

"WHAT CAN WE LEARN FROM FAILURE"

by

Spyros MAKRIDAKIS*

N° 91/09/TM

* Research Professor of Decision Sciences and Information Systems, INSEAD,
Boulevard de Constance, Fontainebleau 77305 Cedex, France.

Printed at INSEAD,
Fontainebleau, France.

WHAT CAN WE LEARN FROM FAILURE?¹

A good part of American business has to do with that most un-American of ideas: failure.

Robert Boyden LAMB, Author of *Running American Business: Top CEOs Rethink Their Major Decisions*

Abstract

Failure is a natural process, observed in both biological and organizational systems. In this article different types of failure are illustrated and the most common factors that contribute to failure described. Delaying or avoiding failure is discussed as a conscious organizational process requiring a clear understanding of the factors that cause failure and the ability and willingness to do something to avoid their negative consequences. The need to recognize permanent environmental changes and the critical tasks of learning and adaptation to such changes are stressed. Finally, the statement that success breeds its own failure is explored and the implications discussed.

INTRODUCTION

Charles Babbage was a genial British engineer. He created the speedometer, the actuarial tables for the insurance industry, the cowcatcher for railroads, and several other important inventions. In 1822 Babbage started building the first computer. The principles of his computer were the same as those of modern computers, yet Babbage had neither electricity nor electronics at his disposal to put his theoretical design into operation. That did not prevent him from building a full-scale computer, which consisted of an intricate collection of steam-powered cranks, gears, pulleys and levers. It is exhibited in a museum in London. Babbage's mechanical computer was ingenious. It included the idea of programming, a central processing unit, memory, and means of information input and of printing the output. Babbage worked on his computer until he died in 1871. He spent all his money, a \$34,000 grant (the equivalent of about \$10 million in today's dollars) from the government and large

1 This article is based on chapter 11 of the book Forecasting, Planning and Strategy for the 21st Century (The Free Press, New York, 1990) written by this author.

sums made available through his friends, to build his computer. His house was full of a series of half-completed models of his visionary creation.

Babbage's work on mechanical computers was a total failure, as the tolerances required for accurate processing of information were far beyond the capabilities of the best of machinists and metallurgists of his time. Babbage was a prophet of the modern computer. More than a century and a half ago he foresaw the value of such a machine and tried his best to build it. Unfortunately, his timing was off by a little more than 120 years. Had he lived a century later, Babbage might have been successful and ahead of everyone else in producing a workable computer.

AM (Addressograph-Multigraph) International was created in 1930. It developed, manufactured, marketed, and serviced a wide variety of business machines and related equipment, including embossed-metal address plates and duplicators capable of printing a whole page in a single stroke. Until the early 1960s, AM was considered one of the best managed companies in the business annals of the times and a darling of Wall Street, included in most blue-chip portfolios. In 1946, for instance, AM's sales were close to one-fourth of those of IBM and seven times those of Xerox.

The management of AM International first ignored photocopying and the changes being brought about by electronics during the late 1950s and the 1960s. The executives considered photocopying too expensive to replace their cheap duplicating machines and concluded that the new technology in electronics was but a passing fad with little practical value for their own business. They were convinced that no competitor could uproot them; after all, they had a formidable network of suppliers and maintenance centers both in the United States and abroad, providing them with impressive competitive advantages. In the middle 1960s photocopying started making series inroads into AM's business, and its management suddenly realized that something had to be done. Its response was to overreact to the emerging technological

threat. New products (automatic duplicators, copiers, electronic communicators, automatic printers, and others) were rushed to the market. They were misconceived, barely tested, mispriced, and targeted to the wrong segment. The results of the R&D and marketing efforts were disastrous, further aggravating AM's financial problems, as sales had stagnated and profits flattened.

In an effort to show growth, AM's management went on an acquisition spree, but that did not help either. The companies bought were not carefully chosen and were scattered in too many unrelated fields. They had to be resold to raise needed cash and to retrench to AM's main business: duplicating. By then it was too late. The new photocopying technology had rendered mechanical duplicators obsolete, and with them AM International, which filed for bankruptcy under Chapter 11 in April 1982.

Western Union was founded in 1856. Its telegram business was a monopoly that grew and flourished for most of the first half of our century. It also provided a high rate of return and substantial dividends for its shareholders. Western Union was the high-tech company in the early part of this century and did reasonably well until the 1960s. The decline started in the early 1960s. It was slow and persistent, as long distance telephone rates dropped and new forms of communication were discovered (telex, electronic mail, overnight delivery, fax). More aggressive companies appeared, and Western Union lost its monopoly position and its accrued competitive advantages. Management did little to correct the situation. Somehow it was felt that nothing could be done or that there was no need to do anything, because nobody could threaten Western Union's basic business. The company managed to show reasonable profits during the 1960s and 1970s. In the early 1980s Western Union's problems started accumulating and its cash flow deteriorated. In 1984 the prospect of bankruptcy first appeared on the horizon, but reorganization was averted when a group of banks agreed to lend the corporation \$100 million. At that time the price of its stock dropped to \$9 from a high of \$47 less than a year earlier. The attempted turnaround was not

successful. The downhill trend continued until December 10, 1987, when Western Union's slow, steady decline led to bankruptcy proceedings under Chapter 11.

A somewhat different story of failure is that of WOW (Worlds Of Wonders). In 1986 WOW's revenues from toy manufacturing were close to \$100 million after only six months of existence. In 1987 revenues jumped to \$327 million. Stock was valued at \$29 a share when the company went public in 1986. WOW was growing fast in a high-margin market. It became a Wall Street favorite because of its imaginative toys that kids loved to play with and its marketing skills in distributing and pushing such toys. By early 1987 WOW employed 900 people and was planning to market more than a hundred new toys. Success ended abruptly, even faster than it had started. In March 1988 WOW went into Chapter 11 proceedings. Its staff was cut to 130 and its stock plummeted to one dollar. Early success had made WOW management overly optimistic and resulted in overstretching the company's resources and capabilities. Had WOW managed its growth and set more realistic goals, it would probably have remained a highly successful toy manufacturer.

The stories of Babbage, AM International, Western Union and WOW's present "typical" failures. But such stories are not well known nor are they being used to help us learn and avoid future ones. As Argenti (1976), one of the first writers who seriously studied failure, says:

"I do not wish to overstress the pain of failure, but I wish to contrast the almost conspiratorial silence that surrounds the existence of failure and its consequences with the brash and blaring self-congratulatory ballyhoo that often greet success".

Thus, it becomes imperative to identify, study and classify the various types of past failures in order to learn as much as possible from them in a way that will allow us to delay or avoid future ones.

WHAT IS FAILURE ?

There are many types of failure. This article deals with organizational ones which also cover a wide spectrum. In order to clarify the term "failure" and to avoid the use of special jargon its day-to-day definition is presented.

Defining Fail, Failure and Setback

Fail:

1. to be lacking or insufficient; fall short.
2. to lose power or strength; weaken; die away.
3. to stop operating or working.
4. to be deficient or negligent in an obligation; duty; expectation; default.
5. to be unsuccessful in obtaining a desired end; be unable to do or become; miss.
6. to become bankrupt.

Failure:

1. the act, state, or fact of failing.
2. a person or thing that fails

Setback:

A reversal, check, or interruption in progress; relapse; upset.

The range of definitions of fail and failure is wide. It spreads from "be lacking or insufficient" and goes all the way to "stop operating" and "become bankrupt". Failure is clearly distinguished from a setback which is a "reversal" or a "relapse" which can be overcome. Failure is more serious and has a more permanent effect than a setback. For the purpose of this article the most appropriate definition of failure is N° 3 and N° 6. Definition N° 2 is also appropriate if losing power or strength leads to more permanent damage and eventual irreparable decline. Definitions N° 1, 4 and 5 are not as clear cut as far as business failure is concerned except if they resulted to long term deficiencies which could eventually caused permanent damages that could not be

overcome. Otherwise, they would indicate temporary failures, that is, setbacks that could be surmounted.

EXTENT OF AND REASONS FOR FAILURE

Failures abound. Even though they might outnumber successes, they are somehow less well known. People obviously do not like to talk about their failures; often they hide or rationalize them, or they pretend that nothing has happened. Writing about failures is not as easy as publicizing successes; the person blamed for failure can sue the writer. The public does not want to read about failure, having far more interest in heroes and success stories. Apart from failures that bring laughter (the Woody Allen type) and some spectacular ones that get a lot of publicity, little is made of the phenomenon. From a rational point of view, failures should be publicized even more than successes. It might even be worthwhile to create a "museum" of failures where they can be studied with a view to helping future generations learn how to avoid similar ones.

The extent and pervasiveness of failure can be inferred from the following statistics collected from various sources such as government statistics, books and articles, and business publications of the type of **Business Week**, **The Economist**, **Fortune** and **Forbes**:

- ◆ Between 35 and 80 percent (depending on the specific study) of new products fail ever to make a profit.
- ◆ More than half of spending on new products is used for products that never make it to the market.
- ◆ On average it takes eight years until corporate ventures become successful, while the majority of new ventures never make a profit.
- ◆ There were close to half a million business bankruptcies in 1988, a number that increases substantially during periods of recession.
- ◆ Personal bankruptcies grew more than two-thirds between 1980 and 1988, with about one person in every 250 declaring bankruptcy.
- ◆ For every successful corporate turnaround there are two that fail.

- ◆ In the automobile industry alone more than 1,500 firms have failed, including that of Charles Duryea, founder of the first automobile company; that of William Durant, the creator of GM, who founded his own company after he was ousted from GM; and that of John De Lorean, the charismatic auto executive.
- ◆ In the computer industry more than 350 firms have failed in the last twenty years.
- ◆ Texaco was fined \$10.3 billion by a court, and in the end it had to pay \$3 billion as an out-of-court settlement to Pennzoil.
- ◆ GM lost 12 percent of its market share between 1978 and 1987 (worth about \$24 billion).
- ◆ In 1987 there were twenty-six U.S. companies with losses of more than \$100 million.
- ◆ In 1987 U.S. banks lost a staggering \$5 billion -close to 8 percent of their equities.
- ◆ In 1989 there were more than \$7 billion losses among the top 200 world banks.
- ◆ Between 1987 and 1991 it is estimated that the U.S. savings and loan industry loss between \$200 and \$500 billions (more that the total G.N.P. of all but a handful of countries)
- ◆ In 1987, among the largest thousand global corporations, there were forty companies that accumulated more than \$10 billion in losses.
- ◆ At least three people committed suicide following the stock market collapse of October 19, 1987.

FACTORS THAT CONTRIBUTE TO FAILURE

Table 1 presents sixteen prominent failures collected as representative cases of those most common among business organizations. It also summarizes the factors most likely to have contributed to failure and the consequences involved. In this section, the factors that contribute to failure are classified and elucidated, although the causes of failure are sometimes so diffuse that they can hardly be attributed to a single factor.

Failure As A Natural Process

In the biological world failure is synonymous with death and is considered a natural event. There are no exceptions to biological failure. Living systems are born, mature, age, and die. Death cannot be avoided, although life expectancy among humans has almost doubled during the last hundred years. In organizational systems, however,

failure or death is not as certain or as regular. Some organizations (both profit and nonprofit) manage to survive and prosper much longer than others, although until now no organizations (including nations - see Kennedy, 1987) have managed to avoid the effects of aging and actual or relative decline. There are few organizations whose life span extends more than a few centuries. Failure seems to be as natural among organizational systems as it is among living ones, although it does not show the same degree of regularity. Avoiding or delaying failure seems to be the exception rather than the rule. Large size, excellent management, and monopolistic or other advantages are not guarantees for continued survival and actual or relative prosperity.

In an article entitled "It's Tough Up There," *Forbes* (1988) concludes that only twenty-two of the one hundred largest companies in 1917 were also included in the 1987 list. Of the remaining seventy-eight, the majority had ceased to exist as companies, while the remainder had dropped well below the top hundred. For companies below the largest hundred on the list, survival becomes even tougher and prosperity more difficult, as smaller companies are swallowed by larger ones or fade away for lack of sufficient resources to attain economies of scale in production, marketing, and R&D.

In addition to a considerable turnover among firms, whole sectors and industries also are born, mature, age, and die. Until the turn of the century agriculture was the most successful sector. It was then replaced by manufacturing, which in turn is being overshadowed by services. Within sectors, there are also growth, mature, and declining industries. In the last century small textile firms prospered. In the earlier part of this century mining and automobile companies did well, followed later by chemicals, steel, tool manufacturing, construction, aluminum, and airplane construction companies. Today the "best" industries are high-tech, including computer, pharmaceutical, and service industries. In the future the growth industries might be biochemical or genetic engineering, artificial intelligence, superconductors,

high-speed trains, supersonic airplanes, and space industries. In the service sector, the growth industries might be entertainment, vacations, tourism, education, caring for the old, and research.

As new technologies emerge, the growth patterns shift and new industries and firms appear and prosper. At the same time the older ones become less competitive and lose their real or relative advantages. Although many of the older industries can operate for a long time after new technologies appear or consumer attitudes change, they lose their dynamism and their potential to generate adequate returns on investments. As they eventually slow down, they are merged into other companies, are bought out, or stop operating altogether. This S-curve pattern of birth, steep growth, plateau, and eventual decline can be observed in a great many cases, including technologies, products, services, companies, and, as we have said, even industries and whole sectors. S-curves, the equivalent of biological birth, maturity, old age, and death, seem inevitable unless something is done to reverse their natural course. Western Union, mentioned earlier, is a perfect example of a failure brought about by "natural" causes. Western Union was unable to adapt to environmental changes. It became obsolete and basically died in a slow and natural manner. As a group, the steel industry has also declined because of "natural causes," as new technological developments have provided cheaper and better quality substitutes for steel.

Organizational Arteriosclerosis

As organizations grow older, their managements and the organizations themselves usually become more conservative and more bureaucratic. Conservatism results in resistance to changed established ways of doing things. That is particularly true for successful organizations whose founder or top management see little reason to change established goals and directions or the way the organization operates. Henry Ford's insistence on continuing to manufacture the model T when consumer preferences had changed is a prime example of the inability to recognize the need to alter goals and

perceptions when the market or the economic environment has changed. This is characteristically true when the current way of doing things has proven to be overly successful. In addition, increased size brings more bureaucracy, which diminishes individual initiative and emphasizes control and formal procedures over effectiveness and efficiency. The examples of GM, (see Perot, 1988) and IBM (see Loomis, 1987), and many other large companies come readily to mind. Although formal policies and written procedures are necessary to improve control, overemphasizing them hampers decision-making and results in diminished dynamism, which in turn becomes the point of departure for eventual relative or absolute decline.

Organizational arteriosclerosis accelerates the failure brought about by natural causes. Conservative and bureaucratic organizations often ignore technological or environmental changes by believing they are temporary fads that will not affect them. Table 1 contains failures caused by inability or unwillingness to innovate and compete effectively with companies using new technologies or new ideas. For instance, a common response of conservative, bureaucratic organizations is to wait until others innovate so as to determine whether or not there are economic benefits to be obtained by following the innovators. Although such a strategy is much better than ignoring changes altogether, it is not without potential long-term problems, as early innovators can accrue advantages and shape the market in desired directions. IBM's difficulties stem partly from its unwillingness to be a technological innovator, letting others play that role. As the cases of Cray and Digital Equipment in the mainframe market and Apple and Compaq in microcomputers have illustrated, such a strategy is full of long-term dangers. Cray, Digital, Apple, and Compaq have established their reputation for technological excellence and they have been able to translate that reputation into higher sales. At the industry level, the steel companies lost their ability to innovate and let aluminum and other lightweight materials take away demand for steel (lately they have tried to gain some of their losses through accelerated innovation - see McWilliams, 1990 - in time we will be able to determine whether or not they will be able to slow

down or reverse the decline of their industry). That could have been avoided had the steel companies started much earlier to compete actively with steel substitutes by reducing costs and innovating with new manufacturing processes and higher-quality products.

General Motors provides a good example of a company that is failing because of conservatism/bureaucracy. GM, the biggest and most integrated of all the automobile companies, cannot effectively compete in today's fast-changing car market. Its decline, which started much earlier, has greatly accelerated during the last decade. GM's ambitious business strategy of redesigning each of its cars and modernizing each of its factories failed miserably. Ten years and \$80 billion later, GM is no longer the lowest-cost manufacturer among automobile companies but the highest-cost. Its integrated factories and high technology are hardly more efficient than the old system, and all its cars look alike. Locked into heavy investment plans, GM continued spending in the expectation of profits and a recapture of its lost market share instead of questioning whether its modernization strategy made sense. Today things are changing at GM, but whether they are changing in the right direction and fast enough to keep up with competition still remains to be seen. GM's rigid bureaucracy, and conservatism have decreased its flexibility and have brought to this once-excellent company what I have been calling organizational arteriosclerosis. Most importantly its management (Smith, 1989) is not willing to accept that anything is wrong believing that it is only a question of time until its policies and actions will bring back the old glory. Arteriosclerosis requires serious medicine and possible operations not just aspirins.

Being Dazzled By New Technologies

Although some organizations are unable to innovate, others fail by attempting to innovate too much or too early. It can be done by introducing new products or new technologies that are not economically viable. Schnaars (1989) regards this as the main reason for what he labels managerial megamistakes: decision-makers seduced by

the alleged wonders of new technologies and the potential profits they will bring if exploited faster than by competitors. Consumers are resistant if changes are not justified by lower prices or added benefits. But the advocates of new technologies (picturephones, moving sidewalks, three-dimensional TV, three-dimensional cameras, dehydrated foods) have tended to overestimate their concrete benefits in comparison with existing products while underestimating the costs, which depend heavily on the amount being sold. Demand cannot increase until prices go down, which creates a chicken-or-egg situation in which prices must decrease in order for demand to increase, but costs (and prices) cannot go down unless sales go up and thus reduce costs and decrease prices. Hence organizations must walk a tightrope: They must determine when it is profitable to innovate while at the same time guarding against premature or uneconomical technologies.

Once they are commercially profitable, new technologies increase demand and provide large opportunities for growth and profit. Such growth and profit potential inevitably attracts competition and causes many failures. In the computer industry alone more than 350 major firms have failed in the last twenty years. Today the computer industry is concentrated in a handful of firms, which hold large market shares and dominate the market. But failures have been legion. A good illustration of this point is Xerox.

In 1968 Xerox bought SDS (Scientific Data Systems) in an attempt to diversify into computers. It paid \$900 million, ninety-two times the 1968 SDS earnings, to purchase the company. Poor management, inadequate resources, and open rivalry destroyed SDS's envisaged role and resulted in poor results. SDS lost considerable sums in 1970 and 1971. The losses increased in 1972, 1973, and 1974 (totaling more than \$130 million). Xerox's venture into the computer business proved exorbitantly expensive. In July 1975 the board unanimously resolved that the purchase of SDS was "a mistake" and decided to get rid of its prominent investment. The writeoff necessary to get rid of

SDS amounted to just under \$1.3 billion, a huge amount even for a big company like Xerox.

Taking Risks

Taking risks is usually necessary in order to succeed, particularly if success on a big scale is sought. At the same time, risk-taking can lead to financial and other difficulties and can result in big failures. New and smaller firms must do something different from established or larger companies if they want to establish themselves and gain advantages over their powerful competitors. This often involves trying new, untested technologies, investing in new markets, and taking higher risks than seasoned firms. At the same time, new firms are usually hard-pressed for working capital (cash). Everybody is aware of the successes of Polaroid, Xerox, Compaq or Apple today, but those companies had to take considerable risks and overcome huge obstacles at the initial stage. Large, profitable companies can also get into serious difficulty or even go bankrupt by taking risks, pursuing new products, or going after untested technologies. The pressure to maintain high growth rates is usually responsible for such risk-taking among large, successful companies.

Bank of America, once the dominant firm in the world banking system, also fell victim to too many unnecessary risks. Its management gave priority to size and growth at the expense of quality and soundness of investments. During the 1970s Bank of America reaped record profits by globalizing its reach and lending to giant corporations and Third World countries. Gambling on a fall in interest rates during 1979 and 1980, it increased its mortgage sales. The rates rose, which resulted in a \$3.5-billion loss. Unexpected loan losses, expensive computer breakdowns, unsuccessful takeover attempts, and employee involvement in consumer fraud cases all contributed to ethical problems and enormous overall losses. On top of that, many of the bank's loans to Third World countries had to be written off or discounted, which further increased its heavy losses. Today the bank's share of loan problems is still proportionately higher

than that of most other big banks. The bank faced a \$915-million loss for 1987 and continued having serious problems in 1988 and 1989 while doing better starting in 1990. But no matter how well the Bank of America can overcome its problems it is doubtful that it will ever get back to its old glories of being the number one bank in the world.

Overextending Resources And Capabilities

Initial success can lead to grandiose goals of uninterrupted success and rapid growth, which can either overextend the organization's resources and capabilities or lead to a situation of unmanageable growth, both of which can contribute to problems and eventual failure. The example of WOW, discussed earlier in this article, and several other failures listed in Table 1 fall into this category. A prominent recent case is Carlo De Benedetti, the Italian financier who launched an acquisition campaign in the 1980s using the booming European stock exchange to assemble a multi-billion-dollar empire. Using small equity holdings, he grabbed control of extensive assets, ranging from computers (Olivetti) to pasta (Buitoni). At the end of 1987 the sales of his empire were about \$14 billion and its market value, despite the crash, was almost \$10 billion. However, Benedetti's raid on Société Générale de Belgique, the Belgian holding company, which he hoped to make the center of his vast European industrial holding, failed. Although he invested \$1.6 billion, he emerged with only 45 percent of the company's shares, making him a minority shareholder with no board representation. A rival, Compagnie Financière de Suez, managed to take control of Société Générale. Benedetti misjudged his opposition. Some associates expressed the opinion that Benedetti had "spread himself too thin," and others said they felt he was overconfident. At the same time the European Corporate Community bitterly resisted his brash, American-style hostile takeover tactics. Rivals were surprised at how poorly the bid was executed, since he had a head start by beginning in January and by paying more per share than the stock market value. But he lost big in terms of management time,

money, and prestige by overextending his resources and capabilities while underestimating his opponents.

Being Overoptimistic

Being overoptimistic is a common judgmental bias that can lead to serious problems as difficulties are underestimated and future uncertainty ignored. Successful entrepreneurs often see themselves as gamblers and feel that they must take risks in order to succeed in situations where the odds are against them. Such success becomes a special reward of its own and an external recognition of their ability to recognize and exploit opportunities. Thus they can defend their unnecessary risk-taking with an overoptimistic outlook: They underestimate the dangers and overestimate the benefits. They say otherwise they would never have attempted to take such high risks and built successful empires.

Genex was commonly believed to be destined for great success in genetic engineering. The idea was to use genetic engineering techniques to make specialized chemicals needed in the manufacture of consumer and industrial goods. The idea helped the firm to raise \$50 million in venture capital. Genex's board of directors came from IBM, Scott Paper, Emerson Electric, and other leading companies. After going public in 1982 and becoming a "hot" stock to buy, Genex saw its market value fall from \$300 to \$30 million in a few months. Genex had hoped initially to sell to Searle Corporation the key ingredients of its sugarless sweetener in bulk quantities. By doing so, Genex expected to generate quick cash, which it could use for working capital while at the same time starting to work on other specialized chemicals for long-term profitability. But Searle decided to manufacture the sugarless sweetener itself, as Genex had not secured a patent for its new products and had also failed to secure a long-term supply contract from Searle. Without a buyer, Genex's sales fell 39 percent in 1985, and the firm lost \$16 million. In 1986, burdened with idle capacity, Genex lost \$12 million more on sales of only \$3.3 million, all of which came from contract research. Using

high technology to produce an unpatented commodity product that could be made just as easily and cheaply elsewhere proved to be overoptimistic behavior.

Ignoring Or Underestimating Competition

Ignoring or underestimating competition can lead to serious problems and eventual failure. First, it must be assumed that existing competitors will constantly attempt to gain market share or other competitive advantages, especially at the expense of successful, profitable firms. Second, it must be accepted that new competitors can enter the industry, taking market share away from existing firms. Third, it must be recognized that technological developments (aluminum replacing steel, or plastics replacing aluminum) can allow substitution effects and in so doing change the boundaries of the market, thus bringing in new competitors from outside of what was considered to be a certain industry. Fourth, it must be acknowledged that foreign firms and the globalization of trade can change competitive forces and patterns in fundamental ways.

Examples of companies that underestimated the response of their competitors abound: the Pepsi-Coke, McDonald's-Burger King, and Gillette-Bic wars are examples. Yamaha underestimated Honda's response when it decided to challenge Honda's leadership and become the world's top manufacturer of motorcycles. Honda counterattacked furiously by introducing many new models and slashing prices so drastically that the weaker Yamaha could not respond. When the war was over, not only had Yamaha gained nothing, but it had lost its second position to Suzuki and become a distant third. Similar counteractions can be provoked even from much weaker opponents whose response is underestimated. The military defeat of the U.S. army in Vietnam and the forced Soviet "withdrawal" from Afghanistan were mostly due to an underestimation of an opponent's will to respond to superior force.

Preoccupation With The Short Term

Too much preoccupation with the short term can create serious problems in the long term that could lead to failure. Many critics mention this as the main reason for the decline of U.S. firms in relation to Japanese ones. Investing in people, improving the quality of products or services, nurturing long-term customer relationships, adequate R&D spending, introducing new technologies, and the like might reduce short-term profits and put a strain on cash flows, but they are necessary to maintain or improve long-term competitive advantages. Critics argue that there are areas emphasized by the Japanese which frequently become the critical determinants of their success. Along the same lines, critics charge that U.S. companies are too concerned with, and driven by, short-term financial performance and how Wall Street will react to their short-term earnings.

Revco D.S. is an illustration of how short-term motives can lead to failure. In the hope of improving short-term profitability, Revco's management embarked on an uncontrolled expansion drive and took too many risks. In 1983 its vitamins were blamed for the deaths of thirty-eight infants. In 1984 another company was bought to avoid a hostile takeover, but the takeover danger was not eliminated by its short-sighted actions. Revco's CEO was obliged to arrange a leveraged buyout, which greatly increased Revco's debt and eventually forced it to apply for chapter 11 proceedings.

Believing in Quick Fixes

Many problems facing organizations cannot be corrected easily and quickly. Some of them are deeply rooted in the corporate culture. Others might involve managing and rewarding people, managerial skills, or the organizational structure and strategy, while others might stem from the fact that the firm is operating in a mature or declining industry. A belief that a new theory or a highly paid consultant can quickly correct such problems is naive and can even further aggravate them. Solving these problems

requires a long-term outlook, persistence, and some fundamental changes in what Kilmann (1984) calls the five areas (organizational culture, management skills, team building, strategy-structure and reward system) that determine organizational success or failure in the final analysis.

Pan American World Airways is just one example of the quick fix's failure to work. Pan Am suffered huge losses as a result of the deregulation of the airline industry. Deep in debt and with little prospect of making a profit from its airline business, Pan Am chose to sell off most of its profitable assets, which included a centrally located New York building and the Intercontinental hotel chain. As its losses continued, it sold off some of its profitable routes to other airlines and was ultimately left with no non-airline assets and only highly competitive routes. Management failed to realize that selling the airline business might have been the best way of getting rid of losses and achieving long-term profitability.

Believing In Barriers To Entry

Large, successful organizations believe that their size and financial might are adequate deterrents to competition. Firms with monopolistic or oligopolistic advantages also think they can keep competitors away. History has shown that no barriers can be effective in the long run, as competitors, attracted by high profits, will always find ways of overcoming them. IBM's great advantages and formidable barriers did not stop competition. The oligopolistic power of the U.S. automobile firms did not stop imports. OPEC did not manage to impose its will and maintain high oil prices, although it could control a large part of oil production.

Overreacting

Once things start deteriorating and the prospect of failure becomes real, overreacting is a common response. The actions of AM International, described earlier, are typical of firms that suddenly realize the magnitude and severity of the problems facing them and

attempt to solve them without thinking carefully about the consequences of their actions. In the same category are high-growth companies that see their growth flattening and the price of their stock suddenly falling because of forecasts predicting reductions in the future growth of their earnings. To reverse the trend, such companies often overreact by diversifying into high-tech industries or introducing new products aimed at exploiting new needs or creating new markets. Such actions often fail, however, because acquired companies are bought at a high price and new products do not live up to the expectations of the desperate managers looking for quick fixes. The example of Xerox, mentioned earlier; the search for new high-growth, high-profit ventures made by ITT, that has to be sold later at a big loss; the entrance of many companies into the computer market; and the expensive acquisition of biotech firms are typical of the urge to maintain high growth rates at any cost, often without proper consideration of the consequences.

The Personality And Ability Of The CEO

In an extensive study of the decision-making process among top executives of large U.S. companies Lamb (1987) explores the principal reasons why some of their decisions lead to failure. According to Lamb, the most crucial factor of all is the personality of the CEO and his ability to translate essentially simple ideas into workable strategies. Some executives can destroy their organizations through autocratic management, which leads to high turnover among top executives (Lamb cites the example of James Dutt of the Beatrice company, who had a hand in changing three presidents in one division over a two-year period and three in another in a single year). Others cannot recognize or are incapable of changing the deeply rooted culture of their organization (for example, John de Butts's attempt to change AT&T's culture after the deregulation of telecommunications in the late 1970s). Others can pursue unrealistic or misconceived strategies despite clear evidence that such strategies will lead to disaster.

Top management can also be responsible along with the CEO for failure. Groupthink and the inability to accept threatening evidence can lead to failure. The debacle of TV-Cable Week is an illustration of involvement of the CEO and top management in a failure. TV Cable Week was the most heavily promoted magazine startup in Time Inc.'s history. The company was planning to spend more than \$100 million to make the project a big success. After five months of publication, Time Inc. closed the magazine. The direct cash flow loss was approximately \$50 million, but the indirect damage was far greater: In less than two weeks Time Inc. stock lost \$750 million in market value. The magazine was developed in an effort to maintain high growth rates and earnings by pursuing new, potentially profitable, and high-growth projects. However, disconfirming evidence was ignored, as top management was not willing to accept the fact that its "pet" project was not going to be profitable. Grandiose goals were pursued. Top management rejected market testing and pushed hard to publish a magazine that had no chance of ever making a profit. In doing so, they transformed a failure into a disaster.

The Role Of Luck In Failures

Such events as new technologies, new products, new competitors, recessions, changes in customers' preferences, political unrest, physical catastrophes, and the like that cannot be predicted can sometimes lead to failure. Because planning for discontinuous events is impossible or impractical, the failure they bring can be, at least partly, attributed to bad luck. Malcolm Mclean, the man who pioneered the concept of container shipping and changed the world of shipping with his company, Sea-Land Corporation, typifies what bad luck can do. He sold Sea-Land to RJR in 1969, created a holding company, Mclean Industries, and bought another company, "U.S. Lines". Betting on a rising demand for oil, Mclean bought twelve supertankers for \$570 million. They were slower but more fuel-efficient vessels than his competitors were using. However, luck deserted him. The oil market collapsed starting in the middle of the 1970s, and oil prices increased, giving faster ships an advantage. Mclean

Industries filed for Chapter 11 protection from creditors in late 1986, almost \$1.3 billion in debt.

Incompatibility

The fashion for diversification and large conglomerates that brought together diverse firms under a single corporate umbrella in the 1960s and early 1970s was reversed in the late 1970s and 1980s, when streamlining and restructuring to reduce costs became necessary. Examples of mergers and acquisitions that created incompatibility and thus led to failure are legion. The examples of LTV, ITT, and other monstrous conglomerates come easily to mind. Companies buying their way into the computer, aerospace, biotechnology, and other high-tech industries are also relevant examples of the inability to avoid failure through incompatible acquisitions. Diversification did not provide opportunities for synergy. Few benefits could be gained through these acquisitions. There was little or no know-how for running the firms being bought. If corporate top management interfered with the running of the acquired company, it had no expertise to contribute and could even make things worse. If it did nothing, no synergy could be gained, and its firms could go their own ways.

CAN FAILURE BE AVOIDED OR DELAYED ?

Very few business and nonprofit organizations have managed to survive for long periods. Most importantly, only a tiny percentage of them have maintained above-average performance for considerable spans of time. Organizations must therefore take concrete steps to reverse what seems to be the natural process leading to organizational arteriosclerosis and eventual failure. Some of those steps are described below. Others are the equivalent of maintaining success and are dealt with elsewhere (see Makridakis, 1990).

Understanding The Nature Of Failure And The Factors That Contributed To It

Failure must be accepted as a natural process affecting all organizations unless some conscious efforts are made to avoid or delay it. That is not always easy to accept, as top executives tend to believe that their organizations are different from the majority and therefore cannot fail. Ways of rejuvenating organizations must be conceived and implemented. They should include fighting bureaucracy, continuously injecting dynamism into managerial and other personnel, and in general avoiding the factors that contribute to failure described in the preceding section.

Recognizing Mistakes

Along with accepting the inevitability of failure, unless conscious efforts are made to halt its natural progress, mistakes must be recognized in order to avoid making similar ones in the future. Recognizing mistakes is not an easy task. For one thing, in our Western culture mistakes are considered shameful and those making them rationalize them or hide their existence; for another, in many managerial decisions feedback is neither precise nor frequent, making it difficult to identify mistakes: finally, undesired outcomes do not always imply mistaken decisions, since unforeseen events and factors outside a company's control can be responsible. Learning about mistakes therefore requires an open attitude similar to that of managers in Japan, where mistakes are publicized so that others can learn to avoid them. Moreover, it must be accepted that those making them should not be penalized. Instead, procedures for evaluation of past decisions must be set in place and ways of learning from mistaken ones established.

Failure can result from judgmental biases such as overoptimism, wishfull thinking or underestimating uncertainty which must also be recognized so that steps can be taken to eliminate or minimize their negative impact. The consequences of such mistakes (or judgmental biases) are amplified when committed by CEOs or top managers. In this case, recognizing these mistakes is more difficult, for few people in the organization

are willing to tell top executives that they are wrong or that their judgment is faulty and biased.

Does Success Breed Its Own Failure ?

It is natural for success to produce arrogance and similar psychological attitudes among the executives of successful organizations. Such arrogance, in combination with the factors listed below, can slow down success, foster mediocrity, and eventually lead to failure.

◆ **Inviting Imitation.** Successful companies must attract attention and become models for imitation by other firms in their industries which attempt to reproduce their success and the factors that contribute to it.

◆ **Motivating Competition.** Successful companies earn higher than average profits, which attract new entrants on the markets and encourage existing ones to increase their capacity or more forcefully compete for products and markets.

◆ **Encouraging Segmentation.** Existing competitors and new entrants might not be able or willing to compete directly, particularly if successful companies have accrued substantial advantages. They often choose instead the indirect approach of carving out a segment of the market in which they can specialize. Often such a segment is small and unimportant to the big company, but with time its importance grows or it serves as a base for obtaining experience and expertise, which are then used to expand to other segments and possibly the entire market.

◆ **Stimulating Higher Fixed Costs and Possible Conservatism.** Once organizations become successful, they must take several steps to maintain their advantage. Success might entail:

- (1) paying higher salaries to keep their managerial and scientific personnel or hire new recruits;
- (2) investing more in R&D;
- (3) increasing fixed expenses by establishing structures and procedures to manage growth and maintain success; and possibly;
- (4) becoming more bureaucratic in order to be able to maintain and control their success.

◆ **Cultivating Arrogance.** Successful companies are often "impressed" by their own achievements, which tends to exaggerate their confidence in their ability to continue to be successful. It also leads them to underrate dangerously the capacities of their competitors to threaten or overtake them. They are likely to drop the low end of the market from strategic consideration as not profitable enough, which opens the door to segmentation as competitors move in to cater to the neglected part of the market.

Even when successful companies do not fail outright, there is a tendency toward average performance. Regression toward mediocrity is a historical fact that can be observed not only among business firms but also among non-profit organizations, the

military, and, most notably, nations. To be avoided, it requires conscious, concerted efforts aimed at reversing the natural effects of organizational aging and neutralizing the other potentially negative factors discussed in this article.

THE PARADOXES OF FAILURE

1. At the societal level failure is a natural process allowing for renewal and continued dynamism, yet from an individual firm's standpoint failure leads to permanent problems and eventual bankruptcy or halting of operations, which must be avoided at all costs.
2. Organizations must adapt to environmental changes, yet they cannot be sure beforehand whether a change will be temporary or permanent.
3. Organizations must often take risks in order to succeed, yet risk-taking, by its very nature, can lead to failure. On the other hand, not taking risks can also lead to failure, as more aggressive competitors will be willing to take such risks and might succeed.
4. Organizations must innovate, yet premature innovation can lead to serious financial problems and other difficulties if the espoused innovation turns out to be uneconomical.
5. As organizations become successful and grow they have to become more bureaucratic to maintain adequate control, yet bureaucracy lessens individual initiative and hampers the effectiveness and efficiency of decision-making.
6. Organizations must use their accrued competitive advantages to achieve desired objectives, yet they should not overestimate their own importance or underestimate the ability of competition to overcome such advantages, especially over the long term.

THE CHALLENGE AHEAD

1. Reverse the natural tendency of organizations toward aging and eventual decline.
2. Take calculated risks in order to succeed, but at the same time protect the organization against failure.
3. Understand the major factors causing failure and take steps to avoid or delay their negative influences.
4. Overcome organizational resistance to change.
5. Avoid rigidity and bureaucracy without losing control.

CONCLUSION

Business executives must always walk a tightrope. Taking too many risks can be as bad as taking no risks at all. Failing to fend off competitive attacks might be as fatal as seeing danger everywhere. Delaying or preferably avoiding failure is a challenge of the highest order that must, along with success, strategy, and creativity, engage the time and efforts of top executives. The possibility of failure must not be ignored or downgraded just because it is an unpleasant subject. In my view failure requires as much consideration as strategy, creativity, and success. It is a natural process caused by organizational aging and decline. History has clearly shown that organizational failure is almost inevitable unless something is actively done to delay or avoid it. Organizations must therefore constantly innovate and adapt. The greatest challenge facing executives is to know when and how fast to innovate and what changes to adapt to. Another serious challenge is overcoming the resistance to change present in most organizations so that the desired program can be implemented.

REFERENCES AND SUGGESTED BIBLIOGRAPHY

- Argenti, J., 1976, **Corporate Collapse: the Cases and Symptoms**, McGraw-Hill, New York.
- Barmash, I., 1973, **Great Business Disasters**, Ballantine Books, New York.
- Byron, C. M., 1986, **The Fanciest Dive**, New American Library, New York.
- Clutterbuck, D. and Kernaghan, S., 1990, **The Phoenix Factor: Lessons for Success from Management Failure**, Weidenfeld & Nicolson, London.
- Deming, W. E., 1986, **Out Of Crisis**, Cambridge University Press, Cambridge, U.K.
- Durand W. and Durand A., 1968, **The Lessons of History**, Simon and Schuster, New York.
- Hartley, R. F., 1986, **Marketing Mistakes**, 3rd ed., John Wiley, New York
- Heller, R., 1990, **Culture Shock: The Office Revolution**, Hodder & Stoughton, London.
- Kennedy, P., 1987, **The Rise and Fall Of the Great Powers: Economic Change and Military Conflict From 1500 to 2000**, Random House, New York
- Kharbanda, O. P. and Stallworthy, E. A., 1989, **Corporate Failure - Prediction, Panacea and Prevention**, McGraw-Hill, New York.
- Kilmann, R. H., 1984., **Beyond The Quick Fix: Managing Five Tracks to Organizational Success.**, Jossey-Bass, San-Francisco.
- Lamb, R. B., 1987, **Running American Business: Top CEOs Rethink Their Major Decisions**, Basic Books, New York.
- Loomis, C. J., 1987, "IBM's Big Blues: A Legend Tries to Remake Itself", **Fortune**, January 19, pp. 48-50.
- Magaziner, I. and Patinkin, M., 1989, **The Silent War: Inside the Global Business Battle Shaping America's Future**, Random House, New York.
- Makridakis, S., 1990, **Forecasting, Planning and Strategy for the 21st Century**, The Free Press, New York.
- McGill, M. E., 1988, **American Business and the Quick Fix**, Henry Holt, New York.
- McWilliams, G., 1990, "A Revolution in Steel Making", **Business Week**, September 24, pp. 48-49
- Miller, D., 1990, **The Icarus Paradox: How Exceptional Companies Bring About Their own Downfall: Success, Decline, and Renewal**. Harper Business, New York.
- Perot, R., 1988, "How I would Turn Around GM", **Fortune**, February 5, pp. 22-27.

Schnaars, S. P., 1988, **Megamistakes: Forecasting and the Myth of Rapid Technological Change**, The Free press, New York.

Smith, D. k. and Alexander, R. C., 1988, **Fumbling the Future: How Xerox Invented, Then Ignored, the First Personal Computer**, William Morrow and Company, New York.

Smith, R., 1988, "Roger Smith Replies to Ross Perot", **Fortune** February 5, p. 28.

Van Fleet, J. K., 1973, **The 22 Biggest Mistakes Managers Make and How to Correct Them**, Parker Publishing Company, West Nyack, New York.

Walsh, W. I., 1986, **The Rise and Decline of the Great Atlantic and Pacific Tea Company**, Lyle Stuart, New Jersey.

Williams, C. M., 1984, "When the Mighty Stumble", **Harvard Business Review**, July/August, pp.

-----, 1988, "It Is Tough Up There", **Forbes**, July 13, p. 145

Table 1: Sixteen Prominent Failures

| <i>Name</i> | <i>Industry</i> | <i>Event</i> | <i>Consequence</i> | <i>Main Contributing Factor</i> |
|--|------------------------|---|---|---|
| ALCOA (Aluminum Company of America) | Metal | Other materials edged into and diminished the aluminum market. | Lack of growth and increased competition | Natural causes |
| Bank of America | Banking | President could not remedy misguided policies of predecessors, caused by unexpected loan losses, expensive computer breakdowns, and high interest rates. | Bank grew too big to manage. Bank lost \$3.5 billion, \$955 million in 1987 alone. | Overextension, overoptimism, preoccupation with the short term, CEO |
| Beech-Nut Nutrition | Baby food manufacturer | Stripped of its profitable chewing gum division. Sells only baby food. To save costs it used a synthetic concentrate, which it described as 100% pure (but it was not perceived as such). | Fines estimated at \$25 million as well as legal costs, slumped sales, and negative publicity caused a 20% drop in market share during 1987-88. | Quick-fix belief |
| Burlington Northern | Railroad | Longest U.S. railroad, operating in a mature industry | Misguided diversification into oil, gas, and pipelining so as to compensate for the pitfalls of railways | Natural causes, organizational arteriosclerosis, overoptimism, quick-fix belief |
| Eastern Air | Airline | \$182 million loss in 1987; hostile management-labor relations. | Poor performance; labor detesting CEO; no solution in sight | Quick-fix belief, CEO |
| E. F. Hutton | Financial | Disorganization and mismanagement; CEO wielded absolute power for a long time; extravagance in both investing and spending | Profits slipped since 1981; in 1985 firm was found guilty of 2,000 counts of fraud; in 1986 firm lost \$90 million. | Organizational arteriosclerosis, preoccupation with the short term, CEO |
| Exxon | Oil giant | Diversified into office automation market—the growth industry | Spent \$2 billion, never made any money; new company sold for a pittance in 1985 | New technology over-dazzle, taking risks, incompatibility |
| Ford's Edsel car model | Automobiles | A medium-priced car (Edsel) conceived and designed using the best of marketing and design techniques | An estimated loss of \$200 million during 1957-60 | Poor judgment, overoptimism, unforeseen recession |

Table 1: (Continued)

| <i>Name</i> | <i>Industry</i> | <i>Event</i> | <i>Consequence</i> | <i>Main Contributing Factor</i> |
|-------------------------|-----------------------------|--|---|---|
| Genex | Biotechnology | Developed an unpatented product that could be made cheaply using biotechnology | Clients started manufacturing the product themselves; Genex had not secured a long-term supply contract; sales tumbled; idle plants added to costs | New technology over-dazzle, overoptimism, ignoring competition |
| BM Japan Ltd. | Computer manufacturer | Since 1979 has progressively lost its market dominance | Reacted with an atypical IBM strategy that included joint ventures, discounts and system integration; IBM seemed not to realize that it had to compete in Japanese style | Ignoring competition, quick-fix belief, overreaction |
| International Harvester | Machinery/truck manufacture | Decades of weak management | Insolvent; sold farm machinery firm; represented today by Navistar in the truck market | Natural causes, organizational arteriosclerosis, CEO |
| Osborne Computers | Computers | Founded in 1980; produced the first "portable" computer; sales of \$100 million in 1982 | Filed for bankruptcy in September 1983 | New technology over-dazzle, overextension, ignoring competition, CEO |
| Penn Central | Railroad | A three-way merger among three East Coast railroads | Three-way merger burdened with huge labor costs and flat dividends; in 1970 rail operations went bankrupt; nonrailway assets were sold to public at a huge loss in 1987 | Natural causes, organizational arteriosclerosis, others |
| Texaco | Oil | Acquired Getty Oil in 1984; \$3 billion out-of-court settlement for buying Getty, which Pennzoil had arranged to acquire | Most valuable company to go to Chapter 11 bankruptcy proceedings | Taking risks, overoptimism; CEO |
| Time Inc. | Publishing | Launched TV <i>Cable Week</i> . | After five months and \$47 million loss it closed the magazine | Overoptimism, ignoring competition, quick-fix belief, CEO |
| Union Carbide | Chemicals | Cloud of toxic gas spewed from the Bhopal plant, India killing about 3,000 people | Simultaneous failures in design, systems, safety, decision-making procedures; firm subject to global protests and sanctions; stock price fell; compensation still to be settled | Organizational arteriosclerosis, taking risks, overoptimism, quick-fix belief, bad luck |

INSEAD WORKING PAPERS SERIES

| | | | | | |
|-------------|--|---|-------|--|--|
| | | | 88/12 | Spyros MAKRIDAKIS | "Business firms and managers in the 21st century", February 1988 |
| | | | 88/13 | Manfred KETS DE VRIES | "Alexithymia in organizational life: the organization man revisited", February 1988. |
| <u>1988</u> | | | 88/14 | Alain NOEL | "The interpretation of strategies: a study of the impact of CEOs on the corporation", March 1988. |
| 88/01 | Michael LAWRENCE and Spyros MAKRIDAKIS | "Factors affecting judgemental forecasts and confidence intervals", January 1988. | | | |
| 88/02 | Spyros MAKRIDAKIS | "Predicting recessions and other turning points", January 1988. | 88/15 | Anil DEOLALIKAR and Lars-Hendrik RÖLLER | "The production of and returns from industrial innovation: an econometric analysis for a developing country", December 1987. |
| 88/03 | James TEBOUL | "De-industrialize service for quality", January 1988. | | | |
| 88/04 | Susan SCHNEIDER | "National vs. corporate culture: implications for human resource management", January 1988. | 88/16 | Gabriel HAWAWINI | "Market efficiency and equity pricing: international evidence and implications for global investing", March 1988. |
| 88/05 | Charles WYPLOSZ | "The swinging dollar: is Europe out of step?", January 1988. | 88/17 | Michael BURDA | "Monopolistic competition, costs of adjustment and the behavior of European employment", September 1987. |
| 88/06 | Reinhard ANGELMAR | "Les conflits dans les canaux de distribution", January 1988. | 88/18 | Michael BURDA | "Reflections on "Wait Unemployment" in Europe", November 1987, revised February 1988. |
| 88/07 | Ingemar DIERICKX and Karel COOL | "Competitive advantage: a resource based perspective", January 1988. | 88/19 | M.J. LAWRENCE and Spyros MAKRIDAKIS | "Individual bias in judgements of confidence", March 1988. |
| 88/08 | Reinhard ANGELMAR and Susan SCHNEIDER | "Issues in the study of organizational cognition", February 1988. | 88/20 | Jean DERMINE, Damien NEVEN and J.F. THISSE | "Portfolio selection by mutual funds, an equilibrium model", March 1988. |
| 88/09 | Bernard SINCLAIR-DESGAGNÉ | "Price formation and product design through bidding", February 1988. | 88/21 | James TEBOUL | "De-industrialize service for quality", March 1988 (88/03 Revised). |
| 88/10 | Bernard SINCLAIR-DESGAGNÉ | "The robustness of some standard auction game forms", February 1988. | 88/22 | Lars-Hendrik RÖLLER | "Proper Quadratic Functions with an Application to AT&T", May 1987 (Revised March 1988). |
| 88/11 | Bernard SINCLAIR-DESGAGNÉ | "When stationary strategies are equilibrium bidding strategy: The single-crossing property", February 1988. | | | |

| | | | | | |
|-------|---|---|-------|---|--|
| 88/23 | Sjur Didrik FLAM and Georges ZACCOUR | "Equilibres de Nash-Cournot dans le marché européen du gaz: un cas où les solutions en boucle ouverte et en feedback coïncident", Mars 1988. | 88/34 | Mihkel M. TOMBAK | "Flexibility: an important dimension in manufacturing", June 1988. |
| 88/24 | B. Espen ECKBO and Hervig LANGOHR | "Information disclosure, means of payment, and takeover premia. Public and Private tender offers in France", July 1985, Sixth revision, April 1988. | 88/35 | Mihkel M. TOMBAK | "A strategic analysis of investment in flexible manufacturing systems", July 1988. |
| 88/25 | Everette S. GARDNER and Spyros MAKRIDAKIS | "The future of forecasting", April 1988. | 88/36 | Vikas TIBREWALA and Bruce BUCHANAN | "A Predictive Test of the NBD Model that Controls for Non-stationarity", June 1988. |
| 88/26 | Sjur Didrik FLAM and Georges ZACCOUR | "Semi-competitive Cournot equilibrium in multistage oligopolies", April 1988. | 88/37 | Murugappa KRISHNAN Lars-Hendrik RÖLLER | "Regulating Price-Liability Competition To Improve Welfare", July 1988. |
| 88/27 | Murugappa KRISHNAN Lars-Hendrik RÖLLER | "Entry game with resalable capacity", April 1988. | 88/38 | Manfred KETS DE VRIES | "The Motivating Role of Envy : A Forgotten Factor in Management", April 88. |
| 88/28 | Sumantra GHOSHAL and C. A. BARTLETT | "The multinational corporation as a network: perspectives from interorganizational theory", May 1988. | 88/39 | Manfred KETS DE VRIES | "The Leader as Mirror : Clinical Reflections", July 1988. |
| 88/29 | Naresh K. MALHOTRA, Christian PINSON and Arun K. JAIN | "Consumer cognitive complexity and the dimensionality of multidimensional scaling configurations", May 1988. | 88/40 | Josef LAKONISHOK and Theo VERMAELEN | "Anomalous price behavior around repurchase tender offers", August 1988. |
| 88/30 | Catherine C. ECKEL and Theo VERMAELEN | "The financial fallout from Chernobyl: risk perceptions and regulatory response", May 1988. | 88/41 | Charles WYPLOSZ | "Assymetry in the EMS: intentional or systemic?", August 1988. |
| 88/31 | Sumantra GHOSHAL and Christopher BARTLETT | "Creation, adoption, and diffusion of innovations by subsidiaries of multinational corporations", June 1988. | 88/42 | Paul EVANS | "Organizational development in the transnational enterprise", June 1988. |
| 88/32 | Kasra FERDOWS and David SACKRIDER | "International manufacturing: positioning plants for success", June 1988. | 88/43 | B. SINCLAIR-DESGAGNÉ | "Group decision support systems implement Bayesian rationality", September 1988. |
| 88/33 | Mihkel M. TOMBAK | "The importance of flexibility in manufacturing", June 1988. | 88/44 | Essam MAHMOUD and Spyros MAKRIDAKIS | "The state of the art and future directions in combining forecasts", September 1988. |
| | | | 88/45 | Robert KORAJCZYK and Claude VIALLET | "An empirical investigation of international asset pricing", November 1986, revised August 1988. |
| | | | 88/46 | Yves DOZ and Amy SHUEN | "From intent to outcome: a process framework for partnerships", August 1988. |
| | | | 88/47 | Alain BULTEZ, Els GIJSBRECHTS, | "Asymmetric cannibalism between substitute items listed by retailers", September 1988. |

| | | | | | |
|-------|--|---|-------------|---|---|
| | Philippe NAERT and Piet VANDEN ABEELE | | 88/59 | Martin KILDUFF | "The interpersonal structure of decision making: a social comparison approach to organizational choice", November 1988. |
| 88/48 | Michael BURDA | "Reflections on 'Wait unemployment' in Europe, II", April 1988 revised September 1988. | 88/60 | Michael BURDA | "Is mismatch really the problem? Some estimates of the Chelwood Gate II model with US data", September 1988. |
| 88/49 | Nathalie DIERKENS | "Information asymmetry and equity issues", September 1988. | 88/61 | Lars-Hendrik RÖLLER | "Modelling cost structure: the Bell System revisited", November 1988. |
| 88/50 | Rob WEITZ and Arnoud DE MEYER | "Managing expert systems: from inception through updating", October 1987. | 88/62 | Cynthia VAN HULLE, Theo VERMAELEN and Paul DE WOUTERS | "Regulation, taxes and the market for corporate control in Belgium", September 1988. |
| 88/51 | Rob WEITZ | "Technology, work, and the organization: the impact of expert systems", July 1988. | 88/63 | Fernando NASCIMENTO and Wilfried R. VANHONACKER | "Strategic pricing of differentiated consumer durables in a dynamic duopoly: a numerical analysis", October 1988. |
| 88/52 | Susan SCHNEIDER and Reinhard ANGELMAR | "Cognition and organizational analysis: who's minding the store?", September 1988. | 88/64 | Kasra FERDOWS | "Charting strategic roles for international factories", December 1988. |
| 88/53 | Manfred KETS DE VRIES | "Whatever happened to the philosopher-king: the leader's addiction to power, September 1988.. | 88/65 | Arnoud DE MEYER and Kasra FERDOWS | "Quality up, technology down", October 1988 |
| 88/54 | Lars-Hendrik RÖLLER and Mihkel M. TOMBAK | "Strategic choice of flexible production technologies and welfare implications", October 1988 | 88/66 | Nathalie DIERKENS | "A discussion of exact measures of information assymetry: the example of Myers and Majhuf model or the importance of the asset structure of the firm", December 1988. |
| 88/55 | Peter BOSSAERTS and Pierre HILLION | "Method of moments tests of contingent claims asset pricing models", October 1988. | 88/67 | Paul S. ADLER and Kasra FERDOWS | "The chief technology officer", December 1988. |
| 88/56 | Pierre HILLION | "Size-sorted portfolios and the violation of the random walk hypothesis: Additional empirical evidence and implication for tests of asset pricing models", June 1988. | | | |
| | | | <u>1989</u> | | |
| 88/57 | Wilfried VANHONACKER and Lydia PRICE | "Data transferability: estimating the response effect of future events based on historical analogy", October 1988. | 89/01 | Joyce K. BYRER and Tawfik JELASSI | "The impact of language theories on DSS dialog", January 1989. |
| 88/58 | B. SINCLAIR-DESGAGNÉ and Mihkel M. TOMBAK | "Assessing economic inequality", November 1988. | 89/02 | Louis A. LE BLANC and Tawfik JELASSI | "DSS software selection: a multiple criteria decision methodology", January 1989. |

| | | | | | |
|-------|--|---|-------|---|---|
| 89/03 | Beth H. JONES and Tawfik JELASSI | "Negotiation support: the effects of computer intervention and conflict level on bargaining outcome", January 1989. | 89/13 | Manfred KETS DE VRIES | "The impostor syndrome: a disquieting phenomenon in organizational life", February 1989. |
| 89/04 | Kasra FERDOWS and Arnoud DE MEYER | "Lasting improvement in manufacturing performance: In search of a new theory", January 1989. | 89/14 | Reinhard ANGELMAR | "Product innovation: a tool for competitive advantage", March 1989. |
| 89/05 | Martin KILDUFF and Reinhard ANGELMAR | "Shared history or shared culture? The effects of time, culture, and performance on institutionalization in simulated organizations", January 1989. | 89/15 | Reinhard ANGELMAR | "Evaluating a firm's product innovation performance", March 1989. |
| 89/06 | Mihkel M. TOMBAK and B. SINCLAIR-DESGAGNÉ | "Coordinating manufacturing and business strategies: I", February 1989. | 89/16 | Wilfried VANHONACKER, Donald LEHMANN and Fareena SULTAN | "Combining related and sparse data in linear regression models", February 1989. |
| 89/07 | Damien J. NEVEN | "Structural adjustment in European retail banking. Some view from industrial organisation", January 1989. | 89/17 | Gilles AMADO, Claude FAUCHEUX and André LAURENT | "Changement organisationnel et réalités culturelles: contrastes franco-américains", March 1989. |
| 89/08 | Arnoud DE MEYER and Hellmut SCHÜTTE | "Trends in the development of technology and their effects on the production structure in the European Community", January 1989. | 89/18 | Srinivasan BALAK- RISHNAN and Mitchell KOZA | "Information asymmetry, market failure and joint-ventures: theory and evidence", March 1989. |
| 89/09 | Damien NEVEN, Carmen MATUTES and Marcel CORSTJENS | "Brand proliferation and entry deterrence", February 1989. | 89/19 | Wilfried VANHONACKER, Donald LEHMANN and Fareena SULTAN | "Combining related and sparse data in linear regression models", Revised March 1989. |
| 89/10 | Nathalie DIERKENS, Bruno GERARD and Pierre HILLION | "A market based approach to the valuation of the assets in place and the growth opportunities of the firm", December 1988. | 89/20 | Wilfried VANHONACKER and Russell WINER | "A rational random behavior model of choice", Revised March 1989. |
| 89/11 | Manfred KETS DE VRIES and Alain NOEL | "Understanding the leader-strategy interface: application of the strategic relationship interview method", February 1989. | 89/21 | Arnoud de MEYER and Kasra FERDOWS | "Influence of manufacturing improvement programmes on performance", April 1989. |
| 89/12 | Wilfried VANHONACKER | "Estimating dynamic response models when the data are subject to different temporal aggregation", January 1989. | 89/22 | Manfred KETS DE VRIES and Sydney PERZOW | "What is the role of character in psychoanalysis?" April 1989. |
| | | | 89/23 | Robert KORAJCZYK and Claude VIALLET | "Equity risk premia and the pricing of foreign exchange risk" April 1989. |
| | | | 89/24 | Martin KILDUFF and Mitchel ABOLAFIA | "The social destruction of reality: Organisational conflict as social drama" zApril 1989. |

| | | | | | |
|-------|--|---|-------|---|--|
| 89/25 | Roger BETANCOURT and David GAUTSCHI | "Two essential characteristics of retail markets and their economic consequences" March 1989. | 89/36 | Martin KILDUFF | "A dispositional approach to social networks: the case of organizational choice", May 1989. |
| 89/26 | Charles BEAN, Edmond MALINVAUD, Peter BERNHOLZ, Francesco GIAVAZZI and Charles WYPLOSZ | "Macroeconomic policies for 1992: the transition and after", April 1989. | 89/37 | Manfred KETS DE VRIES | "The organisational fool: balancing a leader's hubris", May 1989. |
| 89/27 | David KRACKHARDT and Martin KILDUFF | "Friendship patterns and cultural attributions: the control of organizational diversity", April 1989. | 89/38 | Manfred KETS DE VRIES | "The CEO blues", June 1989. |
| 89/28 | Martin KILDUFF | "The interpersonal structure of decision making: a social comparison approach to organizational choice", Revised April 1989. | 89/39 | Robert KORAJCZYK and Claude VIALLET | "An empirical investigation of international asset pricing", (Revised June 1989). |
| 89/29 | Robert GOGEL and Jean-Claude LARRECHE | "The battlefield for 1992: product strength and geographic coverage", May 1989. | 89/40 | Balaji CHAKRAVARTHY | "Management systems for innovation and productivity", June 1989. |
| 89/30 | Lars-Hendrik ROLLER and Mihkel M. TOMBAK | "Competition and Investment in Flexible Technologies", May 1989. | 89/41 | B. SINCLAIR-DESGAGNE and Nathalie DIERKENS | "The strategic supply of precisions", June 1989. |
| 89/31 | Michael C. BURDA and Stefan GERLACH | "Intertemporal prices and the US trade balance in durable goods", July 1989. | 89/42 | Robert ANSON and Tawfik JELASSI | "A development framework for computer-supported conflict resolution", July 1989. |
| 89/32 | Peter HAUG and Tawfik JELASSI | "Application and evaluation of a multi-criteria decision support system for the dynamic selection of U.S. manufacturing locations", May 1989. | 89/43 | Michael BURDA | "A note on firing costs and severance benefits in equilibrium unemployment", June 1989. |
| 89/33 | Bernard SINCLAIR-DESGAGNÉ | "Design flexibility in monopsonistic industries", May 1989. | 89/44 | Balaji CHAKRAVARTHY and Peter LORANGE | "Strategic adaptation in multi-business firms", June 1989. |
| 89/34 | Sumantra GHOSHAL and Nittin NOHRIA | "Requisite variety versus shared values: managing corporate-division relationships in the M-Form organisation", May 1989. | 89/45 | Rob WEITZ and Arnoud DE MEYER | "Managing expert systems: a framework and case study", June 1989. |
| 89/35 | Jean DERMINE and Pierre HILLION | "Deposit rate ceilings and the market value of banks: The case of France 1971-1981", May 1989. | 89/46 | Marcel CORSTJENS, Carmen MATUTES and Damien NEVEN | "Entry Encouragement", July 1989. |
| | | | 89/47 | Manfred KETS DE VRIES and Christine MEAD | "The global dimension in leadership and organization: issues and controversies", April 1989. |
| | | | 89/48 | Damien NEVEN and Lars-Hendrik RÖLLER | "European integration and trade flows", August 1989. |

| | | | | | |
|------------------|--|--|---------------------------|--|--|
| 89/49 | Jean DERMINE | "Home country control and mutual recognition", July 1989. | 89/62 (TM) | Arnoud DE MEYER | "Technology strategy and international R&D operations", October 1989. |
| 89/50 | Jean DERMINE | "The specialization of financial institutions, the EEC model", August 1989. | 89/63 (TM) | Enver YUCESAN and Lee SCHRUBEN | "Equivalence of simulations: A graph approach", November 1989. |
| 89/51 | Spyros MAKRIDAKIS | "Sliding simulation: a new approach to time series forecasting", July 1989. | 89/64 (TM) | Enver YUCESAN and Lee SCHRUBEN | "Complexity of simulation models: A graph theoretic approach", November 1989. |
| 89/52 | Arnoud DE MEYER | "Shortening development cycle times: a manufacturer's perspective", August 1989. | 89/65 (TM, AC, FIN) | Soumitra DUTTA and Piero BONISSONE | "MARS: A mergers and acquisitions reasoning system", November 1989. |
| 89/53 | Spyros MAKRIDAKIS | "Why combining works?", July 1989. | 89/66 (TM,EP) | B. SINCLAIR-DESGAGNÉ | "On the regulation of procurement bids", November 1989. |
| 89/54 | S. BALAKRISHNAN and Mitchell KOZA | "Organisation costs and a theory of joint ventures", September 1989. | 89/67 (FIN) | Peter BOSSAERTS and Pierre HILLION | "Market microstructure effects of government intervention in the foreign exchange market", December 1989. |
| 89/55 | H. SCHUTTE | "Euro-Japanese cooperation in information technology", September 1989. | | | |
| 89/56 | Wilfried VANHONACKER and Lydia PRICE | "On the practical usefulness of meta-analysis results", September 1989. | <u>1990</u> | | |
| 89/57 | Taekwon KIM, Lars-Hendrik RÖLLER and Mihkel TOMBAK | "Market growth and the diffusion of multiproduct technologies", September 1989. | 90/01 TM/EP/AC | B. SINCLAIR-DESGAGNÉ | "Unavoidable Mechanisms", January 1990. |
| 89/58 (EP,TM) | Lars-Hendrik RÖLLER and Mihkel TOMBAK | "Strategic aspects of flexible production technologies", October 1989. | 90/02 EP | Michael BURDA | "Monopolistic Competition, Costs of Adjustment, and the Behaviour of European Manufacturing Employment", January 1990. |
| 89/59 (OB) | Manfred KETS DE VRIES, Daphna ZEVADI, Alain NOEL and Mihkel TOMBAK | "Locus of control and entrepreneurship: a three-country comparative study", October 1989. | 90/03 TM | Arnoud DE MEYER | "Management of Communication in International Research and Development", January 1990. |
| 89/60 (TM) | Enver YUCESAN and Lee SCHRUBEN | "Simulation graphs for design and analysis of discrete event simulation models", October 1989. | 90/04 FIN/EP | Gabriel HAWAWINI and Eric RAJENDRA | "The Transformation of the European Financial Services Industry: From Fragmentation to Integration", January 1990. |
| 89/61 (All) | Susan SCHNEIDER and Arnoud DE MEYER | "Interpreting and responding to strategic issues: The impact of national culture", October 1989. | 90/05 FIN/EP | Gabriel HAWAWINI and Bertrand JACQUILLAT | "European Equity Markets: Toward 1992 and Beyond", January 1990. |

| | | | | | |
|-----------------|---|--|-----------------|---|--|
| 90/06 FIN/EP | Gabriel HAWAWINI and Eric RAJENDRA | "Integration of European Equity Markets: Implications of Structural Change for Key Market Participants to and Beyond 1992", January 1990. | 90/17 FIN | Nathalie DIERKENS | "Information Asymmetry and Equity Issues", Revised January 1990. |
| 90/07 FIN/EP | Gabriel HAWAWINI | "Stock Market Anomalies and the Pricing of Equity on the Tokyo Stock Exchange", January 1990. | 90/18 MKT | Wilfried VANHONACKER | "Managerial Decision Rules and the Estimation of Dynamic Sales Response Models", Revised January 1990. |
| 90/08 TM/EP | Tawfik JELASSI and B. SINCLAIR-DESGAGNÉ | "Modelling with MCDSS: What about Ethics?", January 1990. | 90/19 TM | Beth JONES and Tawfik JELASSI | "The Effect of Computer Intervention and Task Structure on Bargaining Outcome", February 1990. |
| 90/09 EP/FIN | Alberto GIOVANNINI and Jae WON PARK | "Capital Controls and International Trade Finance", January 1990. | 90/20 TM | Tawfik JELASSI, Gregory KERSTEN and Stanley ZIONTIS | "An Introduction to Group Decision and Negotiation Support", February 1990. |
| 90/10 TM | Joyce BRYER and Tawfik JELASSI | "The Impact of Language Theories on DSS Dialog", January 1990. | 90/21 FIN | Roy SMITH and Ingo WALTER | "Reconfiguration of the Global Securities Industry in the 1990's", February 1990. |
| 90/11 TM | Enver YUCESAN | "An Overview of Frequency Domain Methodology for Simulation Sensitivity Analysis", January 1990. | 90/22 FIN | Ingo WALTER | "European Financial Integration and Its Implications for the United States", February 1990. |
| 90/12 EP | Michael BURDA | "Structural Change, Unemployment Benefits and High Unemployment: A U.S.-European Comparison", January 1990, | 90/23 EP/SM | Damien NEVEN | "EEC Integration towards 1992: Some Distributional Aspects", Revised December 1989 |
| 90/13 TM | Soumitra DUTTA and Shashi SHEKHAR | "Approximate Reasoning about Temporal Constraints in Real Time Planning and Search", January 1990. | 90/24 FIN/EP | Lars Tyge NIELSEN | "Positive Prices in CAPM", January 1990. |
| 90/14 TM | Albert ANGEHRN and Hans-Jakob LÜTHI | "Visual Interactive Modelling and Intelligent DSS: Putting Theory Into Practice", January 1990. | 90/25 FIN/EP | Lars Tyge NIELSEN | "Existence of Equilibrium in CAPM", January 1990. |
| 90/15 TM | Arnoud DE MEYER, Dirk DESCHOOLMEESTER, Rudy MOENAERT and Jan BARBE | "The Internal Technological Renewal of a Business Unit with a Mature Technology", January 1990. | 90/26 OB/BP | Charles KADUSHIN and Michael BRIMM | "Why networking Fails: Double Binds and the Limitations of Shadow Networks", February 1990. |
| 90/16 FIN | Richard LEVICH and Ingo WALTER | "Tax-Driven Regulatory Drag: European Financial Centers in the 1990's", January 1990. | 90/27 TM | Abbas FOROUGHI and Tawfik JELASSI | "NSS Solutions to Major Negotiation Stumbling Blocks", February 1990. |
| | | | 90/28 TM | Arnoud DE MEYER | "The Manufacturing Contribution to Innovation", February 1990. |

| | | | | | |
|-------------------|--|---|-----------------|---|---|
| 90/29 FIN/AC | Nathalie DIERKENS | "A Discussion of Correct Measures of Information Asymmetry", January 1990. | 90/40 OB | Manfred KETS DE VRIES | "Leaders on the Couch: The case of Roberto Calvi", April 1990. |
| 90/30 FIN/EP | Lars Tyge NIELSEN | "The Expected Utility of Portfolios of Assets", March 1990. | 90/41 FIN/EP | Gabriel HAWAWINI, Itzhak SWARY and Ik HWAN JANG | "Capital Market Reaction to the Announcement of Interstate Banking Legislation", March 1990. |
| 90/31 MKT/EP | David GAUTSCHI and Roger BETANCOURT | "What Determines U.S. Retail Margins?", February 1990. | 90/42 MKT | Joel STECKEL and Wilfried VANHONACKER | "Cross-Validating Regression Models in Marketing Research", (Revised April 1990). |
| 90/32 SM | Srinivasan BALAK- RISHNAN and Mitchell KOZA | "Information Asymmetry, Adverse Selection and Joint-Ventures: Theory and Evidence", Revised, January 1990. | 90/43 FIN | Robert KORAJCZYK and Claude VIALLET | "Equity Risk Premia and the Pricing of Foreign Exchange Risk", May 1990. |
| 90/33 OB | Caren SIEHL, David BOWEN and Christine PEARSON | "The Role of Rites of Integration in Service Delivery", March 1990. | 90/44 OB | Gilles AMADO, Claude FAUCHEUX and André LAURENT | "Organisational Change and Cultural Realities: Franco-American Contrasts", April 1990. |
| 90/34 FIN/EP | Jean DERMINE | "The Gains from European Banking Integration, a Call for a Pro-Active Competition Policy", April 1990. | 90/45 TM | Soumitra DUTTA and Piero BONISSONE | "Integrating Case Based and Rule Based Reasoning: The Possibilistic Connection", May 1990. |
| 90/35 EP | Jae Won PARK | "Changing Uncertainty and the Time-Varying Risk Premia in the Term Structure of Nominal Interest Rates", December 1988, Revised March 1990. | 90/46 TM | Spyros MAKRIDAKIS and Michèle HIBON | "Exponential Smoothing: The Effect of Initial Values and Loss Functions on Post-Sample Forecasting Accuracy". |
| 90/36 TM | Arnoud DE MEYER | "An Empirical Investigation of Manufacturing Strategies in European Industry", April 1990. | 90/47 MKT | Lydia PRICE and Wilfried VANHONACKER | "Improper Sampling in Natural Experiments: Limitations on the Use of Meta-Analysis Results in Bayesian Updating", Revised May 1990. |
| 90/37 TM/OB/SM | William CATS-BARIL | "Executive Information Systems: Developing an Approach to Open the Possibles", April 1990. | 90/48 EP | Jae WON PARK | "The Information in the Term Structure of Interest Rates: Out-of-Sample Forecasting Performance", June 1990. |
| 90/38 MKT | Wilfried VANHONACKER | "Managerial Decision Behaviour and the Estimation of Dynamic Sales Response Models", (Revised February 1990). | 90/49 TM | Soumitra DUTTA | "Approximate Reasoning by Analogy to Answer Null Queries", June 1990. |
| 90/39 TM | Louis LE BLANC and Tawfik JELASSI | "An Evaluation and Selection Methodology for Expert System Shells", May 1990. | 90/50 EP | Daniel COHEN and Charles WYPLOSZ | "Price and Trade Effects of Exchange Rates Fluctuations and the Design of Policy Coordination", April 1990. |

| | | | | | |
|------------------------|---|--|--------------------|---|---|
| 90/51 EP | Michael BURDA and Charles WYPLOSZ | "Gross Labour Market Flows in Europe: Some Stylized Facts", June 1990. | 90/63 SM | Sumantra GHOSHAL and Eleanor WESTNEY | "Organising Competitor Analysis Systems", August 1990 |
| 90/52 FIN | Lars Tyge NIELSEN | "The Utility of Infinite Menus", June 1990. | 90/64 SM | Sumantra GHOSHAL | "Internal Differentiation and Corporate Performance: Case of the Multinational Corporation", August 1990 |
| 90/53 EP | Michael Burda | "The Consequences of German Economic and Monetary Union", June 1990. | 90/65 EP | Charles WYPLOSZ | "A Note on the Real Exchange Rate Effect of German Unification", August 1990 |
| 90/54 EP | Damien NEVEN and Colin MEYER | "European Financial Regulation: A Framework for Policy Analysis", (Revised May 1990). | 90/66 TM/SE/FIN | Soumitra DUTTA and Piero BONISSONE | "Computer Support for Strategic and Tactical Planning in Mergers and Acquisitions", September 1990 |
| 90/55 EP | Michael BURDA and Stefan GERLACH | "Intertemporal Prices and the US Trade Balance", (Revised July 1990). | 90/67 TM/SE/FIN | Soumitra DUTTA and Piero BONISSONE | "Integrating Prior Cases and Expert Knowledge In a Mergers and Acquisitions Reasoning System", September 1990 |
| 90/56 EP | Damien NEVEN and Lars-Hendrik RÖLLER | "The Structure and Determinants of East-West Trade: A Preliminary Analysis of the Manufacturing Sector", July 1990 | 90/68 TM/SE | Soumitra DUTTA | "A Framework and Methodology for Enhancing the Business Impact of Artificial Intelligence Applications", September 1990 |
| 90/57 FIN/EP/ TM | Lars Tyge NIELSEN | Common Knowledge of a Multivariate Aggregate Statistic", July 1990 | 90/69 TM | Soumitra DUTTA | "A Model for Temporal Reasoning in Medical Expert Systems", September 1990 |
| 90/58 FIN/EP/TM | Lars Tyge NIELSEN | "Common Knowledge of Price and Expected Cost in an Oligopolistic Market", August 1990 | 90/70 TM | Albert ANGEHRN | "Triple C': A Visual Interactive MCDSS", September 1990 |
| 90/59 FIN | Jean DERMINE and Lars-Hendrik RÖLLER | "Economies of Scale and Scope in the French Mutual Funds (SICAV) Industry", August 1990 | 90/71 MKT | Philip PARKER and Hubert GATIGNON | "Competitive Effects in Diffusion Models: An Empirical Analysis", September 1990 |
| 90/60 TM | Peri IZ and Tawfik JELASSI | "An Interactive Group Decision Aid for Multiobjective Problems: An Empirical Assessment", September 1990 | 90/72 TM | Enver YÜCESAN | "Analysis of Markov Chains Using Simulation Graph Models", October 1990 |
| 90/61 TM | Pankaj CHANDRA and Mihkel TOMBAK | "Models for the Evaluation of Manufacturing Flexibility", August 1990 | 90/73 TM | Arnoud DE MEYER and Kasra FERDOWS | "Removing the Barriers in Manufacturing", October 1990 |
| 90/62 EP | Damien NEVEN and Menno VAN DIJK | "Public Policy Towards TV Broadcasting in the Netherlands", August 1990 | 90/74 SM | Sumantra GHOSHAL and Nitin NOHRIA | "Requisite Complexity: Organising Headquarters- Subsidiary Relations in MNCs", October 1990 |

| | | | | | |
|-----------------|--|--|-----------------|---|---|
| 90/75 MKT | Roger BETANCOURT and David GAUTSCHI | "The Outputs of Retail Activities: Concepts, Measurement and Evidence", October 1990 | 90/87 FIN/EP | Lars Tyge NIELSEN | "Existence of Equilibrium in CAPM: Further Results", December 1990 |
| 90/76 MKT | Wilfried VANHONACKER | "Managerial Decision Behaviour and the Estimation of Dynamic Sales Response Models", Revised October 1990 | 90/88 OB/MKT | Susan C. SCHNEIDER and Reinhard ANGELMAR | "Cognition in Organisational Analysis: Who's Minding the Store?" Revised, December 1990 |
| 90/77 MKT | Wilfried VANHONACKER | "Testing the Koyck Scheme of Sales Response to Advertising: An Aggregation-Independent Autocorrelation Test", October 1990 | 90/89 OB | Manfred F.R. KETS DE VRIES | "The CEO Who Couldn't Talk Straight and Other Tales from the Board Room," December 1990 |
| 90/78 EP | Michael BURDA and Stefan GERLACH | "Exchange Rate Dynamics and Currency Unification: The Ostmark - DM Rate", October 1990 | 90/90 MKT | Philip PARKER | "Price Elasticity Dynamics over the Adoption Lifecycle: An Empirical Study," December 1990 |
| 90/79 TM | Anil GABA | "Inferences with an Unknown Noise Level in a Bernoulli Process", October 1990 | | | |
| 90/80 TM | Anil GABA and Robert WINKLER | "Using Survey Data in Inferences about Purchase Behaviour", October 1990 | 1991 | | |
| 90/81 TM | Tawfik JELASSI | "Du Présent au Futur: Bilan et Orientations des Systèmes Interactifs d'Aide à la Décision," October 1990 | 91/01 TM/SM | Luk VAN WASSENHOVE, Leonard FORTUIN and Paul VAN BEEK | "Operational Research Can Do More for Managers Than They Think!," January 1991 |
| 90/82 EP | Charles WYPLOSZ | "Monetary Union and Fiscal Policy Discipline," November 1990 | 91/02 TM/SM | Luk VAN WASSENHOVE, Leonard FORTUIN and Paul VAN BEEK | "Operational Research and Environment," January 1991 |
| 90/83 FIN/TM | Nathalie DIERKENS and Bernard SINCLAIR-DESGAGNE | "Information Asymmetry and Corporate Communication: Results of a Pilot Study", November 1990 | 91/03 FIN | Pekka HIETALA and Timo LÖYTTYNIEMI | "An Implicit Dividend Increase in Rights Issues: Theory and Evidence," January 1991 |
| 90/84 MKT | Philip M. PARKER | "The Effect of Advertising on Price and Quality: The Optometric Industry Revisited," December 1990 | 91/04 FIN | Lars Tyge NIELSEN | "Two-Fund Separation, Factor Structure and Robustness," January 1991 |
| 90/85 MKT | Avijit GHOSH and Vikas TIBREWALA | "Optimal Timing and Location in Competitive Markets," November 1990 | 91/05 OB | Susan SCHNEIDER | "Managing Boundaries in Organisations," January 1991 |
| 90/86 EP/TM | Olivier CADOT and Bernard SINCLAIR-DESGAGNE | "Prudence and Success in Politics," November 1990 | 91/06 OB | Manfred KETS DE VRIES, Danny MILLER and Alain NOEL | "Understanding the Leader-Strategy Interface: Application of the Strategic Relationship Interview Method," January 1990 (89/11, revised April 1990) |

91/07
EP

Olivier CADOT

"Lending to Insolvent Countries: A Paradoxical Story," January 1991

91/08
EP

Charles WYPLOSZ

"Post-Reform East and West: Capital Accumulation and the Labour Mobility Constraint," January 1991