

# Kapittel 5. Engineers and Management in Germany and The United States

- a discussion of the origins of diversity in management systems<sup>1</sup>

## Introduction

By the early nineties it had almost become conventional wisdom that the Japanese and Germans with their "producer economics" had developed superior productive capabilities, whereas the USA and Great Britain, the archetypes of "consumer" or "financial economies", were in long-term decline as industrial powers. This perception of the situation is now challenged by mass media reports about an Anglo-Saxon comeback and a serious decline in German and Japanese economic performance (The Economist 1996a 1996b, Business Week 1995). The available empirical evidence, however, remains ambiguous. A great deal of the recovery might be due to fluctuations in currency values, such as the strong decline in the value of the dollar in the late eighties and early nineties. Most scholarly books on the issue still seem to favor the thesis of a relative long-term decline in American competitiveness (Cooper and Blumenstein 1996, Baumol 1995, Kenworthy 1995). The purpose of this chapter is neither to decide nor to discuss this issue, but rather to focus on one of the most popular explanations for this relative decline, the post-war shift toward conglomerates and the increasing dominance of business school graduates and financially oriented executives in the United States. The question is why this did not happen to the same extent in Germany.<sup>2</sup>

Chandler and Fligstein have documented a consistent relationship between managerial strategies and organizational forms in the USA. The early movers in product diversification also developed the multidivisional organizational form. Fligstein's research also indicates a close relationship between a sales and financial conception of control and the multi-divisional form on the one hand, and a manufacturing conception of control and a functional organizational form, on the other (tabel 5.1). In a previous paper, I found that there was a very significant relationship between engineers and

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<sup>2</sup> Among the first to develop this argument were Hayes and Abernathy (1980) in their Harvard Business Review article "Managing our Way to Economic Decline". More recent examples of the argument are found in Fligstein (1990), Reich (1991), Thurow (1992), Scott (1992:186), Locke (1996), and Mintzberg (1996).

manufacturing executives in Fligstein's sample. Based on this evidence, I suggested that the gradual decline of manufacturing dominance in American industry was an outcome of the engineers' failure to develop successful strategies and that they were for this reason excluded from power positions. It might have been their conception of industrial administration as such and not their attachment to particular functions that made engineers less successful than in Germany and Japan (Byrkjeflot 1993).

*Table 5.1. Control Structures in Large Firms in the USA 1900 - 1990*

Period	Dominant strategy	Dominant structure	Dominant president background	Subunit on The rise
1900 – 19	Monopolization	Holding company	Entrepreneur	Manufacturing
1919 – 39	Manufacturing integration	Functional	Manufacturing	Sales and marketing
1939 – 58	Mass production/ Focusing on a few product markets, Often multinational	Multi-divisional	Manufacturing/ sales and marketing	Finance
1959 – present	Diversification / Simultaneously focusing on a variety of product markets	Multi-divisional	Finance/ manufacturing	

Source: adapted from Fligstein (1987:48).

My suggestion is that the roots of the opposing conceptions of management in Germany and the USA are to be found in the pre-World War II era. Furthermore, it is necessary to focus on the genesis of both American and German engineering executives and the two different models of industrial administration associated with their rise to executive power in order to understand this example of the making of "diversity in the western conception of management" (Laurent 1985).

From 1890 to 1910, both Germany and the USA went through a transition from entrepreneurial to manufacturing capitalism. The engineers emerged from this transformation as a powerful group in both cases. But their role in the transition was different. They did develop contrasting conceptions of management and organization; they were embedded in different cultures and were supported by

different power-bases. In this chapter, I will attempt to describe the nature of these various conceptions, positions and strategies in order to explain what followed. After having traced the reasons why the engineers were so successful in each case, I will then turn to the next task, which is to make suggestions about why engineers and manufacturing executives started to lose their hegemony in the largest corporations in the USA in the 1930s, whereas they have continued to be predominant in Germany until today. How do we explain the failure of engineers and the rise of the multi-divisional corporation and finance and marketing executives in the USA? To what extent did contrasting circumstances such as the international context, different national institutional frameworks, and size of domestic markets influence the formation of management? I will argue that it is not necessary to make a choice between actor-centered or structural models, and that we can develop better explanations of contrasting development patterns by combining them.

## **Contrasting organization and management practices in Germany and the USA**

Let me use an example to illustrate the major contrast in industrial administration. In 1954 Harbison et al. did a comparison of an American and a German steel-mill. They found that the American steel-mill, Inland Steel, employed ten times as many senior technical staff personnel as a mill of the same size in Dortmund, Germany, more than three times as many general foremen and supervisors, and one-fifth as many junior technical and clerical employees.<sup>3</sup> Formal educational training was considerably higher among the German line managers. 17 out of 20 top managers at the Dortmund mill had a university degree, while only 2 out of 12 had an equivalent degree at Inland Steel. The conception of the managerial task was quite different: "The main criterion of successful job performance of the Inland executive is the co-ordination and work of a staff, whereas the Dortmund executive must himself have a broad technical training, and he must also personally supervise technical operations (1955: 37)." A much higher proportion of the managers in the German firm were practically oriented engineers who relied "quite extensively on the all-round skill of trained craftsmen

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<sup>3</sup> Along with other contemporary scholars, this research team saw these differences basically as an effect of the more extensive use of automatic machines in the United States. Maurice and his associates, however, did find the same contrasts between German and British firms at similar technological level. They attributed the contrast to a "societal effect" and, since then, there has been a series of studies developing the argument about societal effects on factory organization (Maurice et al. 1980, 1986, Sorge and Warner 1986, Lane 1989, 1995, Whitley and Kristensen 1996, see also footnote 4).

who can carry out their tasks with a minimum of supervision" (Harbison et al. 1955:37). Inland steel, on the other hand, stressed formal education for its middle management staff, a strata that was, I repeat, ten times larger than at the German mill. The same was the case with the supervisors. 15 per cent of the foremen at Inland had a college degree, whereas practically none of the supervisors at Dortmund had any higher educational training. The status of the foremen and supervisors was different; "at Inland Steel the persons holding these positions were considered to be part of management... At Dortmund these persons, were considered to be workers and eligible for union membership" (p. 31).

The empirical findings of this study have been confirmed by a whole series of studies on how German management and organization practices have differed historically from American and British practices. In his comparison of organization practices at IG Farben and DuPont in the inter-war period, Dornseifer finds that "In comparison with DuPont, IG Farben had an extremely flat managerial hierarchy, even though the organization was much larger in size" (1995:29). He also finds that the middle management level was much more "voluminous" in the American than in the German case. Indeed, DuPont had more than twice the number of layers in their technical organization, in comparison with IG Farben. Based on this and other evidence, Dornseifer (1993:90) argues that American firms were earlier and more extensively bureaucratized than German ones and that the common thesis about German "private bureaucracy" needs to be revised (Kocka 1969). A series of historical and comparative studies confirms this claim. Let me summarize some of the comparative evidence:<sup>4</sup>

1) The main criterion of successful job performance for an executive in the USA was advancement into top management by specializing in administration, whereas a German executive could advance without giving up his specialized product and technological competence. German top executives (*Unternehmer*) conceive of themselves foremost as experts in a technical field (in law, for instance, or engineering), whereas the American is a *general manager*. The German top executive has

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<sup>4</sup> This argument is based on these among other sources: Veblen 1915, Steinmetz 1916, Dawson 1919, Hartmann 1959, Harbison et al. 1955, Granick 1962, Dyas and Thanheiser 1976, Maurice et. al 1980 and 1986, Kocka 1980, Lawrence 1980, Kotter 1982, Cable 1983, Sorge and Warner 1986, Locke 1984,1989 and 1996, Eberwein and Tholen 1993, Hampden-Turner 1993, Guillén 1994, Dornseifer 1993, 1995, Kogut 1993, Calori and de Woot 1994, Stewart et al. 1994, Lane 1995, Mayer and Whittington 1996, Mintzberg 1996.

ultimate authority and is more directly involved in production, whereas the authority of the American manager rests on his claim to having superior administrative abilities.

2) The various practices for distinguishing between manager, worker and professional were related to these contrasting perceptions of the management function. The top executive in Germany retained for himself the function of leadership and delegated only authority of routine operations. The consequence of this was that the various staff specialties did not identify themselves as managers, but took a deferential position. The distinction in the USA is more between labor as a routine function and management as a professional function and it is drawn at much lower levels. First-line supervisors in Germany were workers, whereas they were defined as managers in the USA. College graduates in staff functions were managerial employees in the USA, whereas German graduates in the same positions frequently were unionized.

3) German business organizations manage with a relative low overall staffing level, whereas French, British and American organizations tend to build larger staffs and white collar hierarchies. German organizations take more the form of a pyramid, while Americans develop onion-shaped organizations.

4) There is not the same consistent relationship between diversification of production and the development of the multidivisional form in Germany as in the USA. The large corporations in Germany around 1930 were more diversified than the American, but they did not develop the multidivisional form until after the second World War, 30 years after the Americans. When the multidivisional form was developed it operated on other principles. The performance effect of the development of the M-form is more often negative in Germany than in the USA.

These arguments about contrast in managerial careers, authority relationships, conceptions of the executive function and organization forms are remarkably consistent over time. In the following, I will present a political-institutional perspective on why these managerial and organizational configurations may have emerged and become institutionalized. The key question is why the engineering-executives started to lose their position in American industry in the 1930s, whereas the German engineering-executives have continued to dominate until today. It is interesting to find out how early the various

conceptions relating to the managerial function developed in each case and in what way its formation was instituted in particular organizational forms and patterns of authority.

### Theoretical background: management in a political-institutional perspective

The new institutionalism in organizational sociology puts emphasis both on the conceptual and structural basis of organizations. DiMaggio and Powell (1983) argue that it is necessary to understand the institutionalization and structuring of organizational fields in order to explain the emergence of particular organizational forms.<sup>5</sup> The question, then, is whether the most important organizational fields for the executives of the large industrial corporations were other large corporations, other corporations in the same industry or other entrepreneurs pursuing the same product markets. The answer is that this varies according to time and place, and that the question about whether industrial executives perceive themselves to be operating in a field of large corporations or specific industries is in itself important in an explanation of the emergence of particular models for industrial administration.

In order to discover an organizational field, one has to identify key actors and relevant actors, as well as organizations and structures. In the following, I will focus on three overlapping groups which might be distinguished according to the period in which they were most important and the organizational fields in which they perceived themselves to be operating: *entrepreneurs*, *manufacturing executives* and *general managers*. By focusing on these three groups, the overlaps between them, and the changes in their influence in major industries at various periods in the late nineteenth and early twentieth century, I emphasize the relationship between the emergence of particular organizational forms, types of top executives and models of industrial administration (table 5.2). I will also present a prospective fourth type, viz. *investment managers*, and suggest that there might be an increasing trend toward Americanization of German industry in the late 1990s.

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<sup>5</sup> DiMaggio and Powell (1983:148) define an organizational field as "those actors and organizations that constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services and products. An organization field is a totality of relevant actors".

*Table 5.2. Four types of executives according to the period in which they were most important, conceptions of organizational field and models of industrial administration.*

Dominant group	Period	Organizational field	Model of industrial administration
Entrepreneurs	Entrepreneurial capitalism (before 1920)	Other entrepreneurs	Direct control
Manufacturing executives	Producer capitalism (USA: 1920-1935 Germany after 1920)	Industry-specific	Production and control
General managers	Consumer capitalism (USA after 1935 Germany: not yet)	Other large companies	Marketing & finance
Investment managers	Investor capitalism (USA: from late 1980s Germany: not yet, some tendencies after 1996)	Consultants & investment bankers	Shareholder value

Which actors each group of top executives perceived of as belonging to their organizational field depended on their career path before reaching the top, the companies with which they were in competition, and the type of role models they imitated. Entrepreneurs made more moves between companies and industries during their careers than did the manufacturing executives that followed them.<sup>6</sup> Entrepreneurs, particularly in the USA, operated in unstable organizational fields where their competitors attempted to obtain direct control over their companies and markets. Industries were not yet clearly defined. The next phase was a period in which manufacturing performance mattered most and industrial domains were more clearly defined. The typical mobility pattern for engineers were industry-specific careers and this might explain their success in top executive positions in this era. Then, with the advent of graduates from business schools and the rise of marketing and finance, organizational fields were again destabilized in the USA. Industries became less important as the diversified multi-product multidivisional organizational form emerged. Executives with business

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<sup>6</sup> My own data and Warner and Abegglen's extensive survey of career patterns among the American business elite in 1928 and 1952 document this difference in career patterns (Warner/Abegglen 1955, Byrkjeflot 1993). Bendix (1956/1974:135) also found that entrepreneurs show a greater mobility between industries compared with bureaucrats, but that bureaucrats tended to shift jobs more frequently within these industry sectors.

degrees and external career patterns and less industry-specific skills were more successful in these companies. The multidivisional firm did not take hold in Germany and continental Europe until the 1960s, and even then it was often only an on-paper-adoption for the purpose of appearing modern (Kogut 1993:195). The demarcation line between strategic and operating responsibilities were often lacking. Only one third of the European firms adopting the divisionalized structure between in the sixties set up a general office. This is partly attributed to the collegial management board tradition in Germany and the consistent family-domination of many European large companies. The operating principles and the performance characteristics of multidivisional firms in Germany differed from those in the USA and the holding company structure has had a surprisingly strong persistence in Europe (Dyas and Thanheiser 1976, Cable 1983, Fligstein 1990, Kogut 1993, Mayer and Whittington 1996).

The trend toward a post management model in the United States since the late 1980s has been noted by Useem (1996), who found that the careers of managerial elites have changed drastically in the United States during the last ten years. Whereas MBA recruits previously went straight into upper management positions, consultancy and investment banking have now emerged as their major pathways into top management.<sup>7</sup> The project these new investment managers have in common is to proffer the so-called shareholder value model, and the associated accounting techniques used for measuring corporate and managerial performance. Strange (1997), among others, has argued that the American global reach now can be seen in everything from food and drug regulation to accounting and transparency standards for private and public companies. Schröter (1996) has documented the gradual move toward adopting American anti-trust regulation in Europe. It appears that European integration is now also speeding up the diffusion process whereby European companies are adopting the same design for organization and accounting which has been predominant in the American business culture.

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<sup>7</sup> One-fifth to one-third of those leaving Wharton, Stanford and Harvard with an MBA-degree can be expected to enter money management. Most of the remainder can be expected to enter company management, a majority through management consulting (Useem, 1996:270-71). Mintzberg (1996:66) suggests closing down MBA programs as a consequence of this, since he thinks the new MBA manager represents a threat to the whole corporate sector in American society.

In the wake of an economic downturn, and a massive wave of German investment abroad, important top managers like Jürgen E. Schrempp at Daimler-Benz and Ulrich Hartmann at VEBA have declared it their primary goal to enhance shareholder value (Der Spiegel 1997). These declarations represent a break with the German social market concept, and the tradition of codetermination between workers and managers. Not only have the representatives of churches and union leaders criticized the concept, but also several top managers (Rosen 1997). It is even argued that the concept is unconstitutional, since it is stated in the German constitution that property ownership entails certain social duties (Financial Times, 1996).<sup>8</sup>

Similarly, Hartmann (1996) has found that the patterns for management selection in Germany are now approaching the American model. The share of managers with a technical background and with apprenticeship origins has sunk drastically. It seems that the future German manager, like his American counterpart, is more likely to have an education in business administration than in engineering. The German education in business administration, however, is still fundamentally different from the American, and the new data on corporate careers does not necessarily indicate that German industry is being invaded by general managers or investment managers of the American type. Fligstein and Freeland (1995) argue that the American concept of financial control is not likely to be adopted in the European market, due to state and elite resistance and legal frameworks that allow states to control property rights and governance. One might add that the present trend toward Americanization is associated with problems like high unemployment, and that this might generate a backlash against further Americanization. The era of the engineer, unchallenged at the top of German industry, might be approaching its end, but this does not necessarily mean that the investment managers are taking over.

The major topic in this chapter, however is the transition which took place before the 1980s. The engineering profession was the key group in the transformation in the United States of an unstable organizational field organized around entrepreneurs to an industrial field organized around production

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<sup>8</sup> According to a survey in *Der Spiegel* (1997) 25% of the largest 250 companies in Germany have declared their support for the shareholder value-principle, "They want to be 'global players', not patriarchs" (100). "During the last five years there has been a change in top management in almost all the large companies in this country. Cold, calculating managers, that mainly care about the interest of the shareholders, have replaced the traditional patriarchs" (93).

specialists. The question is to what extent engineers were also involved in the next transition from product-specific to multi-product companies, and from the functional to the multidivisional firm. This struggle between the entrepreneurial, manufacturing and financial models for industrial organization did not take place in a vacuum, of course. The engineering executives operated within particular structural and organizational environments that limited their range of choices and gave them different opportunities. It is necessary to examine these organizations and environments in order to understand why top executives in the USA abandoned the manufacturing model of capitalism. Such is the subject of the next part of this chapter. I will then attempt to combine the actor-centered institutional model developed above with this more macro-institutional or structural framework. A "late developer" hypothesis is proposed as an explanation for the particular development pattern in Germany. Alternative approaches emphasize state-societal arrangements and the size of markets, but I will argue that these explanations cannot stand alone, but may gain in explanatory power when combined with an actor-centered political-institutional perspective.

## Conceptual roots: engineers' professional projects in Germany and the USA

What are the origins of the conceptions of organizing that enabled top executives to stabilize large German and American firms early in this century? Kocka argues that the early enterprise in Germany was organized according to models borrowed from the public bureaucracy; written procedures, regulations and systematic job descriptions were emphasized. Private bureaucracies sprang up that differed little from those in the government and in the state enterprises (Kocka 1980:97).<sup>9</sup> In the USA, on the other hand, industrialization preceded the development of large scale public bureaucracies. Private railroads were the first large-scale organizations, and modern factory management had its genesis at the U.S. Army's Armory at Springfield, Massachusetts (Chandler 1977:72-12 1).<sup>10</sup> It is, however, not sufficient to base an account on such general conceptions. If we want to understand the particular outcomes in organizational forms we have to identify the motivation

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<sup>9</sup> It is this thesis Dornseifer wants to modify by arguing that "the majority of the American large enterprises are probably closer to the classic bureaucratic model than the majority of German enterprises" (Dornseifer 1993:78). Similarly, Lawrence argues that "a series of studies find that the Germans are not the most bureaucratic, but lie somewhere between the French and the British" (Lawrence 1994:144).

and mental maps of the people who built specific organizations and organizational fields. The argument that different historical "models" were important can only be proven correct if we are able to document that key actors were influenced by them, or used them in their organization-building activities. My argument is that the manufacturing model of industrial administration emerged among engineers as part of a professional project during the second industrial revolution.<sup>11</sup> Engineers were, after all, the first group to define the management function as a career and profession. Scientific management was a very influential strategy invented by American engineers to advance their professional interests in the early twentieth century. Although differently positioned, German engineers were equally influential in the technical core of the manufacturing sector and in the shaping of the management function (Lee and Smith 1992, Fligstein 1990).

There was, however, a very important contrast between German and American engineer-executives. In Germany, engineers saw the manager function as a product-based, specialized, technical function. It was thus difficult to distinguish between technical and managerial knowledge and techniques. Engineers in the USA aspired to be *general managers* at the upper and middle level in the corporation. It did not matter what kind of corporation. Their strategic knowledge base was less technical, more "acting with" other people than "acting on" a particular product or technology. The idea was to "manage" through other people rather than to be personally involved in the supervision of the production function.<sup>12</sup> The engineer-managers in Germany also aspired to control the upper levels of the organizational hierarchy, but their claim was based on their competence as "Fachmann", a production specialist, and not as a professional administrator. German engineers were embedded in a

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<sup>10</sup> See also Meyer (1995), who argues that the American reception of Weber's theory on bureaucracy was systematically biased and that the differences in European and American discourses reflect the more bureaucratic underpinnings of organizational reality in Germany (Meyer 1995:33- 34).

<sup>11</sup> Fligstein's notion 'conception of control' is useful when tracing how such models of industrial administration are constituted and spread (1990:10). These are "totalizing world views that cause actors to interpret every situation from a given perspective. They are forms of analysis used by actors to find solutions to the current problems of the organization." He argues that direct control was the dominant conception in American industrial administration until 1920 when the manufacturing conception of control took over.

<sup>12</sup> The prominent historian and engineer, Conrad H. Matschoss, characterized the differences between the American and German engineer in the following way in 1927: The American engineer "finds employment in all the commercial and industrial activities you can imagine... he sees education in a college or a university as a foundation for his further activities , as a general basic education which could be useful in a range of occupations...it does not appear to him that he has to be employed in a diesel motor factory just because he has been told a lot about diesel motors by his colleagues". The implication was, of course, that this was the case in Germany (Matschoss 1927, p. 45).

much stronger technical culture, spanning the lowest technical job in the firm to that of top manager. They therefore saw their interests in harmony with, and not in opposition to, other technical workers.

The mobilization of the whole qualificational space of "technik" was the natural strategy for German engineers, whereas it was just as natural for American engineers to place an emphasis on their middle class identity and use science as a strategy for "efficiency and uplift", which were key ideas in the American progressive era (Haber 1964). German engineer-executives, then, saw themselves as managers in a particular industry, whereas American industrial engineers and executives were more oriented toward industry in general.<sup>13</sup>

Four interrelated factors may explain why engineers in Germany and the USA developed contrasting world-views or conceptions of control between 1870 and 1925:

1. The status of entrepreneurs and engineers in society
2. The way engineers organized themselves
3. The role of technical education
4. The emergence of a catch up mentality among German engineers

1) Historians have noted that the entrepreneurial stage of American capitalism was a golden age of prestige for the American engineer, precisely because so many of them were entrepreneurs. The men who founded the professional associations in the USA were men secure in their social status. They transferred to the occupation of engineer the status they already possessed as individual entrepreneurs. As the large industrial corporation took over, the model of the engineer-entrepreneur also faded. The new role models were graduates from engineering schools, these engineers had to fight their way up the corporate ladder against men of the "old order", and their professional model represented a sharp break with the entrepreneurial model of direct corporate control (Layton 1969:281, Calvert 1967:131, 1972:49, Fligstein 1990)

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<sup>13</sup> For documentation here, consult *DATSCH Abhandlungen 1912-1927*, *SPEE bulletin 1909 - 1927* and the Wickenden report (1930). The term "techniker" is used as a generic term for engineers and technicians in top managerial positions in Germany (e.g. DATSCH IV 1912:85). The emphasis in the USA is on individual administrative abilities and "the ability to go anywhere and do anything" (Wickenden 1930:1002).

In Germany, there was no need for a total change in direction, since the status of the entrepreneur had always been low. The persistence of feudal elements well into the nineteenth century had dramatically retarded the emergence of independent entrepreneurs. Science had been used as an argument for heightened status since the birth of engineering. The rise of large corporations in Germany augmented the influence of practitioners and industrialists, and not academics as in the USA. As the industrial revolution took off in Germany, academic-minded engineers faced an increasingly strong reform movement among practitioners and industrialists. They adapted by accepting the establishment of middle technical schools and by transforming engineering science and education into a more practical pursuit. The outcome was that German engineers achieved a better balance between the theoretical and practical sides of engineering within the same professional status (Gispen 1989, Ludwig and König 1981).

2) Another important factor was the way the engineers organized. The engineering association in Germany was unified, coordinated its actions with the state, and was much more actively involved in the political aspects of skill formation. They engaged in the reform movement in technical education, and in the development of an industry-based apprenticeship system. The American engineering profession was divided into the so-called four "founder societies" already in the 1880s, and all these associations were dominated by "un-educated" entrepreneurs until around 1905 (Layton 1971). The American engineering profession proliferated into various organizations and specialties, and questions of skills formation were left to academic entrepreneurs and teachers (Wickenden 1930, Gispen 1989, Torstendahl 1982). It was these groups that developed a new professional model in American engineering, not business interests as maintained in certain influential accounts of the history of engineering in the USA (Noble 1977, Hughes 1989).<sup>14</sup>

This partly explains why American engineers came to demarcate themselves so sharply from other "technicians" and identified themselves as (prospective) managers as opposed to traditional engineers, who were embedded in the old industrial culture. In Germany, on the other hand, academics started out being the core group in the engineering association, which actually was founded by a group of students at Berlin's technical school. None of the founders were industrial

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<sup>14</sup> The evidence against the "business domination" explanation for the development of engineering in the USA is discussed in my study on technical education in the USA and Germany (Byrkjeflot 1991).

entrepreneurs, which is in sharp contrast to the United States. The academics, however, lost their hegemony over the German association as early as the late 1870s (Gispén 1989:130-159, Manegold 1978).

3) The technical education system in Germany was developed earlier and may be characterized as integrated from the level of craftsman to academic engineer, whereas the American system was more differentiated and polarized between so-called industrial education on the one hand, and engineering education on the other. There was no link between these two types of schooling. The term technical education was not used in the USA. In continental Europe, on the other hand, this was a frequently used inclusive term for the training of all ranks of technicians (Wickenden 1930:751). This distinction in the school system increasingly corresponded with a sharp demarcation between technicians and engineers in American and British corporations, whereas the development was in the opposite direction in Germany from 1890 on.

4) Engineers participated actively in the development of the ideology and diffusion of particular practices in the "catch-up phase" of German industrialization (see table 5.3 and below). The reports from Franz Reuleaux, a leading engineer and authority on technological development, from the industrial exhibition in Philadelphia in 1876 illustrate how this "catch up" mentality emerged. In his letters, Reuleaux summarized the performance of German industry and engineers as "cheap and bad". The letters were widely published and created an uproar and a reassessment of the whole engineering culture in Germany (Gispén 1989:115-21). This mentality, along with the Great Depression from 1873 to 1896, encouraged German engineers to emphasize the cultural and nationalistic aspects of industry and technology. In this context, it was easier for the profession to mobilize resources in support of technical education and technical associations. The result of this was a stronger and more unified technical culture across classes, industries and societal institutions. Technology was not primarily a tool for achieving individual economic progress and status, but a collective symbol of Germany's military strength and its ability to rise from economic backwardness (Herf 1984). The industrialization process took a more collectivistic form than in the U.S., where the technical culture was much more "individualistic in its aims and ideas" (Wickenden 1930:1002). Engineers in Germany may also have developed a more international orientation as part of their search for best practices, patents and technologies.

Ironically, it only became apparent later that American engineers had undermined their own power base, i.e. their detailed knowledge about and control over uncertainties in the production function. The trust relationship between engineers and other important technical groups was often lost at the time of the introduction of scientific management. After all, the engineers' strategy was to destroy the crafts, eliminate uncertainty and formalize everything in production. Once they had done this, and as they disengaged themselves from particular industries, their claim on strategic knowledge about the production function became less and less legitimate. If top management jobs were not about technology, manufacturing and product development, but a more general people-oriented and financial skill, then accountants, lawyers, and sales personnel could also do the job. The consequence of the initial definition of the management function as a profession in itself separate from engineering was that the position of engineering-executives within the corporate structure was more vulnerable than in Germany. It was a lot easier for other professions to invade the managerial jurisdiction in the USA, because the engineers initially conceived of the managerial function as a profession in itself.

German engineers not only conceived of management as a technical function, but they were also able to maintain a more fluid division of labor between managers and workers and crafts. There was a higher level of trust among the various technical functions. There was actually competition among these groups for advancement in the hierarchy, and this was accepted because they basically belonged to the same technical association and industry. For this reason, and since the top managers themselves possessed a fair amount of technical knowledge, it was less usual to build up technical staffs of university-educated professionals in German firms (Sorge 1978 and 1979, Glover 1978, Sorge and Warner 1986).

### **Structural roots: the impact of the international economy, states and markets in the structuring of organizational fields**

I have sketched some of the major differences in world views and conceptions of the management function among engineering executives in the U.S. and Germany. It is likely that these practices and conceptions were systematically related to a wider set of structural and macro-institutional

characteristics that also emerged during the second industrial revolution. The way economic institutions, states and markets functioned and were perceived by engineers and other key actors in the construction of organizational fields is of major importance here.

### Institutional approach

Some major structuring factors in the environment of firms in Germany and the USA are listed in table 5.3 below. The first aspect of major importance is that Germany was a "late industrializer", about half a century behind Britain, and at least two decades after France, but approximately at the same stage as the United States (Kocka 1980: 78-79). In the mid-nineteenth century, it regarded itself as a victim of "economic backwardness" (Veblen 1915/1954, Gerschenkron 1952). The same feeling and the associated "catch-up mentality" seem not to have been wide spread among industrializing American entrepreneurs, engineers and top executives. This definition of the situation among industrial elites in the USA was related to the lack of external threats, the abundance of natural resources, and the geographical distance to the more "advanced" industrial nations. These factors, along with the close cultural connection between Great Britain and the USA, are probably among the major reasons why the American nation-state is not also usually labeled as a "late-developer", although it went through its main industrialization phase at about the same time as Germany. Germany's economic and political elite's developed an industrial policy that specifically addressed the challenge of "catching up". Their set of responses to the "backwardness" problem mirrored those of late twentieth-century Asian nations. All industrialized late, were poor in resources, and depended heavily on exports (Veblen 1915/1934, Allen 1987:81,88, Hampden-Turner and Trompenaars 1993:201).

Industrial development in Germany, like that of Japan, was one of "organized" or "cooperative capitalism" (Steinmetz 1916, Chandler 1990). Banks, employer associations, cartels, the state and large corporations, as well as state-run universities and educational institutions, were major elements in the new economic regime. These economic arrangements and networks, once established in the late nineteenth century, continued throughout the twentieth century. The heavy dependence of the nation's large corporations on exports made it essential that industry work closely with large banks to improve Germany's international position. These corporate collectivist institutions thus structured the emergence of markets and influenced the new German nation-state (Shonfield 1969).

Table 5.3. Institutional and structural factors affecting organization fields of large German and American companies<sup>15</sup>

	Germany	USA
1. Subjective time/position	Late industrializer	Fast industrializer
2. Historical role of government in industry	Facilitate industrialization, create favorable infrastructure and cooperation	Generate equal chances / avoid collusion
3. Law	No anti-trust laws before WWII Cartels legal until 1947 Collegial management with labor representation	Anti-trusts laws since 1890 Cartels illegal Individual Chief Executive Officer (CEO)/ no labor representation
4. Finance	Banks and internal financing Low uncertainty Deep knowledge Close relations	Stock markets more important High uncertainty Limited knowledge Fleeting relations

Gerschenkrohn (1952) argued that the German practices of investment banking, where a bank followed an enterprise "from the cradle to the grave", was a consequence of its status as a latecomer in industrialization, "whose backwardness does not exceed certain limits". In countries that were even more backward than Germany there would be less bank capital available and the state would have to take on a greater role as financial entrepreneur, whereas the financial markets would be more fragmented in early industrializers like Great Britain. This argument is problematic, however, considering that the USA was just as much a latecomer as Germany, but nonetheless developed a much more fragmented financial system. The consequence of this is that top executives in the USA have to deal with fragmented stockholders, whereas German executives share power with powerful financial intermediaries. It is argued that it is exactly this network of banks and their representatives which has created the German form of cooperative capitalism and also that the flatter hierarchies at

<sup>15</sup> The table is based on among others Chandler (1990) and Hampden-Turner and Trompenaars (1993).

the top of German firms are related to the influence of these networks (Roe 1994, Ziegler et al. 1985, Windolf and Beyer 1995).

This system of financial intermediaries explains the persistence of another institutionalized and legal practice with a long history in Germany, *the collegial management tradition* (Roe 1994:149, Bleicher and Paul 1986). Whereas there has to be Chief Executive Officer (CEO) and an outside board in the USA, there is both a management board (*vorstand*) and an outside or supervisory board (*Aufsichtsrat*) in Germany. The *Vorstand* is collectively responsible for the daily affairs of the company in the same way that is a CEO in the USA. In most instances, there is now a *Vorsitzende* at the management board, but this was often not the case previously even in larger firms, and it is still not a legal requirement. Parks has noted that the *Vorsitzende* at the German companies tends to function more like a "first among equals" than an autocratic director of the *Vorstand*; "decisions often seem to evolve after extensive give and take discussions; thus they develop more by indirection than direction. They come slowly, are influenced by considerable "input" from the various management sectors, and are finally arrived at, more or less, by mutual agreement" (Parks 1966:87). Another important limitation on top executive power contributing to this consensual management style is the 50 per cent labor representation on supervisory boards of large companies and the associated tradition of codetermination (Streeck 1992).

### Market-centered approach

It is Chandler's hypothesis that American corporations were pioneers in product diversification and organizational differentiation because their markets were larger and because they had to cope with a more energetic industrial environment (table 5.4). The influence of market dynamics on organizational and economic development was more fundamental in the USA than in other countries. Similarly, he argues that its managerial hierarchies were developed the furthest because of this. A related kind of explanation is Williamson's "market and hierarchy" thesis. Williamson (1985) argues that the cause of the shift from entrepreneurial to manufacturing capitalism was that entrepreneurs, after weighing the cost and benefits of market versus organization, found that transaction costs were lower in

organizations.<sup>16</sup> More knowledge-intensive and technologically advanced production forms gave hierarchies increasing transaction cost advantages, because they allowed for a better utilization of increasingly specialized production equipment and human resources. It was for this reason functional for large firms to develop managerial hierarchies and internal labor markets.

Whereas Williamson views the emergence of asset specificity's as inevitable and a result of "market failure", Chandler see them as an outcome of managerial strategies. Particularly important are the development of managerial hierarchies. This is in line with the general emphasis in American culture on the manager as a strategic and general administrator, and the executive function as a major productive factor. Williamson puts more emphasis on the adaptive aspects of the organization, but it follows from both perspectives that the dominant managerial strategies and organizational forms are the most efficient responses to given market circumstances. German management thought, in contrast, emphasizes leadership abilities i.e. abilities to mobilize the workforce and product developments as the key elements. The market adaptive and strictly routine administrative tasks are left to the subordinate "*Leitende Angestellte*" (upper white collar) strata in the firm.<sup>17</sup>

The market explanation of the formation of different organizational paradigms, then, is that the size and the rate of expansion in the American market explains the transition from manufacturing to marketing and financial capitalism. The success of scientific management and the managerial orientation of American engineers, then, follows basically from the early dominance of mass production and the subsequent invention of the diversified multidivisional firm. This hypothesis is of course difficult to confirm or disprove, since the USA so far has been the only case of a very large internal market (Chandler1977:478). An implication would be that one had to expect American firms and plants to be larger, since they could concentrate on mass production for the American home market. German firms, on the other hand, should produce smaller, and possibly more diversified

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<sup>16</sup> Transaction costs are the costs of doing economic transactions, such as maintaining contracts, searching for skilled labor, monitoring performance etc.

<sup>17</sup> Chandler's idea about the development of managerial hierarchies as a third necessary strategic move, besides scale and scope, is flawed by a strong culturalist bias as long as he takes the American model of management as his archetypical point of departure. Guillén (1994) has partly done the same in his impressive comparative work on models of management, by only studying the diffusion of organizational approaches stemming from American academic discourse. Williamson's attempt to provide an explanation of hybrid types of organizations is also biased, since he takes the American legal framework, as a precondition for his argument. For a recent critique of

batches because they had less opportunity to grow by developing economies of scale and speed. Maddison (1995:52-53) claims that Chandler's argument about scale and scope is not based on empirical evidence. The average plant has more employees in the United States than in Germany, but it is just as important that the median number of employees in German plants is larger than in the United States. The average plant size hasn't changed much in the United States between 1929 and 1986.<sup>18</sup> The impact of market size on scale economies, then, seems to be rather modest.

It is also difficult to explain from the market efficiency argument why the large multi-product, multi-functional divisionalized firm did not also develop in Germany before World War II. In Williamson's theory, the development of the multi-divisional form among top executives in Dupont and General Motors in the 1930s was basically, "a result of information overload and a strategy to avoid loss of control as a consequence of this" (Williamson 1985: 279-280). The late development of the multidivisional form in Germany would then have to be explained by the fact that German companies were consistently smaller. If skills formation systems are also basically shaped by markets, then it follows that the USA developed a top-heavy polarized technical education system as opposed to the Germans because the American system of production did not need skilled workers at first level of supervision and on the shop-floor. There was accordingly demand for a more academic type of engineer-manager in the USA.

Kocka (1980:106) argues that differences in market size do not seem to be a significant factor; otherwise, Britain and Germany would be more similar. He also argues that the development of the modern German business enterprise initially did not lag behind that of the managerial firm in the United States. Product diversification was more advanced in the 100 largest German corporations in 1907 than in the United States two years later (Kocka 1980:104).<sup>19</sup> Paradoxically, it is the lack of a

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"Anglo-Saxon" imperialism in management research, see the conclusion of Stewart's comparative work on Britain and Germany (Stewart et al. 1994:197, Chandler 1990, Lazonick 1991, Williamson 1991).

<sup>18</sup> Median is defined in relation to total manufacturing employment. Half the employees are in plants smaller than the median, half in plants above that size. These data are based on the situation in 1987. He does not present historical data on Germany, but the data he presents on the United States indicate that the size of the median establishment has only changed from 46,7 in 1929 to 53,9 in 1986, down from 66.3 in 1980 (Maddison 1995: 52).

<sup>19</sup> Diversification is measured on the basis of a classification of industries according to how many product-lines they provide. 60 per cent of the 80 largest companies in Germany had diversified into 5 product groups or more in 1907, whereas only 18% of the 82 largest American companies had advanced to this stage. The difference in 1927/1929 was narrower, as 66 per cent of the German companies were now competing in 5 product groups and above, but only 36% of the American (Kocka and Siegrist 1979:86, Siegrist 1980:81).

market infrastructure that in Kocka's view explains why the early large corporations in Germany diversified earlier than their American counterparts:

There seems to be a reciprocal relationship between the underdevelopment of an economy as a whole and the modernity of the structures and strategies of its largest enterprises, which function as islands of modernity in a sea of traditional small and medium-sized enterprises (Kocka 1980:110).

In agreement with this Herrigel (1996) argues that large German firms had to develop internal capacities because of the lack of an industrial infrastructure, but he disagrees with the emphasis Kocka and other have put on these large firms in their account of German industrialization. He argues that the large firm sector, which he calls the autarkic sector, was "a highly contingent outcome to regionally specific governance problems", viz. the problem of large firms in the industrially underdeveloped regions of Prussia, Hannover and Bavaria (Herrigel 1996:116). The problem with the previous accounts of industrialization in Germany is that they have overlooked an alternative industrial order, the regional *Mittelstand*, which had emerged earlier on in regions with a rich pre-industrial infrastructure of craft skills and small-holder property.

It is not clear how Herrigel's argument affects our comparison of management structures in Germany and the USA, except that one might suggest that it accounts for the persistence of paternalistic management structures in Germany, and probably also the strength of the craft system. On the other hand, it might be argued that the research focus has been on large companies in most of the other countries as well, particularly the Chandlerian studies Kocka responded to in his article. As noted, the median German plant is larger than its American counterpart, and it would probably not be correct to compare management structures in smaller firms in Germany with large firms in the United States. Secondly, Herrigel does not convince us that large firms haven't been a major force behind the development of industrial and governance structures in general.

Another argument proposed by Herrigel, that the new globalized production systems in the 1990s are too innovative and flexible for the Germans to catch up with, also represents a serious challenge to other recent accounts of industrialization in Germany. These accounts have emphasized precisely the flexibility of the German skills formation system. For example, it has been argued by Lash and Urry that the strength of the German production system is based on its "practical reflexivity", which

means that engineers, technicians, foremen and skilled workers occupy the same "qualification spaces", whereas there are sharper dividing lines between academic and practical reflexivity and professional crafts and labor in the United States (Lash and Urry 1994:87,108). According to Herrigel, however, firms now have to break down internal divisions within their production units in order to survive. Given the centrality of skill as a form of social organization in Germany, it has not been easy to deconstruct skill jurisdictions and careers to the extent that the new economy seems to require (Herrigel 1996: 195, 201). The irony of this argument, however, is that Herrigel among others, having argued for the small firms' advantages, now finds that German small firms are not flexible enough to cope with the global uncertainties of the 1990s. It remains to be seen whether this re-interpretation of the flexibility problem in the German economy relates to specific sectors in the economy in the 1990s only, or whether the standard account of the skill advantage of small craft-based firms, and the German production system in general will have to be revised.

#### State-centered approach

Political economists argue that markets are social constructions that reflect their institutional environments, and that they cannot exist without states supporting them. The early role of the state was not to intervene in or impede the development of markets, as economists argue, but to constitute them (Polanyi 1957). Property rights law, other forms of state regulation and industrial policies were of fundamental importance for the emergence of markets, and it is necessary to understand the state's role in this process in order to explain different constellations of markets and hierarchies. Birnbaum uses comparisons across Western Europe and between European states and the USA to show that strong states that are highly institutionalized, autonomous, and differentiated systematically induce different patterns of collective action, political ideologies and types of political regimes (e.g. corporatism vs. totalitarianism) than those of weak states (Birnbaum 1988). Fligstein (1990) argues that the conceptions of control among American top managers were a response to the development of antitrust laws and the interpretation of them by American governments. Similarly, Heidenheimer (1988:7) argues that the development of professional strategies might be predicted on the basis of the level of "stateness".

If these authors are right, then it should also be possible to explain different traditions of industrial administration and engineers' professional strategies by focusing on the role of the state in the

economy. Fligstein has studied how state regulation stimulated organizational innovation and the rise of financial executives in American industrial administration. The American government forced corporations to compete in several product markets and industries by making it illegal to develop larger market shares in basic industries. The stages of industrial development (direct control, manufacturing, marketing control, financial control) are outcomes of struggles among subdivisions in the firm for control over the top executive position. Each form of regulation requires a different strategic response, and new types of executives emerge because the new regulatory regime allows them to obtain an advantage in internal power struggles. Similarly Roe (1994:49) argues that it was American populism that created fragmented banks and gave them a strong voice in Congress. Americans in general have been discomforted by concentrated economic power. It was the politics stemming from this discomfort that most influenced the structure of the large public firm in the United States. In general, he thinks that "firms in nations that have tolerated large pools of private economic power evolved differently than did firms in nations that have repeatedly fragmented financial institutions" (Roe 1994: 286).

Skocpol (1979:108), as a protagonist for the new state-centered approach in sociology, argues that the Prussian state was highly autonomous and that it was an "extraordinarily disciplined and efficient administrative machine". Other sociologists and historians in the same Weber-Hintzean tradition maintain that German industrialization was driven by state interests and that the cartelized economy and the growth of the German engineering profession was a result of state planning. Several scholars depart from this view of the state as an omnipotent force in Imperial Germany. Birnbaum argues that the state in Germany was of medium strength compared to France and Great Britain, and that this fact explains why corporatism developed in only Germany among the larger industrial nation-states. The German state was strong enough to influence, but not strong enough to prevent the development of corporatist institutions. The French state was too strong and the British too weak to allow corporatist institutions to develop. Similarly, Jarausch sees neocorporatism as the predominant strategy among German professions. This means that the professions and the *Unternehmer* in large firms used the state to secure income and social position, while at the same time rejecting its control over practice and organization (Jarausch 1990:22-23). Streeck (1997:38) has argued that the German postwar state is "neither laissez-faire nor étatiste, and is best described as an *enabling* state" (1997). Others have noted that the *Mittelstand* and the autarkic sector have had differing historical

relationships with the state. Whereas the states were thought of as a colleague in the regional system, they were regarded by the autarkic sector as a "hostile body covetous of the industrialist rights to property and continuously seeking to arbitrarily intrude in the private realm of manufacturing and money making" (Herrigel 1996:84). The importance of local movements and voluntary associations should also be noted. Dawson has for example argued that the early development of a technical education system in Saxony was "not a species of pedagogy thrust upon an unwilling people by a patriarchal Government... it is emphatically the result of a spontaneous desire and enthusiasm for technical education. Even before the state troubled itself about technical schools, these institutions existed in large number" (Dawson 1919:105-106).

Exactly how strong the German state was relative to the American, then, is not necessarily the major question. States do not necessarily matter only because they are strong. States have to be taken into account because markets are constituted by and depend on them. Whereas the American state intervened in the economy in order to develop a level playing field, the local states in Germany acted as more direct facilitators for regional industrialization, whereas the central state was instrumental in developing the neo-corporatist framework for governing the economy. In this sense, there is no doubt that the states took a more active role in industrialization in Germany than in the USA.

Meyer has argued that "the coincidence of physical force and administrative rationality was perhaps the most patent mechanism to socialize an entire people in the habit of paternalistic deference" (Meyer 1995: 35). Similarly, Scott Lash has argued that German bourgeois identity formation was linked with their experience with the state apparatus (Lash 1989:70)

## Combination of macro-historical explanations

I have so far suggested how the predominant conceptions of industrial administration among top executives in Germany were different from those in the USA, and that the original constellations and power distribution or authority structures among elite's and between elite's and subordinates might explain what followed later. Then, I have introduced markets as the external force pushing top executives toward diversification as one possible explanation for the failure of American engineers to consolidate their position in top executive positions. The other argument was that particular elite's,

such as engineers, were more influential in the German environment because of state dominance which prevented the same type of external influence from developing. The question now is whether these perspectives are contradictory or whether they can be combined and thereby made more plausible.

### States and markets combined

In reality, the various macro-historical explanations are often combined. Chandler (1990), for instance, mentions the legal environment and the state as a residual category in his comparison of Britain, Germany and the United States. The reason for this is that differences in market size cannot explain the difference between Germany and Britain. A strong state in a small internal market leads to cooperative capitalism (Germany), a weak state in a "small" market economy, on the other hand, results in personal capitalism (Britain), while the USA with its weak state and large market takes the role of "the seedbed of managerial capitalism" (Chandler 1990). (table 5.4).

*Table 5.4. A categorization of countries according to strength of state and size of national market*

Market size/ state strength	Strong state	Weak state
Large market		Managerial capitalism
Small market	Cooperative capitalism	Personal capitalism

This explanation is very difficult to "test" because of a lack of cases in the large market category. Among the small market cases, however, it seems that the model will not work very well. Birnbaum has argued that the state in France is stronger than in Germany, but it is difficult to argue that there is more cooperation among French capitalists. Rather, since Germany developed corporatism one might expect that the industrial relations system would be more cooperative and governance structures more oriented toward collective arrangements. Indeed, this is exactly what most literature on the subject finds to be the case. Work organizations and managerial hierarchies in France are actually more similar to those in Britain and the USA than to those in Germany (Sorge and Warner 1986). Similarly, the state-centered argument should indicate that German organizations were consistently more bureaucratic because they imitated the state apparatus. This assumption is not

supported by the various comparative studies on industrial organization referred to above. This does not mean, however, that a certain combination of market and state explanations cannot explain the various outcomes. It might be possible, for instance, that the state plays a very different role in small and large economies. The market argument, then, will have to be given more weight in the American case than in the German, and more in the German case than among smaller industrial states (Katzenstein 1985). Other characteristics of the state than its strength might have to be taken into account and given more emphasis, such as its geographical position and its class foundation (Moore 1966, Wallerstein 1974). Esping-Andersen's argument that managers in the USA fill a welfare-state vacuum might also be considered (Esping-Andersen 1990).

### States and institutions combined

An interesting attempt at combining states with institutions is Jeffrey Hart's comparison of competitiveness in Japan, France, Germany, the USA and Great Britain (Hart 1992). He argues that *state-societal arrangements* are the key factors behind the various development patterns in the post-war era. By this he means 1) the way government is organized and, in particular, the instruments available for industrial policies, 2) how business and labor are organized and 3) what institutions are developed to link state and society, e.g. education and training systems, para-statal institutions for interest group mediation etc. It is the distribution of power among government, business and labor that underpins the respective state-societal arrangements. The reason for the economic success of Japan and Germany is the shared power arrangements between business and the state and labor and business, respectively, whereas the USA has problems because of the one-sided dominance of business interests. Hart argues that this model has the advantage that it can explain change. His own analysis does not demonstrate this point, since he is not able to present any cases where the distribution of power changed fundamentally and affected competitiveness. Germany is a likely candidate here, because of the power shift from a state-business arrangement before World War II to a labor-business arrangement afterward. Since he only considers the post-war era, he is not able to demonstrate that productive capabilities and economic performance were affected in any major way by these new power arrangements. On the other hand, what seems to matter is whether power is shared or not, and not who shares power. Kenworthy (1995), who has studied the economic performance of the 17 richest industrialized economies between 1960 and 1990 also argues that the key to national economic success is balancing competition and cooperation. The recent improvement

in the performance of the American and British economies, however, throws some doubt on these findings, since it appears that these are the societies in which business interests are most predominant.

#### Path dependency and institutional explanations combined

I find the combined structural arguments developed above to be plausible and serious challengers for the institutional logics type of arguments to be developed below. These arguments start out with a different presupposition than the market and state-centered approaches: viz. that markets were neither there to begin with nor were they reflections of state practices, but they were constructed by the same people who were involved in the construction of other types of institutions such as corporations and industries. It is difficult, then, to argue that managerial strategies and demand for engineers in top positions can be explained by the nature of markets or power balance between the major social forces. It is also difficult to argue that state-societal arrangements at a given point in time are all that matters. The habits, preferences and world-views of the key actors are important. The power of engineer-executives can not be deduced from their potential status as a third party in a shared power arrangement between labor and business. Other third parties could have taken this role. The engineers' position must therefore indicate that they developed a conception of society and organization that was regarded as authoritative for other actors' behavior and beliefs. Engineering power may have been justified in different ways. The construction of a technical education system and the various movements for industrialization may have affected the processes whereby a conception of the firm and the management function emerged (Stinchcombe 1965, Gerschenkron 1952). Struck e.g. has argued that the industrial education system of Germany was developed at a time when apprenticeship was still strongly supported and when the nation was a country of small shops. The methods of production had not yet become as highly specialized as those in the United States and the master-apprenticeship model was the predominant way of justifying hierarchical structures (Struck 1930:91).

This brings me to the last suggestion in this section: that it might be useful to combine the "late-developer" argument and explanations emphasizing dominant organizational logics in a given society. Biggart uses this idea in a comparison of South Korea, Taiwan and Japan. All three economies operate according to a network logic, but Japanese business groups enact a communitarian logic,

Korean a patrimonial and Taiwanese a patrilineal logic. Each logic penetrates not only the economy but also social relations in the main institutional domains.<sup>20</sup> This approach has some similarities to the so-called "societal approach" developed by French industrial sociologists in the late seventies in an attempt to account for major differences between the way large corporations were organized in Germany and France (Maurice et al. 1980). In this explanation, however, the source of dominant "institutional logics" was not found in network relationships and authority patterns, but in education systems and employment systems.<sup>21</sup> The protagonist for the societal approach would probably argue that authority structures and networks emerge along with skills formation and employment systems and that these domains are more fundamental in explaining economic organization (Biggart 1991, Maurice et al. 1986). The structure of the argument is similar. A given institutional logic penetrates the economy as well as society in general. It is not necessarily states and markets that account for the type of capitalisms, organizational forms and engineering professions found in Germany and the USA, but more the institutional framework within which particular actors are socialized into "qualificational spaces" and adapt to changes based on these logics. The *path dependency* model (Arthur 1988, 1989) and more particularly the late development hypothesis are useful conceptual tools since they make us pay attention to the origins of particular infrastructures and look for the possibility that what happens later might depend on the circumstances under which the major institutions affecting industrial administration emerged. Lodge (1987) and Allen (1987) note that the American institutional and cultural framework encourages individualized behavior, while the German corporatist framework evokes more communitarian action patterns. It is difficult to explain the consistency of these action patterns either by a market or a power distribution model. Political institutions and market arrangements have changed, but some of the observed contrasts in action-patterns have remained relatively constant. The same type of stability appears to have existed in management practices.

The path dependency model, combined with a focus on authority structures and the major institutional domains and actors supporting them, therefore seems to be a promising explanatory framework. The perception of the situation and motivation among powerful actors, as well as the

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<sup>20</sup> By "organizational logic", Biggart (1991:222) refers to "a legitimating principle that is elaborated in an array of derivative social practices. In other words, organizational logics are the ideational bases for institutionalized authority relations".

institutions and the structural conditions that have constrained and shaped their behavior, have to be taken into account in this perspective. A different type of presupposition than market and power distribution appears. Not only can collective actors, such as professions, employer associations and educational institutions actually make a difference, but it also matters at what point in history they were shaped and linked with the state and the economy. The actions of individual actors are not only related to their interests and strategies, but also their world-views that indeed may have come to affect their interests and strategies in the first place. Managers and professionals are not only socially constructed but also strategic actors; they do not merely fulfill the needs of capitalism by adapting automatically to technologies, markets and elite's. Neither do they take everything (e.g. that bureaucracy is the appropriate form or organization) for granted; their actions cannot be explained by "rationalized myths" or imitation alone (Meyer and Rowan 1977, Zucker 1983). It does not therefore suffice to study power distributions and the macro-institutional and economic environment in order to explain various outcomes; we also need to know the nature of the individuals who created markets and, of equal importance, the nature of the organizations and the critical events (wars, economic crisis) that influenced states and markets in the first place.

## Summary and conclusion

Engineers were successful in both countries before 1935. The large American corporations developed governance structures based on a managerial conception of capitalism, whereas the Germans firms kept their manufacturing identity. This opened the area for financial and marketing oriented executives and the emergence of the multi-divisional firm in the United States, whereas the German top executives continued to define themselves as *Unternehmer* and manufacturing executives. In order to explain this divergence, I have developed three macro-historical perspectives and suggested a combined explanation. Let me now again bring the analysis down to an actor-centered level and recapitulate the three main perspectives on industrial administration from this point of view (table 5.5).

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<sup>21</sup> For a development of this argument, see Fligstein and Byrkjeflot (1996).

**The three actor-centered models**

In the market model, executives are bounded rational. Their major motivation is to improve efficiency and adapt to market circumstances. There is only one best way to organize, and the top executives need to develop elaborate staff functions and communication practices in order to approach this model (table 5.5). The most important prediction is that managers in the USA had to build larger organizations and that there was a demand for a more academic and universalistic type of industrial administration for this reason.

*Table 5.5. Presuppositions about executives, strategies and structures in market, power and institutional models*

Model	Presuppositions about top executives	Major motivation behind strategies	Presuppositions about structural outcomes
Market	Bounded rational. Markets given most attention	Improve efficiency	There is one best way depending on market structures
Power struggle	Actors are mainly preoccupied with who gets what and how	Growth in external and internal power	Structures negotiated or enforced orders/outcome of power struggles
Institutional	" Habitus " provides actors with motivation and preferences, and limits what actors see and pay attention to	Organizational survival and reproduction of ideas and structures underpinning habitus	Fit between structures, personnel and environment

The power model focuses on executives as participants in power struggles and on structures as negotiated or enforced outcomes of these. The argument is that business interests were practically uncontested in the USA, whereas there was a power balance between the state, labor and business in Germany. This has important consequences for the type of state regulation that becomes possible and for the emergence of particular governance structures, such as industries, cartels etc. Whereas "third parties" such as engineers and other management specialties were integrated in managerial hierarchies in the USA, these groups were less developed and more likely to pursue their own collective objectives in Germany. The fact that executive positions in German industry were longer dominated by family-owned enterprises might be explained by reluctance among business elites to

transfer power to these "third parties". The particular type of German authority structure and industrial administration was developed in order to secure the ultimate dominance of the traditional owner-executives in the firm, whereas the "third parties" were only delegated the responsibility for routine functions. This meant that it was not as necessary to draw a sharp distinction between first-line supervision and workers. The higher degree of collective organization among the various managerial specialties and the higher white-collar strata in Germany have to be explained on this basis. The various professions and staff specialties in the United States on the other hand were more subordinated to business interests to start with and thereby also bound to pursue more academic strategies based on the idea of *general management*.

In the third argument: the institutional model, executives are perceived as driven and limited by their respective habituses. Their chief motivation as executives is the survival of the organization of which they are in charge. Structures are developed in order to fit the institutional environment and presuppositions underpinning their present habitus. It is not power relationships or markets that account for the major differences in strategies and structures, but particular institutional frameworks, e.g. those developed in the period when major industries experienced their first major phase of expansion (e.g. second industrial revolution). In this perspective, one is more interested in managerial, state and business elites as *status groups* than as *interest groups* (power model) or *rational actors* (market model). The difference is that one does not know what strategies and structures status groups will pursue, whereas the acts of interest groups and rational actors follow from their structural location. In order to explain strategies and structures in an institutional model, one has to focus on the institutional environments, as well as the social construction of key status groups and their conception of management and industrial order. Particularly important is the phase of emergence of status groups and particular institutional frameworks, since these are perceived to shape the way these groups define their interests and their relationship to other groups (group habitus).

#### A political-institutional explanation

I find it particularly useful to combine the political and institutional models and use them as a framework for the macro-historical analysis of the formation of management and organizational practices in Germany and the USA. Fligstein (1990) has developed a conceptual and periodical

categorization for organizational forms and conceptions of control in the USA, which I have used as a basis for comparison with the German case. I expected to find that the development patterns in Germany would be different, and that it would be necessary to develop new concepts that could be used to explain the contrasts more accurately. The mechanisms for change in Fligstein's model are all exogenous variables, such as state regulation and invasion of a given market by new companies or conglomerates pursuing new markets. In the model proposed herein, engineers and a manufacturing conception of control lost out in the USA because companies had to diversify into new markets in order to grow. Since the engineers were attached to the manufacturing function, they resisted diversification and were therefore selected out.

I suggest that the changes in conceptions of control could also be driven by endogenous and path-dependent factors, and that the American engineers' initial definition of the managerial jurisdiction might be crucial. I argue that American engineers had developed a *general management* conception of management in the 1920s and that, partly for this reason, they were not able to stabilize their power position within the firm. The German engineers, in contrast, were more successful because they developed a more particularistic and functional approach toward management. Management and governance structures in industry may have changed as a response to shifting economic and political environments, but it would not be possible to explain the outcomes without paying attention to inherited institutional frameworks and the way the major actors perceived of the situation.

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