

A movable feast? : competition in the network economy

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Inaugural lecture
28 May 2004

prof.dr. A.P. de Man

a movable feast?

competition in the
network economy

/ department of technology management

Inaugural lecture

Given on 28 May 2004
at Eindhoven University of Technology

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Inleiding

Mr. Rector, Ladies and Gentlemen,

Since the second half of the 1980s we have witnessed the rise of the network as a complementary form of organization. Networks are defined as groups of autonomous organizations, which are connected directly or indirectly through strategic alliances. Much has been written about the reasons behind the trend towards networking. Frequently mentioned drivers for networking are individualization of demand, the high speed of technological development, internationalisation and increased competition. And indeed, these are important factors, driving the network economy forward¹.

In this lecture I will not explore the reasons behind the network economy in detail. The thrust of the lecture is on the impact of networks on the process of competition. Competition is generally considered to be one of the most important forces driving economic progress and innovation. On the company level, the search for a way to beat the competition has a major influence on the strategy and structure of organizations. In the past competition was shaped by forms of economic organization like the guilds and the vertically integrated enterprise. Various studies have shown how competition has been affected by the use of these particular forms of organization². The effects of networks on competition have not yet been extensively studied. Traditional economic analysis maintains that increased collaboration between companies decreases competition, because competition only flourishes when a large number of competitors are present. Others claim that rather than the number of competitors the intensity of competition is relevant. As collaboration may reduce the intensity of competition, again networks may limit competition. There is a general consensus in the literature that increasing collaboration automatically leads to a decrease in competition. My thesis is that collaboration in today's economy is more likely to result in an increase in competition than a decrease. The arguments supporting this thesis are three-fold:

Strategy and competition

- limiting competition is the main objective of a small minority of networks;
- in networks, new forms of competition exist;
- network membership is not stable.

The fact that networks do have an effect on competition seems to be obvious. Networking has proliferated to such an extent that one of the most salient characteristics of the modern corporation is the fact that it is embedded in a network of alliances (Table 1). Companies collaborate on virtually any business activity: R&D, production, marketing, sales and many others. This embeddedness in networks changes the relationship between companies and will therefore affect the way in which they compete with each other as well.

table 1

Company	Alliances	Company	Alliances
Cisco	56	Microsoft	125
Dell	22	Motorola	105
Ebay	26	Nokia	65
Eli Lilly	40	Nortel	30
Glaxo	74	Pfizer	59
HP	145	Philips	61
IBM	168	Siebel	31
Infineon	32	Toshiba	49
Intel	66	STM	27
Merck	49	SUN	81

Number of alliances announced by a sample of companies between 1998 and 2002
Source: CGCP

How networks affect competition depends on their strategic underpinnings. Broadly two types of strategies may be distinguished³: Industrial Organization based strategy and Austrian Economics based strategy. Industrial Organization based strategy is rooted in a tradition of research focusing on the way in which industry structure and company conduct affect performance. Austrian Economics based strategy derives from a research tradition originating from Austrian economists like Menger, Schumpeter and Hayek and has found an expression in evolutionary economics, which lies at the root of most of the thinking about company capabilities and competences. The two traditions are different in four respects (Table 2):

- Strategic objective. Industrial Organization-based strategies are directed at restricting competitive forces, whereas Austrian based strategies emphasize that superior profitability will emerge from entrepreneurial discovery and innovation.
- Market conditions. Industrial Organization, related to neoclassical economics, believes market equilibrium to be a useful method for the analysis of competitive processes. Austrians see markets as being in disequilibrium, mainly because of the uneven spread of knowledge and the existence of imperfect information. According to the Austrians, equilibrium cannot be reconciled with the significance of entrepreneurial discovery observed in practice. Especially the fact that innovation causes continuous disruption of the path to equilibrium, implies that an equilibrium will never be achieved.
- Profitability modelling. IO-based strategy is largely based on the structure-conduct-performance paradigm⁴. It rests on the belief that there are empirical regularities that govern business behaviour and determine profits. The Austrian tradition rejects this idea and states that heterogeneity is the most fundamental trait of the economy. Complex interactions between different variables prevent any constant process from arising and firm specific elements are a source of competitive advantage.
- The nature of success factors. The IO-tradition looks for strategic factors that can be observed in practice (e.g. firm size), whereas the



Austrian tradition believes invisible assets to be the key to success (e.g. tacit knowledge).

table 2

I.O.-based strategy and Austrian-based strategy compared	Industrial Organization-based strategy	Austrian Economics-based strategy
Strategic objective	Restricting competitive forces	Entrepreneurial discovery
Market conditions	Equilibrium	Disequilibrium
Profitability modelling	Empirical regularities	Heterogeneity
Nature of success factors	Observed strategic factors	Unobservable factors

Source: Jacobson, 1992

Whether networks limit competition is determined by the extent to which they follow I.O.-based strategies or Austrian based strategies. These strategies lead to different types of networks (Table 3) The more Austrian networks, the more competition. The more I.O.-networks, the weaker competition.

The aim of I.O.-based strategy is to reap superior profitability by limiting competition. Networks make use of various mechanisms to realize an I.O.-based strategy. One example is the creation of exclusive agreements among partners. Companies may also limit access to the network, by applying strict partner selection criteria. In this way they create 'closed networks'. In closed networks it is easier to divide profits among partners than in open networks, which are characterized by continuous in- and outflow of partners. Joint ventures and cross-shareholdings are the legal form these networks take. Integration of the partners is either far-reaching or long-term (strong ties). The aim of networks following an I.O.-based strategy is mostly to achieve quasi-integration and to carve up markets between competitors. By dividing markets among the partners in a network, each partner is able to set higher prices and hence increase profits. This is, rightly or wrongly,

table 3

widely believed to be harmful to economic progress.

I.O. networks versus Austrian networks

	Industrial Organization-based network	Austrian Economics-based network
Aim	Increase profitability by limiting competition	Increase profitability by innovating
Legal characteristics	Equity: joint-ventures, cross-shareholding Exclusive Closed	Non-equity: contractual Non-exclusive Open
Tie strength	Strong ties	Weak ties
Duration	Long	Short

The aim of Austrian Economics-based strategies is to reap superior profits by innovating. Rather than trying to limit competition, companies try to build up new competitive advantages over their competitors. These strategies actually stimulate competition because they lead to a larger variety of products in the market, giving the consumer more choice. Realization of Austrian Economics-based strategies in networks tends to involve the set up of flexible and non-exclusive forms of collaboration, aimed at the creation of new products and processes. Contracts are preferred over equity holdings, because the uncertainty connected to innovation makes long-term arrangements less useful. Austrian Economics-based networks also tend to be open networks. New partners may enter the network easily, because they bring in new knowledge. This stimulates innovation, which is what Austrian Economics-based networks are after. The relationship between companies in the network is characterized by limited integration and short duration.

Airline alliances like the Star Alliance or the Oneworld alliance are an example of I.O.-based networks. These networks actually reduce competition, as former competitors now collaborate in their core business. Moreover the networks are of a closed and exclusive nature:



not every airline can become a member and a member of one alliance cannot be a member of another alliance at the same time. Even so, the competition-limiting effect of I.O.-based networks may not be so substantial or harmful as they may appear. First of all I.O.-based networks tend to occur at the end of an industry life cycle, when increased efficiency and economies of scale are important to the survival of the companies in the network. This requires collaboration, without which they may disappear altogether. Second, empirically exclusivity may occur regularly in individual alliances, on a network level exclusivity is rare⁵. Most types of networks are non-exclusive. The number of partners collaborating makes it difficult to realize exclusivity, because the gains of exclusivity in a multi-partner situation are likely to be lower than in a bilateral situation. Profits from exclusivity must be shared with a large number of partners. Third, even I.O.-based networks may have innovative aspects in them. Airline alliances for example offer some better services like improved connections and better loyalty programmes. In summary: networks pursuing an I.O.-based strategy are limited in number. Those that do exist often reap economies of scale or have innovative aspects in them.

The majority of networks follow an Austrian Economics-based strategy. They aim to innovate, create new markets and products, as well as to explore new business opportunities. Networks aimed at setting a standard or developing a new technology are examples of this. The increased importance of such networks is seen in the continuous decline in the percentage of equity alliances of all alliances established (Figure 1)⁶. Most alliances nowadays are non-equity alliances. The more flexible and short-term nature of non-equity alliances indicates that most companies build their networks on Austrian Economics-based strategies. Still each network has its I.O.-based components as well. An R&D network will never involve all players in an industry. Consequently, not all companies have access to the same technology, enabling members of a network to exploit their technology in the market longer and for a higher price. Where each I.O.-based network will have Austrian based elements in it, so each Austrian Economics-based network will have some I.O.-elements in it.

figure 1

Non-equity alliances as a percentage of the total number of alliances (worldwide), 1970-2000, three year moving averages
Source: MERIT-CATI database



New forms of competition

The prevalence of Austrian based networks over I.O.-based networks is a first indication that the statement that in general collaboration limits



competition may not fit with reality. There is another reason why the competition-limiting effect of networks is not that strong. This reason lies in new forms of competition emerging in practice: in a network economy new forms of competition arise. Increased collaboration and increased competition may actually go hand in hand. The new forms of competition are: co-opetition⁷, group based competition⁸ and organizational form based competition⁹.

Competition in networks or co-opetition (a contraction of cooperation and competition) refers to the idea that collaborating partners often are competitors as well. In the original statement of co-opetition the analysis was limited to competition in direct relationships between partners. It now appears that there are three different types of co-opetition:

- Direct or first order co-opetition. This is collaboration and competition with a direct competitor, customer, supplier or complementor. Collaboration with these partners may aim to save costs, spread risks or create new markets. In general it tends to create value. The partners may subsequently compete to divide that value. Depending on the value of the capabilities they contribute, their network position and their bargaining savvy, companies extract more or less value from the network than their partners. The cost of the development of new microchips for instance is often shared between competitors. In the next phase, each competitor may bring his own chip to the market and so compete with its (former) partner. So first of all companies compete for revenues. A second aspect of direct co-opetition, especially when it occurs between direct competitors, is that such collaboration leads to a decline in company differences and hence price competition may result sooner. Even when price competition does not come about because companies fix prices or divide markets, the net benefit of the collaboration may still be high. Without the network, the new chip technology might not have been developed at all.
- Indirect or second order co-opetition. One company may collaborate with partners that are competitors to each other. In the IT industry many examples exist. HP is a partner of Microsoft, but it also works with open source companies that invest in technology that competes with Microsoft. In the IT industry the number of alliances is so large that it is possible that one company develops two sales

pitches for the same client, one with partner A and one with partner B. Managing indirect co-opetition is a complex task and companies use a variety of techniques to handle this phenomenon. The first is to make clear upfront that a particular partnership is non-exclusive. Clear communication at the outset of the collaboration is crucial to avoid problems later on. Secondly, companies need to build in guarantees that information and knowledge from partner A does not flow to partner B. A large American supplier of car parts and paints delivers to both GM and Ford. To manage this form of co-opetition this supplier has erected Chinese walls between the teams working for each company. This means that the teams are completely separated, are not allowed to communicate and there is a guarantee that individual employees will not change teams. Third, companies need to clarify engagement procedures upfront. It should be clear to all partners what the rules are for serving clients. A fourth possibility is compartmentalization. In that case there are competitors in the overall network, but each competitor has an exclusive relations for certain products, industries or regions. For example, a company may work with company A in Europe and with its competitor company B in the U.S.A. Finally, in some industries second order co-opetition is seen as a fact of life. Specifically in the IT-industry it is so common, that companies still may not like it, but neither see it as a walk-away issue in network negotiations. A completely different way of dealing with second order co-opetition occurs in some supply networks with a strong lead partner. In that case, the lead partner may exploit the presence of competing suppliers in a network by creating and maintaining learning races among them¹⁰. By stimulating competition between partners, the network is kept fresh and alive. Toyota for instance continuously stimulates its suppliers to improve, among others by benchmarking them and rewarding them on their relative performance.

- Asynchronous or third order co-opetition. This occurs when a company educates a network partner who at a later period in time becomes his competitor. General Motors for instance helped Toyota establish itself in the U.S.A. Currently Toyota is one of General Motors' fiercest competitors. Managing asynchronous co-opetition requires companies to take stock of the long-term implication of networking. If companies focus only on the immediate cost and revenues, the long-term implications of collaboration are neglected.



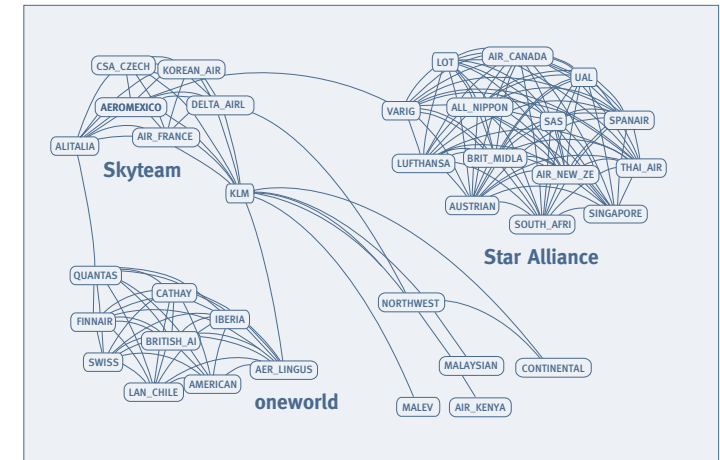
A contractual guarantee not to compete in each other's markets for a certain period of time may limit third order co-opetition, but will rarely be sufficient. An acquired capability may be exploited in many unforeseeable ways. Therefore companies must try to find out the long-term strategy of their network partners to determine whether third order co-opetition may occur. For instance, by studying the knowledge a partner is most interested in, a company may start to understand the long-term interests of the partner. Managing third order co-opetition may also require a company to look at the partner's network. By studying a partner's network a pattern may be revealed that clarifies much about a partner's real intentions.

Competition between networks or group based competition is the second new form of competition in the network economy. Whereas co-opetition takes place inside networks, group based competition takes place at a higher level. It occurs when networks compete with other networks. As a concentration of power tends to induce the emergence of a countervailing power, a new network may soon face the competition of a competing network. In that case, competition no longer takes place on the company level, but shifts to the network (group) level. Whether group based competition emerges depends on many variables including competitive uncertainty, the number of companies in the market and the degree of technological turbulence¹¹. Most notable example are airline alliances in which three groups compete: Skyteam, Oneworld and Star Alliance (Figure 2). Each of these groups consists of a number of airlines. Together they provide an integrated route network, they sell each other's tickets and jointly offer their frequent flier programs. The intensity of group based competition is determined by the cohesion of the group and the strength of the constituent partners. When the group consists of weak partners or when the partners have not sufficiently integrated their operations, a group may not be a strong competitor. The more co-opetition in the group, the less it will be able to act in unison. The extent of integration in a group depends on the joint benefits that come from cooperation. A key issue for companies is recognizing when competition moves to the group level. This may not be hard to discern, because networks may emerge out of bilateral relations. In the course of time these bilateral relations may be formalized in one multi-partner alliance. The Star Alliance emerged in this way. The first alliance precursor of the Star Alliance was established in 1992 between Air

Canada and United Airlines. It was not until 1997 that five airlines set up one multi-partner alliance.

figure 2

Group based competition among airlines Source: CGCP



The third new form of competition is competition with other organizational forms. Networks may be an effective means to compete with vertically integrated organizations or powerful organizations in an industry. By joining forces, smaller companies may become effective competitors to large organizations. In the network economy, large companies that would not have faced competition previously, may face competition from a combined force of smaller rivals. In the process of competition, alternative ways of organizing are tested on their effectiveness and the most effective will prevail. An example is that Europe's dominant mobile phone company Vodafone, now faces competition from two networks, which both try to provide as much geographical coverage as Vodafone. Similarly, computer manufacturer Dell uses a network strategy with its suppliers whereas its most important competitors have a higher level of vertical integration. In the pharmaceutical industry, Eli Lilly relies on an extensive alliance network for R&D, whereas many other pharma companies try to meet some of the challenges of innovation by means of mergers and acquisitions. Similar to group based competition, the intensity of organization form

based competition is determined by the extent to which the alliance groups are a credible threat to the dominant organization. Managing this type of competition requires companies to think through the best organizational form for their business. For large companies there is no safety in size any more. They may still be attacked on their turf by smaller competitors joining forces. Small companies may have an impact beyond their size by means of smart networking.

These three new forms of competition exist in different types of network. Table 4 gives an overview of practical examples of the different forms of competition in different types of networks.

table 4

Examples of new forms of competition in different network types	Co-opetition	Group based competition	Organizational form competition
Quasi-integration	Transora	Star Alliance vs. Oneworld vs. Skyteam	Vodafone vs. Freemove
Vertical supply	Sun: partner learning races	Toyota vs. GM	IBM vs. Dell
Solution	SAP vs. Oracle	Stork consortium vs. others offering to NAM	HP vs. IBM
R&D	Research consortia (e.g. Jessi)	Consortia in micro-electronics	Eli Lilly vs. Pfizer
Standardization	WAP Forum	DVD recording consortia	MS Passport vs. Liberty Alliance

The fact that new forms of competition are emerging may imply that competition actually increases as a result of networking. Networks enable smaller companies to compete credibly with large companies, whereas previously the latter would remain unchallenged; competition between networks emerges next to competition in networks; and all this



occurs in all types of networks. The days that competition was only company to company are gone. Company to company competition still exists, but new forms of competition have emerged.

Competitive tactics

A final aspect of competition in the network economy is its dynamics. Rarely will one network compete with another network over a long period of time. Whereas Ford, General Motors and Chrysler have been a stable set of competitors in the car industry for almost a century, on a network level the stability is limited. Companies join and leave networks continuously, repeatedly upsetting the status quo. Any limit on competition emanating from networks will therefore not be durable.

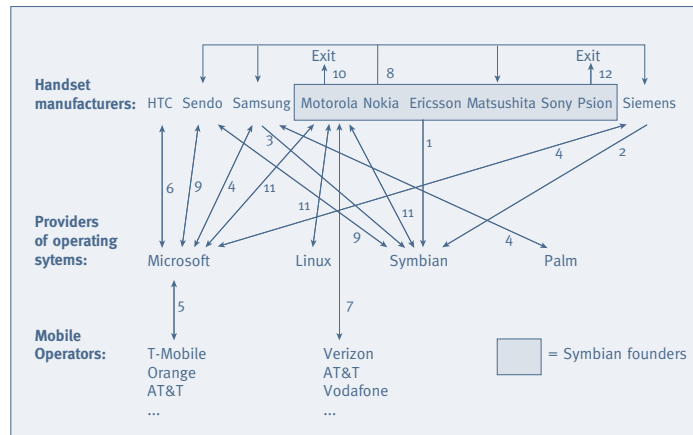
A good example of the dynamics of network competition is the struggle around operating system software for mobile use, which started in 1998¹². Figure 3 depicts the moves and countermoves in this industry. Three industries are relevant in the battle for setting a standard operating system for handheld devices. The first industry consists of



manufacturers of handsets, the most important one being the Finnish company Nokia. The second relevant industry is that of companies offering operating systems software for handsets, like Microsoft, Linux-companies (offering a version of the open source software Linux) and Palm. Finally mobile operators are telecom companies who offer mobile phone services. They are the most important sales channels for handsets.

figure 3

Moves and counter-moves in mobile software



Handset manufacturers have recognized that operating systems for handheld devices are an important market. The largest software company in the world, Microsoft, has its eye on this market and has developed an operating system for handsets. Handset manufacturers were not willing to let Microsoft have this market and they set up a joint venture, which was to offer a competing operating system. This joint venture was created in 1998 and is called Symbian (1). The handset manufacturers involved in this alliance were Motorola, Nokia, Ericsson (later Sony-Ericsson), Matsushita (with its Panasonic brand), Sony and Psion. Psion was the original creator of the operating system that Symbian continued to develop. In 2002 Siemens joined the alliance (2) and Samsung joined in 2003 (3). Hence, all major handset manufacturers joined forces in this alliance against Microsoft. Siemens and Samsung however did not want to put all their eggs in one basket and next to taking a stake in Symbian, they also entered into licensing

agreements with other companies offering operating systems. They both licensed the Microsoft software and Samsung also worked with another operating system, developed by Palm (4).

Microsoft's easiest route to market for its software would have been to license its operating system to all handset manufacturers. Seeing this road foreclosed by the Symbian alliance, it tried to set up relationships directly with the clients of the handset manufacturers: the mobile operators (5). It started offering them handsets which they could sell with their own brands and which ran on Microsoft software. In order to do this, Microsoft required a handset manufacturer to produce handsets. The company HTC was prepared to do so and Microsoft started to collaborate with HTC in 2002 (6). The handsets were sold to telecom companies like Orange and T-Mobile.

Motorola followed this example in the same year by selling its own handsets under the mobile operators' brands, entering into relationships with among others Verizon and Vodafone (7). Nokia in the meantime had developed a user interface based on Symbian's operating system, which it licensed to Samsung, Matsushita, Siemens, and a handset manufacturer called Sendo (8). Sendo had set up an alliance with Microsoft in 2001, but abandoned the Microsoft camp in 2002 by licensing the Nokia user interface and Symbian's operating system (9). With the success of its user interface, Nokia's already powerful position in the handset market was extended to a powerful position in the software industry as well. This prompted Motorola to leave Symbian as a shareholder: it feared that Nokia might become too dominant (10). Having first sided with Nokia to avoid Microsoft domination, it now decided to follow a different strategy to avoid Nokia domination. Although it sold its shares in Symbian in 2002, it continued to license the Symbian software, but it also licensed Microsoft software and software based on a Linux platform in 2003 (11). With this strategy it hopes to avoid any of the partners from becoming too dominant, enabling Motorola to pursue an independent strategy. The Motorola shares in Symbian were sold to Nokia and Psion. Nokia became the largest shareholder in Symbian (32% of the shares in the joint venture). In February 2004 Nokia bought out Psion, bringing its stake in Symbian to 63.3% (12). Under the terms of the deal, the other shareholders in Symbian had the right to increase their holdings in Symbian, in order to



prevent Nokia from obtaining the majority of Symbian shares. Ericsson tried to stimulate the other shareholders to exercise that option, fearing Nokia domination of the mobile software industry. Today the outcome of this game of chess in the mobile sector is not yet clear. There are different operating systems, backed by different alliance groups. By means of further manoeuvring and alliance tactics the fortunes of each of the operating systems may grow or diminish. Three basic competitive positions exist: a 'Nokia/Symbian' group, a Microsoft group and a group of hedgers (among others Motorola and Samsung). But with 85% of the handset market using Symbian software, Nokia seems to be well positioned. Provided of course, that its current partners do not forge new alliances to counter Nokia's dominant position.

This case shows first of all the importance of alliance tactics in competition. Companies need to be constantly vigilant, analyse alliance actions by competitors and think through the consequences of their own alliance tactics, anticipating competitive counter-attacks. Each partner is looking to advance its own situation at the expense of others. Each partner applies some self interested, opportunistic and Machiavellian manoeuvres. The overall effect is positive though, with new technologies coming to market faster, cheaper and in greater variety. This effect of self interest on progress was already elegantly summarized by Mandeville 300 years ago: '...every part is full of vice; Yet the whole mass a paradise'¹³.

Various forms of competition are discernable in this case. There is direct, first order co-opetition in the Symbian alliance. Nokia's competitors work with Nokia, whilst competing with Nokia on handsets. Second order co-opetition is found in the networks of Siemens, Samsung and later Motorola, who all have established alliances with competing technologies. Finally, there is organization form based competition. The Symbian group competes with Microsoft. Later this turns into group based competition: a Microsoft group competes with the Nokia group.

The example also illustrates that network membership is not stable. Motorola actually leaves the Symbian group and Sendo switches allegiance as well. This case clearly shows the dynamics of competition generated by the instability of networks. Very few positions are fixed and when a partner wants to change networks he will usually be able

to do so relatively easily. Dominant positions, which limit competition, are contestable. They seldom are sustainable. Competition is constantly present but rarely at the same place. Instead it is a movable feast. It moves across levels of organization, alliances and networks; it aims for technology development, partners and/or customers; it may initially revolve around first order co-opetition and form based competition, later evolving to second-order co-opetition and group based competition. The party is always on the move and companies must continuously monitor competition in order not to miss out on the benefits that are to be had. This underlines the relevance of the Austrian view of competition in the network economy.

The conclusion is that in general the idea that collaboration limits competition is unwarranted. In fact it is the exception. Only when there is, first, a closed network with exclusive arrangements between its members, second, absence of co-opetition, group based competition and form based competition and third, long-term network membership is a decline in competition certain. This analysis of competition in the network economy has a number of implications for governmental policy, management and research.



Policy implications

Few interventions from government in the economic process in otherwise free market economies are as little disputed as competition or antitrust policy. An increasingly important reason for antitrust policy is stimulating innovation. Some authors have asked the question whether governments should try to create an optimal balance between networking and competition in order to stimulate innovation. The reasoning is that innovation is a result of competition forcing firms to continuously renew to gain a competitive advantage. Competition is a necessary condition for innovation. On the other hand innovation requires knowledge exchange between companies and this is often done in networks. Hence both competition and collaboration are necessary and the two need to be balanced. This argument has two flaws. First it assumes that networking and competition are by nature opposing forces. The previous analysis has shown that this is not true. Collaboration may actually enhance competition. Second, the amount of knowledge required to carry out such a policy is prohibitive. The combination of network types, types of competition and network behaviour, is very complex. Optimal network structures differ per sector. Besides, for a correct innovation policy the internal capabilities of companies need to be taken into account as well: the optimal network structure depends crucially on the level of internal R&D capabilities⁴. A proper assessment of the question whether a network increases innovation or not consequently requires an analysis of very many factors. So much knowledge specific to time and place⁵ is required that it does not appear to be feasible for a government to gather all relevant knowledge and subsequently create an optimal balance of networks and competition. Theory may have identified reasons for antitrust policy related to networks, whether such a policy also makes sense in practice is yet to be proved and is currently more a matter of belief than based on factual evidence. In general, there may not be a need for a strict antitrust policy in a network economy.

In practice antitrust authorities recognize the issue of network

competition. They increasingly take industry networks into account in their decision-making. When the French airline Air France took over its Dutch colleague KLM, both the European and the American antitrust authorities explicitly studied the networks created by airline alliances. The take-over not only combined the two companies, it also combined two alliance groups: Wings (a.o. KLM, Northwest and Continental) and Skyteam (a.o. Air France, Alitalia and Delta). In theory the power block thus created may limit competition. The antitrust authorities found that this power block would face sufficient competition from the Oneworld alliance and the Star Alliance. This decision recognized that group based competition is as strong a form of competition as competition between individual companies.

A more important role for governments is to alert companies to the new challenges of competing in the network economy. It is the quality of network management that largely determines the competitiveness of companies. Improving that quality should therefore be high on the policy agenda. This may involve alerting managers to new management techniques, setting up academic centres of excellence in network management and stimulating the development and diffusion of network management techniques.

Management implications

A first implication for companies is that they need to realize at what level competition takes place. Competition in an industry may have shifted from company based competition to group based competition, requiring a shift in focus of the company. Companies need to determine whether they want to access a group, to position between groups or to go it alone, benefiting from the niches groups leave open. Once the step is taken to compete on a network level, companies should factor in the good of the network in their actions. The further integration in a network goes, the wiser it becomes to optimise network performance rather than company performance. Thinking on a network level opens up many new opportunities for gaining and sustaining a competitive advantage.

Second, companies aiming to reduce competition in their industry may find that networking is not the way to go about it. Networks come with new forms of competition and therefore a company may end up in an environment that is more competitive than before. Analysing intra–



network competition may reveal that competition inside a network is too high and the benefits for the partners too low to create a stable network. Entering such a network will not reduce competition but create many other issues to compete about. For the exact same reason, companies should try to assess the reaction of other companies to a competitive move. Examples exist in a variety of industries of how networks trigger further networks. The example of competition in mobile software also showed the moves and countermoves companies make. Without understanding the dynamics of competition in networks, plans for networking may not realize the original objectives and certainly will not curb competition. This does not imply that companies should not enter networks. They may have to for many reasons. It does imply that companies should not enter networks for the wrong reason. It also implies that companies should be well-prepared when they enter a network, for they will face many new challenges.

A final issue lies in competitive intelligence. If the premise of competition on a network level is accepted, than competitive intelligence

should not just study the competitor's strengths and weaknesses, but its network position as well. What type of networks does a competitor move in? What competitive threats do those networks pose? Does network behaviour strengthen the competitor's position or not? Is there co-opetition in his network? As the focus and locus of competition are continually changing, companies need to understand when the rules change in order not to end up at the wrong feast.

Research implications

The literature on networks is extensive, but attention for competition is still limited. Most literature deals with the role of individual companies in a network. Less attention has been paid to the relationship between companies, networks and competition. For researchers a variety of questions remain to be addressed. First and foremost many questions around the strategic underpinning of competition in the network economy are little understood. How do companies balance the I.O. aspect of networks with the Austrian aspect? How does the strategic underpinning change over an industry or technology lifecycle? Second, there has been remarkably little attention for the tactics companies use to position themselves in the network economy. The Symbian case has shown how important these tactics are in shaping the outcome of economic processes. The gap in theory and research in this area must be filled. What tactics do companies and networks employ? How do groups of companies react to moves of other groups? A third area of research relates to the performance implications of the new types of competition. Some research is available on the implications of network membership on innovation¹⁶, but research in this area is only in its infancy. How profitable is co-opetition, group based competition and organization form based competition? What is their effect on the performance of networks and the firm in the network? Fourth, the impact of the forms of competition probably differs per sector. Most research has looked at high tech sectors like biotech and microelectronics. The three new forms of competition occur in other industries as well. Cross-sectional research into differences between sectors is relevant for understanding the conditions that stimulate the use of new forms of competition. Are sectors affected differently by the new forms of competition that have emerged? Which technological and market conditions stimulate new forms of competition? Finally, the literature has looked at each of the new forms of competition separately. It deals with either group based



competition or co-opetition, but it rarely studies them in combination. What is the effect of co-opetition in an alliance group on the competitive strength of that alliance group? How does enhanced group based competition affect intra-group co-opetition? When is it effective to combine organization form based competition with co-opetition, in order to successfully compete with a large competitor?

Next to these 'content' questions about what should be researched, there also is a methodological question about how these issues should be researched. As far as competition is concerned, the Austrian economists were right in emphasizing the dynamic and changing nature of competition. Processes of this nature are studied best by looking at practice and by executing longitudinal case studies into the processes shaping competition in the network economy. This should generate the hypotheses we require to do large-scale empirical research into the ins and outs of network competition. Methodological pluriformity is what drives our understanding forward. I would therefore like to plead for the use of a variety of research methods to answer the questions asked above. A disregard for approaches other than our own has never served us in the past and it will certainly not serve us in coming to grips with the complexity of our networked future.



Conclusion

The network economy is an economy in which competition flourishes. New rules of the competitive game are established, forcing companies to adapt to a new competitive situation. Networks do not tend to limit competition. Only a minority of networks have limiting competition as their prime goal. Most networks are set up not to lessen competition, but to face it head on. New forms of competition are emerging with co-opetition, group based competition and organizational form based competition. In this new competitive reality, networks are not everlasting and stable. Partners switch networks often and companies apply various tactics to outsmart their competitors.

It took society decades to come to terms with the effects of previous industrial revolutions. The current economic changes will keep us occupied for many years to come. It will take time before everybody has adapted to networks and network competition. That process of adaptation will bring many new challenges, but also many new opportunities are waiting to be discovered. For this reason, studying the ins and outs of the network economy is something I look forward to with great pleasure.



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Curriculum Vitae



Prof.dr. A.P. de Man has been appointed part-time professor of Organization Science, in particular Organizational Aspects of the Network Economy, at the Department of Technology Management as of May 1st 2003, for a period of four years.

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