

**"MANAGEMENT DEVELOPMENT AS
GLUE TECHNOLOGY"**

by

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A B S T R A C T

In the global enterprise, one of the major tasks of management development is providing organizational glue - integrating subsidiaries and other units that need their own autonomy. In this way the firm is able to escape the traditional centralization-decentralization dilemma. The article outlines a hierarchy of tools of glue technology and the pitfalls in their use. It emphasizes the importance of "dosing the glue" so to focus on building strategic and operational linkages, avoiding the traps of "strong culture" firms. Finally, a paradox is discussed: while the human resource function has an important role to play in managing management development, that function is itself often a prisoner of the centralization-decentralization dilemma.

The role of management development is changing. Its focus has long been on "getting the right people into the right places at the right times" through recruitment, succession management, training and other forms of development. And as the "places" have changed from static boxes on an organization chart to strategic and business goals, so its role has come to encompass the implementation of these new strategies and plans.

In today's multinational firm, its role is broadening further. Management development has become a tool for organization development, for managing the informal organization that is often known as "the network" (Evans, 1989a). In multinational enterprises, the formal tools of organization (structure and systems) cannot cope alone with dilemmas such as the opposing pulls of centralization and decentralization. Many firms have tried, for example devising matrix structures. As Davis and Lawrence (1977) saw it, matrix offers "the promise of a release from the dilemma, of the flexibility of both centralization and decentralization, specialization and integration" (p.xi). Yet when the two dimensional matrix of product by geography becomes a four to six dimensional matrix (product, geography, customer/industry segment, supplier segment, core competence, and functional competence) even the most stalwart advocate of matrix structure is forced to acknowledge its limits. And when speed in implementation

becomes a competitive success factor in the shape of "time to market" and transfer of know how, we find that the formal organization always lags behind. Matrix becomes not so much a question of structure but more one of management development. How can one create a matrix in the mind of managers and build a matrix of needed relationships (Bartlett & Ghoshal, 1990)?

The objective of this article is to answer this question, based on a study of more than forty firms that have been struggling with these dilemmas (see Evans, Doz and Laurent (1989) for an earlier report). In the conclusion, I will turn to the implications for the human resource function. The starting point is the discussion of the centralization-decentralization dilemma that confronts every major international organization.

THE BACKGROUND: THE CENTRALIZATION-DECENTRALIZATION DILEMMA

Let me begin by outlining the history of this dilemma in simplified form. In the early stages of internationalization, until the late 60s, most firms were comparatively centralized. This was logical in that the center had the skilled technical and managerial resources, the manufacturing know how, and the access to capital (Doz & Prahalad, 1981). Export departments became international divisions, companies invested in sales

subsidiaries abroad and exported skilled personnel to command operations or establish local plants.

As internationalization accelerated in the late 60s, the pendulum began to swing toward decentralization. Foreign affiliates and labor markets had now developed their own technical and managerial resources. With the internationalization of capital markets, they could often secure their own financing. In a tougher market, local initiative was becoming the competitive success factor - service to local customers, adaptation of products to local needs, attraction of local entrepreneurs. This swing of the pendulum was reinforced by the early wave of acquisition of foreign companies.

How do we organize decentralized operations? This created organizational dilemmas, especially for diversified enterprises with ambitions for international growth. Do we organize by geography (regional divisions) or by product (worldwide product divisions)? Some firms muddled through with successive waves of reorganization. Others organized by product division, selling off unrelated businesses so as to focus on the "knitting" that fitted into these product lines. But the majority of companies turned to the new matrix structure, occasionally in its pure form of dual reporting lines but more typically in the shape of dotted-line

relationships complementing the chosen product or geographic structure.

Line managers were the central players in these organizational dramas - regional and country heads, plant managers, and product managers. Functional departments, and notably personnel, were typically backstage players. With the attention now being given to strategic HRM and new concerns such as EEO and the changing industrial relations scene, central personnel departments often mushroomed. But this reflected the interests of the mother country. Local and even divisional personnel managers went their own way, serving the interests of their local masters and largely unaffected by the new dotted lines on the organization chart.

"Globalization" in the 80's heralded a new shift, with the pendulum swinging back toward "centralization". Global clients began to demand worldwide coordination of their needs. Economies of scale in sourcing and purchasing necessitated greater global coordination, as did technology and manufacturing. Duplication of local initiatives in MIS, QM and the like had to be avoided, and the transfer of learning from one business or country to another became more important. Greater control was needed to enter and leave the growing number of joint ventures, alliances, sales and acquisitions of operations. Closer relations between local detection of opportunities, central research, regional manufacturing and

local marketing became important to speed up "time-to-market" which in some industries was becoming a major source of competitive advantage. In fact, "globalization" has become an umbrella label for forces such as these.

However, the twist was that few of these pressures could now be satisfied by resorting to yesterday's tools of centralization. The imperatives of decentralization were equally strong: the need for customer orientation, the fact that many innovations originate at the local or customer interface, the need for greater specialization and differentiation in focus, the unwillingness of talented local employees to respond to distant central masters - complemented by the emergence of new logics like the localization of technical or functional centers of competence that can often best be managed locally where the initial opportunity and talent base lies.

Thus the feature of the 80s was that the forces of centralization and decentralization simultaneously reached a peak, exacerbated by the fact that solutions must now add organizational value at the lowest possible cost (see Note 1).

Escape from this dilemma has come from the recognition that centralization is only one form of INTEGRATION, which is the higher level concept. As the classic study of Lawrence and Lorsch (1967) pointed out, centralization is only the formal

end of a continuum of integration mechanisms. An increasing number of studies have suggested the power of more subtle and informal methods of integration (see Martinez & Jarillo, 1989, for a review). For example, a recent empirical study of 23 subsidiaries within Matsushita and Philips even found that while formal structure had no discernible influence on interunit communication, these more informal integration processes had significant positive effects on vertical and horizontal communication within the two multinationals (Ghoshal, Korine & Szulanski, 1991).

Management scholars recognized this in the early-mid 80s (Prahalad & Doz, 1987; Hedlund, 1986; Bartlett & Ghoshal, 1989). The "either-or" pendulum of centralization-decentralization has been replaced by a new "and-and" challenge of decentralization and integration: How can a firm provide integration to subsidiaries and other units that need some measure of their own autonomy?

Behind this new duality lie some significant on-going changes in mindset about organization and organizational processes. First, it reflects a growing awareness of the limits of the formal tools of organization (structure and systems), and a shift to managing the informal organization through what I call glue technology. Second, it reflects a corresponding awareness of the limits of hierarchy. While I do not believe that networks will replace hierarchy, they are certainly

coming to complement it. Third, it embodies a change in focus from matrix structures to matrix mindsets, as mentioned earlier. And fourth, it paves the way for a more differentiated approach to organizational management where different parts are managed in different ways.

THE RESPONSE: THE INTEGRATION CHALLENGE

The limits to which an organization can handle differentiation and decentralization are set by its ability to handle the complementary challenge of integration. Integration is the challenge, with its three elements : direction (goals, visions, targets), control, and coordination.

Let's jump into the future and see how the global firm of the year 2005 handles integration, taking business planning as an example.

The enterprise is organized into multiple centers or units - let's say 600 business units, geographic units, centers of technical and functional competence, global customer centers, and some centers at the boundary of the firm (e.g. manufacturing, development and IT partnerships with other firms). The centers of competence may not be located in the mother country, even though they serve the whole firm. They are located where they can best develop their competence - in

Japan if that is the source of qualified labor, in Europe if that is the major customer base.

Even today, a firm with global aspirations like Asea Brown Boveri (ABB) consists of some 2400 such centers. And as Quinn Mills (1991) points out, the theoretical design limit on the number of differentiated centers is that each person is a business center. The practical limit, as I said, is set by the degree to which one can integrate these centres.

Top management's task is to specify who has to work with whom. This specification of linkages is a formal process, guided by the strategy for the future. There is of course a structure (e.g. global product divisions) which reflects the dominant linkages, and a majority but far from all of these interdependencies lie within the structural unit. As the strategy and competitive situation changes, so the specification of who-has-to-collaborate-with-whom will change.

Thus the business manager for a particular center (lets call him Jacques Dupont in Lyon France) may be formally interdependent with, say, 25 other centers. Jacques prepares his business plan, which he sends to these centers, including one headed by Margaret Smith in Milwaukee. Margaret reads the plan. If it does not meet her needs, if she feels that there is an interest in pooling resources or exploring an unidentified opportunity, she gives Jacques a call. They

resolve the matter on the phone, meet or set up a task force, and they revise their plans accordingly.

It is only if they cannot sort things out that the matter is referred to the formal hierarchy. The hierarchy exists, but as a court of contention. If Margaret and Henry cannot sort things out, it is probably because the issue raises a basic question of strategy, structure or principle, which should indeed be referred up the hierarchy.

This system is integrating a vast amount of complexity that would require a mammoth bureaucracy to handle in yesterday's conventional organization. From top management's perspective, the priorities are being filtered out so that they can focus on the wood rather than the trees.

However, will it work? The basic premise for this system is very simple. Let's come back to Jacques and Margaret. If Jacques is simply an anonymous name in an intercompany phone directory, if there is no trust and common purpose between them, what will Margaret do? She'll put the business plan in her in-tray. One month goes by, and she'll say to her secretary, "File it away - it wasn't important after all!"

To employ the label of Bartlett and Ghoshal (1989), we can call this firm the differentiated network organization. It is highly differentiated, but held together by a network of

relationships. We come back to the simple truth that things get done through relationships.

The three elements of integration are found in these "relationships" :

1. Shared Superordinate Vision. This is the DIRECTION component of integration. Jacques and Margaret must understand and accept the reasoning behind the formal linkage between them. They are responsible for different units, but they must also understand WHY they should collaborate.
2. Control. Jacques and Margaret must have the capacity for self-control. This implies that they are "the right people in the right places", and that the evaluation and reward systems foster their collaboration on important matters. Networking is analogous to delegation: one should not delegate or give up hierarchic control to someone who does not have the capacity for self-control.
3. Coordination. The capacity of Margaret and Jacques to negotiate their differences also depends to a large measure on the personal quality of their relationship. At one extreme, if they once worked with each other and were personal friends, it is probably that they will work out a deal. At the other extreme, if they have never met and have stereotypes about

"those Frenchies" and "the Yanks", it is unlikely that they will work things out.

These are demanding but far from impossible requirements. Step by step, many organizations are proceeding in this direction - Shell, IBM, Hewlett Packard, Matsushita, Ciba Geigy, Unilever. This 2005 organization is not realized overnight with one simple reorganization. It is realized by progressive application of what I call "glue technology", the management development technology of integration.

APPLYING GLUE TECHNOLOGY

Integration capabilities are built up progressively, step-by-step, through the application of glue to the linkage points where it is needed.

Glue technology can be conceptualized in terms of an inverted hierarchy of mechanisms, as shown in Figure 1. The foundations are provided by simple mechanisms that are relatively inexpensive and easy to employ. The use of more sophisticated mechanisms assumes that these foundations have been laid. If not, attempts to use powerful glue technology are likely to abort.

INSERT FIGURE 1 ABOUT HERE

Building Face-to-Face Relationships

The bottom of the hierarchy builds on the fact that barriers and stereotypes fade through face-to-face contact. The specific tools are company conferences, annual "jamborees", regional or worldwide functional meetings, exchange seminars, workshops between two companies after a merger, or central training programs.

Sure, there may be some informational or educational input at these meetings but this should be complementary to the objective of building necessary relationships. These are created at the bar or golf course, through debate and discussion, through active exchange rather than by listening to input. Thus there is considerable art to the design of such functions - managing process is as important than managing content. The expensive failures are those where people feel that they have only listened to inputs they could have read at home, and where they have only socialized with close colleagues. The cheap successes are those where participants build useful relations with new people, learn new perspectives, and modify stereotypes of other functions and affiliates. Appropriately designed, these occasions develop the interpersonal networking skills that are fundamental to the functioning of the global enterprise.

While these meetings may lack a defined task objective, they create the confidence and basic network that allow the firm to proceed to the next tool.

Horizontal Project Groups

Lateral project management is one of the building blocks of the differentiated network. New opportunities are developed not by central management or HQ staff but by project teams or task forces whose members are drawn from the decentralized units. Problems and conflicts are tackled by similar project groups that may cut across the formal structure. The success of these teams or ad hoc task forces fosters further development of the network.

The role of corporate, divisional or regional headquarters does not vanish, though it changes qualitatively (and quantitatively since fewer central staff are needed). This role is not to solve people's problems for them but to lead a process whereby people get together to solve their problems or to explore opportunities that require joint collaboration. Instead of providing expertise and solutions, as in the past, the role of headquarters is to provide what I call network leadership.

This is leadership rather than management, to use the current cliché, and without it, horizontal project management will

remain no more than an ideal. Leadership means "ears-to-the-ground" to ensure that project teams are set up around real priority problems. It means ensuring that the team members from local units are the right people - those with the knowledge, the local clout, and not simply those who are available.

This paves the way for the later implementation of centers of excellence or competence. Headquarters does not have the monopoly on expertise. Locating centers of technical or functional competency where it is cheapest and most natural is quite commonsensical. However, this concept cannot be implemented until the conception of the headquarter role has changed and until local managers have developed capabilities in working across the organization.

How does top management start this ball rolling? Initial talk of project management, networking and horizontal collaboration (for example at the first level meetings mentioned above) is important to sensitize people. Some successes, closely steering by top management, will reinforce this. But this is not enough. Paradoxically, I have observed that the most important tool is to limit the extent to which local managers can solve problems and grab opportunities via conventional means! Exercise tight budgets, limit resources and financing while emphasizing the importance of horizontal project management!! This means getting to grips with what my

colleague Sumantra Ghoshal graphically calls "satisfactory underperformance". As long as the resource pool is open, as long as there is tolerance for satisfactory underperformance, decentralized managers will continue to build local empires, reinvent-the-wheel, resource opportunities for their own vested interest, and remain within the not-invented-here syndrome. I will provide an example of how resource constraints triggered the creation of a global network in one firm's HR function later in this article.

At this stage, the functioning of these project teams and ad hoc task forces may be far from perfect. Problems emerge which are the agenda for later stages: local bosses don't want to release the right people, the accountability and reward system does not facilitate horizontal work, the vision behind these project groups is not shared by local units. This leads us to the next level of glue technology.

Project-oriented Training

Here I am referring to seminars and workshops that are tailored to organizational problems and their implementation. These programs may develop individual competences, as in traditional training, but the prime objective is to develop organization competences. Let me provide an example.

A few years ago, INSEAD's Euro-Asian Centre was asked by the chairman of group of companies headquartered in South East Asia to develop such a program for a selected group of executives, tailored to various strategic and organizational priorities. On the final evening of this two-week program, he flew in for the traditional chairman's closing speech, where what he said was: "I look forward to hearing your recommendations and proposals, which I hope this meeting has generated. But I want you to know one of the main reasons why I asked you to attend this special program - I sent you here to get drunk with each other!"

You can well imagine the reaction of the seminar faculty sitting at the back of the room! Afterward, they discussed this with him, concluding that he was a very astute businessman. He explained that "the reason why I commissioned this program was that I have so many detailed problems on my desk that I can't do my job - I can't see the wood for the trees. And the reason why I have these problems on my desk is that Mr Goh in Singapore isn't collaborating with Mr Williams in London, and Dr Muller from business area X isn't working with Mr Ismail in business area Y." One could see how his mind had worked. He had personalized these problems in terms of key executives who had to collaborate, and then he had decided to lock them up for two weeks both to build personal relations (and there may be some truth that

inebriation facilitates the breakdown of barriers!) and to develop a common sense of problems and opportunities.

Project-oriented training differs from conventional training in two important respects. First, there are no "attend when and if you can" sign-up lists. Careful attention is paid to the choice of who will attend (reflecting the network of key actors one wishes to build), and attendance is obligatory. In practice, this means that this training is sponsored by line management rather than the personnel department.

Second, the focus is on working through an agenda of strategic, organizational and operational problems. The program may take the form of a workshop or a weekend meeting, and there may be no conventional faculty. The output is a clarification of problems and opportunities, steps towards a shared sense of priorities and necessary action, and what Prahalad & Doz (1986) call "multiple perspectives".

These meetings pave the way for what will in time become the basic strategic management process in the "differentiated network". They constitute an apprenticeship in the annual and *ad hoc* strategic meetings where directions and priorities are sorted out - resulting in the collective sense of direction, the heightened self-control, and the network of personal relationships that characterize this organization. The problems that these meetings surface eventually become the

agenda for a consolidation process at stage five ("vision and values").

Career and Mobility Management

While prior attention has been given to career and mobility management, it is at this stage that it becomes central. Royal Dutch/Shell is an enterprise that illustrates this well.

The principle of decentralization and autonomy to local operating companies has been Shell's basic organizational philosophy for the last forty years. Thus Shell Oil is an independent U.S. company, while Deutsche Shell in Germany is expected to function as a German firm. Nevertheless, Shell functions as an integrated group since it has long paid close attention to glue technology. As Lo Van Waachem, the former chairman of the Group, is reputed to have said: "There are three things that hold this group of autonomous companies together. The first is the common logo, the Shell pecten and the values of quality that this represents. The second is common financial systems - the rationale behind the performance evaluations is the same for all operating companies. And the third and most important source of cohesion is management development - close attention to central training and particularly to career management".

Carefully employed, career management is very powerful glue technology. Managed mobility results in an array of vital outcomes :

1. Individual management development.

One of my earliest research studies showed that the principal tool to develop management leadership qualities is mobility (Evans, 1974; 1989b). "Getting results through other people" (the usual definition of management) requires some form of authority. Early professional development develops the authority of expertise in one's functional or technical area. While expertise-oriented managers are the bedrock of any organization, they succumb to Peter Principle traps when in leadership positions: they tend to overcontrol what lies within their area of expertise so as to maintain their authority, and they overdelegate most matters outside their expertise. But if one moves a manager who is thought to have leadership potential to another area of expertise, that person is obliged to develop leadership skills in delivering results through people who have more expertise. The duration of this cross-functional job should be at least 3-4 years (contrary to the practice of many firms) - otherwise people will only develop skills in starting things off, not in implementation and execution.

I'm still surprised by the number of major firms that have not learnt this fundamental lesson. But mobility goes much further than this.

2. Cross-cultural competency.

"How does one develop an international manager, someone capable of working across cultures?", is one of the more frequent questions that I am asked these days. There are some useful and obvious tools at lower stages in the hierarchy of glue technology: discussing cultural differences at seminars, workshops with staff from different nations, travel abroad, face-to-face international project teams. But the only way in which an American will develop deep cross-cultural competence is by being put in a line role where that person is accountable for delivering results through a team of German (or Japanese, French, Dutch ...) subordinates. That individual is obliged to come to an understanding of the German way. The deeper competence that is developed is the realization that, to put it crudely, "there is more than one way of skinning a cat" ... and the German way has some merits to it after all! This begins to facilitate organizational learning through the transfer of management know how from one culture to another.

3. Broadened Perspectives and Relationships

Shell, IBM and Unilever ideally want to have local managers running local businesses. But none of these companies would ever entrust a local with the leadership of an important center unless that person had proven him or herself in another country and a headquarter or central staff role. The perspectives of the person would be too narrow. Coordination with other centers and adopting the higher level corporate perspective would not be high on the priority of the individual.

Mechanisms that were discussed earlier serve to broaden perspectives, but depth of broad perspective (a necessary duality) comes only through the deep experiences that are fostered by mobility. And experience in different jobs also develops the network of personal relationships based on long-term trust through which important horizontal initiatives get planned and implemented.

4. Building the Nervous System.

In time, this network becomes the nervous system of the organization. As Granovetter (1977) pointed out, a network does not require everyone to know everyone else. For it to function effectively, it requires "loose ties" - knowing someone who knows someone who knows someone. Network theory and research show that a relatively small number of strong ties (strong relationships) among

appropriate "gatekeepers" (to use the term of Allen (1977)) can provide a vast set of potential linkages.

Moreover, this nervous system facilitates responsiveness. The soft signals and information on competitive moves, technological shifts and the like are transferred through the network, rather like the proverbial grapevine.

5. Transfer of Learning.

Transfer of cross-cultural learning (what Adler (1986) calls cultural synergy) was mentioned above. But what about the transfer of substantive product, process, market and technological know how? Ghoshal & Bartlett (1988) have showed in an empirical study that the stronger are the informal communication links between units in a company, the greater is the diffusion and adoption of innovation.

My own experience with multinationals is that lower level glue technology facilitates the transfer of learning, but slowly. Exchange sessions, project interactions, the informal network of relationships leads to the awareness of innovations. But rapid and successful transfer of innovation is typically the result of the transfer of a specific person. Exchange does not build the confidence that is needed if a unit is to put an innovation on its priority list for resourcing and risk-taking. The

presence of a "champion" who has done it before and who is eager to adapt that know-how to a new situation is what it takes to move from words to action.

Using mobility to transfer learning is seen in Pucik's study of joint ventures between Western and Japanese partners (Pucik, 1987). The Japanese partner assigns its highest potential engineers to the venture on medium-term assignments. These engineers acquire the know how that the Japanese firm did not possess (the initial rationale behind the joint venture). These engineers are then transferred back to the mother company to adapt and develop that know how, ultimately leading to the collapse of the venture since the Japanese have now developed superior know how.

As glue technology takes effect through the evidence of its success, intermediate mechanisms for the transfer of learning develop. If there are strong ties between two otherwise autonomous units, these units may engage in part time project-based swapping of expertise and champions, without resorting to full-time moves. This is a further step in the natural progression to global centers of competence.

Managing mobility and career development is obviously a complex domain that goes beyond the scope of this article (see

Evans, Farquhar and Lank (1989) for a review). It is a flexible tool of glue technology. To provide some examples, Shell feels that it requires a lot of cohesion to balance its strong attachment to the autonomy of operating companies. So Shell monitors centrally the careers of some 10,000 individuals, nearly 7% of the total workforce. At IBM and ICI, central monitoring covers around 1%, though ICI has recently doubled the number. Obviously, the monitoring of careers is a cascading process in most corporations.

One other aspect of career management that is a tool of glue technology should be mentioned, namely explicit career pathing. This is used to build durable linkages between separate units or functions, initially complementing formal structure and control but ultimately lightening it.

Take for example refinery operations and oil marketing in a petrochemical company. With quite distinct operating cultures, these require their separate functional identities. However, they must collaborate closely in short-term operations, and long-term developments, and they must resolve frequent conflicts. Traditionally, this required substantial hierarchical centralization (reporting structures, central staff, planning and control systems). However, the cumbersome hierarchic apparatus can over time be lightened by introducing a simple career path rule: no senior executive in either

function can hold that office unless he or she has proven themselves in a previous line job in the other function.

In time, this does more than just ensure breadth of perspective and the network of relationships on the part of senior management. It also affects behaviors lower down in the firm. Ambitious young managers learn that they must take people in the other function seriously, and their interest in interfunctional training and projects is boosted. They realize that if they undermine their counterparts in the other function, this will catch up on them when they are in their rotational job, damaging their further career prospects.

The norm that members of local management teams must have experience at headquarters has a similar effect. And Pascale (1990) provides us with some rich examples of how Honda in Japan employs career pathing and related devices. Research, engineering and manufacturing are autonomous companies at Honda, with research as the primus inter parus. But they are linked by a variety of subtle career norms. For example, the explicit rule is that the president of research will become the president of Honda. This signals the importance of research to the other companies. It also ensures that research collaborates closely with engineering and manufacturing - otherwise the future president will inherit problems of his own making!

Building Shared "Vision" and "Values"

This evolution so far in the application of glue technology is far from problem-free. There are many obstacles and resistances reflecting inconsistencies between new behaviors and the historic reward, performance and job evaluation systems, as well the heritage of the hierarchic culture. The measure of success that has been achieved leads top management to believe that a major organizational overhaul is necessary. Where can formal structures be lightened (delaying)? How can horizontal behaviors in the emerging differentiated network be facilitated?

And how can these behaviors be channeled? Success in glue technology creates two new problems (Evans & Doz, 1989, pp 240-242). The first is the risk of politicization of decision-making processes. Since decision-making is increasingly horizontal and informal, there are cases where decision processes are subverted by the vested interests of individuals or coalitions. These subterfuges can be camouflaged in the complexity of the firm, which is the second problem - the need to steer the complexity of emerging organizational processes.

Top management begins to feel the necessity to pay close attention to the steering mechanisms of the firm - strategic and operational goal-setting ("vision") and control mechanisms ("values"). The dualistic law of organization is that the more

top management decentralizes operational decision making and problem solving, the more it must pay attention to channeling those decentralized behaviors in the interests of the firm (for a discussion of the dualities in organization, see Evans & Doz, 1989; Evans, 1989(a); Evans, 1991).

The vehicle for undertaking this overhaul is the next step in glue technology, the process of building shared vision and values. Let me restrict myself to two related comments concerning output and process respectively.

The first point is that vision must be rooted in reality, and that values must mobilize energy and action. Thus, the output of this process must be both general and specific. In terms of vision, the output may be broad buy-in to a long term strategic intent or definition of business development goals. But the output is also the elaboration of and commitment to specific management processes for strategic and operational goal-setting and resource allocation (e.g. annual conferences of key unit managers to discuss strategic directions, formalization of linkages between centers and units, elaboration of plans, etc.).

I saw one \$3 billion enterprise go round in circles for eighteen months after the president succeeded in a company-wide exercise to build a vision and values built on the theme of "The \$10 billion enterprise in the year 2000". Yet this

vision was not rooted in concrete realities and action plans. Top management waited for the middle to take specific initiatives while middle management waited for the top to tell them what to do!

Similarly, the output in terms of values may be general ("reward for achievement", "unity in diversity", "tolerance for legitimate mistakes"), but these values are worthless unless they energize specific changes in policy, roles and behaviors. The values must mobilize a revision of the performance evaluation system so that it allows for multidimensional goals (i.e. "unity in diversity"), they must fuel an overhaul of the reward system (i.e. "reward for achievement"). Note also that the earlier mastery of horizontal project management allows implementation of these significant changes and reinforces the glue.

The second point is that it is the process of developing shared vision and values that both creates the glue and mobilizes action, not the content alone. For those who are not involved in the process, the results are only words on a paper that are unlikely to create energy. I observed this in a study of such a vision/value exercise undertaken by the French group Lafarge-Coppée, the number two world player in the cement industry. Faced with the need to build cohesion among newly acquired companies, the president launched a one year process leading to the development of new "Principles of

Action". My interviews showed that the 50 executives who were involved indeed developed a cohesive understanding of the new vision, structure and values, and of the intent and nuances behind them. This was also true for lower management in the Brazilian subsidiary, where the management team spent six months adapting these values to fuel changes in the company. But in the Canadian affiliate, where they were announced at a single weekend meeting, they were seen as a worthless booklet of vacuous ideals.

BP (British Petroleum) is a company that is currently at this stage in the development of glue technology. Robert Horton, the new chairman, launched a total overhaul of the organization, vision, values, and management processes. Initially, this focused on the top fifty people, then it was worked through the next 500 at open seminars (Lorenz, 1990). I remember a conference discussion led by a BP executive who outlined what was happening. Someone in the audience laughed: "I suppose that you now are going to run this through the other 70,000 employees!!" "Yes, that is exactly what we are thinking of doing", was the reply. Indeed, BP has given itself two years to work this process through the top 26,000 employees. What is noteworthy in BP's attention to process is the recognition that this must involve more than top-down communication. If it is to result in genuine commitment, the downward cascade must allow for middle-up suggestions, refinements and revisions. The process is two-third completed

at the time of writing, and the vision-value statement is currently at its sixth iterative change.

This global overhaul may well pay off for BP because it has a mastery of lower level glue technology. For other firms without that mastery, that type of exercise might be a futile and expensive waste of time.

A diversified Australian company which masters lower level glue technology provides an example of what happens if there is not this "stage five" commitment to common vision and values. Deregulation of its Australian market led two major competitors to put themselves up for sale. The management team agreed "in principle" that acquiring one or both of these companies was attractive, though there was no deeply shared vision for the future of the corporation. The reality was that each business head was locked into a resource allocation plan, unwilling to adjust this so as to release cash for the purchase. It took them so long to reach agreement to sacrifice their individual vested interests that they missed the window of opportunity - both companies were bought by competitors.

Applying those Values to Human Resource Development

The strongest tool we know in the arsenal of glue technology comes next. Those core values are then applied as rigorously

as possible to guide the selection, socialization, development, and promotion of staff.

Let's take an example of a strong glue (i.e. strong culture) company, that of Hewlett Packard. Its core values are embodied in the well-known "HP-Way", and it is a company that has practiced what it preaches as well as any other. When it recruits a German engineer for its plant operations at Büblingen in Germany, it is not just looking for a technically-skilled engineer: it is looking for an engineer who is deviant on basic German values, someone who is attracted by the values of Hewlett Packard rather than the more mainstream values of a Siemens or a BASF! Subtle indoctrination methods will be used to develop the value-fit in the early career years, and the person's likelihood of promotion depends to some extent on that value fit (as shown by the research of my colleague André Laurent in such strong culture companies). The result is a very cohesive corporation, where autonomous individuals know exactly "what Bill Hewlett or Dave Packard would have done if they had been in my shoes".

Such strong culture companies (HP, IBM, some major Japanese firms) were fashionable in the early 80s, with the early wave of interest in glue technology. Today's observation is more nuanced, as we'll see in the next section.

DOSING THE GLUE

Glue technology has to be dosed in moderation and with care. Colin Harvey, a senior executive with the Shell Group of companies, expresses this with an analogy :

"One of my son's hobbies is building model aircraft. The key to building an aircraft that will fly is dosing the glue at the right places. Too little glue at the key spots, and the plane falls apart when you try to fly it. But sometimes he falls into the opposite trap. He and the plane get covered with glue, and the plane is so heavy with glue that it won't fly. It's the same for organizations - some are so sticky that they can't fly."

Let me build on Harvey's analogy with two related points to which human resource executives in particular should pay attention.

The Weakness of Strong Cultures

One of the basic tenets of duality theory (Evans, 1991) is that anything, taken to the extreme, becomes pathological. This is true for extremes of centralization and decentralization, and it is true for extremes of glue technology. There is nothing virtuous in and of itself about a strong culture.

One of the negative consequences of strong culture is loss of strategic flexibility. Hewlett Packard is a good illustration (Evans & Lorange, 1989). The HP-way reflects this company's heritage in the instruments business. But HP was led by technological shifts into the computer sector, where different values are required to be successful. It faced a choice point

in the mid-80s - whether to differentiate its values (and the underlying management practices) so as to permit diversification, or whether it should stick to its values and limits its mission to instruments. With the acquisition of Apollo Computers, HP committed itself to the former route and is currently engaged in a difficult process of differentiation or glue removal (creating a culture with more tolerance for diversity).

With internationalization, many major Japanese firms face a similar dilemma. Their strong and cohesive management processes are built on Japanese values. Direct foreign investment means localization of management, and this is made difficult by the very strength of the management development system. This has been described as the Achilles heel of Japanese management (Bartlett & Yoshihara, 1988). The same may be true for IBM, which has experienced difficulties in creating room for mavericks in a culture geared to foot soldiers. One of IBM's strengths is the value it attaches to measurement (IBM="I-Believe-in-Measurement). Yet anything taken to the extreme becomes pathological - and overattachment to measurement can focus an entire organization on short-term measurables rather than longer-term reorientation.

Focusing on the Business Imperative

One implication is that glue technology must only be applied to tackle identified strategic and business imperatives - in

the right strength and at the right places. Figure 2 provides a listing of strategic and operational justifications for using glue technology.

INSERT FIGURE 2 ABOUT HERE

There's nothing virtuous about exchange meetings and project groups unless they are clearly linked to such imperatives. In fact, a poorly designed exchange meeting backfires in that it makes the use of such glue technology less credible in the future. Management mobility is a dangerous tool if it is not rigorously guided by the need to build identified linkages. I've seen tremendous human sacrifice and dislocation in some companies that is justified by the questionably extreme logic of management development officers that "high potential people have to prove themselves in ten different jobs over a twenty year period of time". And Stefan Winsnes, one of the architects of Apple Computers' approach to HRM, taught me a deep truth about value systems when he commented on the widespread discussion of these values within the company:

"In my view, the Apple Values are a catalyst in order to provoke discussion on what is 'OUR way of doing things'. I'm not worried that there is discussion about whether they are a dream or whether they are a reality - as long as there is discussion! ... We have to find our own way, the way we feel good about. The deep value is that we must find our way of doing things." (Evans & Farquhar, 1989).

From this perspective, values are not worth much unless they fuel debate and focus action. And they become dangerous when

they become so institutionalized as to be non-controversial (see Note 2).

Zealous human resource managers who are eager to apply the glue technology of management development in the service of functional professionalism ("After all, isn't management development our historic preserve?") are a dangerous species. Since the starting point is the needed business linkages (see Charan, 1991, for other good illustrations), the use of glue technology must be led by line management, assisted in its application by the human resource function. This brings us to the final section of this article.

IMPLICATIONS FOR THE HUMAN RESOURCE FUNCTION

What then does this signify for the HR function itself? The function cannot cope with these challenges if it itself epitomizes the problems.

The Organization of the HR function

All too often, the function mirrors the basic centralization-decentralization dilemma. In some companies there is an excessive attachment to lean headquarters and decentralization. The human resource function consists of a lone executive in transition to retirement who has been given

the job as a reward for faithful service. Such companies may be ripe candidates for takeover bids (see Note 3).

Equally often, the HR function is too centralized and top heavy. There are hundreds of chiefs at central headquarters responsible for succession planning, human resource planning, occupational safety, EEO, management training, job evaluation, expatriate compensation, rewards and benefits, organizational development, executive resourcing, personnel information systems, performance appraisal, and so forth. These chiefs spend much of their time devising sterile policies, talking with their counterparts at other companies, attending conferences, tuning into to the latest emanations from academic authorities, trying to outwit their counterparts for increasingly limited budgets ... and complaining about their powerlessness and frustrations.

Decentralize the vast majority of these persons, and everyone will be much more satisfied! And I mean decentralize rather than downsize or delayer! Occupational safety, EEO, reward systems, staff appraisal and evaluation, human resource planning, and many other aspects of personnel management are important domains - as long as they are close to the action and the realities. Yet if EEO is a central headquarter service in an American multinational, we get the parody of a department trying to adapt legitimate U.S. concerns under the umbrella of "a cultural diversity program" to a Japan or a

Germany that shares few of these concerns. How can a human resource planning function serve anything else than an "academic" role (in the pejorative sense of the term) unless it is close to the line managers who are the partners in the task of human resource management? Human resource managers have complained since the birth of HRM fifteen years ago that line managers do not take them seriously. Well, how about reorganizing oneself so as to get close to the preoccupations of line managers?

Network Leadership at the Top

However, as emphasized earlier, as one decentralizes so one has to pay corresponding attention to the opposite requirements of integration. This means that although few people are needed in the headquarter function, the qualitative requirements of their role become more important. What is required is strong network leadership.

If managerial leadership can be defined as the ability to channel and harness other people who have more expertise than oneself (as suggested earlier), so network leadership is the analogous top management ability to channel and harness a network of decentralized expertise in the service of corporate objectives - a network of people who have real expertise in different domains of HRM because they are close to the action.

Let me provide a final example to illustrate what network leadership involves. Although this case is drawn from the HR function, it illustrates in microcosm the progressive application of glue technology within a corporation. It is drawn from the ongoing events at the \$8 billion Swedish telecommunications multinational, the Ericsson Group.

In 1988, Britt Reigo was appointed as senior vice president for human resources at Ericsson, her former job being director of in-flight services for SAS, the Scandinavian airline. She inherited a central Ericsson staff of 30 persons, people were up-to-date on strategic human resource developments but who tended to have a Swedish rather than global orientation. Many of these professionals were moved out to the product divisions (today there are only 12 central persons), while Reigo's role focused initially on assisting the new CEO and top management in the preparation of an organizational change.

The new president launched in late 1990 the planned change in Ericsson's organization, which was fueled by difficulties during the 80s such as the lack of success in penetrating the U.S. market. In order to strengthen customer orientation, lead countries now reported directly to the CEO, and business areas were refocused on product lines. It was clear that the achievement of Ericsson's goals for the future would depend on close linkages between the newly enhanced country managers, product divisions, and technology centers.

Britt Reigo's next challenge was to develop the managers in her own function throughout the world so that they could meet these challenges, and to achieve this in line with corporate cost constraints - without hiring new staff. Increased demands but limited resources! With good leadership, this is a formula that forces constructive innovation. She decided to build a network of the product and country personnel managers spread throughout the world. The vehicle was two worldwide HR programs for these personnel managers.

The programs design involved two 2-week periods separated by six months, with inside and outside speakers and workshop sessions. But within three days of the first program, a process began of surfacing specific needs, problems and frustrations, and of matching these needs with the expertise, advice and assistance that others could provide. This was formalized in an open market for exchange on problems and resources. "I need help in designing a performance-oriented reward system for my management", someone would say; someone else would respond, "We've done that! Let's get some interested people together to share some of the do's-and-don't's".

Within a year, the initial conference (level one in the hierarchy of glue technology) had developed into a set of specific projects, coordinated by Reigo and her staff but led

by local personnel and other managers - a total of 16 projects in areas such as management planning, reward systems, absenteeism, HR recruitment marketing, international assignments, and the HR role in the future (level two glue technology). The network is now beginning to tackle longer range strategic issues (level three glue technology). A earlier review of management planning processes is coming to fruition, complemented by inputs from the growing network (level four). And one of the major outputs of the two HR programs was a guiding vision and set of values (level five) known as "Foundations for Human Resource Work in Ericsson". These "foundations" were prepared by the participants on the first program, elaborated and ratified by the second group. Local companies have set up their own project teams to tackle local coordination problems, while a global training network has been created to avoid reinventing-the-wheel and ensure transfer of learning in the domain of leadership training initiatives.

A "differentiated network" is perhaps in the making. Nearly half of Britt Reigo's time today is spent "out on the road", working with local management teams to reinforce what has begun.

CONCLUSION

The Ericsson events are an example of the application of glue technology, here within the HR function itself. Reigo's activities are focused on developing individual HR managers and on developing the organization and its capabilities. Who can say where one task ends and the other begins? An organization is being built up that is decentralized and differentiated, close to the action, and yet tightly integrated through network relationships. It is far more dynamic than can be captured by old clichés of matrix organization. Foster Rogers, one of her collaborators, described it as follows :

"We start to lack good terms to describe and convey what we are doing. It's not a hierarchy of networks, it is more like interlinking layers of networks. It's like the spiral of a DNA-molecule where everything is linked to everything else: incredibly simple and yet incredibly complex."

The DNA-metaphor is indeed an apt conclusion in that I have often been struck by the way in which the progressive and successful application of glue technology results in a spiralling process of organization development (Evans, 1989a).

NOTESNote 1:

Bear in mind that it was only ten years ago that Michael Porter suggested that companies have a choice between two generic strategies, differentiation/high value-added or low cost (Porter, 1980). This reasoning could justify the high cost of formal "bureaucratic" coordination if it resulted in added value. However, Porter's observations were based on historical data and were obsolete even at the time of publication. Today, competitive advantage is a matter of both - high value-added at the lowest possible cost. To be fair, this does not detract from other insights by Porter, whose later work emphasized the importance of building the horizontal organization through human resource management (Porter, 1985).

Note 2:

The only values that merit deep institutionalization are the dualities that reflect the essence of human and organizational dynamics - the need to balance opposite and complementary forces (integration vs local responsiveness, vision vs reality, top-down vs bottom-up, change vs continuity, technical logic vs business logic, short term vs long term, delegation vs control, speed in decision making vs care in decision making, and so forth). Institutionalization of these dualistic values fuels a permanent and never-ending process of continuous improvement and organizational innovation. Why? Because they reflect the deep dynamics of development and because they can never be attained or resolved once and for all.

The reader will discern duality theory, as I call it, throughout this article. I believe that duality theory is one of the more significant areas of emerging organizational theory (see Evans & Doz, 1989; Evans, 1989; Evans, 1990, as well as various forthcoming articles). Duality theory is also known under other names - the dilemma theory of Hampden-Turner (1990); the competing values framework of Robert Quinn (Quinn & Cameron, 1988); paradox theory (Pascale, 1990).

Note 3:

Minimal attention to corporate level HRM is justified in a holding company if indeed there are no potential linkages or synergies between the portfolio of firms in the group. However, the rationale behind a holding philosophy may sometimes be that the costs of coordination do not justify the investment. This may sometimes be dangerous reasoning,

demonstrating a lack of understanding of informal and well as formal coordination, as the following example shows.

I recently worked with a European company that via international acquisitions in the early 80s had become the world leader in an important industry. However, no attempt had been made to build linkages via glue technology between these acquired companies. There was a modest corporate staff, primarily engaged in overseeing the work of the mother country, and including one overworked and frustrated human resource executive. What began a urgent process of change was when a corporate raider made a bid on the firm: "If you are not realizing any synergies through the integration of these acquired companies, I can make money by acquiring the corporation, disbanding the useless headquarters, and selling off the regional companies to others who will build those synergies".

FIGURE 1 : The hierarchy of glue technology mechanisms

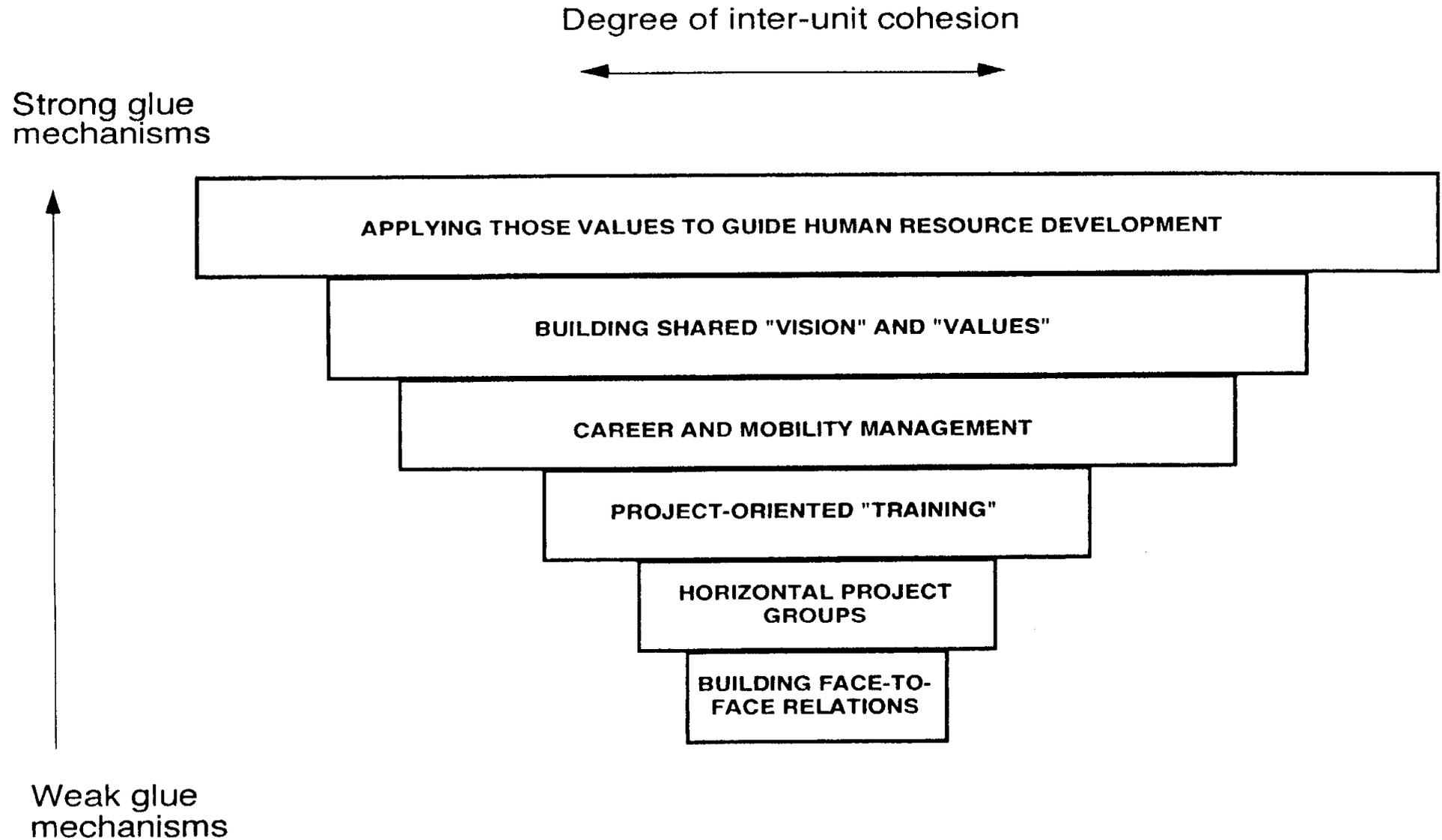


FIGURE 2 : A listing of some business imperatives that may require the use of glue technology

- Managing the flow of products or services across functions or units
- Mirroring the needs of global or corporate customers
- Economies of scale in sourcing and purchasing
- Reducing lead times in product development and worldwide/regional commercialization
- Combining economies of scale in R&D or manufacturing with localizing product marketing
- Transfer of learning, know-how, experience (overcoming Not-Invented-Here)
- Building local-but-global centres of competence (avoiding HQ bureaucracy and local duplication)
- Fostering innovation (in management and organization as well as products and services)
- Responsiveness (speed and agility in responding to change)
- Managing strategic interdependencies such as acquisitions, joint ventures, and partnerships
- Providing career opportunities, retaining and developing good people
- Development of leadership capabilities
- Maintaining Group/corporate identity and image

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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	Tackwon 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 ZIONTS	"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 TOMBAL	"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 DUJ	"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	91/19 MKT	Vikas TIBREWALA and Bruce BUCHANAN	"An Aggregate Test of Purchase Regularity", March 1991
91/08 EP	Charles WYPLOSZ	"Post-Reform East and West: Capital Accumulation and the Labour Mobility Constraint," January 1991	91/20 MKT	Darius SABAVALA and Vikas TIBREWALA	"Monitoring Short-Run Changes in Purchasing Behaviour", March 1991
91/09 TM	Spyros MAKRIDAKIS	"What can we Learn from Failure?", February 1991	91/21 SM	Sumantra GHOSHAL, Harry KORINE and Gabriel SZULANSKI	"Interunit Communication within MNCs: The Influence of Formal Structure Versus Integrative Processes", April 1991
91/10 TM	Luc Van WASSENHOVE and C. N. POTTS	"Integrating Scheduling with Batching and Lot-Sizing: A Review of Algorithms and Complexity", February 1991	91/22 EP	David GOOD, Lars-Hendrik RÖLLER and Robin SICKLES	"EC Integration and the Structure of the Franco-American Airline Industries: Implications for Efficiency and Welfare", April 1991
91/11 TM	Luc VAN WASSENHOVE et al.	"Multi-Item Lotsizing in Capacitated Multi-Stage Serial Systems", February 1991	91/23 TM	Spyros MAKRIDAKIS and Michèle HIBON	"Exponential Smoothing: The Effect of Initial Values and Loss Functions on Post-Sample Forecasting Accuracy", April 1991 (Revision of 90/46)
91/12 TM	Albert ANGEHRN	"Interpretative Computer Intelligence: A Link between Users, Models and Methods in DSS", February 1991	91/24 TM	Louis LE BLANC and Tawfik JELASSI	"An Empirical Assessment of Choice Models for Software Evaluation and Selection", May 1991
91/13 EP	Michael BURDA	"Labor and Product Markets in Czechoslovakia and the Ex-GDR: A Twin Study", February 1991	91/25 SM/TM	Luk N. VAN WASSENHOVE and Charles J. CORBETT	"Trade-Offs? What Trade-Offs?" April 1991
91/14 MKT	Roger BETANCOURT and David GAUTSCHI	"The Output of Retail Activities: French Evidence", February 1991	91/26 TM	Luk N. VAN WASSENHOVE and C.N. POTTS	"Single Machine Scheduling to Minimize Total Late Work", April 1991
91/15 OB	Manfred F.R. KETS DE VRIES	"Exploding the Myth about Rational Organisations and Executives", March 1991	91/27 FIN	Nathalie DIERKENS	"A Discussion of Correct Measures of Information Asymmetry: The Example of Myers and Majluf's Model or the Importance of the Asset Structure of the Firm", May 1991
91/16 TM	Arnoud DE MEYER and Kasra FERDOWS et.al.	"Factories of the Future: Executive Summary of the 1990 International Manufacturing Futures Survey", March 1991	91/28 MKT	Philip M. PARKER	"A Note on: 'Advertising and the Price and Quality of Optometric Services', June 1991
91/17 TM	Dirk CATTRYSSSE, Roelof KUIK, Marc SALOMON and Luk VAN WASSENHOVE	"Heuristics for the Discrete Lotsizing and Scheduling Problem with Setup Times", March 1991	91/29 TM	Tawfik JELASSI and Abbas FOROUGHJI	"An Empirical Study of an Interactive, Session-Oriented Computerised Negotiation Support System (NSS)", June 1991
91/18 TM	C.N. POTTS and Luk VAN WASSENHOVE	"Approximation Algorithms for Scheduling a Single Machine to Minimize Total Late Work", March 1991			

91/30 MKT	Wilfried R. VANHONACKER and Lydia J. PRICE	"Using Meta-Analysis Results in Bayesian Updating: The Empty Cell Problem", June 1991	91/43 SM	Sumantra GHOSHAL and Christopher BARTLETT	"Building Transnational Capabilities: The Management Challenge", September 1991
91/31 FIN	Rezaul KABIR and Theo VERMAELEN	"Insider Trading Restrictions and the Stock Market", June 1991	91/44 SM	Sumantra GHOSHAL and Nitin NOHRIA	"Distributed Innovation in the 'Differentiated Network' Multinational", September 1991
91/32 OB	Susan C. SCHNEIDER	"Organisational Sensemaking: 1992", June 1991	91/45 MKT	Philip M. PARKER	"The Effect of Advertising on Price and Quality: An Empirical Study of Eye Examinations, Sweet Lemons and Self-Deceivers", September 1991
91/33 EP	Michael C. BURDA and Michael FUNKE	"German Trade Unions after Unification - Third Degree Wage Discriminating Monopolists?", June 1991	91/46 MKT	Philip M. PARKER	"Pricing Strategies in Markets with Dynamic Elasticities", October 1991
91/34 FIN	Jean DERMINE	"The BIS Proposal for the Measurement of Interest Rate Risk, Some Pitfalls", June 1991	91/47 MKT	Philip M. PARKER	"A Study of Price Elasticity Dynamics Using Parsimonious Replacement/Multiple Purchase Diffusion Models", October 1991
91/35 FIN	Jean DERMINE	"The Regulation of Financial Services in the EC, Centralization or National Autonomy?" June 1991	91/48 EP/TM	H. Landis GABEL and Bernard SINCLAIR-DESGAGNE	"Managerial Incentives and Environmental Compliance", October 1991
91/36 TM	Albert ANGEHRN	"Supporting Multicriteria Decision Making: New Perspectives and New Systems", August 1991	91/49 TM	Bernard SINCLAIR-DESGAGNE	"The First-Order Approach to Multi-Task Principal-Agent Problems", October 1991
91/37 EP	Ingo WALTER and Hugh THOMAS	"The Introduction of Universal Banking in Canada: An Event Study", August 1991	91/50 SM/TM	Luk VAN WASSENHOVE and Charles CORBETT	"How Green is Your Manufacturing Strategy?" October 1991
91/38 EP	Ingo WALTER and Anthony SAUNDERS	"National and Global Competitiveness of New York City as a Financial Center", August 1991	91/51 MKT	Philip M. PARKER	"Choosing Among Diffusion Models: Some Empirical Guidelines", October 1991
91/39 EP	Ingo WALTER and Anthony SAUNDERS	"Reconfiguration of Banking and Capital Markets in Eastern Europe", August 1991	91/52 EP	Michael BURDA and Charles WYPLOSZ	"Human Capital, Investment and Migration in an Integrated Europe", October 1991
91/40 TM	Luk VAN WASSENHOVE, Dirk CATTRYSSE and Marc SALOMON	"A Set Partitioning Heuristic for the Generalized Assignment Problem", August 1991	91/53 EP	Michael BURDA and Charles WYPLOSZ	"Labour Mobility and German Integration: Some Vignettes", October 1991
91/41 TM	Luk VAN WASSENHOVE, M.Y. KOVALYOU and C.N. POTTS	"A Fully Polynomial Approximation Scheme for Scheduling a Single Machine to Minimize Total Weighted Late Work", August 1991	91/54 TM	Albert ANGEHRN	"Stimulus Agents: An Alternative Framework for Computer-Aided Decision Making", October 1991
91/42 TM	Rob R. WEITZ and Tawfik JELASSI	"Solving A Multi-Criteria Allocation Problem: A Decision Support System Approach", August 1991			

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| 91/55
EP/SM | Robin HOGARTH,
Claude MICHAUD,
Yves DOZ and
Ludo VAN DER HEYDEN | "Longevity of Business Firms: A Four-Stage
Framework for Analysis", November 1991 |
| 91/56
TM/EP | Bernard SINCLAIR-DESGAGNE | "Aspirations and Economic Development",
November 1991 |
| 91/57
MKT | Lydia J. PRICE | "The Indirect Effects of Negative Information on
Attitude Change", November 1991 |
| 91/58
OB | Manfred F. R. KETS DE VRIES | "Leaders Who Go Crazy", November 1991 |