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An Empirical Investigation of the Antecedents of Sales Force Control Systems

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Contents

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Abstract

11 hypotheses from agency theory, transaction cost analysis, and Ouchi's theoretical approach on the impact of environmental, company and salespeople characteristics on the design of salesforce control systems (outcome- vs. behavior-based) are summarized and tested on a data set of 270 German sales organizations. Many of the hypotheses get empirical support. Contrary to hypothesis, however, salesforce size is negatively related to the use of behavior-based control in salesforces.

Introduction

For many companies, their salesforce is the most important marketing tool on the interface between the company and its customers. Especially for industrial goods firms, personal selling often is the only function generating sales. Therefore, the proper design of compensation and monitoring systems to control the salesforce is of vital interest for many companies. This is no easy task since sales managers have to combine a vast number of different control elements, such as commission rates, intensity of supervision, and different control bases, which might affect the salespeople's behavior differently depending on their combination (Bergen, Dutta, and Walker 1992, p. 12). Consequently, the combination of single control elements to holistic governance structures is a complex issue. This problem becomes even more difficult against the background of turbulent and changing business environments (Babakus et al. 1996).

Sales managers might try to solve this by looking for "best practices" or industry standards. Though commercial studies performed by e.g. Dartnell reveal differences in the use of control elements (Heide 1994), they only report averages of single elements, not predominant use of governance structures as combinations of elements. Other shortcomings are the substantial variance even within industries and the lack of explanation for *why* companies use certain control elements or systems. Recent theoretical approaches such as agency theory and transaction cost analysis might remedy this, since they identify behavior-based and outcome-based control systems as polar managerial strategies and also suggest circumstances under which they are appropriate (Eisenhardt 1989). Since these extreme control approaches first have been applied to the salesforce control issue by Anderson and Oliver (1987), a few empirical tests of the *consequences* (like job satisfaction, performance) of salesforce control systems have been undertaken (Cravens et al. 1993; Oliver and Anderson 1994; Oliver and Anderson 1995,

Challagalla and Shervani 1996). However, no attempt to investigate the *antecedents* of salesforce control systems has been made so far. This paper aims to fill this gap through an empirical test of how certain constructs identified by the above mentioned approaches affect the design of control systems along the continuum anchored by outcome-based and behavior-based management strategies.

The article is organized as follows. The first section serves to derive a set of hypotheses. In the second section relevant research on salesforce control systems is shortly reviewed. In order to test the hypotheses, a mail survey among German chief sales executives has been conducted. The research design, especially variable operationalizations are reported in the third section. Following this, the results of the empirical test are reported and discussed (sections 4 and 5). The paper concludes with study limitations, management implications and directions for further research (section 6).

1. Research Framework and Hypotheses

Few theoretical approaches have influenced research on management and control as much as agency theory and transaction cost analysis. These frameworks have been applied to marketing issues such as channel coordination and control, franchising, make-or-buy decisions, and sales management (for a review see Bergen, Dutta, and Walker 1992). In sales management, agency theory has been applied to the question of salary vs. commission compensation (Basu et al. 1985; Lal and Srinivasan 1993), while transaction cost analysis has been used to explain the use of direct salesforces vs. manufacturer representatives (Anderson 1985) and the proportion of salary to total compensation (John and Weitz 1989).

Agency theory is concerned with the analysis and optimal design of contracts between principals and agents to whom the principals delegate decision-making authority. In general,

agency theory assumes uncertain sales environments and information costs that make it difficult to monitor the agent's behavior perfectly. Another central premise is that principals and agents pursue divergent goals and have different risk attitudes. Against this background, agency-theoretical models focus on designing compensation schemes and control systems that realign the incentives of both parties so that they aim at the same outcome ("incentive compatibility"). Generally, firms have two contrasting choices. On the one side, the principal can purchase information about the agents' input and reward certain behavior ("behavior control"). On the other side, firms can measure outputs and hold the agents responsible for them ("outcome control"). While the second choice shifts risk from the principal to the agent, the opposite is true for the first choice. For more details, see Eisenhardt (1985).

Based on a more general model by Holmström (1979), Basu et al. (1985) applied agency theory to derive optimal compensation contracts for homogeneous salesforces in the sense of proportion of total compensation that should be fixed (equivalent to behavior control) versus the proportion that should be variable (outcome control). Comparative statics indicate that higher environmental uncertainty or sales volatility, sales managers' willingness to take risk and salespeople's risk aversion should lead to higher percentages of fixed salary (i.e. more behavior control). This percentage should also be higher when measuring inputs is less expensive and more accurate than measuring outputs. If the salespeople are more effective, agency theory predicts lower proportions of salary to total compensation, while higher minimum utility requirements should be accounted for with higher percentages of fixed salary (for a recent review of the Basu et al. model and extensions see Coughlan 1993; Albers 1996). If we treat higher proportions of salary as equivalent to behavior control, we arrive at the hypotheses given in Table 1.

[Table 1 about here]

Transaction cost analysis (TCA) is based on Coase's article on the Theory of the Firm (1937) and was later refined and further developed to a theoretical framework by Williamson (1981, 1985). TCA is focussing on whether transactions should be carried out within a company or through market contracting outside the "boundaries of a firm". This theory especially aims at identifying cost efficient organizational solutions.

Market contracting (or outcome control) is generally considered to be more cost efficient than integrating transactions (i.e. behavior control). Only in the case of high uncertainty, idiosyncratic (i.e. transaction specific) assets, or frequent transactions, the market becomes inefficient. In those cases, integrating transactions (using behavior control) is more appropriate. Contrary to agency theory, TCA predicts that environmental uncertainty or sales volatility *per se* does not have an impact on the use of either outcome or behavior control. Only if a firm experiences high uncertainty and employs salespeople with considerable transaction specific assets, it should deviate from the 'default' option of outcome control and direct its salesforce via behavior control. As in agency theory, TCA hypothesizes that companies should apply outcome control if accurate outcome measures are readily available. These hypotheses are also shown in Table 1. For more details see Williamson (1981, 1985), Anderson (1985), Eisenhardt (1989), and John and Weitz (1989).

Ouchi's organizational approach (Ouchi 1979) states that goal conflicts between agents and principals can also be overcome by socialization. The measurement of either behavior, outcome, or both may be impossible (see Eisenhardt 1985). In the latter case, neither outcome nor behavior control may be appropriate, but "clan control" by socialization, a third type of control system. Since clans as control type are still poorly understood (Anderson and Oliver 1987), they are not considered in this paper.

Ouchi's approach acknowledges, as does agency theory and TCA, that behavior control becomes more appropriate when outcome measures are costly or inaccurate. Specific to this approach is, that Ouchi recommends to use behavior control systems if the transformation process between salespeople's inputs and the outcome of the selling process is known (Ouchi 1979).

Summary

The conclusions drawn from agency theory, TCA, and Ouchi's organizational approach are summarized and presented in Table 1. As in Anderson and Oliver's (1987) paper, the variables are organized as environmental, company, and salespeople variables. We did not consider all of their hypotheses (e.g. we excluded clans as a control type) and introduced new hypotheses on the impact of minimum utility requirement and transaction specific assets of salespeople. Prior to testing these hypotheses on a fresh data set, we shortly review the empirical literature on control system practices among companies.

2. Previous Empirical Research

To date, four published studies have focussed on *consequences* of behavior-based versus outcome-based salesforce control systems at the organizational or individual level. Oliver and Anderson (1995) also examined the properties of control systems and report that 39% of the sample represent hybrid control philosophies, i.e. control systems not being normatively correct. Of further interest for our paper are the different approaches to operationalize and measure behavior and outcome control. Cravens et al. (1993) obtained the surprising result that salesforce compensation is independent from field sales management control (i.e. monitoring and direction). Therefore, these authors treated them as distinct control dimensions to test their effect on consequences such as salesforce characteristics, performance, and effectiveness. Oliver and Anderson (1994) factor analyze 23 control system measures and report six independent factors

that are combined as causal or formative indicators of the control system. In contrast to this approach, Challagalla and Shervani (1996) distinguish between measures of behavior and outcome control. They report that even behavior control does not represent a unidimensional construct, but is made up by 'activity control' and 'capability control' as separate dimensions. From this review we can conclude that there is no uniform approach to measure the extent of behavior versus outcome control.

Note also that none of the four studies focuses on the *antecedents* of salesforce control systems. So we have to refer to studies mostly focussing on compensation as a single element of the control system. Major contributions are from John and Weitz (1989), Coughlan and Narasimhan (1992), Lal, Outland, and Staelin (1994), and Joseph and Kalwani (1995). As a review and additional data by Krafft, Lal, and Albers (1996) reveal, the findings on the impact of 'uncertainty' are mixed, while 'size of the salesforce' shows effects contrary to the hypothesis. Support is provided on the effects of 'knowledge of the transformation process' and 'measurability of outcome', while the hypothesis on 'measurability of behavior' is not supported. To the best of our knowledge, 'management's willingness to assume risk' has never been investigated so far. Joseph and Kalwani report a supporting positive effect of salespeople's risk aversion on the percentage of salary. Coughlan and Narasimhan as well as Krafft, Lal, and Albers find some support for the minimum utility required by salespeople. While the latter authors also report supporting findings on the impact of effectiveness, the former authors find significant positive as well as negative effects. Non-significant findings are reported for the impact of transaction specifity both in John and Weitz' and Krafft, Lal, and Albers' paper.

Thus, the empirical studies on salesforce compensation tend to support some of the hypotheses stated in the previous section. However, we still have to bear in mind that these

studies are focussing on compensation as one control system element and "were not collected with the specific intent of identifying outcome and behavior control philosophies" (Anderson and Oliver 1987, p. 85). We therefore want to contribute to further understanding of *why* companies select certain control philosophies.

3. Research Design and Measures

Setting and Sample

To test the hypotheses described in section 1, we mailed a questionnaire to 1,099 chief sales executives of German salesforces. This seems appropriate since firms mostly use only one control system for the whole salesforce. Thus, we seek to capture the perceptions of chief sales executives who are involved in the design of salesforce control systems. The questionnaire was developed and pretested with 10 top sales executives. Several efforts were made to solicit the response of the chief sales executives. The intial mailing was followed up by a second mailing after 4-6 weeks. Further efforts to improve the response rate were made through a contact by fax and promise of sharing the results of our study. The survey was completed about twelve weeks after the first mailing and resulted in a response rate of about 25%. Of the 270 responding firms, 61 firms used only manufacturer representatives, 173 used a direct salesforce and 36 used reps *and* direct salespeople. A comparison of our sample with other German studies is reported in Table 2 and shows that our data set corresponds to the average annual sales, salesforce size, age, tenure, total pay, and percentage of fixed salary.

[Table 2 about here]

Dependent Variables

Anderson and Oliver (1987) presented a behavior versus outcome salesforce control continuum based on methods of monitoring, evaluating, directing, and compensating salespeople's inputs

and results. We decided to follow Cravens et al. (1993) and use direct measures of single control elements. We include the fixed salary percentage (FIXPERC) as a measure of compensation control, while direction and supervision are assessed using span of control (SPANCTRL) and the extent of reporting (REPORT). The latter variable and the performance evaluation scale (EVALUATE) as the fourth component were computed by weighting different dummy variables on categories of reports and evaluation criteria. For more details see Table A-1 in the Appendix.

Following Oliver and Anderson (1994), we generate a *behavior-control index*. Though the above mentioned four components are positively correlated with each other, the internal consistency of the index is very modest (Cronbach's $\alpha = 0.53$). Similar findings have been reported by both Cravens et al. (1993) and Oliver and Anderson (1994) and clearly show that some managers design control systems in which some elements are not in balance with the overall control system (so-called hybrid systems). Nevertheless, we compute a behavior-control index by adding the z-values of all four control system elements and dividing the sum by 4. This index represents a "formative indicator" (see Bollen and Lennox 1991 and the review in Oliver and Anderson 1994) with higher (lower) scores representing a rather behavior (outcome)-based control system. The reasoning behind this overall index is that salespeople face "a control system that is the totality of its parts" (Oliver and Anderson 1994, p. 59). Of 270 observations, 242 respondents answered on all four questions. These cases were used for further analyses.

Due to the modest internal consistency of this index, we decided to classify all observations into two subsamples with companies applying normatively correct systems versus hybrid control systems. Again we used the standardized scores for the four control system components. While consistent positive (negative) z-scores indicate a behavior (outcome)-based orientation, positive *and* negative scores for one observation point to the fact that a hybrid system is applied. Z-scores

between -0.5 and 0.5 were treated as being neither behavior- nor outcome-oriented. Assume for example that a company reveals the following z-scores for the control system components: 1.4 (ZFIXPERC), -0.3 (ZEVALUAT), 0.8 (ZREPORT), and -1.2 (ZSPANCTR). The components 'percentage of salary' and 'reporting' indicate a behavior-based system, while the score on 'span of control' let us expect an outcome-oriented system. Because of its low z-score, 'performance evaluation' did not serve as classification criteria for this observation. The observation described above represents a hybrid control system, since two components indicate a behavior-based system, while the 'span of control' score indicates an outcome-based control system. Therefore, this observation is assigned cell 2 (behavior control); 1 (outcome control). All observations were classified in the same way and assigned to cells of the following matrix:

[Table 3 about here]

The classification matrix clearly shows that 34.7% of the observations are characterized by hybrid control systems (shown in shaded cells) which is very close to Oliver and Anderson's (1995) finding of 39%. The normatively correct cases (clear cells) are slightly dominated by behavior-based control systems. This can be explained by the large number of companies with direct salesforces, that typically are compensated with high percentages of salary and closely directed and supervised.

We now consider only the 153 coherent control systems (the five 'neither-nor' cases in the upper left cell in Table 3 are omitted) and differentiate between normatively correct outcome (cells 0;1 to 0;4) and behavior control systems (cells 1;0 to 4;0). A new variable is computed: Observations assigned to the first group are coded as '0', while the second group is coded as '1'. This binary variable is treated as an additional dependent variable in a logistic regression in order to validate or qualify results obtained from the regression on the behavior-control index.

Differences between findings from the analyses of the index and the 0/1 variable of normatively correct observations can also be interpreted as the differences of hybrid versus coherent control systems.

Independent Variables

In the following, we shortly describe the operationalizations of the independent variables identified in section 1. For more details see Table A-2 in the Appendix.

Environment

Uncertainty. This construct has been approached through a variety of measures in the literature, where each measure captures a somewhat different dimension of the overall construct. In our study we include items used in previous studies but also measure the number of customers per salesperson to capture the possibility of avoiding uncertainty through diversification of the selling effort (Porter 1980). A confirmatory factor analysis of these items results in three different factors: environmental uncertainty, sales volatility and diversification of risk.

Company Variables

Size of the salesforce. This is directly measured in terms of the number of salespeople.

Management's willingness to assume risk. The risk attitude of sales managers is measured by adapting a lottery technique used by Oliver and Weitz (1991) and Ross (1991). The sales managers are asked to compare a situation in which they are offered to manage either a business unit with a certain outcome X or a new division with innovative products and an equally likely outcome of e.g. DM 600,000 or DM 900,000. The chief sales executives are then asked to specify a certain amount X which they feel is equivalent to the uncertain outcomes of either DM 600,000 or DM 900,000. All respondents with amounts less than DM 750,000 are considered risk averse, while amounts above DM 750,000 indicate a risk seeking attitude. This scale seems

preferable to single item measures as used in Cravens et al. (1993). Note also that meta analyses indicate that risk measures based on natural situations and lotteries are superior to other scales (see MacCrimmon and Wehrung 1986, pp. 196 ff. and 216 ff.).

Measurability of outcome. This construct is measured through a three-item agree/disagree scale. While two items are adapted from Anderson (1985), one new item is added. It measures the number of factors beyond the control of salespeople that have an impact on their outcome. In addition, we used a single-item measure capturing costs of output measurement as perceived by the sales executive, based on arguments from Eisenhardt (1985) and Anderson and Oliver (1987).

Measurability of behavior. This construct is measured through a four-item agree/disagree scale as in John and Weitz (1989). We complement this scale by a single-item agree/disagree measure on whether exact activity reports are available.

Knowledge of transformation process. As Eisenhardt (1985, 1988) proposed we use a two-item agree/disagree scale on the complexity of products as a proxy negatively related to this construct. We also measure this construct by the time it takes to assimilate new hires - a similar indicator has been applied by Jaworski, Stathakopoulus, and Krishnan (1993) in a survey on marketing managers. This indicator is expected to be negatively related to the construct, too. As a third measure, we consider the importance of routine activities in the selling process as an indicator positively related to the construct. In detail, travel time is treated as routine, while sales calls are considered as non-standard activities. Our measure of routine activities is derived by subtracting the percentage of time for sales calls from the percentage of traveling time (as a percentage of total effort).

Salespeople Variables

Transaction specifity. To measure this construct we choose a two-stage approach. First, we ask the sales executive to specify the total costs for training new salespeople. Secondly, the sales executives are asked to specify how much time of this training is needed for acquiring customer specific know-how, general selling skills etc. The indicator for transaction specifity is then derived by multiplying the total costs with the percentage of customer specific know-how.

Salespeople's risk aversion. We assess the risk aversion of salespersons in a very similar way to the construct 'management's willingness to assume risk'. The sales managers are asked to assume that they are an average salesperson of their salesforce. Again, a lottery technique is applied. We describe a scenario in which a typical salesperson's income (commissions only) varies between e.g. DM 80K and DM 120K (the expected high and low income is suited to each subindustry's standard). The high and low earnings are described as being equally likely. We then present the informants with a choice of trading these risky incomes for a guaranteed annual salary. The respondents are then asked to specify a salary they feel is equivalent to the risky commissions only income of either DM 80K or DM 120K. All responses with amounts less than DM 100K are considered risk averse, while amounts above DM 100K indicate a risk seeking attitude.

Effectiveness. This construct is measured through average tenure, age, and average selling experience. While the latter is a new indicator, the first two variables already have been proposed and applied similarly by Coughlan and Narasimhan (1992).

Minimum utility requirement. We measure this through a weighted index of education as an indicator. This variable has been applied by Coughlan and Narasimhan (1992).

4. Estimation

All in all we use 18 variables as independent variables. We eliminate all cases with missing values on at least one variable (casewise deletion). This reduces our behavior control index (BCI) dataset from 242 to 172 cases and the sample of normatively correct systems from 153 to 104.

Prior to analyzing the remaining sample, we check for whether the assumptions of multiple regression analysis are met. A preliminary regression run and pairwise deletion of 'uncertainty' and 'uncertainty*transaction specifity' denotes that the interaction term is multicollinear. After deletion of the interaction term, we observe mild collinearity in the correlation matrix of the independent variables. With the exception of 'assimilation of new hires' and 'transaction specifity' ($r = 0.57$), all correlations are < 0.5. By analyzing residual plots, partial regression plots, normal probability plots, and running a Kolmogorov-Smirnov test, we examined the appropriateness of our regression model. Preliminary runs also reveal, that there are four influential observations in the sample of normatively correct systems (Cook's distance > 1.518 [$F(18, 104, 0.95)$]) and one outlier in the BCI sample, with a standardized residual larger than 3σ.

The overall goodness of the OLS regression of the behavior-control index (BCI) and the logistic regression model are excellent. The R^2 of the OLS regression indicates that more than 50% of the overall variance of the BCI are explained by the 18 variables identified in approaches from Agency theory, transaction cost analysis and Ouchis organizational concept. The logistic regression, used for validation of the findings from the BCI model, shows highly significant statistical tests for the overall goodness of the model. The logistic regression model also classifies very well with an overall hit rate of 95% (98.5% of the behavior- and 87.9% of the outcome-control cases). Further information on statistical tests and the resulting coefficients of both the multiple linear and logistic regression are given in Table 4.

[Table 4 about here]

5. Discussion of Results

Table 4 repeats the hypotheses derived in section 1, and presents the coefficients of both models. Positive signs imply a higher behavior-control index (linear regression) or probability of applying a normatively correct behavior-control system. Negative coefficients imply a more outcome-oriented control system. In this section, which is first organized by categories of variables, we mostly refer to results obtained from the multiple linear regression on the BCI. Results from logistic regression serve as validation or for qualifying the evidence from the BCI regression. At the end of this section, we will discuss how useful single theoretical approaches or categories of variables are in explaining the design of salesforce control systems.

Environment

Uncertainty. Two out of three measures of this construct, namely environmental uncertainty and customers per salesperson show significant effects in the hypothesized direction. Thus, uncertainty has a positive impact on the use of behavior control systems.

Company Variables

Size of the salesforce. Contrary to expectations, the number of salespeople is negatively related to the extent of applying a behavior-based control system. This finding contradicts our hypothesis derived from TCA, but supports Shapiro's (1977) argument, that larger organizations are more difficult to control. Additionally, John and Weitz (1989, p. 9) report a significant negative impact on the role of salary. We therefore reject this hypothesis.

Management's willingness to assume risk. While the coefficient of this variable is not significantly related to the BCI, the positive coefficient from our logistic regression model supports our hypothesis. Since the signs of this construct are conflicting in the logistic regression

and the BCI model, we do not find unambiguous support for this hypothesis. But we conclude, that the risk attitude of sales managers plays a significant role in designing control systems, if we restrict ourselves to organizations applying normatively correct control systems. To the best of our knowledge, this construct has never been tested before, so we cannot report additional findings from other studies.

Measurability of outcome. The variable 'output inadequate as measure of performance' has a positive impact on the BCI and thereby supports our hypothesis derived from both Agency theory, TCA and Ouchi's approach. We also find a significant positive sign of our second measure 'costs of output measurement', thereby supporting the hypothesis derived from Agency theory. Analogous supporting findings in Anderson (1985) and John and Weitz (1989) emphasize the role of this construct in designing salesforce control systems.

Measurability of behavior. While 'input inadequate as measure of performance' as a reversed scale shows the expected negative sign, the item 'exact reports available' is directly related to the BCI. Thus, the hypothesized positive impact of this construct on the use of behavior control systems is supported by both variables in our data set.

Knowledge of transformation process. The operationalizations of this construct consistently have signs in the hypothesized direction. In detail, the BCI diminishes as the 'complexity of products' goes up and increases with an increasing 'percentage of routine activities'. Further support is given by the consistent negative signs of 'assimilation of new hires', though this variable only has a significant impact in the logistic regression model. Thus, we find strong support for the positive role of the knowledge of the transformation process in designing behavior control systems.

Salespeople Variables

Transaction specifity. In both models, transaction specific assets do not play a significant role in the choice and design of salesforce control systems. This finding is in accordance with the weakly or non-significant coefficients of transaction specifity reported in John and Weitz (1989) and Krafft, Lal, and Albers (1996).

Salespeople's risk aversion. The hypothesis, that control systems should be more behavior-based with an increase in risk aversion of salespeople, is not supported by our data. We find two non-significant coefficients with conflicting signs in our models.

Effectiveness. The negative impact of this construct as hypothesized by Agency theory is not supported. 'Selling experience' and 'tenure' even show positive, though non-significant coefficients. Only the choice of normatively correct behavior control systems is negatively related to increasing values of the transformed 'age' measure. Thus, we cannot support this hypothesis.

Minimum utility requirement. As suggested by Agency theory, control systems are more behavior-based the higher the minimum utility required by the salespeople.

Usefulness of Agency Theory, Transaction Cost Analysis, and Ouchi's approach

If we distinguish our findings between the theoretical approaches tested in this paper, we find strong support for Ouchi's hypotheses, that control systems should be positively related to the inadequateness of output as a measure of performance and to the knowledge of the transformation process. With the exception of effectiveness, all constructs typical for Agency theory find strong support in our survey. There is also support of hypotheses derived from TCA, but the hypotheses on the impact of the two TCA specific constructs ('size of the salesforce', 'transaction specifity') either are rejected or not supported. We feel that the limited impact of

TCA variables may be a consequence of the dominant role of salary in control systems, for which TCA shows low explanatory power, as reported in John and Weitz (1989) and Krafft, Lal, and Albers (1996).

Impact of categories of variables

Further inspection of the results reported in Table 4 reveals, that company variables (e.g. 'measurability of behavior', 'measurability of outcome', and 'knowledge of transformation process') have the strongest impact on the design and use of control systems, as measured by their β coefficients. This finding intuitively makes sense, since these constructs are strongly related to the selling task. E.g., it seems obvious that a control system is more behavior-based, if output measures are inadequate as performance indicators or only available at high costs. Another interesting finding is the general support of the hypothesized positive impact of 'uncertainty' on the use of behavior-based control systems. This is especially astonishing due to the contradictory findings reported in the compensation and vertical integration literature (e.g. non significant impacts are reported in Anderson (1985) and John and Weitz (1989), contrary findings in Coughlan and Narasimhan (1992) and Krafft, Lal, and Albers (1996), respectively). We also feel that the limited role of salespeople variables is an interesting finding: With the exception of 'minimum utility requirement', no single construct gets support in our survey. Thus, the design of control systems depends much more on market conditions and the selling process than on characteristics of the salesforce.

6. Managerial Implications and Future Research

In this paper we report strong evidence for a salesforce control system framework similar to the one proposed by Anderson and Oliver (1987). This framework is based on hypotheses derived from agency theory (AT), transaction cost analysis (TCA) and Ouchi's organizational

approach. The descriptive power of the framework presented here is very high and lets us draw the following conclusions.

Managerial implications

Most of the companies analyzed design their control system in accordance with the theoretical approaches discussed in section 1. Sales executives who are planning to build up new sales organizations might therefore refer to the contingency hypotheses presented and discussed in this paper. Since control systems should not be adapted after each marginal change of any contingency factor (e.g. environmental uncertainty), sales managers might also try to change the actual or perceived value of these factors. For instance, environmental uncertainty may increase and thus imply to change a rather outcome-based to a more input-based control system. But, sales managers might reduce *actual* uncertainty by extending a salesperson's territory or product line, thus allowing her/him to select customers or products from a wider scope. *Perceived* uncertainty could be reduced by coaching and training.

It could also be shown that environmental and company factors play a much more important role in the design of control systems than salespeople characteristics. But, we have to qualify these findings, since they are based on the assumption that the actual design of control systems in German sales organizations is on the whole effective and that our results are generalizable to other cultural settings etc. Nevertheless, we would argue from a darwinian perspective that all companies in our data set are still 'alive' and have to design effective control systems in order to survive in the market (see Anderson 1988). The similar design of control systems in Germany and the U.S.A. is an indicator for the similarity of salesforce control in North America and Central Europe. This is also emphasized by the findings reported in Hofstede (1996), where he shows that the U.S.A. and Germany (among other European countries) very often are close to

each other with regard to uncertainty avoidance, femininity/masculinity, power distance, and individualism/collectivism. Remaining differences might be accounted for by the contingency factors investigated in our framework.

Limitations and future research

The present investigation of antecedents of salesforce control systems as well as previous empirical papers on properties and consequences of such systems assume that we are able to differentiate between causes and effects. But all papers published so far are cross-sectional and non-experimental surveys. We would therefore strongly encourage further tests of the behavior- versus outcome-based salesforce control framework with the help of longitudinal studies and experiments with sales executives. Nevertheless, we feel that the present study and the strong support of the framework are promising.

Although the hypotheses from AT, TCA, and Ouchi's approach find strong empirical support, some questions remain unsolved. Is the average practice of designing salesforce control systems in accordance with predictions from these theoretical concepts effective or not? It seems appealing to investigate the following related research questions in more detail: (1) Are hybrid systems performing better or worse than normatively correct systems? A first step has been taken by Oliver and Anderson (1995). (2) Do firms deviating from average control systems show lower effectiveness than companies that apply control systems in accordance with industry standards? An approach like the one by Anderson (1988) might help in designing proper research designs. (3) Are there other conceptual or theoretical approaches that might supplement the framework tested in the present paper? We are looking forward to seeing more research that will help to increase our understanding of these intriguing issues.

Tables

Table 1: Hypotheses Regarding the Choice of Salesforce Control Systems

	Hypotheses		
Factors Influencing the Control System	Ouchi's Theoretical Approach	Agency Theory	Transaction Cost Analysis
Environmental Variables:			
Uncertainty of the environment		Behavior	
Company Variables:			
Size of the salesforce			Behavior
Management's willingness to assume risk		Behavior	
Measurability of outcome	Outcome	Outcome	Outcome
Measurability of behavior		Behavior	
Knowledge of transformation process	Behavior		
Salespeople Variables:			
Transaction specifity			Behavior
Risk aversion		Behavior	
Effectiveness of selling effort		Outcome	
Minimum utility requirement		Behavior	
Interaction Effect:			
Uncertainty * transaction specifity			Behavior

Table 2: Comparison of the sample (direct salespeople only) with commercial compensation studies

Characteristics	Kienbaum	Our study	Müller
Number of employees	872	2,081	
Annual sales in million DM	207	315	
Annual sales per salesperson		5,857,000 DM	2,893,000 DM
Salesforce size (mode)		30	23
Tenure of salespeople (in years)	8.0	7.98	
Average age of salespeople	42.0	41.31	
Total pay in DM	95,000	91,200	81,217
Percentage of fixed salary	73.0 %	76.2 %	84.6 %

Source: Kienbaum Vergütungsberatung (1993), pp. 9 ff., Verlag Norbert Müller (1992), pp. 10 ff.

Table 3: Classification matrix of companies with normatively correct or hybrid control systems

	Behavior control				
Outcome control	**0**	**1**	**2**	**3**	**4**
0	5	26	40	20	4
1	14	27	27	3	
2	22	19	6		
3	20	2			
4	7				

Observations in shaded cells represent hybrid systems (versus normatively correct control systems in clear, framed cells)

Table 4: Empirical Test of Hypotheses Regarding the Choice of Salesforce Control Systems

Factors Influencing the Salesforce Control System	Hypotheses OT	AT	TCA	Coefficients OLS-Regression	Logistic Regression	Empirical findings OT	AT	TCA
Environmental Variables:								
Uncertainty								
- Environmental uncertainty		+		+0.1390 **	+0.2317 n.s.		✓	
- Sales volatility		+		–0.0720 n.s.	+0.2126 n.s.			
- Customers per salesperson		–		–0.1099 **	–0.0031 *		✓	
Company Variables:								
Size of the salesforce			+	–0.2018 ***	–0.0044 n.s.			f
Sales Management is risk seeking		+		–0.0350 n.s.	+0.7431 **		(✓)	
Measurability of outcome								
- Output inadequate as measure of performance	+	+	+	+0.2209 ***	+0.0388 n.s.	✓	✓	✓
- Costs of output measurement		+		+0.1136 **	+1.6636 **		✓	
Measurability of behavior								
- Input inadequate as measure of performance		–		–0.1594 **	–0.4524 **		✓	
- Exact reports available		+		+0.3021 ***	+1.0537 ***		✓	
Knowledge of transformation process								
- Complexity of products	–			–0.1714 ***	–0.3557 *	✓		
- Percentage of routine activities	+			+0.2403 ***	+0.1468 **	✓		
- Assimilation of new hires	–			–0.0937 n.s.	–0.0653 **	(✓)		
Salespeople Variables:								
Transaction specifity			+	+0.0369 n.s.	+0.0001 n.s.			
Risk aversion		+		+0.0423 n.s.	–0.4241 n.s.			
Effectiveness								
- Selling experience		–		+0.0528 n.s.	+0.3126 n.s.			
- Tenure (duration at company)		–		+0.0326 n.s.	–0.0665 n.s.			
- Age (transformed)		–		–0.0371 n.s.	–2.3288 **		(✓)	
Minimum utility requirement								
- Education level		+		+0.3662 ***	+0.0341 ***		✓	
Interaction Effect:								
Uncertainty * transaction specifity			+	deleted	deleted			
			Observations	172	100			
			R^2	51.4 %				
			(adjusted R^2)	(45.6 %)				
			F	8.92				
			(Significance level)	(0.0000)				
			Goodness-of-Fit chi-square		41.450			
			(Significance)		(0.9999)			
			Model chi-square		95.347			
			(Significance)		(0.0000)			

Hypothesis / finding:

+	control system rather behavior-based	*	p < .10	✓	hypothesis supported
–	control system rather outcome-based	**	p < .05	f	hypothesis not supported
n.s.	not significant	***	p < .01	( )	tendential finding

Appendices

Table A-1: Description of the behavior-control index (dependent variable)

Component, Operationalization, *Remarks*

Span of control

How many salespeople does a first level sales manager supervise? ..... salespeople ***(SPANCTRL)***

Performance evaluation *(multiple responses were possible - respondents were asked to check the appropriate boxes)*

What are the criteria on which you evaluate your salespeople?

- ☐ number of sales calls (CALLPERF)
- ☐ merchandising, service, or the like (SERVPERF)
- ☐ performance (e.g. sales volume, quota achievement, number of orders) (QUANPERF)
- ☐ qualitative aspects of selling (e.g. customer satisfaction) (QUALPERF)

*(**EVALUATE** was computed as 2*CALLPERF+SERVPERF-2*QUANPERF+4*QUALPERF)*

Reporting *(multiple responses were possible - respondents were asked to check the appropriate boxes)*

What kind of information do you receive from your salespeople?

- ☐ number of sales calls (CALLREP)
- ☐ sales in units and volume (SALESREP)
- ☐ sales promotion activities (PROMOREP)
- ☐ travel times and other (non-selling) activities (TRAVLREP)
- ☐ information on activities of competitors (COMPREP)

*(**REPORT** was computed as 3*CALLREP-SALESREP+PROMOREP+3*TRAVLREP+3*COMPREP)*

Proportion of salary to total pay

How many of your salespeople are compensated by the following plans ?

- Straight salary .....%
- Straight commission (COMMONLY) .....%
- A combination plan, such as
  - salary plus sommission (SALCOM) .....%
  - commission and drawing account (COMMDRAW) .....%
  - salary plus bonus (SALBON) .....%
  - commission plus bonus (COMMBON) .....%
  - salary plus commission plus bonus (SACOBO) .....%

If you are offering combination plans, what level does the proportion of variable income to total pay typically reach? ..... % (VARPERC)

(The variable proportion was computed via the formula: COMMONLY+COMMDRAW+COMMBON+(VARPERC((SALCOM+SALBON+SACOBO)/100)). The 'proportion of salary to total pay' **(FIXPERC)** is then the complement to 100%).*

Behavior-control index (BCI)

This index is computed as the sum of the standardized scores of CTRLSPAN, EVALUATI, REPORT, and FIXPERC, divided by 4.

Table A-2: Description of Independent Variables

Construct (Cronbachs α), Operationalizations, *Remarks*	Source
Environmental Variables	
Environmental uncertainty (α = .64) *7-point semantic differential scale*	
How often do you or one of your competitors introduce competitive new products? (seldom - often)	adapted from Anderson (1985)
How fast does the environment of your company change (i.e. technology, intensity of competition? (slowly - fast)	adapted from Anderson (1985)
How strong do you perceive the intensity of competition in your market (segment) ? (low - high)	adapted from Anderson (1985)
Sales volatility (α = .73) *5-point semantic differential scale (±0-5%, ±5-10%, ±10-15%, ±15-20%, >±20%*	
How much did the market volume of your industry vary on average over the last five years?	John/Weitz (1989)
How much did overall sales of your entire salesforce vary on average over the last five years?	John/Weitz (1989)
How much did your actual overall sales differ from your expected overall sales?	John/Weitz (1989)
Customers per salesperson (negatively related to uncertainty)	
One salesperson is on average responsible for about ..... accounts	new
Company Variables	
Size of the salesforce (frequency of transaction)	
How many salespeople (employed and independent representatives) are primarily working for your sales organization (without sales management)? ..... salespeople	John/Weitz (1989)
Management's willingness to assume risk	
At this point we would like to ask for your individual risk attitude as top sales manager. Please consider the following situation: Your salesforce should sell in future an innovative product instead of the current but obsolete products. This will result in the equally likely situation of achieving DM 600,000 or DM 900,000 of sales volume. Alternatively, your CEO offers you to sell a well introduced product with certain sales volume. At which sales volume, do you think, are yu indifferent of selling the well introduced product and the innovative product? *(six categories to check: DM 600K, DM 650K, DM 700K, DM 750K, DM 800K, DM 850K)*	adapted from Oliver/Weitz (1991) and Ross (1991)
Ouput inadequate as measure of performance (α = .72) *7-point semantic differential scale*	
Using outcome measures (i.e. overall sales) how precisely do they represent the actual effort? (inaccurately - precisely)	adapted from Anderson (1985)
How precisely can you infer the actual individual selling effort from the outcome measures? (inaccurately - precisely)	adapted from Anderson (1985)
How many factors beyond the control of your salespersons do influence the selling outcome? (few - many)	new
Costs of ouput measurement *7-point semantic differential item*	
The costs of measuring selling outcomes are ... (very low - very high)	new
Input inadequate as measure of performance (α = .69) *7-point scale anchored with 'strongly disagree' (1) and 'strongly agree' (7)*	
It is just not possible to supervise our salespeople closely	John/Weitz (1989)
It is difficult to evaluate how much effort any individual in this group really puts into his job	John/Weitz (1989)

These salespeople travel so much that close supervision is impossible	John/Weitz (1989)
It is easy for these salespeople to turn in falsified sales call reports if they want to	John/Weitz (1989)
Exact reports available *7-point item anchored with 'strongly disagree' (1) and 'strongly agree' (7)*	
We have accurate activity reports for each of these salespeople	John/Weitz (1989)
Complexity of products (α = .?) *7-point scale anchored with 'strongly disagree' (1) and 'strongly agree' (7)*	
Our products can be explained easily toward our accounts, such that salespeople could sell all of our products already after a short training time. *(Reversed)*	adapted from Anderson (1985)
The products offered by our salespeople are complex.	adapted from Anderson (1985)
Percentage of routine activities *(This construct was computed as TRAVEL - CALL)*	new
Of their total working time your salespeople use ..... % for sales calls (CALL) ..... % for traveling and waiting (TRAVEL)	
Assimilation of new hires	
How long does it take to assimilate a new salesperson? about ..... weeks	adapted from Eisenhardt (1985)

Salespeople Variables	
Transaction specific assets (*product of 'total costs' and 'percentage of customer, product and company specific know-how'*)	
What are the total costs for training new salespersons (costs of training, compensation of the salesperson)? about ..... DM per salesperson	new
How much time of the training is needed for .....% customer specific know-how, ...% product specific know-how, ...% company specific know-how, ...% know-how of general selling techniques, ...% other: .....?	new
Salespeople's risk aversion	
In the following we would like to measure the risk attitude of your salespeople. Imagine you were a "typical" salesperson of your sales organisation and you would be compensated by straight commission. Your annual compensation is uncertain and amounts to DM 80,000 or DM 120,000 with 50% probability, respectively. Alternatively, you are offered a straight salary. Please indicate the amount of straight salary, that you as a typical salesperson perceive as being **equivalent** to the uncertain commission! *(six categories to check: DM 85K, DM 90K, DM 95K, DM 100K, DM 105K, DM 110K)*	adapted from Oliver/Weitz (1991) and Ross (1991)
Selling experience: How many of your salespeople did prior to the job in your company have • less than three years ..... % • three to seven years ..... % • more than seven years ..... % experience in selling?	adapted from Coughlan/Narasimhan (1992)

Tenure: **(duration at company)**	How many of your salespeople have worked in your sales organization for ..... % less than one year, ... % one to less than three years, ... % three to less than five years, ... % five to less than ten years, resp. ..... % ten years or longer	adapted from Coughlan/Narasimhan (1992)
Age: *(transformed as the inverse of the absolute deviation from 40 years)*	How many of your salespeople are ..... % younger than 25, ... % 25 to < 35, ... % 35 to < 45, ... % 45 to < 55, ... % older than 55?	adapted from Coughlan/Narasimhan (1992)
Education: (*weighted index*)	How many of your salespeople have received their highest degree from ..... % Hauptschule (*9 years highschool*), ... % Mittlere Reife (*10 years highschool*), ... % Abitur (*13 years special track of highschool*), ... % college-degree, ... % university-degree?	adapted from Coughlan/Narasimhan (1992)

References

Albers, Sönke (1996), "Optimization models for salesforce compensation," *European Journal of Operational Research*, 89, 1-17.

Anderson, Erin (1985), "The Salesperson as Outside Agent or Employee: A Transaction Cost Analysis," *Marketing Science*, 4 (Summer), 234-54.

---- (1988), "Strategic Implications of Darwinian Economics for Selling Efficiency and Choice of Integrated or Independent Sales Forces," *Management Science*, 34 (May), 599 - 618.

---- and Richard L. Oliver (1987), "Perspectives on Behavior-Based Versus Outcome-Based Salesforce Control Systems," *Journal of Marketing*, 51 (October), 76-88.

Babakus, Emin, David W. Cravens, Ken Grant, Thomas N. Ingram, and Raymond W. LaForge (1996), "Investigating the Relationships among Sales, Management Control, Sales Territory Design, Salesperson Performance, and Sales Organization Effectiveness," *International Journal of Research in Marketing*, 13 (October), 345-63.

Basu, Amiya K., Rajiv Lal, V. Srinivasan, and Richard Staelin (1985), "Salesforce Compensation Plans: An Agency Theoretic Perspective," *Marketing Science*, 4 (Fall), 267-91.

Bergen, Mark, Shantanu Dutta, and Orville C. Walker, Jr. (1992), "Agency Relationships in Marketing: A Review of the Implications and Applications of Agency and Related Theories," *Journal of Marketing*, 56 (July), 1-24.

Bollen, Kenneth and Richard Lennox (1991), "Conventional Wisdom on Measurement: A Structural Equation Perspective," *Psychological Bulletin*, 110 (September), 305-14.

Challagalla, Goutam N. and Tasadduq A. Shervani (1996), "Dimensions and Types of Supervisory Control: Effects on Salesperson Performance and Satisfaction," *Journal of Marketing*, 60 (January), 89-105.

Coase, Ronald H. (1937), "The Nature of the Firm," *Economica, N. S.*, 4, 386-405.

Coughlan, Anne T. (1993), "Salesforce Compensation: A Review of MS/OR Advances," in *Handbook in Operations Research and Management Science, Vol. 5: Marketing*, Jehoshua Eliashberg and Gary L. Lilien, eds. Amsterdam et al.: North-Holland, 611-51.

---- and Chakravarthi Narasimhan (1992), "An Empirical Analysis of Sales-Force Compensation Plans," *Journal of Business*, 65 (1), 93-121.

Cravens, David W., Thomas N. Ingram, Raymond W. LaForge, and Clifford E. Young (1993), "Behavior-Based and Outcome-Based Salesforce Control Systems," *Journal of Marketing*, 57 (October), 47-59.

Eisenhardt, Kathleen M. (1985), "Control: Organizational and Economic Approaches," *Management Science*, 31 (February), 134-49.

---- (1988), "Agency- and Institutional-Theory Explanations: The Case of Retail Sales Compensation," *Academy of Management Journal*, 31 (3), 488-511.

---- (1989), "Agency Theory: An Assessment and Review," *Academy of Management Review*, 14 (1), 57-74.

Heide, Christen P. (1994), *Dartnell's 28th Sales Force Compensation Survey 1994-1995*. Chicago: Dartnell Corporation.

Hofstede, Geert (1996), *Culture's Consequences: International Differences in Work-Related Values*. Newbury Park et al.: Sage.

Holmström, Bengt (1979), "Moral Hazard and Observability," *Bell Journal of Economics*, 10 (Spring), 74-91.

Jaworski, Bernard J., Vlasis Stathakopoulos and H. Shanker Krishnan (1993), "Control Combinations in Marketing: Conceptual Framework and Empirical Evidence," *Journal of Marketing*, 57 (January), 57-69.

John, George and Barton Weitz (1989), "Salesforce Compensation: An Empirical Investigation of Factors Related to Use of Salary Versus Incentive Compensation," *Journal of Marketing Research*, 26 (February), 1-14.

Kienbaum Vergütungsberatung (1993), *Vergütung 1993 - Führungs- und Fachkräfte im Außendienst* (Compensation 1993 - Managers and Qualified Personell in Salesforces), Gummersbach (Germany): Kienbaum Personalberatung.

Krafft, Manfred, Rajiv Lal, and Sönke Albers (1996), "Relative Explanatory Power of Agency Theory and Transaction Cost Analysis in German Salesforces," working paper, Stanford University, Graduate School of Business.

Lal, Rajiv and V. Srinivasan (1993), "Compensation Plans for Single- and Multi-product Salesforces: An Application of the Holmstrom-Milgrom Model," *Management Science*, 39 (July), 777-93.

MacCrimmon, Kenneth R. and Donald A. Wehrung (1986), *Taking Risks: The Management of Uncertainty*. New York: The Free Press.

Verlag Norbert Müller (1992), *Gehälter und Spesen im Außendienst: Untersuchungsbericht über Einkommen, Lohn-Anreizsysteme, Spesenhöhe und Spesenregelung im Außendienst* (Salaries and Expenses in Salesforces: Survey Report about Total Compensation, Compensation Systems, Amount of Expenses and Expense Reimbursement in Salesforces), München: Verlag Norbert Müller.

Oliver, Richard L. and Erin Anderson (1994), "An Empirical Test of the Consequences of Behavior- and Outcome-Based Sales Control Systems," *Journal of Marketing*, 58 (October), 53-67.

---- and ---- (1995), "Behavior- and Outcome-Based Sales Control Systems: Evidence and Consequences of Pure-Form and Hybrid Governance," *Journal of Personal Selling & Sales Management*, 15 (Fall), 1-15.

---- and Barton A. Weitz (1991), *The Effects of Risk Preference, Uncertainty, and Incentive Compensation on Salesperson Motivation.* Cambridge, MA: Marketing Science Institute (Report No. 91-104).

Ouchi, William G. (1979), "A Conceptual Framework for the Design of Organizational Control Mechanisms," *Management Science*, 25 (September), 833-49.

Ross, Jr., William T. (1991), "Performance Against Quota and the Call Selection Decision," *Journal of Marketing Research*, 28 (August), 292-306.

Shapiro, Benson (1977), *Sales Program Management: Formulation and Implementation.* New York: McGraw-Hill.

Williamson, Oliver E. (1981), "The Economics of Organization: The Transaction Cost Approach," *American Journal of Sociology*, 87 (3), 548-77.

---- (1985), *The Economic Institutions of Capitalism.* New York: The Free Press.