprenticeship; the skills required for lawn maintenance, home cleaning, or painting can be acquired in a matter of days. The limited innovation and investment in human capital needed to start such popular but marginal businesses is only to be expected. The ease of entry makes the businesses popular—and limits their profitability. It is surprising, however, that most successful businesses, like the *Inc*. 500 companies, also do not start with innovative concepts or founders with much significant prior experience or training.

Concepts

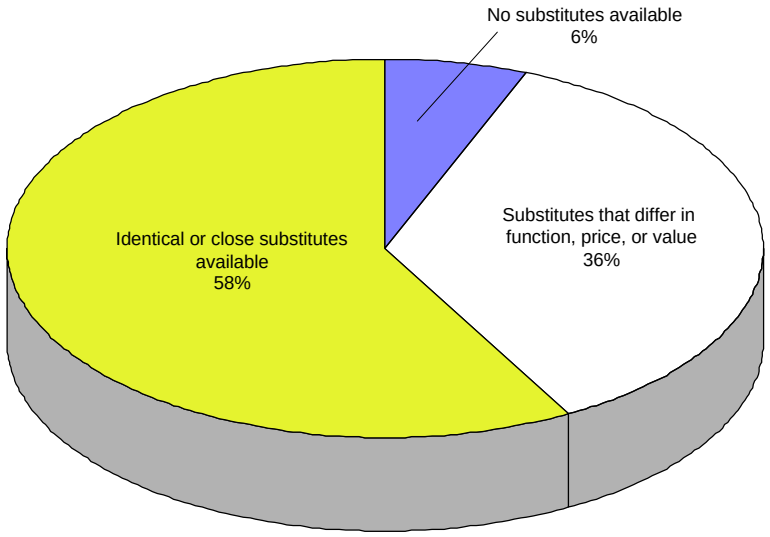
The typical *Inc*. company starts with products or services that are quite similar, at least in their tangible attributes, to the products or services offered by other companies. Of the 100 *Inc.* founders we

interviewed, only 6% even claimed to have started with unique products or services. As indicated in **Figure 2.2**, 58% said that identical or very close substitutes were available for their product or service and the rest indicated slight to moderate differences between their offerings and those of their competitors. Another survey of all *Inc.* 500 founders from 1982 to 1989 also suggests that most promising new ventures do not start with a unique or proprietary product. Only 12% of the founders attributed the success of their companies to "an unusual or extraordinary idea." 88% reported their success was mainly due to the "exceptional execution of an ordinary idea."[60]

AVAILABILITY OF SUBSTITUTES

Figure 2.2

Percentage of 1989 Inc.500 Founders Surveyed



Source: Author's survey

The *Inc.* founders we interviewed typically imitated someone else's ideas that they often encountered in the course of a previous job. Any innovations were incremental or easily replicated; they were too obvious to qualify for a patent and were too visible to protect as a trade secret. To illustrate:

Sean Ropko and his wife founded Excel to sell used copier equipment to wholesalers. Ropko had previously performed the same function for Xerox but started his own firm after Xerox decided to shut down its in-house operation. "People have been buying and selling for years," Ropko told us. "We simply do it better than anyone else."

Carol Sosadian and Atul Tucker started a Attronica Computers as a franchisee of Byte computers, a retail chain. Byte went bankrupt two weeks later. The founders then became a World of Computers franchisee, which also folded. Attronica then became an independent dealer, primarily of AT&T's products and grew their business by gaining more technical proficiency with the line than AT&T's own direct sales force.

Robert Grosshandler and two partners started the Softa Group, because they saw opportunities for "a simple software product." Their first product, Total Recall, gave the partners "market knowledge" but was otherwise not a great success. On the side the Softa Group operated another mundane business—selling hardware and peripherals—to generate cash flow.

Ken Dougan, who had previously worked in the military and as a longshoreman started Unique Transportation Systems. Notwithstanding the name, its business was simply to provide trucking services with "one straight truck and two vans." Dougan drove one of the trucks. "I'd talk to people in shipping and I'd do anything they'd ask me to do."

Philip Cramer founded Compuclassics, a software mail-order company in 1984. In his previous job at a music company, Cramer had telephoned a mail order company to purchase a data-base package: "It took me about ten calls to get through, so I thought that either they can't handle the demand or they have a lousy phone system!" Cramer had a brother-in-law who was a software distributor. "I was tired of the music business, so I asked him about mail order. He thought it was a good idea, but he couldn't do it because he didn't want to compete against the people he was selling to." Cramer then decided to enter the business himself. "We weren't breaking new ground---we were in the second wave. But, we had examples which told us that if we did it right, we'd be O.K. Our philosophy was that we'd charge a little more and go out of our way to service.

Karen Kirsch founded Best Mailing Lists, a broker of mailing lists for the direct mail industry after working for another company in the same business. "My service and product were not unique, but I offered service to which no one could compare."

Mark Lavender and a partner founded Colter Bay to manufacture and sell sweaters and apparel under 'private label' to retailers. He had previously been a senior executive in a sweater manufacturer. Lavender's experience and relationships helped Colter Bay "shave 12 to 15 percent off the cost factor" and offer "a quality product at a fair market price."

Stephanie DiMarco and her partner founded Advent Software to develop PC based software for the investment services industry. Investment management software already existed for mainframes and minicomputers; like other startups in the early eighties, Advent attempted to deliver similar features at lower cost on personal computers.

Carol Russell and Rosalind Katz started Russell Personnel Services to provide temporary and full-time workers to employers in San Francisco—a business Russell had previously worked in for 19 years. Asked what was special about their enterprise, Russell told us that the company gradually differentiated itself in three ways: "First, we introduced the idea of a spokesperson—Carol Russell. If you have a strong personality and credibility, people will buy from you. Second, we took a new approach to advertising—humor. In 1983, nobody did. Third, our counselors became salaried, not commissioned."

John Katzman started the Princeton Review, a test preparation service, by conducting classes at Hunter College in New York. Over time, Katzman differentiated his company's services by offering

smaller classes, more computer support and "clever teaching techniques" acquired by recruiting Adam Robinson, a highly regarded tutor.

My students' papers on successful entrepreneurs, too, indicate that start-ups based on novel products are the exception. Imitation or mundane adaptation is the rule for startups that go on to become household names and blockbuster successes, not just for the average company on an *Inc.* 500 list. (See insert "Undistinguished Origins.")

Undistinguished Origins

Of the two hundred or so "successful entrepreneurs" that my students wrote papers on, only a very small proportion started with a significant innovation. Like the *Inc*. 500 founders, most of the entrepreneurs started by imitating or slightly modifying someone else's idea and introduced breakthrough products or new ways of doing business many years later. To illustrate:

Word Perfect. Alan Ashton and Bruce Bastian started the company in 1978. They first tried to develop a word-processing software package for mini- and mainframe computers, but they couldn't raise the capital they needed: VCs turned them down because Wang and other competitors already offered such products. Ashton and Bastian then became contract programmers and secured a project to write a customized word processing package for the city of Orem, Utah, on a Data General mini-computer. The Orem project helped fund a word-processing package for the IBM PC, which Word Perfect released in January 1983. Their product wasn't the first in the market, however; it was introduced almost one year after WordStar's, program. WordStar continued to be the market leader until 1985, when it stumbled in its introduction of WordStar 2000. WordStar 2000 was more difficult to use than the previous generation product WordStar 3.1 and did not easily read files created in the 3.1 version. At about this time WordPerfect released a new version of its software which was "easy to use, provided a seamless conversion from WordStar 3.1, and most of all, it was a technically superior product." More than six years after launch, WordPerfect finally had its "first 'killer' application,"[61] which made it the number one vendor of word processing software for several years thereafter. (In 1994, Novell acquired WordPerfect for $885 million.)

Rolling Stone. Jann Wenner's magazine followed several other publications that emphasized rock and roll. Paul Williams had previously started Crawdaddy, which billed itself as "a magazine of rock and roll criticism." It "was the first to take rock seriously as a cultural phenomenon but failed to recognize the need to cater to a popular audience. Crawdaddy! was elitist in nature and only could secure limited readership. *Mojo Navigator R&R News* was the first to target a broader market and included celebrity interviews and industry gossip. It also was the first of its genre to secure advertising from the rock and roll industry. In England, there were several popular rock and roll newspapers such as *Melody Maker*, which served as a model for Rolling Stone. Wenner's goal was simply to do "a more popular and commercial magazine" about that would take rock and roll "seriously on the terms that it was then coming out."

The Virgin Group. Richard Branson, founder of the Virgin group, started with a string of undistinguished businesses. In 1967, Branson launched a magazine called Student. The venture was unprofitable. Two other unprofitable, and not very original, ventures followed: a mail order record business and a record shop. In 1973 Branson started a music publishing business, Virgin Records. The company's first album, Mike Oldfield's Tubular

Bells, was a hit and helped finance further growth. By 1984 Virgin Record's revenues approached 100 million pounds and its associated retail company had become the third largest retailer in the United Kingdom. Branson also diversified into nightclubs, computer games software and property development and, by 1993, had amassed a personal fortune of over $1 billion.

Clayton Homes. Now the leading "manufactured" or "mobile" home company in the United States, with over $1 billion in revenues in 1997, Clayton Homes started as a pure imitator. Its founder, Jim Clayton, started as a car dealer in 1957. Nine years later, while taking a customer on a test drive Clayton saw a mobile home being pulled off into a lot and decided to start selling mobile homes. From 1968 to 1973, Clayton sold mobile homes at the unprecedented rate of seven hundred a year from a single lot. Clayton took advantage of not having a novel product. A national retailer, Taylor homes was located a few blocks away from Clayton's lot. "Taylor spent heavily on advertising," my students Anderson and Keller write. "Clayton succeeded at stealing many of Taylor's customers that stopped by his lot on their way to Taylor." Clayton's status as a local TV personality also helped: from 1960 to 1976 he served as part-time host of Startime, a weekly variety show, in which he played the guitar and sang with celebrities such as Dolly Parton. In 1970 Clayton began building some of the homes he sold in an auto body shop and in the following two years started two manufacturing lots. By 1997, the company was vertically integrated with over a dozen manufacturing plants, over 500 retail centers, a subsidiary that provides financing to purchasers of homes and 67 mobile home communities in 28 states with nearly 20,000 homesites.

Prior Experience

Many individuals who have the initiative and the incentive to start their own business often lack deep business experience. Cringely describes the entrepreneurs who built the personal computer industry as "amateurs" who had "little previous work experience and no previous success." Steve Wozniak who built the first Apple Computer "was an undistinguished engineer at Hewlett Packard."[62] His partner, Steve Jobs, had just "worked part-time at a video game company" and neither had graduated from college. Bill Gates dropped out of Harvard in his sophomore year to start Microsoft and Michael Dell quit the University of Texas in his freshman year to start Dell Computers. Substantial businesses have been started by inexperienced founders in other fields as well. Richard Branson, founder of the Virgin Group was just 16 when he started his first magazine. Jann S. Wenner, a drop-out from the University of California at Berkeley was a 21 year-old when he started Rolling Stone in 1967. Wenner says he "knew nothing about the magazine business", so "the business aspects of how you created such an enterprise didn't even occur to me." [63]

I do not mean to suggest that Jobs, Gates, et al were ordinary individuals who got lucky. In Chapter 5 I will in fact suggest that individuals who start promising ventures have an unusual tolerance for ambiguity, and compared to the founders of popular businesses, more education and come from more well-to-do backgrounds. Certain intrinsic qualities of the founders, such as their tolerance for ambiguity and capacity to adapt, are a critical determinant of the success of their businesses.. Here we simple note that a significant number of successful companies are started by individuals who don't have extensive

prior business training and experience. They may have unusual talents that reveal themselves later, but they don't have verifiable human capital or objective business experience.

Besides lacking business or managerial experience, entrepreneurs often have limited knowledge of or contacts in the industry they enter. In some cases, this is because the industry is so new that no one has deep prior knowledge. We also find individuals who want to leave the mature or declining fields in which they have previously worked to enter new fields that offer more opportunity but where they lack personal experience. About 40% of the *Inc*. founders I interviewed had no prior experience in the industry in which they launched their ventures. And, among those who did, the experience often did not seem deep or well-rounded. For instance, John Katzman had been a part-time tutor in college before he launched the Princeton Review, an SAT preparation service. Karen Kirch, a recent college graduate, had worked at a list broker for just over a year before she started her own brokerage. Richard Schoenberg was enrolled at the American Film Institute, when he briefly worked for someone who was a broker for film stock, before he started his own business in the field. Jan Wenner, describes himself as an "amateur journalist" when he started Rolling Stone: while a student at Berkeley, he had written a rock column for *The Daily Californian*. He left college to become the entertainment editor of *Sunday Ramparts* and began thinking about his own publication after that weekly folded and Wenner was out of a job. These prior experiences were invaluable in exposing entrepreneurs to opportunities and ideas they could imitate and adapt; such brief stints could not, however, allow the individuals to accumulate deep knowledge, personal reputations or trusted relationships. They usually accumulated such human capital in the course of operating their business.

2. CAPITAL CONSTRAINTS

The widespread lack of innovative ideas, often accompanied by limited business or industry experience, precludes the typical entrepreneurs from raising much capital from investors. In order to issue equity in a start-up which does not have an ongoing stream of cash flows, an entrepreneur has to convince investors that the enterprise has intangible assets that have the potential to generate cash flows in the future. To borrow terms from the VC industry, investors have to believe that the start-up merits a positive 'pre-money' valuation deriving from some intellectual property or human capital that the entrepreneur has contributed to the venture. Most start-ups, however, don't have the assets that an objective investor would consider valuable. The founders, therefore, have to rely on their own resources or raise funds from relatives or friends who are willing to overlook the founder's me-too strategies and inexperience.

Many entrepreneurs don't have significant personal means (or rich and trusting friends), so ventures that turn out to be out of the ordinary successes often start with the same limited means as the typical lawn care or painting business. As we might expect, most of the hundreds of thousands of businesses launched in the United States every year start with little capital. The Census Bureau's 1987 survey of businesses showed that 30% of all companies were started with less than $5,000 and only a third had more than

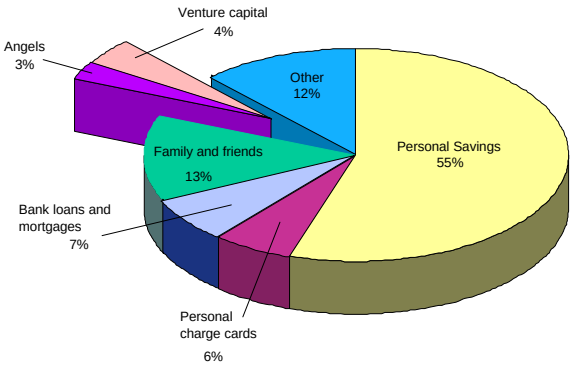
$50,000. Promising ventures like the *Inc.* 500 companies also start with similar amounts. As previously mentioned, most of the founders of companies on the 1989 "*Inc.* 500" list that I interviewed "bootstrapped" their ventures with meager personal savings and borrowings or funds raised from families and friends. 26% started with less than $5,000; only 21% raised more than $50,000 and just two raised more than $1 million. Most founders did not even try to raise outside equity for their start-ups; about a quarter tried to raise venture capital funding and failed.

Inc.'s survey of all the companies on its "500" lists from 1982 to 1989 produced similar results. More than a third of respondents started their businesses with less than $10,000 and more than another third started with between $10,000 and $50,000. Most reported "own resources," "personal loans" and the like as a significant or most important source of capital. Less than 5% relied on outside equity investors.[64] The funding sources for companies on the *Inc.* lists in the 90s were similar to those who made the *Inc.* lists in the 80s. Companies on the *Inc.* 1996 list (more than three quarters of which were launched after 1988) raised an average of $25,000 at the start-up stage. Only 4% reported raising any money from professional venture capitalists and 3% from the so-called venture angels*. As with the 1980s generation of *Inc.* start-ups, the main sources of funding were personal savings and borrowings (See **Figure 2.3** for further breakdown of funding sources). [65]

PRIMARY SOURCE OF INITIAL FUNDING

Figure 2.3

Percentage of 1996 Inc. 500 Companies



Source: *Inc.* Magazine

The capital constraint problem faced by start-ups, we may note, goes beyond the usual information asymmetry and agency problems in going concerns that financial economists often focus on.[66] When an established firm sells stock, it has to overcome the suspicion of investors that the executives know that the stock is really worth less than its issue price because they are privy to confidential information about the

company's prospects. According to the 'pecking order hypothesis' this information asymmetry problem—the difficulty of persuading investors that they aren't being sold a 'lemon'—leads companies to first rely on internally generated funds, then on debt, and issue equity only as a last resort. Agency issues—for example, the fear that the decision-makers will slack off after they have sold all or part of their interest in a business—poses another problem in selling equity to investors.

In many start-ups the founders face a more intractable problem than the fear of lemons or conflicts of interest–they have little to offer investors besides their hopes and dreams. Mechanisms such as audits and contracts can mitigate lemon and agency problems: an investor can be offered the opportunity to conduct extensive due diligence or may rely on incentive schemes that (to some degree) motivate decision makers to increase the value of the firm. These mechanisms cannot address, however, the asymmetry of expectations that exists when entrepreneurs do not have an observable innovation, experience, or a record of past achievement. The entrepreneurs believe that they can somehow make a profit but investors do not. Their capital constraint derives from the absence of objective information about their ability to make a profit, rather than their inability to accurately communicate this information†. Even with utterly honest entrepreneurs, investors can only discover who has the innate capacity to succeed after the fact. If the average entrepreneur cannot earn a profit, investors will not back any of them.

In a relatively small number of promising start-ups, information asymmetry and agency problems do constrain capital raising. As previously mentioned, about 10% of the founders of *Inc*. companies claimed they started with unique products or ideas. Here access to funding depends on whether the expected returns are large enough to cover the costs of investigation and ongoing oversight. As we will see in the chapter on VC backed start-ups, these costs can be substantial compared to the magnitude of the expected payoffs. Therefore, many entrepreneurs with novel ideas cannot raise outside capital and must bootstrap their ventures. Only rarely does the expected value of the intellectual property and human capital contributed by the entrepreneur cover investors' due-diligence and monitoring costs only in the most select of cases.

3. NICHE OPPORTUNITIES

Entrepreneurs who don't have a significant innovation or access to much capital cannot pursue opportunities likely to generate large profits. They cannot, for instance, contemplate high-volume production, where they would have to incur substantial costs in advance of the realization of revenues. They cannot make large up-front investments—to develop a major drug or oil field or build a national brand, for instance. Nor can they easily withstand the competition from large, well-established companies that they would likely encounter if they tried to take a significant share of a large market. Instead, most

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* Venture angels are wealthy individuals who invest in new ventures on an ad-hoc basis. Unlike professional venture capitalists they do not form structured limited partnerships that invest others' funds.
† In Camerer's terms, this is a problem of uncertainty or ambiguity, which he defines as "known to be missing information." (Camerer (1995) p. 644

entrepreneurs start in niche markets where they cannot realistically expect million dollar profits but do not need much working capital or up-front investment in R&D, manufacturing plant or marketing and where they do not have to confront large rivals.

Most of the *Inc.* companies I studied started off by serving local markets or a small number of customers with specialized needs. For instance, Sosadian and Tucker's Attronica Computers served the Washington, D.C. market, Russel Personnel Services restricted itself to San Francisco clients, and Katzman started the Princeton Review offering SAT preparation classes using the premises of Hunter College located in the upper east side of Manhattan. Over 60% of *Inc*. companies I interviewed started out serving just local or regional markets; just over a third served national markets and only two reported overseas customers. Moreover, many of the startups that ventured outside local or regional markets often provided specialized or even customized solutions to the problems of a few customers. For instance, Roxy Westphal and Bob Davis's Corporate Resource Associates designed and developed customized training programs (for sales staff, users of new accounting or bank teller systems, for example) for large companies like the Bank of America, Hewlett-Packard, and AT&T. Electrotek, started by Bud Miles and two partners, provided consulting studies and developed software systems for electric utilities around the country.

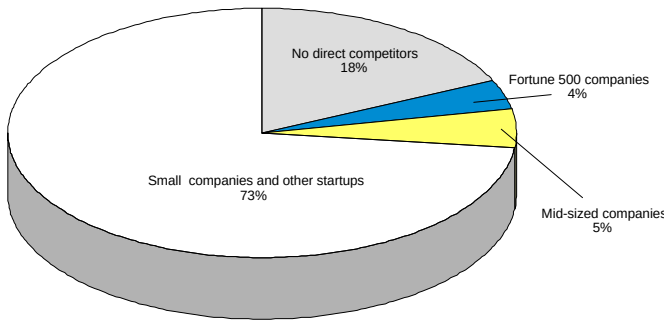
In some cases, the *Inc*. companies served customers who were both local and had special needs. The first client for Inter-Ad, a manufacturer of public access computer information systems was the city of Rochester. Inter-Ad's founder, James Odorczyk recalled: "The city was about to celebrate its 150th birthday, and they needed a system to put in City Hall to talk about Rochester. We were offering touch screens and high-resolution graphics which attracted a lot of people. And, the City wanted someone local and they had budgets and timelines which didn't allow them to do a lot of shopping. We were the only game in town then, and we did a complete system, with custom programming included, for $25,000."

By serving local or specialized customers, the *Inc*. start-ups avoided competition from large, well-established companies: As **Figure 2.4** shows, fewer than 5% of the *Inc*. 500 start-ups I studied competed

COMPETITORS FACED BY 1989 INC. 500 STARTUPS

Figure 2.4

Percentage of 1989 Inc. 500 Founders Surveyed



Source: Author's survey

against large *Fortune* 500 type companies. 73% competed against small companies or other start-ups, 5% against mid-sized companies and the rest reported no direct competitors.

In some cases, entrepreneurs picked niche markets where they did not expect large profits because they wanted to establish a springboard or base for more ambitious subsequent initiatives.

For example, Raju Patel launched NAC with the goal of serving the Baby Bells created by the AT&T breakup. NAC's first offering, however, targeted companies reselling long-distance services from carriers like MCI. "We thought it would be appropriate to get a cash generator to make us known as a new entrant," Patel explained. After Patel happened to meet a reseller who mentioned his need for more accurate customer-billing capability, NAC rapidly developed and shipped a billing system. The system was later phased out as the customers themselves began to fold. But its quick, albeit short-lived, success helped NAC attract the engineers it needed to grow because it enabled Patel to offer security as well as the excitement of a start-up. "We weren't seen as a revolving-door company. We were able to offer health plans and other benefits comparable to those of large companies." More ambitious products, aimed at the Bell companies, followed. By 1989, NAC had become a supplier of intelligent network platforms to the Bell companies, with $26.7 million in revenues.

Robert Grosshandler's Softa group also used the cash flow from one small scale activity to fund a larger business. "Our property management software was funded by selling hardware and peripherals. It was low-margin, but it had fast turnaround. Goods arrived in the morning and left in the evening. Our software, on the other hand, took nearly a year to develop."

In other cases, the entrepreneurs overestimated the potential of their initial business but then stumbled into larger and more profitable opportunities. For instance, Robert Rodriguez started a business with Eddie Sarasola in 1982 to rent large inflatable balloons festooned with advertisements to auto dealerships in Miami. "Eddie and I thought," recalls Rodriguez, "that eventually there would be one of those balloons in every corner of the country. We would be the next IBM." The business of renting balloons to auto dealers did not meet these lofty expectations, but it led Rodriguez and his partner to providing balloons for special events (such as the inauguration of a new location) and conventions to large companies like Eastern Airlines and Burger King. In 1985 Natcom began organizing promotional programs for this clientele and by 1989, balloon rentals accounted for less than 5% of revenues of $3.89 million.

Many members of today's blue-chip companies also started with niche opportunities which they could exploit without much capital or having to face large competitors. Companies like Compaq, which went head-to-head against IBM from the start and booked $100M of sales in its first year, are unusual. Companies like Microsoft, which started in a niche which was too small to interest the establishment, are more common. When Bill Gates and Paul Allen launched Microsoft in 1975, their first product, the 8080 BASIC computer language, ran just on the Altair, a rudimentary personal computer made by MITS, a tiny Albuquerque start-up. MITS sold the Altair in kit form to hobbyists at a rate of a few thousand units a

year. Microsoft's competitors were, like Gates and Allen, other freelance programmers, not IBM or Digital.*

Similarly, Hewlett and Packard started with an audio oscillator for which there was limited demand—another entrepreneur, Walt Disney was one of their first customers. HP developed products for broader markets such as printers and calculators decades later. Other companies like General Motors, Ford, and Eastman Kodak started off in niches that they subsequently helped transform into mass markets. When William Durant formed the General Motors company in 1908, the Buick Company, the leading automobile producer in the United States, sold 8,487 units. Ford, the second largest (it had just introduced the Model T), sold 6,181 vehicles and Cadillac was third with 2,380 units.[67] Wayne Huizenga, founder of Waste Management, started in Fort Lauderdale, with one "beat-up open truck, one helper and a few containers" and generated revenues of $500 a month. He then expanded to four trucks, bought another three truck business in Pompano and proceeded over the next decade to build a NYSE-listed company operating in 32 states.

Serving niche markets not only allows entrepreneurs to start a business with limited funds, it also limits the competition they face from well-capitalized entities. Established corporations and professional venture capital funds expend considerable resources on evaluating and monitoring their investments. They tend to avoid investments in niche opportunities whose profit potential isn't large enough to cover their fixed evaluation and monitoring costs. Therefore, the bootstrapped entrepreneur in a niche market faces direct competition mainly from other undercapitalized businesses.

4. TURBULENT MARKETS

Capital and other constraints, we have seen, usually force the founders of promising ventures to pursue small-scale opportunities. But small scale, by itself, cannot explain the unusual profitability of such start-ups; after all, the popular marginal ventures also operate in small, localized markets. The distinguishing characteristic of promising niches, we will see next, is uncertainty. Uncertainty does not, of course, assure attractive returns, but it does allow entrepreneurs with meager initial resources a better chance of making a profit than the typical popular business with predictably poor returns. Although promising businesses have the same low most likely payoff, they come with a valuable option or lottery ticket attached.

One important source of uncertainty derives from unsettled market conditions—about half the *Inc.* founders I studied started businesses in fields that were in a state of flux or turbulence because of a new technology, regulatory regime, fashion or other such external change. Turbulence improves a start-up's prospects in several ways. Starting a profitable business in a stable market, where competitive forces have

* Gates and Allen suggest that right from the start, their mission was to put "a computer on every desk and in every home, running Microsoft software." That apparently prescient goal, would at the time have seemed as outlandish to industry executives, as Natcom's vision of becoming the IBM of balloon rentals.

long shaken out weak technologies and firms, requires a significantly better approach or new "combination". In highly competitive fields, such as house painting or lawn care, providing the same products or services as everyone else can only yield low industry average returns. In businesses where long-standing relationships, reputations and other such barriers to entry generate high profits for the incumbents, imitation or small modification of existing products and technologies leads to returns that are *worse* than industry average.

In a new or changing market, however, entrepreneurs often do not require a significant innovation or insight to make a profit. Customers and suppliers lack information about their alternatives so many firms, all offering the same products and using the same technologies, can make a profit. We commonly attribute such profits to 'shortages' or an 'excess of demand over supply;' in fact, entrepreneurs do not need the foresight or luck to acquire a good that later becomes scarce. They can exploit the lack of *information*, buying inputs cheap from uninformed suppliers and selling them dear to uninformed customers. They do not even need to discover the opportunity themselves or realize they are engaging in a form of arbitrage. As long as buyers and sellers remain ill-informed, they can simply follow the example of others.

New markets have other attractive features for start-ups. Incentives to compete on price are limited, especially if demand is expanding, because all the players are profitable. Inexperience makes customers more tolerant and trusting. They don't have well formed expectations about product quality and knowledge of what could go wrong. The playing field is level. The start up does not have to displace rivals who have established reputations, and cost advantages deriving from their accumulated experience, and customers locked in because of inertia or switching costs. In mature markets, entrants have to take share away from entrenched incumbents.

The entrepreneur's inability to raise outside funding does not pose a serious handicap, because their competitors face the same problem. Even if the distribution of returns has a positive skew, investors often avoid nascent markets because the expected profit cannot cover their evaluation and monitoring costs. The irreducible uncertainty of new markets also discourages large-scale investment. As we will see in Chapters 6 and 7, decision-makers with discretion over significant amounts of capital usually require objective evidence about the prospects of new initiatives. They avoid markets where they cannot obtain critical data needed to evaluate the risks and returns and where the technologies, customer wants and so on can evolve in innumerable ways. They tend to wait until the prospects about market size and structures have become clear enough to place bets with well-defined probabilities. Until then, the bootstrapped entrepreneur faces rivals who are also capital constrained rather than well funded corporate or venture capital backed entities.

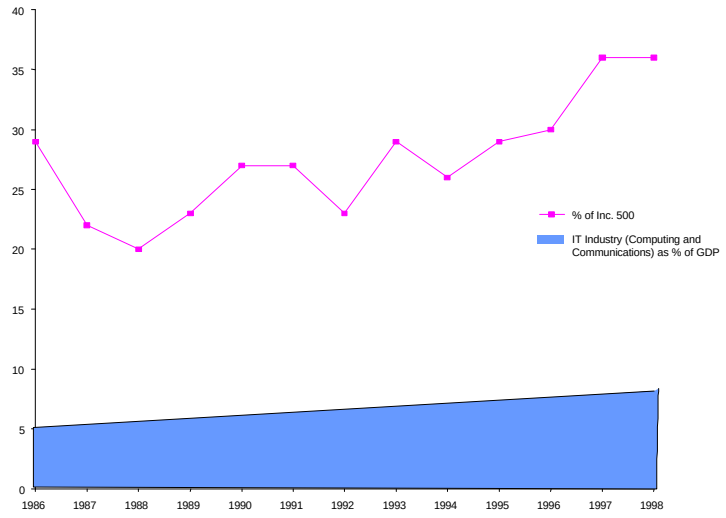
It is also hard to imagine that Microsoft's founders foresaw that they would come to dominate large markets for PC operating systems, spread sheets and word processors which simply did not exist in 1975.

The leverage provided by external change is illustrated by the success of numerous start-ups in the personal computer industry. For the last two decades, the industry has been in a constant state of flux. Successive waves of change, such as the introduction of the Apple II, the IBM PC, the Macintosh, new generations of Intel micro-processors and Windows 3.0 created opportunities for innumerable entrepreneurs who didn't have a breakthrough product, great managerial abilities or much capital. The introduction of the IBM PC in 1980, which legitimized personal computers in the corporate world, created new markets for low cost clones, add-on boards, applications software, training, and distribution. Start-ups did not have to be first or possess exceptional skill to make a profit. More than a quarter of the entrepreneurs I interviewed had started computer related businesses; all of them had started at least two years after the introduction of the IBM PC and five years after the introduction of the Apple II. Their products were fairly mundane: training videotapes and software with features that were available on mini-computers and Apple IIs. Sales and service businesses needed technical knowledge that was probably easier to acquire than competence in automobile repair. But because buyers weren't very knowledgeable or demanding, the installation and servicing of computers generated sizable profits and growth. As one Midwestern dealer told me: "We have a joke slogan around here: 'We aren't as incompetent as our competitors.'"

Changes in the basic hardware, operating systems and networks continued to offer new openings for start-ups through the 1980's and 1990s. Entrepreneurs who missed the opportunity to start dealerships for IBM PCs and clones later found chances to become dealers and system integrators for Novell's networking products. The introduction of Windows 3.0 in 1990 created opportunities for software startups just s the introduction of DOS had in 1980. The disproportionate number of promising startup in the computer area reflects the abundance of such opportunities. For instance, the proportion of computer related businesses in the *Inc*. 500 lists has been consistently more than four times the proportion of overall economic activity accounted for by this sector. As indicated in **Figure 2.5**, computer related businesses have accounted for 20 per cent or more of the companies appearing on the *Inc*. 500 lists between 1986 and 1988. By contrast, a broadly defined "Information Technology" sector, comprising all computing and telecommunications, represented only 5 to 6.4% of the Gross Domestic Product of the United States during that period.[68]

PERCENTAGE OF COMPUTER COMPANIES IN INC. 500

Figure 2.5



Source: *Inc.* Magazine;
U.S. Dept. of Commerce Economics and Statistics Administration (1998) report
(estimates based on Bureau of Economic and Analysis and Census data)

Changing customer tastes and regulatory regimes, like technological discontinuities, can create opportunities for entrepreneurs to profit from uninformed buyers and sellers. Bob Reiss for instance, started a profitable watch business by taking advantage of the 'fashion watch' trend. Until the 1980s, watches sold in the United States comprised three main categories: expensive, high fashion such as Piaget and Rolex; conservative, moderately priced such as Seiko and Citizen; and "popular" priced, functional such as Casio and Timex. Sales growth in this mature market was in line with G.N.P growth. In the 1980s, the Swiss company Swatch stimulated an increase in watch ownership by introducing moderately priced watches, marketed to consumers as fashion accessories. Unit sales more than doubled as consumers began to own several watches with artistic designs, licensed characters such as Mickey Mouse, the logos of professional sports teams and Christmas motifs. Swatch, the innovator, was only one of several companies to profit. Entrepreneurs would use free-lance artists to design watch-faces, secure a license from companies like Disney, or simply copy someone else's design. Factories in Hong Kong and China made the watches, and mail order catalog companies, home shopping TV networks, mass merchandisers like Wal-Mart, and specialty watch chains handled the sales. Without any proprietary assets or technology, an entrepreneur could realize $10 or more for a watch that would cost about $5 to make and enjoy rapid growth. For instance, Bob Reiss launched Valdawn in 1988, several years after the trend towards fashion and fun watches had been in place. By 1994, Valdawn's annual revenues had grown to over $7 million, with a pre-tax profit margin exceeding 15%. The company made the *Inc.* 500 list three years in a row.[69]

Changing tastes and sensibilities also created an opportunity for *Rolling Stone*. Founder Jann Wenner recalls that when he launched the magazine in 1967, "it was the beginning of a new era in rock

and roll. The nature of what musicians and bands were doing was changing. They began to really take themselves seriously and we wanted to write about these, serious meaningful things. There was a big cultural shift taking place. We were at the beginning of it. We caught it, we withstood it and we rode it." As described in a previous insert, Rolling Stone was not the first or only rock and roll magazine of the time. The 21-year-old self-described "amateur journalist" had raised all of $7500 from sympathetic individuals who, according to Wenner, "figured they weren't going to ever get any of it back." Wenner says that he had "no clue whatsoever" about where the first issue was shipped: In fact, six months later, we found out that most of the boxes [containing the first issue] weren't even opened." The start-up missed four publishing dates in its first year. But, because Rolling Stone was tapping into a new market, it didn't have to compete with a Time or a Newsweek; it simply had to deliver higher quality and reliability than only slightly older rivals who faced similar organizational problems. "As amateurish as some of the first issues were," Wenner says, Rolling Stone could "set itself apart" through "serious in-depth interviews and exclusive articles on major artists and issues."[70]

The low representation of "promising" startups from many prominent but mature markets also points to the important contribution of disequilibrium to the profitability of undifferentiated ventures. In my *Inc.* sample, I did not encounter a single company in textiles, chemicals, fertilizers, footwear, and other such mainstays of US industry. We interviewed only one entrepreneur who had started a business (in brake remanufacturing) connected with the automotive industry. Besides the big three—General Motors, Ford and Chrysler—the automotive sector includes many small businesses. But lacking any significant technological upheavals, the field has apparently not provided easy profits or growth to entrepreneurs. If Inc. lists had been compiled in the 1900s and 1910s, it would probably have been as well populated with dealers and suppliers of ancillary goods and services for automobiles as contemporary lists have been with computer related businesses.

Entering a turbulent and unsettled market does not of course ensure large profits. Notwithstanding the tailwind of a "new era in rock and roll" the objective best guess return from starting *Rolling Stone* could not have been much greater than zero. Even where imbalances create opportunities for riskless arbitrage, the profits tend to be small and transitory. The main contribution of market turbulence is to create a small chance of noteworthy success. The entrepreneur who starts a rock and roll magazine in the 'sixties has some hope of building a *Rolling Stone*. Taking advantage of transitory opportunities to assemble clones of IBM PCs in the early 'eighties provides a springboard for a college student like Michael Dell to then build a more substantial enterprise.

5. ENTREPRENEURS' VALUE ADDED

The founders' capacity to differentiate their product or service through their personal effort seems to be an important reason for the profitability of many of the *Inc.* companies I studied. In about 40% of cases, start-ups had neither a unique product nor the benefit of a market in disequilibrium. Like Ken Dougan, founder of Unique Transportation Systems ("I'd talk to people in shipping and I'd do anything

they would ask me to do") or Karen Kirsch, who founded Best Mailing Lists ("I offered service to which no one could compare"), the entrepreneurs relied entirely on their personal capacity to provide services customers valued. The entrepreneur, rather than a product or technology, represented the principal source of the start-up's profits. As Carol Russell of Russell Personnel Services put it: "Our business is done on the cult of personality. You roll up your sleeves and say to the customer, 'Hi, I'm Carol Russell, and I'm going to work overtime to get you employed or employees.' In a people business, being a young company and visible is an advantage. In the large services, you won't meet the Mr. Olstens or the Mr. Kellys."

Some entrepreneurs claimed they secured customers by reading the true nature of their expectations. Clay Teramo, founder of Computer Media Technology, a computer supplies distributor, described the way he used the customer's perception of service to make up for the fact that his larger competitors carried more inventory. When someone called with a next-day order that Computer Media couldn't handle, Teramo would tell them that he didn't have the whole order in stock and ask if he could fill part of it the next day and part later on. If the customer agreed, he'd follow up personally to make sure everything had gone smoothly and to say thanks. As Teramo pointed out, his competitors could probably have filled the whole order at once, but the customer wouldn't think he had received any special service.

The impact of an entrepreneur's ability and effort depends in part on the size and capital intensity of the business. The CEO's labor represents a relatively small proportion of the value added in a large, capital intensive oil-refining company, where plant location, process technology, access to distribution channels, organizational cohesiveness and teamwork, and other such factors have a significant impact on profitability. But all small, labor intensive businesses do not hold the same promise – few hard working and resourceful proprietors of grocery stores and hair salons make it into the ranks of the *Inc.* 500. The potential for entrepreneurs like Clay Teramo or Carol Russel to earn high profits by dint of their diligence or "hustle" often seems to derive from the nature of the features or attributes that their customers value.

In markets for standardized goods and services, such as the delivery of newspapers, customers evaluate offerings along simple, concrete dimensions such as whether the newspaper is delivered punctually and regularly and placed on the doorstep instead of in a puddle. Entrepreneurs who provide such goods and services cannot easily differentiate their offerings and have to accept prices set by a competitive market. An especially diligent, good natured, or courteous individual may earn higher than average tips; but even generous tips in these businesses will not generate the profitability and cash flow of an *Inc*. 500 type company. The relatively low value that customers place on the intangible elements of the service they receive limits the difference in the profitability of the best and worst providers.

In fields such as entertainment, fashion, professional services, and made-to-order construction, buyers don't have an obvious, well ordered set of preferences. They place a high value on what Sabini and Silver call "fuzzy" attributes[71], whose dimensions, such as trendiness, elegance, and responsiveness, they cannot easily measure or define. Their behavior may even contradict the purchasing criteria they espouse. For example, people who say they just want to maximize returns may nonetheless retain an investment advisor

whose performance consistently lags market averages because the advisor caters to some inchoate desire for reassurance and attention. The value that customers place on fuzzy or ill-defined attributes, allows entrepreneurs to differentiate their offerings by tapping into the psyche of their customers or by responding to their unspoken wants. As we saw in the case of Teramo, because fuzzy attributes allow for multiple interpretations of quality, entrepreneurs can even put a positive spin on their weaknesses.

Entrepreneurs who have a superior innate capacity for (or willingness to work at) satisfying fuzzy wants can realize high profit margins without proprietary technologies or assets. Rivals cannot imitate product or service offerings whose critical attributes are not easily observable and are embedded in the personal efforts of the suppliers' principals. They cannot lower prices to compensate for perceptions of inferior quality, because these market niches have a "winner-take-all" nature. Customers who don't fully understand what they want can't easily make price and quality trade-offs, and are willing to pay a considerable price premium to the "best" provider. And, to the degree that products with fuzzy attributes cannot be produced through a standardized process, entrepreneurs with superior operational skills can also enjoy cost advantages over their rivals.

In other words, a venture's dependence on the personal efforts of its founders represents a desirable source of uncertainty that adds a positive skew to its prospects. The innate talent, motivation and drive of an entrepreneur can make a significant difference in businesses when standardized processes and inputs do not produce the outputs that customers value. The objective prospects of all entrants may be low because of the limited capital or qualifications required to start such businesses; nevertheless a few entrepreneurs can enjoy high profits. B y contrast, in marginal businesses standardized customer wants that any entrepreneurs can satisfy, lock all firms into a narrow zone of low profitability. (For an illustration of how the attributes customers value affect the profit potential of start-ups, see the insert 'Comparing Upscale Restaurants and Laundries' which illustrates.)

Comparing Upscale Restaurants and Laundries

In both fields, barriers to entry are low and competition is intense: entrepreneurs can easily obtain the technology and equipment needed to open a new establishment. Average profitability and survival rates are notoriously low. But, the range in the profitability of upscale restaurants seems to be greater than the range in the profitability of laundries. Although the financial prospects of the typical new restaurant are grim, every so often someone scores a hit. A city like Boston contains several establishments such as Anthony's Pier 4 and the Hilltop Steakhouse that have generated significant wealth for their proprietors. Laundries, in contrast, do not seem to offer anyone a path to riches. A few hundred thousand dollars in profit seems to mark the limit of success.

The value that many customers place on the intangible aspects of their overall dining experience helps explain why some restaurants can make exceptional returns. Customers pay not just for the physical inputs and labor that goes into their meal, but also for the quality of the food, the choices on the menu, the decor and ambiance, and whether the establishment is considered 'in'. Restaurateurs who can create the right atmosphere and 'buzz' and provide a popular menu fill their establishments. Their gross profits considerably exceed their fixed costs, generating

attractive profits. Rivals of a successful fine dining establishment cannot easily copy the elements that derive from the skill and personality of its owner. Nor can they draw away customers by lowering prices.

In the laundry business, customers may prefer well-lit, pleasant stores and courteous counter staff; they do not, however, go out of their way to patronize particular establishments because of the ambiance or the personality of the owner. Many competitors can provide the concrete attributes that customers value—the hours the store is open, the turnaround time, the removal of stains and so on. Moreover, they all incur similar costs. In a restaurant, costs vary with the proprietor's skill in purchasing, control of waste, menu design, management of the kitchen staff and so on. In a laundry, all establishments use the same mature technology, the same raw materials and a small, unskilled staff to produce more or less the same outputs. Competitive forces and imitation therefore lead to a uniformity of prices and service levels and low overall profitability: the typical laundry generates a 6% return on capital. This return—and the 'wage income' the establishment often generates for family members—may be adequate for the owner, but it does not lead to the profits and growth of an *Inc.* 500 company.

(The nature of competition in the low budget or "value" fast food market, however, is different. Customers value concrete (albeit intangible) attributes such as reliability, speed, convenience, and (often scripted) courtesy. Imitation and price competition is widespread. Profits depend on the firm's brand names, locations, systems and other such proprietary assets rather than the personal touch of the principals.)

The leverage that the founders of *Inc.* companies derived from serving fuzzy wants shows up in the nature of their offerings. Most *Inc.* companies did not offer goods or services for which customers could easily do comparison-shopping or would tend to reflexively buy the leading brand. Rather, they competed in markets where the purchasing decision involved subtle criteria and cognitively challenging trade-offs that the entrepreneurs could influence.

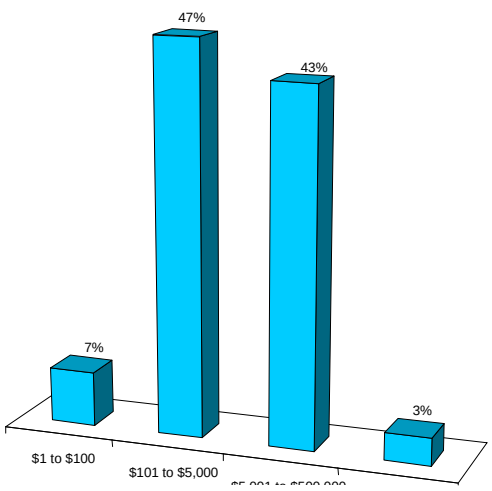
Three quarters of the *Inc.* founders we interviewed served as their company's chief or only salesperson. Only 10% used brokers or distributors. The sales cycle in 75% of the cases ranged from days to months. Therefore, in contrast to a door-to-door vacuum cleaner sale, understanding and responding to the customer's situation and concerns was more important than closing the transaction quickly.

The median unit sale was $5,000, an amount high enough to support direct personal selling and allow

DOLLAR VALUE OF UNIT SALES

Figure 2.6

Percentage of 1989 Inc.500 Founders Surveyed



for customization of terms and features. Most *Inc*. start-ups sold to other businesses—only 14% offered consumer goods or services. The few consumer items we encountered also represented purchases that buyers would tend to think about and the entrepreneur could personally influence, such as a $20,000 recreational vehicle from Chariot Eagle. The companies did not sell $5 to $10 packaged goods for which the purchasing decision is based on habit or on impersonal factors such as advertising and shelf space. (**Figure 2.6** shows the distribution of unit sale prices for 1989 Inc. 500 companies.)

In the high-ticket items sold by the *Inc.* start-ups, entrepreneurs reported that their personal passion, persuasiveness and willingness to satisfy special requirements were as important as the attributes of their products. As John Mineck, co-founder of Practice Management Systems, said, "People buy a salesperson. They bought me and I had no sales experience. But I truly believed our systems and software for automating doctors' offices would work—so the customers did too. Also, we did an awful lot for our first clients; if they wanted something, we'd deliver. We were providing service and support long before that became a cliché."

As with the uncertainties that derive from turbulent market conditions, high dependence on the founders' personal value added ameliorates the disadvantage entrepreneurs might otherwise face because they cannot raise outside funding. Capital providers avoid businesses whose profitability depends just on the principals' "hustle". Most startups make low profits and it is difficult for investors to predict which entrepreneur has the innate qualities to break from the pack. Investors also face difficult problems of motivation and appropriability of returns. To the extent that providers of capital bear the risks, they reduce the entrepreneur's incentive to make the critical but unobservable extra effort that separates the winners from the also-rans. And, the value created by a successful "hustle" venture is closely attached to the founders rather than to the legal entity they operate in. The valuable assets of an advertising agency for instance lie in the reputations and know-how of the principals. Once these assets have been created, the principals can walk away to start a new agency leaving little behind for the investors who provide the start-up capital. The reluctance of professional investors to back businesses whose value depends almost exclusively on the efforts and human capital of a few principals limits the bootstrapped entrepreneur's competition to other self-financed players.

6. SUMMARY

The typical new venture confronts serious limitations. The founders of businesses usually start without an original idea and they also often lack deep business or industry experience. These limited endowments preclude most entrepreneurs from raising much capital and force them to bootstrap their ventures with personal funds or small amounts raised from friends or relatives.

Entrepreneurs can more easily cope with their lack of original ideas, experience and capital if they start niche businesses with high uncertainty due to unsettled market conditions or nearly total dependence on the entrepreneur's personal ability to satisfy fuzzy customer wants. Although the most likely payoff in such businesses isn't large, they provide the entrepreneur with a chance of making a significant return. By contrast, in popular fields for start-ups such as beauty care salons and lawn maintenance, competition between businesses of roughly equal capabilities forces all businesses to subsist at a very similar and low level of profitability. Competing in small, uncertain niches also allows the bootstrapped entrepreneur to avoid competing against well-capitalized rivals.

CHAPTER 3: PLANNING VERSUS OPPORTUNISTIC ADAPTATION

This chapter examines why the adaptation to unforeseen problems and opportunities represents an important task for the founders of promising businesses. Sections 1 describes how most entrepreneurs start businesses without much prior planning. Section 2 suggests that the costs of extensive planning in a typical start-up exceed the benefits. Section 3 discusses the importance of adapting to unexpected problems and opportunities. Section 4 brings out the opportunistic nature of entrepreneurial adaptation by comparing it to other types of selection strategies such as scientific experimentation and Darwinian processes of biological evolution.

When Paul Allen and Bill Gates developed Microsoft's first product, they do any market research or competitor analysis first. In December 1974 Allen visited his high school friend Gates, then a sophmore at Harvard. He spotted an issue of *Popular Electronics* featuring the Altair 8080 on the cover at a kiosk in Harvard Square. "I bought a copy, read it, and raced back to Bill's dorm to talk to him" Allen recalled. "I told Bill, 'Well here's our opportunity to do something with BASIC.'"[72] Allen and Gates did not write a business plan; they started working on a version of BASIC for the Altair right away. Gates writes that they "were like the characters in those Judy Garland and Mickey Rooney movies: "Let's put on a show in the barn!" We thought there was no time to waste, and we set right to it." Gates and Allen "didn't sleep much and lost track of night and day," in order to complete their BASIC in four weeks.[73]

Some theories suggest that such unplanned approaches to starting a business reflect entrepreneurial overconfidence. Whatever its psychological roots, I will suggest in this chapter, the lack of research and planning that we find in many promising startups has a sound economic basis. Capital constrained entrepreneurs cannot afford to do much prior analysis and research. The limited profit potential and high uncertainty of the opportunities they usually pursue also makes the benefits low compared to the costs. In lieu of extensive planning, we will also see, entrepreneurs have to rely on adaptation: they start with a sketchy idea of how they want to do business, which they alter and refine as they encounter unforeseen problems and opportunities. Moreover, the adaptation is often more opportunistic or myopic than scientific or strategic: the founders of promising startups experiment with course changes to maximize short run cash flow rather than to verify a general theory or to make the best possible a long-term choices.

1. LIMITED RESEARCH AND ANALYSIS

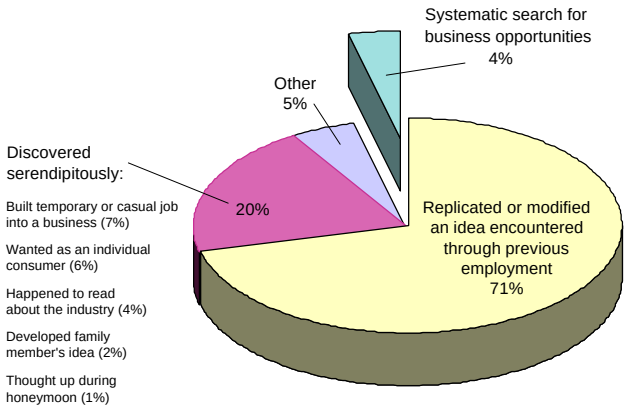
Few of the entrepreneurs I studied followed a systematic approach to identifying and evaluating opportunities. Only 4% of the *Inc.* founders we interviewed found their business ideas through a systematic search. 71% replicated or modified an idea encountered through previous employment, and another 20% discovered their ideas serendipitously. (See **Figure 3.1**). Having found an idea in an ad-hoc fashion, the entrepreneurs did not spend much time on research or planning, either. 41% of the entrepreneurs had no business plan at all. 26% had just a rudimentary plan: Carol Russell, for instance, recalls that she and her partner, "got together in the public library to plan, but we had no paper. We did our projections on the back of an envelope." 5% worked up financial projections for investors. Only 28% wrote up a full-blown business plan.

Another survey of the founders of all *Inc.* "500" companies from 1982 to 1989 generated similar results. Only 7% had done a systematic search for business opportunities, and only 21% had developed a formal business plan. Having decided to pursue an opportunity, the entrepreneurs proceeded quickly, and apparently without much preparation. More than half did not consult with a lawyer, for instance and three quarters did not develop any marketing materials. The period from the original idea to the beginning of operations was usually brief: as **Figure 3.2** indicates, over 63% took a few months or less, while only 9% took more than a year.[74]

SOURCES OF STARTUP IDEAS

Figure 3.1

Percentage of 1989 Inc.500 Founders Surveyed

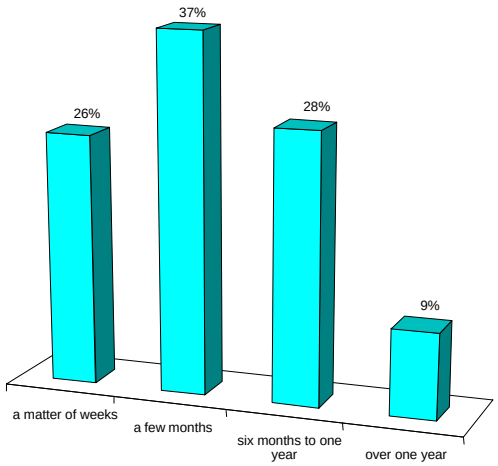


Source: Author's survey

TIME FROM IDEA TO STARTUP

Figure 3.2

Percentage of Inc. 500 Founders Responding



Source: Case, John, "The Origins of Entrepreneurship", *Inc.* Magazine, 1989.

My student's papers on successful entrepreneurs also record that the founders of many of today's well-established corporations too did not start their businesses in a planned, systematic way. Jan Wenner, founder of Rolling Stone, recalls that "the idea of making a business plan, finding out what other magazines were doing, studying the competition didn't even occur to me." Calvin Klein too started his

fashion empire with his childhood friend Barry Schwartz without any planning: "We just sold as many coats as we could" Schwartz says "and we worked seven days a week."

2. COSTS AND BENEFITS

Why didn't Gates and Allen conduct market research on the potential revenues or assess systematically their capabilities vis-à-vis other programmers who were also trying to develop a BASIC for the Altair? Why do so few *Inc*. founders compile even basic information on market size and competitive climate or draw up five-year financial projections? Lovallo and Camerer suggest that entrepreneurs have "blind spots" and fail to appreciate how much competition there will be in a market. Or, they may know about the competition they face and "overconfidently think their firm will succeed while most others will fail."[75] Several studies from the field of experimental psychology have shown that "most people rate themselves above the average on almost every positive personal trait – including driving ability, a sense of humor, managerial risk-taking and expected longevity."[76] Lovallo and Camerer's experiments suggest that expertise exacerbates rather than mitigates the propensity towards overconfidence: experts are more likely to over-rate their abilities vis-à-vis other experts than are novices against other novices. Their work also suggests that experts are more likely to overate their prospects in games involving skill rather than chance.[77] Thus entrepreneurs like Gates and Allen might have such confidence in their programming skills that they do not bother with an objective evaluation of the abilities of their rivals and under invest in research and planning.

It may well be true that entrepreneurs have a greater propensity towards overconfidence than the population at large. Their apparently cavalier attitude towards planning does not, however, reflect an irrational, overestimate of relative ability or an underestimate of the value of analysis and research. Rather, their initial endowments and constraints as well as the type of opportunities they pursue, dictate that entrepreneurs proceed quickly from idea to implementation.

Endowments and constraints

The inability many entrepreneurs to raise outside funding, their limited opportunity costs and their prior knowledge discourage them from devoting much effort to prior research and planning.

Capital constraints. The entrepreneur's inability to raise much capital makes the opportunity cost of doing research prohibitive and precludes extensive investigation of an idea. Large corporations routinely spend, I can report from first-hand experience, hundreds of thousands of dollars to investigate new business opportunities. The typical entrepreneur who starts with ten or twenty thousand dollars in initial capital obviously cannot afford such research: scarce funds are much better spent on trying to make or sell a product than on conducting competitor analysis or focus groups. The line between 'doing' and research therefore is blurred. As one founder recalls, "My market research consisted of taking a prototype to a trade show and seeing if I could write orders." Mark Nickel, founder of Sampler Publications spent $450 to see if "anyone would be interested in advertising in a crafts catalog." (See Insert, Researching By Doing).

This conflation of research and selling approach may not produce reliable information. The orders-at-a-trade-show test can generate false positives or false negatives—the entrepreneur may, for instance, secure an order by a lucky fluke. But most entrepreneurs do not have much of a choice: they simply cannot afford truly objective, statistically significant data.

Researching by Doing: Sampler Publications

Mark Nickel founded Sampler Publications in 1984. Prior to Sampler, Nickel had worked as a managing editor of a magazine in Chicago. He came up with the idea of a folk crafts ad quarterly while attempting to market craft work made by his wife: "My wife and a friend of hers made crafts out of her house. They bought crocks, painted them with country designs and put lids on them. They sold well at craft shows. I was tired of working downtown and asked myself, 'Why not build a crafts business?' We then decided, 'why don't we try to sell mail-order?' We looked around for country-style magazines to advertise in---that is, Country Living and Country Home. They had black and white ad sections in the backs of the books. A sixth...cost $1750! That's a lot of money for selling a $3 widget. There was no good medium to advertise in. So, I said to myself, 'why don't I start my own?' The result was *Country Sampler*.

" I decided to see if anyone would be interested in advertising in a crafts catalog. I ran ads to get ads. I figured that a guy could spend $450. I ran two ads in magazines that crafters read. I also mailed my ads to all the crafters listed in the classifieds of the two magazines....I'd go to craft shows and mail ads back to the people I met there.

"I got a good response, so I started putting a prototype together -- at this time, the people responding to my ad still had not seen anything to show them what the product would look like. I did a four page 11 x 17 foldup. A bank gave me a personal signature loan of $3500 for printing the piece. I shot pictures of the products with dummy captions, product descriptions, etc. I hand addressed and stamped each one, sent them out to everyone who had responded to my ads, and waited to see what would happen...The deadline for advertisements was February 15, 1984. I got orders from 84 people. They had to pay up-front. At $450 each, they paid for the production of the catalog. If it had bombed, I would only have lost $3500.

"The product was a five-color, high-quality piece, with no editorial content. I ran an ad in Country Living: 'buy direct from America's craftsmen!'

"It was a one-time deal initially. I told the crafters that I'd run their ads for one year. They didn't care! It was a pretty book, and they wanted to be in it. I didn't know what I was going to do next, but crafters started seeing this and saying 'holy cow!' I quit my job when I knew that I had enough business for a second catalog. I was still employed at the time, but I'd go in early to my office at around 7:30, and have my stuff done by 9:00.

"For the second one, I reprinted the pages as they were and added more. I was getting between 2000 and 2500 responses per month. Anyone could sell these catalogs at booths, craftshops etc. Crafters sold them. They sold like crazy...The ads paid for the production, and I made $3 every time we sold a magazine. I never had to borrow anymore."

Limited opportunity costs. Entrepreneurs do not have much to lose from an erroneous forecast of relative ability or market size. As we have seen, they usually do not put much capital at risk. The opportunity cost of their time is often low because, like Gates and Allen, they don't have the credentials

and experiences that could secure them highly paid employment. As Michael Dell who dropped out of college to start Dell Computers explained: "The opportunity looked so attractive, I couldn't stay in school. The risk was small. I could lose a year of college."[78] The individuals, who face high opportunity costs, we will see in later chapters, usually do not start small, bootstrapped ventures. Like Jim Clark, who was an associate professor at Stanford before he started Silicon Graphics, they pursue opportunities with the large likely returns (and capital requirements) that are commensurate with their opportunity costs.

Many of the *Inc*. 500 founders I interviewed did not even have to incur the emotional costs of quitting a satisfactory job: over a third had been fired or left after a serious disagreement. Others worked on another job to support themselves while they launched their businesses. John Mineck, for instance, started Practice Management Systems in 1982 while still employed by the Personal Care Division of Gillette, Inc. "You could do something on the side very easily," he recalls. "They seemed to discourage hard work." Thus, while entrepreneurs may lack an objective basis for believing they can out compete their rivals, their overconfidence isn't particularly consequential.

Prior knowledge. The entrepreneur's previous experience, even if it is relatively brief, mitigates the risks of inadequate research. Entrepreneurs who start a business by imitating or modifying an idea they encountered in their jobs already have first hand evidence of the viability of the concept and knowledge of the critical market facts. Steve Shevlin and his partner, Robert Wilken, for instance were only about 20 when they started Compu-Link in 1984. Their business was simple: "We brought in great rolls of computer cable, cut them and sold them, usually within 24 hours." They confidently launched this business without market research. Shevlin, who had worked briefly for a company in the same business, knew one crucial fact: his previous employer was making a gross margin of about 90%. Shevlin and Wilken made up batches of IBM printer cables and secured orders on the very first day by cold calling computer dealers listed in the Yellow Pages. The dealers didn't have many other suppliers calling them at the time—the business was new—and they could sell a printer cable for $60 which they paid Compu-Link $16 for, and which cost Compu-Link only a couple of dollars.

Nature of Opportunities

The low likely profit and investment requirements and the high uncertainty of promising startup opportunities also has a significant impact on the costs and benefits of prior analysis and research.

Profit and Investment. The magnitude of the expected profits in a niche market cannot justify much expenditure on research. When a company such as General Electric contemplates a global trading company or Citicorp executives decide whether to build an investment banking business in Japan, the stakes are high enough to justify large outlays on the analysis of competitors and customers. The business of splicing up computer cables does not. Low capital requirements also ameliorate the false positive or the "fluky" order problem that arises where selling is combined with research. A small, bootstrapped business with low capital requirements – does not need to serve many customers; as we will discuss in the next

chapter, entrepreneurs can make satisfactory profits just by serving the unusual needs of unusual customers.

In fact, in many niche businesses the specific information generated by doing is more valuable than research about the world at large. 'Average' costs and prices may not be relevant to the specialized markets in which entrepreneurs often start their ventures and the entrepreneur may only be able to assess the viability of the venture by taking the concrete steps necessary to launch it. The profitability of a new restaurant, for instance, may depend on the terms of the lease; low rents might change the venture from a mediocre proposition to a significant source of cash. But, an entrepreneur's ability to negotiate a good lease cannot be easily determined from a general prior analysis; he or she must enter into a serious negotiation with a specific landlord for a specific property. (Conversely, a large corporation that contemplates opening a chain of restaurants has to first investigate 'average' prices and costs in its target area, before researching conditions in particular locations.)

Uncertainty. The uncertain nature of many promising opportunities also reduces the value of prior analysis. In new or changing markets, research can be costly because of the transient nature of the opportunity. By the time the entrepreneur has completed a thorough investigation, the imbalances and confusion that start-ups can profit from may disappear. The profit margins that Shevlin and his partner enjoyed on selling computer cable were both extraordinary and short-lived. Similarly if Gates and Allen had spent the time to do a competitor or market analysis, they might have missed the boat, since several other programmers were trying to develop BASIC for MITS's Altair at the same time as Gates and Allen. Ed Roberts, the founder of MITS, says that "we had at least 50 people approach us saying they had a BASIC."[79]

Entrepreneurs cannot expect, in uncertain businesses, to gather reliable data on potential demand and competition. How could Gates and Allen have known which other programmers were working on a BASIC or how capable they were? They had to trust their abilities to produce a working BASIC first; if they had been wrong they would have wasted just a few months of labor. Similarly, entrepreneurs cannot objectively evaluate their relative ability to serve amorphous customer wants. Karen Kirsch found, after the fact, that she could build a profitable mailing list brokerage business simply by providing better service. But, apart from her prior experience at another broker, Kirsch could not collect data to support an objective prediction of such an outcome. Kirsch could only test this assumption by starting the business. Similarly Warren Anderson, had to make instructional videotapes in order to discover whether customers would buy them. In 1982, Anderson was offering training courses in microcomputers, when he conceived of the idea of turning the service into a video-taped based product. He discussed the idea with "a lot of people" who said "it sounds good, but it depends on how well it is done" or "'I'd have to see it first." Anderson then "just went on gut" and spent $30,000 on producing a video for D-base software.

Evidence

We cannot prove, of course, that entrepreneurs who do not plan would not enjoy higher returns (or fewer losses) if they researched their opportunities more extensively. But we cannot find any correlation between start-up success and extensive planning, either. For instance, a 1990 National Federation of Independent Business study of 2,994 startups showed that founders who spent a long time in study, reflection and planning were no more likely to survive their first three years than those who seized opportunities without planning. My interviews also suggested that the few entrepreneurs who conducted extensive market research and formulated detailed business plans did so mainly because of their prior education and experience in large corporations. While planning was consistent with their prior conditioning, it did not seem to protect the entrepreneurs from the vagaries of starting a business. The limited utility of planning, especially in fluid and unstable environments, was dramatically illustrated by two interviews that we conducted in a single day in the Washington D.C. area.

By coincidence, our interviewees, the founders of Attronica Computers and Bohdan Associates, had both started their businesses in 1983 about ten miles away from each other. Both evolved (See insert "Does Planning Pay?") into companies that distributed computers to corporate customers. Attronica's founders, who had worked together in a large telecommunications company, had decided after extensive market research and planning, to purchase a franchise from a computer retail chain for $150,000. After that and other attempts to serve the retail market failed Attronica developed, through trial-and error, into a company serving corporate and government accounts. In 1988, the company had revenues of about $8.1 million. Bohdan's founder in contrast started selling computers out of his home by accident—he placed an ad to sell his used computer and was surprised by the demand. Then, simply by "reacting" to customers, Bohdan grew to a $48 million revenue business by 1988.

Does Planning Pay? Attronica vs. Bohdan.

Attronica. Carol Sosdian and Atul Tucker, who had worked together in a large corporation, started Attronica in 1983 to retail personal computers in Washington, D.C.. Carol recalls that Atul "wrote a one paragraph business plan and brought it to me, and I turned it into a real business plan. It took about one month, and then we bantered back and forth over the next three months. We got to where we thought it might work, and then we showed it to some friends. It passed the 'friend's test'."

Heartened, Carol and Atul conducted almost two years of market research, which led them to purchase a Byte franchise for $150,000. Soon after they open their first store, however, Byte folded. They then signed on as a franchisee of World of Computers, which also folded; and in 1985, Attronica began to operate as an independent, direct dealer for AT&T's computers. This partnership clicked, and Attronica soon became one of AT&T's best dealers. Attronica also changed its customer focus from people off the street to corporate and government clients. They found large clients much more profitable because they valued Attronica's technical expertise and service.

Bohdan. Peter Zacharkiw founded in Bohdan Associates in a Washington, D.C. suburb in the same year that Atul and Carol launched Attronica. Zacharkiw did not conduct any research, however. He was employed by Bechtel

and invested in tax shelters on the side. He bought a computer for his tax shelter calculations, expecting to deduct the cost of the machine from his income. When Zacharkiw discovered that he was overdeducted for the year, he placed an ad in the Washington Post to sell his computer. He got over 50 responses and sold his machine for profit. Zacharkiw figured that if he had had 50 machines, he could have sold them all and decided to begin selling computers from his home. "At first, I just wanted to earn a little extra Christmas money," he recalls. "My wife put systems together during the day, and I delivered them at night. We grew up to $300,000 per month, and I was still working full-time. I made more than I would have made the entire year at Bechtel. "

Like Attronica, Bohdan evolved into serving corporate clients. "First, we sold to individuals responding to ads. But these people were working for companies, and they would tell their purchasing agents, 'Hey, I know where you can get these.' It was an all-referral business. I gave better service than anyone else. I knew the machines technically better than anyone else. I would deliver them, install them, and spend time teaching buyers how to use them. " In 1985, after customers started asking for Compaq machines, Bohdan became a computer dealer, and the business really took off. "We're very reactive, not pro active," Zacharkiw observes. "Business comes to us, and we react. We have never had a business plan."

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3. THE IMPORTANCE OF ADAPTATION

With high uncertainty and limited planning, entrepreneurs often encounter surprises and set-backs which require them to modify or completely revamp the original business idea. More than one-third of the *Inc*. 500 founders we interviewed significantly altered their initial concepts and another third reported moderate changes. Apparently, instead of committing to technology, customer, product line and other such basic choices, entrepreneurs start with a set of tentative hypotheses. Then, as the venture unfolds, entrepreneurs revise their hypotheses rapidly through a series of experiments and adaptive responses to unforeseen problems and opportunities.

Common events that trigger a change in strategy include:

Failure to generate sales. The entrepreneur runs into a wall because customers are unwilling to switch from their existing vendors or do not find adequate value in the product or service the start-up has to offer. This problem is common because the entrepreneur did not have the time or money to do market research or because the willingness of customers to purchase was unknowable before the fact.

Declining profitability. The opportunities that entrepreneurs find in new or unsettled markets are often short lived: the 80% profit margins that companies like Compu-Link earned in the early 1980s from chopping up rolls of premier cable were obviously not sustainable. But even though the declining profits are predictable, entrepreneurs often do not plan for that eventuality. This apparently myopic behavior is not irrational, however because the short-lived nature of the opportunity requires quick rather than deliberate action. Also, although declining profits may be predictable, the future of the industry may be too uncertain to allow for a useful ex-ante plan, and the entrepreneur may just have to wait and see how the market evolves. Finally, the entrepreneur can make satisfactory short term profits even if the long-run prospects of business are poor. Exploiting a short term opportunity without a long term plan thus creates

an attractive option; and, as the option begins to expire, the entrepreneur can stay in the game by finding new opportunities in the now-changed market or can walk away. In either case, the decision is made ex-post rather than ex-ante.

Stalled growth. The initial niche, even if profitable, may be too small to satisfy the entrepreneurs aspirations for growth. In some cases (as in Raju Patel of NAC) the entrepreneur may already have a plan to exploit a larger market; often, however, entrepreneurs will start in a niche simply because it is expedient, and helps create an option. When the potential of that niche is exhausted the entrepreneur starts looking for new opportunities.

Unexpected Opportunities. Sometimes, entrepreneurs encounter opportunities to build a much larger and more profitable business than they had initially expected or even wished for. Several founders of the *Inc*. companies I interviewed had no intention of building a multi-million dollar business. They started small ventures with relatively low expectations before stumbling into larger profit opportunities. These opportunities were not merely unplanned; they were unforseeable at the start. Just as Fleming had to work in a lab to discover penicillin, the entrepreneurs had to start a business to encounter opportunities that would be invisible to an outsider.

The unexpected problems and opportunities that entrepreneurs encounter after they have launched their businesses can trigger radical changes in the nature of the products of service offered, customers served, channels of distribution used, and so on. (See "Adaptation: Illustrative Example.") As discussed in Chapters 6 and 7, such changes are less likely to be found in corporate initiatives and in VC-backed start-ups.

Adaptation: Illustrative Examples

The founders of Factor-Fox changed the basic service they had started their company to offer. Rich Fox and his partner, Allen Factor, had both worked for non-profit companies, before they decided to start a company that would "raise money for the causes [they] believed in." Their original plan was to help their clients raise money through direct mail solicitation, but they found it difficult to secure any business. A direct mail solicitation involves significant up-front expenditures on printing and mailing without any assurance of results. Factor-Fox's prospects were apparently unwilling to entrust such projects to a startup. They were, Fox recalls, "not open to hearing our message. The risks were too high, and they'd say 'we're happy with what we have." The founders then decided to offer telemarketing services which did not require clients to make large up-front commitments. In telemarketing, Fox recalls, the responses were extraordinary. We apparently had a winning formula. So we gave up on direct mail."

Silton-Bookman Systems altered both its product and its target market. The founders initially planned to sell PC-based software for human resource development. But established competitors who already sold similar software on mainframes were beginning to develop products for PCs. So the company adopted a niche strategy and developed a training registration product. And although the founders had initially targeted small companies that couldn't afford mainframe solutions, their first customer was someone from IBM who happened to respond to an ad. Thereafter, Silton-Bookman concentrated its efforts on large companies.

Gammalink found a niche for its product only after a series of setbacks and frustrating experiments. In 1984, Gammalink announced its first product, an internal fax modem for PCs in *PCWeek*. The announcement attracted attention from independent sales representatives in the terminal emulation business but no orders. The founders had initially believed that customers would use their product for PC-to-PC communication but finding no takers, they redesigned it for PC-to-mainframe communication by adding a rack mounted host modem chassis. The redesign led to a deal with Dialog, a provider of on-line information services. Dialog planned to set up a data base of trademarks which its clients could download from their offices. Such a service required a modem (now commonplace, but novel in 1984) which could receive graphics images. But, after purchasing three modems, Dialog decided to abandon its trademark project. Gammalink then sent out a mailing to the MIS managers of 5,000 companies. The mailing led to a single customer, BMW of North America. The BMW order suggested that while Gammalink's fax modem did not appeal to customers who connected their mainframes to PCs through leased lines, it was "suitable for large companies with dispersed PCs but not enough demand to justify dedicated leased lines."

Philip Doganeiro, founder of National Data Products, started selling business forms in 1982. In 1985, he started selling printers. Doganeiro recalls that a customer, AT&T Paradyne, "came to me and said 'do you think you can handle printers? We plan on buying 7-800 Epson printers". Doganeiro thereupon secured a line of credit from Epson and sold a million dollars of their printers in one year. In 1986, the company moved into selling computer systems after hiring a new controller, Anthony Limbo. "I knew that he had a degree from Villanova and an MBA from the University of South Florida" Doganeiro told us, "but I didn't know that he had a knowledge of computer systems that I didn't have. He had been at Arthur Andersen's consulting division, during which time he had worked with systems. At his urging, we got into computer systems."

The founders of Eaglebrook Plastics similarly discovered opportunities to build a larger and more profitable businesses than they originally envisioned. Eaglebrook Plastics was founded in 1983 by Andrew Stephens and Bob Thompson who had been chemical engineering students at Purdue. At first, they bought plastic scrap, had it ground by someone else, then sold it, primarily to the pipe industry. One year later, they bought a used $700 grinder, which they operated at night so that they could sell during the day. Soon they moved up to a $25,000 grinder. In 1985, the company developed an innovative process for purifying paper-contaminated plastic scrap—and began to make a name for itself in the industry. In 1987, with the profitability of scrap declining, the partners turned to recycling plastic bottles, a novel idea at the time. Next came plastic from recycled materials and then, most recently, a joint venture with the National Polyethylene Recycling Corporations to manage their styrofoam recycling operations. By the early 1990s, Eaglebrook Plastics was one of the largest high-density polyethylene recyclers in the United States.

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4. MYOPIC OPPORTUNISM

So far I have distinguished between adaptation on the one hand from planning and anticipation on the other hand and suggested that the typical entrepreneur relies more on the former than on the latter. The importance of this distinction will become clearer in Chapter 6 when we will see that corporate initiatives have the opposite tendency. Now we will explore the distinctive features of entrepreneurial adaptation. Like natural selection – and unlike scientific experimentation – in many promising startups this adaptation has an opportunistic or myopic nature. But, in contrast to the random process of biological evolution, the effectiveness of adaptation in startups depends on the conscious and purposive choices made

by the entrepreneur. Unlike a biological species, entrepreneurs also have the capacity to make radical (as opposed to evolutionary) changes and to switch from a myopic to a strategic approach.

Unscientific Experimentation

Although we may speak in a broad way of an entrepreneur's 'experiments,' they have little in common with scientific experiments and empirical methods. Well-designed scientific experiments are informed by a general theory or paradigm. Researchers derive testable hypotheses from the general theory and collect data that supports or refutes the hypothesis. Accidental discoveries—of penicillin by Fleming and x-rays by Roentgen—have of course played a significant role in our understanding of the physical world, but such events fall outside normal research methods. In order to secure funds (and subsequent recognition) for their work, modern scientists must demonstrate its likely contribution to the long-term development of their field. In contrast, entrepreneurs experiment in order to solve a problem. They have little interest in validating general truths or principles. Finding that the initial business idea is unviable—(that is, refuting the initial hypothesis)—has less value than discovering a substitute that works. In the initial stage of a business, the entrepreneur is well-satisfied with an anomalous or fluky source of cash.

The scientific method, as we will see in Chapter 6, has more in common with the market research techniques used by large corporations: before a Procter & Gamble (P&G) undertakes the national launch of a new product, decision makers make an effort to confirm their hypothesis about its viability through large-scale tests. P&G may also use market research to choose between specific alternatives such as using coupons to stimulate sales or in-store promotions; in contrast, capital constraints require entrepreneurs to rapidly generate positive cash flow rather than discover the best possible alternative. As suggested by several examples in the insert, it was is more important for the founders of promising businesses to secure a paying customer than to find the highest valued use for their product or service.

Opportunistic Selection

Entrepreneurial adaptation has some interesting parallels to biological evolution by chance variation and natural selection: Although entrepreneurs have the cognitive capacity to act in a strategic fashion, they often exhibit an opportunism and myopia that Elster observes represents an essential feature of evolution.

Mutations occur randomly in nature, Elster notes, but the subsequent process of selection takes place in a simple deterministic way—the evolutionary 'machine' accepts a mutation if it endows the first organism in which it occurs with a superior reproductive capacity. Natural selection thus has an "impatient, myopic or opportunistic" character—it has "no memory of the past and no ability to act in terms of the future." The evolutionary machine cannot learn from past mistakes, because "only success is carried over from the past." It cannot wait; nature does not forgo favorable mutations now to realize better ones later. And, it does not "employ the kind of indirect strategies epitomized in the phrase 'one step backward, two steps forward."[80]

Humans can adapt and solve problems with more foresight. As Elster observes, humans have the capacity for delayed gratification or waiting: they can "reject favorable options in order to gain access to even more favorable ones later on." They can also employ "indirect strategies" of accepting "unfavorable options in order to gain access to very favorable ones later on."[81] For instance, humans can consume less now in order to consume more in the future.[82]

Entrepreneurs, however, often do not exercise their 'unique human capacity' for waiting or for sacrificing for the long term. Rather, like an evolutionary machine, they make seemingly opportunistic and myopic choices. This is in part due to the capital constraints faced by entrepreneurs, who may have no long-term at all if they fail to seize whatever short term opportunities happen to come their way. Furthermore, because many entrepreneurs stumble into their businesses without a long-term strategy in mind, they don't have any criteria or calculus which tells them when to wait or what sacrifices to make. A few entrepreneurs like Jan Wenner of Rolling Stone do start out with a long-term vision for their business. Many entrepreneurs do not; consequently they have a propensity to pursue any option that yields them a short term profit. (It is the well-established companies that have the resources that allow them to wait and the strategies for making trade offs with the long view in mind. Indeed, as I will argue in Part 2 of this book the development of such strategies is a critical step in the transformation of a start-up into a long-lived enterprise.)

Contrast with Natural Selection

To anticipate some arguments made in later chapters, we may also note some characteristics of entrepreneurial adaptation that distinguish it from natural selection.

Conscious choices. Entrepreneurs encounter many chance events; whether and how they respond often depends on the significance they attach to these events rather than on a mechanistic natural selection rule. Consider for instance, Peter Zacharkiw's description of how he took on Compaq's line of computers after starting as a 'gray market' (that is, unofficial) dealer of IBM computers: "When we were in the gray market, some people would ask for Compaq. I was impressed with them from the engineering standpoint of how they are put together. I called them to see if I could become a dealer. They turned me down at first, but I had a friend there who recommended that they reconsider us. He pushed us through." The move to Compaq was thus triggered by a chance event—customers asking for Compaq—and by Zacharkiw's good fortune in having a friend at the company. But the start-up's 'mutation' was certainly not automatic—another entrepreneur might have ignored customer requests or not pursued Compaq so persistently. Zacharkiw's claim—"we're very reactive, not proactive; business comes to us and we react"—seems overly modest and understates the critical role of choice and resolve.

Imaginative variations. Entrepreneurs can try out variations which initially exist only in their minds. As the geneticist François Jacob put it "men choose between unactualized possibilities, whereas natural selection can choose only among the actual alternatives."[83] Entrepreneurial adaptations result from *imaginative* responses to unforeseen events. Although exogenous events trigger entrepreneurial

responses, the responses themselves are the product of the entrepreneur's imagination. For instance, as described in the previous insert, the unwillingness of potential clients to use Factor-Fox for direct mail campaigns represented an unpleasant surprise for the founders. The founders' counter proposal—'will you try us for telemarketing instead?'—was not a chance variation. It was an attempted mutation or experiment that arose from the entrepreneurs' goal-seeking imaginations. If that experiment had failed, the entrepreneurs would likely have thought of another angle.

Radical changes. In nature, mutations in an organism are usually of small magnitude—hence we speak of evolutionary rather than revolutionary change. Variations that arise out of an entrepreneur's mind can allow for much larger scale changes from the status quo. This capacity for large scale change offsets the tendency for opportunistic choices to lead to local maxima. The natural evolutionary machine, which adopts mutations without any regard to their cumulative effect, Elster writes "may lead a species to climb along a fitness gradient until it reaches a point from which all further movement can be downward only, and there it comes to a halt."[84] Thus a species can fall into an evolutionary backwater because it happened to encounter a particular sequence of mutations. It cannot escape from this backwater because of the small magnitude of the typical random mutation. Opportunistic choices may similarly lead entrepreneurs towards enterprises that have limited long-term value. But entrepreneurs can break out of an undesirable local maxima by reinventing their business in a radical way. For instance, after a few years of grinding plastic scrap, the founders of Eaglebrook Plastics could branch out into the recycling business by developing a proprietary technology. After over a decade of struggling with manufacturing software, Mitchell Kertzman, founder of Powersoft, developed the successful PowerBuilder software aimed at users of client/server computing. Or, to take a celebrated older example, 3M grew out of a failed effort to develop a carborundum mine.

Adoption of strategies. Entrepreneurs who start by making purely opportunistic choices can subsequently adopt a long-term strategy that allows for waiting and the sacrifice of short-term profit. Natural selection by contrast is consistently myopic.

These distinctions will play an important role in subsequent chapters, when we will discuss the importance of entrepreneurial talents and skills. As we will see, some stochastic and evolutionary models (such as Nelson and Winter's) suggest that long-run outcomes depend entirely on the sequence of random events that a business encounters. I will argue that entrepreneurs' capacity to recognize important changes and to frame imaginative responses, to make radical changes if a dead end has been reached and, eventually, to formulate a long-term strategy have a major influence on the development of a business.

5. SUMMARY

In the last chapter we found that promising businesses whose founders lack novel ideas, experience and funds tend to cluster in small, uncertain market niches. In this chapter we have seen why the meager endowments and the types of opportunities that founders of promising startups pursue limit the resources they devote to prior planning and research: Capital constraints and the small scale of expected profit

preclude much investment in prior planning and the uncertainty of the enterprise limits its utility. Apparently, the 'unmeasurable' and 'unquantifiable' risks that promising start-ups face cannot be easily reduced by expenditures on research even if the entrepreneur has the means to incur them. The low level of prior planning and high uncertainty in turn require entrepreneurs to adapt to unexpected problems and opportunities. Capital constraints and the lack of a long-term strategy for the business often give this adaptation, like the processes of natural selection, an opportunistic or myopic character.

CHAPTER 4: SECURING RESOURCES

This chapter examines how founders of promising businesses persuade customers, employees, suppliers and other resource providers to participate in their ventures. Section 1 analyzes the problems that entrepreneurs face and Section 2, some offsetting or mitigating factors. Section 3 discusses the strategies entrepreneurs adopt to secure resources.

The meager endowments that make it virtually impossible for many entrepreneurs to raise significant capital also make it difficult for them to attract customers, employees, suppliers and other such resource providers. But, whereas investors may be dispensable, these other sources of revenues and inputs are not. Securing these resource providers thus represents a critical problem for start-ups, which we will explore in this chapter.

Resource providers can face considerable risks in doing business with a start-up. If a new business fails, for instance, customers may suffer serious disruptions, ex-employees may not be able to return to their old positions, and suppliers may not be able to collect on their receivables. Unlike well-capitalized corporations, entrepreneurs cannot, however, easily underwrite others' risks or provide credible signals of their competence or staying power. Therefore, rather than offer insurance, entrepreneurs often provide quick gratification of immediate needs to resource providers with limited alternatives, unusual preferences or a myopic disregard for long-term consequences.

Scope. I will focus primarily on customers and, to a lesser degree, on employees and suppliers. In most of the start-ups I studied, customers appeared to face the greatest risk. For example, clients who retained Factor-Fox to execute a direct mail campaign were at risk not just for the fees they would pay Factor-Fox but also for the much larger costs of printing and mailing the materials. Similarly, the exposure of Advent Software's customers extended well beyond the purchase price of Advent's portfolio management software. If the software was flawed or Advent went out of business and could no longer support its product, clients would face significant costs in switching to another system. Employees and suppliers faced fewer risks, and often did not have much choice; the problem of signing them on, therefore, wasn't as difficult as the problem of securing customers. The basic principles I discuss, however, apply to all outside resource providers.

1. PROBLEMS

The 'rational' calculus of resource providers, that is the choices that traditional economic models assume people typically make to maximize their utilities pose special problems for the founders of promising businesses. 'Behavioral' tendencies, that is to deviations from the usual assumptions of rational decision making due to cognitive biases or automated responses to stimuli, also pose difficulties.

'Rational' Calculus

The objective concerns of resource providers derive from their prognosis of the start-up and from their own switching costs. We should expect that customers, employees, suppliers and so on will, like potential investors, assess the chances of survival of a start-up before they make an irreversible commitment of time or money, or close off other options. As Tom Davis, founder of Modular Instruments, manufacturers of medical and research equipment recalls, "When we first started selling, people would ask, 'When are you going to go out of business?'" The company's first product, launched in 1984, was built around a PC and sold for $6,000—one fifth of the $30,000 price for existing mini-computer based products. But, customers worried that the costs they would incur if Modular Instruments wasn't around to service and maintain its products would be greater than their substantial initial savings.

The objective evidence about most start-ups does not provide much reassurance about their prospects. Modular Instruments, at least, had a unique product, whereas most ventures have no verifiable source of competitive advantage. As previously mentioned, the founders also often lack deep management or business experience; before launching Modular Instruments, Davis had been an assistant professor at the University of Pennsylvania's medical school, and his co-founder was one of his post-doctoral students. Some entrepreneurs may have an innate capability to outperform their rivals, acquire managerial skills and thus build a flourishing business. But it is difficult for customers (and others) to identify founders with these innate capabilities. Entrepreneurs without much business experience also don't have deep prior relationships or reputations that might provide reassurance about their capabilities. For instance, less than 30% of the *Inc*. founders I studied used prior relationships to make their early sales—over 70% had to get orders from customers who were more or less strangers.

The undercapitalization of start-ups also raises concerns about their longevity. The lack of capital obviously increases the prospect of financial distress; it also provides some subtle negative signals. It raises the possibility that the entrepreneur lacks the business sense to understand the risks of running out of cash or, alternatively, has failed to attract capital because investors were skeptical about the prospects of the venture. Low initial capital can also create negative perceptions of the founder's commitment to the business; with not much to lose, the entrepreneur may walk away if the venture does not get off to a good start. Or, the entrepreneur may so completely redefine the enterprise that from that, from the perspective of a resource provider, the original business no longer exists.

Switching costs can discourage resource providers from doing business with a start-up in several ways. Contracting with a new supplier involves administrative costs—the customer may have to generate new vendor numbers and close an existing account. Similarly an employee who changes jobs faces the bother of enrolling in a new health or pension plan. Switching can entail the loss of specialized "relation-specific" assets such as the applications a customer has created using a particular vendor's software or the valuable knowledge an employee develops about how things work in a certain organization. And, switching requires resource providers to incur search costs, without any assurance that the search will

yield a superior alternative to the status quo. Therefore, resource providers who are satisfied with their current arrangements have no incentive to look further afield. Although neoclassical economists do not fully embrace the principle of 'satisficing' – don't look for a better solution if you are happy with what you have – it provides a powerful explanation for the stability we observe in commercial relationships.*

Search costs pose special problems for start-ups because they don't have a track record that resource providers can rely on. The first set of customers, employees, suppliers and so on have to conduct their own tests and investigations instead of using references or making inquiries with credit or Better Business Bureaus. The rational approach is to let someone else go first. But if all resource providers try to take a free ride on someone else's experience, then a start-up will never get a chance.

Start-ups thus face an expectations trap. Resource providers' concerns about a start-up's prospects discourage them from taking a chance on the start-up; and, this hesitation hurts the prospects of the venture. In other words start-ups can fail just because others expect them to fail.

Behavioral Factors

Cognitive biases (see insert) can amplify the rational predilections of resource providers to avoid start-ups. The objective concerns of customers about the survival of a new business get reinforced by their 'loss aversion', or status quo bias particularly if the existing supplier frames the choice in a manner that plays up to the customer's fears. If resource providers are satisfied with current arrangements and face high switching costs, their tendency to avoid disconfirming data reinforces their tendency to stick with existing relationships. A few vivid personal experiences with failed start-ups may also lead resource providers to believe that such events happen more frequently (or have worse consequences) than they actually do.

Cognitive biases

The work of psychologists and experimental economists has generated a "long list of human judgmental biases, deficiencies and cognitive errors."[85] Researchers like Kahneman and Tversky have found that, contrary to assumptions of rational decision making models, the judgments and decisions of human subjects show "extreme sensitivity" to " subtle changes in problem format and response mode."[86] Differences in labels or the framing of choices, not just the actual payoffs, apparently lead to different preferences. For instance, asked to choose between a certain but small loss (say $5) and a large but unlikely loss (say $5,000 with 0.1% probability) most subjects will

* 'Don't search if satisfied,' we should note, represents a rational rule. As Simon and several others have stressed, search costs force satisficing. Winter puts it well: it does not pay to acquire "information on unchanging aspects of the environment" or to "review constantly decisions which require no review." But "without observing the environment, or reviewing the decision, there is no way of knowing whether the environment is changing or the decision requires review." Decision-makers therefore have to set "limits to the range of possibilities explored" which depend on their threshold of satisfaction. So, "at some level of analysis, all goal seeking behavior is satisficing behavior." (Winter (1964) pp.262-4, cited in Elster (1993) p.140.)

take their chances with the larger loss. Labeling the small loss as an "insurance premium" produces a significant change in preferences; a majority of subjects choose to pay the premium rather than risk a large loss. Similarly, Thaler indicates, it matters to customers whether a difference between two prices is labeled as a surcharge or a discount; customers will more willingly forgo a discount than accept a surcharge.[87] Kahneman and Tversky suggest that these framing effects derive in part from our greater aversion to losing what we have to our desire for a gain of the same magnitude. Thus customers will more readily give up the 'gain' of a discount than accept the 'loss' of paying a surcharge (over a price which they believe is already 'theirs'), even though the net effect is the same.

Camerer[88] provides a comprehensive overview of the evidence on such systematic violations of rational models. Besides the preference reversals due to loss aversion already mentioned, Camerer discusses several other "mistakes" in judgments and choices. These include the following: 1. **Overconfidence** in judging the likelihood of events: for instance, events people say are certain to happen only 80% of the time). 2. **Memory biases** :people remember the most and least pleasant memories more easily; overweigh personal and concrete experiences; and, allow available theories and options to limit their consideration of other alternatives. 3.) **Confirmation bias**: people seek evidence to confirm their hypothesis and avoid data that might refute it). 4.) **Self-fulfilling prophecies**: Peoples' prior beliefs evoke actions that generate more but biased evidence to support those beliefs—a waiter treats badly dressed customers poorly because he believes they give low tips and thus reinforces his theory). **Myopia**: people show greater impatience about immediate delays than about equivalent future delays.

The reflexive behavior (See Insert) of resource providers, like their cognitive biases, can reinforce the rational propensity to avoid start-ups. The reflexive tendency to rely on 'social proofs,' (to do what others are doing) for instance, reinforces the objective logic of letting someone else try out the start-up first: if no one else is buying, there must be something wrong with the product. Similarly the principle of consistency reinforces the resources providers' switching costs. Cialdini describes this principle as a "nearly obsessive desire to be (and to appear) consistent with what we have already done." Once people make a choice or take a stand, they tend to act in ways that justify that choice. Thus after customers have sunk resources into a vendor's products or simply made a difficult decision to go with a particular vendor, they will feel an internal pressure to stick with that choice that goes beyond the tangible costs of switching.

Reflexive Behavior

Robert Cialdini's book, *Influence: Science and Practice,* provides an engaging account derived from laboratory experiments and from field observations of how reflexive or automated responses to stimuli affect behavior. Reflexive responses, Cialdini notes, are a common feature of animal and human behavior. Ethnologists who study animals in their natural setting have shown that a particular trigger feature will set off the same response, time after

time. For instance, a male robin will seek to defend his territory by attacking a clump of robin-redbreast feathers placed there but will ignore a perfect stuffed replica of a robin without the feathers (page 3). Similar "fixed action patterns" have been documented by psychologists in humans as well. For instance, Ellen Langer's experiments suggest that people are more likely to accede to a request if it is accompanied by a reason, but without necessarily paying attention to the reason. For instance, "Excuse me, I have five pages. May I use the Xerox machine, because I'm in a rush?" got a significantly higher favorable response (94% to 60%) than just "Excuse me, I have five pages. May I use the Xerox machine?" However, the non-sequitor, "Excuse me, I have five pages. May I use the Xerox machine, because I have to make some copies?" also generated a 93% favorable response.

Automatic, stereotyped behavior, Cialdini writes, "is prevalent in much of human action because, in many cases, it is the most efficient form of behaving, and in other cases it is simply necessary." 89 It enables individuals to act quickly, without gathering and processing much data and helps avoid cognitive overload. "We need short cuts," Cialdini writes. We can't be expected to recognize and analyze all the aspects in each person, event and situation we encounter... Instead we must very often use our stereotypes, our rules of thumb to classify a few things according to a few key features and then to respond mindlessly when one or another of them trigger features present." Reflexive responses can be particularly valuable when the outcome is of such little consequence that it does not merit much analysis, where a speedy response is essential, or where uncertainty limits the utility of decisions based on careful, causal predictions.

In some circumstances, however, fixed action patterns can lead to silly or even destructive behavior. Cialdini cites the case of an automobile company that erroneously printed and mailed out coupons offering no savings to customers. These coupons generated the same response from customers as correctly printed coupons offering substantial savings. Similarly, animal behaviorists have found several predators that mimic trigger features that cause their prey to reflexively lower their defenses. For example, the killer females of the Photuris genus of fireflies mimic the special code used by fireflies of the Photinus genus to signal their readiness to mate. The subterfuge leads Photinus males to fly towards rather than away from their Photuris hunters.

Cialdini discusses several "fundamental psychological principles" that humans reflexively adhere to. They usually promote desirable outcomes but can occasionally lead individuals to make self-damaging choices. For example, the principle of reciprocation causes us to automatically accept and subsequently repay favors and gifts. Rejecting the initial gift or then failing to reciprocate leads to external social disapproval as well as the internal discomfort of transgressing a rule we have been conditioned to believe in. The rule and the attendant "web of indebtedness," anthropologists argue facilitates exchange and the specialization of labor; it can also be deployed to evoke responses that individuals would otherwise avoid. Cialdini describes how members of one Hare Krishna movement press flowers on business travelers at airports to elicit donations. The gift is unwanted and quickly discarded. Nevertheless the traveler, who is not predisposed to like the solicitors, cannot refuse the flower and feels impelled to make a reciprocal donation whose value typically far exceeds the cost of the flower.

Similarly the principle of social proof ("the tendency to see an action as appropriate when others are doing it") usually works quite well: people generally make "fewer mistakes by acting in accord with social evidence than by

acting contrary to it."[90] But doing what others do—or merely responding to triggers which suggest what others are doing—can lead to choices that would not be consciously made. When questioned, TV viewers describe the canned laugh tracks on TV shows as "stupid, phony and obvious."[91] Nevertheless, experiments have shown that the disagreeable tracks cause audiences to laugh longer and more often at humorous material and to rate the material as funnier.

2. MITIGATING FACTORS

Some rational factors and behavioral tendencies can offset or mitigate the problems start-ups face in securing customers and other resources.

Rational Offsets

Limited or poor alternatives. Resource providers sometimes don't have the option of dealing with stable, well capitalized entities. As we have seen, promising start-ups tend to thrive in businesses that large companies avoid and in new markets in which there are no established players. As Robert Grosshandler who started a PC based software company in 1984 observed: "Everybody in the business was new then. There were not many choices, and we weren't any worse than anyone else." In such markets, buyers have to deal with a new company or forego the product or service altogether. "We had no track record and no commercial office—I was running the company from my home," recalled Prabhu Goel, founder of Gateway Design Automation, which supplies CAE software tools. "So we went after the users who had a problem that needed to be solved. The risk of dealing with us was small compared with the risk of not solving the problem."

Similarly experienced managers, large suppliers or multinational banks might shy away from a risky start-up; however unemployed or unqualified workers, small suppliers, local lending institutions and so on, have to take their chances with employers, purchasers and borrowers that don't have excellent long-term prospects. For instance, George Brostoff, founder of Symplex Communications, says that early employees weren't "risk concerned" because they had come from businesses that had failed.

Search costs. If resource providers believe that the quality of alternatives is likely to be poor they have an incentive to go with the first available choice, particularly if their need is pressing. When MITS contracted with Microsoft to supply a BASIC for the Altair, they followed a simple rule: pick the first supplier with at least a semi-functional product. MITS needed a BASIC quickly and they knew that while many individual programmers were working on one, established companies like IBM weren't. So the youth and inexperience of Microsoft's two partners did not represent a major stumbling block.

Psychic utilities. The pecuniary risks of doing business with a start-up may be offset by the psychic benefits. For instance, an employee may value the thrill of working for a new business. A customer may similarly enjoy the excitement and prestige of being an early adopter or the satisfaction of giving a

struggling entrepreneur a break.* Philip Doganeiro, founder of National Data Products, says that some of his early clients "believed in me and wanted to see a young guy who was busting his tail succeed." John Mineck of Practice Management Systems, a provider of PC based office automation systems for medical practices, looked back to the risks his customers faced when he started in 1983: "People must have been crazy to do business with us. We're talking about trusting one's livelihood on software with immature technology. No one really understood what it was about or whether it was reliable. And, you had to kludge things together – you had to get your hard drive from one company, software from another." The first customers were "risk-takers" who "saw the value" and liked and believed in Mineck: "I never believed it wouldn't work. I truly believed – so the customers did too."

Personal agendas. Start-ups may secure resources from employees of organizations whose interests conflict with their employer's interests. From a company's point of view, buying software from an untested vendor may represent an unwarranted risk. The same purchase, however, may help the Information Technology (IT) staff justify their jobs and budgets, gain experience in their field as leading edge users, enhance personal learning and provide the satisfaction of backing an underdog. Given the frequency with which IT personnel change jobs (and the legal barriers to getting reliable employee references), the employer, not the employee, bears the costs of the failure of the start-up.

The flexibility of newness. The lack of an existing customer base or employees provides some advantages that can help alleviate the 'liability of newness.' The entrepreneur can provide special deals which a going business cannot easily match because its existing customers or employees might demand the same terms. Start-ups also have an advantage because the founder interacts directly with the resource providers. An entrepreneur can make quick decisions and counter offers to customers and potential employees, whereas a sales person or human relations employee is bound by policies and must seek the approval of superiors to deviate from them. "We got customers because I was the owner/salesman," Richard Nopper, founder of Beckett Corporation told us. "I wouldn't allow the salespeople who work for me today to make the kind of crackpot promises that I used to make. They would tear this place down!"

Entrepreneurs can also give the resource providers the satisfaction of dealing with the owners of the business, instead of a low or mid-level employees. Robert Grosshandler of the Softa Corporation said that because he was personally involved in the selling and many of the early clients were small, "it was an owner to owner sale. It gave my prospects a lot of confidence that I knew what I was talking about." In a large company, the CEO can only call on a few important accounts or interview recruits for just the top level positions.

* Moreover, the typical promising start-up doesn't need to secure many customers, employers or suppliers. The 'average' potential customer may be too risk averse to do business with a start-up, preferring to let someone else go first. A promising start-up with low fixed costs can, however, often generate positive cash-flow with just a few exceptional buyers who are not quite as risk averse.

Aligned interests. Once someone has signed on with a start-up he or she has an incentive to help the entrepreneur attract other resource providers. For instance, the purchaser of a new software package has a vested interest in the survival of the vendor and can therefore be expected to provide testimonials and leads that will help convert other customers.

Behavioral Offsets

Confirmations biases. When desperation or convenience creates an incentive to do business with a start-up, resource providers will often avoid disconfirming evidence. "Very few people checked us out says Practice Management's Mineck. "A couple of clients visited our office once, but that was all." Another entrepreneur got a long term lease on his office because the commercial real estate market was depressed and the landlord did not do a credit check. Apparently, as the insert 'Natcom's Whopper' also indicates, resource providers who don't know how shaky the prospects of a start-up really are, often don't want to find out.

Natcom's Whopper

Robert Rodriguez started Natcom in 1982 by renting balloons to used car dealers but then moved to serving a corporate clientele. (See Chapter 2) One of his early customers was Burger King. Rodriguez recalled: We painted 'Burger King' on a balloon and flew it in front of their office. The hoopla it created gave us a foot in the door, and, by early 1983, we were putting balloons at the grand openings of restaurants for Burger King.

"In 1984, I was invited to a meeting with the executive vice president of marketing. He said, 'I want to do something incredibly elaborate for our national convention in Nevada. I want to build a hot air balloon in the shape of a Whopper sandwich." I said, "Wow! What an opportunity. This is for us.

"We made a presentation which they really liked, but I was scared they would send somebody down to see our little operation. They would have been shocked if they had seen our office: we were in an office sharing complex in North Miami. I said to my partner, "Man, if they send anyone here to investigate us: do you think a major corporation like Burger King is going to let us manage and build a hot air balloon, if they see this place? In fact, Burger King was too busy to do due diligence. They just wanted someone who sounded like they knew what they were doing, and they gave us a $35,000 advance to build the Whopper. It worked perfectly. Once that convention was over, we signed a two year management contract. Burger King would pay us $75,000 a year to take this hot-air balloon with its pilot all over the country.

Myopia. Confirmation biases seem closely related to the timing of benefits received: immediate benefits often lead resource providers to myopically disregard (and avoid investigating) the long-term costs. Customers of the *Inc*. founders I surveyed seemed willing to make risky purchases from a start-up if its products or services could provide immediate and sizable advantages. They would buy a new firm's microprocessor because it was five times as fast as other models. A data processing manager would place an order for an innovative fax board because it enabled him to set up a communications network without contracting for expensive leased lines. The tangible payback period for customers that were at risk rarely

exceeded a year. Given these quick payoffs, customers would ask the entrepreneur, in a perfunctory way, about what would happen if the start-up failed—but then proceed to buy anyway.

Other resource providers also ignored (or heavily discounted) long-term outcomes when they realized immediate benefits. Employees escaped from unrewarding jobs or even unemployment. Suppliers who provided goods and services in small volumes to start-ups realized higher profit margins than from larger, well-established customers. Any outside investors in the start-ups were repaid quickly—most of the firms in our *Inc*. sample achieved profitability in a year or two, if not in months. The short term gains apparently eclipsed long-run concerns. Employees did not usually ask for—nor were they offered—equity or options. 76% of the *Inc.* founders interviewed did not make equity or equity options available to employees.* They overlooked, or could be persuaded by the entrepreneurs to disregard, the long-term risks such as being let go if they could not grow with the company. The small banks that provided credit when the big banks would not apparently did not worry that, as the venture grew, it would naturally look for more prestigious lenders with higher credit limits.

Conversely, long-term inducements generally did not seem to adequately compensate the resource providers for their perceived risks. As we have seen, entrepreneurs usually could not persuade VCs to make a long-term bet on their ventures. They also had little success in convincing well-qualified or experienced personnel to give up current income in return for a share of the long-term upside and had to make do with employees with limited alternatives.

Reciprocity. Even a token or unwanted gift such as a restaurant recommendation or a tidbit of industry gossip from an entrepreneur (like the Hare Krishna solicitor's flower discussed in the insert) can evoke a reciprocal favor from a resource provider.

Consistency. The urge to justify a prior action can lead resource providers to escalate their commitment to a venture. Seemingly inconsequential initial concessions create internal pressures to act consistently and grant larger favors later. Thus a buyer's willingness to grant a five-minute hearing can lead to the placing of a small trial order and then a larger order; at each decision point, the buyer does not want to believe that the previous decision was a mistake. Per Cialdini's discussion, the strength of the resource provider's subsequent support depends on whether the initial commitment was public, involved undergoing pain or trouble and whether it was regarded as flowing out of an internal choice rather than made in response to external rewards or compulsions. The early converts to, say, the Mac computer who made a risky, non-conformist choice may be expected, therefore, to be especially fervent supporters of the enterprise.

Contrasts. The tendency to exaggerate differences between two things that are presented one after the other helps entrepreneurs whose competitors often do not appear to be particularly competent. "If we are talking to a very attractive individual of the opposite sex at a party and are then joined by an

unattractive individual of the opposite sex," Cialdini observes, "the second will strike us as less attractive than he or she actually is."[92] Similarly, buyers may be expected to overate the prospects and competence of a venture, if they have recently encountered a somewhat less inspiring competitor.

Credibility triggers. An entrepreneur who mimics the appearance of a well-established business can trigger an impression of stability. As Frank Vanini, founder of Continental Financial Resources, an equipment leasing company, put it: " In a young business, perception is as important as reality. Take our name for example. People didn't know if we were big or small. I only wear white shirts and dark suits when I'm doing business. If you make the proper presentation, people will make the proper assumptions about you. If you have a nice [company] name, a nice suit, if you speak well, etc. you must know the business. It was hard to get into the door, but folks assumed we knew the business once we got in."

3. STRATEGIES EMPLOYED

Entrepreneurs utilize several strategies to contain the problems they face in securing resources and to take advantage of the mitigating factors. These, my research suggests, include:

Special deals and benefits

The entrepreneurs I studied often provided special incentives to overcome the reluctance of resource providers to go first. For instance, they offered extensive customization or free ancillary services and training to their early customers. "We did a lot of things for our first clients that we wouldn't do today," said Practice Management System's John Mineck. Stephanie DiMarco, co-founder of Advent Software, recalls that the company "spent hours on the telephone solving problems that didn't have anything to do with us. Some people had never worked on a PC before. We would do anything to get their systems to work." Brostoff, founder of Symplex Communications, recalls that their first significant order, from Mead Data, took about 4 months of "consultative" selling: "As we demonstrated our products we helped Mead refine their existing data network, so whether or not they bought our component, they would have an improved system."

Another special benefit entrepreneurs provided was simply to serve customers (or give jobs to individuals) that other businesses would not. As I will discuss in a later section, startups often served customers with poor credit histories or difficult personalities and hired individuals who were unemployed and faced limited job opportunities.

The start-ups I studied, however, seldom offered price breaks that would lead to losses. First, they needed the cash flow. Bootstrapped start-ups couldn't afford to buy market share by giving away their products or services; usually only the ancillary services and support were free. Second, many entrepreneurs felt that the donation of their core offering would undermine their credibility and that users might not give a serious trial to a free sample. Third, the entrepreneurs believed that concerns of the users

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* In contrast startups backed by professional venture capitalists usually offer equity options to employees because they have higher opportunity costs than the employees of promising startups.

were not primarily related to price and that their cost benefit calculus could not be significantly altered by an introductory price discount.

Mimicry

Many entrepreneurs sought to create perceptions of stability and reliability by adopting the outward manifestations of larger, more well-established businesses. "You have to create an image that you exist", the founder of Wang Communications told us. "I learned to use 'we' instead of 'I' when talking about the company. I hired an answering service with a live person to take messages. We [!] couldn't risk having a machine; that would show we weren't committed." Bud Miles, founder of Electrotek Concepts, initially a provider of consulting and subsequently of software, to electric utilities said: "We used a lot of smoke and mirrors to get people to think we were bigger than we are. We used consultants all over the place. They were experienced in how to do business and how to project to companies. Our proposals were absolutely stellar. People would say 'my god, you must be a $20 million dollar company.'"

James Odorczyk, founder of Inter-ad, "described the future of the company as if it were the present." and "maintained an air of being bigger than we were" by producing quality brochures and sales materials and a professionally designed logo. "With a lot of companies, you can tell that the logo was designed by the person running the business. The logo might not cost a lot, but most companies do without a professionally designed logo. There is a mentality that engineers have that the product will sell itself. I saw it in myself and tried to fight it." Although Odorczyk was on an "austerity budget" he moved into an office suite, so that he could have an "'office-sounding' address." Marcia and Steve Plotkin who started Real World Systems, operated out of their home for several years, but when customers called, Marcia would tell them that "Steve is in the warehouse, which meant that he was in the garage!"*

Bruce Neurohr, founder of Transamerica Energy Associates, spent $1,500 a month on travel expenses, because "I had to let customers see that I could afford to call on them. In the early years I had to demonstrate that I was viable."

Richard Schoenberg, founder of Steadi-Systems, bought a computer with a dot matrix printer. At the time, he says, no one else used computers, so he could "give the impression of being a much larger company while still being in my living room."

Samir Barakat, co-founder of the consulting firm Barakat and Chamberlain, says they always "kept their capacity tight. . . "I'm a firm believer in telegraphing that you are a scarce commodity. If you can get your clients to believe that you don't need them, then you can get them. When clients get the perception that you are desperate for business, that's the worst thing. Of course we say to the client that you're important, but there's a balance to be struck."

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* At one stage, Real World sought a dealership from IBM. Marcia Plotkin recalls: "IBM was tough. IBM came to our house---we had told them ahead of time that we worked out of our house. IBM had a policy against dealers who worked out of their homes. You had to have a store front. They said, 'we have

Stephanie DiMarco, whose company that sold portfolio management software had a "sober logo" theory. DiMarco was a woman in her twenties when she started Advent software, while her customer base was "predominantly male" and "the average portfolio manager was 50." Therefore, DiMarco didn't want the company logo to be "splashy" and say "we're a California software company. Our letters to portfolio managers looked like the letters they would receive from a colleague."

Going back to 1939, David Packard writes that when he and William Hewlett designated their first product the Model 200A "because we thought the name would make us look like we'd been around for a while. We were afraid that if people knew that we'd never actually developed, designed and built a finished product, they'd be scared off."[93]

These efforts by entrepreneurs to mimic the appearance of a more established business may be contrasted with an IBM campaign to advertise a new computer line. The latter represents, in standard economic terms, a true signal of commitment to the business because it is costly and irreversible. Mimicry, on the other hand, is intended to trigger an unthinking, automated belief in the start-up's stability without requiring the entrepreneur to incur a significant expense: A sober letterhead does not cost more than a flamboyant one. The thought that goes into adopting a reassuring appearance may, however, provide genuine evidence about the entrepreneur's long-term prospects: entrepreneurs who have the foresight to think about how others will perceive them are more likely to survive than those who do not. Resource providers can also expect such entrepreneurs to be more sensitive and responsive to their other needs as well.

Framing

The Inc. company founders we interviewed 'framed' choices and tradeoffs to minimize their resource providers' perceptions of risk: they "accentuated the positives", "provided customers with as pretty and glossy a picture as possible" and "provided the facts, but with lots of glitz." William Rizzo, founder of Rizzo Associates, and engineering and environmental services company, recalls with regret that "we promised employees substantial opportunities in terms of personal growth and sold them a future. But we did not tell them that they had to live up to that future. In time, we had to bring people in over them, and they felt their future was sealed off. Eventually they said, 'The hell with you.' Four of the first seven employees who could not grow with the company left. Today I would be more candid about the fact that our promises are contingent on their performance.

Some entrepreneurs emphasized the value of a 'safe' complementary good that they bundled with their more risky product or service. For instance, ICT was a 'systems integrator' of turnkey Computer Aided Design (CAD) systems: the company put together IBM PCs with a modified version of Autodesk's Autocad software. At the time, Autodesk was a small 17 employee company; therefore co-founder Harman Cadis recalls: "We didn't tell people that the software was Autocad." Instead they emphasized

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to get approval about the house.' But, by then, we had six employees and they could see that we were a

that the system was "based on a standard IBM PC. If ICT went out of business, they could still keep the hardware. Of the $18,000 list price, $12,000 was hardware and $2-3,000 was for installation and training. The software was a small part of the whole sale." (It also helped according to Cadis that although ICT was based in California's Silicon Valley, the customers were based in Michigan and Ohio: "We sold to computer illiterate people who were more easily wowed by the technology. We sold very little to Silicon Valley.")

Entrepreneurs put the best face (or 'spin') on their limitations. Clay Teramo started Computer Media Technologies, as what he called "a non-stocking dealer": Vendors would not give the startup distribution contracts and with just $10,000 in initial capital Termao couldn't afford to carry much inventory. "I anticipated customers would be concerned about this," said Teramo "and I came up with an answer. I would say 'I have unlimited inventory. I draw from all manufacturers. If I was a distributor and I ran out of inventory, then you would have to wait for me to get more product."

Bruce Singer, founder of RPM Rent-A-Car, who started selling used cars to pay for a JD/MBA program, describes the importance of framing of otherwise problematic facts:

"When I started in the used car business, the Federal Trade Commission wanted to standardize used car dealers. I thought it was a neat idea---I would be the most honest used car dealer in the world. I would have an accurate description of each car in the windshield, and run a silent auction. It failed miserably! You need someone to make the sale. Cold facts by themselves are frightening if you just read them. Say you read on a form, 'XYZ part may need to be replaced.' You are scared away. But, if there is a salesman who points out that if you are a student who is only going to drive around campus for six months, and therefore you are unlikely to have to replace the part, you are going to feel more secure. Customers need a human being to decipher how certain facts fit their needs."

Downplaying the risks or glossing over deficiencies, I should note here does not necessarily mean exaggerating the benefits. Indeed many of the entrepreneurs we interviewed claimed that they build credibility with customers and valuable references by not over-promising or overselling. As George Brostoff of Symplex Communication put it: "We set our customers' expectations below what we knew we could do and pleased our customers by exceeding them."

Broad search

Entrepreneurs had to conduct an extensive search to identify the resource providers who will take a chance on their ventures. Only a few providers had the right combination of objective needs, the psychic desire to help the underdog, disregard for long-term returns risks and so on. Entrepreneurs could not easily identify these unusual, high potential prospects because their special characteristics often were invisible. So, in order to find resource providers with the best 'fit,' entrepreneurs have to cast a wide net and approach as many prospects as they can until they find the right one.

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business"

The problem of locating the right customers was especially acute. The best prospects for a start-up weren't the most obvious or visible. Unlike hungry suppliers or out-or-work job seekers, customers generally did not proactively approach start-ups; and the best entrepreneurs, I found, often had more success securing customers with sporadic or off-beat or sporadic needs rather than customers with recurring or mainstream needs. Frequent buyers have more choices because they represent a more obvious target for vendors. They have a greater incentive to establish systematic procedures for identifying and evaluating suppliers. (See insert on Ken Dougan.) They are also more likely to have had some bad experiences with unreliable vendors; the "availability" or "vividness" of these memories can lead them to avoid untried start-ups. Infrequent purchasers conversely face fewer choices. They are more likely to be flattered by the attention an entrepreneur gives them. Lacking prior experience with start-ups, they may be ignorant of the risks they face or have an unwarranted confidence in their capacity to identify good entrepreneurs. Similarly, customers were more likely to give a chance to start-ups when they had an urgent, unexpected need rather than when the need was well anticipated. A buyer in a rush has few options, and as was discussed in the Natcom insert, may myopically disregard the risks of doing business with a new vendor.

How light users can make easier prospects: Ken Dougan's experience.

When Ken Dougan started Unique Transportation systems, a provider of trucking services in Lewisville, Texas, his first interstate account was the local unit of Burroughs Computer (now Unisys). Burroughs had relatively low volume needs—one shipment a week out to Pennsylvania and two incoming shipments from Massachusetts and Connecticut respectively. Larger truckers weren't too keen on this business because of its low volumes, but Dougan was able to make a profit by consolidating the Burroughs loads with other small loads that he found through a broker. High volume shippers like food processing companies balked, however: Sara Lee said Dougan's company was too small. Tri-Valley Growers said they wouldn't do business with Dougan unless he could provide 25-30 trailers a day. Unlike Burroughs, the high-volume shippers had a list of approved carriers and required their vendors to provide financial statements that would prove their stability.

Locating customers who are in a rush or not tightly bound to a regular supplier, however, is like trying to find a needle in a haystack. The sporadic or unexpected purchases of customers that create openings for start-ups also make finding them a difficult proposition. The entrepreneur has to use a shotgun rather than rifle shot approach, approaching a very large number of prospects to find a few situations that click. To illustrate, let us return to the GammaLink example that we discussed in a previous chapter. As previously described, GammaLink's founders mailed out a thousand brochures to locate one customer, BMW of North America. Recall also that BMW had an unusual requirement: it needed to transmit data to many locations, but the volume of data was too low to justify dedicated lines. If this problem had been critical, the data processing manager would have proactively searched for a

solution instead of waiting for a brochure to arrive in the mail. If BMW had been a high volume purchaser of data transmission services, its suppliers might have tried to provide a solution. As it was, BMW of North America was not a high profile customer, and while GammaLink provided a valuable solution, the company could have carried on without it. The small, out-of-the-way need both created an opportunity for GammaLink to secure its first customer and also made the search difficult.

The role of individual preferences and traits adds to the difficulty of finding the right prospects. Many of the entrepreneurs interviewed suggested that the attributes of particular decision-makers played an important role giving them their early breaks. A "courageous head of marketing" at MCI entrusted Devon Direct, a six-month-old direct mail and adverting agency, with a campaign to get consumers to switch their long-distance telephone service providers after AT&T was broken up in 1984. According to founder Brostoff, "movers and shakers who were seeking to better themselves and their companies" gave Symplex Communications its early orders. "We didn't sell to the typical procurement people. You had to get people who saw the value and needed the service." Bruce Neurohr recalls that many of the prospects he called on "would ask for our financial statements. We relied on young managers at our clients who understood that you just don't have anything when you are starting out."

But unconventional individuals who have a taste for the untried and a soft spot for struggling entrepreneurs are not easy to locate. Indeed, if their propensity to experiment with new products or give entrepreneurs a chance conflicts with their employer's interests, they have an incentive to hide this tendency. Entrepreneurs, therefore, have to do a lot of digging to find such individuals.

Incremental commitments

Entrepreneurs got resource providers to increase their risks in stages. For example, because portfolio managers would not readily purchase a complete portfolio management system from a new vendor Advent Software initially just provided accounting functions. The company then added reporting and performance measurement functions, and eventually "filled out the whole map of investment functions." Robert Grosshandler, co-founder of the Softa Group, recalls that that their first real-estate management software sold for $5,000. Five years later, an enhanced package was priced at $20,000. Customers often placed orders for multiple units, so one sale could generate $500,000 for Softa. "We have gone from low-ticket, low-risk to high-ticket, high-risk," said Grosshandler. "The buyer now consists of a committee of 17 people who spend three days here kicking the tires."

Russel Personnel Services started off by helping clients find permanent secretaries. This was a simple, low risk brokerage function, because the client had full discretion over who to employ. The brokerage activity then served as a springboard for providing temporary secretaries. The temp business required clients to trust Russel to screen the temps carefully; clients also saw themselves at some risk if Russel defaulted on its payments to the temporary workers.

According to co-founder Samir Barakat, his consulting firm, Barakat and Chamberlain, started with "behind the scenes" assignments for clients rather than "high visibility" studies: "When we started, we

were willing to do the $50,000 studies which the bigger firms were unwilling to do. We started with more analytical work and then we moved up to more management stuff. We first did most of our work with supervisors, then managers and now with vice presidents and presidents."

If the entrepreneurs had started with an 'all or nothing approach' they likely would not have made much headway. The gradual approach allowed customers to step up their commitment as their information about the start-up improved and it built a credible track record. The gradualism may also have been effective because of the psychological need to make choices that are consistent with previous commitments. Cialdini describes the 'foot-in-the-door' technique that sales professionals sometimes employ to take advantage of this tendency. "For the salesperson," Cialdini writes, "the strategy is to obtain a large purchase by starting with a small one. Almost any small sale will do because the purpose of that small transaction is not profit, it is commitment. Further purchases, even much larger ones, are expected to flow naturally from that commitment."[94]

The utility of getting resource providers to make small commitments in order to get them emotionally hooked is illustrated by the following account of how Silton-Bookman secured credit from a bank. Banks rarely lend to start-ups that don't have a track record or collateral. Therefore, Phil Bookman and his partner did not even try to get a loan when they launched their software company. Instead, they opened an account with a bank and would periodically ask the branch manager for business advice. About three years later, Bookman went to the banker with the company's [financial statements and projections.] "He looked over the numbers," Bookman explained, "and said, 'It looks like you need a $50,000 term loan.' We knew that all along, but it was important that he suggested it. We got the loan and paid it back, then used the same method the next year to get a line of credit."

By first asking for the banker's advice, Bookman generated an internal commitment which then paved the way for the more difficult decision to approve a loan.

Second-tier resources

The inability to provide compelling short-term inducements (or credible long-term insurance or payoffs) to top tier resource providers forced entrepreneurs to make do with the second tier. "When you are new and cold-calling customers," observed Fred Zak of Venture Graphics, "the business that comes your way is usually from customers who can't pay the bills or shop only on price. They form the worst customer base. They are the kiss of death—unless you are physically very big and ugly." About 40% of his early work, Zak recalls, came from "deadbeats." To collect on his bills he would show up unannounced and make it so "nerve wracking", that they would "pay us off so they wouldn't see me again." Zak also had one big early customer, TSR Hobbies who manufactured the game Dungeons and Dragons: "They were not in good financial shape and I gave them terms. But it was better to be doing something than nothing. I worked with them and serviced them really well. As they became stronger, they caught up with their payments."

Entrepreneurs took a similar approach to recruiting personnel. In the typical VC backed start-up, the VCs will insist that the entrepreneur recruit a top quality team quickly. Generous cash compensation and stock options are used to attract experienced and capable personnel. It is not unusual, for instance, for such start-ups to hire CFOs or marketing managers at over $100,000 a year. Bootstrapped ventures cannot afford to pay such salaries; and the perceived value of equity in their companies also is low. In the early days, therefore, the founders I studied served as the "chief cook and bottle washers," who performed all critical tasks. Other employees, if any, performed routine or mechanical tasks for modest pay. They were rarely well educated or experienced, and many had been unemployed or dissatisfied with their previous jobs. Mark Nickel, founder of Sampler Publications, did everything himself for a year. Then he hired the sister of a friend who lived across the street. Her husband had just left her and she needed to support her kids. His second employee was "a suicidal alcoholic neighbor. I thought I'd rehabilitate her. When she sobered up, I'd let her come over and type names." The third employee was a friend of the second employee.

John Greenwood's first employee at Micron Separations was a 62-year-old machine shop worker who had just been laid off. His production manager was a Worcester Polytechnic Institute graduate who had been working as an accountant in a company he hated and was looking for another job. "We never attempted to lure anybody away from another company," Greenwood told us. "One, we were cheap. Two, we had moral reasons—if we went under and it didn't work out for them, we wouldn't feel so bad.

Natcom's early employees were, founder Robert Rodriguez recalls, "street fighters:"

> To get hired in this organization was a joke. If you came in and we needed a warm body, you were hired. Literally for any position. Our turnover was high because we had to fire many employees–they had a bad attitude or were doing side deals. I had to fire several Operations Managers. One took some of our merchandise and started his own balloon rental business. I had to call the police to get our stolen merchandise back.
>
> In a small company, unfortunately, such problems are unavoidable. We could not afford the committed professionals who, by their nature are less interested in side deals. The average salary here was $15,000 to $20,000. Large companies can hire by credentials and screen people carefully. We needed to have things happen quickly and took people on the basis of their initial presentation. But many didn't do what they said they could.

4. SUMMARY AND CONCLUSION

Entrepreneurs who start businesses without much capital or high personal opportunity costs in uncertain markets, acquire in effect a cheap option to build a business. The value of the option depends in part on the entrepreneur's ability to get others to bear some of the risks. To do so, we saw in this chapter, entrepreneurs adopt a variety of strategies, which often involve the exploitation of others' cognitive biases

and reflexive tendencies, and by locating resource providers with unusual needs or willingness to bear the risks.

The material that we have covered so far also allows us to make some inferences about the economic function or value added of the typical entrepreneur and about the role luck plays in their ventures.

Functions. As we saw in the Introduction, economists have described the role of an entrepreneur (as distinct from other factors of production such as capital and labor) in a variety of ways: innovation (Schumpeter), coordination and combination of other factors of production (Say), risk-bearing (Cantillon), responsibility for uncertainty (Knight), and arbitrage (Kirzner). From these many roles that entrepreneurs can in principle perform, we can now identify those that the founders of 'promising' companies actually do perform. We have seen that most do not start out as innovators or risk-bearers to any significant degree; those roles, we will see in part 2 of this book, become salient at a later stage of the enterprise. Their activities (in the start-up stage) seem to correspond more closely to the role of arbitrageur: as we saw in Chapter 2, they often take advantage of information gaps to buy cheap and sell dear. And to the extent that they combine multiple inputs (rather than arbitrage an already existing good) we can attribute the role of coordinator to them as well.

From the data and analysis of this chapter we may add to the entrepreneur's coordination function the role of risk syndication: as we saw, entrepreneurs persuade several resource providers to bear risks, and for their trouble, earn a claim to profits of the enterprise. We also found that, in addition to coordinating other's labor and inputs, entrepreneurs also make a significant contribution of their own effort and skill to the enterprise. Thus the 'entrepreneurial' role of arbitrage and risk-syndication is closely intertwined with the doing of the actual work (or their labor input).

Luck. The finding that promising businesses usually start in 'uncertain' market niches, and our analysis of the difficulties entrepreneurs face in securing resource providers, helps explain the common belief that luck plays an important role in the success of new ventures. In businesses with changing technologies and regulations or with amorphous consumer preferences, one should expect random events to have a greater effect than a business operating in a stable environment. Similarly chance will likely affect when and how entrepreneurs connect with the 'right,' out-of-the ordinary resource provider. The observation that chance plays an important role does not necessarily mean, however, that successful entrepreneurs are especially lucky individuals. Although this is difficult to prove or measure, everything did not go smoothly for the entrepreneurs I studied. More often than not they had to overcome many set backs and disappointments. Differences in the capacity to adapt to chance events and to execute strategies for acquiring resources apparently play an important role in separating the winners from the losers. In the next chapter we will examine the traits and skills that these capacities derive from.

CHAPTER 5: DISTINCTIVE QUALITIES

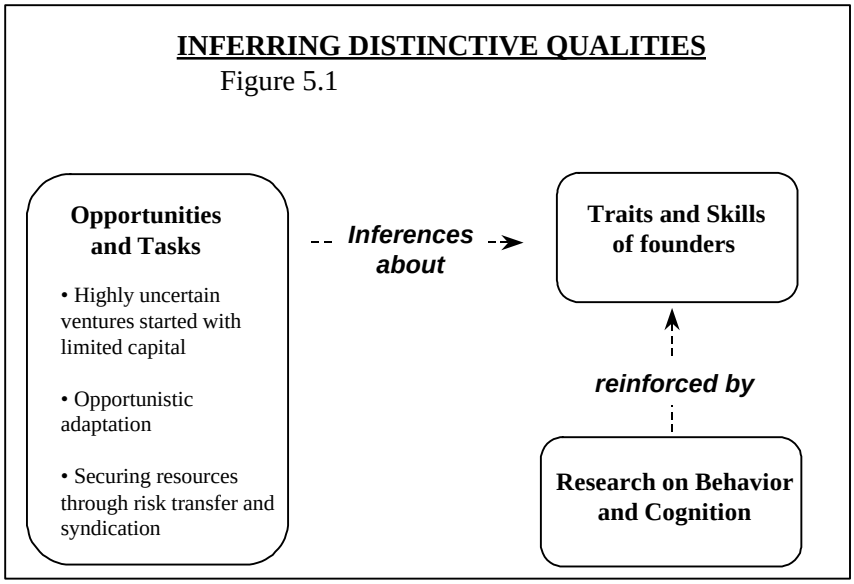
This chapter examines the traits and skills that predispose certain individuals to start promising businesses and affect their capacity to undertake the tasks of doing so. Section 1 examines the factors that predispose individuals to start promising businesses. Section 2 discusses the qualities that affect an entrepreneur's capacity to adapt, and Section 3 looks at the qualities that influence the capacity to secure resources. Section 4 discusses attributes that do not significantly influence the success of entrepreneurs in promising fields.

The belief that entrepreneurs are special has widespread appeal, but we cannot easily specify their distinctive traits and skills. Folklore attributes many qualities to the entrepreneur—great energy, vision, leadership skills, and a never-say-die spirit—to name just a few. Some formal research on entrepreneurship, too, assumes individuals with distinctive traits and skills. At best, however, empirical studies provide weak support for the beliefs. As suggested in the insert, 'Profiling the entrepreneur's personality', the studies have suffered from some basic methodological problems. First, many researchers have tried to identify a universal entrepreneurial personality. They have implicitly assumed that the owners of car dealerships, self-employed accountants, and the founders of software companies share common traits that distinguish them from the population at large. This seems unlikely, given the wide variety of problems and tasks that these individuals face. A related problem derives from the arbitrary selection of traits. Researchers have studied whether entrepreneurs have 'Type A' personalities or a high need for achievement, without specifying why these qualities matter.

I have followed a different approach. Instead of trying to identify a universal entrepreneurial type, I will focus only on the founders of promising businesses. As shown in **Figure 5.1**, I will make inferences about the traits and skills of these founders from the distinctive nature of the businesses they start and the tasks they face. Where possible, I will use existing research on human behavior and cognition to support

INFERRING DISTINCTIVE QUALITIES

Figure 5.1



these inferences.

We will address three questions: What characteristics predispose some individuals to start promising businesses? Given the appropriate predisposition, what traits and skills determine an individual's capacity to adapt to new circumstances and to secure resources? (Which we previously identified as the crucial problems of promising start-ups). Conversely, what qualities do not have a material bearing on an individual's willingness and capacity to start a promising business?

Profiling the entrepreneur's personality

Following David McClelland's pioneering research, several studies have tried to identify the personality attributes that characterize the "entrepreneur." Such studies typically use survey questionnaires to assess whether certain attributes have a high incidence among entrepreneurs or association with the performance of a business. Researchers have tested a variety of attributes – Hornaday's survey lists forty-two attributes about which some claims have been made in one or several studies.[95] These attributes include:

- *Need for achievement (n Ach*). A person high in *n Ach* prefers personal responsibility for decisions, desires to attain high self-defined standards, likes clear means of assessing goal accomplishment, and seeks to surpass others.
- *Risk-taking propensity*: willingness to undertake a venture despite certain calculable probabilities of failure.
- *Internal locus-of-control*: the belief that personal effort is the primary determinant of outcomes; this belief is in turn associated with self-confidence, penchant for action, task orientation and resilience.
- *Tolerance for ambiguity*: willingness to act in an uncertain situation.
- *Type A behavior*: an incessant striving to achieve more and more in less and less time, and general competitiveness.

The studies have not yielded convincing results – Kelly Shaver and Linda Scott characterize the quest for a distinctive personality profile of the entrepreneur as largely "fruitless".[96] The support for unusual incidence of some traits among entrepreneurs has been weak or non-existent. For instance, conflicting findings across studies led Brockhaus and Horwitz, to conclude that risk-taking propensity "was not an accurate way of distinguishing entrepreneurs."[97] Similarly, whereas studies suggest that entrepreneurs have a stronger internal locus of control and a propensity towards Type A behavior than the population at large, these attributes do not distinguish them from managers and other such groups.

Some researchers attribute the inconclusive results of profiling studies to measurement problems; researchers don't have instruments designed to measure the traits entrepreneurs are supposed to posses and are forced to use measures intended for other purposes. Others attribute the conflicting results across studies to differences in the definition of an entrepreneur. Some studies define entrepreneurs as the founders of small high growth businesses. Other researchers study aspiring entrepreneurs, often students enrolled in business courses who express a strong intention to start their own business. Yet other studies count as entrepreneurs, the founders or owners of any kind of business that has survived for a specified period. According to Brockhaus[98], these differences create "noise" that makes it difficult to identify a single clear profile.

These problems have led some researchers to abandon the search for a single entrepreneurial profile in favor of the identification of multiple types. One early example – Norman Smith's 1967 study – distinguished between the "craftsman-entrepreneur" and the "opportunistic-entrepreneur." Smith suggested that craftsman entrepreneurs had more limited cultural backgrounds and social involvement, a lower propensity for long term planning and likelihood of heading "adaptive" firms.[99] Subsequent researchers divided entrepreneurs into more categories – for instance, Karl Vesper identified eleven basic types and several sub-types.[100] This research, according to Hornaday, has led to a "bewildering" proliferation of "types" across studies with findings that are as inconclusive as the results of studies that sought to identify a single entrepreneurial profile.[101]

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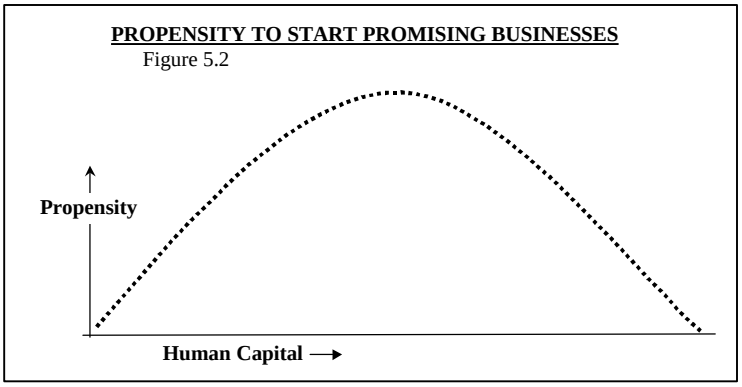
1. PROPENSITY TO START

Undeniably, chance events often provide the spark for starting a promising businesses. Entrepreneurs often encounter their opportunities by accident; Bohdan's founder, Peter Zacharkiw, it may be recalled, started selling computers after a classified ad he placed for his home machine drew a large number of buyers. Thus, some individuals may not start promising businesses because they did not encounter such opportunities or because chance first inserted them into the larger arena of marginal businesses. In addition to these random events, we can also identify two factors that predispose some individuals to look for and take advantage of chance events: human capital and family backgrounds and tolerance for ambiguity.

Human Capital and Family Backgrounds

The propensity to start a promising business can be thought of as an inverted u-shaped function of an individual's human capital. Too much prior training and experience raises the opportunity costs and risks of starting a small, uncertain enterprise whereas too little human capital increases the chances of starting a marginal rather than promising business. (See Fi**gure 5.2**) Similarly with backgrounds:

PROPENSITY TO START PROMISING BUSINESSES
Figure 5.2



individuals from middle class backgrounds are more likely to start promising businesses than individuals from either extremely wealthy or extremely deprived backgrounds.

Overqualification. We have already seen that founders of promising businesses usually face low risks because of their low opportunity costs. They do not have to give up high-paying jobs because they

lack valuable experience and credentials. Some are unemployed, while others like Zacharkiw have jobs which allow them to start their businesses on the side. Small uncertain ventures therefore provide high payoffs compared to the risks (at least in an objective financial sense). Individuals with secure, well-paying jobs obviously face different trade-offs, and are much less likely to start small, uncertain businesses. Gates and Allen wrote BASIC for the Altair and Hewlett and Packard tinkered with off-beat electronic devices in the hope that larger opportunities would materialize later. Few high-ranking employees at Microsoft and HP (or professors at Harvard and Stanford) would make that choice. They have an incentive to either stay on the corporate track or participate in the launch of the atypical ventures (to be discussed in Chapter 7) that have a concrete plan for securing large payoffs that match their greater opportunity costs.

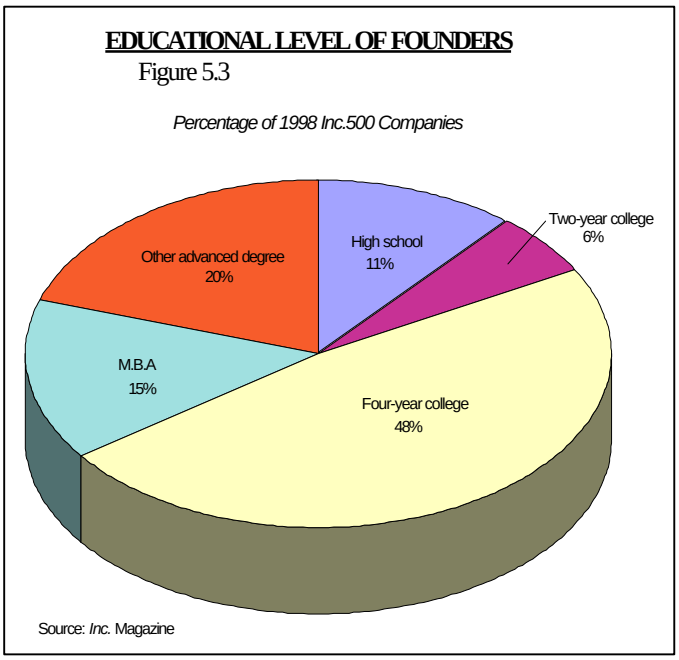
The same considerations apply to individuals born into extreme wealth or who have become extremely wealthy. Except perhaps as a hobby, inheritors of large fortunes will generally not bother with niche businesses. To the extent they have an interest in starting a business, they will tend to try something that is large enough to make a difference to their wealth or likely to provide a sense of accomplishment. Even entrepreneurs who have made a success of small boot-strapped businesses, will often tend to start on a much larger scale the second time around. For instance, Jobs and Wozniak started Apple in their garage, making and selling computers for what was then a niche market. Jobs started his subsequent ventures, Next and Pixar, on a much larger scale.

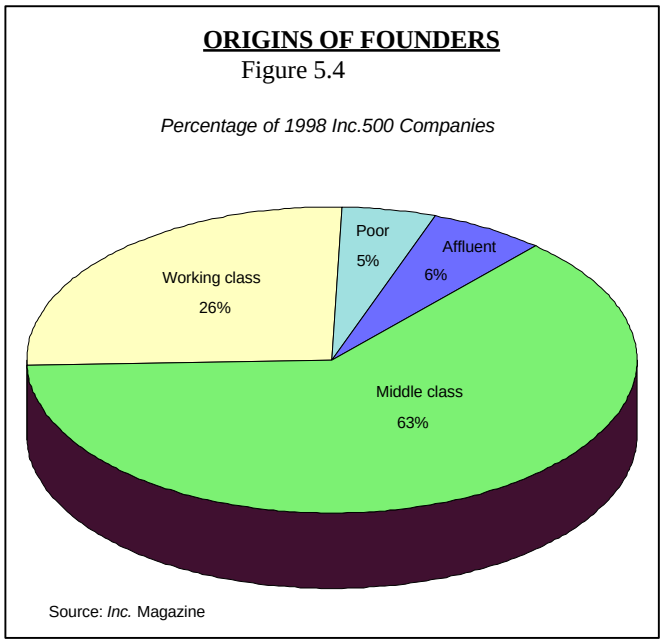
Minimum Thresholds. Too little human capital or truly deprived backgrounds can also reduce the odds of starting a promising business. The individuals who start such businesses usually lack deep business experience or great wealth. But they do have education and family background that gives them the confidence and ambition to undertake promising venture rather than open the marginal lawn care or beauty salon business. HP founders, David Packard and William Hewlett, received engineering degrees from Stanford. Packard's father was a lawyer and Hewlett's father was a professor at Stanford Medical School. Bill Gates, a student at Harvard when he started Microsoft, was the son of a well-to-do lawyer. Gates and his partner, Allen, had previously attended Lakeside, a private school in Seattle, which "always drew on the city's big-money establishment."[102] Lakeside got Gates and Allen hooked on computers at an early age. In 1968, the school decided to expose its students to computers. The Lakeside Mothers Club held a rummage sale to help raise the funds needed to make Lakeside "one of the first schools in the country with computer capability."[103] Richard Branson, founder of the Virgin Group, did not have rich parents and did not attend college; his social background was by no means lower class, however. Branson was "descended from a distinguished country family" and his mother "had grand ideas for her only son—including the dream that he would one day become Prime Minister" of the United Kingdom.[104]

Most of the *Inc.* company founders I interviewed were well educated: 81% had college degrees and 10% had MBAs. Few had emerged from great poverty. According to *Inc.*'s own surveys, college education and a middle class upbringing have been a consistent feature of the backgrounds of the founders

of the companies that make its '500' list. For instance, as shown in **Figure 5.3**, over 83% had at least a four-year college degree, and as **Figure 5.4** indicates, only 5% reported that they came from poor backgrounds.

These backgrounds likely discouraged the entrepreneurs from pursuing marginal businesses and increased their likelihood of encountering promising opportunities. Gates and Allen would start a very small-scale software business but would probably not think about opening a laundry. Zacharkiw's chance encounter with computers came about because he was an early user. He was an employee of Bechtel, the well-known engineering company, and had bought a computer to track the tax-shelters he invested in on the side. Conversely, many of the individuals who start marginal businesses have backgrounds and training that make it unlikely they will encounter or contemplate promising opportunities. The laundry business, for instance, represents a magnet for immigrants who have a poor command of English[105] and





—unlike several foreign-born entrepreneurs who have successfully started computer businesses in the United States—who also lack technical skills.

Tolerance for Ambiguity

From a purely financial point of view, all individuals with low opportunity costs and adequate training should pursue "promising" opportunities where they have little to lose and something to gain. But, as we will see next, an innate or psychological unwillingness to act in the face of uncertainty can discourage many individuals from taking advantage of "heads-I-win, tails-I-don't-lose" situations. Individuals who seek out such opportunities, or jump on them quickly when they accidentally encounter them, have an unusual tolerance for ambiguity. In the section below, I will discuss the widespread

prevalence of "ambiguity aversion" relying principally on Camerer's[106] review. I will further suggest that the low ambiguity aversion of entrepreneurs derives from their high self-confidence and the low weight they place on the social and psychological consequences of failure.

Ambiguity Aversion. Camerer defines ambiguity broadly as "known-to-be-missing information." The definition, which includes missing information about probability distributions, is closely related to Knight's uncertainty and to the notion of fuzzy or vague probabilities. Ambiguity does not play a role in mainstream micro-economic theory, where decision-makers maximize their "subjective expected utilities"; the fuzziness of probability estimates doesn't matter because, by definition, the decision makers can develop a subjective estimate of outcomes. But, notwithstanding the assumptions of this theory, Camerer points to considerable experimental evidence suggesting that people do take ambiguity into account and make distinctions between known and unknown probabilities.

Following on a thought experiment by Ellsberg,[107] Becker and Brownson[108] conducted the following experiment that showed the considerable aversion people have towards ambiguity. Subjects were presented with two urns each containing a mix of red and black balls. They were told the precise distribution of reds and blacks for one of the urns (say 50 reds and 50 blacks) but not for the other. Subjects would choose a ball from one of the two urns and if they drew a red they would receive $1. Subjects could choose which of the two urns they wanted to pick from and had to indicate how much they would pay for being able to make that choice.

Although the subjects did not have any reason to believe that the urn with the unknown distribution might contain fewer red balls, subjects always picked the urn with the known distribution. Moreover, they would pay high amounts for the privilege: for instance, subjects paid an average 36 cents for the right to pick from an urn with 50 reds and 50 blacks. In other words, they would surrender 72% of the 50 cent ($1 × .5) expected value of a draw just to avoid ambiguity. Rational utility maximizers should, in theory, we may note, pay nothing unless they suspected that the experimenter had deliberately placed fewer red balls in the unknown urn.

Becker and Brownson's results, reported in a 1964 paper, led to several studies in the 1970s and 1980s that examined different variants and aspects of the urn problem. All the studies confirmed the original finding of ambiguity aversion and the willingness of subjects to surrender a significant portion of the expected value for the option of selecting from an urn with a known distribution. The studies also generated several other "stylized facts" such as Slovic and Tversky's[109] finding that ambiguity aversions are unmoved by written arguments against their paradoxical choices. Three such stylized facts seem particularly relevant to our discussion of start-ups.

First, increasing the range of possible probabilities (of the ambiguous urn) increases ambiguity aversion.[110] Thus the high uncertainty of promising opportunities may represent a significant deterrent for many individuals. Second, subjects are more averse to ambiguity when they know the contents of the ambiguous urn will be revealed afterwards to others.[111] Thus we might expect that many individuals will

avoid objectively attractive opportunities because they are afraid of what others may think if they do not succeed, even if it costs them little to play. Third, and perhaps most significantly for our purposes, attitudes towards risk and attitudes towards ambiguity are uncorrelated;[112] risk-taking individuals who are prepared to bet heavily on structured gambles may be highly averse to ambiguity, and an ambiguity-tolerant individual may be exceptionally risk averse. Entrepreneurs who have the high tolerance for ambiguity needed to start promising businesses, we may infer, may not have a risk-seeking disposition.

Offsetting Factors. In contrast to the axioms of standard theories of choice, Camerer writes, ambiguity aversion implies "a gap between subjects' beliefs about an event's likelihood and their willingness to bet on that event."[113] Heath and Tversky[114] suggest that competence—knowledge, skill and comprehension—may help close that gap. In their experiments, subjects were offered a choice between an ambiguous natural event and a structured draw with known probabilities. Knowledge apparently offset ambiguity aversion—subjects who had prior knowledge about the domain of the event, bet on the event. Those who knew little, bet on the unambiguous draw. Heath and Tversky suggested that knowledge influenced choices because of the subjects' asymmetric assignment of blame and credit. Experts could take credit, in their own minds and in the eyes of others, for winning in a way that less-knowledgeable subjects could not. Moreover, those who lacked knowledge would also blame themselves more if they lost.

Heath and Tversky's conjecture is consistent with the results of experimental markets. Subjects apparently show considerable ambiguity aversion early in the experiment: they would rather do nothing and forgo profits than act in an environment they consider ambiguous. Later in the experiment, as the subjects learn and gain knowledge, they become less ambiguity averse and conservative.

Knowledge and expertise do not, however, seem to provide a compelling explanation for why some individuals are willing to start uncertain businesses. Few of the *Inc.* founders I studied had deep experience in their fields; and indeed, in a new market, few individuals have true expertise, except perhaps in their own minds. Moreover, as I have previously argued, high levels of expertise increase an individual's opportunity costs and thus reduce the propensity to start a small, uncertain business. More plausibly, the low ambiguity aversion of the individuals who start promising businesses, derives from (or is a manifestation of) exceptionally high levels of self-confidence. Most individuals, we know, have a high opinion of their relative abilities for which they lack any objective basis. To hold such beliefs is one matter; to act on them is another. While many people believe that they drive cars better than the "average" this usually does not affect what they do when they get behind the steering wheel of an automobile. The self-confidence of entrepreneurs, however, appears so strong that they are prepared to start a business where they do not have any objective advantages over their rivals or even any knowledge of their relative abilities. As one entrepreneur put it, "entrepreneurs are like gamblers in a casino who know they are good at craps and therefore are likely to win. They believe: 'I'm smarter, more creative, and harder working than most people.'" This is a different attitude, we should note, from a belief in one's

luck: entrepreneurs apparently have the confidence that they can make their own luck and can cope with some bad throws.

The high self-confidence of entrepreneurs may thus have different consequences than is sometimes believed. Even if objectively unwarranted, it does not necessarily lead to overinvestment in ventures with negative expected value. Rather, my analysis suggests, it can offset excessive ambiguity aversion and thus mitigate underinvestment in uncertain businesses. (Overconfidence may, however, lead to overinvestment in businesses that involve high initial commitments. The decision-maker's disregard for what others are doing can lead to boom-and-bust cycles in capital-intensive fields such as real estate, mining, and chemicals. But this very capital intensity puts such businesses outside the realm of the typical entrepreneur.)

We may further speculate that the unusual manner in which some individuals make attributions for success and failure may also influence their willingness to start uncertain businesses. Expertise, according to Heath and Tversky, increases the propensity to take credit for success and to avoid blame for failure. This tendency may be innate for entrepreneurs. Entrepreneurs may also be less concerned about avoiding regret or about what others will think if they fail—they don't avoid ambiguous urns whose contents will subsequently be made public. Thus, in addition to low objective or financial risks, they may be less exposed than others to social or psychological costs.

To summarize: Promising opportunities have attractive risk-returns, but only to those individuals with optimal skills and backgrounds and a high tolerance for ambiguity. Thus the number of entrants into such fields is likely to be smaller than in popular business where the requirements for human capital, background, and ambiguity tolerance are not as great. But fewer entrants in these uncertain, off-beat fields does not imply the absence of competition or ensure profits. As we have seen, start-ups in promising fields have similar—and limited—initial resources and capabilities. They all usually lack distinguishing ideas, capital or founders with deep experience and contacts. It is what entrepreneurs do after they start their business—how they adapt to unforeseen circumstances and secure resources—that separates the winners from the losers. In the next two sections, we will explore the traits and skills that determine the performance of the post start-up tasks.

2. CAPACITY FOR ADAPTATION

The section below discusses four traits that help determine an entrepreneur's ability to adapt to unforeseen problems and opportunities: decisiveness, open-mindedness, the capacity to manage inner conflict, and a talent for good attribution.

Decisiveness

The unexpected problems and opportunities that entrepreneurs encounter often require quick rather than well-thought-out or deliberated responses. For instance, the insert, Marcia Radosevich and the Health Payment Review, (HPR) describes the case of an entrepreneur who must overcome the objections of

an MIS manager at an insurance company. The MIS manager will not recommend the purchase of HPR's software, because it is written in the C programming language. The entrepreneur has to make an on-the-spot decision about whether to offer to rewrite the software in COBOL. There is no time for further reflection, gathering data, and so on. If she hesitates, the moment is lost; it could be a long time before she gets to see the MIS manager again.

Marcia Radosevich and the Health Payment Review

Marcia Radosevich and several health care experts launched Health Payment Review (HPR) to develop and market software that would review reimbursement claims submitted by doctors, hospitals, and laboratories. HPR management believed that reviewing claims for overcharges and inconsistencies could result in significant savings for providers of health plans such as HMOs, insurance companies, and corporations. Payments for surgical procedures, for example, could be reduced by 5% to 15%. And, using software would be far less costly than manually inspecting claims.

HPR developed its code in the C programming language. According to Radosevich:

> Our design was quite clever. Business applications on mainframes were traditionally written in a programming language called COBOL. Our software, written in a language called C, would run on several types of hardware "servers." These servers would be connected to but outside the mainframe, because we needed to update our knowledge bases frequently, and we didn't want to bring the whole system down while we did it. Besides, adding servers is much cheaper than adding more mainframe capacity.

Selling the software proved problematic, however:

> I tried to sell this concept all over the country, and I was just been laughed at. The industry was hooked on 1970s' technology. When I used words like servers, C, and Unix, they acted like I was a communist, feminist radical from Boston.

The summer of 1989 found Radosevich in Fort Wayne, Indiana, trying to sell the product to an insurance company client. She recalled her conversation with the company's MIS manager:

> He was a great big guy, with a great big brass belt buckle. I was standing at a board, like a professor, doing price-performance charts, trying to convince him this is the cheapest way: you don't have to buy more iron, and you don't have to hire more people. This great big guy hitched up his belt buckle, slammed his hand down on the table, and said, "Little lady. I run me a COBOL shop and got me a bank of 3090 mainframes, and I got me an army of COBOL programmers. Don't give me this C s_ _t."
>
> It was summer. It was hot. I had had it. I looked at him and said, "If I give this to you in COBOL to reside on your mainframe, would you buy it?" He said, "Yes." I said "Done."
>
> I now came home to Boston and wondered, "What are we going to do?" We had to architect an affordable, flexible, and maintainable COBOL product that would reside on a host without having to rewrite it for every different database manager and every different telecommunication system. It took a little while to get there, but we finally hit upon it, and then it all seemed easy and natural.

Decisiveness, in the context of a promising start-up, isn't simply the opposite of procrastination:[115] it involves quick choices under conditions of high uncertainty (or "ambiguity"). In the HPR case, the entrepreneur actually made the commitment to rewrite the software without having crucial information about how much it would cost, how long it would take, or whether it was even technically feasible. (We may further note that this kind of decisiveness also represents one of the factors that predisposes individuals to enter uncertain businesses.)

Open-mindedness

Entrepreneurs need to be "open-minded" or willing to revise their mental models and forecasts because of the uncertain nature of their markets and their limited initial planning. In rapidly changing markets, unforeseeable developments can make previously sound assumptions obsolete. Snap initial judgments made without the benefit of much objective research, may be wrong from the start. Even trained professionals (see insert) who repeatedly make the same decisions show considerable inconsistency when they rely on intuition to make quick judgments. Relatively inexperienced entrepreneurs, we might expect, would be prone to even greater error, especially with judgments that are not routinely and frequently made. To compensate, they have to be open to learning from their mistakes.

HPR for instance had developed its program in the C language, so that it could run on cheap server computers instead of taking up expensive mainframe computing capacity. HPR's founders had never sold software to corporate users and lacked the means to conduct market research. Consequently, they failed to anticipate that MIS personnel would have a vested interest in expanding their mainframe empires and would resist applications in C. HPR survived because instead of trying to overcome objections to C, the entrepreneur was willing to try rewriting the software.

Open-mindedness requires decision-makers to avoid some common cognitive errors. "Confirmation biases"—the tendency to look for and pay attention to only the evidence that confirms one's hypotheses and to ignore evidence that does not—represents an important source of close-mindedness. When negative outcomes are too obvious to be ignored, other biases can cause individuals to avoid correcting mistaken assumptions,. A bias towards rationalization, for instance, leads to explanations that preserve one's positive self-image. "To avoid the pain of admitting mistakes," Russo and Schoemaker write, we may "distort our meaning of what we actually did or said," or "unrealistically blame the failure on others".[116] Conversely, people attribute to their skill successes that may have been entirely due to luck—for instance, winners of lotteries may provide elaborate explanations for how they picked their winning tickets. "Hindsight-biases" can also hamper learning from experience. Several studies have demonstrated that people convince themselves, after an event has taken place, that they knew it would happen all along. In such studies, researchers ask subjects to make a prediction or provide a probability estimate of an event. Later, after the outcome is known, they are asked to recall their prediction or estimate. Subjects usually reconstruct their predictions to align them more closely with the outcomes. They will "remember," for instance, assigning a higher probability to whether Nixon would

meet Mao in 1972, than they actually did before they knew what happened. Like the rationalization of mistakes, "the false clarity of hindsight creates the illusion that there is no lesson to be learned."[117]

Entrepreneurs who learn quickly may have an unusually low propensity to make these cognitive errors. Or they may have an especially strong preference for quick wins ("positive feedback") which encourages them to revise their models and assumptions. "Impatience" for profit (that is,, a high discount rate) may mitigate their confirmation biases and related cognitive errors. That is, entrepreneurs will be more willing to change their minds if they are anxious for a quick profit. Conversely, individuals who value being proven right over quick returns or actually derive positive utility from setbacks will be less likely to change their views. The tolerance for extended sacrifices in the pursuit of a deep inner conviction shown by a Galileo or a religious prophet does not serve most entrepreneurs.

Managing Internal Conflict

Adaptive entrepreneurs have to feel and communicate great confidence in the same theories and assumptions that they must be willing to reject. To start a business in an uncertain market requires a strong conviction in one's chosen course; getting others to put their resources at risk also often requires entrepreneurs to make convincing public declarations of their confidence. But even as they convince themselves and others of the soundness of their views, entrepreneurs have to be open to revising them . Moreover, when entrepreneurs change course, they have to feel and express the same belief in the new course as they did in the old. They cannot allow a previous error to undermine their self-confidence. Somehow, they have to manage in their minds an ongoing conflict between the reservations of an objective skeptic and the faith of a believer.

Adaptation in an uncertain business requires a challenging kind of open-mindedness. Meteorologists have to be prepared to revise their forecasts and hypotheses as well, but they typically do not confront the risk of losing face or self-confidence to the same degree. The distinctive entrepreneurial open-mindedness is much closer to the mindset that I have observed among bond and currency traders: in order to initiate a position, the traders have to believe their estimates are superior to the market's. If the position turns unprofitable, they will quickly revise their estimates, following the principle of "cut your losses and let your winners run." Sometimes, they may even with great conviction entirely reverse their view, and go "long" if they were " short" or vice versa. But, to continue in their jobs they cannot let setbacks undermine their confidence in their ability to "beat the market."

We may further note that the internal conflicts described above are especially sharp in the typical promising start-up because the entrepreneur does not face a boss or outside investors. In corporate or VC-backed initiatives, individuals who did not initiate the project provide external monitoring of progress

against forecasts and assumptions. As we will see, such a separation brings its own problems; but they do not include the combination of believer or skeptic in one mind.*

An analysis of how entrepreneurs manage their internal conflict is beyond my scope here. We may speculate that a certain amount of "hindsight bias," "selective memory," or "self-serving explanations" may help preserve self-confidence. Entrepreneurs may justify erroneous forecasts on the grounds that "no one could have known" or that they lacked the resources to do much research. Such explanations can allow entrepreneurs to distinguish between confidence in their abilities and confidence in their ideas of the moment, so that they can drop the latter without affecting the former.

Attribution Skill

Open-mindedness is a necessary but not sufficient condition for effective adaptation; the entrepreneur must also have an unusual capacity for attributing unexpected events to the right causes. The difficulty of deriving accurate explanations from the available facts may be illustrated by considering the predicament of an entrepreneur who has failed to generate sales. The entrepreneur faces several possibilities: a deeply flawed offering; deficiencies in certain features; weaknesses in the sales pitch; the wrong target market; or, just bad luck in not being able to find the right customer. A number of factors make it difficult for entrepreneurs to distinguish between these possibilities and learn from their failure.

Missing Information. Customers may simply say "no" or even refuse to see the entrepreneur without providing any reasons.

Noise. Customers may raise numerous objections, only some of which are critical. Or they may offer reasons intended to protect the entrepreneur's feelings ("we don't need your services right now, but call us in six months") rather than the real reasons for not placing an order. The failure to generate orders itself constitutes a noisy, difficult-to-interpret signal. As previously suggested, an entrepreneur should expect a low hit rate in getting early orders, and has no basis for knowing which rate indicates a significant problem: do 50 or 100 or a 1,000 failures suggest a fatal flaw?

Lack of Repetition. Differences between successive attempts make generalizations difficult. Each prospect may have special needs or reasons for turning down the entrepreneur. Moreover, cash-constrained entrepreneurs tend to change their offering (or the sales pitch) continuously in order to incorporate the lessons learned in previous attempts. If the modifications don't work, entrepreneurs face a data set they cannot easily interpret because they have held little constant.

Wrong Model. The entrepreneur's observations and learning are based on an implicit theory or model of the purchaser's incentives and behavior. Inexperienced entrepreneurs operating in new or changing markets may start with a model that focuses their attention on the wrong variables. For instance, they may focus on the prospect's concerns about price and features instead of vendor reliability. Or they may fail to recognize the influence individuals operating in the background have on the purchase

* The problem may be mitigated to a degree in partnerships where one individual provides the objective

decision. These faulty models cannot easily be corrected by "observation," if the wrong variables are being observed.*

To summarize: Entrepreneurial adaptation, unlike natural selection, is not automatic or deterministic. The effectiveness of entrepreneurs' responses to unexpected circumstances depend on their ability to act decisively, to be open-minded and yet confident, and to have a talent for assessing cause and effect from limited and confusing data.

3. CAPACITY FOR SECURING RESOURCES

In Chapter 4 we explored the strategies that entrepreneurs who start with meager resources employ to get others to take a chance on their ventures. We saw how entrepreneurs offer special deals and benefits to the early resource providers, mimick the superficial features of larger, well established corporations, frame choices to minimize perceptions of risk, conduct a broad search, gain commitments incrementally and make do with second-tier resources. Now we will examine four qualities that help determine an entrepreneur's ability to implement these strategies: tactical ingenuity, self-control, perceptiveness, and a capacity for face-to-face selling. I will also briefly discuss the overlap between these qualities and the ones previously discussed in relation to an entrepreneur's capacity to adapt.

Tactical Ingenuity

Although most start-ups do not involve major innovations—entrepreneurs engage in business that several others are engaged in as well—we find considerable ingenuity in the details of how entrepreneurs overcome (and adapt to) the problems they face in attracting customers, suppliers, capital, and so on. For example:

Richard Fox, co-founder of Factor-Fox, a telemarketing firm that raises money for nonprofits, initially faced clients who were unwilling to let a new firm contact their contributors. Fox then proposed to WNET, the public television station in New York, a trial where his firm would telemarket just to inactive or "lapsed" contributors. This proposal vastly reduced the perceived risk and earned Factor-Fox a chance to prove its capabilities.

Bruce Singer, co-founder of RPM Rent-A-Car, generated customers from competitors who had taken more reservations than they had rental cars. He printed cards with "Overbooked?" written on them and RPM's number. This gave him prequalified (that is,, low credit risk) customers and he did not have to pay commissions to an agent. It was, as Singer says, "like the Motel Six recruiting guests at a Hyatt!"

Entrepreneurs used creative ploys to get to get appointments with buyers. Buyers often resist seeing entrepreneurs, perhaps because they do not want to waste time or because they understand that if they agree to a visit they might feel an internal pressure to place an order (per the commitment principle). One gambit that entrepreneurs used to overcome this resistance was to claim that they "happened" to be

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voice of reason that balances the other's enthusiasm.

visiting from out of town. Deaver Brown, for example, repeatedly called a buyer from a pay phone in a New York airport, "saying I was in the Detroit area and could I stop by to see him. He said yes once and I immediately flew out to Detroit."

Steve Belkin used creative excuses to preserve a facade of stability. Belkin and his partner started Trans National Travel in Belkin's apartment where they had no space for meeting with clients. So, Belkin "always met people at the airport, said I was just leaving on a flight, then waited until they had gone before going back home."

Entrepreneurs coped with their capital constraints creatively. "We measured every penny," Carol Russel recalls. "We left out vowels in our classified ads. We used lots of Is and Ls because you can fit more words into a line of type. Os take up a lot of space."

Jay Boberg and Miles Copeland, who launched International Record Syndicate (IRS) in 1979, used low-cost guerrilla marketing to promote their music label. Boberg and Miles produced "alternative" music—undiscovered British groups such as the Buzzcocks and Skafish—which the major labels were ignoring because their potential sales were too small. But other small companies were also producing alternative music. IRS became one of the most successful new music labels in North America by coming up with alternative marketing methods to promote their alternative music. For instance, at the time, the major record labels had not yet realized that music videos on television could be used effectively to promote their products. Boberg, however, jumped at the opportunity to produce a rock show, "The Cutting Edge," for MTV. The show proved to be a hit with fans and an effective promotional tool for IRS. Before "The Cutting Edge," Boberg had to plead with radio stations to play his songs. Afterward, the MTV audience demanded that disc jockeys play the songs they had heard on the show.

Sampler Publications founder, Mark Nickel, told us that when he his company in 1984, "copier companies allowed you to use their copiers at no cost for a trial period. We would use a copier for a few weeks and then go to another brand. We went through about 6 of them!"

Self-control

Securing orders for a new business requires great self-control and resilience. Entrepreneurs have to cope with considerable—and sometimes unpleasantly delivered—rejection and difficult demands. Doors do not open as easily for entrepreneurs as they do for, say, IBM sales representatives. The IBM representative has established personal connections, and customers presume that the rep has something distinctive and valuable to offer. Ongoing relationships and interdependencies also encourage customers to behave in a civil and polite manner. In contrast, most of the entrepreneurs I studied did not have prior relationships with customers and many offered 'me-too' products or services.

The capacity to deal with rejection is also important because the search for the right prospect involves many more misses than hits. Entrepreneurs cannot easily target the prospects who are likely to

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[*] As George Wu pointed out to me: "It is much easier to estimate the values of the parameters of a model

buy their products or services. As we saw in Chapter 3, the most receptive prospects have hidden our out-of-the-ordinary preferences and can only be identified after an extensive search. Similarly, entrepreneurs often get a break because they are "in the right place at the right time" when the customer has an unexpected need. But unless the entrepreneur is very lucky, getting such a break requires being in many places at many times. Plugging on with a low-yield search requires considerable resilience. "There was a point halfway through year two," Julie Wang, founder of Wang Communications, told us, "when I felt I would never get another client. I was taking antidepressants."

Rejections are not always gracious, and the entrepreneur has to deal stoically with gratuitous unpleasantness. The many entrepreneurs who lack a distinctive product or service face a great imbalance of power in bargaining with their customers. Some customers are sympathetic to the entrepreneurs' plight, whereas others are indifferent or may even derive pleasure in exercising their power. Unreturned phone calls, long waits in reception rooms, and canceled appointments are par for the course. The customer, however difficult or unpleasant, has to be served; as the insert on Philip Doganeiro suggests, entrepreneurs may have to put aside their pride and sometimes their dignity in order to secure an order.

Doganeiro's Donuts

Philip Doganeiro started National Data Products in 1982 selling computer forms. Some early prospects were predisposed to giving the young entrepreneur a break, but one large account proved difficult. Doganeiro recalls:

"No matter what I'd do, they just wouldn't see me. I called on them for months, and no response. I found out from a secretary that the person I needed to see liked donuts, so I brought donuts every time I visited. He'd come out to the reception area, take the donuts, look at me and go back into his office without saying a word to me. I did this for 4 weeks! Then, one day, he came out and got the donuts and turned to go back into his office. I was about to leave, and then he said 'come on in---I've got a chance for you!'"

"It was 1982, the day before Thanksgiving. He was having problems with a supplier who didn't have the forms he needed. I drove to a supplier, loaded as much paper as I could into my car, drove back to their dock, and started unloading the paper. He saw me, came out, and helped me unload. From that day, I've always done business with them."

Weak bargaining positions also expose entrepreneurs to difficult demands; getting an order can often require acceding to seemingly unreasonable conditions. Microsoft's breakthrough order to supply an operating system for IBM's PC required Gates and company to go along with IBM's numerous demands. For instance, they readily signed IBM's nondisclosure agreement, which Cringley describes as "the legal equivalent of a neutron bomb." Writes Cringley: "Nondisclosure agreements place limits on the ability of parties to reveal the secrets of organizations with which they are doing business. IBM's standard nondisclosure agreement goes even further. By signing the IBM agreement, would-be suppliers agree that whatever they tell IBM is not confidential, while whatever IBM tells them *is* confidential. . . . And if IBM

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than to change the parameters themselves."

takes legal action, the agreement prohibits the other party from even offering a defense."[118] Digital Research, which made CP/M, the then-dominant microcomputer operating system—and IBM's first choice—refused to sign this agreement thus opening the door for Microsoft.

Many individuals also lack the self-control needed to handle rejection or give in to difficult or capricious demands. What Thaler calls "bounded willpower"[119] is a common human trait. There is considerable evidence to show that even though people know what they need to do to achieve their goals, they lack the will power to do it. A person on a diet may have the desire to lose weight but just cannot stay away from dessert. Similarly, at an intellectual level, an entrepreneur may understand the importance of tolerating rudeness or saying acceding to capricious demands, but in practice cannot avoid lashing back. As Argyris and Schon put it, their 'theory-in-use' conflicts with their espoused theory.

Moreover, the capacity to endure rejection and slights can conflict with the traits that predispose individuals to start a business. Starting a business requires considerable self-confidence and a desire for control: the reasons that entrepreneurs typically offer for why they started their businesses often relate to a desire to have control over their destinies and avoid reporting to a boss. Such individuals are not naturally inclined to be compliant and willing to accede to others' demands; subjugating their egos requires an out-of-the-ordinary level of self-control and goal orientation. Bill Gates, for instance, has a reputation for a short temper and blunt expression of his opinions. In his classes at Harvard, a contemporary recalls, Gates "would look very bored, then a half hour into a proof on the blackboard, Bill would raise his hand and blurt out, 'You made a mistake; I'll show you.' He would stump the teacher. He seemed to take great joy in that."[120] In his dealings with IBM, however, Gates apparently kept these traits in check. He might excoriate or insult his programmers but not the employees of an important customer; the goal of getting the order governed all other impulses.

Perceptiveness

Entrepreneurs who win orders by satisfying psychic needs or providing an ancillary intangible service have to look through their customers' superficial requirements and objections and observe the unstated wants and inchoate fears. Perceptive entrepreneurs require an "allocentric" orientation: they must look at the world through others' eyes and see what others value and how they 'frame' their choices. They have to be skilled at eliciting information, asking questions in an unthreatening way that encourages others to open up. They have to listen without a confirmation bias and be sensitive to the unspoken, to body language and other nonverbal cues. As one entrepreneur observed:

> Clients will sometimes say, "Here's the language I want in the contract" and it will be totally unacceptable. You never say 'No'; you say 'let me understand what your concern is here. What's the problem you are trying to solve with this language?' Then you find out that they don't really want your firstborn child.

Perceptiveness does not, however, require unselfishness. Successful entrepreneurs don't identify with their customers in the same fashion that therapists may with their patients or hostages with their abductors. They see the world through others' eyes in order to advance their own interests.

Entrepreneurs also need the capacity to look through the superficial qualifications, or the lack thereof, of potential employees. As we have seen, the typical start-up faces an adverse selection problem—it can only attract employees who have poor job prospects. The entrepreneur faces the challenge of distinguishing between the individuals whose lack of credentials and prior employment accurately reflects their inherent abilities from those who have been unlucky.

"I never hired experienced people," said Bohdan Associate's founder Peter Zacharkiw, "and there are very few college graduates here. My vice president of sales was the best curb painter around—but that's the secret. He'll always be the best at what he does. Personality and common sense are the most important things that people here have." Similarly, John Greenwood, co-founder of Micron Separations, believed that "people in the unemployment market are just as good if not better than the people in the employment market. And we have no prejudice against people who've been fired! My partner and I started Micron after we were fired! In large companies, people tend to get fired for lack of political skills."

But, in order to identify individuals without experience who have "common sense", or employees who have been fired because of politics rather than for good cause, entrepreneurs need unusual judgment or perceptiveness. Otherwise, as we saw in the previous chapter, they can end up with slackers or thieves.

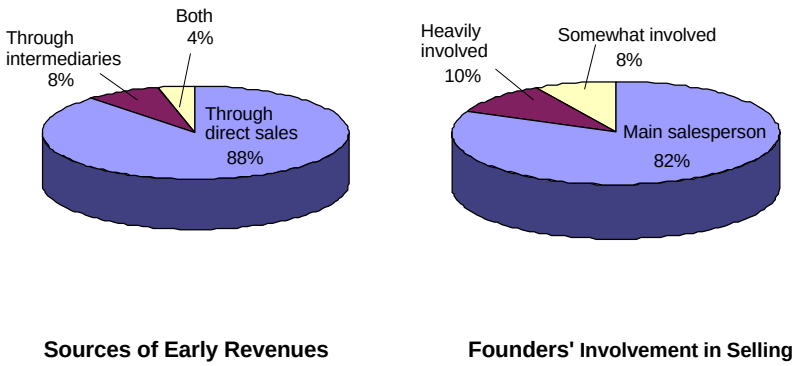
Sales Skills

Effective face-to-face selling is critical for entrepreneurs. They cannot afford to advertise and have to secure orders by calling on prospects personally. In my *Inc.* 500 survey, for instance, only 12% of the founders secured their early revenues through intermediaries. The other eighty-eight percent of founders sold directly to end-users. And in all but a handful of cases, the entrepreneur (rather than an employed salesperson) was principally responsible for making the sale (see **Figure 5.5**).

IMPORTANCE OF FOUNDERS' SALES EFFORTS

Figure 5.5

Percentage of Inc. 500 Companies Surveyed



Source: Author's survey

Unlike corporations that usually rely on a specialized sales staff, entrepreneurs cannot hire others to do the selling for them. An employee may not have the same zeal and passion as the founder and cannot provide customers with the psychic benefits of dealing with a principal. Competent sales personnel may be impossible to attract until the venture has established a track record. Good salespersons often tend to seek out "hot" items where their skills will quickly generate high commissions; few have an interest in the missionary selling necessary to sell the products or services of a new company. Furthermore, in a start-up, obtaining an order can involve more than just selling. As indicated by the earlier HPR example, making a sale can require on-the-spot strategic choices, which entrepreneurs cannot easily entrust to subordinates.

Effective selling requires the intangible qualities discussed previously: resilience, self-control and perceptiveness. It also involves knowledge of and skill in using concrete techniques, for objection handling, closing, and so on. (See insert 'Sales Techniques'.) Many individuals who start businesses without prior experience or training in sales do not know these techniques and have fundamental misconceptions about the mindset required for getting orders. "I had imagined salespeople to be slick, fast-talking, amusing persons," recalls Marcia Radosevich, co-founder of HPR, who had trained as a sociologist and taught at Yale. Then, before starting with HPR, she worked for two entrepreneurs who taught her that:

> Selling is about building a relationship. It's about getting in early, defining the playing ground and the rules of the game, creating a sense of urgency, and building toward a conclusion. It's about being nonthreatening: "Go ahead and think I'm some nice girl from Iowa, and I'm a Ph.D. and I would never be threatening to anyone."
>
> These guys never raised their voices. They were smart, unassuming, and their egos didn't get in the way. They let somebody else take credit for their ideas. They spent all the time they needed to—morning, noon and night—being available.

Unlike Radosevich, however, many individuals start businesses without the benefit of an apprenticeship with effective salespeople; unless they have great natural instincts, they face a considerable handicap.

Sales Techniques

"Closing" the sale, or asking for the order.

Although quite obvious, explicitly asking for the order is extremely important. Inexperienced salespeople do not ask for the order, expecting the customer to state a desire to buy. This does not often occur. The following are some techniques which I have found effective in asking for the order:

The Straightforward or Direct Close: Summarize the benefits and ask for the order.

Subordinate Question Close: Ask a minor question that implies yes to a major question. (Example: What color would you like? or, Cash or charge?)

The Window of Opportunity Close: Ask for the order based upon the benefits of having the product/service before a particular event. (Example: Do you want the product delivered before the end-of-the-quarter budget closes?)

Puppy Dog Close: Ask for a trial order over some time period, with no obligation.

Multiple Choice Close: Give the customer alternative choices, both of which imply commitment. (Example: Do you want the 20-inch or the 25-inch TV?)

Objection Handling:

Asking for the order often brings out customers' objections, even when you think they have agreed in the previous phase that the product or service will meet their needs… There are a number of ways to handle objections. For example, suppose your customer objects to the weight of your computer.

Direct Answer: Provide a direct answer to the objection. ("It weighs less than any other computer on the market. Or, "you stated a need for a computer weighing less than 5 pounds, this one weighs only 4 pounds.)

Outweigh Objection: Play down the importance of the objection as compared with other benefits. ("For your needs, the ability to have a CD ROM player and a portable color screen far outweigh the half-pound of extra weight.")

Minimize Objection: Reduce the importance or restate the objection in more favorable terms. (This is a desktop computer, and therefore, the weight is not really important.)

Reverse Objection: Turn the objection into a reason to buy. (We have found that thieves avoid heavier computers.)

From: *Selling as a Systematic Process*, Alter and Bhide (1994)

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4. LESS IMPORTANT QUALITIES

The success of promising ventures usually turns on a limited set of traits and skills. These businesses do not require "superhuman" founders; in particular, the following attributes, common in the entrepreneurship lore, do not appear to play a significant role in an individual's propensity to embark on such ventures or to solve the problems involved in making them profitable:

Risk-taking. As we have seen, starting an uncertain business requires a low aversion to ambiguity, rather than to objective loss. It is true that entrepreneurs often claim they have an exceptional willingness to take risk. For instance, in my survey of Harvard Business School's self-employed alumni, 87% "agreed" or "strongly agreed" with the statement "I am a greater risk-taker than most people." But this self-image may simply derive from a universal tendency to rate oneself as above-average on any desirable trait. Quite likely, most ambitious individuals today like to think of themselves as risk-takers. Thus the proportion of self-employed HBS alumni who saw themselves as above-average risk-takers is virtually the same as the proportion of all HBS alumni.[121] Alternatively, entrepreneurs may equate risk-taking with an unusual willingness to deal with uncertainty and to tolerate the social and psychological consequences of failure.

Breakthrough creativity. Successful start-ups usually do not involve a blockbuster innovation. The entrepreneurs' ability to recognize the promise of someone else's idea, and to show resourcefulness and ingenuity in solving the problems of its implementation, provides a sufficient basis for success.

Vision and foresight. The capacity to formulate a coherent, long-term view for the future of the business, or to make good forecasts and plans does not appear to play a critical role. Given a fortuitous or

deliberate choice of an adequately promising market niche, entrepreneurs can rely on "myopic" opportunism and adaptation.

Grand ambition. Schumpeter suggested that entrepreneurs are driven by the desire to build empires. This does not appear to be the case with the founders of most start-ups; only a few such as Gates and Allen start out with the goal of building a megacorporation or supplying software to every household in America. In fact, the desire to change (or capture) the world can be detrimental unless it is tempered by pragmatism about the here and now. Individuals captured by an idée fixe or who see themselves as the architects of a new paradigm cannot easily adapt to unforeseen circumstances or change erroneous forecasts. At least in the cases that I have encountered, they tend to carry on relentlessly with the rationalization that they are ahead of their times, rather than on the wrong track.

Charisma. Whereas the ability to read others' wants and fears and the capacity for low-key persuasion play significant roles in the success of most start-ups, the entrepreneur does not need to have exceptional charm, magnetism, or a capacity to inspire devotion. For instance, according to Cringley, the microcomputer industry has been built by "nerds." Cheatham, a computer science professor at Harvard, recalls that his former student, Gates, "had a bad personality and a great intellect. In a place like Harvard, where there are a lot of bright kids, when you are better than your peers, some tend to be nice and others obnoxious. He was the latter."[122] A fellow student who often found Gates asleep at the table after a night of programming in the Computer Center recalls thinking Gates was "not going to amount to anything. He seemed like a hacker, a nerd. I knew he was bright, but with those glasses, his dandruff, sleeping on tables, you sort of formed that impression. I obviously didn't see the future as clearly as he did."[123]

Using power. The ability to use one's position or control of resources to bend others to one's will has little importance in the early stages of an enterprise. Similarly, Machiavelli's advice that "it is better to be feared than loved" is more appropriate for a prince than for the founder of a new business. As we have seen, it is more important for entrepreneurs to control their own emotions than dictate others' actions and to appear non-threatening rather than intimidating.

Administrative abilities. The efficient administration (or "management") or an organization does not represent a critical challenge in the early stages of most new businesses. As we have seen, founders often perform many of the important functions and do not have many employees to manage. The business tends to be simple, and with limited product lines and activities, entrepreneurs do not have to establish and oversee complex coordination and control routines. The competitors that start-ups face do not have deep managerial capabilities, and especially in new markets, customers expect delays and defects: missing a publication date for *Rolling Stone* or the presence of bugs in Microsoft's software did not cause great consternation in the early days of these ventures. Therefore, the lack of administrative ability is not as crucial as, say, the capacity to sell and to react quickly.

In fact, the experiences and training that enhance an individual's administrative abilities may impair the more crucial facilities. For instance, business school graduates and corporate executives are

often conditioned to conduct extensive analyses before making a decision. Such efforts not only have limited utility in highly uncertain situations, they may also lead to emotional attachments to a plan and thus create a psychological barrier to responding to new information. Management education and experience can also impair an individual's capacity to secure resources. Corporate cultures often encourage executives to advocate their positions forcefully rather than to listen attentively or see things someone else's way. Successful executives have experience in selling themselves and their ideas, of course, but this is usually from a position of strength: head-hunters court recruits who have accumulated the human capital that many employers want. Selling is thus closely associated with negotiating the best possible deal. Experienced executives are similarly steeped in the exercise of power, of bending others to their will. Pleading for orders and caving in to others' demands—saying "yes" —isn't part of their usual repertoire. Inexperienced individuals who have never tasted of much authority may thus have a greater capacity to subjugate their egos and not let pride stand in the way of getting business.

I do not mean to suggest, however, that qualities that are secondary in starting the typical promising venture are unimportant in all entrepreneurial endeavors. For instance, administrative abilities acquire considerable importance in starting larger and less-uncertain ventures: in Chapter 7 we will see that evidence of such abilities is essential in securing capital for venture capital-backed start-ups. Similarly, in Part 2 we will see how some qualities that do not have great importance in starting promising ventures become critical in their subsequent evolution and growth: entrepreneurs who cannot develop these new attitudes and skills cannot easily build large, long-lived businesses.

5. SUMMARY AND CONCLUSIONS

To conclude, let us take stock of the main features of promising start-ups that we have examined so far. In Chapter 2, we saw that most entrepreneurs start without a proprietary idea, exceptional training and qualifications, or significant amounts of capital. Given these limited endowments, profitable start-ups tend to cluster in small, uncertain market niches. In Chapter 3 we saw that capital constraints, and small uncertain opportunities preclude much planning and require rapid adaptation to unforeseen circumstances. In Chapter 4 we found that the meager endowments of entrepreneurs make it difficult for them to secure customers and other resource providers, and we examined the strategies they use to cope. In this chapter we have explored the distinctive qualities that predispose some individuals to start promising businesses and that affect their capacity to adapt and secure resources. We saw that although the individuals who successfully start small uncertain businesses lack verifiable or observable human capital, they do need a willingness to tolerate uncertainty, open-mindedness, and other such innate qualities.

These qualities do not overlap with the common image of the entrepreneur as an irrational, overoptimistic risk-taker. Successful entrepreneurs are more likely to conform to models of rational behavior than the population at large, along several dimensions; they have a lower aversion to ambiguity, a lower propensity towards information biases and can exercise greater self-control, for instance. And

they rely on exploiting others' cognitive defects and reflexive tendencies to secure the resources they need. We also saw that starting a promising business does not require "superhuman" qualities; long-term vision, foresight, charisma, and so on do not play a significant role in the success of most start-ups. The bundle of qualities that entrepreneurs require is unusual, but not extraordinary.

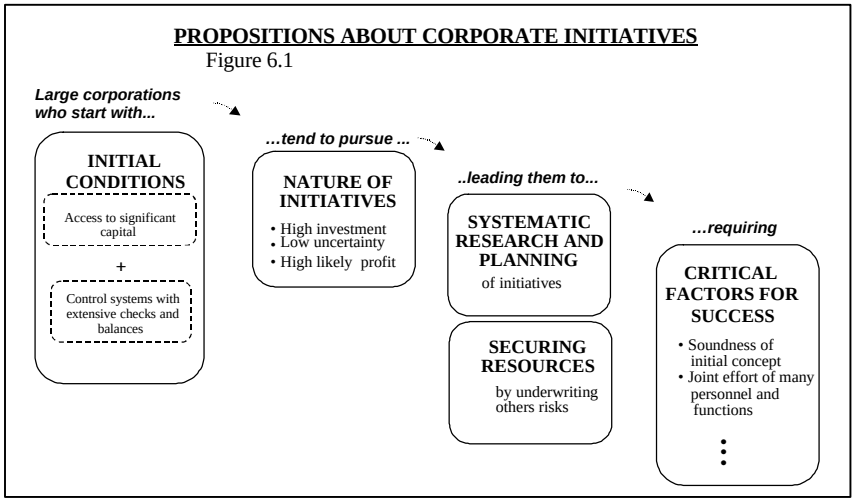
CHAPTER 6: CORPORATE INITIATIVES

This chapter contrasts initiatives undertaken by large well established corporations with promising businesses started by individual entrepreneurs.. Section 1 examines how the endowments and constraints of corporate decision makers help determine the nature of the opportunities they usually pursue. Section 2 discusses why corporations rely more on prior research and planning than on ex-post adaptation. Section 3 covers the strategies they employ to attract customers and other resource providers, and Section 4 discusses how qualities that determine the success of corporate ventures are different from the qualities that are crucial to the success of promising start-ups.

Large corporations usually undertake initiatives that occupy the lower right hand region of the investment-uncertainty-profit diagram. Corporate executives, as we will see in this chapter, start with different endowments and constraints than do individual entrepreneurs. Stockholders give executives control over large amounts of capital. In return, corporations institute processes to evaluate and monitor new initiatives that involve extensive checks and balances. As a result, corporations tend to concentrate their investments on a few initiatives with well-defined risks and returns and to avoid the small uncertain opportunities that individual entrepreneurs often thrive on.

To illustrate: Scientists and engineers at the Xerox Palo Alto Research Center (PARC) developed innovative computer technologies such as the mouse pointing device and local area networks in the 1970s. Startups and small companies such as 3Com and Apple, not Xerox, commercialized these inventions. The unwillingness of Xerox's top executives to provide the attention and funding needed to turn the PARC inventions into profitable businesses, according to my analysis, reflects the small and uncertain profits from commercialization rather than flaws in the company's decision making. The comparative advantage of large corporations lies in undertaking projects with low uncertainty and large capital requirements such as the development of Intel's Pentium chip, Merck's cholesterol reducing drugs and Gillette' Mach3 razor.

The initial conditions and the types of initiatives corporations undertake also influence (see **Figure 6.1**) the effort they devote to planning, the strategies they adopt for securing resources, and to



factors which determine the success of their endeavors. Corporations devote much greater efforts to planning and research than do most entrepreneurs; they underwrite resource providers' risks and play up to their loss aversive tendencies. And the success of corporate initiatives depends more on the initial plans and assumptions than on ex-post adaptation, and on organizational capabilities more than the talents of a few individuals.

Scope. The discussion will focus on large public companies such as IBM, PepsiCo, Procter & Gamble, 3M, and the 1990s Microsoft. These corporations have complex operations (multiple product lines and worldwide presence), are well-established (that is,, they have been in business for decades and do not face an immediate threat to their survival), and profitable. Closely held companies and partnerships (like Fidelity Investments and most professional services firms), small family businesses, up-and-coming companies (like Microsoft through the early 1980s) and large companies that face financial distress (such as Chrysler in the mid-1970s) lie outside the scope of this discussion. We will analyze risky initiatives (that is, ones that have some chance of failure) that corporations consciously undertake to secure new profits. This excludes accidental discoveries, riskless profit improvements due to learning by doing and investments to replace depreciated assets. For convenience, the initiatives discussed will refer mainly to new product introductions and entry into new markets, although the general argument can easily be extended to projects such as a cost reducing process innovation.

1. INITIAL CONDITIONS AND NATURE OF OPPORTUNITIES

Corporate decision-makers, we will see below, have access to significant amounts of capital and the incentive to invest in new initiatives. The checks and balances of internal control systems, however, limit their discretion over corporate funds. The combination of available capital and extensive internal controls leads corporations to undertake initiatives that require large initial investment and involve relatively low uncertainty.

Ample Capital

Established corporations have "sustainable competitive advantages" or "franchises" that generate significantly greater cash than they consumed in their normal course of business. Although companies could remit the surplus cash to stockholders via dividends or stock repurchases, they usually reinvest a significant portion of the funds. Explanations for this tendency often point to the conflict of interest between corporate executives and stockholders. Executives, it is claimed, retain funds for self-aggrandizement or because their compensation is linked to the size of the business rather than returns to shareholders.

In Part 2 of this book, I will argue that competition for capital, employees and customers also creates powerful incentives to grow a firm. Corporate executives likely would not advertise their commitment to growth as widely as they do if it was entirely against the interests of their stockholders. A firm's growth prospects help determine its cost of capital. According to a common investment heuristic,

the ratio of a firm's stock price to its profits should equal the expected rate of growth of its earnings; this means investors usually pay high prices for the stocks of firms with high expected rates of growth. High growth helps attract ambitious and talented recruits whereas expectations of stagnation and decline can become a self-fulfilling prophecy that leads the best employees – and sometimes its customers – to leave. With the exception of firms that do not face much competition for customers, employees and capital, long run survival requires the capacity to undertake initiatives that will generate new sources of profit.*

Whatever the reason, corporate retained (and occasional new debt and equity issues) result in investments of a formidable magnitude. For instance, Jensen compiled a data set of all 432 firms on COMPUSTAT with 1989 sales exceeding $250 million for which complete data on R&D, capital expenditures and some other measures were available for 1980 through 1990. Mean R&D expenditures for the 432 companies amounted to $1.3 billion in the 1980-1990 period and net capital expenditures amounted to $1.4 billion. Some large companies had by themselves larger R&D and net capital expenditures than the total investments of the venture capital industry. For instance, GM spent a total of $67.2 billion on R&D and net capital expenditures and IBM spent $62.2 billion. Total disbursements by venture capitalists in this period amounted to just $27.8 billion.[124]

Control Systems

On the surface, corporate decision-makers appear to have wide, open-ended discretion over investments. The evolution of common and statutory laws have given corporate executives and directors great leeway in the investments and initiatives they can pursue. While in the nineteenth century (and as recently as 1927 in Ohio, among other states), corporate charters were granted for a single, closely defined business, often after a negotiation between the legislature, the promoters, and the investors.[125] Now there is no negotiation, and off-the-shelf charters allow a corporation to enter any legitimate business. Formerly major corporate decisions (such as those relating to dividend policies or diversification) had to be unanimously approved by stockholders; now, with the expanding "business judgment" rule, courts give the directors of corporations wide latitude in these matters. As Clark puts it: "As a matter of statutory law, stockholders' powers in a public corporation are extremely limited . . . To influence corporate managers stockholders can vote for directors and approve or veto director-initiated organic changes, but cannot do much else."[126]

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* A reviewer of the manuscript suggests that growth is not as important for the survival of large corporations as it was in the 1970s and 1980s. My observations suggest that labor and capital market pressures are, if anything, more intense: high growth companies hold a powerful attraction for an increasingly mobile pool of technical and managerial talent and can secure seemingly outlandish valuations from the capital markets. What may have changed is the propensity of some large companies to satisfy stock market pressures for increased profit by reducing their costs. Profit growth through cost reduction cannot easily motivate rank-and-file employees, however. And once companies have exhausted the potential of cost reductions to increase profits, they face renewed pressure from capital markets to find new sources of revenue.

By way of contrast we may note that in other forms of legal entities, decision-makers face more stringent contractual limits on their discretion. The limited partnership agreements used by venture capitalists often include provisions that preclude the general partner from making certain kinds of investments—for instance an agreement may specify that the partnership will not make real-estate investments or conduct business overseas. General partners are also usually bound to wind up the partnership after a specified number of years. Corporate executives, in contrast, do not have to return funds to stockholders.

Discretion over significant funds allows corporate decision-makers to make large, long term investments without revealing sensitive information. General Motors can negotiate a $900 million sponsorship deal with the International Olympic Committee. Intel can invest $1.5 billion on a single fabrication facility. Gillette can invest $750 million to develop the triple bladed Mach3 razor. Corporations can limit the risks of tipping off competitors prematurely because they do not seek approval from their stockholders before they undertake such initiatives. At the same time, giving corporate executives perpetual discretion over large sums of money exposes the stockholders of public corporations to the risk of abuse and self-dealing by the executives. As a safeguard, the large public corporation provides for more extensive checks and balances than we usually find in other forms of organization.

According to Fama and Jensen's analysis,[127] stockholders rely on the legal requirement of an independent board of directors for protection against the abuse of managerial discretion.[*] The separation of ownership and control, argue Fama and Jensen, requires a parallel separation between decision management (the initiation and implementation of decisions) and decision control (the ratification and monitoring of decisions). The combination of management and control in the hands of the same few individuals exists only in private or 'closed' corporations where the senior executives also own most of the stock. In a public corporation, these functions are separated: the board of directors wields control rights that hold the executives' management powers in check.

The diversity of activities in a large corporation requires the boards and top executives to delegate their control and management responsibilities to employees with the appropriate specific knowledge. Top executives do not initiate or implement many concrete proposals. Rather, they influence the initiatives undertaken by subordinates by formulating an overall corporate strategy and by shaping the organization's decision making routines. The board similarly ratifies the strategy and the processes for

[*]Hostile takeovers, or the so-called market for corporate control, I have argued elsewhere, provide only modest protection for stockholders. Unsolicited tender offers, which Rappaport claims represent "the most effective check on management autonomy devised" can in fact protect stockholders only against flagrant incompetence or abuses. Acquirers who make unsolicited tender offers operate under significant informational constraints: they have to raise money deal-by-deal, making their case to financiers from publicly available data. Even at their peak in 1985-1987, these acquirers posed a threat to only a small number of diversified firms whose break-up values could be reliably determined from public data to be significantly higher than their market values. Similarly, incentive compensation schemes may also help align the interests of executives and stockholders, but only to a limited degree.

evaluating new initiatives, not specific investment decisions. Rather than monitor the implementation of every project, the board evaluates aggregate performance and the control system. For instance, the board may evaluate whether the auditing function has sufficient independence from the operating managers.

The separation of "management" and "control" of broad policy thus leads to a corresponding separation of roles for specific decisions. By instituting monitoring devices and policies, boards and top executives can give decision-making rights to subordinates who they cannot directly supervise, while protecting shareholders from abuse of these rights. For instance, a salesperson or brand manager who has direct knowledge of customer needs and competitive offerings may initiate a proposal for a new product. A superior reviews the proposal and, if appropriate, forwards it up the corporate hierarchy with an endorsement. Higher-ups then decide whether to proceed, perhaps after seeking the advice of a specialized staff or outside consultants. Similarly, employees with the appropriate expertise may be given the discretion to implement the product launch, subject to monitoring and oversight by superiors and by an independent finance or control staff.

Objective Evaluations

Multilevel and multifunctional evaluations of new initiatives entail extensive documentation and evidence. Individuals who start businesses with their own limited funds may trust their intuition and their innate capacity to adapt to unforeseen circumstances. Corporation decision-makers require objective data on markets and the firm's capabilities vis-à-vis its competitors. The role of the evaluators of new initiatives is to play devil's advocate: to challenge assumptions and to try to poke holes in the case for proceeding. According to Heath, Larrick and Klayman[128], they provide an organizational remedy for the cognitive errors that individuals have a propensity to make, including avoiding disconfirming evidence, relying too much on vivid or available information, and so on.

The incentives of the staff who specialize in evaluating new initiatives encourage them to reject poorly documented proposals. Evaluators in staff positions do not receive bonuses for endorsing ventures that turn out well. If the venture fails and they did not follow proper procedures, they may be accused of dereliction of duty. Evaluators also may have limited personal contact with the initiators of proposals who work at a different level of the hierarchy or in a different function. The organizational remoteness and anonymity of the evaluators that increases their objectivity limits their capacity to rely just on the personal abilities of the initiator.

The so-called line managers in a corporate hierarchy who also bear some responsibility for vetting projects proposed by their subordinates have somewhat different incentives from analysts in the staff function. Successful projects improve their prospects for promotions and their standing within the organization. They may also be influenced by their personal relationships with subordinates who advocate the initiative. The resulting tension between line and staff evaluators represents an important component of the distinctive checks and balances of the corporate form of organization. As we will see Chapter 6, the

venture capital firms rely on mutual monitoring by the partners of each other's investments and do not provide for scrutiny by an independent staff.

I do not mean to suggest that corporate evaluations are totally objective and that personal relationships and reputations don't matter. Employees with good connections and standing within their organizations have an edge in securing funding for their projects, just as well connected and regarded borrowers have an edge in securing bank loans. But, corporate control systems (and bank credit approval procedures) help set minimum standards of objective evidence and analysis. Although they don't eliminate personal or political considerations, they protect stockholders from a system of pure cronyism.

Aversion to Uncertainty

The nature of the evidence required by corporate decision-makers leads them to favor initiatives where the risks and returns can be objectively assessed. Large corporations seek opportunities with the following characteristics: Demand has stabilized or has attained a predictable growth trajectory, allowing analysts to make reasonable projections of expected revenues. Consumer preferences are stable, measurable, and can be projected from an appropriately selected sample to the market at large. The company's known strengths (in marketing and distribution, for instance) may be expected to provide competitive advantages over identifiable rivals. The need for objective and impersonal evaluation discourage investments where unpredictable or difficult to measure factors can lead to significant differences in outcomes.

A computer company like IBM will tend to avoid unformed markets (such as the PC business in 1975) where demand is difficult to predict or is subject to great technological or regulatory turbulence. Corporations will also avoid businesses whose profits depend on the superior abilities or skills of one or two individuals rather than an already established verifiable corporate capability. The fundamental nature of their evaluation process, in other words, leads corporations away from the uncertainty that individual entrepreneurs exploit, because the ambiguity or the "missing information" is too great.

Large corporations also lack the ability to monitor the implementation of uncertain initiatives. The successful implementation of uncertain initiatives we have seen involves tasks such as adapting to unexpected circumstances and responding to the unspoken wants of customers. An objective, multi-level monitoring system cannot easily evaluate the performance of such tasks and differentiate between bad luck and the lack of effort or talent.* And, when corporations underwrite the risks of projects whose implementation they cannot effectively monitor, they face a moral hazard problem. The individuals responsible for undertaking the project have an incentive to slack off and attribute their slow progress to circumstances beyond their control.

Corporate decision-makers often wait until the uncertainty of a business has been reduced before they invest in it. IBM's Entry Systems Division lab director William Lowe secured funding from the

Corporate Management Committee to build a personal computer in 1980, after some of the critical uncertainties about the market and technology had been resolved. Microsoft developed its web browser after Mosaic, Netscape and others had established the market. We similarly find large corporations invest in businesses after an entrepreneur has established a valuable technology or formula and the profits of the business do not depend just on the personal effort of the principals. After Rick Rosenfield and Larry Flax had developed California Pizza Kitchen's 'formula' and proven its viability, PepsiCo bought a 50% stake in the company and financed its subsequent expansion.*

This is not to say that large companies avoid well-defined risk. Control systems that lead corporations to avoid irreducible uncertainty do not preclude them from taking calculated gambles. Indeed according to Fama and Jensen's analysis, public companies are well suited to finance (conventionally) risky projects because their stockholders can diversify their portfolios. The owner-managers of private firms and partnerships are more risk averse because much of their wealth is tied to their companies. They tend to "underinvest in assets with long term payoffs."[129] Compared to private oil producers, public companies like Exxon and Mobil place much larger exploration and development bets. Only one of the 'majors' can put up the $2-3 billion it requires to develop a medium sized heavy oil field in Venezuela, for instance.

But, the types of opportunities that public companies pursue have characteristics that allow decision-makers to measure, quantify and objectively research the risks and returns. Before a large oil company makes a significant commitment to a new field, for instance, geologists and petroleum engineers can carefully examine seismic data and conduct preliminary drilling tests. Financial analysts can study multiyear cash flow projections to see whether successful development will provide an adequate return on investment. Corporations can also try to diversify away their "quantifiable and measurable" risks. Large oil companies, for instance, have a portfolio of exploration activities and will often develop fields jointly with competitors so that they spread their bets more widely. When the irreducible uncertainty is high, however, and the probability distribution of outcomes cannot be assessed, the risks cannot be reliably diversified away.

Similarly, control systems do not discourage corporations from developing or exploiting new technologies. Companies like Intel and Merck spend over a billion dollars each year on R&D. The evidence suggests that the R&D expenditures as percentage of sales are greater in large companies than in small companies.[130] If anything, aversion to uncertainty leads large companies to favor investments in technologies and intellectual property they can control rather than in the human capital of individual employees who can leave to join other firms. Decision-makers similarly favor initiatives that exploit an innovative technology instead of relying just on the hustle of a few individuals because they can more

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* In the next chapter I will suggest that venture capital firms are better suited to making these subjective judgments.

easily evaluate the risks and returns. New technologies, in other words, has desirable uncertainty-limiting property because it can reduce the firm's reliance on difficult to control human agents.

A corporation's aversion to uncertainty does however affect the nature of its R&D efforts. Objective evaluation criteria favor projects with well-defined risks and payoffs. Significant outlays on speculative research projects that have no prior path to commercial exploitation reflect a failure of a corporation's checks and balances and its managerial processes. Such projects tend to contribute more to the public good than to the stockholders' interests.

To illustrate the nature of objective scrutiny, consider Intel co-founder Gordon Moore's (1996) description of how the company allocates its billion dollar plus annual R&D budget. "Each product group", writes Moore, "is required to submit a project list ordered in decreasing priority, explain in sometimes excruciating detail why the list is ordered as it is, and indicate where the line ought to be drawn between projects to work on and projects to put off." Only a "small group" tries to "stay abreast with what is going on more broadly in the semiconductor industry" and even this group avoids programs that will generate results only after ten years. The company has learned to avoid technologies which are too far ahead of the market – in the 1970s developed and sold complete speech recognition systems at the rate of two per year.[131] Now, Intel "limits internal basic R&D to what is needed to solve immediate problems" and "looks to universities" for much of its basic research.[132] It does not "mount research efforts aimed at truly understanding problems and producing publishable technological solutions."[133]

Moore contrasts Intel's strategy with the more exploratory approach traditionally adopted by "the large, central research laboratories of the premier semiconductor firms." AT&T's Bell Labs and Fairchild Semiconductor's large research organizations probably "contributed more to the common good than they did to their corporations." Similarly, Xerox Corporation's Palo Alto Research Center "made some tremendous contributions to the community at large, notably in the area of local area networks and the graphical user interface…Xerox itself, however, did not benefit nearly as much."[134] These other organizations Moore notes have now changed their approach: "While it used to be that each of the major [semiconductor] players had a fairly important laboratory conducting basic research, much of that has disappeared."[135] Arguably the firms have given up on blue-sky R&D efforts because of the pressure top executives now face to provide higher returns to their stockholders.

The case of Merck, one of the world's leading pharmaceutical companies, also illustrates how management efforts to maximize the productivity of R&D helps to curtail uncertainty. Merck's former CEO, P. Roy Vagelos, describes how he established the criteria for selecting research projects after he took over as the head of its research labs in 1975. Each research group he found was "working on as many as ten projects at once" which he believed "almost guarantee[d] that no single project would have the critical mass to succeed." The basic criteria Vagelos established to bring provide more focus helped limit

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* Some businesses remain dependent on the inalienable human capital of their principals and therefore outside the domain of large corporations.

the competitive and scientific uncertainties. "We would look for areas" reports Vagelos, "where there were no therapies or drugs available, where the science was advanced enough for us to believe that we could make a breakthrough, and where we had enough knowledge of the disease to have some idea about how to arrest it."[136] The criteria did not guarantee the success of Merck's projects. But, by ensuring a market for successful developments ("no therapies or drugs [currently] available") and eliminating the more speculative efforts (through the requirement for existing advanced science), Merck made the risks and returns of its research portfolio more predictable.

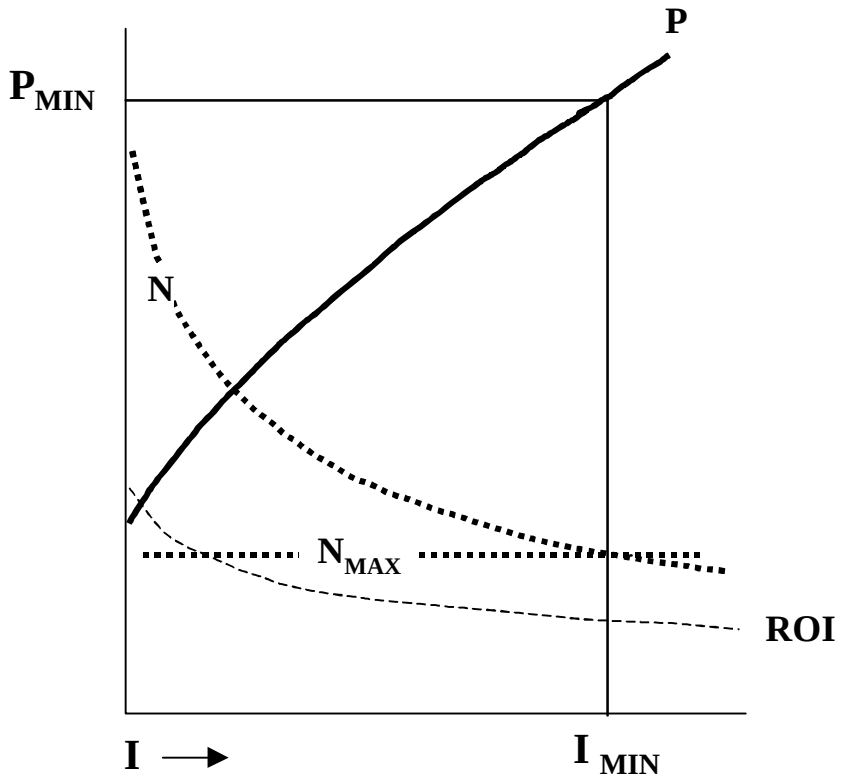
This is not to suggest that large corporations *always* avoid projects with high uncertainty. Top executives, who perceive an extreme threat or once-in-a-lifetime opportunity (for instance, due to the Internet revolution) or have an autocratic bent, may override normal decision making processes to take a great leap in the dark. Or they may establish a small slush fund to seed uncertain initiatives. My argument about the bias against large irreducible uncertainty pertains to the normal pattern in healthy organizations. Intel may allocate some funds for uncertain investments in venture capital partnerships, but the bulk of its R&D, fixed plant and marketing expenditures will be devoted to investments with well-defined risks and returns.

Profit Requirements

The process corporations use to scrutinize new initiatives also leads them to concentrate their investments on a few initiatives that hold the promise of high total profit. Just as banks apply the same credit analysis to all loan applications, corporate routines demand a minimum level of evaluation and monitoring for all new initiatives. But, at least in the short run, corporations have a fixed staff available to provide such oversight, which limits the number of initiatives they can undertake. In order to meet their goals for growth therefore, corporations allocate their limited evaluation capacity to a few projects that they expect will generate substantial total returns even if smaller projects offer higher percentage returns on investment.

SIZE OF CORPORATE INITIATIVES

Figure 6.2



By way of a simplified example (See **Figure 6.2**), consider a corporation with total income of $2 billion that, in order to satisfy the expectations of its employees and the stock market, must undertake initiatives capable of generating $200 million in new profit each year. Assume further that the corporation has:

- A range of projects it can undertake, where each project requires an investment of $I and is likely to produce a profit of $P. As shown in the figure, larger projects produce proportionately lower profits that is, the return on investment (ROI, or the ratio of P to I) decreases with I.
- Checks and balances that require each project be subjected to six man-months of evaluation.
- A fixed annual capacity of 42 man-months available to evaluate new projects. Therefore it cannot undertake more than seven (42 divided by 6) projects per year, indicated by the horizontal line N_{max} in the figure.

In order to meet its profit goal of $200 million, the corporation can undertake many small projects or a few large projects — as shown in **Figure 6.2**, the required number of projects decreases with I. The corporation would prefer to undertake many small projects, because projects with smaller I have higher ROIs. But it cannot undertake more than seven projects. Each project must therefore generate a

profit of at least $28.57 million ($P_{min)}$ with an investment of I_{min} even though smaller projects have higher ROIs, and more projects would lead to greater diversification of the risks.

Corporate decision makers therefore require evidence not just for why a new initiative can be expected to make a profit but also for why the size of the opportunity is large enough to meet corporate requirements. Individuals like Bill Gates and Paul Allen may start a niche business with the hope of finding ways to subsequently build a substantial enterprise. The proponent of a new initiative at an IBM or P&G must make a plausible case at the outset for how it will grow into a large business. Similarly an independent wildcatter will be happy to exploit a small well, but Mobil will not invest in a project unless it has the potential to generate at least a $100 million after tax profit. These minimum profit requirements can frustrate employees who uncover small opportunities and create an incentive for them to start their own businesses or at least to complain about their employer's bias against entrepreneurship.

Competitive considerations often reinforce the tendency to focus on a few big investments: a corporation that introduces a new product for a large market, but does not back it with sufficient resources to establish first mover advantages, may fail to appropriate the full benefit of its innovation.

The former president of PepsiCo, Andrall Pearson, writes:

> Once an idea or concept is properly developed, it seems logical to assume that any sensible company would throw the book at it to make it a success. Yet I've found that reality is often quite different. Looking back, most of the new-product mistakes I've seen grew from the company's failure to back up the innovation with enough resources—not from overspending . . . many people fail to recognize that their competitors will retaliate—especially if their innovation takes customers away... Second, people try to stretch their resources to finance too many projects at once [so] that none of the projects gets enough sustained support and effort to ensure its success. The only way around it is to be disciplined enough to say "next year" to most of the good ideas available. . . .
>
> In contrast, the big winners make careful plans to throw everything needed at new products to ensure their success.... They've learned that doing it right the first time is lots more effective (and usually far less costly) than doing the job on a shoestring and then scrambling to fix things when what happens doesn't meet expectation. They also know they're never going to have the first-blood advantage again, and that the best way to preempt or block out competition is to do it right the first time.[137]

To summarize: Large public corporations have an extensive capability for evaluating and monitoring initiatives which helps determine their area of comparative advantage. The capability gives corporations access to substantial amounts of capital. This allows decision makers to undertake projects which require large amounts of up-front investment but discourages them from pursuing small opportunities. The evaluation and monitoring capability also leads corporations to avoid uncertainty; or, put more positively, it encourages corporations to pursue projects where their distinctive capacity to evaluate and manage objective risk has the most value.

2. A WELL-PLANNED PROCESS

Most start-ups, as we saw in Chapter 3, are improvised—entrepreneurs often find new business ideas by accident rather than through a systematic search, they do not devote much effort to prior planning and research, and they make extensive changes in response to unforeseen circumstances. In contrast corporations follow a much more rule-based and structured approach. They are more likely than individual entrepreneurs to find opportunities after a systematic search, to conduct extensive research and formulate careful plans, and to stick to their plans once an initiative has been launched. This seemingly regimented approach does not reflect the incompetence or the bureaucratic tendencies of corporate executives, as their critics sometimes claim. Rather, it is a necessary consequence of the resources they control and the constraints they face.

Systematic Search

Top managers of large corporations, as we have seen, institute general policies to control the activities of employees who they cannot directly supervise. These policies (or long-term "strategies") guide the search for new corporate initiatives. IBM and Hewlett-Packard, for instance, did not start making PCs (which accounted for 14% and 16% of their respective 1997 revenues) by accident. They made a strategic commitment to enter the market in order to defend and build upon their minicomputer and mainframe businesses. There are exceptions of course: 3M's now ubiquitous Post-it notes started with a failed attempt by scientist Spencer Silver to develop a strong glue. Later, another 3M scientist, Art Fry, was inspired to develop bookmarks using the glue while singing in a church choir. He scribbled a note to his boss on a prototype bookmark and thus invented Post-it.[138] The appeal of the Post-it story however lies in its unusualness: the norm is an orderly pursuit of strategy. Corporate decision-makers evaluate business ideas not just in terms of their stand-alone returns but also in terms of their conformance to long-term goals and interactions with existing activities.

Andrall Pearson's *Harvard Business Review* article, "Tough-minded Ways to get Innovative," reflects the perspective of a successful corporate executive and consultant. Pearson, who had served as president of PepsiCo for 15 years and was a director of McKinsey & Co. before that, writes that a "systematic effort to institutionalize innovation is what gives market leaders their competitive edges."[139] Pearson advises companies to make conscious choices about where to direct their innovative efforts. An unfocussed approach—"put smart people to work and pray that they'll come up with something great"—usually produces "lots of small ideas that don't lead anywhere, big costs and embarrassing write-offs, and a great deal of frustration and stop-and-go activity." In contrast, successful innovators have "a pretty clear idea of the kind of creative competitive edges they're seeking," and "because their directions are so clearly set, their people can channel their efforts toward things that will work against competitors." Similarly, Pearson argues, "good concrete ideas" do not come out of techniques like brainstorming; rather, they "most often flow from the process of taking a hard look at your customers, and your business."[140]

Merck's Vagelos, former CEO of Merck, one to world's leading pharmaceutical companies, describes how he introduced a systematic research process to complement a "focus on the big projects that could result in breakthrough drugs." In 1975, Merck's labs:

> were engaging in random screening of compounds, which meant that scientists were testing microorganisms, soil samples, or plant extracts, as well as chemicals made in our own laboratories to see if they caused any pharmacological activity. If they did, the scientists tried to create a drug. If they didn't, the scientists tested more compounds. We introduced a more targeted method that focused on creating specific molecules to attack specific molecular targets, an approach now known as rational drug discovery.[141]

Under the new approach, Merck relied extensively on 'enzyme inhibition' – "blocking the action of particular enzymes involved in the disease process." For instance when scientists looked for a drug to lower high cholesterol, they focused on blocking the enzyme that controls the overproduction of cholesterol and eventually developed two drugs, Mevacor and Zocor. Enzyme inhibition also led to Vasotec, used to treat high blood pressure, and Proscar for prostate disease. Merck's approach was widely adopted by its competitors. "Today the entire industry uses the rational-drug-discovery process"[142] Vagelos notes, making serendipitous development of new therapies an exception to the systematic rule.

Research

Corporations conduct extensive research in order to generate objective data for evaluating initiatives. A policy of investing in a few, large initiatives reinforces (as well as derives from) the requirement for extensive research and analysis. With substantial investments at stake, top decision-makers have to ensure that over confident subordinates do not make inappropriate commitments to new ventures. Before approving the launch of a new product they require their staff to collect information on competitive offerings and plans, examine demographic factors and trends, study customer preferences (through focus groups, open-ended interviews, structured surveys and so on) and conduct market tests and trials. According to one estimate, in 1995, each *Fortune* 500 company employed, on average, nine full-time market research professionals and had research budgets of $4.2 million.[143] Packaged goods companies (which spend about 20% more on average than non-packaged goods companies) have developed a culture of extensive research and testing. A former assistant brand manager at Procter & Gamble recalls:

> Every brand at P&G has a research person supporting them. Research people have maybe 3-5 brands each. There are always multiple research projects going on—a quantitative survey, focus groups . . . something.
>
> We could not do anything without testing it. For example, I worked on a line extension of a base product, which was a blue pill. We planned to make the line extension blue too. Unfortunately, product development told us that we could not make it blue—in testing, it started to turn purple over time. Our second choice was yellow (mostly because a lot of other colors were associated with the competition). I went to the General Manager for the category—a senior manager at a level right below VP—and recommended this yellow pill. He was quite disturbed at the thought of changing the

> color and insisted that I run a test (at a cost of more than $10,000) to see whether consumers liked the yellow or the blue. I wasn't sure how the research would be useful—even if consumers liked the blue, we could not make it blue—but I was forced to run the test. As it happened consumers preferred the yellow, so we made the decision to use yellow. Even though it did not feel right to my GM in his gut, he accepted the results of the research like the truth from God.

David Ogilvy, co-founder of the advertising agency Ogilvy and Mather, describes the importance of testing for companies who serve mass markets.

> The most important word in the vocabulary of advertising is TEST. If you pretest your product with consumers, and pretest your advertising, you will do well in the marketplace. Twenty-four out of 25 new products never get out of test markets. The manufacturers who don't test market their products incur the colossal cost (and disgrace) of having their products fail on a national scale, instead of dying inconspicuously and economically in test markets. Test your promise. Test your media. Test your headlines and illustrations. Test your level of expenditure. Test your commercials. Never stop testing and your advertising will never stop improving.[144]

Even companies such as 3M, which have a reputation for serendipitous development for products like Post-it, conduct extensive tests. The color of Post-it—yellow—was guided by market research. Before a national launch in 1980, the product was tested in Richmond, Virginia, and three other cities through office-supply stationers. The "turning point" was "an intense sampling and marketing campaign in Boise, Idaho."[145] According to Post-it's inventor Fry, the market research quelled doubts in 3M: "In the office supply business, an intent-to-reorder rate of 40% or 50% is considered a miracle. In our test market, we achieved a 90% intent-to-reorder rate. That was the end of the skepticism."[146] Research also led to further product extensions. For instance in 1981, 3M introduced the Post-it Note Tray after research showed the pads were getting lost on customers' desks. By 1984, 3M had added 22 other such follow-on products to the Post-it line.[147]

The experiments and trials corporations conduct before making a commitment to a full-scale launch have a different purpose and structure than the opportunistic adaptation practiced by capital constrained entrepreneurs. The founders of companies like Factor-Fox and Silton Bookman modify their offerings in order to make a sale. Their adaptation has a short-term, satisficing objective: they want to generate cash flow rather than to choose between multiple projects or find the optimal way of proceeding. The information their efforts generate represent a by-product. Their experiments are like those of miner panning for gold at different places in a riverbed. The primary goal of corporate research by contrast is to reduce uncertainty and verify prior beliefs. Is their enough gold in a particular field to justify a large scale mining operation? What is the optimal price point for the Mach3 razor? Corporate research represents an investment in information rather than an effort to generate cash. The cost of extracting a sample core far exceeds the value of the gold it might contain.

Corporate research is correspondingly more scientific. Capital constrained entrepreneurs respond to, sometimes without much aforethought, to the preferences of individual prospects in order to make a sale. Their adaptation to the specific local circumstances impairs their capacity to draw general inferences and test hypotheses. Corporations try to factor out idiosyncratic factors and select large and representative samples for their experiments. When Gillette conducts market research or a mining companies drills test holes they want to make sure that they can draw reliable inferences about the preferences of the typical customer and of the richness of the overall deposit. Corporate decision-makers who use research to place large bets have to be wary of encouraging but false positive results. They cannot rely on the ad-hoc improvisation of bootstrapped entrepreneurs who can cover low fixed costs with fluky sales made to unusual customers. They have to undertake well-designed and controlled experiments.

Adhering to Plans

In addition to evidence on why a new initiative is likely to succeed, corporate decision-makers also require extensive plans on how it will unfold. While a self-financed entrepreneur may draw up a plan on the back of an envelope, proposals for new corporate initiatives contain detailed milestones, staffing requirements, financial projections and so on, which facilitate objective evaluations and monitoring of new projects. The complexity of corporate ventures also requires more planning. Promising ventures started on a small scale usually involve straightforward tasks and simple functions. For instance, in order to start Compu-Link, Steve Shevlin and his partner bought a large roll of printer cable, cut it into smaller pieces and sold them over the telephone to dealers listed in the Yellow Pages. Starting Microsoft required Gates and Allen to write a version of BASIC for MITS's Altair and then strike a deal with MITS's owner, Roberts. Planning was neither possible nor necessary. In contrast, the large projects corporations undertake tend to be complex: the development and launch of New Coke or Microsoft's Windows NT involves numerous activities and functions located within and outside the firm.* Such initiatives require detailed plans to coordinate these functions and activities. To revert to the analogy used earlier, an individual skipping across the stones in a stream has little use for planning. The Golden Gate Bridge, on the other hand, cannot be built without extensive planning and preparation.

Cypress Semiconductor's "goal system" illustrates how established companies use plans to coordinate complex initiatives. According to CEO T. J. Rodgers, most of the work at Cypress is organized by project rather than by function. Each project has numerous long-term and short-term goals. For example, to design and ship the company's third generation of PROM chips, a team of circuit designers, product engineers and test engineers completed 3,278 goals over roughly two years.[148] Cypress management reviews project goals more or less continuously. After project teams meet on Monday, goals are fed into a central computer. On Tuesday mornings, functional managers receive printouts on the

status of their direct reports' new goals. On Wednesday mornings, the vice presidents of the company receive goal printouts for the people below them. On Wednesday afternoons, the CEO reviews reports with the vice presidents.[149]

Just as construction of the Golden Gate Bridge follows the basic initial blueprint, once corporations have decided on a plan, they tend to stick to its basic elements. Several factors keep corporate initiatives on their planned course. Corporations don't need or expect to generate positive cash flow as quickly as the bootstrapped entrepreneur. In many large projects, such as PepsiCo's entry into India, or IBM's launch of its OS/2 operating system, top decision-makers expect to lose money for quite a long period. Slower-than-expected progress does not therefore automatically force a change in direction as it often does with capital constrained entrepreneurs. The choice of low-uncertainty initiatives and extensive prior analysis also reduces the chances of major surprises and hence the need for significant changes in direction.

Large, complex projects that require the coordination of many individuals and tasks cannot be easily reoriented. Intel, for instance, cannot institute significant changes in the direction of its Pentium development effort in mid-stream. The many levels of approval required to make changes also encourages companies to stick with a plan that has been agreed upon in spite of the subsequent discovery of some shortcomings. Moreover, if a plan has been internally or externally publicized, a major change in direction may damage the reputations and credibility of powerful individuals. An organization may go into a state of denial about the need for changes if subordinates are fearful of carrying bad news to their bosses.†

Criticism of the Corporate Approach

Critics of large companies sometimes claim that their structured approach to new initiatives is overly bureaucratic and that executives should become "more entrepreneurial." Such claims overlook basic differences between corporate and individual initiatives. Although corporate checks and balances slow down decision-making and can sometimes become dysfunctional, they are inextricably linked to the specialization of risk bearing and management and to their capacity to undertake large and complex projects.

Careful research, planning and testing can significantly extend the time it takes to launch new initiatives. Corporations take considerably longer than the weeks or months it takes for many individual entrepreneurs to go from having an idea to becoming operational. For instance, 3M patented the adhesive behind Post-it in 1974 and launched the product in 1980. Intel began work on its Pentium microprocessor in 1989 and using a development process that is much admired in the industry for its speed and efficiency

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* In Part 2 I will argue that the capacity to coordinate many resources and activities represents an important *raison de etre* of the large corporation.

†The difficulty of making changes also reinforces incentives to plan carefully and prepare for all contingencies and to avoid turbulent or uncertain environments which make quick adjustments unavoidable.

was able to launch the product in 1993. Gillette took over a decade to launch its Mach3 razor. (See Insert 'Mach3 Milestones')

Mach3 Milestones

1985: Research begins on developing the first new edge for Gillette's blades since 1969.

1988: Researchers arrange three blades in a progressive alignment, meaning the first blade sticks out less than the second and third blades.

1992: An advanced prototype, Manx, beats SensorExcel, Gillette's most advanced razor, in shave tests.

1995: Gillette's board approves Manx development.

Mid-1996: Gillette engineers develop a method of assembling Manx's cartridge that is three times as fast as SensorExcel production.

Fall, 1997: Board approves final stage of the $750 million investment. Production begins.

Apr. 14, 1998: Mach3 unveiled.

From: William C. Symonds, "Would You Spend $1.50 For a Razor Blade?" Business Week, April 27, 1998, p 46.

Sometimes, the decision-making process can become dysfunctional. Chris Argyris describes an organization where "the completion of the paperwork became an end in itself. Seventy-one percent of the middle managers reported that the maintenance of the product planning and program review paper flow became as crucial as accomplishing the line responsibility assigned to each group . . . Still another frequently reported problem was the immobilization of the group with countless small decisions."[150] A normal corporate aversion to high uncertainty become a pathological unwillingness to tolerate any at all, and prudent due processes make it impossible to undertake to undertake new initiatives in a timely fashion. The failure to undertake new initiatives ultimately leads to the demise of the organization; as mentioned corporations have to keep finding new profit opportunities to survive.

Corporations cannot however adopt the adopt the free-wheeling ways of bootstrapped entrepreneurs. Without careful, objective review and oversight, investors would not readily give boards and top managers of large companies broad discretion over large sums. Adherence to due process and fact-based decision making can also promote teamwork and preserve organizational morale in large organizations. Large companies have many employees generating new initiatives. Employees who secure corporate backing for their initiatives have the satisfaction of seeing their ideas implemented and increase their chances of receiving promotions or bonuses. An organization that selects ideas capriciously or because of personal pull will discourage talented employees from displaying initiative and reduce its chances of long-term survival. Conversely, companies that make fair, by-the-book choices secure more loyalty. Thus the General Manager at Procter & Gamble who puts aside his personal misgivings about yellow pills reinforces the company's reputation for fairness and respect for the facts.

Moreover, large companies usually compete in oligopolistic markets against other firms subject to the same pressure to institute checks and balances. Provided they don't take due process to extremes, the benefits of careful research and planning exceed the costs that large companies incur. According to Pearson, PepsiCo's disciplined approach "led to $2 billion to $3 billion worth of successful innovations."[151] The "rational drug discovery process" that didn't stray too far from the existing science instituted by Vagelos at Merck led to a series of drugs with total annual sales of $6.1 billion.[152] The "excruciating detail" required to justify projects and a focus on solving "immediate problems", Moore suggests, has given Intel a much higher "R&D capture ratio" than did Fairchild Semiconductor's ad-hoc approach. Intel has generated few spin-offs or technologies of greater value to society than to its stockholders.[153] Its approach concedes Moore, "might at some point, cause Intel to miss a revolutionary idea that has the potential to wipe out established positions." He argues however that the alternative, of having large R&D organizations conducting basic research, "has not been shown to be protection against change in a basic business paradigm."[154]

Procter & Gamble's "testing fetish," Peters and Waterman suggest, has played a valuable role in the success of its new product introductions. They cite comments made by an employee of Crown Zellerbach, a competitor of Procter in some paper product markets:

> P&G tests and tests and tests. You can see them coming for months, often years. But you know that when they get there, it is probably time for you to move to another niche, not to be in their way. They leave no stone unturned, no variable untested.[155]

Companies, of course, vary in their scrutiny of new initiatives and requirements for planning and research. "Flat" organizations with lean staff may evaluate initiatives relatively expeditiously. Similarly, differences in administrative skill, culture, and internal trust, may lead some companies to have less stringent demands for objective evidence than others. But, even the most free-wheeling large companies like 3M have more stringent procedures and criteria and devote more resources to evaluation and monitoring their projects than the typical bootstrapped entrepreneur. And, as the insert, 'Routinized Innovation: the 3M Case' illustrates, growth in size and complexity leads to increasing pressures to systematize its decision-making. 3M may never become as disciplined or focused as PepsiCo or P&G. But, nor will its management processes allow two engineers to buy a grinder and start a plastic scrap brokering business as Eaglebrook's founders did in 1983. It is telling that 3M has participated in the PC revolution, mainly through high-volume, relatively stable products such as diskettes and other storage media. No matter how entrepreneurial a large company might be, the threshold requirements for total profit, verifiable advantages, budgets, milestones and so on significantly exceed those of bootstrapped start-ups.

Routinized Innovation: the 3M Case

Bartlett and Mohammed's "3M: Profile of an Innovating Company" illustrates how the pressures to adopt systematic processes for finding and evaluating new business opportunities escalate over time. In 1902, five businessmen from Minnesota formed 3M to mine corundum, an abrasive mineral. When the mine failed, 3M began to manufacture sandpaper. The sandpaper business, too, generated losses until a young bookkeeper, William McKnight, took over the sales manager's job. McKnight subsequently served as the company's president from 1929 to 1949 and then as its chairman from 1949 to 1969.

McKnight, who was the company's "spiritual leader," Bartlett and Mohammed write, "developed an unshakable belief in the power of individual entrepreneurship."[156] 3M encouraged researchers to pursue projects of personal interest. As a result, 3M "stumbled onto literally scores of new products and technologies." Management adopted a philosophy of "make a little, sell a little," not only because 3M could make a profit in niche markets but also because "many products and technologies subsequently found applications never [originally] dreamed of." For instance, a material first introduced as a decorative ribbon "spawned scores of other products" from "protective face masks, to surgical tape, to Scotch Brite cleaning pads."

Eventually, however, questions about the effectiveness of the new product development process led McKnight's successors to change its freewheeling approach. When Lou Lehr, a 35-year 3M veteran became CEO in 1980, he expressed concerns about "fragmentation" of the company's efforts. Under Lehr, the company adopted "a new organization structure, planning process and funding policies" that "had an enduring impact on 3M's product and process development." Bartlett and Mohammed quote a division vice president:

> Previously innovation was driven by management asking researchers, "What rabbit can you pull out of the hat to meet our targets?" We relied on a pool of technology, some talented people, and a supportive culture to create innovations by spontaneous combustion. The individuals who came up with the new products were heroes, no matter what the fit with existing businesses or market access. So there were hundreds of initiatives—you could do anything. But as development became more expensive and riskier, we needed the focus and discipline of the new structure and processes.[157]

3M did not reduce its commitment to innovation, however; during Lehr's six-year term as CEO, spending on R&D more than doubled from $238 million in 1979 to $507 million in 1985. Allen Jacobson, who took over as CEO in 1986, wanted 3M to become even "more focused in its choice of project development." Under his tenure, the company began to develop "a more disciplined approach" to funding projects. According to a vice president of the Dental Products Division:

> Previously a scientist could work on a project for years, with money just dribbling out to support it and management not really knowing how much had been invested or what the potential was. Today we try to do a lot more sorting out early. We ask for a product positioning statement right up front, and if it's not clear, it won't be funded. . . . So now, instead of running 100 programs as we did before, our division is focused on 12.[158]

Another vice president observed that "the day of the individual entrepreneur is over at 3M" although "we still like to talk about the brilliant inventor who converts his innovation into a new business."[159]

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3. SECURING RESOURCES

In Chapter 4 we saw that startups face significant problems in securing customers, employees, suppliers, and so on. Entrepreneurs have to overcome the liability of newness: resource providers are

reluctant to take chances on startups that may not survive. Doing business with a newly formed business also involves high switching costs. Below we will see how established corporations have several advantages over bootstrapped startups in securing resources, as well as some distinctive challenges. We will also examine how the strategies corporations pursue are different from the approaches individual entrepreneurs use to secure resources.

Corporate Advantages and Problems

Several factors mitigate the concerns of resource providers about the survival of corporate initiatives. The extensive scrutiny and analysis that corporations perform on new initiatives provide some reassurance about the soundness of the enterprise. The cash flows generated by existing businesses, financial reserves and unused borrowing capacity similarly provide comfort about a corporation's staying power.

Corporations, having made large up-front investments and wishing to protect their reputations have greater incentives have a greater incentive to stick to the initiatives they have chosen to pursue. Resource providers can expect that IBM will not quickly abandon a floundering initiative (such as the PC Jr. computer or the OS/2 operating system) after it has spent significant resources on planning and market research, product development and advertising and has put its credibility at stake. A small scale assembler of PC clones, in contrast, is much more likely to shut down quickly or embark on a different business—as many entrepreneurs in fact did when profits from assembling clones declined in the mid-1980s.

A corporation's resource providers also face lower switching and search costs. When Hewlett-Packard introduces a new product, potential customers know what they can expect in terms of quality, value-for-money, ongoing support and so on. Similarly, potential recruits can easily investigate the working conditions and organizational climate at HP. Existing relationships can also reduce costs: buying an additional, new item from HP is less burdensome than adding another vendor to the company's list of approved vendors. A popular business heuristic suggests that selling to existing customers is more profitable than cultivating new customers, and maintaining customer loyalty is less costly than adding new customers. Similarly companies with an existing pool of employees have an advantage in staffing up new initiatives because internal transfers of personnel involve less disruption and loss of specific knowledge than switching across firms.

Well-established companies can benefit from the unwillingness of other organizations' employees to take personal risks when benefits accrue mainly to their employers. For instance, employees in other organizations may order expensive laptops because they see no advantage in buying a cheaper no-name clone. With a clone, the employer reaps the savings while the employee receives little benefit; if the cheaper computer malfunctions, the employee gets faulted for having made a poor choice. Buying IBM is safe, "no one ever gets fired buying from IBM." The large scale of new corporate initiatives provides psychologically reassuring "social-proofs": the buyer knows that lots of others will be buying IBM's new

computers and does not have to fear being alone. Further reassurance is provided by the perception of expertise: just as people will unthinkingly follow the orders of doctors and other such figures of authority, they may defer to the credentials of an IBM "systems engineer" or "networking specialist" who tells them what they should buy.

Against these advantages, however, corporations also face the problems of securing larger quantities and higher quality of customers and employees than do start-ups. For instance, bootstrapped start-ups can make attractive profits serving a very small number of customers because their fixed costs are low. The typical large corporation has to secure significantly more customers to earn an attractive return. New Coke generated more sales in its first year than did Nantucket Nectars's entire line drinks five years after the company was started. And, as Christensen points out, Apple sold three times as many Newtons as it had Apple IIs in the first two years after their respective launches: by 1994, Newton had sold 140,000 units and by 1979, the Apple II had sold 43,000 units[160]. But, because Coca Cola and Apple dedicated vast resources to launching New Coke and the Newton, both products represented major flops. Whereas a start-up can make do by identifying a few offbeat customers and adapting their offerings to their customers' needs, the products and services of large corporations must have mass appeal.

The size of corporate initiatives and the competition they typically encounter requires top quality resources. In a small startup that faces undistinguished rivals, the founder's personal drive and skills can compensate for "second-tier" resources. When Coca Cola launches a new soft drink on a national scale and attempts to take share away from Pepsi, or 3M goes head-to-head against Iomega's popular Jaz line with a new high-density drive, they need stellar resources; employees, suppliers, distributors, ad agencies and so on must be of a high caliber. Marginal providers of labor and services who are eager to do the job because they lack better alternatives are often not good enough.

Securing top-quality (rather than merely adequate) resources involves special challenges. Although credentials may provide good signals of quality, they are not foolproof. Where bootstrapped start-ups struggle to find the false positives—employees that are inherently better than their qualifications would indicate, large companies face the problem of avoiding the false negatives—personnel who pass objective screens, but are not as talented as their résumés would indicate. The joint effort involved in corporate initiatives also makes it difficult to detect mediocre hires quickly. In a large and complex project involving many personnel, the performance of individuals is difficult to evaluate. And, many talented personnel do not like to work for large corporations: the security and other such inducements that corporations are uniquely positioned to offer may not appeal to them.

Corporate Strategies

Existing reputations, relationships, and access to capital allow large companies to pursue strategies for attracting resources that capital-constrained start-ups cannot. Entrepreneurs, we have seen, struggle to get others to bear the risks of their ventures, whereas companies like IBM can underwrite the risks for resource providers through explicit or implicit guarantees. For instance, they can offer customers

money-back guarantees or contracts with penalty clauses. They can mitigate the career risks of the employees who participate in new initiatives by making an implicit promise to retain them if the initiative fails; thus we often find corporate policies that say "we do not punish failure."

They can publicly stake their reputations to a new initiative. The irreversible up-front investments that corporations make to launch a new initiative in R&D, market research, new capacity and so on, provides a signal of commitment that "speaks for itself." Corporations often amplify the signal by undertaking extensive advertising and public relations campaigns. For instance, IBM's recent ads in the mass media seem like an inefficient way for IBM to communicate the launch of its 'e-business' line of web servers and software; at most a few thousand of the millions of readers who will see the advertisement have any role in purchasing such offerings. But the ads provide a credible signal of IBM's commitment: if the company weren't determined to make the venture a success, it wouldn't stake its reputation so visibly to the new line of business.*

Companies also advertise their overall stability and prosperity. Usually this is done indirectly. Investment banks, lawyers and other professional firms receive clients in well-appointed offices, high tech firms maintain verdant campuses, and firms like Mobil sponsor programs on public television. Sometimes, the message is explicit. In a recent full-page ad in *The Wall Street Journal*, insurance company Conceco declared: "We are unapologetically profitable. Profitability is the ultimate security for our policyholders. And it's also the most important factor in our agents' long-term success. We are driven to perform for our customers, agents, and shareholders."[161]

Corporations can take advantage of existing relationships with customers, suppliers, banks and other resource providers. A competent sales person at IBM can identify the customers who will derive the most value from a new product, understands how the purchasing processes work, and knows the influential decision makers and what they respond to. Furthermore, the sales-person's personal relationships, trust, and past favors (personal and professional) done for the client can help secure orders. Similarly, existing relationships with suppliers can be used to get them to tool up for a new line.

Corporations often reduce the risks to consumers by offering new products or services at substantially discounted prices or even for free. Packaged goods companies like Procter & Gamble, for instance, often distribute coupons or free samples of new products through the mail or at supermarkets. AT&T offered a "no fee for life" deal to anyone who signed up for its Universal Credit Card in its introductory year. Microsoft captured a 25% share of the Internet browser market in two years simply by giving away its product, the Explorer.

On the cognitive and psychological side, corporations can frame choices that play up to the resource providers' tendency to loss aversion. Their sales forces, for instance, may sow FUD—fear, uncertainty and doubt—in their customers' minds to dissuade them from considering new or less well

established vendors. They take advantage of the reflexive tendency of customers to follow the lead of authority figures and experts. Shoe companies like Nike, for instance, sign multimillion-dollar contracts with top athletes to wear and endorse their products. Such endorsements have helped Nike redefine what consumers look for and the prices they are willing to pay for shoes. Colgate grew the sales of its premium priced designer pet foods from $40 million in 1982 to $900 million in 1996. The company spent very little on traditional advertising; rather, it concentrated its marketing and promotion budgets on persuading veterinarians to recommend its brands.

In some extreme cases, a company that dominates its field may be able to force resource providers to sign on. For instance, when Microsoft introduces a new version of its word processing or spreadsheet software (and stops supporting the old version) many customers feel compelled to switch. Similarly, independent software producers have to rewrite their applications when Microsoft introduces a new operating system.

The strategies do not, of course, ensure the success of corporate ventures. The capital and other advantages corporations enjoy more or less ensure the availability of *some* customers and employees. They cannot, however, guarantee that the volume of sales will be high enough or that employees will be talented enough to provide a large enough return to meet the corporate standards of success.

4. REQUIREMENTS FOR SUCCESS

The success of corporate initiatives depends on factors that are quite different from those which pertain to bootstrapped start-ups. First, the initial or pre-launch conditions and concepts matter a great deal more in corporate ventures. Entrepreneurs can start with an undistinguished product or business concept but may still make a worthwhile profit by dint of what they do after they get started: they can generate orders if they knock on enough doors, modify their offering in response to what customers tell them they really want, work hard to satisfy their first clients and so on. Corporate initiatives such as the IBM PC Jr. or New Coke may be doomed from the start. Corporations cannot easily make major mid-course corrections because of the scale and complexity of their initiatives and because of the number of players involved. It can be difficult, and sometimes impossible, to recover from inappropriate choices of product design, advertising, distribution channels and so on that were made before launch. (I do not at all mean to suggest that good plans are a sufficient condition. As I will argue at length in Part 2, good execution is as important in a large enterprise as it is in a start-up—a sound design and blueprints alone did not assure the successful completion of the Golden Gate bridge.)

Second, broad-based organizational capabilities, rather than the talents of a few individuals, play a more important role in determining the success of corporate initiatives. Compared to bootstrapped startups, corporate initiatives depend more on the joint effort of many individuals and on specialized functions. As we have seen, individual entrepreneurs (or a small team of founders) bear considerable

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* In the early 1990s, IBM undertook a similar media blitz to reassure customers about its continued commitment to

responsibility for the success or failure of bootstrapped ventures. The entrepreneur secures—or fails to secure—orders. The entrepreneur is responsible for the quality of services provided. Employees, if any, play a secondary role. The entrepreneur also personally makes important tradeoffs such as what additional features or services to offer in order to make a sale. This concentration of responsibility and decision-making results from the small scale of the enterprise.

In a large corporate initiative, critical responsibilities for evaluation, planning and execution are diffused across many employees located in several specialized functions. The introduction of Coca Cola's new soft drink or IBM's new computer requires the joint efforts of many product design, marketing, financial control, production, logistics and other such personnel rather than the talents of a few versatile individuals. As we will see in Part 2, the quality of the joint effort in turn depends on the caliber of individual contributors as well as on the organizational mechanisms and routines used to coordinate their work and resolve conflicts. Reporting relationships, incentives, control systems, formal policies, tacit norms and other such factors which affect how diverse functions with different knowledge, outlooks and interests work together have a significant influence on results. They determine whether the organization can strike the right balance between objective criticism and the repair of cognitive defects on the one hand and the elimination of all initiative on the other. They also determine whether plans to take advantage of existing reputations, sources of capital and other such assets can be realized or whether they crumble during execution.

5. SUMMARY

Corporate decision-makers have access to significantly more capital than individual entrepreneurs, but control systems intended to protect stockholders place limits on their discretion. These initial conditions lead corporations to favor large, low uncertainty initiatives and to plan their ventures carefully instead of relying on opportunistic adaptation. The cash flows, relationships, and reputations provided by existing businesses help corporations secure customers, employees and other resources for their new initiatives; corporations do, however, face tougher quality and quantity requirements than most new start-ups.

The factors that determine the success of corporate initiatives also are different. The soundness of the original concept and the joint efforts of several players are much more important for corporate ventures than they are for promising start-ups.

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its AS1400 line of mid-sized computers.

CHAPTER 7: VC-BACKED START-UPS

This chapter examines the unusual nature of venture capital (VC) backed startups in order to put the characteristics of the more common promising ventures into sharper relief. Section 1 examines the endowments and constraints of the founders of VC-backed start-ups. Section 2 shows how the initial conditions affect the scale and uncertainty, degree of prior plans, strategies for securing resources and key success requirements. Section 3 discusses whether or not the small number of VC-backed start-ups is a temporary phase that reflects the immaturity of the field.

Venture Capital (VC) backed start-ups have had a powerful influence in shaping popular beliefs (and formal research) about new ventures for several reasons. They have made significantly greater contributions than promising ventures to certain high technology fields such as semiconductors and genetic engineering. Their geographic concentration (notably in California and Massachusetts) raises intriguing questions for policy makers, economists and sociologists. Researchers can more easily document their strategies and performance. They make more of a splash—the successful VC-backed start-up grows at a much faster rate than the average *Inc*. 500 company, going public or getting acquired in about five years, as opposed to the *Inc.* companies which remain privately owned for about eight years.

We should not, however, confuse vividness with representativeness. Only 5% or so of *Inc*.500 companies start with VC funding and, overall, VCs fund a few hundred new businesses a year. As we will see, VC-backed start-ups have several out-of-the ordinary features. Their founders have exceptional qualifications and ideas, which allow them to raise much more capital than the founders of the typical promising start-up. The typical *Inc*. 500 company, we have seen, starts off with under $30,000 whereas VC-backed ventures raise between two to five million dollars. The capital has strings attached, however. In contrast to the founders of self-financed businesses, VC-backed entrepreneurs face extensive scrutiny of their plans and on-going monitoring of their performance by their capital providers. These distinctive initial conditions lead them to pursue opportunities with greater investment and less uncertainty, rely more on anticipation and planning and less on improvisation and adaptation, use different strategies for securing resources and face different requirements for success.

Scope. This chapter contrasts VC-backed and promising *startups*. Some promising startups do subsequently raise financing from VCs, and in fact, the VC industry typically disburses about two thirds of its funds to post-startup, or 'later stage' companies. But this reinforces my claim that few entrepreneurs starting new businesses fit the VC investment model. The high proportion of later stage investments reveal a strong preference for funding businesses after entrepreneurs have reduced the high uncertainties of the start-up stage and demonstrated the potential for large payoffs.*

* In Part 2 we will study the evolutionary process which changes the uncertainty and size characteristics of businesses and makes them eligible for substantial outside funding.

1. INITIAL CONDITIONS

In the section below, I will offer an explanation for the large amounts of capital available to VC funded entrepreneurs, the unusual ideas and human capital they must have, and the scrutiny and monitoring they face. Investing in start-ups (as opposed to, say, publicly traded stocks) requires careful evaluation and monitoring. Time constraints limit the number of investments VCs can make and encourage them to concentrate on a few start-ups they expect will produce large payoffs. Furthermore, only a few individuals have the ideas and human capital VCs consider necessary to generate large returns. I will also briefly contrast some of the initial conditions found in a VC-backed start-up with those of corporate initiatives; as we will see, VC-backed start-ups don't have access to as much capital as corporate initiatives but are usually subject to less scrutiny and monitoring.

Evaluation and Monitoring

Investors in start-ups have an incentive to conduct more due diligence than investors in the stock of well-established public companies. Modern finance theory suggests that investors in publicly traded stocks do not get rewarded for assuming company specific risk. These risks can be diversified away by holding a portfolio of stocks. The 'market' or 'systematic' risk of the portfolio, rather than astuteness in the choice of individual securities, determines the investors' long-run return. Efforts to analyze a company's prospects carry little reward because the market price already reflects all available information. Investing in start-ups represents a qualitatively different game. Discrimination among opportunities is crucial, because investors cannot take a free ride off the research and due-diligence incorporated in 'market prices'. While prudence demands some diversification, diversification is not an adequate substitute for choosing individual investments carefully.

Buying twenty randomly selected stocks listed on the New York Stock Exchange eliminates most company-specific risk and provides returns that track those of the overall stock market. Historically, this has amounted to about 10% per year. Providing venture capital to twenty random entrepreneurs (out of more than half-a-million startups a year) will likely provide, given the dubious prospects of most new businesses, a return of close to zero. Moreover, backing randomly selected ventures without doing any screening makes investors vulnerable to opportunistic or self-dealing founders. Dispersed investors in startups do not enjoy the protections available to minority shareholders in public companies through the SEC, stock exchange rules, the scrutiny of analysts, and the threat of takeovers. Therefore, we should expect investors to analyze each venture they back carefully. We should also expect investors to expend resources in negotiating prices and terms; investors in startups cannot count on the trading and arbitrage in public markets that equilibrates the expected risks and returns of individual securities.

Investors in startups also have an incentive to provide considerable monitoring and oversight of the venture's ongoing performance. In public markets, the diversified investor's ability to monitor and to intervene is low. Firms cannot engage in meaningful dialogue about strategy and performance with

widely dispersed public investors; consequently stockholders lack the confidential information to monitor managers and distinguish between their luck and skill. Free-rider problems also undermine incentives for stockholders to intervene; the stockholder who incurs the costs of inducing a firm to change its strategy or management must share the benefits with the other stockholders who did not make the effort.[162] Investors (such as index funds) therefore take a passive approach and make no effort to evaluate firm management; others follow the so-called Wall Street rule of selling a stock if they are unhappy. In small, private firms, however, investors can demand access to the information they need to evaluate performance. Free rider problems are mitigated by smaller investment groups and the lack of liquidity precludes investors from avoiding intervention by selling their holdings. The extent and quality of monitoring, therefore, influences investors' returns.

Partnership Terms

VCs, who invest others' funds rather than their own capital, face additional incentives to institute systematic procedures and criteria for evaluating and monitoring investments.

Wealthy individuals, pension funds, and other entities who have the capital to invest in start-ups often lack the resources (or confidence) to evaluate and monitor such ventures. Instead, they invest in limited partnerships organized by professional VC firms. Under the terms of such partnerships, VCs have broad discretion over the funds under management. At or before the expiration of the life of the partnership, usually within ten years, VCs sell the illiquid holdings of the partnership for cash or convert them into marketable securities and return the proceeds to their clients. For the services they provide, VCs receive a flat annual fee (usually 1-2% of assets managed) as well as a "carried interest" or share (on the order of 20%) of profits generated for clients.[163]

These terms may be contrasted with the arrangements that investors have with the so-called 'investment advisors' for publicly traded securities. Investment advisory activity that does not involve as much due diligence and oversight, easily can be scaled up—it does not take much more effort to invest $1 billion in liquid securities than it does $100 million. The typical investment advisor, therefore, handles substantially greater funds than a VC. An advisor serving institutional clients with less than a few billion dollars under management is considered small, and many advisors manage tens of billions of dollars. The average VC partnership, in contrast, is well under $100 million. Investment advisors also usually receive a smaller annual fee (ranging from 0.1 to 0.6% of assets) from institutional clients and do not share in the profits of the portfolio. And, because holdings are liquid, clients can withdraw funds from or terminate the services of an investment advisor at any time.

The terms of their deals with clients encourages VCs to formalize their investment processes and criteria. Limited partnership structures allow VCs to avoid the delays and leakage of sensitive information that might result from having to raise funds for individual investments; but, they also require clients to cede full control over investment decisions to VCs for an extended period. The 'carried interest,' which gives VCs a share of the profits but not of the losses, creates an incentive to invest in excessively risky projects. VCs therefore

institute—and advertise—procedures to reassure clients that they will not abuse their discretion by making reckless investments. And, when successful VCs, raise seek to raise new funds, they try to convince potential investors that their past records are the result of a systematic investment process rather than say intuition or luck.

The evidence seems to bear out the claims VCs make to market their services. Professional VCs do seem to devote considerable effort to performing due diligence, structuring deals, and providing ongoing counsel and oversight. Partners in VC firms, Sahlman reports, usually have responsibility for just under nine investments and sit on five boards of directors. They visit each company they have invested in about 19 times a year and spend 100 hours in direct contact (either on site or by phone) with the company. They "help recruit and compensate key individuals, work with suppliers and customers, help establish tactics and strategy, play a major role in raising capital, and help structure transactions such as mergers and acquisitions. They often assume more direct control by changing management and are sometimes willing to take over day-to-day operations themselves."[164] Lerner's study of VCs who serve on the board of the companies in their portfolios suggests that their involvement becomes more intense around events such as the turnover of the chief executive and that they tend to serve on the boards of companies that are located close by.[165]

Typical Criteria and Process

As with corporate initiatives, the limit to the number of deals VCs can effectively manage establishes a high threshold to the total return they require from each deal. Instead of fragmenting their time across many small opportunities, VCs prefer to concentrate on a few ventures that have the potential—based on objective or verifiable data—to make substantial absolute returns. Significant failure rates and limited time horizons reinforce this preference. Even after extensive due diligence and monitoring, many VC investments yield disappointing returns: one study of venture capital portfolios by *Venture Economics, Inc.* reported that about 7% of investments accounted for more than 60% of the profits, while fully one-third resulted in a partial or total loss. VCs therefore avoid small opportunities where even substantial returns on a percentage basis will not cover the opportunity costs of their time or compensate for the other failures in their portfolios. Every venture they invest in must hold the promise to provide returns in the tens of millions of dollars, rather than in the tens or even hundreds of thousands.

The attractiveness of a venture also depends on how long VCs expect it will take them to "harvest" or cash out of their investment. VCs have to cash out before the life of their partnership expires. In a ten-year fund, a venture that does not fold typically is taken public or sold to another company within five years. This consideration also leads VCs to favor investments with the potential for large payoffs: small companies cannot afford the fixed costs of going public and then conforming to regulatory and reporting requirements.

A brochure produced by Primus Venture Partners describing the firm's investment criteria and process illustrates how VCs try to identify ventures that have the potential to generate high absolute

returns. The first "core requirement" listed in the brochure is "competent management with deep experience in the industry or markets they address." The second core requirement is the company's potential to become "a leader in its chosen market" by providing "distinctive products with a proprietary edge" or "unique services with strong customer appeal." The brochure also indicates that Primus expects to realize a return in a span of three to five years, has an "optimum investment size" of $1 million to $5 million and has some industry preferences, but is "more attracted to outstanding management teams" than to specific industries.

Primus's evaluation process, according to the brochure, begins with the review of a business plan developed by the entrepreneur seeking funding. The minimum information these plans must contain, according to the brochure, includes:

- A statement of the strategic direction the business is to follow and why that direction makes sense within the company's market or industry environment;
- A detailed description of the products or services to be provided with special emphasis on their proprietary nature;
- Profiles or resumes of the key managers;
- A brief analysis of the markets served and their outlook (e.g. the competitive climate, trends influencing projected changes in market size, the role of foreign competitors);
- Five-year financial projections on where the business can be taken in sales and profits over three to five years.

According to the brochure, if the business fits Primus's investment criteria and management has the necessary experience profile, Primus professionals then have extensive discussions with management and conduct a complete check of their references. They also independently investigate the company's products, markets and competition, conducting "as thorough a review as time permits in order to verify that management has a high probability of making their plan work."

Other VC firms have somewhat different criteria. Some have a stronger industry focus—Hummer Winblad for instance will only invest in software deals. John Doerr, of Kleiner Perkins, says he looks for "technical excellence; outstanding management; strategic focus on a large, rapidly growing market [and] a tremendous sense of urgency." Kliener Perkins seeks to "back ventures that are the first or second entrants in their markets, so speeding the product to market in advance of competition is absolutely critical."[166] But the core elements of Primus's approach—the need for proprietary products, experienced managers, minimum investment thresholds, and extensive due diligence—are fairly uniform across VC firms because they derive from a universal incentive to identify big winners. A small firm for instance, can be profitable simply as a result of an entrepreneur's personal drive, energy, relationships and so on: but a significant payoff, realized through the sale of the company or a public issue of its stock, generally requires something inherently proprietary in its products or processes.* Similarly, experienced founders

* There are of course exceptions to this general pattern. A renowned individual with exceptional skills or know-how may receive funding to find an opportunity and develop a business plan; this is not how VCs usually operate or advertise their value added to their clients.

significantly increase a venture's chances of attaining large scale quickly. Some untrained or inexperienced individuals may be able learn how to manage rapidly growing firms, but it is difficult, before the fact, for VCs to identify entrepreneurs with this latent capacity.

Unusual Founders

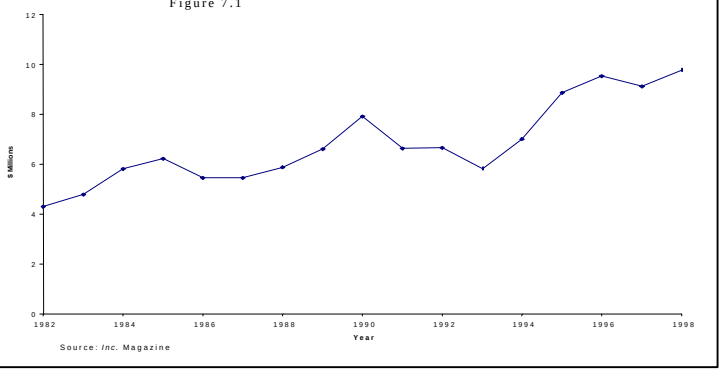
Few individuals start with the ideas and human capital necessary to secure VC funding. Mitch Kapor had adequate endowments to secure VC funding when he started Lotus in 1982; when Gates and Allen started Microsoft in 1975, they did not. (See insert "Meeting VC Criteria.") But most founders of new ventures are like Gates and Allen rather than Kapor; they do not meet VC criteria. This holds true even if one looks only at ex-post successes such as the founders of the *Inc*. 500 companies.

Initial Business Ideas. Most entrepreneurs do not have a proprietary product or service capable of generating significant revenues. They are often not the first or second entrants in their markets. As we have seen, they often copy the products of other firms. In other cases, they develop an idea independently but at the same time as many other entrepreneurs. In yet other cases, an entrepreneur's idea is easily imitated.

Usually the revenue potential of an initial concept is limited. Most entrepreneurs start off in small niches which cannot justify the million dollar investment thresholds of most VCs. Their immediate goal is to generate enough sales to cover their low fixed costs. Those who go on to make the *Inc*. 500 list subsequently add new customers or products but, as we have seen, this expansion is usually more opportunistic than planned. Investors cannot count on such an expansion at the outset. Entrepreneurs might be confident that they will find growth opportunities, but they cannot provide much objective data.

Moreover, even the exceptional, after-the-fact growth that the founders of the *Inc*.500 companies manage to generate often falls short of the magnitudes necessary to meet VC standards of success. Most companies on the *Inc.500* list are between five to eight years old—a five-year track record is a requirement for inclusion and less than 30% are older than nine years. Thus their typical age is somewhat

MEDIAN REVENUES OF INC.500 COMPANIES
Figure 7.1



greater than the three-to-five-year VC investment horizon. But, their revenues tend to be considerably less, even after eight years, than the revenues booked by VC-backed successes like Compaq and Lotus in their first couple of years. As **Figure 7.1** shows, companies on the *Inc.* 500 lists have median revenues

below $10 million. In contrast, the typical VC-backed company that goes public does so just five years after formation,[167] (see **Table 7.1**) with revenues in the prior year (that is, four years after formation) of about $37 million.[168]

VENTURE BACKED IPOS, 1984 - 1994

Table 7.1

Year	No. of IPOS	Average Offering Valuation ($ millions)	Median Age of Co. at IPO (years)
1984	53	65.9	5
1985	47	69.7	3
1986	98	86.7	5
1987	81	85.1	5
1988	36	91.8	5
1989	39	100.0	5
1990	42	109.3	6
1991	122	118.5	6
1992	157	101.7	6
1993	165	100.5	7
1994	136	86.8	7
Totals/Average	**976**		**5**

Source: *Venture Capital Journal* February 1995, p 45.

Human Capital. Most entrepreneurs don't have the experience that VCs believe is necessary to rapidly build and manage large companies. And, the entrepreneurs themselves may lack the confidence to pursue the growth rates dictated by the economics of the VC business. Some entrepreneurs we interviewed said that self-doubt about their management capabilities led them to avoid rapid expansion. Stephanie DiMarco, who co-founded Advent Software in 1983, had previously worked as a financial analyst and portfolio manager at the Bank of America, Summit Investments, and Cole Financial Group. These experiences exposed DiMarco to the opportunity for developing portfolio management software for PCs, but did not prepare her to run and manage a business. DiMarco recalls holding back on hiring a marketing manager because "it was important for me to learn the business myself before I hired someone else. I had never managed anybody before. Instead of trying to create an organization, I was trying to prove myself first."* As Advent's founders gained experience and confidence, revenues grew, from $167,000 in 1983 to $2.3 million in 1988. From 1988 to 1996, revenues grew nearly twenty-fold reaching about $40 million in 1996. In 1995 Advent completed a public offering of its stock at a valuation of just over $125 million. But, a rate of growth that satisfied DiMarco likely would not have been optimal from

* Asked what she might do differently if she had to start Advent over again, DiMarco said that she and her partner would "have grown the company faster" because they would "know how to run a company."

the point of view of a VC. Annual revenue of $2.3 million five years after start-up would likely not represent a stellar success to a VC whose initial investments are of that magnitude. Similarly, waiting twelve years for a public offering does not suit a limited partnership that is set to terminate after ten.

In exceptional cases, an inexperienced founder may team up with a seasoned manager; and in fact, VCs can help entrepreneurs create such teams. This requires, however, a high potential idea or technology. If, as is often the case, entrepreneurs start off with a me-too concept or a differentiated product for a small market, they cannot initially recruit partners or employees with the experience profile that a firm like Primus Ventures would consider necessary to fund the venture.

Contrast with Corporations

VCs have fewer resources to devote to scrutinizing and monitoring initiatives than do large corporations. VC firms have flat organizations comprising a small number of general partners and associates (who serve as apprentices to the partners). For instance, Institutional Venture Partners, a relatively large and prominent firm, Sahlman found, had just six partners and two associates managing funds of several hundred million dollars. Thus, the total pool of labor available to evaluate and monitor investments is low. In contrast, large companies like IBM have several layers of hierarchy, staffs at divisional and corporate levels, and large budgets for consultants available to scrutinize and monitor investments.*

The VC process also involves fewer checks and balances. As in any partnership form of organization, a general partner's decision to proceed with a project is subject to some 'mutual monitoring' by the other partners who have a financial interest in the returns. But, as a matter of practice, while the other partners may express concerns, they usually will not override one another's decisions. Unlike credit committees in some banks, which vote on loan applications, peer reviews in VC firms generally involve 'advice and consent.' In contrast, a decision to launch a new product at a company such as IBM or P&G has to be reviewed and ratified at several levels, with the input of various staff functions. And (unlike partners in VC firms), the individuals who evaluate and ratify the initiative usually do not have a financial stake in the project. They do not, therefore, have much of an incentive to say 'yes' without a thorough analysis.

Corporations also have significantly more capital available for investment than VCs, perhaps (per the Fama and Jensen analysis) because of the more extensive safeguards that their control systems provide investors.† As Sahlman points out, IBM spent three times as much on capital outlays and R&D in 1988 as the amounts disbursed by all professional VCs that year.[169] Similarly, Merck's budget for developing

* Note that my comments here apply only to the 'quantity' of resources devoted to evaluating new initiatives, not their quality or effectiveness.

† US regulations which encourage institutional investors to own the stocks of publicly traded corporations (Bhidé (1993)) may also limit the funds such investors will supply to private partnerships. Large, established corporations may also have advantages in exploiting large-scale opportunities. For instance, as we saw in the last chapter, they can use existing relationships and reputations to quickly secure customers, employees, credit and so on.

and marketing a drug or Intel's outlays on a single semi-conductor fabrication facility are larger than the total capital of many VC funds.

To summarize: The initial conditions in a VC-backed start-up are quite different from those found in a typical promising start-up. The founders of VC-backed firms have unique ideas and deeper managerial experience. They can therefore raise significant amounts of capital from VCs, who also provide more oversight and monitoring. The less qualified founders of promising ventures who copy or slightly modify others concepts cannot raise much capital and are also not answerable to their investors. VC-backed start-ups do not have access to as much capital and do not face as much scrutiny and monitoring as corporate initiatives, however. The configuration of initial conditions in a VC-backed startup thus falls between those of promising new ventures and corporate initiatives.

Meeting VC Criteria: Kapor vs. Gates

Mitch Kapor could obtain VC funding to start Lotus Development Corporation because he had the necessary endowments. Gates and his partner, Allen, who didn't, were forced to bootstrap. Although Kapor was not a corporate type—he had previously worked as a disk jockey and transcendental meditation instructor—he had a degree in cybernetics from Yale and had completed three-fourths of an accelerated masters in business program from M.I.T. Before launching Lotus, Kapor had successfully developed Tiny Troll, VisiPlot and Visitrend software and had been the product manager for Visicalc, the first electronic spreadsheet. Kapor made a significant personal investment to fund the early development of Lotus's software—he had earned more than $1 million from Tiny Troll, VisiPlot and Visitrend—and hired Jonathan Sachs who had fifteen years of programming experience. Sachs had already designed and implemented spreadsheet software for minicomputers. By 1982, the market potential for personal computers was well established. In 1981, 836,000 personal computers had been shipped and the Yankee Group was forecasting annual growth rates of about 66% per year. Visicalc had established spreadsheets as a viable product category—about one in three personal computer owners at the time used the software. In his business plan, therefore, Kapor could project revenue of $24.9 million by the third year of operation with conservative estimates of market share.[170] Additionally, according to Ben Rosen, the VC who backed Kapor, Lotus's first product, 1-2-3, was "significantly superior" to Visicalc.[171] IBM had just introduced the Personal Computer (PC). 1-2-3 took advantage of the new 16-bit architecture of the PC to provide more functions and sharper graphics than could the then dominant spreadsheet, Visicalc, on Apple's 8-bit machines.

In contrast, when Gates and Allen launched Microsoft in 1975, only a small number of hobbyists even knew about personal computers. Microsoft's first product did not have the potential to generate significant revenues. Steve Jobs had not yet conceived of the Apple. Kapor's 1982 business plan contained objective industry data on competitors, customer segments, the installed base of computers and so on. Given the nascent state of the PC industry in 1975, Microsoft's founders could not have drawn up such a plan. By objective standards, Microsoft lacked the "outstanding management" required by VCs like Primus. Gates was still a teenager and Allen only two years older than Gates. Both had dropped out of college. Compared to Kapor in 1982, they had limited business or industry experience or the capacity to attract seasoned personnel.

Microsoft, unlike Lotus, could not have productively utilized much start-up capital either. $4.7 million in VC funding allowed Lotus to accelerate its product introduction and launch 1-2-3 with the software industry's first serious advertising campaign. 1-2-3 quickly dominated the market for spreadsheets for the new 16-bit generation of personal computers. A slower roll-out or less aggressive marketing expenditures to lock in customers might have allowed the makers of Visicalc to catch up. The tiny hobbyists' market for Microsoft's BASIC for the Altair, in contrast, could not justify much investment in promotion, distribution or marketing. For Gates and Allen, therefore, start-up financing from VCs was neither feasible nor useful.

Moreover, even though Microsoft eventually overshadowed Lotus, it is not obvious that an investment in Microsoft would have produced a more attractive return for a VC over the usual three- to five-year investment horizon. Lotus exceeded its sales projections by a wide margin, shipping $53 million in its first year.[172] In October 1983, less than two years after receiving VC funding of $4.7 million,[173] Lotus went public at a valuation in excess of $200 million. In contrast, five years after launch in 1980, Microsoft was booking about $5 million dollars in sales from several niche products, without any imminent prospect of a public stock offering. By the standard of an average start-up, Microsoft made spectacular progress in its first five years and made the 1984 *Inc*. 500 list. But compared to VC-backed successes like Lotus and Compaq, the absolute increase in firm value in its early years was undistinguished—it took about nine years for Microsoft to book the same revenues that Lotus did in its first year, and ten years for it to go public.

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2. IMPLICATIONS OF THE INITIAL CONDITIONS

In the section below, we will discuss how initial conditions affect the opportunities VC-backed start-ups pursue, their approach to planning and to securing resources, and to their requirements for success. Reflecting the 'in-between' nature of the initial conditions, we will find that VC-backed start-ups have hybrid features (in terms of opportunities, planning and so on) that fall between those of promising and corporate ventures.

Opportunities

VC-backed start-ups seek to exploit larger and less uncertain opportunities than the typical promising venture; compared to corporate initiatives however, the size is smaller and the uncertainty is greater.

Uncertainty. The due diligence processes of VCs and their requirement for objective evidence leads them to avoid the types of uncertainty that the founders of promising ventures often exploit. VC-backed start-ups (like many promising new businesses) do seek to take advantage of exogenous change, but with two important differences that reduce the uncertainty of expected profits. First, VCs do not generally back ventures unless there is evidence, to use John Doerr's words, of a "large and rapidly growing" market. Thus, most VCs did not fund start-ups in the PC industry in the 1970s when there was great uncertainty about what large-scale needs, if any, PCs could satisfy. Second, VC-backed start-ups do not rely only on market turbulence. They start with some unique asset that the founders and VCs expect will distinguish the start-up from other players in the market and will afford some protection from adverse external

developments. Proprietary products and technologies are thus expected to mitigate uncontrollable market uncertainties.

Similarly, VCs usually will not fund businesses when profits depend primarily on an entrepreneur's personal ability to satisfy fuzzy customer wants. VCs expect their firms to enjoy high profit margins because of a differentiated product or technology. The entrepreneur has the responsibility for effectively exploiting this asset—a critical role which leads VCs to say that the quality of the founders is the most important determinant of the success of a start-up. But VCs generally do not fund ventures whose expected competitive advantages are more or less entirely embedded in the capabilities of the entrepreneur. The uncertain and unverifiable prospects of such businesses do not meet VC requirements for due diligence.

VCs do however have a greater tolerance for uncertainty and 'missing information' than corporations, because their decisions do not involve as much multi-party scrutiny. The greater discretion available to VC general partners allows them to rely on judgments about the entrepreneur and the opportunity to fill in gaps left by missing information. VCs who are in close personal touch with entrepreneurs can monitor the subjective quality of their ongoing effort instead of having to rely just on the numbers. Their carried interest or share of partnership profits also gives VCs a greater incentive (than corporate employees) to approve uncertain projects. Consequently they may be more willing to take a chance on new markets and technologies sooner than large corporations will.

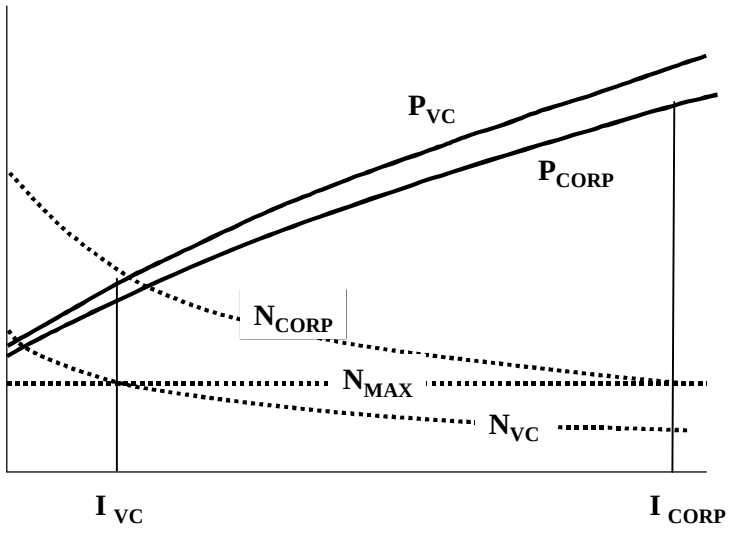
Size. VCs require, we have seen, their ventures to have the potential to generate much larger profits than the typical Inc. 500 start-up. Conversely, the availability of VC funding enables entrepreneurs to undertake larger ventures than they could through bootstrapping. At the same time, VCs do not control as much capital as corporate executives do and the new businesses they create do not have to be as large. A multi-billion dollar corporation has to create much larger profit streams to satisfy the growth expectations of its investors and employees than does a $100 million venture capital fund. Therefore the typical VC pursues smaller opportunities (in terms investment and total expected return) that does the large corporation. (See insert, 'Why VCs pursue smaller projects.')

Why VCs pursue smaller projects

By way of a simple illustration, let us compare the hypothetical corporation that we discussed in the previous chapter. Recall that this corporation has to generate $200 million in new profits with a VC fund whose goal is $100 million.

VC AND CORPORATE INITIATIVES

Figure 7.2



Note: N_{CORP} = number of projects the corporation must undertake to meet its $200m profit goals
N_{VC} = number of projects the VC firm must undertake to meet its $100m profit goals

As shown in **Figure 7.2**, the corporation faces a range of projects each of which requires an investment of I and is expected to produce profits of P_{corp}. The VC fund faces a slightly better distribution – investment I leads to profits of $P_{vc,}$– because it is willing to tolerate more uncertainty. As before, the corporation has a minimum requirement of six man-months for evaluation and monitoring, for which it has a total of 42 man-months available. The VC firm has both lower minimum requirements and available capacity, but in the same ratio, so that, like the corporation, it cannot undertake more than 7 projects. (N_{max}) The minimum profit per project required by the corporation is then twice that required by the VC firm ($28.57 million vs. $14.29 million). And, to the degree that the ratio of profits to capital per project declines with the size of the investment, the corporation's minimum investment per project (I_{corp})is more than twice as large as the VC's minimum investment (I_{vc}).

These differences in initiatives call into question claims about the inherent superiority of the decision making processes of VC firms. Some commentators suggest that the flatter structures and financial incentives of VC firms make their decision-making processes more efficient than those of hierarchical corporations. That is, VC's get more bang for their evaluation and monitoring buck. Such claims, however, overlook the relationship between due-diligence and access to capital. The more costly and

deliberate due diligence of large corporations gives them more access to capital and encourages them to undertake initiatives that require greater up-front investment. The more streamlined decision making of VC firms isn't better or worse – it is simply appropriate to a different kind of opportunity. The legendary venture capitalist, Arthur Rock and other investors could provide Robert Noyce and Gordon E. Moore $2.5 million needed to launch Intel in 1968. VCs cannot however fund projects like Intel's 1993 Pentium chip which required an estimated up-front investment exceeding $750 million.* Access to capital on this scale requires the more elaborate checks and balances that the hierarchies of large corporations provide.

Planning vs. Adaptation

VC-backed ventures rely more on prior planning and research and less on adaptation than do promising startups for many of the same reasons that we discussed in the chapter on corporate initiatives. With few exceptions, securing funds from VCs requires an entrepreneur to write up a business plan and to do some research on customers and potential competitors. The due diligence that VCs conduct before making an investment supplements the entrepreneur's research efforts. More planning is also merited by the greater complexity and investment requirements of VC-backed start-ups. Businesses like Compaq or Lotus, which are started on a much more ambitious scale than promising startups, involve the coordination of many more employees and functions, and therefore require more planning.

Similarly, although some adaptation to unforeseen circumstances is inevitable, VC-backed start-ups face less pressure to change their plans than do promising start-ups. The lower inherent uncertainty of the businesses and the greater initial research reduces the likelihood of surprises. The availability of capital reduces the incentive to deviate from initial plans. In contrast, the bootstrapped venture faces great pressure to generate cash; if the initial concept doesn't show positive cash flow, the entrepreneur has to change course quickly or wind up the business. The financial projections of VC-backed firms usually anticipate negative cash flows for several years, and, VCs expect that the projections themselves will be overly optimistic. "Everything takes twice as long and thrice as much money or thrice as long and twice as much money" is an often repeated adage in the business. Therefore, the failure to generate cash for a few years does not, by itself, force a change in strategy. In fact, to avoid diluting the focus on building long-run advantages, VCs often discourage entrepreneurs from pursuing short-term opportunities just to generate cash.

The nature of the entrepreneur's relationship with VCs also fosters adherence to the original plan. VCs and entrepreneurs often negotiate equity sharing arrangements based on the achievement of certain milestones. According to Gompers and Lerner, VCs can "significantly dilute the entrepreneur's stake in subsequent financings" if they fail to meet these targets.[174] Worse yet, admitting to an erroneous forecast can jeopardize the entrepreneur's job. VCs who have selected a venture from many proposals, conducted due diligence, and advocated making the investment to their partners, we may expect, develop a personal

* Intel's total investment in the Pentium over the life of the chip reportedly exceeded $2 billion.

commitment to the concept. If the entrepreneur subsequently proposes a radical change in course, VCs have to decide whether their initial assessment of the idea was erroneous or whether the entrepreneur lacks competence. The entrepreneur's claims about a new strategy rekindle memories of the confidence expressed in the original proposal. The investors have to wonder, "Are we being fooled twice?" Endorsing the proposed new strategy, rather than changing management, requires VCs to discard what seems like hard evidence of the entrepreneur's poor planning, bad judgment or overselling, and to admit the inadequacy of their own research.

The risk of being removed for proposing a radical change can, in turn, encourage entrepreneurs to try to make their initial plans work even when they lose faith in them. The former CEO of an advanced materials company described the pressures to stick with untenable strategies that outside investors can generate.

"When we started, well-defined markets for our materials did not exist. My first job as CEO was to figure out what product market we would go after, so I hit the road for about three months. I identified a product—aluminum oxide substrates—but by the time we got to market, the competition had improved and our substrates never really took off. I realized that, given our size, we should have been manufacturing to order rather than for the market at large. But by that time, we were already stumbling and I was losing credibility with the investors. They weren't interested in a new strategy. They just wanted the substrates to be profitable. I wish I had stood my ground and said, 'I'm turning off the furnace tomorrow.' But I didn't quite have the guts to do that."

Conversely, a VC's incentive to stick with a strategy, if not a specific founder, can lead to the eventual fruition of business ideas that self-financed entrepreneurs would have to abandon. For instance, National Demographics and Lifestyles (NDL) took four rounds of financing (see insert) before it achieved economic viability. Co-founder Jock Bickert, says that he and his partner seriously underestimated the capital and time it would take to reach the critical mass needed to become profitable. Without the support of VCs who were used to overly optimistic projections, the founders of NDL would not have been able to make a fundamentally sound concept work, although they might have successfully redirected their energies to a less capital-intensive enterprise. Whereas capital constraints may require bootstrapped entrepreneurs to quickly reorient their businesses, VC-backed entrepreneurs have the incentive and the option to stick to their basic concept.

This is not to suggest that VC-backed startups rigidly adhere to plans, merely that the nature of the entrepreneur-investor relationship make the degree and occurrence of deviations less than in self-financed businesses. And, when compared to corporate initiatives, VC-backed start-ups rely more on adaptation and less on planning. This is because the irreducible initial uncertainty is greater, the administrative costs of changing course are lower and the availability of capital and the capacity to sustain losses are not as great.

Sticking to Plan: The Case of NDL

Rob Johnson and Jock Bickert started NDL in 1976. They planned to collect data contained in the product registration cards purchasers of items such as refrigerators and stereos submit to manufacturers. The data would enable NDL to compile better marketing lists than those traditionally derived from motor vehicle registrations, telephone listings and so on. According to Tom Claflin, a VC who invested in the company, NDL "looked like a money-making business. The potential operating leverage was tremendous, even allowing for a certain degree of optimism on their part."[175]

In December 1979, NDL raised $1.2 million from VCs. But, by mid-1980 the need for more funding became apparent. Purchases of mailing lists required a minimum number of names and it was taking longer than expected to secure them from the manufacturers who controlled the product registration cards. Bickert and Johnson raised an additional $1.6 million which they estimated would be sufficient to generate positive cash flow. Again, however, NDL failed to meet its projection, forcing it to raise another round of financing. The VC, Claflin, commented:

> All the venture capitalists believe in the company, and in Jock and Rob. Yet this is their fourth time back to the well for capital, when the money raised in each of the previous rounds was supposed to have been sufficient. The company has consistently fallen short of its revenue projections. Although there has been definite progress, the company is once again coming back to the well, at a time when we are a long way from turning the corner. Before the venture group puts in another $1 or $1.5 million, we must address the key issue: is it just taking longer to prime the pump than we expected or is there something fundamentally wrong with the concept?[176]

The VCs ultimately did provide more money, which enabled NDL to turn the corner. A few years later, NDL was acquired for approximately $80 million to the great satisfaction and relief of the founders and VCs.

Securing Resources: Problems and Strategies

Problems. The problems VC-backed start-ups face in securing resources fall between those of bootstrapped ventures and of corporate initiatives. Like any de novo business, VC-backed start-ups face "a liability of newness." They have neither an existing source of profits that can sustain ongoing losses nor an established track record. Their customers and potential recruits face high switching costs. Some factors mitigate these problems, however. Proprietary technologies or other sources of competitive advantage increase the expected likelihood of survival; they can also provide a benefit large enough to offset the resource providers' fixed switching costs. The credentials, personal reputations, and prior relationships of the founders provide reassurance to resource providers. Founders who are generally more qualified than bootstrapped entrepreneurs and who have given up higher paying jobs, may also be expected to be more committed to the enterprise. Greater commitment may also be inferred from the larger initial capital that is sunk.

Venture capitalists contribute to the credibility of the start-up through their scrutiny and certification. Their financial reserves may not be of the same magnitude as those of a company like IBM, but they can certainly keep a business afloat longer than can a bootstrapped entrepreneur. Venture capitalists can also

draw on their own reputations and contracts to help the start-up secure customers, employees, suppliers and so on.

As with corporate ventures, however, the greater expected scale of success poses a quantity and quality problem for VC-based start-ups. A VC-backed start-up cannot earn a satisfactory return by securing a few customers, and cannot rely for its growth on the labor of the founders or inexperienced employees.

Strategies. Although VC-backed start-ups have more capital than promising ventures, they do not have the capacity of a corporation to underwrite others' risks, or (with some exceptions like Netscape) to 'buy' market share. So they have to use, at least to some degree, strategies that exploit others' cognitive biases that we have seen the founders of promising businesses rely on extensively. There are, however, two notable differences between the strategies of VC-backed start-ups and promising start-ups. First, the founders of promising businesses often have to undertake an exhaustive, hit-or-miss search to find the right customers. VC-backed start-ups, which typically serve more defined markets and have conducted more extensive prior research, can target their customers more easily. Second, promising start-ups often rely on employees whose alternative employment prospects are poor, because they cannot afford the salaries required to attract individuals with better qualifications and because a share of their equity has little perceived value. VC-backed start-ups can not only pay higher salaries, they can use stock or stock options as a recruiting tool, because experienced outside investors have ascribed a high value to their equity. Thus, whereas promising start-ups rely on offering an 'immediate' benefit, VC-backed start-ups can hold out a credible prospect of significant long-term returns.

Requirements for Success

In the previous chapter we saw that the quality of the initial plans played a more important role in the success of corporate initiatives than it does in promising start-ups and that organizational capabilities matter more than the talents of one or two individuals. In VC-backed start-ups we find that the soundness of the initial plan is more important than in promising start-ups, but that the capacity to refine and adapt the initial plan is more important than in corporate initiatives. Similarly, the joint efforts of a team play more of a role in VC-backed start-ups than in promising start-ups. But compared to corporate initiatives, this team is not as large or heterogeneous and the role of the top decision-makers is more critical.

Initial Plans and Conditions. Having the right plan or concept from the outset has greater importance in a VC-backed start-up than in a promising start-up. Promising start-ups are 'defined' mainly by their founders, rather than by some initial idea or technology; consequently the entrepreneur can radically change a flawed idea without terminating the 'business.' Moreover, with few employees or investors involved, the obstacles to change are not severe. A VC-backed start-up has, from the beginning, an identity and a life that goes beyond just its founders—it is 'defined' by its core idea or technology and by the VCs and employees enlisted by the entrepreneur to exploit the idea. And, as we have seen, the participation of these multiple players makes changing the core concept difficult. Few VC-backed

ventures, therefore, can survive major flaws in their initial plans and assumptions. When Momenta Corporation could not develop a pen-based computer with accurate handwriting recognition or Stardent stumbled in its launch of superfast workstations, the ventures folded. In such cases, little remains except perhaps the legal shell. Therefore getting the initial conditions and plans right is crucial.*

At the same time, the greater uncertainty makes it difficult for the decision-makers in a VC-backed start-up to anticipate contingencies to the same degree as in a corporate initiative. Therefore, the capacity to adapt (within the framework of the original concept or plan) to unforeseen circumstances plays a greater role in the success of VC-backed start-ups.

Team and Founder Contributions. In the typical promising venture, the entrepreneur's personal contribution has critical importance. The greater size and complexity of VC-backed ventures requires a larger team of employees whose joint efforts have a significant influence on the success of the enterprise. According to the folk wisdom of the VC industry, a great founder cannot compensate for a mediocre team. At the same time, the number of individuals and functions involved in a VC-backed start-up is often smaller than in a significant corporate initiative. Therefore the quality of these individuals (including the founders) and their interpersonal chemistry has a more significant role than the 'organizational' routines and cultures discussed in the chapter on corporate initiatives.

We may further note that the set of traits and skills that determine the effectiveness of the founders of VC-backed start-ups is broader than the set that the founders of promising start-ups need. Tolerance for objective risk (or low loss-aversion) can have a major impact on an individual's propensity to start a VC-backed business. Whereas the founders of promising businesses have little to lose, the founders of VC-backed start-ups can face significant opportunity costs. Direct financial exposure can also be high because VCs often encourage entrepreneurs to invest their personal savings (or sometimes the proceeds from second mortgages on their homes) in their ventures in order to demonstrate their commitment to the enterprise.

A long term vision and the ability to communicate it to others also play a more important role in VC-backed start-ups. In order to secure funding and recruit a top quality team, entrepreneurs have to envision and articulate a long term path which leads to the creation of significant new value in which others can share. The founder of a promising business, in contrast, can make do, at least initially, with opportunistic adaptation. Similarly, to launch a larger and more complex venture, VC-backed entrepreneurs also require administrative or managerial talents and experience, qualities that the founders of promising ventures, who do it all themselves, need not have.

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* To emphasize the point that there are no second chances, one entrepreneur distributed T-shirts emblazoned with a saber-toothed tiger to his employees. In attacking a mammoth, the entrepreneur told his employees, the tiger had one chance to kill. If the first attack failed, the intended prey would usually destroy its predator.

3. A TEMPORARY PHASE?

In the sections above I suggested that the relatively small number of VC-backed start-ups reflects a scarcity of entrepreneurs who have the ideas and qualifications to qualify for significant funding. Alternatively it could be argued that the VC industry is in a transitional state (See insert, 'A New Industry' and has not yet attracted its equilibrium level of funds. That is, the VC industry faces a capital shortage. As its funding pool increases, VCs will back more entrepreneurs and VC-backed start-ups will become much less unusual. Below I will argue, that whereas professional VC firms represent a relatively new form of financial intermediation, the notion of shortages of venture capital does not seem consistent with the distribution and returns of VC investments.

A New Industry

The VC industry has gained prominence and significant capital in just the last two decades. In the 1950s, with the exception of a couple of firms like American Research and Development (founded in 1946), professional firms that specialized in funding new ventures did not exist. The authors of a Federal Reserve study on venture capital note that in the 1950s many ventures were financed on "an ad-hoc, deal by deal basis" by syndicates of wealthy individuals and institutional investors organized by investment banks.[177] The Small Business Investment Act of 1958 provided for the establishment of Small Business Investment Companies or SBICs. SBICs, forerunners of modern VC firms, were intended to "provide professionally managed capital to risky companies" and could supplement their capital with Small Business Administration (SBA) loans. But, many SBICs "concentrated on providing debt financing to small companies that had positive cash flows" in order to "take advantage of the leverage provided by SBA loans." And, as an SBA administrator told Congress in June 1968, the SBA faced losses of about $18 million in the program because of "the wrong people who operate[d] SBICs." About a third of SBICs were "problem companies" because of "dubious practices and self-dealing." With tightened supervision, the number of SBICs fell from about 700 in 1968 to 276 in 1977.[178]

A "hot new issues market" in 1968-69 engendered a spurt in the formation of limited partnerships organized by professional VCs. In 1969 such partnerships raised a record $171 million. By modern standards, the partnerships were small, with funds between $2.5 million and $10 million, raised mainly from individuals. The next eight years saw modest growth, with about $100 million of new commitments to limited partnerships annually. "Numerous favorable regulatory and tax changes" between 1977 and 1980 led to "explosive growth" in the early 1980s. Commitments to limited partnerships in 1980-82 were two and a half times the commitments during the entire decade of the 1970s. Following this surge, commitments to VC partnerships fluctuated between $2 and $3 billion for the rest of the 1980s. Commitments fell in the 1990-91 recession, but then rebounded to reach a new high of $4.2 billion. [179] As shown in **Table 7.2**, overall the outstanding stock of venture capital rose eight-fold from $4.5 billion in 1980 to $34 billion in 1994.

VENTURE CAPITAL PARTNERSHIPS

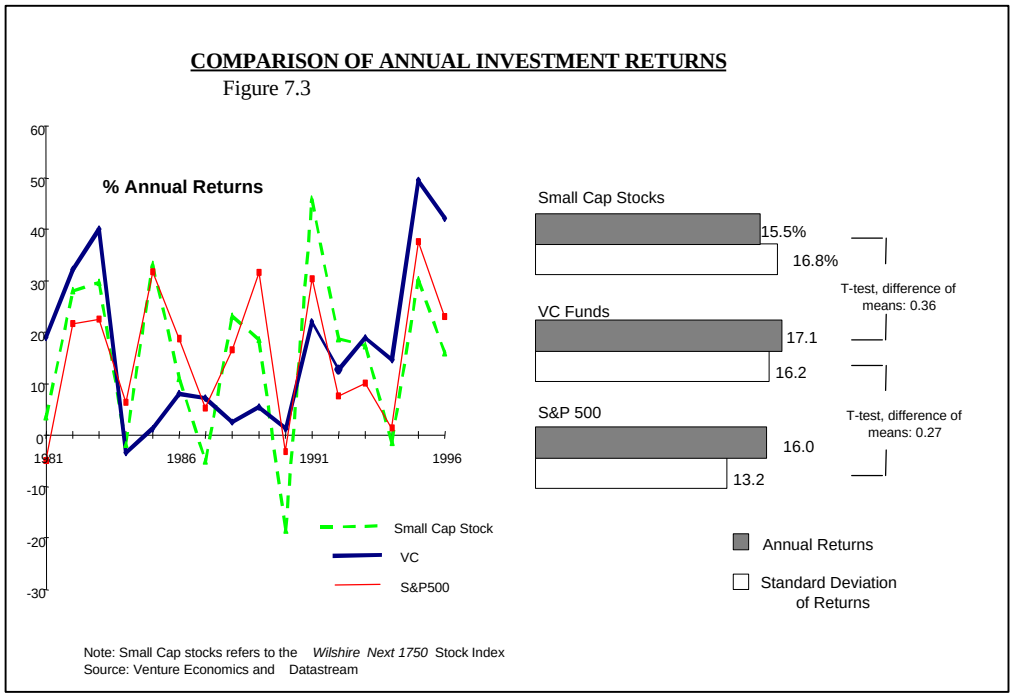
Table 7.2:

Year	New commitments to VC partnerships	Number of new partnerships formed	Average partnership size (millions of dollars)	Venture capital stock outstanding (billions of dollars)
1980	.62	26	28.0	4.5
1981	.83	40	24.3	5.8
1982	1.21	40	27.4	7.6
1983	2.49	76	39.1	12.1
1984	3.02	83	38.4	16.3
1985	1.77	59	32.8	19.6
1986	2.01	59	51.6	24.1
1987	3.11	78	43.7	29.0
1988	2.06	54	44.3	31.1
1989	2.76	64	47.6	34.4
1990	1.65	21	52.0	35.9
1991	1.37	21	50.8	32.9
1992	2.57	33	64.7	31.1
1993	2.89	37	78.9	34.8
1994	4.20			34.1
1980-94	32.56			

Source: Fenn, Liang & Prowse (1995) p 12-13.
In billions of dollars

Starting from a virtually non-existent base, the number of VC-backed start-ups has grown exponentially, but their proportion of the overall population of start-ups remains extremely small. In the record year of 1987, for instance, VCs invested in just 344 seed and start-up investments. The proportion of venture backed firms in the *Inc.* 500 lists of the 1980s and 1990s remained between 5 and 10 percent. Most of the *Inc*.500 founders I interviewed were aware of VCs but chose not to approach them or tried to raise VC funding and failed.

It could be argued that VCs have gained visibility but not sufficient funds. This reasoning suggests that if VCs had more capital they would relax the criteria they use and fund more start-ups. But if in fact capital shortages had led VCs to adopt overly stringent criteria, we should expect to see exceptionally high returns and low failure rates. In fact, as **Figure 7.3** shows, we do not find statistically significant differences between the average returns of VC funds and publicly traded stocks (which also offer investors greater liquidity). And, notwithstanding a careful selection process, a high proportion of VC-backed projects have failed to yield attractive returns. Even in the pre-1980 period, when we might expect the small number of VC firms to have been even more selective than they are today, the proportion of successful investments does not seem to have been especially high. For instance, the first modern,



professionally managed VC firm, American Research and Development (ARD) generated a 15.8% annualized rate of return over its 25-year existence as an independent entity from 1946 to 1971. But, excluding a single $70,000 investment in Digital Equipment (out of total investments of $48 million), ARD's annual returns were only 7.4%, compared to 12.8% on the Dow Jones Industrial average over the same period.[180]

VC returns in the last two decades seem to have followed a boom-to-bust pattern, suggesting capital "shortages" have been cyclical and temporary rather than chronic. Moreover, in periods of ample availability of funds, VCs seem to pay higher prices for the stock of businesses that fit their profile rather than to materially alter their criteria in the direction of the *Inc.* 500 type start-ups. Gompers and Lerner estimate that a doubling of capital available to venture funds leads to a 7% to 21% increase in the prices they pay for their stakes.[181] The "over investment" in favored companies and sectors, Sahlman's and Stevenson's paper[182] on the disk-drive industry suggests, then leads to low returns and a temporary "bust."

The distribution of VC investments also suggests that more capital would not necessarily lead to a large increase in the number of VC-backed start-ups. A significant and increasing portion of the funds raised in the so-called private equity market have been used for leveraged buyouts and other such investments in established companies. Fenn, Liang and Prowse, authors of a Federal Reserve study of the industry, argue that the shift away from 'traditional' venture capital investments has been "due principally to an abundance of profitable opportunities" in established companies rather than greater risk aversion or change in the culture of VC firms. Venture investing in the 1980s, they note, produced lower returns than non-venture investing, suggesting that "private equity capital has flowed to its most productive uses."[183]

Even in their "traditional" venture investments, VCs seem to favor 'later stage' companies over de novo ventures. The National Venture Capital Association's annual report shows that in 1996, 77% of companies receiving venture capital funding were three years or older. Over 80% had more than 25 employees. Similarly, data collected by Fenn, Liang and Prowse from the *Venture Capital Journal* shows that only about a third of investments are "early stage." Two thirds are "later stage" investments (see **Table 7.3**) in companies that Fenn et al write "have a proven technology and a proven market for their product. They are typically growing fast and generating profits." Such investments are "larger than early stage investments, ranging from $2 million to $5 million, and are held for a shorter term, simply because the firm is closer to being sold publicly or to another firm."[184]

INVESTMENTS BY VENTURE CAPITAL PARTNERSHIPS, 1980-94

Table 7.3:

Year	Total amount invested (billions of dollars)	Number of companies invested in	Average investment per company (millions of dollars)	Early-stage investments as a percentage of total
1980	.61	504	1.21	...
1981	1.16	797	1.46	...
1982	1.45	918	1.58	
1983	2.58	1,320	1.95	35
1984	2.73	1,410	1.96	34
1985	2.67	1,388	1.92	30
1986	3.22	1,512	2.13	35
1987	3.97	1,740	2.26	29
1988	3.85	1,530	2.52	29
1989	3.38	1,465	2.31	21
1990	2.30	1,176	1.96	30
1991	1.36	792	1.72	31
1992	2.54	1,093	2.33	24
1993	3.07	969	3.13	24
1994	2.74	1,011	2.71	37

Source: Fenn, Liang & Prowse (1995) p 14.

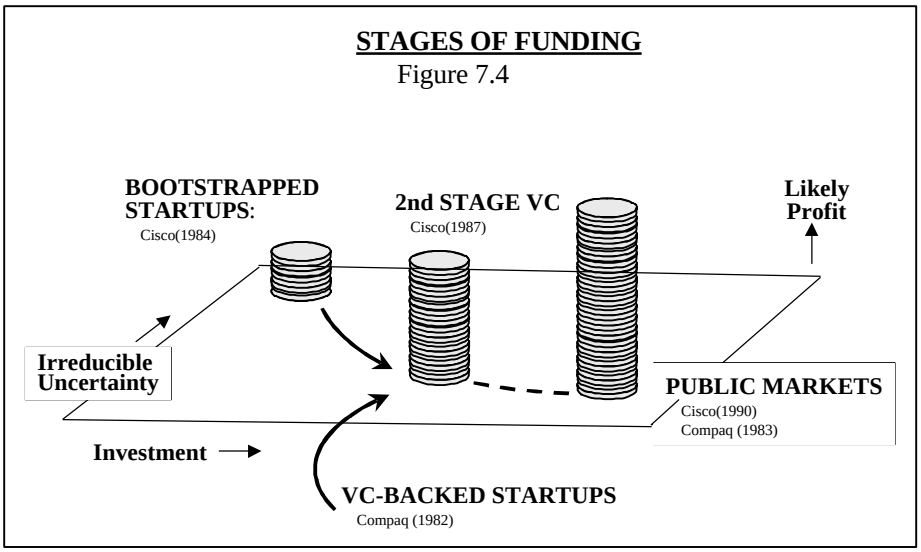
I do not mean to downplay the role of later stage investments. VCs for instance helped turn Cisco from a small, struggling enterprise into the world's leading supplier of the "routers" that link computer networks in different locations. Sandy Lerner and Len Bosak started Cisco in 1984. They put a used mainframe in their garage and persuaded friends and relatives to work for deferred pay.[185] They financed the venture by running up bills on their credit cards and at one point in 1986, Lerner took a job as a corporate data processing manager to provide more cash. In 1987 Cisco received funding from Sequoia

Capital. Cisco's founders and Sequoia agreed, according to partner Donald Valentine, that besides providing financing, Sequoia would find and recruit management, and we would help create a management process. None of which existed in the company when we arrived." Valentine hired an experienced manager, John Morgridge to run Cisco in 1989 who duly installed a professional management process and paved the way for an IPO in February 1990. As of November 30, 1998 the market value of Cisco's stock exceeded $118 billion. It booked revenues of $8.45 billion in 1988.

McAfee Associates founder John McAfee credits VCs for the transformation of his bootstrapped business into a large, publicly traded company. John McAfee started selling software to combat computer viruses in 1989. The company was entirely self-financed and the founder represented the company's entire management team until 1991 when he sold shares to two venture capital firms. The VCs recruited William Larson to become CEO. Larson, a veteran of Apple Computers and Sun Microsystem, and the VCs recruited other experienced managers, focused on the growing network management industry, made acquisitions to expand the product line and helped establish basic controls. In 1992 McAfee went public. On November 30, 1998 the company (renamed as Network Associates) had a market value of 6.6 billion and annual sales of about $900 million.*

The preference of many VCs for later stage investments has significance for my argument in what it reveals about their area of comparative advantage. The VC model best suits initiatives in the middle of the investment-uncertainty- profit diagram. VC funding allows only some exceptional ventures like Compaq and Lotus to start out in that space. These exceptions apart, firms receive VC funding *after* the high initial uncertainties about the size of the market and the profitability of the business have been reduced (see **Figure 7.4**). John McAfee had a profitable product and $15 million cash in the bank when he sold stock in his company to VCs. When Cisco secured VC financing in 1987, it faced a serious shortage of cash, but it was making profits. According to co-founder Bosack, the company was booking between $250,000 and $350,000 in monthly sales, "without a professional sales staff and without an official conventionally recognized marketing campaign. So it wasn't a bad business just right then." Up to that point, Bosack and Lerner had failed to get any funding – Sequoia was the seventy-seventh venture capital firm the founders approached. The low likely profit and high uncertainty associated with most start-ups seem incompatible with the structure and decision making process of the typical VC firm.

* VCs have played a less active role in other later stage investments. Microsoft apparently sold a small number of shares to VCs shortly before its IPO, mainly for the reassurance that VCs could provide to prospective public purchasers of its stock. Moreover a majority of companies, including Wal-Mart, HP, Oracle and Dell, make the transition to public ownerships without ever raising venture capital: between 1978 and 1997. According to data compiled by Gompers and Lerner (1999), the number of venture backed IPOs and a percent of all IPOs ranged from a low of 3.74% in 1979 to a high of 36.22% in 1995.



To summarize: The availability of appropriate investment opportunities rather than of capital limits the number of VC-backed start-ups. Perhaps Hewlett and Packard bootstrapped their company because there were not many sources of professional financing available for start-ups at the time. But capital shortages cannot explain the high proportion of bootstrapped *Inc*. 500 companies in the midst of a VC boom. An increase in the funds available will not make VC-backed start-ups a common phenomenon, unless there is a corresponding increase in the number of appropriately endowed individuals with proprietary ideas who want to start businesses.

4. SUMMARY AND CONCLUSIONS

VCs provide startup funding to an elite group of entrepreneurs who have innovative ideas or technologies and a verifiable record of business or technical achievement. The capital, ideas and expertise enables the startups to leapfrog into the middle region of investment-uncertainty-profit diagram – a place which takes promising businesses many years to reach. Compared to promising businesses, VC backed startups also rely more on prior planning and research and less on opportunistic adaptation. They can secure resources more easily but also face more stringent quality and quantity requirements. And, the talent and drive of the founders of VC backed startups represents one of several factors that determine the success of the venture.

CHAPTER 8: REVOLUTIONARY VENTURES

This chapter looks at ventures that offer a revolutionary new product or service. It represents the last stop in our tour of the investment-uncertainty-profit diagram. Section 1 summarizes the differentiating features of the archetype. Sections 2,3 and 4 illustrate these features with three examples of revolutionary ventures.

In the popular imagination, Fredrick Smith's launch of Federal Express represents the epitome of entrepreneurship. Smith had a bold vision for a company that would operate a national network of jets, trucks and personnel to provide reliable overnight delivery of letters and small packages. The charismatic former Marine Corps pilot risked his personal wealth, raised about $70 million—a substantial amount for an individual entrepreneur in the early 1970s – from outside investors and lenders, built a fiercely loyal workforce, lobbied regulators and politicians, and, after many brushes with bankruptcy made his company's service a ubiquitous verb ("to FedEx").

Although such stories are captivating, ventures like Federal Express that provide a revolutionary product or service lie far outside the normal pattern. Whereas VC backed startups are unusual, revolutionary ventures are extremely rare. Moreover, many transitional businesses pursue opportunities with the same investment, uncertainty and profit profile as VC-backed startups. In contrast, the region on the investment-uncertainty-profit diagram that revolutionary ventures occupy is sparsely populated. Only larger-than-life entrepreneurs can undertake initiatives that require large investment *and* involve high uncertainty.

Examining these outliers reinforces our understanding of more typical new initiatives. Given the small population of the revolutionary ventures, we cannot, however, illustrate their features with many examples. I will therefore use just three cases: Frederick Smith's Federal Express, Daniel Ludwig's attempt to develop a timber, pulp and farming enterprise in the jungles of the Jari region of Brazil; and Motorola's ongoing Iridium project to provide a global, satellite-based, cellular phone service.*

1. FEATURES

Below, I discuss the features of revolutionary ventures started by individual entrepreneurs; as we will see in Section 4, however, many of these features also apply to revolutionary corporate ventures.

Initial conditions. A revolutionary venture requires major new insight about customer needs; often, these needs are latent or not well articulated. Revolutionary ventures also typically involve creative new processes or technologies; opportunities to provide valuable products or services are rarely overlooked unless there are serious technological problems in providing them. For instance, the recognition of an untapped market for a reliable overnight delivery service was a necessary but not sufficient condition for

** The descriptions include more detail and color than I provided in previous examples in order to highlight the distinctive features of the archetype. I hope readers find the stories interesting; those who do not may skim sections 2,3 and 4.

starting Federal Express. In order to serve reliably a large network of cities with a relatively small fleet of planes, Smith and his associates also had to design a non-linear hub-and-spoke logistics system.

Founders of revolutionary ventures require considerable personal wealth, contacts and credibility in order to fund their ventures. Revolutionary ventures require substantial capital to develop and refine new technologies; to acquire dedicated assets or infrastructure (radical innovations often preclude the use of standardized or off-the-shelf inputs); to educate consumers and distributors about the benefits of the offering; and to cover losses until the venture attains critical mass. As one example, Smith had to raise substantial amounts of capital because Federal Express could not use commercial flights. To provide its unique service of overnight delivery, the company acquired a dedicated fleet of jets. The jets, a central hub, operations in 25 states and several hundred trained employees had to be in place before the company could open for business. The venture also had to absorb losses (amounting to over $29 million in its first 26 months of operations) before revenues became large enough to cover the high fixed costs of the enterprise.

Type of opportunity. Revolutionary ventures have to hold the promise of very large profits to justify the substantial initial investments. For instance, in order to raise capital for launching Federal Express, Frederick Smith had to demonstrate the potential for securing a significant share of an untapped $1 billion market. Billionaire Daniel Ludwig started on his Jari forestry venture anticipating a worldwide shortage of wood that would yield him profits on the scale of the fortune he had already accumulated in shipping.[186] Revolutionary ventures also involve significant uncertainty vis-à-vis customer preferences, whether the new technologies and processes developed will work, and sometimes, because of the size of the project, regulatory issues. In the case of Federal Express, for instance, the customers surveyed by market researchers said they wanted the option of reliable overnight delivery; but it was impossible to determine how many would actually pay a premium for the service and whether the hub-and-spoke transportation system would provide the reliability that was central to the idea. The willingness of the Civil Aeronautics Board (CAB) to grant the regulatory waivers Federal Express needed to fly its jets was also a source of uncertainty.*

Planning and Adaptation. Revolutionary ventures require extensive prior research and planning to attract capital on a large scale and to coordinate the deployment of heterogeneous resources: as we will see, Frederick Smith commissioned two consulting firms to undertake independent studies of the feasibility of the Federal Express concept. Unlike the founders of promising businesses who launch their business in weeks or months of getting their idea, it took Smith about eight years from the time he conceived of a business that would provide overnight delivery to the time it became operational.

* Unlike many promising or VC-backed start-ups, revolutionary ventures usually do not, however, seek to capitalize on exogenous turbulence. In fact, with great external uncertainty, customers and investors may be hesitant to back a radical product and technology until the environment settles down.

The scope for adapting or changing the basic concept (for the reasons that we discussed in connection with corporate and VC-backed ventures) is very limited after the business is launched. If the core assumptions of the Federal Express plan had been mistaken, the startup would have failed. But, given the high irreducible uncertainty which cannot be eliminated through prior research, the entrepreneur often has to change important elements of the plan; for instance, Federal Express had to adopt a new marketing approach in order to generate adequate revenues.

Securing resources. Revolutionary ventures face significant hurdles in securing resources of sufficient quantity and quality. They have to attract a large number of customers to cover fixed costs. The large size and high uncertainty also demands highly talented and motivated employees. To secure such employees, the entrepreneur has to rely on the potential of large long-term financial payoffs, as well as on the psychic benefits of participating in a revolutionary enterprise.

Requirements for success. To succeed, a revolutionary venture must fulfill requirements much more demanding than those met by the other types of start-ups we have discussed. The founder of a revolutionary venture must start with the right basic concept and cope with serious unexpected problems. Success requires highly skilled and cohesive teams as well as entrepreneurs with exceptional qualities and talents. The entrepreneur must have a high tolerance for uncertainty and for risk. As we will see in the Frederick Smith and Daniel Ludwig examples, entrepreneurs who dedicate themselves to a grand plan face huge personal losses if they fail.

Vision, tenacity, and charisma also are critical qualities for revolutionary entrepreneurs. Founders of promising businesses, we have seen, often start with a short-term opportunity rather than a long-term plan. Persistence with a failing concept can impair their chances of success. And as long as they can make a few critical sales, they do not need great charisma. In contrast, the revolutionary entrepreneur has to have an audacious vision and the fortitude to stay the course through serious crises and setbacks. The entrepreneur also needs an evangelical ability and personal magnetism to attract and retain investors, employees, customers and other resource providers.

2.FREDERICK SMITH'S FEDERAL EXPRESS

Frederick Smith's launch of Federal Express, illustrates most of the features of revolutionary ventures outlined above. Below I will describe Smith's background (or "endowments,") how he developed and researched the concept, secured the resources needed to launch the company and coped with numerous crises before Federal Express finally turned a profit. The facts and quotes I will use are drawn from *Absolutely, Positively Overnight* by Robert Sigafoos.

Background.

Frederick ("Fred") Wallace Smith was the son of a wealthy Memphis businessman (also Fredrick Smith) and his fourth wife, Sally. His father had made his fortune in fast food restaurants and a bus line: The elder Smith invested in a struggling restaurant chain called the Toddle House in 1934 and expanded

its operations throughout the United States. He also built one of the largest bus lines in the South, which Greyhound Bus Lines subsequently purchased. When Smith was born in 1944, his father was 49 and his mother 23. His father died when Smith was just four, and young Frederick was raised by his mother in Memphis.

Smith was born with a bone-socket hip disorder called Calvé-Perthes disease, which required him to wear braces and use crutches throughout grammar school. He grew out of the hip disorder and distinguished himself as a student leader and as an athlete at the prep school he attended.[187] He entered Yale in 1962. Unlike Gates, who did well in the graduate level math courses he took as a freshman at Harvard, Smith did not shine academically in college. He graduated with a B minus average and says he was a "crummy student."[188] Smith was also more sociable than Gates, however. He organized the Yale Flying Club, was elected to the prestigious Skull and Bones Society, and enrolled in the United States Marine Corps platoon leaders' program.

At graduation, Smith was commissioned as a second lieutenant in the Marine Corps and sent into active duty in Vietnam. By the time Smith was discharged in July 1969, he had attained the rank of Captain and been awarded the Silver Star, Bronze Star, two Purple Hearts, the Navy Commendation medal and the Vietnamese Cross of Gallantry. According to Sigafoos, Vietnam was "an awakening" for Smith, exposing him to a much less privileged world than that to which he had become accustomed to in Memphis and at Yale.*

In August 1969, shortly after his return from Vietnam, Smith purchased a controlling interest in a struggling Little Rock company called Arkansas Aviation Sales. His stepfather, a former general in the Air Force, had taken over the company, which provided maintenance services for turbo-prop aircraft and corporate jets, in 1967. Upon taking control, Smith turned Arkansas Aviation into an "aggressive business buying and selling used corporate jets."[189] Smith also began investing in real estate.

Smith's purchase of Arkansas Aviation and his real estate investments were financed through an inheritance he had received when he turned 21. Sigafoos does not provide the size of this inheritance but we may infer from subsequent events that it was of the order of several million dollars. Smith was also the beneficiary of a trust called the Frederick Smith Enterprise Company ("Enterprise Company"), whose assets included real estate in Memphis and Squibb-Beechnut stock worth about $13 million in 1971. Smith was the 38.5% beneficiary of the Enterprise company; two half-sisters, Fredette and Laura, had slightly smaller shares. The National Bank of commerce in Memphis acted as trustee. In 1965, Smith had joined the board of directors of the Enterprise Company and in 1971, he became president of the

*Sigafoos (1983) p. 26. Quite possibly the Vietnam experience helped mold a charismatic personality who evoked great loyalty. In the colorful words of an employee Sigafoos interviewed: "If Fred Smith lined up all 13,000 Federal Express employees on the Hernando de Soto Bridge in Memphis and said, 'Jump!' 99 percent of them would leap into the Mississippi River below. That's how much faith they've got in this guy." (Sigafoos (1983) p.23)

board. Enterprise and his personal inheritance would provide substantial funds for starting Federal Express.

By 1971 Smith had also established "a good credit relationship with the local banks." The bankers saw "a financial golden boy, bright, handsome, wealthy, self-confident, a battle-decorated leader possessing a proven business record—even though that record was less than 36 months old."[190] Thus when he started Federal Express, Smith had access to both debt and equity capital.

Developing the Concept

Smith had conceived of the original idea for Federal Express in the course of writing a term paper at Yale in 1965. The paper had suggested that there was "a huge market" for "an efficient service for moving high-priority, time-sensitive mail shipments like medicines, computer parts and electronics."[191] This market was not being well served by air freight shippers who relied on the passenger route systems: "Air freight would only work in a system designed specifically for it, not as a simple add on to passenger service."[192] Under the existing system, packages were "hippety-hopping around the country from city to city and from airline to airline before reaching their destination."[193] The paper did not provide much detail about an alternative system; it was a last-minute effort for which Smith famously received a grade of 'C.'

Smith returned to the idea after he began running Arkansas Aviation. Its first incarnation was a scheme to contract with the Federal Reserve System "to move cash letters within the system on an overnight basis."[194] The check-clearing process at the time was "cumbersome and inefficient. It often took two or more days to get checks sorted and distributed back through the system to the correct Fed district."[195] Smith proposed a scheme whereby "planes would pick up cash letters from 36 points in the United States, fly them to a central sorting hub, and, overnight, fly the sorted items to an appropriate drop-off point."[196] In May 1971, Smith asked the Enterprise board to provide $250,000 of seed capital to a company that would provide such a service. Smith promised to match the Enterprise investment with his personal funds. Upon receiving approval from the board, Smith incorporated Federal Express in Delaware on June 18, 1971.

On June 29th, Smith persuaded the Enterprise board to guarantee a $3.6 million loan in order to purchase two Dassault Falcon 20 Fan Jets from Pan American World Airways. Purchasing the two jets, Smith claimed, would convince the Federal Reserve that the new venture was serious and would lead to the grant of a five-year contract for transporting checks. With such a contract in hand, Federal Express could secure credit for buying more jets. Smith's half sisters and the other board members agreed to put up $4 million of Beechnut stock as collateral for the Falcon jet loan. Shortly after the planes had been acquired, however, the Federal Reserve project collapsed—the Federal Reserve District banks "could not reach a consensus on Smith's proposal. Each wanted to arrange for its own transportation network."[197]

Thus, by the summer of 1971, Federal Express was merely "a shell organization" with two jets, Smith, and two employees.[198]

Smith continued to pursue the idea of starting an air cargo company. An investment banker suggested that Smith commission a research study that would "verify what you think the status of the domestic air freight industry is like."[199] In December 1971, Smith retained national consulting firm A.T. Kearney (for a $75,000 fee) to estimate the market size, capital requirements and profitability of a business that would serve "businesses shipping priority items"—a clientele that would include banks, brokerage houses, department stores, and petro-chemical companies. Shortly after commissioning the A.T. Kearney study, Smith visited a much smaller outfit—the Aerospace Advance Planning Group (AAPG)—a New York-based consulting firm started by Art Bass, Vincent Fagan and Tucker Taylor, men who had previously sold corporate airplanes for Pan American Business Jets. According to Sigafoos, "Smith felt a special rapport with Bass, Fagan, and Taylor and hired them to duplicate the market study A.T. Kearney had just been hired to do," for the same $75,000 fee.[200] Neither group was told, however, that the other was at work on the same assignment.

According to Roger Frock, the New York-based consultant who led the A.T. Kearney study, Smith "really wanted to know if his concept was practical." Sigafoos suggests two other possible reasons that Smith paid $150,000 for two feasibility studies. He felt it "would require two independent studies to convince investors" and he "wanted statistical data on the market for priority air freight to take to the Civil Aeronautics Board."[201] Federal Express would require a special regulatory dispensation from the Civil Aeronautics Board (CAB) to use Falcon jets to haul air freight.

A.T. Kearney and AAPG took about six months to complete their studies—both consultants independently concluded that there was " a large untapped air freight market" for priority cargo which "represented over a $1 billion annual business." Overnight service was not available "within a network of at least 100 major cities." The consultants estimated that start-up costs would range from $6.5 million to $15.9 million and the business would be profitable within six to twelve months after launch.[202] Smith and the consultants also mapped out the following strategy for the business that would continue to operate under the Federal Express name:

The company would focus on small packages. According to Smith, Federal Express would not "carry mice and elephants on the same plane like a lot of [competing] cargo outfits."[203] Unlike other shippers, it would have its own jets and trucks in order to provide a high level of reliability.* Federal Express would provide overnight service "between most American cities, not just the major metropolitan markets."[204] To serve these many locations, the company would use the hub-and-spoke logistics that had been planned for the Federal Reserve business. The company would have 23 jets in service with three

* Responding to criticism that trucks and airlines were distinct businesses Smith observed: "A plane and a truck are both vehicles. One has a pilot, and one has a driver. What's the difference?" (Sigafoos (1983)p. 43.)

back-up planes. In order to maximize the use of the planes during the day, Federal Express would offer a same-day charter service to customers with extremely urgent needs.

Securing Resources

Smith had to secure a wide variety of resources to implement the plan to launch the venture. Below we will see how he acquired the aircraft, waivers from the Civil Aeronautics Board, personnel, infrastructure, customers, and capital that Federal Express needed for its overnight delivery business.

Aircraft. As previously mentioned, Smith had acquired two Falcon jets for a Federal Reserve Board contract that fell through. He quickly took steps to acquire more Falcons well before his consultants completed their feasibility studies.* In December 1971—the same month that Smith was commissioning the A.T. Kearney and AATG studies—Federal Express signed an option to purchase 23 Falcons from Pan Am's Business Jet division. Apparently the market for the Falcons had been depressed and Pan Am had stored these jets in the desert near Roswell, New Mexico, hoping for prices to rise. But a desperate need for cash forced Pan Am to enter into the following deal with Smith: Federal Express would pay approximately $1.26 million for each jet and would begin taking delivery about nine months later, in September 1972. Federal Express paid $1.15M to Pan Am for this option—money that it borrowed from a local bank against a guarantee extended by Enterprise, the Smith family trust company. In February 1972, two months after securing the Pan Am option, Federal Express purchased eight second-hand Falcons, financed with short term demand notes mainly from the Worthen Bank in Little Rock. With this purchase, Sigafoos writes, "Smith was elated. He felt he had cornered the market for Falcons and had purchased the planes at bargain rates."[205]

CAB waivers. Federal Express had to secure a special regulatory dispensation to use the Falcons. Air transportation was then closely regulated by the Civil Aeronautics Board. Smith planned to operate Federal Express as an "air taxi operator" to avoid restrictions on routes and schedules faced by "certified carriers." But, the Falcons that Federal Express planned to use violated the Part 298 regulations governing air taxis. Part 298 forbade air taxis from using airplanes whose take-off weight exceeded 12,500 pounds. Citing an unserved public need for overnight delivery, Federal Express proposed amending the regulation to limit payload capacity instead of take-off weight.

The CAB held hearings in January 1972. Smith's proposal to expand the capacity of planes flying under Part 298 authority drew strong opposition from certified carriers, especially local service airlines. The certified carriers claimed that the change would lead to unfair competition from air taxis operating outside the regulated structure. Nevertheless, Smith--assisted by respected Washington attorney Ramsey Potts--prevailed, and on July 18, 1972, the CAB amended Part 298. Later that year, the Hughes

*Sigafoos suggests that Smith "had his emergency exit covered:" If the air freight operation did not materialize, the Falcons could be sold at a profit (Sigafoos (1983) p.49.). This seems implausible: Smith modified the 12 seat corporate passenger jets for cargo use, at considerable expense, as quickly as he could. More likely Smith had prejudged the results of the consulting studies.

Air Corporation, North Central Airlines and the Air Line Pilots Association petitioned the United States Court of Appeals for a review of the CAB order. On December 5, 1972, the Appeals Court ruled that the CAB had acted properly in liberalizing Part 298. A Federal Express lawyer later observed that "if the court had ruled in favor of Hughes and the others, there wouldn't have been a Federal Express." An adverse ruling would have forced the company to go through a certification process which would have had a "crushing effect "on the company's ability to obtain financing.[206]

Personnel. In 1983, after Federal Express had become a billion dollar corporation, Sigafoos wrote that "Smith *is* Federal Express. He is as well known as the company. Most of the rank and file employees believe it; security analysts believe it; the competition believe it; and certainly Fred Smith appears to believe it."[207] But in spite of this close identification with his company, the success of Federal Express has been due, Sigafoos suggests, "to the huge contributions of a loyal and talented group of senior officers and managers" who " willingly accepted a secondary role when the publicity (sic) started flooding the media about Fred Smith and *his* Federal Express."[208]

Unlike Bill Gates and Paul Allen (as well as most of the *Inc*.500 founders I interviewed), who "did it all" in the early years, Smith relied heavily on others from the start. Smith retained two consulting firms to plan the venture and in his frequent visits to New York to review their progress, Smith would arrive with an entourage from Arkansas. Smith would bring with him a close aide Irby Tedder, attorneys Frank L. Watson, Jr. and William N. Carter of Little Rock, and Robert L. Cox, his personal attorney who was also secretary of the Enterprise Company."[209] In May 1972, even before the final A.T. Kearney report had been submitted, Smith began an extensive recruiting effort. Like many *Inc*. 500 founders, Smith hired some people he knew or people referred by friends and relatives. But he also went well beyond this ad-hoc recruiting to secure high-powered talent.

Roger Frock, who had led the A.T. Kearney study, was one of the first recruits. Frock was hired as general manager for $36,000 a year. While this was $1,000 a year more than Smith's own salary, it represented "a big pay cut" for Frock who had worked at A.T. Kearney for 10 years. Smith was "very persuasive," Frock recalls, offering an oral commitment that Frock would get stock if Federal Express became successful. Some months later, Art Bass, who had led the AAPG study, joined Federal Express to develop a marketing plan and handle industrial relations. Bass's partners, Taylor and Fagan, remained at AAPG but did considerable work for Federal Express. In 1974, they closed their consulting firm and joined Bass at the company.

Smith used executive search firms to recruit many key technical personnel.[210] His persuasive powers also played an important role. As Bass recalls:

> If anyone he wanted showed a reluctance to accept his offer, he'd really go to work on them. Fred's face would light, and he'd paint this glowing portrait of how Federal Express was to be a giant *Fortune* 500 corporation, and that they ought to be part of this adventure. Of course, Little Rock was the end of the Earth to some of these

> fellows and their families, but Fred Smith successfully overcame most of their concerns.[211]

The first pilots were either from the military or had experience flying Falcons as corporate jets. Smith also established a Veteran's Administration-supported Flight Training School in October 1972 to train pilots for the Falcons. The government paid most of the tuition for the trainees, producing "a double benefit"—a source of revenue and a pool of trained pilots.[212] The company closed the school a year later, after it had satisfied its need for pilots.

Infrastructure. Federal Express contracted with Little Rock Automotive (LRA) to modify the Falcons. LRA installed large doors (which were 74 inches high instead of the original 31 inches), revamped the interiors, installed avionics and painted the company name on the planes' exteriors. In early 1973, Federal Express purchased LRA outright.* The LRA acquisition provided Federal Express with a fully equipped hangar, a flight school, and office space.

In January 1973 Federal Express moved its base of flight operations from Little Rock to Memphis. The Memphis and Shelby County Authority had "an aggressive management interested in promoting additional revenue generating activities."[213] Smith knew the key people heading the Authority, and they agreed to lease Federal Express hangar facilities and issue bonds that would finance improvements of these facilities as well as the construction of administrative and cargo handling buildings. The public agencies in Little Rock would not match the Memphis package. "The favorable lease terms provided by the Airport Authority," writes Sigafoos, "were a stroke of good fortune...It is doubtful that any other major metropolitan airport would have made such a generous deal to an unproven company run by a 28-year-old with limited business experience."[214] Construction work began immediately, and by March, a relatively primitive "hub" capable of handling 10,000 packages per hour was in place. On March 12, 1973, Federal Express began offering its service to a network of 11 cities.

Customers. While Federal Express was building the infrastructure for its package delivery system, it sought other uses for its Falcons. The United States Postal Service was the company's first customer. Federal Express won a three-year contract to fly six mail routes starting on July 10, 1972. The company "low-balled" its bids "because Smith really wanted these contracts."[215] During that summer, Federal Express also sought to sell charter services to large industrial shippers. Ford Motor Company, for instance, contracted with Federal Express to fly a shipment of auto parts from Ypsilanti to Kansas City. Overall, however, this effort was not a great success. Smith tried to use his Arkansas corporate jet sales force to sell charter services; but "this flamboyant, unruly group," which was "used to selling million dollar aircraft and living it up on expense accounts"[216] did not readily adapt to their new assignment.

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* LRA was on the verge of bankruptcy because its main customer, Federal Express, had not paid its bills. Smith perusaded the Worthern bank to lend Federal Express $2.5 million for the purchase of LRA.

Finding customers for the company's core overnight package-delivery business also proved extremely difficult. The first night of service--March 12, 1973-- was, according to Mike Fitzgerald, head of the sales force was "a bust." The Falcons that flew into Memphis carried a total of six packages, one of which was a birthday present for Smith from one of his aides. This failure led to the realization, according to Fitzgerald, "that we didn't have enough cities and people hadn't heard of us."[217]

Federal Express expanded its network to 25 cities for a second try on April 17, 1973. This time the Falcons flew in a total of 186 packages. Sigafoos writes that "getting Federal Express known to the business public, and converting prospects into sales, was a hard struggle during the summer and early fall of 1973."[218] The nightly package count averaged 473 in May, 1,000 in late July and 2,517 in October. The facility however, was constructed to handle 10,000 packages *per hour*. With potential recruits, airport authorities, local bankers and so on, Smith could rely on his contacts, persuasiveness and vision. But to reach a critical mass of customers, dispersed throughout the country, required mass marketing. As we will see, the cash and time that it took to refine and implement an effective marketing strategy would keep Federal Express on the brink of bankruptcy for several years. It took over 27 months--not the six to twelve originally estimated--to build the volume of business needed to cover fixed costs.

Capital. In the early stages, Smith raised capital with relative ease. The initial requirements, although large by the standards of an *Inc*. 500 type start-up, were commensurate with Smith's personal wealth and credit capacity. The need for funds, however, quickly escalated: for instance, where the consultants had estimated that the initial start-up costs would range between $6.5 million to $15.9 million, Sigafoos calculates that Federal Express paid $56.1 million just for the purchase of the Falcon jets and their conversion from passenger to cargo use. Consequently, "Smith's enormous energy was almost totally consumed trying to get commitments from groups of venture capitalists and lenders. At the same time, Smith had at bay a legion of creditors demanding payment and threatening foreclosure, or its equivalent—confiscating the Falcons."[219]

As previously mentioned, Federal Express purchased two Falcons from Pan Am in the summer of 1971 with loans guaranteed by Enterprise, the family trust company. Local banks provided the loans to purchase another eight used jets in February 1972. In May 1972, with the preliminary results of the A.T. Kearney and AATG studies in hand, Smith sought long-term financing from Commercial Credit Equipment Corporation (CECC), a subsidiary of Control Data Corporation.* On July 8, 1972, CECC entered into a loan agreement with Federal Express to provide a 10-year, $13.8 million loan. The loan was secured by a mortgage on the 10 Falcons Federal Express owned. Sigafoos's account suggests (although he is not clear on this point) that the local banks that had provided the short-term credit to

* Smith had prior connections with CECC. While serving in Vietnam, Smith had used his inheritance to help his step-father acquire a controlling interest in Arkansas Aviation. Later, when Arkansas Aviation ran into financial difficulties and Smith had returned from Vietnam, he took control of the company from his stepfather, and

finance the purchase of the planes had not secured their loans with a first lien on the asset. In addition to the security of the planes, CECC relied on a personal guarantee from Smith and a $2 million guarantee provided by Enterprise. The Enterprise board also agreed to purchase $2 million of Federal Express common stock.

We cannot tell from the Sigafoos history how the $13.8 million was used. His account of the Arkansas banks' subsequent efforts to recover their loans suggests that Federal Express did not retire its short-term obligations.* Presumably the CECC loan was used to buy and convert more jets, establish the hub-and-spoke infrastructure, and pay for operating expenses. In any event, the $13.8 million loan and the $2 million Enterprise equity investment was not enough to pay for the 23 Falcons that Federal Express had under option. Smith would need to raise much more capital.

Smith had initiated discussions for financing Federal Express with the old-line investment banking firm of White, Weld & Co. in November 1971. It had been a White Weld partner who had advised him to commission a feasibility study. Smith was told that "third-party opinions greatly soothe the trepidations of venture capitalists." Smith had kept the White Weld investment bankers informed of the progress of the A.T. Kearney and AAPG studies; and they were, according to Smith, "extremely enthusiastic" about the prospects for Federal Express. In September 1972, White Weld outlined a rough plan to raise venture capital for Federal Express. A few months later, the firm "sent Homer Rees, one of its key people, to Little Rock for an extended period so he could assemble the operational and financial details of the company and examine Federal's corporate plan."[220]

White Weld's time table and due diligence prevented Federal Express from purchasing the Falcons from Pan Am before its option expired. The 27-year-old Smith had either underestimated or simply not considered the time it would take to raise capital when he purchased the option in December 1971; when it expired in September 1972, he had to agree to pay a higher price to extend the option for another month. At this juncture, Smith was probably maneuvering for time—White Weld had not even proposed a detailed financing plan, so there was no realistic possibility of paying for the Falcons. But, according to Sigafoos, if Pan Am had sold the planes to someone else, it would have "sealed the company's doom. Replacement Falcons could neither have been found quickly, nor on such favorable terms as had been granted by Pan Am."[221]

Federal Express negotiated a second delay in November 1972 and then asked for a third in January 1973. The January negotiations were "bitter" because "Pan Am desperately needed the cash." A Federal Express counsel, Frank Watson, an attorney for Federal Express, says the company was dealing with "unyielding and unpleasant" negotiators. Watson spent 23 days in New York working on a deal "to

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contributed equity to pay down some of the company debts. CECC had been one of the creditors helped by Smith's intervention.

* Sigafoos also notes that at the end of 1972, Federal Express's debt stood at $21.7 million. This number suggests that the company continued to owe about $8 million to its banks.

keep Pan Am from selling the Falcons out from under us...We had to play real hard ball to keep the agreement alive...Federal Express almost died at the bitter meetings." Under the terms of the agreement that was eventually signed, Federal Express gave Pan Am warrants on its common stock. Federal Express could buy the Falcons until May 15, 1973, but every day it delayed after March 31, it would incur a price increase of $1,500 per plane. May 15 thus became, according to Sigafoos, a "do-or-die target date."[222]

While Federal Express was negotiating with Pan Am, White Weld was completing its financing plan. On February 2, 1973, it offered a proposal to raise $6 million in equity and $4 million in subordinated notes (with attached warrants) for Federal Express. The $10 million would provide working capital for Federal Express and would also enable the company to raise an equivalent amount of bank debt. White Weld did not guarantee it would succeed in raising the funds; rather it promised to use its "best efforts."

White Weld also asked Smith to contribute an additional $1.5 million of equity to Federal Express. By then, Smith and Enterprise had already invested $3.25 in the company's equity. Apparently, because relations with his half-sisters had become strained, Smith did not want to ask them to authorize a further Enterprise investment. Instead, he submitted a fabricated copy of a resolution of the Enterprise board to the Union Bank in Little Rock to obtain a $2 million loan. The resolution purported to secure the loan through the assignment of a stock repurchase agreement between Smith and the Enterprise company. Smith forged the signature of the board secretary, Robert Cox, on the resolution. Later, when the forgery came to light, Smith would face serious legal consequences. But in February 1973, argues Sigafoos, "there can be no doubt that without the Union Bank loan, Federal Express would have collapsed."[223]

Although Smith may have averted "a collapse," he and White Weld were unable to raise the $20 million. By the end of April 1973, Federal Express had accumulated losses of over $4.4 million. "Most of what Fred Smith had personally invested, as well as what Enterprise Company had invested, was gone," writes Sigafoos. "Once again, the end appeared imminent."[224] And once again, Smith raised a $1 million short-term loan using a fictitious Enterprise board resolution.[225]

On May 4th, just 11 days before the Pan Am option was scheduled to expire, a White Weld partner arranged for Smith to meet Henry Crown. Crown, an industrialist and financier, was the controlling stockholder of General Dynamics, an industrial conglomerate.* Crown was impressed with Smith's presentation, and the following week organized several meetings between Smith and General Dynamics executives. On May 12th, General Dynamics signed an agreement guaranteeing loans to Federal Express totaling $23.7 million in return for an option to buy 80.1% of Federal Express for $16 million. The agreement gave General Dynamics three months to decide whether to exercise its option; if it did, Federal Express would effectively become a subsidiary, but if General Dynamics decided against

*Crown, whose personal wealth exceeded a billion dollars, also had large real estate investments and owned a significant portion of Hilton Hotels stock.

investing in Federal Express, its loan guarantee would terminate. (General Dynamics would still receive six percent of Federal Express stock for having provided a three-month loan guarantee).

The solution was short-term, but it did enable Federal Express to exercise its option to purchase 18 Falcons from Pan Am.* Chase Manhattan, General Dynamics's corporate bank, provided a four-month loan, secured by the 18 jets. To protect the value of Chase's security, the loan agreement prohibited Federal Express from converting the jets to cargo use. Federal Express personnel ignored these prohibitions.[226]

General Dynamics sent a 15-person technical team to investigate Federal Express's business—as we have seen, Federal Express had already begun operations. The team "interviewed all of Smith's key people, examined the company's plans, and prepared 'best case,' 'middle road,' and 'worst case' forecasts."[227] Engineers on the team tested the landing gear, cargo handling capabilities and the operational characteristics of the Falcons. On July 12th, the team submitted a favorable report on the "excellent results" that Federal Express had already achieved and anticipated that it would operate profitably in the fiscal year of 1974.[228] Nevertheless on July 19, 1973, the General Dynamics board decided against exercising its option to purchase Federal Express stock. The board was concerned about CAB regulations that might block its investment, as well as the possibility that the Federal Express investment would distract managerial efforts from more urgent problems that General Dynamics faced.

General Dynamics did, however, agree to extend its guarantee on the Chase loan. It also indicated a willingness to invest $5 million to purchase a minority interest in Federal Express—a non-controlling stake would not expose General Dynamics to regulatory issues with the CAB.†

On July 23, 1973, White Weld, now joined by New Court Securities, resumed its efforts to raise capital for Federal Express. Again the goal was to raise $20 million in venture capital and a similar amount in long-term bank loans. In addition to the $5 million General Dynamics had said it would probably invest, the Prudential Insurance Company had indicated it would invest $5 million. Prudential did not normally invest such large amounts in start-ups, and earlier in the year it had written to Smith indicating that it would not invest in Federal Express. Apparently, the intercession of Arkansas Congressman Wilbur Smith, Chairman of the House Ways and Means Committee, caused a change of view at the Prudential. (Mills had also called Henry Crown earlier to recommend Smith.)[229]

In order to raise the remaining $10 million, White Weld and New Court called the venture capital groups at Citicorp, Bank of America, first National Bank of Chicago, Allstate Insurance, as well as several private limited partnerships. Those who showed interest were invited to Memphis for presentations by Federal Express and by the General Dynamics team that had just completed its feasibility

* Apparently, Federal Express had already purchased five of the 23 jets it had under option.

† General Dynamics also helped Federal Express by purchasing one Falcon from Federal Express for $1.55 million and leasing it back. The transaction helped mollify the Worthen Bank of Little Rock which had provided the financing in 1972 and was now threatening to call its loan.

study. In October 1973, the investment bankers had lined up 23 investors who pledged a total of $23 million.

Bank loans were secured after extended negotiations. Chase Manhattan, the First National Bank of Chicago and a group of regional banks agreed to provide a $20 million revolving line of credit, and a second tranche of $5 million if Federal Express reached certain financial targets. To secure this credit, the Enterprise Company had to invest an additional $4 million. On November 6, 1973, Smith got the Enterprise board to make an equity contribution of $1.5 million and a subordinated loan of $2.5 million to Federal Express. A board member representing the trustee bank commented that they had little choice: "Enterprise stood to lose $5.4 million if Federal Express closed its doors. We had a tiger by the tail and we could not let go at this point."[230] With the additional investment, Enterprise's exposure stood at $6.25 million. Smith had already invested $2.5 million of his own funds, so the family had put in a total of $8.75 million. Finally, on November 13, 1973, the closing of the financial package, amounting to $52 million, took place.

As the investment banks put together the financing between July and November, Federal Express faced "mounting vendor suits"[231] for failing to pay its bills. The State of Arkansas pressured the company for unpaid sales and use taxes. On September 14, 1973, Smith sent a memo to employees asking them to delay cashing or depositing their payroll checks. The Worthen Bank of Little Rock had lent Federal Express amounts far in excess of its loan limit for borrowers and had also syndicated some loans to several small Arkansas banks. Worthen Bank's staff visited Federal Express every week to press for repayment. According to an old-time employee, "Every time Worthen's people came around, word was passed to keep the Falcons from landing. If they had chained the planes, that would have been the end of Federal Express."[232].

It might be argued that Smith acted imprudently in buying the options on the Falcons and launching the operation in March 1973 before securing the capital he needed. This financial brinkmanship, however, may have been necessary: Crown, General Dynamics, and the VCs might not have funded Federal simply on the basis of a paper plan drawn up by a 28-year-old.

Reaching Profitability

The November 1973 financing enabled Federal Express to pay off existing creditors but did not leave much of a cash cushion. The company was still operating well below its break even point. Federal Express and Smith would have to overcome several more difficult years before its financial situation finally stabilized.

Fuel shortages represented one unexpected problem. As a result of the oil crisis of 1973, the Federal government started rationing fuel to airlines on November 1, 1973. Allotments were to be based on 1972 consumption levels, but because Federal Express had not started operation until April 1973, there was no benchmark available to determine its quota. According to Sigafoos, "Smith and his assistants swarmed on the newly-created Energy Policy Office of the Department of the Interior in Washington to

plead for special consideration."[233] The Energy Policy Office agreed to give the company an allotment of 40.9 million gallons. The amount "turned out to be far in excess of its actual need;" Federal Express would not reach this level of consumption until the late 1970s. The "generous allotment," Sigafoos writes, "raised the eyebrows of many in the airline industry. Here, they said, was a company getting special consideration which after eight months of operation had taken in only $2.4 million in revenues."[234]

In the fall of 1973 the company adopted new approaches to sales and marketing. In September, Ted Sartoian, a former UPS salesman, was made head of sales. He replaced Bill Lackey, whose previous experience had been in selling corporate jets. Sartoian implemented the "team selling" approach used at UPS. He led, Sigafoos writes, "sales teams of eight persons into different cities to contact in a one or two-week period all the big shippers in those cities. It was a quick-hitting, saturation campaign designed to get immediate results."[235]

Federal Express also reoriented its customer focus in late 1973. After "much experimentation," according to Sigafoos:

> Company planners realized perhaps they should have been trying to attract the same type of customers as Emery Air Freight instead of those using UPS. Emery had traditionally done a heavy volume of business with industrial customers. UPS served a much different clientele and carried primarily consumer-oriented, non-priority-type parcels.[236]

The arrival of Vince Fagan as Senior Vice President for Marketing led to yet another shift. Unlike the former UPS employees, who had hitherto shaped the marketing approach at Federal Express, Fagan believed that calling on prospects in person was "costly and non-productive."[237] Resources devoted to the field sales force, he argued, should be used on advertising instead. Moreover, Fagan stressed the use of television ads, which other companies like UPS and Emery had never used. Another innovation introduced by Fagan was attention to the "front-door" market, comprising professionals working in fields such as law firms, financial services, consultants, and so on. Previously Federal Express (and other freight companies) had focused on shipping departments, mailrooms and loading docks—the so-called "back-door" market. Front-door customers had rarely shipped packages by air; but if Federal Express could get their attention, Fagan believed, these customers would provide large revenues.

Fagan's approach, according to Sigafoos, helped Federal Express recover from its disappointing start, but it did not produce immediate results. The company continued to struggle with cash flow problems in early 1974. Federal Express did not have the systems to collect on its receivables in a timely fashion; on average, customers were paying their bills nearly two months after their receipt. Some employees complained about delayed payroll checks; a disgruntled courier in Kansas City took the station manager hostage and threatened to "blow his head off" unless he was paid the $300 Federal Express owed him. (After some scrambling the $300 was paid and the station manager freed.)[238]

On February 12, 1974, the venture capital group and the lenders met to review the company's situation. Federal Express had failed to meet the revenue and profit projections that had been made in November, and in order to avoid (yet another) "financial collapse," the investors and lenders agreed to infuse another $6.4 million in equity and $5.1 million in debt.[239] This round of financing was scheduled to close on March 19th.

Thirteen days before the closing, however, Union Bank's attempts to collect on an overdue loan to Enterprise led to the exposure of the forgery Smith had committed the previous year. As mentioned, Smith had forged an Enterprise Board resolution to secure a loan from Union in February 1973. Now, when the bank sought to enforce the agreement contained in the resolution, the board informed the bank's officers that there was no such resolution. Smith then had to inform all the investors in the forthcoming financing about his misrepresentation. Smith claimed that he had intended to repay the Union Bank loan and he had been forced into his deception because he had been having a "recurring battle" with the Enterprise board about its continued support for Federal Express.[240]

On March 12th, the investor and lender group met in Chicago to consider Smith's future at Federal Express. The majority decided he should stay, writes Sigafoos, because "they realized he had a real power base": he had "the loyalty and dedication of his employees" and to outsiders "he *was* Federal Express."[241] The group did decide to recruit, however, an experienced chief financial officer and an experienced chief executive. After this meeting, the second round of financing was completed as planned on March 19th.[242] Peter Willmott started as the new Chief Financial Officer on May 6th. Willmott came from the position of treasurer of the Continental Baking Company and had previously worked as a management consultant at Booz, Allen & Hamilton and as an analyst for American Airlines. General Howell M. Estes, who had been serving as President of World Airways, a military and commercial charter airline, after his retirement from the Air Force, was recruited to be CEO. When he joined on June 1, 1974, Smith became President of the company.

Federal Express's survival remained doubtful through the summer of 1974. Shippers were "highly complimentary of the service Federal Express was providing," but "earnings were non-existent and there was no cash flow to pay off bank debt."[243] The company "faced a multitude of creditors ranging from the City of Detroit to their own employees. Airport officials in Detroit parked a fire truck in front of a Falcon one day because Federal had not paid the landing fee. Couriers often used their credit cards to buy gasoline for their delivery vans and sought reimbursement from the company later."[244]

After considerable effort, New Court Securities was able to complete a third round of financing in September 1974. Seventeen of the initial 24 investors subscribed to this round which raised $3.876 million. The low price of the new securities made it "very painful for those who chose not to take part."

The Enterprise Company, for instance, which did not invest, saw its share of Federal Express reduced to 0.4% even though it had put up 11 percent of the equity capital to date.*

Wilmott, who had found a "financial administrative mess" when he arrived, took about three months "to get financial numbers that investors could believe in." He also pushed for price increases; "contrary to the thinking of Smith and his staff, Wilmott felt that "if the company offered a quality service, customers would pay for it."[245] Wilmott's views prevailed and the company instituted several price increases in 1974. The inaction of competitors apparently limited the repercussions: if Emery or Airborne Express had competed aggressively for the priority small-package market, Sigafoos suggests, Federal would not have survived.[246]

General Estes lasted nine months. Smith was "always respectful" and did not have "open disagreements" with Estes but did not carry out his suggestions.[247] The "arms-length" relationship between the two men ended in January 1975. On the 21st of that month Smith informed the Federal Express Board that a federal grand jury was investigating his submission of forged documents to secure the Union Bank loan; his sisters had apparently taken up the matter with the Federal authorities. On January 31st, Smith was indicted for using false documents to obtain funds from Union Bank. That very night, Smith hit and killed a pedestrian. He was charged with leaving the scene of the accident and for driving with an expired license. (Smith claimed that he had failed to stop because he did not realize he had hit someone.[248])

On February 25th, the directors of Federal Express met to consider Smith's future with the company. General Estes and several others urged the board to terminate Smith. Other senior executives, however, told the directors that they would resign if Smith was fired, and that Federal Express would probably "cease operations the following Monday morning because of a mass walk out." That afternoon the board announced that it had "accepted with regret the resignation of General Estes" and had decided to reinstate Smith as Chairman.[249] Art Bass would take over Smith's position as President and would also serve as acting CEO until a new individual could be found for that position.

In December 1975 Smith was tried for submitting forged documents to Union Bank. According to Sigafoos, "Smith's defense was based on the theme, "I am Frederick Smith Enterprise Company." Smith testified that:

> Almost 50 percent of the Enterprise Company is Fred Smith, either personally or in trust for me. And I felt at the time that I was the Enterprise Company. It's as simple as that. And I felt that both of the sisters felt the same way. Both of them had written letters to the bankers that sat on the board saying, 'We support Fred Smith in whatever he wants to do.'[250]

* Smith apparently managed to avoid significant dilution of his personal stake. Before the financing he held a 9.8% voting interest, which was similar to the Enterprise Company's 9.25%. Presumably because Smith had the willingness and the resources to participate, his share after the third round dipped only slightly, to 8.5%.

Smith's counsel also had Smith "elaborate extensively on his Marine Corps combat experience in Vietnam and on his development of the concept which led ultimately to the formation of Federal Express."[251] After 10 hours of deliberation, the jury acquitted Smith. Smith had faced a five-year prison term if he had been found guilty.*

The company's finances also began to improve in 1975. In July 1975 Federal Express recorded its first monthly profit -- $55,000. Almost a year later, the company announced its first yearly profit, reporting a net income of $3.6 million for the fiscal year ending May 31, 1976 when it reported. In 1976, Federal Express also became the leading company in the small shipment market. Federal Express handled 19% percent of all priority air shipments under 100 pounds in the United States, whereas the next largest player, Emery, had a 10% share and Airborne Express had 5%.[252]

Two problems limited the company's profitability, however. First, Federal Express was reaching the capacity limit of its aircraft, while some of its "ground" capacity was underutilized. Federal Express asked the CAB to allow it to use DC-9s which had a larger payload as well as lower operating costs than the company's aging Falcons. The certified carriers opposed Federal's request, which the CAB denied. Smith lobbied Congress for legislative relief but failed to get it.

Second, Federal Express faced a heavy debt load, and through 1975 and 1976 had to seek rescheduling of its loan payments. The directors had decided to proceed with the preliminary steps for a public equity offering to reduce the company's debt burden in June 1975. The public offering had been held up, however, by a dispute over warrants that the company had previously granted to its banks. Smith claimed that he had "a right of first refusal" to purchase these warrants in consideration of the dilution he had suffered through successive rounds of financing. Smith "reminded the lenders that the Smith family had put over $8 million into Federal Express, and as of 1976, he held only an 8.5 percent interest, and the family-owned Enterprise Company only 0.4 percent."[253] The banks, however, refused to sell their warrants to Smith. As an alternative, the Federal Express board initiated merger talks with the Purolator Courier Corporation, but Purolator's management decided not to proceed.

Both problems were resolved after the passage of the Air Cargo Deregulation Act in November 1977. The Act, which allowed Federal Express to fly larger aircraft, considerably brightened the company's prospects and "triggered a positive attitude of all parties."[254] On April 12, 1978, Federal Express raised $17.5 million in a public issue of stock priced at $24 a share. The company also made a loan to Smith that enabled him to purchase warrants held by the banks at a price of $5.25 per warrant. (Each warrant gave the holder the right to purchase a share for $250.) Sales and profits grew rapidly thereafter. Federal Express received $1 billion in revenues for the fiscal year ending May 31, 1983 (up

* Smith continued to face a civil charge filed by his half-sisters that he had acted imprudently in investing Enterprise funds in Federal Express. Eventually in 1978, Smith agreed to buy his sisters' interests in Enterprise at a price which reflected their 1971 value. Thus, from Fredette and Laura's point of view at least, the venture was not a great economic success.

from $160 million in 1978) and $89 million in profits (compared to $19.5 million in 1978). Smith "emerged as one the new glamour symbols of the entrepreneurial world" and Federal Express became a "darling" of Wall Street.[255]

3. DANIEL LUDWIG'S JARI DEVELOPMENT

Daniel Ludwig's forestry venture, located at the confluence of the Jari and Amazon Rivers in Brazil, was, in 1981, the "largest individually owned tract" and the "largest tropical forestry company in the world," as well as "the largest project ever embarked upon by a private citizen without recourse to the capital markets."[256] It then comprised 252,000 acres of tree plantations; 2,600 miles of roads; 45 miles of railroad; a Kaolin mine; a pulping complex; and cattle, water buffalo, and rice farms, all "cloaked in secrecy and off limits to Brazilians."[257] The headquarters town of Monte Dourado, which had been built from scratch, accommodated a population of 30,000. Jari was also a colossal failure: Ludwig lost between half a billion and a billion dollars of his personal wealth on the project.

The stories of Daniel Ludwig and Frederick Smith differ in several ways. Smith was 27 years old when he incorporated Federal Express in 1971; Ludwig was 69 when he bought Jari. Smith inherited a small fortune; Ludwig had amassed wealth that put him in the ranks of the super-rich. Smith was a well-known public figure; Ludwig was "obsessed with privacy" and "almost unknown".*[258] Smith relied extensively from the beginning on the advice of consultants and associates, and evoked great loyalty from rank-and-file associates; Ludwig's methods were governed by "impulse" and "a supreme confidence in his intuition." He went through two dozen project directors at Jari, replacing them on average once every six months.

In the sections below, I will discuss Ludwig's background, how he developed the Jari idea and secured the resources needed to launch it and, finally, how the enterprise collapsed.

Background

Accurate details about Ludwig's background are difficult to come by, such was his penchant for secrecy. In 1957, when Ludwig granted his first —and last—in-depth press interview—to Dan Saunders of *Fortune* magazine—he was already the second-largest ship owner in the world and had accumulated a half-billion-dollar fortune. Ludwig provided the following account of his life to Saunders. He had started on his own as a ship owner and operator at the age of 20. He had struggled through the shipping slump after the First World War, started making some money hauling oil in the 1920s, and then had been almost wiped out during the Depression. In the mid-1930s, he developed the ship-financing scheme through which he would earn his fortune: he would secure a long-term charter from an oil company to haul its oil, and use the charter as collateral for a bank loan to finance the ship. The charter contracts would produce a small, steady income, and when they expired, Ludwig would own fully paid up ships.

Initially, Ludwig acquired old ships that he renovated; then, in 1939, he started his own shipbuilding operation in Norfolk, Virginia. During World War II, Ludwig secured government contracts to build tankers for hauling oil to Europe and the Far East. After the war, when the government did not need the tankers, it sold them back to Ludwig. Ludwig, now the fifth-largest ship owner in America, had the fleet to take advantage of the post-war shipping boom.

In 1951, Ludwig secured a lease from the Occupation Government in Japan on the former Imperial Navy Shipyard at Kure and moved most of his shipbuilding operation there. Over the years, Ludwig told Saunders, he had introduced design and structural modifications in shipbuilding techniques that reduced nonessentials and increased cargo-carrying capacity. He also believed in economies of scale:. He had started the race to build larger and larger supertankers with the 30,000-ton *Bulkpetrol* in 1948, and the Kure shipyard had enabled him to stay in the lead. In 1956, for instance, Kure had turned out the 84,730-ton *Universe Leader*, then the world's largest tanker.

Ludwig had also experimented with building self-unloading vessels for dry cargo (such as iron ore and coal) and versatile bulk carriers that could haul petroleum as well as dry cargo. To help fill his ships, Ludwig had diversified into activities such as mining, ranching, oil refining, and salt production in South America, Australia, and a variety of other locations. After the Saunders story appeared, Ludwig continued to diversify into real estate, hotels, banking, and financial services. When he started Jari, therefore, Ludwig had a variety of business interests that spanned the globe.

Jerry Shields, who wrote an unauthorized biography, *The Invisible Billionaire*, provides a more critical account of Ludwig's background. According to Shields, Ludwig was not quite self-made: he was the grandson of a well-to-do Midwesterner who had banking, lumber, and shipbuilding interests. Ludwig's father, Shields suggests, was closely involved in his early forays into shipping. He started off hauling molasses to Canada for a major bootlegging operation. In 1922, at the height of the Prohibition, Customs officials seized and impounded the *Mosher*, a ship co-owned by his father, with Ludwig onboard as engineer. The *Mosher* was carrying a large shipment of rum; Ludwig and his fellow crew were arrested, while his father absconded. But according to Shields, the father's connections in Washington forced the New York District Attorney to drop charges.[259]

In the 1930s and 1940s, according to Shields, Ludwig likely profited from his connections with public officials. For instance, during the war years, Shields suggests, Ludwig sold old ships to the government for "sums in excess of their market price"; chartered tankers for hauling oil at per annum rates which were "far in excess of their market price"; and collected in claims for lost tankers amounts that were considerably greater than their value.[260] He secured the 15-year lease of the Kure shipyard for $275 a month through the intercession of the State Department.[261] Shields does concede, however, that

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* When J. Paul Getty died in 1976, the *Sunday Times* of London wrote that "according to the experts, the man upon whose elderly and seemingly reluctant shoulders the mantle of 'Richest Man in the Word' must fall is the almost completely unknown American tycoon, Daniel K. Ludwig." (Blundy (1976)

"much of Ludwig's success was due to his willingness to venture where more timid entrepreneurs dared not go."[262]

Developing the Concept

In the early 1950s, according to Shields, Ludwig conceived of a scheme to grow trees on a mass scale on or near the Equator, where large tracts of land could be acquired cheaply. If he started planting in the 1960s, Ludwig felt, the trees would be ready for harvesting in the early 1980s, by which time Ludwig expected a worldwide shortage of wood. In the early 1960s, Ludwig began a search for a hardwood tree that would grow rapidly in a tropical climate. Most existing forestry operations involved softwood trees such as pines and firs which grew about twice as fast as hardwood trees; hardwoods would, therefore, continually be in shorter supply. Ludwig commissioned botanists and other scientists knowledgeable in silviculture to look for hardwood species that would grow as fast as a softwood in a hot, wet climate and would be versatile enough to provide the raw material for paper, pulp, lumber, and furniture operations.

A chemical engineer named Everett Wynkoop located the gmelina tree in Nigeria while he was conducting mining surveys for Ludwig. Wynkoop found the Nigerians using hard gmelina parts as props in the mines. The British colonial office had originally imported the tree from India and Burma; it was strong, durable, and grew at the extraordinary rate of a foot a month. Six years after planting a seedling, the tree would be used for pulpwood and, when it was ten years old, it could be harvested for lumber.

Ludwig then experimented with different locations to see where the gmelinas could be successfully grown. He found the seedlings did not thrive in Mexico, but did exceedingly well in Costa Rica, Panama, Honduras, and Venezuela. Other timber company executives who examined the "miracle tree" were skeptical: unlike other commercially grown trees, the gmelina grew somewhat crookedly and branched down to the ground and thus could not be used for long, straight, knot-free lumber. Ludwig, however, was undeterred: he had grown rich by "flying in the face of conventional wisdom and accomplished what lesser men deemed impossible or too risky."[263]

Another novel element of Ludwig's vision was to build "floating factories" in an industrialized country and tow them by water to the locations where the gmelinas would be grown. Ludwig initially planned to build two such factories: a pulp plant and an associated power plant that would generate the electricity for the pulping operation. Later, Ludwig would add a newsprint plant and a plywood factory.

The operation would be highly mechanized—Ludwig's experiences with building supertankers had convinced him of the benefits of substituting capital for labor (and the importance of economies of scale). Ludwig anticipated investing between $300-$500 million, on which he expected to earn a 30% return. Annual revenues were estimated at more than $300 million.

Assembling the Resources

In the early 1960s, Ludwig started looking for a location for his project. According to Shields, he was looking for a several-million-acre tract of cheap land near the Equator, with access to a deepwater plant, and located in a country whose government would grant attractive tax incentives and "keep its nose out of his business."[264] Ludwig had almost settled on Nigeria when Biafran separatists started an uprising there. Ludwig turned his attention to Brazil when the military overthrew the Goulart government in the spring of 1964. The new ruler, General Branco, reversed the previous government's "Brazil for Brazilians" program and sought to attract foreign capital.

In December 1964, Ludwig met the Brazilian Minister for Planning, Roberto Campos, in New York. Campos was especially interested in developing farms, mines, and lumber operations in the Amazon basin. One obstacle, according to Shields, was the so-called "Amazon Factor"—the belief that investments in the region were bound to fail.* Ludwig's interest was, therefore, unusual and welcome. Ludwig was still testing the gmelina seedlings, however, and it was not until two years later, in 1966, that he met with President Branco to discuss his project. Branco promised a 10-year tax holiday; the right to import equipment and materials without the payment of the usual duties; and, according to Shields, the assurance that Ludwig "could run his project in any way he saw fit without interference from the Brazilian government."[265]

In 1967, Ludwig purchased between 3.5 and 4 million acres lying on both sides of the Jari River (a tributary of the Amazon) for an estimated $3 million, or about 75 cents an acre. He opened bank accounts that initially would provide $600,000 per month of operating funds. He also hired an engineer, Rodolfo Dourado, to begin clearing the jungle.[266]

Ludwig did not attempt to determine whether gmelinas would adapt to the conditions at Jari before he concluded the purchase. Two of his employees, Kinkead reports, had surveyed the property on muleback and in dugout canoes, but "made no effort to test the soil."[267] The region had "no history of commercial forestry."[268] Outside of Antarctica and the Sahara, no place on earth was "as empty or underdeveloped." The climate was "merciless" with 100 inches of rainfall a year. It was infested with insect pests that could destroy crops and supplies overnight."[269] Malaria, yellow fever, and dysentery were rampant.

Ludwig did not seek to involve outside investors or debt because he wanted complete control. Similarly, everything within Jari—all the housing, transportation services, retail trade, and so on—would be owned by Ludwig. No other private business would operate within an area the size of Connecticut.

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* Henry Ford's attempt to develop a rubber plantation was part of the Amazon legend. Rubber trees grew in a widely scattered fashion in the Amazonian wilderness which made it expensive to collect their sap. In 1927, Ford purchased a 4,000-square-mile trace (which he called Fordlandia), cleared it, and planted it with rubber trees. Ford apparently did not anticipate the risks that the spread of bugs and blight posed to trees that were planted close together. By the late 1930s, millions of his trees were afflicted with leaf blight, and in 1945 he folded the operation.

Unfolding of the Enterprise

The Jari project, as we will see next, was beset by a number of problems due to faulty initial assumptions, unforeseeable circumstances, and Ludwig's approach to management.

In the 1950s, Ludwig had used giant bulldozers to raze a jungle in Venezuela to make way for a cattle ranch. Ludwig's attempt to use the same mechanized approach to clearing the Jari jungle failed because Ludwig had not properly investigated the ecology and soil conditions. In 1967, Ludwig had shipped 18 bulldozers (*Caterpillar* "jungle crushers") to Jari. Construction crews knocked down and burnt "trees up to 150 years old, some with trunks 12 to 15 feet across."[270] In two years, this operation cleared about 250,000 acres, but the gmelina seedlings planted there "promptly died." The abundance of national vegetation had apparently led Ludwig to an erroneous inference about the richness of the soil; in fact, the Amazon jungle has "a mere scrim of topsoil, and the heavy machinery so compacted this fragile medium, that even weeds couldn't grow."[271]

Ludwig then brought in 2,000 seasonal laborers to clear the jungle through traditional "slash-and-burn" techniques that were less damaging to the soil. Independent contractors called "gatos" ("jungle cats") recruited the laborers from remote, impoverished regions of Brazil. "The cats skinned the workers," according to Kinkead, "sometimes feeding them cheap monkey and bird meat to cut costs." Stories about "inhuman conditions" led to demands from the Brazilian government that Jari provide "decent housing and wages."[272] Ludwig then began constructing the town of Monte Duardo, on which he would eventually incur a $6 million annual expense for social services.[273]

In 1970, heavy floods washed out nearly all of the four million seedlings that had been planted. Two years later, foresters discovered that the soil in about one-third of the plantation was too sandy to support the healthy growth of gmelinas. The underdeveloped gmelinas were removed and that tract was replanted with Caribbean pines. The pines were better adapted to growing in sandy soil, but would take about two to three times as long as the gmelinas to mature.

On the positive side, Ludwig's staff also unexpectedly discovered one of the world's largest deposits of Kaolin, a fine clay used in the manufacture of ceramics. Ludwig quickly started a mining operation and constructed a $25 million plant capable of processing 500 metric tons a day. Ludwig also embarked on a large-scale project (that was not part of the original plan) to grow rice in the southern part of his estate where the soil was too wet to grow trees. By 1980, 30,000 acres of rice paddy were expected to yield 100,000 tons of grain per year.

Ludwig's management style contributed to the problems at Jari. The budget "changed monthly," writes Kinkead:

> One visit from Ludwig, and there'd go another $50 million in another direction. He'd say, "Build 500 workers' houses here, put a road in there." If Jari's director complained about the cost of Ludwig's sudden switching of plans, the boss would reply, "You worry about getting the place built. I'll worry about the money." . . . Suggestions that he economize by opening his company town to private developers and

> entrepreneurs met with, "As long as I'm alive, no one will own a piece of Jari but myself." Since there were no penalties for exceeding budgets, people got to thinking Ludwig had money to burn. They ordered unnecessary equipment and didn't try to shave costs…
>
> Ludwig's capricious changes of managers worsened the confusion. The project's division heads, knowing directors lived on borrowed time, went their own way. When Ludwig asked five people to do the same job, as he often did, the confusion became chaos.[274]

Large, unexpected outlays forced Ludwig to seek outside financing. In 1972, Chase Manhattan led a group of banks that made a $150 million loan. In the mid-1970s, Ludwig tried to get oil and pulp and paper companies to invest in Jari, but they all demurred. Ludwig thereupon borrowed another $400 million—"one of the largest loans ever made to a private investor" according to Shields[275]—from a consortium of banks led by Chase.

By 1976, Ludwig had spent nearly twice as much as he had initially budgeted and his tree farm was several years behind schedule.[276] Nevertheless, encouraged by a doubling of world pulp prices between 1973 and 1975, on February 18, 1976, he placed an order for his "floating" pulping and power plants. The Kure Shipyard in Japan, which had previously built Ludwig's supertankers, would build the plants. The plants, each of which would weigh 30,000 metric tons, would be 250 yards long and nearly 20 stories tall. The pulp plant was designed to convert 4,000 cubic meters of pulpwood a day into 750 metric tons of cellulose. The power plant would burn 2,000 tons of wood a day and generate sufficient electricity to run the pulping plant as well as to meet all of the power needs of the Jari project. Both plants were to be built on a hollow steel hull so that they could be floated to their destination in Brazil.

The Japanese Export Import Bank lent Ludwig $240 million for construction of the plants, $175 million of which was guaranteed by the National Development Bank of Brazil. (Cost overruns on the project were financed by a $29 million loan from Lloyd's Bank of London.)

In January 1978, the plants were completed, and a month later began their journey to Brazil. In about three months, tugboats towed the plants around the Cape of Good Hope, across the South Atlantic, 250 miles up the Amazon, and then another 80 miles northwest up the Jari. Meanwhile, in Jari, workers had constructed a lagoon with a platform of wooden pilings at the bottom for the plants to rest on. Upon their arrival, the plants were towed into the lagoon. Water was pumped into the steel hulls, gradually sinking the plants until they came to rest on the platform at the bottom of the lagoon. The lagoon was then emptied, and the plants bolted to the platform.

"These were the largest industrial plants ever to be moved across water," Shields writes. Ludwig had once again, "flown in the face of the doubters and obstacles and done the seemingly impossible."[277] A team of Brazilian engineers who would operate the plants, Japanese engineers who had designed and constructed them in Kure, and Finnish experts in pulp manufacture worked for about six months to get the pulping operation on-stream.

Although the pulping plant was successfully commissioned, it soon became apparent that the tree plantation would not yield enough pulpwood to keep it operating at full capacity. According to Shields, Ludwig's foresters, who were trying to protect their jobs, had misled Ludwig about the rate of the gmelina growth: "They were taking the best yields on the plantation and passing them off as averages."[278] Wood production in 1979 was half of what it was expected to be, and its cost twice as high.[279]

In 1979, Ludwig faced loan repayments of $60 million on the Jari project, on top of an operating loss of $40 million and $50 million of construction costs. At the insistence of his lenders, Ludwig retained the consulting firm of Cresep, McCormick & Paget to "get things back on track."[280] Following the Cresep report, Ludwig sold off the rice plantation which had been losing between $8 to $10 million dollars a year, sanctioned a variety of cost-cutting measures, and allowed Brazilian merchants to open stores and run taxi services to Jari.[281] An executive council was formed to review policy and act as a "buffer between Ludwig and Jari's managers."[282]

These measures led to a reduction of the operating deficit from $40 million in 1979 to $10 million in 1980. But the venture remained "deeply in the red," with $20 million of construction outlays and debt service of $64 million.[283] Moreover, after an "acrimonious meeting" with the Jari forestry department, the executive council discovered that average yields of gmelina were between 40% and 75% off target.[284] Jari did not have an adequate supply of wood to maintain the pulping plant at a profitable level of capacity utilization. Meanwhile, pulp prices had begun to decline.

In August 1980, Ludwig demanded that the Brazilian government pay for the $6 million a year cost of providing social services at Jari. Otherwise, he would "stop the forestry project and throw several thousand people out of work."[285] In May 1981, Ludwig put the Jari project up for sale, and later that year threatened to default on a $40 million loan installment; the Jari debts now amounted to over $260 million. Eventually, the Brazilian government formed a consortium that would assume Ludwig's debts (in return for his interest in Jari) and keep things running on a shoestring. According to Shields, Ludwig had sunk over $800 million in Jari and it was a "safe bet that he had lost a large part of his investment."[286]

4. MOTOROLA'S IRIDIUM PROJECT

Motorola's $5 billion Iridium project to create a global cellular phone system provides a third example of a revolutionary venture. In Chapter 6, I argued that corporations usually invest in large initiatives with measurable and controllable risk. The Iridium case shows how, once in a very rare while, a visionary CEO may push through a revolutionary, highly uncertain initiative.

According to Hardy,[287] Barry Bertiger, a Motorola employee, conceived of a world-wide phone system in 1985 after his wife could not use her cellular phone in a remote location in the Bahamas. Bertiger conferred with his colleagues Raymond Leopold and Ken Peterson. In their spare time, they formulated a plan that involved a network of 77 low-orbit satellites that would communicate with each

other and with 'gateway' ground stations connecting to earth's telephone systems. The network would thus let users make a telephone call from anywhere to anywhere in the world.

The project's "technological, regulatory, and political complexity," Hardy writes, was "numbing": Iridium's engineers had to mesh more than 25,000 complex design elements. They had to hook 3.5 million lines of communications software into ground stations in at least 11 countries and make it work flawlessly with an additional 14 million lines of code that controlled navigation and call switching in the skies. The satellite manufacturing process had to be shrunk from the usual two or more years to five days, and the cost of a satellite—normally about $200 million—cut by 80%. Iridium had to secure spectrum rights from the World Administrative Radio Conference, a 140-nation body, and from regulators in 200 countries.

There was also great uncertainty about the demand for a worldwide cellular system. According to Hardy, no one could estimate the size of the market for high-priced, universal mobile phones. At $3 per minute, Iridium calls would be more expensive than land-based cellular calls. A technology consultant at Arthur D. Little noted that "there was no good head-count of international businessmen who need this. There may be a market in developing countries, but not in big cities."[288]

Not surprisingly, when Bertiger and his colleagues first proposed the idea, Motorola's senior managers showed little interest. Then Robert Galvin, the chairman, heard about it on his "annual tour" of the company. After two meetings with Bertiger, Galvin told Motorola's President John Mitchell, "If you don't write a check for this, John, I will. Out of my own pocket." Subsequently, Motorola formed a separate company, Iridium LLC, in which it took a 25% equity interest. Motorola also guaranteed nearly $1 billion of Iridium's debt.

The unusual position and background of Motorola's chairman helps explain why the company invested in Iridium. Robert Galvin was the son of Motorola's founder and would accompany his father on business trips from the time he was 10. He joined the Army in 1942 after two years at Notre Dame and after completing his service joined Motorola instead of finishing college. He progressed through the ranks and became President and effective head. At the time the company was a $227 million-a-year manufacturer of car radios and phonographs. Under Galvin, Motorola became an $11 billion-a-year company, the world's leading manufacturer of two-way radios and cellular telephones and the fourth largest semi-conductor manufacturer.[289] As of 1997, his share of Motorola stock was worth over $1 billion. Few CEOs of large companies have the self-confidence and the reputation for good judgment that Galvin had accumulated when he backed the Iridium project. The more typical CEO shies away from uncertain commitments. As a rule, top executives will only endorse large bets with known, well-researched risks.

5. SUMMARY AND CONCLUSIONS

Revolutionary ventures provide a sharp contrast to promising start-ups. The almost epic sagas of Federal Express and the Jari project have little in common with Natcom's balloon rentals, Country

Sampler's craft catalogs, Advent's portfolio management systems and various other *Inc*. 500 businesses reviewed in previous chapters. Promising start-ups often engage in small time quasi-arbitrage, discovering and correcting, as Kirzner puts it "earlier errors made in the course of market exchanges."[290] Revolutionary start-ups have, at their core, a Schumpeterian big idea. Where promising start-ups try to find a profitable niche, revolutionary entrepreneurs seek to transform—in the case of Ludwig, quite literally—the existing landscape. Or to adapt a distinction from Loasby, rather than merely respond to changing data, revolutionaries cause the data to change.[291] Promising start-ups can make a profit at low levels of output; in a revolutionary venture, size and profitability are inextricably linked. Founders of promising ventures syndicate the risks to others, often by downplaying their significance. Revolutionary entrepreneurs confront and assume visible and public risks. Additionally, whereas the founders of promising businesses have some unusual qualities the revolutionaries are extraordinary.

We should note, however, that revolutionary ventures are rare not only in comparison to the universe of new initiatives but also compared to businesses that have a lasting impact on the economic landscape. Federal Express and Iridium are unusual in that they could not have been started on a smaller scale or in incremental stages. More typically, companies like Microsoft and Wal-Mart and industries like the personal computer industry start in a far more modest fashion. Although they also have revolutionary long-term consequences, they are not 'Schumpeterian' at the outset. Ludwig's shipping empire did not start with a big bet on innovative supertankers. Initially he bought and fixed up old ships without risking much of his own money. As with most other entrepreneurs, it took Ludwig decades rather than years to achieve significant scale and scope. In Part 2 of this book, we will examine how this transformation, from promising start-up to a long-lived institution, usually occurs.

PART 1: SUMMARY AND GENERALIZATIONS

The sections below summarize the propositions that we have discussed about promising new businesses and other archetypal new ventures and discusses the generalizations we can draw.

1. SUMMARY OF PROPOSITIONS

Individuals and companies who undertake new initiatives start out with different initial conditions or endowments including as capital, ideas, credentials, and control systems. These differences in endowments affect the:

- Nature of the opportunities they pursue;
- Degree to which they rely on prior analysis and planning rather than adaptation to unforeseen circumstances;
- Strategies they employ to secure customers, employees, credit, supplies and other inputs; and,
- Factors that differentiate the successful initiatives from the unsuccessful ones.

Initial Conditions

Most individuals who start a new business have meager endowments—they usually lack novel ideas, deep experience, and credentials. They also face significant capital constraints. Their personal financial means are limited, and, because they don't have any 'verifiable' intellectual property or human capital to contribute to their ventures, they cannot raise funds from outside investors either.

The employees of large companies who undertake new initiatives have access to considerable funds, and to corporate reputations and relationships. Internal control systems, however, limit the discretion of corporate entrepreneurs. Corporate initiatives face extensive, multi-level scrutiny. This is not an avoidable symptom of a bureaucratic malaise that afflicts large corporations; rather, per agency theory, it is the inevitable consequence of the separation of ownership and management.

Founders of VC-backed start-ups have unusual endowments. Unlike most other individual entrepreneurs, they start with an innovative concept for making significant profits and valuable human capital. They can, therefore, raise significant funds from investors; but, in doing so, subject themselves to outside monitoring and oversight.

Founders of revolutionary ventures (like Frederick Smith's Federal Express) start with truly extraordinary endowments: a blockbuster idea, significant personal wealth or an exceptional capacity to raise capital and resources for a visionary scheme. Similarly corporations like Motorola who launch projects like Iridium have executives with exceptional boldness and a track record that gives them great credibility with investors, bankers, suppliers, employees and so on.

Nature of Opportunities

The entrepreneurs' endowments and constraints influence the types of opportunities they can profitably exploit. Individuals who start without a novel idea or access to capital are most likely to make a profit in businesses with low initial investment requirements and high uncertainty. The lack of capital limits the entrepreneur's capacity to pursue opportunities that require large up-front investment but also makes uncertainty a desirable attribute: the entrepreneur has little to lose if the venture does badly but can earn sizable profits if circumstances are favorable. Uncertainty also allows entrepreneurs who simply copy others' ideas and concepts to make a profit by dint of their hard work and innate talent or by participating in a temporarily rewarding game. Conversely, entrepreneurs who pursue low uncertainty opportunities find that talent or hard work cannot make up for the lack of a differentiating concept or technology.

Large corporations tend to pursue initiatives with large initial investment requirements and low uncertainty. They have the financial wherewithal to pursue projects that require large initial investment and stringent evaluation and monitoring requirements encourage them to pursue a few large projects rather than many small ones. Multi-level evaluations of new initiatives also limit the uncertainty that corporations can tolerate by increasing the requirements for objective evidence. This does not mean corporations avoid well-defined risks and only undertake projects that decision-makers are sure will succeed. In fact, their large profit goals usually entail large irreversible commitments, which makes the potential losses significantly greater than in most de novo startups. But, corporate control systems generally do require proponents of new initiatives to document the case for why the expected returns exceed the expected risks. High uncertainty (due, for instance, to fickle consumer taste, changing regulations, technologies or standards and the lack of a verifiable advantage such as a proprietary technology) makes it difficult for proponents to provide objective evidence about the risks and returns.

Businesses launched by the select group of individuals who can raise capital from VCs occupy the middle ground in terms of their investment and uncertainty. Access to VC funding allows—and requires—the pursuit of larger projects than the typical individual entrepreneur can undertake. At the same time the scrutiny and due diligence of the VCs weeds out the highly uncertain projects that self-financed entrepreneurs often undertake, or in some cases, reduces uncertainty by uncovering new facts. Compared to corporate ventures, however, the uncertainty is greater and the investment is lower. VCs don't have access to as much capital as corporate executives so they cannot fund the mega projects an Intel, Merck or IBM might undertake. And, their more streamlined process can accommodate more uncertainty than corporations will usually tolerate.

Entrepreneurs with radical ideas and exceptional capacity to secure capital and other resources pursue initiatives which require high initial investment and involve great uncertainty. Given the very scarce supply of such entrepreneurs, such ventures are rare.

Planning Versus Adaptation

Initial endowments and constraints, especially the terms and availability of capital, influence the degree of analysis and planning entrepreneurs undertake before they launch their ventures. The severe capital constraints most individual entrepreneurs face preclude much analysis and planning. These constraints also indirectly influence the economics of prior planning by limiting the kinds of opportunities entrepreneurs can profitably pursue: In small and highly uncertain ventures the benefits of prior planning quickly fall below the costs: small businesses cannot cover significant up-front research and planning expenditures. High uncertainty limits the value of prior planning. In lieu of prior planning and research, the founders of promising start-ups rely on their capacity to adapt to unforeseen problems and opportunities.

Corporate control systems require extensive planning and research of new ventures. Indeed, corporations favor large projects because the magnitude of expected profits can pay for extensive up-front research and analysis. Corporations also favor low uncertainty initiatives, where decision-makers can verify the expected risks and returns through objective research and analysis. But, compared to promising startups, corporations tend to make fewer changes after they have launched their initiatives. The low uncertainty of their projects and the prior research they conduct make surprises less likely. Corporations cannot change course easily because significant deviations from plan can require many sign-offs and approvals. And, the size and complexity of corporate projects also discourages opportunistic adaptation.

VC backed start-ups fall between corporate and promising ventures in their degree of prior planning and research. Entrepreneurs who raise venture capital to fund their start-ups have to provide business plans to VCs; and, usually VCs conduct due diligence and independent research to verify the claims made in the plans. The effort devoted, although greater than in the typical promising start-up, usually is less than in large corporations: the funds available for research are scarcer, the checks and balances not quite as elaborate, and the inherent uncertainty of the opportunity is greater. Similarly, the incentive and need for VC-backed start-ups to adapt to new circumstances and modify strategies in the post-start phase also falls between that of promising start-ups and corporate start-ups.

In revolutionary ventures, the high levels of uncertainty make it difficult for the entrepreneur to draw up reliable plans. At the same time, given the scale of the enterprise, extensive research and contingency planning is necessary to raise capital and coordinate resources: ventures like the Iridium project or Federal Express involve many 'moving parts' that have to be integrated in a planned way. Post-launch, we find that decision makers change many elements of their approach but, in contrast to small promising startups, cannot alter their core concept in mid-stream.

Securing Resources

Promising start-ups cannot easily secure customers, employees, supplies and other such 'resource providers' because of their meager endowments. The lack of capital, track records and objective

competitive advantages discourages resource providers from taking a chance on the venture. Entrepreneurs therefore seek out 'atypical' individuals and companies who have limited alternatives, unusual requirements and preferences, or do not properly evaluate the risks they face. Entrepreneurs provide special benefits such as customization and free ancillary services to their first resource providers in order to offset the providers' incentive to let someone else try out the start-up first. Entrepreneurs also use psychological ploys. For instance, they mimic the superficial features of well-established companies to create the perception of permanence and frame choices to downplay the risks that the resource providers face.

Established corporations can rely on their capital, reputations and prior relationships to secure resources. Resource providers derive comfort from the corporation's financial resources and the irreversible commitments it makes to an enterprise. Corporations can underwrite the risks of resource providers by offering free trials and long-term contracts. They can publicly stake their reputations to their initiatives. And, in contrast to promising start-ups, corporations will often emphasize rather than downplay the risks faced by the resource providers to encourage them to make the safe choice of going with an established company.

The lack of a track record and a diversified source of ongoing profit poses a problem for VC-backed startups as it does for any new business. They have some advantages, however: access to capital, the reputation and relationships of well-regarded founders and VCs, and the irreversible investments made at the start, provide reassurance about the prospects of the venture. The valuable intellectual property these start-ups are based on also allows them to attract resource providers by giving them a share of the upside. For instance, VC-backed firms can attract talented employees by offering stock options. (For most other start-ups, the low expected value of the equity makes it difficult to attract high-quality talent with a share of the upside, so such ventures often have to utilize staff who have limited employment alternatives).

Revolutionary ventures, which start with the more innovative ideas and access to capital than other types of start-ups also, face greater problems in securing resources. Their ambitious plans call for high quality talent—unlike promising start-ups, they cannot make do with personnel who have limited alternatives. Nor can they rely on providing exceptional service and benefits to just a few customers. They cannot easily underwrite others' risks, even with access to significant capital because the uncertainty of the enterprise is so great. They can, however, hold out the promise of larger financial rewards, unique and compelling benefits to customers (the only guaranteed overnight delivery service in the case of Federal Express), and the excitement of participating in a pioneering adventure.

The problem of securing resources is of secondary importance in marginal ventures. They have few or no employees. Suppliers do not make irreversible investments or extend credit. Customers have low switching costs and do not face significant losses if the venture fails.

Differentiating Factors

The success of promising start-ups that lack much capital or a proprietary technology depends on the skills and innate abilities of its founders. These include a high tolerance for ambiguity, adaptability to new circumstances and information, resilience, perceptiveness about the wants and needs of others, ingenuity and resourcefulness in solving problems and coping with capital constraints, and face-to-face selling skills. Attributes of lesser importance include tolerance for risk or loss, significant creativity and capacity to innovate, prescience or foresight, and leadership and managerial abilities. Successful promising ventures, in other words, require entrepreneurs with some special qualities and talents, but not all-round super humans.

Requirements for successful corporate initiatives are different in two ways. First, good foresight is more critical; a flawed concept cannot be redeemed through opportunistic adaptation . Second, because of the large size of corporate initiatives, the quality and effectiveness of a team matters more than the caliber of just one or two individuals. Thus the success of a new corporate business depends on the talents of the personnel in a variety of functions in marketing, production, finance and on an organizational capacity to coordinate the specialized functions.

VC-backed start-ups fall between promising and corporate initiatives on both these two dimensions. Success requires more foresight than in promising start-ups and more adaptability than in corporate initiatives. Similarly, the role of team work is greater than in promising start-ups because of the larger scale of the venture, but the quality and talents of the founders also has a significant influence on outcomes. These talents also are somewhat different: for instance, the capacity to manage a sizable team of employees is more important for the founders of VC-backed start-ups than for promising start-ups.

The individuals (or companies) that start revolutionary ventures require the “superhuman” qualities that are sometimes attributed to entrepreneurs. In addition to the qualities that a successful founder of a promising start-up requires (such as adaptability and resilience), revolutionary entrepreneurs also require great foresight, an unusual willingness to take risk, an evangelical ability to inspire others and the capacity to build quickly and manage complex organizational units.

Starting marginal ventures does not involve exceptional talent or skill; or, put differently, a highly talented founder of a laundry or lawn care business does not earn much higher returns than an individual of mediocre talents.

2. GENERAL PROPOSITIONS

Our analysis of archetypal initiatives suggests a general hypothesis that relates the nature of the initiatives organizations tend to undertake to their decision making processes. Different types of organizations use different routines for evaluating and monitoring new investments. For instance, in large publicly traded corporations, we find extensive scrutiny of new initiatives by an organizational hierarchy and specialized staff. In the partnership form of organization, we have fewer checks and balances and a

greater reliance on what Fama and Jensen call mutual monitoring by the partners. In the small sole-proprietorship, the decision to undertake a new initiative lies entirely in the hands of a single owner. We can also find differences within a given form of organization. Some publicly traded companies have fewer levels of hierarchy and smaller staffs than do others. Similarly, some partnerships vest considerable discretion in the hands of a small executive group, while others rely on broadly based committees to evaluate and ratify new initiatives.

Organizations cannot easily adapt their routines to the idiosyncrasies of individual opportunities. In the normal course, all new initiatives undertaken by a particular organization face a minimum level of scrutiny and ongoing oversight. Organizations also have in the short run, a fixed capacity for evaluating and monitoring new projects. A firm may hire consultants for special projects, but it cannot quickly increase the time its core decision makers have available. The combination of a minimum level of scrutiny and a fixed capacity to provide it limits the total number of initiatives an organization can undertake.

The nature of an organization's routines helps determine its access to capital. Companies like IBM, Intel, and Merck can more easily mobilize funds from public markets than young companies with less stringent and well proven evaluation and monitoring capabilities. And, because firms must apportion their available capital to a limited number of projects, they also have a target for the minimum capital they try to invest in each initiative. (For instance, a company with access to $1 billion in total capital, and the capacity to evaluate and monitor 10 initiatives, will search for projects that require an investment of at least $100 million.)

Routines also effect the uncertainty of initiatives. The more rigorous the checks and balances an organization has in place, the lower the unmeasurable and unquantifiable risks it can tolerate. Put alternatively, the highest valued use of an expensive evaluation and monitoring lies in undertaking initiatives whose risk and returns can be objectively assessed.

We therefore find the following specialization: Organizations with rigorous checks and balances undertake projects with relatively low irreducible uncertainty, large investment requirements, and large likely profit (assuming that large likely profits require large investments). Organizations with less rigorous checks and balances undertake projects with high uncertainty, low investment, and low likely profit. The specialization affects the conscious search for new initiatives that organizations undertake as well their exploitation of accidental discoveries. Well-established corporations encourage (or explicitly instruct) their employees to look for new business opportunities that have well defined risks and hold the promise of large profits. They also avoid committing resources to small or highly uncertain investment opportunities that their employees discover as a result of accident or personal interest. Instead, large corporations sell (or cede) the rights to these opportunities to smaller companies or startups. Conversely small companies that develop or accidentally find investment opportunities that require substantial capital sell the rights to exploit these opportunities to large corporations or form joint ventures with them.

Opportunities with high uncertainty and high initial investment requirements (the "revolutionary" archetype discussed in Chapter 8) fall outside the domain of normal business activity. Individuals or organizations that confront such opportunities will try decomposing them into a sequence of projects that involve less uncertainty or require less capital. In some cases however (as in Fredrick Smith's scheme to provide national overnight delivery of small packages) the nature of the opportunity requires an all-or-nothing project. Only extraordinarily influential or wealthy individuals, large corporations acting out of character, or not-for-profit government agencies and universities undertake such projects. Similarly, opportunities with low investment and uncertainty, which do not hold even an outside chance of much profit, also fall outside the domain of normal business activity – individuals undertake such projects as a substitute for low-paid employment.

The insert 'Organizational Specialization: An Illustrative Analysis' provides a simple mathematical demonstration of the hypothesis that different organizations specialize in different regions of the uncertainty-investment-profit diagram. Extensions to the other dimensions such as the reliance on adaptation vs. planning, strategies employed for securing resources, and differentiating factors are fairly obvious.

Organizational Specialization: An Illustrative Analysis

To illustrate how different firms specialized in different types of initiatives, we will make the following simplifying assumption about the universe of available opportunities.

- All initiatives require a single initial investment of I. Each such investment is expected to produce a single slug of cash flow or "profit" P, with (Knightian) uncertainty U. I can be any positive number. U ranges from a maximum value of 1 (when the probability distribution of returns is fully known) to zero .
- P increases with both I and U (that is, the greater the investment and uncertainty, the larger the total profit). The increase is not proportionate however, rather both I and U have diminishing returns.
- The returns from uncertainty diminish faster than the returns from increasing investment. Therefore, large uncertainty and low investment produces lower likely profit than large investment and low uncertainty. The plausibility of this assumption derives from the expected (rather than the after-the-fact) profits that can be attributed to the initiatives. Low investment projects in the real world produce large subsequent profits very unexpectedly or because the project starts with a valuable asset such as a patent.

The relationship $P = K_p I^{\alpha} U^{\beta}$, where $K_p > 1$ and $0 < \beta < \alpha < 1$ conforms to these assumptions. This relationship is depicted in Figure X. Note that profit maximizers will only undertake initiatives when $P > I$. (That is, when $K_p I^{\alpha}U^{\beta} > I$ or $K_p I^{\alpha-1} U^{\beta} > 1$

The firms that seek to exploit these opportunities have different evaluation and monitoring routines and capabilities such that

- Each firm has a fixed staff or managerial capacity for evaluating and monitoring profits, which corresponds to total expenditure of $E.

- Each firm has to devote at least $\$e_{min}$ to every project that it undertakes, where $e_{min} = k_n E$ (that is, firms with large E have greater minimum evaluation and monitoring requirements.) These requirements determine the maximum number of projects (N) a firm can undertake

  $N_{max}\, e_{min} < E$

  Or substituting for $e_{min} = k_n E$,

  $N_{max} < 1/K_n$

- Each firm's evaluation and monitoring capabilities determine the total capital it has available to undertake initiatives (C) as well as the maximum uncertainty it can tolerate in any initiative (U_{max}). Larger Es imply a larger C and a lower U_{max}, such that

$C = K_c E$ and $U_{max} = K_u/C$

Implying that $U_{max} = \frac{K_u}{K_c} \times \frac{1}{C}$

- Firms undertake identical projects that is they cannot undertake projects involving different Us and Is.

Given these assumptions we infer that

- Firms have an incentive to invest their available capital on many small projects instead of one large project because of the declining returns on investment. But, they cannot undertake any more than $1/K_n$ projects. So they undertake this maximum number, in which they invest $\$I = \$C/1/k_n = K_n C$, so $C = I/K_n$

- Because P increases with U, (and there is no limit to the total U across investments), each initiative that a firm invests in, has a $U=U_{max} = K_u/C$

Substituting for $C = I/K_n$, we get

$U = K_u/(I/K_n) = \frac{K_u K_n}{I}$

In other words the U and I of the projects are inversely related.

We can also substitute $I = \frac{K_u K_n}{U}$ into the relationship $P = K_p I^{\alpha} U^{\beta}$

$P = K_p \frac{(K_u K_n)^a}{U^a} U^b$

$P = K_p K_u K_n^{\alpha} U^{\beta-\alpha}$

P is also according to this equation, inversely related to U as long as $\beta-\alpha < 0$ that is, $\alpha > \beta$.

The relationships between U, I, and P conforms to our basic uncertainty-investment-profit diagram: Firms with large E invest in projects with low uncertainty and large required investment and likely profit. Firms with smaller Es specialize in more uncertain projects with less required investment and likely profit (their return on investment (P/I) is however greater because they bear more uncertainty). Large U and Large I projects cannot be funded by small E firm and lie outside the uncertainty tolerance of large E firms. Small U, small I projects are "uneconomical" (that is, $P < I$).

Endnotes

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53 Fortune
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