Dynamics of Organizational Routine Change

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DYNAMICS OF ORGANIZATIONAL ROUTINE CHANGE:
AN ANALYSIS OF DANISH MEDIUM-SIZED FIRMS

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1st Draft, September 25, 2000 (7,913 words including footnotes, references and tables)

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ABSTRACT

This study addresses the relationship between micro and macro level adaptation processes. We propose that the top manager acts as a perceptual filter that links organizational decisions to the firm's performance in its environment.

The study illuminates a chain of causality by which managerial intervention is effectuated. The basic proposition is that organizational decision makers observe the organization's performance, adjust their behavior in response to changed beliefs, and subsequently change the organization's routines. Theoretically, the paper builds upon and extends prior work in the behavioral theory of the firm (Cyert and March, 1963; March, 1991; Levinthal and March, 1981, 1993).

Two samples of medium-sized manufacturing and service firms are analyzed. The empirical results point towards important contextual differences between manufacturing and service firms. We find that managerial control behavior changes in response to organizational performance, and that this leads to changes in organizational formalization.

In manufacturing firms we found a negative relationship between managerial control and past financial performance and the opposite relationship for service firms. The presence of financial slack therefore influences managerial perceptions differently in manufacturing firms.

In service firms, as managerial control increases, the means for achieving control of others' behavior also increases. Increased managerial control is achieved through increased rule orientation, complemented by increased goal orientation. Both provide increased efficiency in routine situations. In manufacturing

firms, goal orientation was not related to rule orientation, just as the effect was not associated to financial performance. At least for some firms, a high degree of formalization is likely to hinder adaptation, and many firms are likely to substitute exploitation strategies for exploration strategies.

The paper concludes that in the process of changing organizational routines, top managers perform a critical link between information about organizational performance and action. The sigificance managers attach to performance information is clearly context dependent.

DYNAMICS OF ORGANIZATIONAL ROUTINE CHANGE:

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Managerial and organizational choice is often perceived as emanating from routinized behavior (Cyert and March, 1963; Nelson and Winter, 1982). Organizations adopt elaborate structures and communication channels in order to cope with the complexity of their environments (Deutsch, 1952), and moreover, such structures embody the organization's prediction about the problems it needs to solve[1].

As organizational structures embody routinized solutions to organizational problems, a key question becomes *how routines change*. At one end of the spectrum, environmental selection processes, such as competition between firms, influence organizational adaptation by favoring organizational forms with higher fitness levels (Hannan and Freeman, 1984; 1989). At the opposite end of the spectrum, managerial preferences and behavior exert influence on organizational adaptation seen from the perspective of the individual enterprise (Andrews, 1971; Child, 1972).

In this paper, we relate macro-level selection processes and micro-level selection processes. Organizational routines are changed in response to changes in the environmental conditions that firms face. These changes are realized by organizational decision makers after evaluating the organization's

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[1] We employ the word "prediction" in an unusual sense, namely to indicate an implicit rather than calculated prediction. In this sense, prediction implies choice rather than deliberation. We view choice differently than calculated decision making, where organizational (and individual) choice is defined as the process of "...[S]orting out options, whether conscious or non-conscious (Tallman and Gray, 1990: 423)."

performance. Therefore, the personal values and preferences held by key organizational decision makers act as a perceptual filter through which information about organizational performance is interpreted and transformed into organizational action (Hambrick and Mason, 1984; Hambrick and Brandon, 1988).

The top manager provides the linking mechanism between organizational action and performance as he is endowed with sufficient power to affect organizational action, and, moreover, functions as a perceptual filter that links strategic organizational decisions to the firm's performance in its environment. Thus our basic proposition is that organizational decision makers observe the organization's performance, adjust their behavior in response to changed beliefs, and subsequently change the organization's routines. Theoretically, the paper builds upon and extends prior work in the behavioral theory of the firm (Cyert and March, 1963; Nelson and Winter, 1982; March, 1991; Levinthal and March, 1981, 1993).

We test the hypotheses on two samples of medium-sized manufacturing and service firms using path analysis. We obtain estimates for both samples, and compare the two types of firms. Our empirical results provide support for all of our hypotheses in the case of service firms, and suggest that in routine situations, organizational adaptation is incremental and path dependent. The results are different in the case of manufacturing firms, suggesting that the process of organizational adaptation is highly context dependent. In particular, financial slack seems to play different roles in manufacturing and service firms, respectively.

Micro and macro level processes of organizational adaptation

In their "Behavioral Theory of the Firm," Cyert and March (1963) suggested that organizational choice is routinized. Organizational adaptation was viewed as the process of choosing between different routines, and the routines that are used most often are more likely to be employed again in the future (Cyert and March, 1963: 99-100). A key problem is to specify a mechanism that selects one routine over another and thereby controls the extent to which routines are changed or remain stable. In formal organizations, a central mechanism is managerial intervention. Top managers have power to alter the behavior of other organizational members through directives, sanctions and rewards. If the outcome of a given routine is perceived to be successful by the top manager the likelihood that the routine is repeated increases.

Managers usually do not draw inferences about the success of routines by mere observation of their execution. Rather, they make their inferences by observing outcomes of routines and correlating outcomes with execution. For example, managers regularly observe the financial performance of the firm and make inferences about the degree of success[2]. Past performance contains information that is relevant to making decisions about future organizational commitments (Lant and Hurley, 1999). Such behavior can produce a bias towards incremental adaptation, as the expected returns from exploiting existing skills are larger and less risky than the expected returns from exploring new opportunities (March, 1991). Learning often requires simplification of complex problems in order to generate sufficiently informative data from limited sample points (Levinthal and March, 1993). With repeated

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[2]   Even if more detailed information is used to evaluate the outcome of a routine, there may not be a transparent mapping between causes and effects, between rules in use and observed outcomes. This situation may lead to superstitious learning (Rumelt, 1995).

successes, organizational routines are likely to become increasingly formalized over time, and successful small sample experiments tend to result in myopia and path dependence. To summarize the previous arguments, we suggest a model of myopic adaptation that is illustrated in figure 1 below. Figure 1 illustrates a two period example. We assume that the process is recurrent.

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Insert figure 1 about here

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Organizational Performance and Managerial Aspirations

A key criterion by which business firms are evaluated by internal and external stakeholders is their financial performance. In Western culture, financially successful firms and their managers often gain considerable status in society. One needs only to consult periodicals such as Business Week or Fortune Magazine to get an impression of the honors that are bestowed upon managers of financially prosperous firms. Financial success is often attributed to the personal skills and values of managers. For example, a number of relationships between organizational structure and policy and the socio-demographic characteristics of managers have been suggested in the literature (Miller, Kets de Vries, and Toulouse (1982), Miller and Toulouse (1986)).

When people observe outcomes of the organizational actions they are involved in, one consequence is that they atrribute success to own skills and failure to external forces (Bernstein, Stephan, and Davis,

1979; Ross and Sicoly, 1979). Self-serving bias in the attribution process is likely to result in managers attributing their own skills and influence to the financial success of the firm. Moreover, as organizational incentive systems often provide substantial career and financial rewards to managers of financially successful firms, individual psychological biases are likely to be reinforced by the social context (March, 1994a, 1994b).

Managers experiencing success will tend to increase behaviors that increase their influence on decision making in the organization. Financial performance provides a feedback about the performance of the manager, and thus an indication of the appropriateness of the manager's dispositions.

Clearly, there are possibilities for false inferences about the true causal relationship underlying the organization's performance. We believe that the effect is the same: Observed financial performance reinforces the manager's beliefs about his own ability to control the situation. Thus, we predict that managers experiencing success will tend to shift towards behaviors that are more likely to indicate an *internal locus of control* than an external locus of control, when they receive positive feed-back in the form of good results. Managers that have an internal locus of control tend to believe that they have control over their environment, rather than being convinced that their performance is contingent upon events and people beyond their control (Rotter, 1966)[3].

To sum up, we propose that managers of financially successful firms will increase their aspirations

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[3] Although a person's locus of control is generally assumed to be stable in the psychological literature (Antonides, 1996: 33), the attribution process referred to above tends to reinforce beliefs about an internal locus of control when success is observed and conversely when failure is observed.

concerning their own ability to control the fate of the firm. Therefore, they will modify their behavior towards greater influence in organizational decision making by increasing the degree of involvement in collecting and interpreting information used in organizational decision making and controlling the implementation of decisions. We refer to this behavior as *managerial control*[4].

> H.1   Past financial performance is positively related to managerial control.

We do need to add a modification to our hypothesis, namely, firms that face highly unusual situations are likely to exhibit non-routine response. Therefore, we only expect the hypothesis to hold for firms in fairly routine circumstances. In non-routine circumstances such as extremely low or extremely high financial performance, we predict that firms initiate search for alternative solutions or increase slack. In the case of very low financial performance, search is initiated because of realized performance below target levels, and in the case of very high performance, the organization may initiate slack search or for that matter enjoy the benefits of the quiet life that comes with wealth (Cyert and March, 1963; March, 1994a). Alternatively, unsatisfactory performance may lead to escalation of commitment (Staw, 1981). Many models are possible, but in routine situations a model of trial and error learning is most likely to apply.

Managerial Aspirations and Organizational Rule Orientation

As managers attempt to increase their influence in organizational decision making processes, they need to adapt the means for actually achieving control. Managers will therefore seek to adopt organizational

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[4]   Please refer to appendix A for a detailed description of the variables employed in this study.

structures that increase their ability to exert control over organizational members. Organizational rule orientation may be viewed as a *means* to achieve control over the behavior of subordinates in the organization (Deutsch, 1952; Scott, 1992). Thereby rule orientation is conceptually separated from managerial control, which we view as an expression of managerial aspirations.

By increasing rule orientation, the top manager can increase his power in the organization by controlling strategically important information and resources (Pfeffer and Salancik, 1978). Rule orientation provides increased reliability in routine situations as coordination becomes more efficient, but is less effective in non-routine situations that are characterized by high complexity and ambiguity (Blau and Scott, 1962: 116-128). Thus, we predict that organizational efficiency increases with rule orientation in routine situations.

We view rule orientation as the attempt to implement rules of behavior in the organization, and to enforce these through organizational control systems. Increased rule orientation reduces the information load on the manager. Rules and control systems substitute for detailed insight into the tasks and behaviors of subordinates. The information processing load on the top manager therefore decreases with increases in rule orientation (Scott, 1992: 234-244).

H.2   Increased managerial control is positively related to rule orientation.

When the top manager's information processing capacity is limited, it may be impossible to personally observe whether subordinates actually carry out the proper procedures. Clearly this creates a gap

between aspirations and implementation. In order to reduce the gap, the top manager can complement detailed supervision of rule following with the use of explicit goals. Using explicit goals for the organization's middle managers provides a standard against which performance is evaluated, and eases the evaluation of the degree of compliance with organizational routines. Moreover, perceived negative discrepancies between actions and goals create motivational inducements for change. As stated by Bandura (1977:161): "The motivational effects do not derive from the goals themselves, but rather from the fact that people respond evaluatively to their own behavior." Therefore rule orientation is positively associated with organizational goal orientation. We think of goal orientation as the extent to which there are formal goals for organizational members, and the extent to which these are met.

H.3   Increased rule orientation is positively related to goal orientation.

Organizational Reliability and Efficiency

Increased formalization of work through rule and goal orientation tends to increase the reliability and efficiency of organizations for at least two reasons. First, the ability to transmit relatively standardized information increases, thereby improving the efficiency of coordination activities (Galbraith, 1973; Blau and Scott, 1962). Secondly, increased rule orientation complemented by increased goal orientation increases the top manager's control over the organization. Both provide increased efficiency as long as the organization does not encounter a non-routine situation. In routine situations goals have substantive meaning, as the discrepancy between the actual and the perceived situation is small. Goal induced

motivational discrepancies increase organizational efficiency (cf. Bandura, 1977).

H4:   Organizational goal orientation is positively related to financial performance.

As past success increases organizational inertia due to positive reinforcement (Miller and Chen, 1994), increased rule orientation and goal orientation favor an exploitation strategy over exploration (March, 1991). Organizational efficiency in routine situations is therefore increased indirectly by rule orientation which works through increased organizational goal orientation.

Control Variables

Organizational formalization is often thought to be causally related to size. In general, empirical research has found a positive relationship between size and formalization (Burton and Obel, 1998; Miller, 1987). We therefore control for the influence of organizational size. Similarly, it has been conjectured that formalization increases with organizational age. Population level studies support the notion that organizational inertia increases with age and size, and one of the key mechanisms that are related to age and size is the development of bureaucratic structures (Hannan and Freeman, 1984, 1989; Miller and Chen, 1994). We also control for possible effects of organizational age.

We have chosen to control for age and size at the end of the causal chain namely as paths to goal orientation. We can improve model fit by also controlling for paths to rule orientation and managerial control, but this comes at the expense of model parsimony. We did perform such alternative analyses,

and the parameter estimates of the hypothesized paths did not change qualitatively or quantitatively. These analyses are available from the first author.

In strategy research, the resource-based view of the firm argues that firm-specific resources influence the firm's performance (Barney, 1991). In order to avoid generating biased estimates of performance effects, we control for unobservable effects on financial performance (Jacobson, 1990: 76). We control for such firm-specific strategy factors by including a control for the direct influence of past performance on current performance.

Towards an Empirical Model

The four hypotheses reflect a model of cumulative causation where adaptation of managerial aspirations in response to changes in performance determine the extent of organizational rule and goal orientation. Organizational rule and goal orientation are related to financial performance through the latter. Note that we distinguish between routine and non-routine situations, and that the hypotheses only hold for routine situations. Non-routineness indicates a boundary condition for the hypotheses. Evaluating the four hypotheses collectively points towards a much more important organizational problem, namely the dynamics of organizational routine change, and thereby towards the sources of organizational inertia. The top manager of the firm therefore functions as the perceptual filter that attributes causes to the firm's level of financial performance, and also determines the extent of changes to the organizational structure and strategy (Hambrick and Mason, 1984; Hambrick and Brandon, 1988).

Clearly, the reasoning presented herein supports a conception of the world as one filled with myopic

actors that learn from experience rather that attempting to apply some measure of foresight. Our line of reasoning therefore builds upon the tradition established by the Carnegie School of Research. The arguments assume a form of retrospective rationality which is in stark contrast to the rational agents, populating theories of economics and rational theories of management.

We analyze the hypotheses using path analysis and use the structural equation modelling program AMOS 4.0 to obtain a simultaneous estimate of the effects (Arbuckle and Wothke, 1999). We employ controls for the influence of past financial performance on current financial performance, and age and size influences on goal orientation in order to avoid biased estimates of the three effects that provide an indirect link between past and current financial performance through path H1 ϭ H2 ϭ H3 ϭ H4. The empirical model and hypotheses are presented in figure 2. We will test the hypothesized model on two different samples of firms. We describe the samples in the next section.

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Insert figure 2 about here

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Our key empirical and theoretical contribution is to test a *process* model that links financial performance to organizational structure through managerial behavior. In order to accept the proposed model, two conditions *must* be fulfilled. First, all of our hypotheses concerning the particular paths need to be accepted. Secondly, our model must fit the data satisfactorily.

Data and Analysis

The sample was drawn from two surveys of 124 medium-sized service firms and 135 manufacturing firms. Both surveys were conducted as combined telephone and mail surveys in the spring of 1997. The two samples were selected from the same geographical location, firm size, and legal organization. The sample consisted of *all firms* within the sampled geographical area (three different counties in Denmark) which had between 50 and 499 employees according to officially registered information, and were organized as limited liability firms. The latter allowed us to obtain the publicly available, and audited financial statements.

Based on the firm's main activity, we identified 273 manufacturing firms and 160 service firms within the sampling criteria[5]. We received answers from 135 manufacturing firms and 124 service firms. The sample was representative as there were no significant differences on the dimensions of size, age and profitability between respondents and non-respondents. The overall response frequency for the total sample was 59.8%. We consider the response rate sufficiently high to be able to generalize to the sample of firms included, and venture that our conclusions also hold for the population of Danish medium-sized firms. Table 1 below shows the response rates for both samples.

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Insert table 1 about here

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[5]   We used the firm's official industry classification as the criterion for categorizing a firm as either a manufacturing or service firm. The classification system used is the standard NACE system established by the European Union.

The survey was carried out as a combined mail and telephone survey during March and April 1997. The target respondent was the CEO of the firm. All participants were promised full confidentiality, but the identities of the participating firms are known to the researchers. The fact that we know the identity of the participating firms allows us to obtain audited publicly available accounting data for the participating firms.

For the variables managerial control, rule orientation, and goal orientation, the respondents were asked to rate the extent to which they agreed with a series of statements on 5 point Likert scales. The variable *managerial control* is measured as an additive scale comprised of 3 Likert scaled items with a Chronbach's á = 0.715. We view management control as the extent to which the top manager of the organization seeks to influence the decision processes in the organization by participating in the collection and interpretation of information, and by controlling the implementation of decisions. The variable *rule orientation* is measured as an additive scale comprised of 3 Likert-scaled items with a Chronbach's á = 0.881. We view rule orientation as the attempt to implement rules of behavior in the organization, and to enforce these through organizational control systems. The variable *goal orientation* is measured as an additive scale comprised of 2 Likert-scaled items with a Chronbach's á =0.733.

To assess the discriminant validity of our constructs, we conducted a confirmatory factor analysis using maximum likelihood estimation[6]. We report the results of the factor analysis in table 2 below.

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[6]   As a note to the interested but sceptical reader: Analyzing our two samples separately yields identical results for the factor solution.

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Insert table 2 about here

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The results of the factor analysis indicate that a 3-factor solution provides an adequate representation of the data, whereas a two-factor solution is not adequate. The loadings and reliabilities indicate that our constructs exhibit convergent and discriminant validity. The values of Chronbach's á above 0.7 for the three additive scales indicate sufficient scale reliability. The description of the three variables appears in appendix A.

Financial data were obtained from the electronic database, CD-Direct, which is published by Købmandstandens Oplysningsbureau, a Danish purveyor of credit information about businesses. The database contains the publicly available financial statements. We used one measure of financial performance, *return on assets* for 1996 and 1997, where income is measured before tax but after interest payments and depreciation.

We measure organizational *size* as the number of employees in the firm, and the organization's *age* as the number of years passed since the legal founding of the firm (2000-founding year). We use the logarithm of these numbers to reduce problems with skewness in the size and age distribution of firms.

Table 3 shows descriptive statistics and correlations for the whole sample. Note that the average financial performance increases slightly from 1996 to 1997. This probably reflects a prosperous business

cycle in the Danish economy.

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Insert table 3 about here

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As a key assumption underlying structural equation modelling is that the data is distributed according to a multivariate normal distribution, we also conducted analyses to assess the degree of non-normality in the data. Table 4 clearly shows that there are severe departures from normality in the data due primarily to the financial data. Based on this analysis, we eliminated 10 observations from the dataset, reducing the number of manufacturing firms to 119 and the number of service firms to 107. The criterion for elimination was Mahalanobi's D. The lower part of table 4 shows that after elimination of outliers we cannot reject the null hypothesis that the data are distributed according to a multivariate normal distribution.

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Insert table 4 about here

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The analysis proceeds as follows. We first estimate the hypothesized model using path analysis. For the samples including all observations, we estimate the model for each sample considered separately. We repeat these analyses for the samples excluding outliers. For each model we evaluate model fit and

regression coefficients. The results of these analyses are reported in tables 5 and 6. Model 1 is the

model analyzing manufacturing firms only. Model 2 is the model analyzing service firms. Models with

* indicate that outliers have been eliminated.

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Insert table 5 about here

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In table 5 we can see that absolute model fit improves as outliers are eliminated. The χ^2 value goes down

considerably for all estimations. Based on the values of χ^2, Model 2 and model 2* provide the best fit

of the data. All of the relative fit indices indicate good model fit compared to the independence model,

and the differences between the various estimated models are negligible. The reported fit indices (NFI,

RFI, IFI, TLI, CFI) compare the model fit of the estimated model with the model fit for the

independence model[7]. If the fit of the estimated model is close to the independence model, the value of

the fit index will approach 0, and conversely a good fit is indicated if the index is close to 1. It should

be noted that model 2* consistently outperforms all other models.

The RMSEA value of 0 found in model 2* indicates a perfect fit (Browne and Cudeck, 1993). We also

report the 90% confidence intervals for RMSEA. Neither model 1 or model 2* fit the data adequately.

The PCLOSE statistic further supports this conclusion. Finally, the values for Hoelther's index indicate

that only model 2* achieves a satisfactory fit. Hoelther's index indicates the largest sample size for which

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[7]   For example, NFI = $\chi^2_{(I)}$ - $\chi^2_{(e)}$ /$\chi^2_{(I)}$, where the subscript I indicates the independence model, and the subscript e indicates the estimated model.

the model can be accepted (Hoelther, 1983).

The various fit indices reported suggest that only model 2 and 2* fit the data adequately. The interpretation is clear: We must reject our hypotheses for the manufacturing firms, while we cannot reject the hypotheses for the service firms based on evaluation of model fit.

In table 6, regression weights are reported along with standard errors and critical ratios (c.r. = estimate/standard error). Again, results are reported for three models. In the discussion, we will restrict the attention to the models excluding outliers, as non-normality seems to influence some of the parameter estimates slightly.

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Insert table 6 about here

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We fail to reject hypothesis 1 for service firms (model 2*). However, hypothesis 1 is firmly rejected for manufacturing firms. In fact, the relationship is more significant in the opposite direction than predicted — and about the same magnitude as the relationship for service firms (p<.01). The result that higher financial performance is negatively related to managerial control in the case of manufacturing firms may indicate that managers in manufacturing firms increase slack search rather than their degree of control over the organization through increased rule and goal orientation.

We fail to reject hypothesis 2 for both samples. In fact the relationship between *managerial control* and *rule orientation* is robust across all the six models (p<.01 and better). In conjunction with the results for hypothesis 1, these results suggest that regardless of the source of their beliefs, if managers are oriented towards an internal locus of control, they will tend towards creating a more formalized organization.

We reject hypothesis 3 for the manufacturing firms, while we fail to reject the hypothesis for the service firms. The goal orientation is increased as a response to rule orientation in service firms, whereas goal orientation is not significantly related to rule orientation in manufacturing firms.

Similarly, we reject hypothesis 4 for the manufacturing firms, while we fail to reject the hypothesis for the service firms. Apparently, goal orientation is not associated with financial performance in the case of manufacturing firms, whereas there is a significant effect in the case of service firms.

Neither size or organizational age seems to have an influence on organizational goal orientation, whereas the influence of past financial performance on current financial performance is highly significant.

Overall, comparisons of parameter estimates for manufacturing firms and service firms seem to indicate that there are important contextual differences between manufacturing and service. These may be caused by differences in organizational technology (cf. Perrow, 1967) or environments (cf. Lawrence and Lorsch, 1967). We attach the greatest theoretical and practical significance to the differences between the parameter estimates relating past financial performance to managerial control. Overall, technological

opportunity is likely to be different for manufacturing and service firms, respectively. Manufacturing firms are likely to have greater opportunities for product and process innovation compared to service firms. The latter are often judged by their ability to deliver a timely and reliable service to customers, and formalization and routinization are more likely to improve organizational efficiency since these favor an exploitation strategy. Manufacturing firms, on the other hand, can often gain considerable competitive advantages by introducing new products as these can be protected by patents and similar isolation mechanisms (Rumelt, 1984). Therefore, increased financial slack may lead to a greater emphasis on exploration strategies in manufacturing firms compared to service firms.

We find support for our main theoretical proposition in the case of service firms: Managerial aspirations are changed in response to experiential learning, and changes in aspirations lead to changes in organizational formalization. Interestingly, after elimination of outliers that exhibit what can only be described as unusually high or low financial performance, we obtained better model fit. The firms we eliminated can all be placed in non-routine circumstances, thus supporting our reservations concerning our predictions. In non-routine situations, behavioral patterns are most likely changed by initiating search for new solutions as aspirations fail to meet expectations (Cyert and March, 1963).

The results concerning the manufacturing firms are somewhat different. These results indicate that managers of manufacturing firms respond differently to financial slack. Rather than strengthening their control over the organization, they tended to reduce it. A probable reason is that financial slack generates slack search in manufacturing, and thereby leads the firm towards an exploration strategy rather than an exploitation strategy.

Discussion and Conclusion

We have analyzed organizational adaptation from a dynamic process perspective, linking managerial behavior, organizational structure, and performance. We have emphasized incremental adaptation in routine situations in the study, and provided an indirect link between the environment and the organization. Decisions about organizational formalization through rule and goal orientation is shaped by the top manager's perceptual filtering. Changes in the top manager's aspirations and behavior happen in response to experiential learning, and lead to changes in organizational formalization. Thus, we have described a process of organizational adaptation that links micro level and macro level selection processes, and provided a more credible account of the process of changing organizational routines.

We hypothesized that past financial performance was positively related to managerial control (H1). Given the self-serving bias of attributing success to internal forces (Bernstein, Stephan, and Davis, 1979; Ross and Sicoly, 1979), increased financial performance was believed to raise managerial aspiration levels. The empirical results provided support for the hypothesized positive relationship in service firms. Managers of service firms tended to attribute financial performance to their own behaviors, and subsequently increase behaviors that increased their influence on organizational decision making processes. The hypothesis was rejected for manufacturing firms, and the relationship was significant with a negative parameter. Apparently, the substantive meaning of the information contained in performance data is context-specific. Therefore more complex managerial and organizational responses may result (Lant and Hurley, 1999). This may indicate that the presence of financial slack relaxes control and coordination pressures, and probably leads to slack search in manufacturing firms.

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The idea that the top manager's personality and behavior is related to organizational performance is not new, and has been studied extensively. Of particular relevance for this study is the work of Danny Miller and associates. For example, Miller, Kets de Vries, and Toulouse (1982) considered the personality dimension locus of control and found that more internal chief executives tended to lead rather than follow competitors, to undertake greater risks, and pursue more innovative strategies. Miller and Toulouse (1986) found that the personality dimension internal locus of control was associated with the pursuit of innovative strategies, and generally future oriented strategies, given their perception of control over the environment. They also found that flexibility was associated with high risk taking in decision making, and that informal organizational designs and need for achievement were related to formal structures and proactive decision making. Miller and Dröge (1986) examined the relationship between chief executive need for achievement and its effects on organizational centralization, formalization, and complexity. Their results showed that the more achievement-oriented the CEO, the more power was centralized, and the more formalization and functional specialization were preferred.

In contrast, our study illuminates a chain of causality by which managerial intervention is effectuated. Moreover, consideration of psychological attribution processes allows us to describe a *process* of organizational adaptation rather than simply capturing the effect of unique personality traits.

We further hypothesized that when managerial influence in decision making processes increases, the means for achieving control over others' behavior also increases (H2 and H3). We failed to reject both hypotheses for service firms, but rejected hypothesis three for manufacturing firms. This indicates that regardless of the source of their beliefs, if oriented towards internal locus of control, managers will create

formalized organizations.

Finally, we hypothesized goal orientation to be related to financial performance (H4). This hypothesis was rejected for manufacturing firms whereas a significant effect was found for service firms. The relationship between goal orientation and performance can be explained by the efficiency achieved by the organization as coordination activities are improved (Galbraith, 1973). Such efficient coordination favors exploitation strategies (March, 1991).

Formalization has often been shown to increase with age and size, either as a result of the development of bureaucratic structures (Hannan and Freeman, 1984) or inertia (Miller and Chen, 1994). Although model fit was improved when controlling for age and size, these variables were not significantly related to any other variable, and the hypothesized paths did not change. Naturally, when controlling for the influence of past performance on current performance the relationship was found highly significant. When we excluded the path from past performance to current performance, the relationship between goal orientation and current performance became non-significant — all other relationships were stable. These estimates are not shown but are available from the first author by request.

It should not be forgotten that our empirical data only cover a relatively short time span. Therefore, the organizational adaptation we capture is decidedly myopic. The results are not likely to reflect major investment initiatives or changes in strategic direction. These are more likely to enter as noise in the sample. Since outliers exhibiting unusual financial performance were excluded from the analysis, the empirical results are only likely to hold in routine situations. In extreme financial situations we expect to

see greater emphasis on search which we did not include in our research (Cyert and March, 1963; March 1994a). Future research should utilize designs that can discriminate between routine and non-routine situations.

The firms were sampled in early 1997 and our accounting data spans both 1996 and 1997. This period was characterized by a growing and prosperous business environment in Denmark. Economic growth, interest rates, unemployment and other macroeconomic indicators were all improving. Manufacturing and service firms operating mainly in the home market were not likely to encounter situations requiring major shifts in strategy or structure. Thus we cannot generalize our results concerning financial performance beyond an economic environment charaterized by progress. Given the opportunity to replicate our study during an economic downturn, we predict different empirical results. At least for some firms, a high degree of formalization is likely to hinder adaptation, and many firms are likely to substitute exploitation strategies for exploration strategies.

The overall lesson learned from this study concerns the process of changing organizational routines. The empirical results show that the top manager performed a critical link between information about organizational performance and organizational action. Moreover, the differences we found between manufacturing and service firms indicate that financial slack influences managerial perceptions and subsequent organizational actions in a more complex way than we suggested.

We have portraied managers as myopic actors learning from experience rather than attempting to use foresight, for example by initiating organizational search activities. In the absence of an explicit

consideration of organizational search, we cannot conclude that managers are as myopic as suggested in this paper. Future research needs to take search processes explicitly into account — and distinguish between systematic and unsystematic search (Simon, 1958).

Clearly more empirical research is needed. Our empirical research only covers a limited time frame, and does not consider the influence of organizational search. In order to shed light on what happens in a different economic environment, longer time series are needed. Unfortunately, the research methodology we used in this paper is not suited for such research, so methods and data are needed for this task.

Appendix A: Description of variables in the questionnaire.

Managerial control

The scale *Managerial control* was constructed from 3 items on a 5-point Likert scale. The respondents were asked to rate the extent to which they agreed with the statements made in this group of questions on a 5-point Likert scale. The scale ranged from "Yes, always," over "Yes, often," "Some times," Rarely," to "Never."

"The CEO is involved in collecting the information that is used for decision making."

"The CEO is involved in the interpretation of the information that is used for making decisions."

"The CEO personally controls that decisions are implemented."

Rule orientation and *goal orientation*

The respondents were given a brief introduction to a group of questions concerning how middle managers operate in the firm. The introduction included a definition of a middle manager:

"**Background and qualifications of middle managers**

By a middle manager is meant a person who has the responsibility of a department or a function and has at least one subordinate."

The respondents were then asked to rate the extent to which they agreed with the statements made in this group of questions on a 5-point Likert scale. The scale ranged from "totally agree" "somewhat agree" "neither agree or disagree" "somewhat disagree" to "totally disagree."

The scale *Rule orientation* is comprised of the following 5 items:

"There are explicit rules for how middle managers perform their duties"

"It is necessary to give detailed instructions to our middle managers about how to perform their work."

"To a great extent, we control the degree to which middle managers follow the rules."

The scale *Goal orientation* is comprised of the following 2 items:

"We often set goals for the middle managers"

" To a great extent, we control whether the results of the middle managers achieve the expected goals."

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TABLES

Table 1. Response rates

	Manufacturing	Service	Total
Expected population	273	160	433
Number of responses	135	124	259
Response rate	49.45%	77.50%	59.82%

Table 2. Rotated Factor Matrix

	Factor		
	Goal orientation	Rule orientation	Managerial control
There are explicit rules for how middle managers perform their duties.	0.108	**0.490**	0.111
It is necessary to give detailed instructions to our middle managers about how to perform their work	0.001	**0.629**	0.177
To a great extent, we control the the degree to which middle managers follow the rules.	0.124	**0.933**	0.099
We often set goals for the middle managers.	**0.985**	0.031	0.025
To a great extent, we control whether the results of the middle managers achieve the expected goals.	**0.787**	0.186	0.083
The CEO is involved in collecting the information that is used for decision making.	-0.082	0.128	**0.645**
The CEO is involved in the interpretation of the information that is used for making decisions.	0.102	0.115	**0.717**
The CEO personally controls that decisions are implemented.	0.111	0.147	**0.638**
Chronbach's Alpha	0.733	0.881	0.715
Percentage of variance accounted for	20.70%	19.96%	17.46%
Cumulative percentage	20.70%	40.66%	58.12%
Test of factor models	$\div^2$	df	p
2 factor model	123.995	13	<0.00001
3 factor model	9.654	7	.209
4 factor model	0.36	2	.835
N = 236			

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

Table 3. Descriptive statistics.

	Mean	Std.dev	Variance	Correlations						
				Return on assets 1996	manageria l control	lnage	lnemploy	rule orientatio n	goal orientatio n	Return on assets 1997
Return on assets 1996	0.072	0.114	0.013	1.000	0.078	0.033	0.181	-0.017	0.030	0.406
manageria l control	8.492	2.024	4.097		1.000	-0.063	-0.176	0.292	0.138	0.179
lnage	2.928	0.626	0.392			1.000	0.115	-0.083	0.090	-0.001
lnemploy	4.647	0.673	0.453				1.000	-0.103	0.070	0.129
rule orientatio n	8.140	2.768	7.663					1.000	0.213	-0.003
goal orientatio n	7.682	2.058	4.234						1.000	0.132
Return on assets 1997	0.078	0.161	0.026							1.000
N=236										

Table 4. Tests for normality.

All observations included (N=236)

	min	max	skew	c.r.	kurtosis	c.r.
Return on assets 1996	-0.562	0.346	-1.523	-9.554	7.066	22.158
managerial control	3	12	-0.276	-1.73	-0.538	-1.688
lnage	1.609	4.86	0.063	0.396	-0.079	-0.247
lnemploy	3.912	7.048	0.984	6.169	0.417	1.306
rule orientation	3	15	0.096	0.601	-0.729	-2.287
goal orientation	2	10	-0.784	-4.914	0.047	0.146
Return on assets 1997	-1.569	0.684	-4.392	-27.544	45.312	142.09
Multivariate					72.616	49.69

Outliers eliminated (N=226)

	min	max	skew	c.r.	kurtosis	c.r.
Return on assets 1996	-0.176	0.346	0.327	2.004	0.49	1.503
managerial control	4	12	-0.254	-1.558	-0.605	-1.856
lnage	1.609	4.86	0.025	0.151	0.047	0.144
lnemploy	3.912	6.477	0.797	4.893	-0.263	-0.808
rule orientation	3	15	0.098	0.601	-0.747	-2.293
goal orientation	2	10	-0.762	-4.676	0.025	0.077
Return on assets 1997	-0.199	0.389	0.336	2.062	0.66	2.026
Multivariate					1.435	0.961

Table 5. Assessment of model fit.

Fit Measure	All observations included		Outliers eliminated		
	Model 1	Model 2	Model 1*	Model 2*	
Discrepancy	30.206	13.182	23.604	10.027	CMIN
Degrees of freedom	13	13	13	13	DF
P	0.004	0.434	0.035	0.692	P
Number of parameters	22	22	22	22	NPAR
Discrepancy / df	2.324	1.014	1.816	0.771	CMIN/DF
Normed fit index	0.985	0.993	0.988	0.995	NFI
Relative fit index	0.968	0.984	0.974	0.989	RFI
Incremental fit index	0.991	1.000	0.995	1.002	IFI
Tucker-Lewis index	0.981	1.000	0.988	1.003	TLI
Comparative fit index	0.991	1.000	0.995	1.000	CFI
RMSEA	0.103	0.011	0.083	0.000	RMSEA
RMSEA lower bound	0.055	0.000	0.022	0.000	RMSEALO
RMSEA upper bound	0.151	0.096	0.136	0.076	RMSEAHI
P for test of close fit	0.037	0.671	0.145	0.854	PCLOSE
Hoelter .05 index	93	185	112	237	HFIVE
Hoelter .01 index	115	229	139	293	HONE

Table 6. Regression Weights[¶]

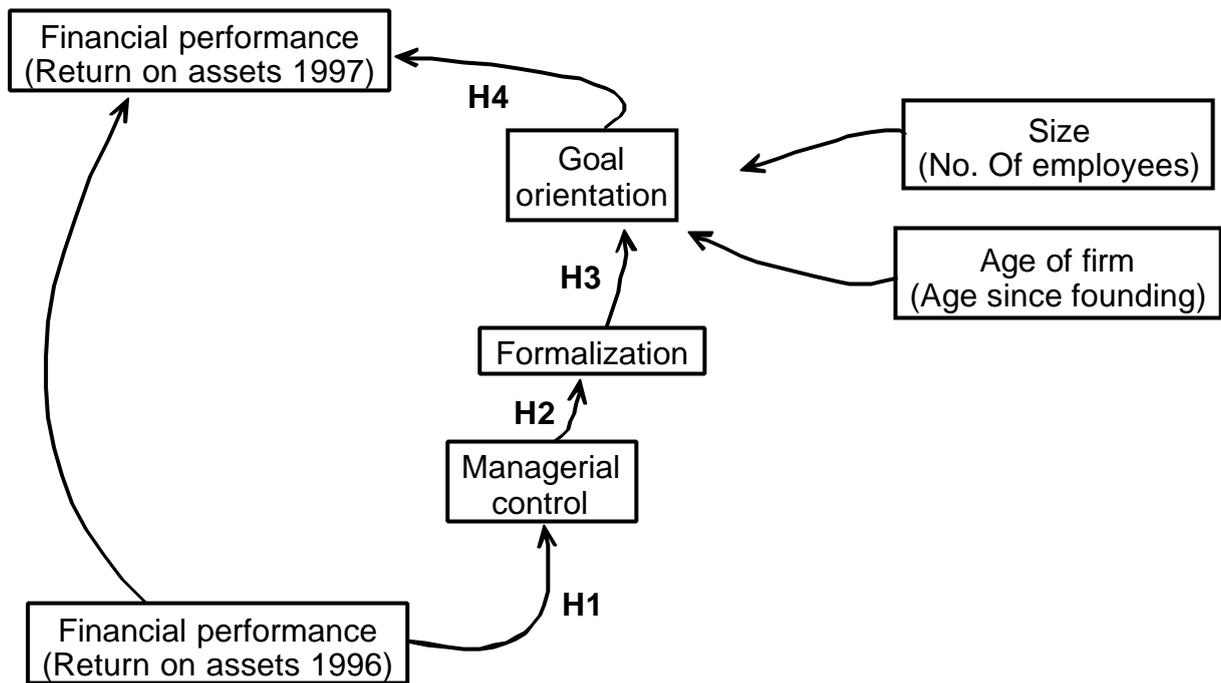|			All observations included		Outliers eliminated	
			Model 2	Model 3	Model 2*	Model 3*
managerial control	<--	Return on assets 1996	-0.344	4.892*	-5.414**	6.522**
			1.341	2.081	1.828	2.353
			-0.257	2.351	-2.962	2.772
rule orientation	<--	managerial control	0.356	0.439***	0.340**	0.457***
			0.118	0.122	0.126	0.126
			3.015	3.612	2.698	3.629
goal orientation	<--	rule orientation	0.124**	0.189**	0.118	0.178***
			0.07	0.063	0.07	0.061
			1.774	3	1.677	2.913
goal orientation	<--	lnage	0.087	0.573*	0.018	0.528**
			0.296	0.291	0.303	0.286
			0.296	1.967	0.061	1.847
goal orientation	<--	lnemploy	0.231	0.409	0.219	0.273
			0.244	0.35	0.264	0.34
			0.948	1.168	0.831	0.802
Return on assets 1997	<--	goal orientation	0	0.022**	0.001	0.007**
			0.005	0.008	0.004	0.003
			-0.047	2.614	0.141	2.166
Return on assets 1997	<--	Return on assets 1996	0.488***	0.737***	0.623***	0.743***
			0.073	0.176	0.096	0.077
			6.64	4.187	6.512	9.683
Squared multiple correlations						
managerial control			0.001	0.048	0.069	0.068
rule orientation			0.068	0.107	0.058	0.110
goal orientation			0.032	0.120	0.029	0.109
Return on assets 1997			0.261	0.185	0.264	0.484
N			126	110	119	107

*p<.05. *' p<.01. ***p<.001

[¶] The table first reports regression coefficients, then standard errors, and critical ratios. (Critical ratio = Estimate/std. error.)

FIGURES
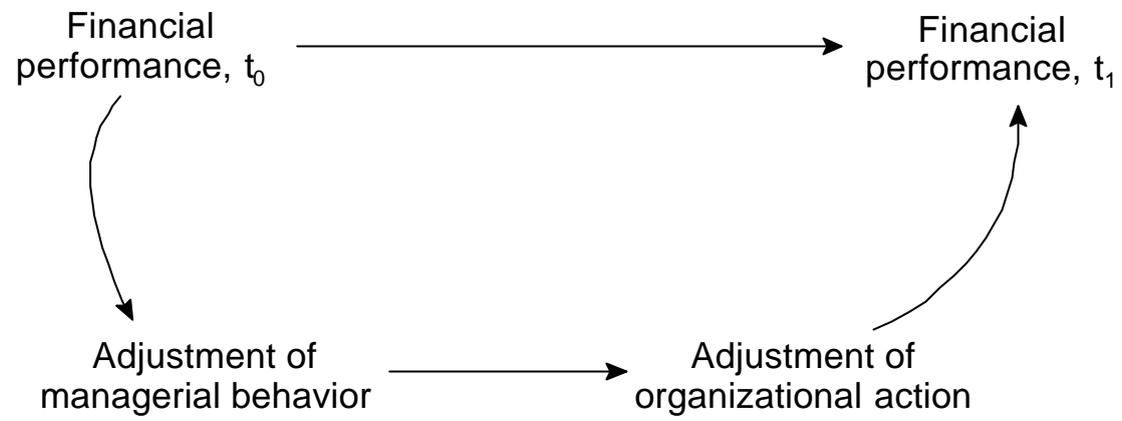
Figure 1 The basic model of organizational adaptation

Figure 2 **The empirical model**