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2 Relative explanatory power of agency theory and transaction cost 3 analysis in German salesforces

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9

10 Abstract

11 In this paper, we take an integrated view of Transaction Cost Analysis (TCA) and Agency Theory (AT) in order to study the
12 direct salesforce vs. rep decision and the design of compensation plans in German salesforces. We test, with a single data set, a
13 set of established and new hypotheses of both theories in the context of both decisions. This allows us to assess the
14 complementarity of AT and TCA by estimating the relative explanatory power of the two frameworks for each of the two
15 decisions. On the one hand, we find support for most of the established hypotheses. However, the hypothesized effect of
16 uncertainty is rejected in our data set. Moreover, we document the impact of some new variables. We also find that, while AT
17 does not add much to explain the decision of direct vs. rep in our data, TCA is equally limiting in helping understand the design
18 of salesforce compensation plans. Therefore, one has to be cautious in treating AT and TCA as complementary theories.
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20 *Keywords:* Agency Theory; Transaction Cost Analysis; Salesforce compensation plans; Direct vs. reps; Germany

21

22 1. Introduction

23 The benefits of effectively managing a salesforce
24 have never been greater. For almost all firms, sales is
25 the only revenue-generating part of the organization,
26 while everything else is a cost center. Moreover, with
27 the increasing emphasis on market orientation in

today's environment, the role of the salesforce has 28
assumed greater importance. However, the costs of 29
using a direct salesforce are escalating by the day, 30
with the average cost of making a personal sales call 31
ranging from \$250 to \$500 in the USA (Kotler, 2003, 32
p. 638) and from 150 to 400 in Germany (Kienbaum 33
Vergütungsberatung, 2002). Furthermore, firms in the 34
USA spend over a trillion \$ annually on salesforces 35
and salesforce materials (Kotler, 2003, p. 637). It is 36
therefore imperative that this asset be used in the most 37
effective and efficient manner. 38

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39 An important aspect of managing a salesforce is
40 related to its design. Depending on the tasks that need
41 to be performed by the salesforce including prospec-
42 ting, communicating, selling, servicing and informa-
43 tion gathering, a firm needs to decide whether it should
44 have a company salesforce (direct) or utilize independ-
45 ent sales representatives (reps). Furthermore, if a
46 company decides to employ a direct salesforce, it
47 needs to design the control and reward systems so as to
48 achieve an optimal utilization of its salesforce's efforts.

49 By now, it is well recognized that a salesperson's
50 performance depends not only on individual-specific
51 factors, but also on the reward system used to
52 motivate a salesforce (see Johnston & Marshall,
53 2003, p. 13). Hence, in the salesforce management
54 literature many efforts have been made to study
55 salesforce compensation plans (see Basu, Lal, Sriniva-
56 san, & Staelin, 1985; Coughlan & Narasimhan,
57 1992; Dearden & Lilien, 1990; John & Weitz, 1989;
58 Joseph & Kalwani, 1995; Joseph & Thevaranjan,
59 1998; Lal, Outland, & Staelin, 1994; Lal & Sriniva-
60 san, 1993; Lal & Staelin, 1986; Raju & Srinivasan,
61 1996; Weinberg, 1975; Zhang & Mahajan, 1995). See
62 also the reviews by Albers (1996, 2002), Coughlan
63 (1993) and Coughlan and Sen (1989).

64 Two of the most popular theoretical frameworks
65 used to study the decision of reps vs. company owned
66 salesforce and design of compensation plans are
67 Transaction Cost Analysis (TCA) and Agency Theory
68 (AT). While researchers such as Anderson (1985) use
69 TCA to study the choice between sales reps and direct
70 salesforce, John and Weitz (1989) use TCA to study
71 the design of compensation plans. On the other hand,
72 Basu et al. (1985), Lal and Srinivasan (1993), Lal and
73 Staelin (1986), Rao (1990), and Zhang and Mahajan
74 (1995) apply Agency Theory to study the design of
75 compensation plans.

76 In this paper, our primary objective is to compare
77 the relative usefulness of Agency Theory and Trans-
78 action Cost Analysis in the context of each of these
79 two decisions. Although these two frameworks appear
80 to be complementary, our investigation is motivated
81 by the fact that TCA was originally advanced to
82 understand and study issues related to the boundaries
83 of the firm (for example, make or buy decisions of a
84 firm), while AT has been proposed to understand the
85 contractual arrangements between a firm and its
86 employees. This suggests that TCA should provide a

relatively better understanding of the direct vs. rep
decision while AT may be more appealing in the
context of compensation plans. However, if a com-
mon test of TCA- and AT-specific variables leads to
the finding that *both* theories significantly explain the
vertical integration as well as contractual issues, this
would extend the usual set of variables applied in
empirical investigations and those taken into consid-
eration by managers.

Our secondary objective is to propose and test the
validity of several new hypotheses related to the
issues of vertical integration and design of compensa-
tion plans. As a side-effect, we also investigate the
generalizability of the empirical findings reported in
the literature to countries outside the USA. This is
important, since it is known that different cultures
favor different attitudes towards work, use different
types of communication and operate in varying legal
environments (Albers, Krafft, & Bielert 1998). We
therefore investigate the usefulness of the above-
mentioned theoretical frameworks in international
contexts.

In the following, we briefly review in Section 2 the
relevant literature on TCA and AT in the sales force
compensation domain, and develop a set of hypoth-
eses with respect to both the decision to employ a rep
organization vs. direct salesforce and the structure of
the compensation plan. In Section 3, we describe the
operationalization of our measures and the research
design of our integrated empirical study. Section 4
presents the empirical results of the explanation of the
vertical integration decision, while Section 5 provides
the results for the salary vs. incentives decision.
Section 6 offers a comparison of the explanatory
power of TCA and AT for the vertical integration and
compensation design decisions. The article concludes
with a summary and some suggested directions for
future research.

2. Literature review and hypotheses development 125

2.1. Literature review 126

In this section, we briefly review the published
TCA- and AT-based work on how to organize a
salesforce (use a direct salesforce vs. reps) and design
salesforce compensation plans (see Table 1). 130

Table 1 Characteristics of empirical investigations of Transaction Cost Analysis (TCA) and Agency Theory (AT) hypotheses regarding the vertical integration issue and the proportion of salary							
Characteristics	Study						
	Anderson (1985)	John and Weitz (1989)	Lal et al. (1994)	Coughlan and Narasimhan (1992)	Joseph and Kalwani (1995)	Present study	
t1.5	Research issue	Vertical integration	Proportion of salary	Proportion of salary	Proportion of salary	Proportion of salary	Vertical integration; proportion of salary
t1.6	Theory tested	TCA	TCA	AT	AT	AT	TCA and AT
t1.7	Unit of research	Sales districts	Companies	Representatives, superiors	Companies	Companies	Companies
	Type of sales force organization	Representatives, employed sales people, hybrids	Representatives, employed salespeople	Employed salespeople	Representatives, employed salespeople, hybrids	Employed salespeople	Vertical integration: reps vs. employed salespeople proportion of salary: employed salespeople
t1.8	Respondents	159 regional sales managers from 13 companies of the electronic components industry	161 manufacturing firms with annual sales exceeding \$50 million	77 representatives from 3 sales forces of a company selling computers and services	233 companies from 39 industries	266 companies from a variety of industries	270 companies
t1.10	Response rate	43.3%	60.5% (first mailing: 21.5%)	50% sales people) 90% (superior)	unknown	33%	24.6%
t1.11	Methodology	Mail survey	Mail survey	Mail survey	Secondary data from Dartnell	Mail survey	Mail survey
t1.12	Investigation period	1981	1984–1985	1989	1986	1993	1992–1993
t1.13	Investigation area	USA	USA	USA	USA	USA	Germany

131 To the best of our knowledge, the only study to
132 date that directly investigates the direct vs. rep
133 decision is provided by [Anderson \(1985\)](#). In this
134 study, Anderson uses TCA to develop a set of
135 hypotheses to determine when the selling function
136 should be integrated vertically rather than farmed out
137 to a rep organization. She confronts these hypotheses
138 with data from the electronics components industry
139 and finds significant support for many of her
140 hypotheses (see [Table 2](#)).

141 The study of salesforce compensation plans has
142 been approached via both Agency Theory and Trans-
143 action Cost Analysis. The literature based on AT
144 originates with the work of [Basu et al. \(1985\)](#) and [Lal
and Srinivasan \(1993\)](#). The authors hypothesize the
146 impact of uncertainty, marginal cost of production,
147 effectiveness and risk aversion of salespeople, and the
148 attractiveness of alternative job opportunities, on the
149 proportion of salary to total compensation changes.
150 [John and Weitz \(1989, p. 3\)](#) apply TCA to the role of
151 the proportion of salary in salesforce compensation
152 plans. They consider the two control mechanisms
153 identified by [Williamson \(1975, 1981, 1985\)](#) and
154 propose that in the salesforce context, while bureau-
155 cratic control corresponds, "... to the use of super-
156 vision to implement compensation plans emphasizing
157 salary, ..., market control mechanisms... correspond
158 to plans emphasizing incentives." Using this analogy,
159 they hypothesize that the salary proportion should
160 increase with an increase in transaction-specific
161 assets, the difficulty of evaluating salespeople's
162 performance, environmental uncertainty facing sales
163 managers and the size of the salesforce.

164 Despite the obvious complementarity of TCA and
165 AT, no single study to date has tried to test a common
166 set of hypotheses with regard to their relative
167 explanatory power. Among the studies that have
168 investigated, hypotheses derived from AT are cross-
169 sectional studies by [Coughlan and Narasimhan
\(1992\)](#), [Joseph and Kalwani \(1995\)](#) and [Lal et al.
\(1994\)](#) and laboratory experiments by [Gaba and Kalra
\(1999\)](#) and [Umanath, Ray, and Campbell \(1993\)](#). In
173 these studies, many AT-based hypotheses are sup-
174 ported, but for some hypotheses, the results are mixed,
175 especially with respect to environmental uncertainty.
176 For a more detailed comparison of the research
177 designs of the cross-sectional studies, see [Table 1](#).
178 The empirical results are reported in [Table 3](#).

179 [John and Weitz \(1989\)](#) are the only authors to date
180 who have investigated whether TCA variables
181 explain the proportion of salary to total pay. Their
182 empirical analysis offers some support for the
183 hypotheses based on TCA. While the ease of
184 replacing salespeople and its interaction with environ-
185 mental uncertainty have a significant impact on salary
186 as predicted, other key constructs are not significantly
187 related to salary. See also [Rindfleisch and Heide
\(1997\)](#) for an extensive review of TCA applications
188 in the marketing literature.
189

190 Thus, it is evident that no single study attempts to
191 test the predictions of both frameworks (TCA and
192 AT) on one data set. The goals of our study are to
193 estimate the explanatory power of these two frame-
194 works in the context of the above-mentioned deci-
195 sions, develop and test some new hypotheses, and
196 lastly, to investigate the generalizability of these
197 frameworks to international contexts. We believe
198 there is a need for a direct comparison of TCA and
199 AT, since the literature published in major journals
200 gives the impression of AT and TCA being comple-
201 mentary approaches. Therefore, our contribution
202 relates to the fact that "... TCA and agency theory
203 complement each other in terms of providing
204 normative implications for the design of compensa-
205 tion plans" ([John & Weitz, 1989, p. 11](#)). This view is
206 shared by many authors including [Anderson and
Oliver \(1987\)](#), who integrate TCA and AT in order to
207 develop a set of contingency hypotheses on the
208 choice of salesforce control systems. Similarly,
209 [Bergen, Dutta, and Walker \(1992, p. 8\)](#) write: "...
210 given that TCA and Agency Theory are concerned
211 with similar issues and appear to be moving toward
212 even more common conceptual ground, blending
213 constructs and propositions from the two theories
214 may further improve our understanding of market
215 phenomena." Similar arguments can be found in
216 [Eisenhardt \(1985\)](#). Finally, [Williamson](#) himself notes
217 that "... my objective view is that these two
218 perspectives are mainly complementary" ([Williamson,
1988, p. 568](#)).
220

2.2. Hypotheses development

222 In this section, we develop a set of hypotheses with
223 respect to both the decision to employ a direct
224 salesforce vs. a rep organization and the structure of

t2.1 Table 2

t2.2 Comparison of our findings on the vertical integration issue with Anderson's results

Variable	Hypotheses		Anderson (1985)	Present Study	Our Findings
	TCA	AT			
<i>Market (market failure)</i>					
t2.5	–Salespeople easily replaceable			+0.4523**	f
t2.6	–Transaction specific assets (TSA)			+0.00001*	✓
t2.7	•Product-specific know-how		+		
t2.8	•Confidential information		+	+	
t2.9	•Customer loyalty		+	–	
t2.10	–Products can easily be explained		–	–0.2643**	✓
t2.11	–Substitutability of products		–	–0.1522 n.s.	0
t2.12	–Difficulty in evaluating performance				
t2.13	•Output is bad performance measure		+	+	+
t2.14	•Costs of measuring selling outcomes		+	+	0
t2.15	•Difficulty of measuring inputs		–	–	0
t2.16	•Precise reports on activities available		+	+	+
t2.17				+0.3405***	✓
t2.18					
<i>Company (frequency of transaction)</i>					
t2.19	–Size of the salesforce		+	n.s.	–0.0023**
t2.20	–Time devoted to selling			–	+0.0176 n.s.
t2.21	–Travel requirements		–	+	n.s.
t2.22					–0.3206***
t2.23					✓ (TCA)
<i>Selling environment</i>					
t2.24	–Uncertainty			n.s.	
t2.25	•Environmental uncertainty		0	+	–0.0471 n.s.
t2.26	•Sales volatility		0	+	–0.7771***
t2.27	•Diversification of risk		0	–	–0.0031 n.s.
t2.28	•Diversification of risk (square root)				+0.0002 n.s.
t2.29	–Environmental uncertainty*TSA		+	+	–0.000006**
t2.30					f
t2.31					
<i>Salesperson</i>					
t2.32	–Effectiveness				
t2.33	•Selling experience (square root)			–	–0.0063 n.s.
t2.34	–Minimum utility				0
t2.35	•Tenure (square root)			+	–0.0021 n.s.
t2.36	•Education (square root)			+	–0.0033 n.s.
t2.37	•Average industry income			+	+0.00005 n.s.
t2.38					0
t2.39					
<i>Control variables</i>					
t2.40	–Industry indicator (categorical variable)				diff. Coeff.***
t2.41	–Total income of average salesperson				+0.00003**
t2.42					
t2.43					
<i>Model Statistics</i>					
t2.44	Log Likelihood (<i>p</i> -value)			–74.16	–62.217 (1.000)
t2.45	Model χ^2 (<i>p</i> -value)				166.688 (<0.001)
t2.46	Nagelkerke R^2				73.0%
t2.47	Hit rate (correctly classified cases)			79%	86%

t2.49 +[–]: The higher the variable, the higher [lower] the probability of choosing employed salespeople.

t2.50 n.s.: not significant; ✓: hypothesis supported; 0: non-significant effect; f: falsified (wrong sign).

t2.51 * Significant at the 10% level.

t2.52 ** Significant at the 5% level.

t2.53 *** Significant at the 1% level.

t3.1 Table 3

t3.2 Comparison of our findings regarding salary as a percentage of total compensation with previous studies

Variable	Hypotheses		John and Weitz (1989)	Lal et al. (1994)	Coughlan and Nara-simhan (1992)	Joseph and Kalwani (1995)	Present study	Our findings	
	TCA	AT							
<i>Market (market failure)</i>									
t3.6	–Salespeople easily replaceable	–	–* ✓				+0.157**	f	
t3.7	–Transaction specific assets	+	n.s. 0				+0.019 n.s.	0	
t3.8	–Products can easily be explained	–					+0.150**	f	
t3.9	–Substitutability of products	–					–0.092 n.s.	0	
t3.10	–Output is a bad performance measure	+	+	+* ✓			+0.087 n.s.	0	
t3.11	–High costs of measuring selling outcomes	+	+				+0.105*	✓	
t3.12	–Difficulty of measuring inputs	–	–	+* f			+0.125*	f	
t3.13	–Precise reports on activities available	+	+				+0.225***	✓	
<i>Company (frequency of transaction)</i>									
t3.16	–Size of the salesforce	+		–** f		–* f	–0.015 n.s.	0	
t3.17	–Time devoted to selling		–	–*** ✓			–0.101*	✓	
t3.18	–Travel requirements	–	+				+0.182**	✓ (AT)	
<i>Selling environment</i>									
–Uncertainty									
t3.22	•Environmental uncertainty	0	+	n.s. 0	+*** ✓	–* f	+*** ✓	–0.086 n.s.	0
t3.23	•Sales volatility	0	+				+0.053 n.s.	0	
t3.24	•Quota achievement	0	+		+*** ✓				
t3.25	•Diversification of risk (cust. per rep)	0	–				+0.306*	f	
t3.26	•Square root (customers per rep)						–0.288*	f	
<i>Salesperson</i>									
t3.29	–Risk aversion		+				+*** ✓		
t3.30	–Effectiveness			–*** ✓					
t3.31	•Selling experience		–		–*** ✓			–0.131*	✓
t3.32	•Sales per call		–		+** f				
t3.33	–Minimum utility requirement								
t3.34	•Tenure		+		+*** ✓			+0.232***	✓
t3.35	•Education		+		+*** ✓			+0.237***	✓
t3.36	•Average industry income		+		–*** f			–0.133*	f
<i>Control variables</i>									
t3.39	–Industry indicators (4 dummy variables)							removed because of non significance	
t3.40	–Total income of average salesperson								
t3.41	R ² (adjusted)		.22	.68	LR: 0.15	not reported	.23		

t3.42 +[–]: The higher the influence of the variable, the higher (smaller) should be the proportion of salary of the employed salespeople.

t3.43 n.s.: not significant; ✓: hypothesis supported; 0: non-significant effect; f: falsified (wrong sign).

t3.44 * Significant at the 10% level.

t3.45 ** Significant at the 5% level.

225 the compensation plan with respect to the variable
 226 portion. Our aim is to integrate predictions of both
 227 Agency Theory and Transaction Cost Analysis.
 228 Therefore, we derive hypotheses based on both
 229 theories.

2.2.1. Direct salesforce vs. reps

Given that the vertical integration issue is the natural domain of TCA, we include all TCA-specific factors used by Anderson (1985), such as transaction-specific assets, difficulty in evaluating performance,

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235 environmental unpredictability, and travel require-
 236 ments. AT has been proposed to study the optimal
 237 contractual arrangements between a principal and an
 238 agent with regard to compensation plans. Because
 239 high fixed salaries represent a solution that is
 240 equivalent to employing direct salespeople, and reps
 241 can only be remunerated (in Germany by law) on a
 242 commission-only basis, we can transfer all AT-based
 243 hypotheses on proportion of salary, to the choice of
 244 direct salespeople vs. reps. In particular, we hypothe-
 245 size that higher uncertainty in the selling environment
 246 and a higher minimum utility requirement favor a
 247 direct sales organization. Similarly, an increase in the
 248 effectiveness of salespeople results in choosing a rep
 249 organization. The only conflicting hypothesis is given
 250 for travel requirements. According to [Anderson](#)
 251 (1985), higher travel requirements leave less time
 252 for selling, and therefore might make direct sales-
 253 people less profitable, whereas independent reps can
 254 allocate travel costs across several product lines. Thus,
 255 TCA favors independent reps in the event of high
 256 travel requirements. However, from the perspective of
 257 AT, travel requirements are non-productive activities
 258 for which independent sales reps cannot be compen-
 259 sated, so that AT would recommend working with
 260 direct salesforces. A complete set of the hypotheses
 261 and corresponding empirical findings to date is
 262 presented in [Table 2](#).

263 2.2.2. Variable portion of compensation plans

264 Given the rich literature on salesforce compensa-
 265 tion plans, in our study we integrate AT and TCA. As
 266 hypothesized in AT, we include the following factors:
 267 environmental uncertainty, effectiveness of the sales-
 268 person, attractiveness of alternative employment
 269 opportunities, ability to measure inputs, and adequacy
 270 of outputs as a measure of performance. While the
 271 impact of the first three factors has been identified in
 272 other empirical studies using AT, the last two factors
 273 are added to our set of variables, since they relate
 274 directly to the design of optimal compensation plans.
 275 AT proposes that incentive plans should be used only
 276 if it is difficult to measure the inputs provided by the
 277 salesperson and/or if outputs are adequate measures of
 278 performance. Otherwise, the most cost-effective way
 279 of compensating a salesperson is through a salary.

280 Finally, while most of the work on salesforce
 281 compensation plans using AT, focuses on the sales-

282 generating aspects of a salesperson's effort, we know
 283 that a portion of the salesperson's effort may be
 284 nonproductive in the short run or even in the long run.
 285 For example, servicing customers, call preparation
 286 and handling orders do not generate sales in the short
 287 run. However, they are essential to the viability of the
 288 firm in the long run. In contrast, travel time is a loss of
 289 productive time and does not result in any payoff even
 290 in the long run. AT predicts that the proportion of
 291 salary to total compensation should increase with an
 292 increase in nonproductive activities, such as travel
 293 time. Similarly, if salespeople have to spend more
 294 time taking orders, servicing accounts, etc., again,
 295 relatively more emphasis on salary is desirable in the
 296 short run. Since our empirical study includes obser-
 297 vations from a variety of different industries, differ-
 298 ences along these dimensions could play an important
 299 role in explaining the variance in proportion of salary
 300 to total pay.

301 The TCA factors used in this study are as follows:
 302 ease in replacing salespeople, transaction-specific
 303 assets, ability to assess performance accurately,
 304 uncertainty facing sales managers, interaction
 305 between replaceability and uncertainty, and size of
 306 salesforce. All these factors are considered by [John](#)
 307 and [Weitz](#) (1989).

308 Again, as for the choice between sales reps and
 309 direct salespeople, we propose one conflicting
 310 hypothesis for travel requirements. As already pointed
 311 out, AT proposes a positive relationship between
 312 proportion of salary and travel requirements, while
 313 TCA favors independent reps.

314 In summary, we seek to validate many of the
 315 hypotheses identified in prior studies of compensation
 316 plans, test a new hypothesis with regard to the effect
 317 of non-selling activities and investigate the relative
 318 explanatory power of AT and TCA. A summary of
 319 these hypotheses and empirical findings to date is
 320 presented in [Table 3](#).

321 3. Research design

322 3.1. Study design

323 In order to test the hypotheses described in the
 324 previous section, we mailed a questionnaire to 1099
 325 chief sales executives of German sales organizations,

bearing in mind the fact that firms mostly use only one compensation scheme for the entire salesforce. In this way, we sought to capture the perceptions of chief sales executives involved in the design of salesforces and incentive plans. The questionnaire was developed and pretested through the direct help of 10 top sales executives. Several efforts were made to solicit the response of the chief sales executives. The initial mailing was followed up by a second mailing after 4–6 weeks. Further efforts to improve the response rate were made through contact by fax and a promise to provide a copy of the results of our study. The survey was completed about 12 weeks after the first mailing and resulted in a response rate of about 25%. This rate is satisfactory, given that average top management survey response rates range from 15% to 20% (Homburg, Workman, & Krohmer, 1999; Menon, Bharadwaj, Adidam, & Edison, 1999). We also tested for possible non-response bias and found no significant differences between early and late responses. Of the 270 responding firms, 61 firms used representatives only, 173 used a direct salesforce and 36 used a hybrid organization. Our sample is characterized by large firms (average number of employees 2081) and comprises 44 observations from the financial services sector, 44 pharmaceutical goods firms, 74 industrial goods companies, 90 firms from the consumer goods industry and 18 leasing companies. A comparison of different characteristics of the empirical studies investigating the direct vs. rep decision and the design of compensation plans is presented in Table 1 and a comparison of our sample with other German studies is reported in Table 4.

3.2. Measures

The two dependent variables in our study are: the nature of salesforce (direct salespeople or reps) and the proportion of salary to total pay in the case of a direct salesforce. The first dependent variable was measured by asking each respondent about the number of salespeople employed in the salesforce and also the number of sales reps in the sales organization. These questions were deemed appropriate, since some salesforces employ both direct salespeople and reps. Due to the fact that the reasons for the existence of hybrid organizations seem to be rather arbitrary and include salesforces

Table 4
Comparison of the sample (direct salespeople only) with commercial compensation studies

Characteristics	Kienbaum	Present study	Müller	
Number of employees	872	2081		t4.1
Annual sales in million DM	207	315		t4.2
Annual sales per salesperson		5,857,000 DM	2,893,000 DM	t4.3
Salesforce size (mode)		30	23	t4.4
Tenure of salespeople (in years)	8.0	7.98		t4.5
Average age of salespeople	42.0	41.31		t4.6
Total pay in DM	95,000	91,200	81,217	t4.7
Percentage of fixed salary	73.0%	76.2%	84.6%	t4.8

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

in transition, vacant territories being temporarily assigned to reps and reps being used as a threat to company salespeople to induce them to improve their performance, we considered only pure organizations with *either* reps *or* employed salespeople in the direct vs. reps investigations. Thus, we excluded hybrid organizations from the subsequent analyses. In order to measure the proportion of salary to total pay, each respondent provided estimates of the percentage of salespeople compensated by straight salary, straight commissions and a combination plan. Furthermore, they provided an estimate of the variable income in a combination plan. Although most salesforces were compensated mainly through one type of plan, we multiplied the reported estimate of the proportion of variable income by the percentage of salesforce compensated by any one of the variable plans (salary plus commissions, salary plus bonus and salary plus commissions plus bonus) to determine the variable portion of the total package for the salesforce. Details of the questions used to measure the dependent variables and the exact formula for the computation of the proportion of salary to total pay are provided in Appendix A.

The independent variables identified in Tables 2 and 3 were measured using multi-item scales as

399 described in Appendix B. These variables can be
400 categorized into groups describing the state of Market
401 failure, Company specifics, the Selling environment,
402 and Salespeople characteristics.

403 3.2.1. Market failure

404 3.2.1.1. *Replaceability*. A three-item scale was used to
405 measure the ease of hiring the kind of salespeople
406 desired by the firm. The items applied are similar to or
407 adapted from studies by Anderson (1985) and John
408 and Weitz (1989).

409 3.2.1.2. *Transaction-specific assets*. We measured the
410 uniqueness of company procedures and the time
411 required to learn about the unique aspects of the
412 firm's customers and products. Since TCA deals with
413 the cost of control mechanisms, we chose to employ a
414 dollar measure constructed by multiplying the total
415 cost of training new salespeople with the fraction of
416 training time needed to develop customer-, company-
417 and product-specific knowledge. This is in accordance
418 with the growing number of TCA researchers that
419 have attempted to measure transaction costs directly,
420 i.e. in monetary terms (see Rindfleisch & Heide,
421 1997). Similar approaches to the one we chose are
422 reported in Bucklin and Sengupta (1993) as well as in
423 Walker and Poppo (1991), and are recommended by
424 Rossiter (2002).

425 3.2.1.3. *Products can easily be explained*. This
426 construct is formed by two agree/disagree items that
427 are similar to statements used by Anderson (1984).

428 3.2.1.4. *Substitutability of products*. This construct is
429 formed by two new agree/disagree items. We included
430 this construct, because of the importance of interde-
431 pendencies across products, as indicated by Coughlan
432 and Sen (1989).

433 3.2.1.5. *Output is a bad performance measure*. This
434 construct is formed by three agree/disagree items. In
435 this manner, we use a more elaborate scale than John
436 and Weitz (1989).

437 3.2.1.6. *High costs of measuring selling outcomes*. We
438 used a single indicator as suggested by Anderson and
439 Oliver (1987).

3.2.1.7. *Difficulty of measuring inputs*. This construct
440 is formed by four agree/disagree items similar to John
441 and Weitz (1989). 442

3.2.1.8. *Precise reports on activities available*. We
443 used a single agree/disagree indicator adapted from
444 John and Weitz (1989). 445

3.2.2. Company specifics 446

447 Like John and Weitz (1989), we measure the *Size*
448 of the *Salesforce* in terms of the number of sales-
449 people. *Time devoted to selling* served as a proxy for
450 the importance of selling activities, while *Travel*
451 requirements for salespeople was measured via the
452 number of hotel stays (similar to Anderson, 1985).

3.2.3. Selling environment 453

454 3.2.3.1. *Uncertainty*. In the literature, this construct has
455 been approached through a variety of measures, where
456 each measure captures a somewhat different dimension
457 of this overall construct. In our study, we include items
458 used in previous studies (Anderson, 1985; John &
459 Weitz, 1989) but also measure the number of customers
460 per salesperson, so as to capture the possibility of
461 avoiding uncertainty through diversification of the
462 selling effort (Porter, 1980). A confirmatory factor
463 analysis of these items resulted in three different
464 factors, *environmental uncertainty*, *sales volatility*
465 and *diversification of risk*, as shown in Appendix B.

3.2.4. Salespeople characteristics 466

467 3.2.4.1. *Effectiveness*. As in Coughlan and Narasimhan
468 (1992), this construct was measured through average
469 selling experience (in years) before joining the firm.

470 3.2.4.2. *Minimum utility requirement*. This construct
471 reflects the attractiveness of alternative employment
472 opportunities for the salesperson, which are equivalent
473 to a salesperson's market value. Therefore, we use
474 measures that can be considered as proxies for a
475 salesperson's market value. In addition, we apply a
476 direct measure of market value as given by *average*
477 *industry income*. Average industry income is com-
478 puted as the mean of the respective values across all
479 observations, within 1 of 17 sub-industries. The
480 income represents the total income paid by the

481 individual firm to an average salesperson, as provided
 482 by the respondents. Thus, we take *tenure* with the
 483 company (i.e. duration of employment) and average
 484 level of *education* in the salesforce to measure this
 485 construct. All these measures, *tenure*, *education* and
 486 *average industry income*, have already been used by
 487 Coughlan and Narasimhan (1992).

488 3.2.5. Control variables

489 To account for possible heterogeneity, we include
 490 industry dummies and the total income of average
 491 salespeople.

492 3.2.5.1. *Industry indicators*. As already described
 493 above, we conducted our study across five different
 494 industries. In order to capture potential industry-
 495 specific effects, we used four dummy variables for
 496 industrial goods, financial services, pharmaceutical
 497 goods and consumer goods (with observations from
 498 the leasing industry as reference).

499 3.2.5.2. *Total income of average salesperson*. We
 500 controlled for potential cross-incentive effects by
 501 including, as a covariate, the total annual income of
 502 an average salesperson.

503 3.3. Estimation

504 In Section 3.2, we explained that we can only
 505 consider the decision between *pure* sales organiza-
 506 tions, using either a direct salesforce or independent
 507 reps. Thus, we excluded 36 observations from hybrid
 508 salesforces. Given the dichotomous nature of the
 509 dependent variable, we estimated the impact of the
 510 independent variables on the vertical integration
 511 decision with the help of logistic regression, which
 512 uses a maximum likelihood procedure (as in Anderson
 513 1985). A further 18 cases were deleted, because they
 514 revealed more than three missing values.¹ This led to
 515 an effective sample size of 216 cases.

516 To investigate the role of fixed *salary as a*
 517 *proportion of total pay*, we had to restrict our analyses
 518 to direct salesforces only. This is due to the fact that

¹ For each case, we computed the number of missing observations and found 72 cases with one missing, 20 cases with two missing, 10 with three missing, and a break, or scree, at four or more missing. For cases with three or fewer missing observations, we ran a mean substitution.

by German law, reps can only be remunerated on a 519
 commission-only basis, while employed salespeople 520
 have to be compensated by a substantial fixed amount. 521
 In this sub-sample, we had to delete 14 cases, because 522
 of more than three missing values, leading to an 523
 effective sample size of 156 (170–14) cases. The 524
 model is estimated via ordinary least-squares regres- 525
 sion, where the dependent variable has been trans- 526
 formed to its logit ($\ln(x/(1-x))$, where x is the 527
 dependent variable). This logit transformation is 528
 required to satisfy the normality assumptions of 529
 ordinary least squares, when the dependent variable 530
 is constrained between 0 and 1, as indicated by John 531
 and Weitz (1989). To check whether this leads to 532
 heteroscedasticity, we weighted each case with the 533
 inverse of the error term of this data point. Based on 534
 OLS and WLS, we did not observe any substantial 535
 differences between our various results. 536

537 4. Results for direct salesforce vs. reps

The results of our analysis of the direct vs. rep 538
 decision are displayed in the second last column of 539
 Table 2 (“present study”). In our study, the TCA and AT 540
 variables explain a significant portion of the variance. 541
 We report the Log Likelihood (LL) of –62.22 and a 542
 model χ^2 of 166.7. Given the degrees of freedom, both 543
 are highly significant. In order to be able to compare the 544
 goodness of fit of our model with the one by Anderson 545
 (1985), we calculated the geometric mean of the 546
 probability ρ with which the observed vertical integra- 547
 tion decision is estimated.² Our model resulted in a 548
 value of $\rho=0.75$, which compares favorably to a value 549
 of $\rho=0.63$ as derived from the Log Likelihood of 550
 –74.16 and a number of 159 observations as reported 551
 by Anderson (1985). In addition, the Nagelkerke 552
 pseudo- R^2 of 73% shows a good fit for our model. 553

In Table 2, the coefficients of our logistic regression 554
 model and the respective significance levels are 555
 displayed in column “present study”. With respect to 556
 the hypothesized effects, which are also reported in 557
 Table 2, we find *support* for the hypotheses that a direct 558
 salesforce is more likely to be employed with increas- 559

² The geometric mean of the estimated probability (ρ) is computed as follows: $\rho=\exp(\text{LL})^{(1/\# \text{ cases})}$. In our case, $\rho=\exp(-62.217)^{(1/216)}=0.7497$.

564 ing transaction-specific assets and increasing difficulty
 565 in evaluating performance (as measured by ‘output is
 566 bad performance measure’ and ‘precise reports on
 567 activities available’). Likewise, the hypotheses are
 568 supported that a rep organization is more likely to be
 569 chosen, if products can easily be explained and if travel
 570 requirements are high. However, we observe signifi-
 571 cant coefficients contrary to our hypotheses for
 572 replaceability of salespeople, size of the salesforce,
 573 sales volatility and the interaction effect of environ-
 574 mental uncertainty and transaction-specific assets. The
 575 contrary finding, that the easier it is to replace sales-
 576 people, the more likely a firm will choose a direct
 577 salesforce, may be due to the fact that German laws
 578 create high barriers for terminating labor contracts. If
 579 replacement costs are high, it might be economically
 580 beneficial to work with independent reps or sales
 581 agencies (independent reps that have employed addi-
 582 tional sales personnel), because the risk of firing poor
 583 performers is transferred to the sales agency. The
 584 second contrary finding, that the size of the salesforce
 585 increases the likelihood of choosing a rep organization,
 586 can be justified by Shapiro’s (1977) observation that
 587 administrative control mechanisms become increas-
 588 ingly costly with size of the organization. Another
 589 explanation could lie in the unavailability of a
 590 sufficiently large, qualified pool of salespeople to
 591 employ. Contrary to AT, but rational from the
 592 manufacturers’ point of view, a higher degree of sales
 593 volatility leads to a rep organization, because this
 594 transfers the market risk to the sales agency, which is
 595 paid on a commission-only basis and thereby bears the
 596 full market risk. Similarly, the interaction between
 597 environmental uncertainty and transaction-specific
 598 assets yields a negative coefficient, contrary to the
 599 TCA hypothesis. This implies that increasing trans-
 600 action-specific assets favor only direct salesforces in
 601 the case of stable environments, while increased
 602 uncertainty moderates this association. One may
 603 speculate that the same rationale indicated for sales
 604 volatility applies here.

605 Comparing our results with those reported by
 606 Anderson (1985), we note that our findings are
 607 consistent with respect to the effects of transaction-
 608 specific assets and difficulty in evaluating performance
 609 (see Table 2). On the other hand, while the effects of
 610 salesforce size, travel requirements and uncertainty
 611 were found to be insignificant in Anderson’s study, we

find significant effects in our data. Finally, while
 Anderson (1985) reports a supporting, positive inter-
 action effect of uncertainty and transaction-specific
 assets, we observe a significant contrary relationship.
 One may speculate whether the different results are due
 to differently specified models and thereby to an
 omitted variable bias. We therefore investigated our
 data by restricting the model to only those variables that
 were used by Anderson. As we found very similar
 results for our two models, this indicates that our richer
 model is not affected by an omitted variable bias.

In our study, we also developed a series of *new*
hypotheses with respect to replaceability, product
 complexity, effectiveness of salespeople and mini-
 mum utility requirements. However, only the effect of
 product complexity is found to be significant and in
 the predicted direction.

Finally, with respect to the conflicting hypotheses
 about uncertainty and travel requirements, our data
 lends support to the TCA-based prediction for travel
 requirements, but rejects the AT based hypothesis for
 uncertainty. Taking all these effects into account, we
 find that only variables derived from TCA exert a
 significant impact on the decision to integrate the
 salesforce.

5. Results for variable portion of compensation plans

The results of the analysis of salary as a percentage
 of total compensation are displayed in Table 3. In our
 study, the AT and TCA variables explain 32.4% of the
 variance (adj. R^2 23.0%) and the model is significant
 at the 0.001 level (F -value=3.433). The explanatory
 power of these variables is in the range of other cross-
 sectional studies of salesforce compensation plans.

With respect to the hypothesized effects, we find
 that the data *supports* the following hypotheses: the
 emphasis on salary increases with the difficulty of
 evaluating performance as measured by the high cost
 of measuring selling outcomes and whether precise
 reports on activities are available, decreasing amount
 of time devoted to selling, decreasing effectiveness of
 salespeople and increasing minimum utility require-
 ments as measured by tenure and education.

However, our data *rejects* the hypotheses that
 compensation plans should emphasize salary with

657 increasing difficulty in replacing salespeople, increas-
 658 ing uncertainty (as measured by the number of
 659 customers per salesperson and its square root)³ and
 660 increasing average industry income. These observa-
 661 tions can be explained in the following manner. Our
 662 finding on replaceability can be understood by noting
 663 the fact that compensation plans which are geared
 664 more towards salary attract less effective salespeople
 665 and these salespeople can be more easily replaced.
 666 Similarly, while an increase in the number of
 667 customers per salesperson is presumed to decrease
 668 the uncertainty in the selling environment, it might be
 669 the case that if all customers need some minimum
 670 level of attention in the form of servicing an account,
 671 an increase in the number of accounts results in a
 672 higher amount of non-selling activity, which in turn
 673 leads to an increase in the emphasis on salary as
 674 evidenced in the data. Finally, we conjecture that
 675 average industry income may not be an accurate
 676 measure of minimum utility. This is because the
 677 measure does not capture disutility from effort. In fact,
 678 it may be a proxy for the skill of a salesperson, in
 679 which case AT-based models predict a negative impact
 680 on the proportion of salary to total compensation.
 681 Finally, with respect to the conflicting hypotheses
 682 about travel requirements, our data lends support to
 683 the AT-based prediction for travel requirements.

684 We now compare our empirical findings to those
 685 reported in the USA (see Table 3). Our findings with
 686 respect to the impact of effectiveness of salespeople
 687 and minimum utility requirements are consistent with
 688 those of Coughlan and Narasimhan (1992) and Lal et
 689 al. (1994). The impact of such factors as time devoted
 690 to selling and difficulty of measuring inputs, is also
 691 consistent with the effects reported by John and Weitz
 692 (1989). Similarly, the insignificant effect of uncer-
 693 tainty observed in our data is consistent with the
 694 findings in other cross-sectional studies such as
 695 Coughlan and Narasimhan (1992) and John and Weitz
 696 (1989). In contrast, the effect of the ease of replacing
 697 salespeople in our data does not support the findings
 698 of John and Weitz (1989). In this manner, we are able

³ Since we expected an inverted U-shaped relationship between number of customers per salesperson and proportion of salary we included the square root term of 'number of customers'. However, we found a total effect of both variables that even slightly increases with a larger 'number of customers'.

to document that most of the findings reported for
 American salesforces *generalize* to Germany.

While one can often provide ex-post rationalizations
 for disconfirming results, it is important to note that the
 effect of uncertainty as one of the more important
 hypotheses of AT has not found significant support in
 any empirical study using cross-sectional data. This is
 particularly interesting, since other studies using
 individual level data (Joseph & Kalwani, 1995; Lal et
 al., 1994) and experimental studies (Gaba & Kalra,
 1999; Umanath et al. 1993) report some evidence for
 this hypothesis. In order to investigate this issue, we
 interviewed some of the executives in our sample.
 These interviews lead us to believe that executives react
 to uncertainty somewhat differently than assumed in
 AT-based analyses. In particular, since uncertainty is
 beyond the control of the firm, management treats it as
 something that the salesforce should be able to deal
 with, and if not, sales executives prefer to find
 salespeople who can. In order to achieve this, a
 sufficient increase in uncertainty is accompanied by
 higher commissions. Salespeople who are unable to
 deal with uncertainty will find such contracts to be
 unattractive and therefore not want to stay with the
 company; while those who can get rewarded through a
 plan that consists of a higher fraction of incentive-
 based compensation. Hence, we conclude that while
 the AT literature on salesforce compensation plans
 deals with uncertainty only through the design of
 compensation plans, managers in our sample seem to
 deal with uncertainty by offering more incentives to
 signal higher uncertainty in the selling environment
 and thus attract an appropriately skilled salesforce. This
 is especially true of Germany, where legal restrictions
 make it extremely difficult to fire salespeople. As a
 consequence, the hiring decision is much more
 important than in the USA.

In summary, we have provided the first empirical
 investigation of both AT- and TCA-based constructs
 through a single data source. We provide a test of
 competing hypotheses with respect to travel require-
 ments and find support for the TCA prediction in the
 vertical integration issue and for the AT hypothesis in
 our model for 'salary as a proportion of total pay'.
 Furthermore, while many findings in the compensation
 literature are confirmed and therefore generalize to
 Germany, we also offer some new findings in the form
 of rejecting some hypotheses and supporting new ones.

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747 The main conclusion with respect to rejecting these
 748 hypotheses is that some of the operationalizations may
 749 not be valid; but more importantly, our findings suggest
 750 that an important consideration has been omitted in
 751 modeling compensation plans. While the extant liter-
 752 ature investigates the impact of changes in the environ-
 753 ment on the design of compensation plans, holding
 754 everything else constant (with the exception of Lal &
 755 Staelin, 1986), sales executives seem to deal with
 756 different selling environments not only through the
 757 design of compensation plans, but also by attracting the
 758 right type of salespeople. In other words, the practice of
 759 sales management suggests an interaction between
 760 design of compensation plans and recruitment/selec-
 761 tion, while the theoretical literature treats these issues
 762 independently.

763 6. Explanatory power of TCA and Agency Theory

764 Both the more recent theoretical and empirical
 765 salesforce management literature have benefited
 766 immensely from two different theoretical develop-
 767 ments in the economics literature, namely Transaction
 768 Cost Analysis and Agency Theory. While some
 769 authors have used Agency Theory as the foundation
 770 for their investigation, others have focused on Trans-
 771 action Cost Analysis. These separate investigations
 772 suggest that both these theoretical approaches provide
 773 significant insight into the issue of composition of
 774 salary and incentives in salesforce compensation plans
 775 and the decision to employ a direct salesforce in lieu
 776 of sales representatives. With this as the motivation,
 777 we conducted our study by integrating constructs
 778 provided by both Agency Theory and TCA.

779 Our study provides the first direct evidence support-
 780 ing both these theoretical approaches when tested
 781 simultaneously in the same data set. However, a natural
 782 question that arises from these empirical studies is: Do
 783 Agency Theory and TCA compete with or complement
 784 each other (Stathakopoulos, 1996)? In the economics
 785 literature, these theories have traditionally been viewed
 786 as separate theories addressing different sets of issues.
 787 Originally, TCA was developed to investigate the
 788 boundaries of the firm and was used extensively in
 789 understanding issues of vertical integration vs. arms
 790 length transactions (Williamson, 1975). Later, Agency
 791 Theory was developed to address issues related to the

internal organization of the firm. More recently, TCA 792
 has also been applied to the choice of internal control 793
 mechanisms (John & Weitz, 1989; Stump & Heide, 794
 1996) and Agency Theory has also been used to study 795
 coordination and interaction between two separate 796
 economic entities (Lal, 1990). The prevailing view in 797
 economics is that the boundaries of the firm are not as 798
 well defined as originally thought and these theories are 799
 viewed as complementing, rather than competing with 800
 each other. In the marketing literature on design of 801
 salesforce compensation plans, while the early appli- 802
 cations of these theories viewed them as competing 803
 frameworks, more recent applications suggest com- 804
 plementarity. With this background, we investigated 805
 the explanatory power of these two approaches for the 806
 two decisions. 807

To address this issue, we estimate the additional 808
 variance explained by Agency Theory-specific varia- 809
 bles and the TCA-specific variables in the decision to 810
 employ a direct salesforce. Because we are interested 811
 in the predictive power of these two theories, we only 812
 considered those variables from our full model that 813
 had a coefficient in the hypothesized direction and a 814
 Wald statistic larger than 1. The latter condition was 815
 chosen, because variables with Wald statistics larger 816
 than 1 indicate that they add more information than 817
 noise. In a first step, we estimated a null model 818
 consisting only of the control variables and constructs 819
 for which both theories provided identical hypotheses. 820
 As control variables, we included four industry 821
 dummies and ‘total income of average salesperson’. 822
 For the constructs ‘output is a bad performance 823
 measure’, ‘high costs of measuring selling outcomes’ 824
 and ‘precise reports on activities available’, both AT 825
 and TCA provided identical hypotheses. In a 826
 second step, we tested whether TCA-specific 827
 variables significantly improved the explanatory 828
 power. The respective four variables were 829
 ‘transaction-specific assets’, ‘products can easily 830
 be explained’, ‘substitutability of products’, and 831
 ‘travel requirements’. In a third step, we finally tested 832
 the additional explanatory power of two AT-specific 833
 variables. These were ‘selling experience’ and 834
 ‘average industry income’. The results are displayed 835
 in Table 5a. It is evident that while the improvement of 836
 the model χ^2 is highly significant if TCA-specific 837
 variables are included, the improvement of the model 838
 χ^2 is not significant if Agency Theory-specific 839

t5.1 Table 5a

t5.2 Explanatory power of TCA- and AT-specific variables for the decision to employ direct salesforce vs. independent representatives

	Null model	Null model plus TCA-specific variables	Null model plus TCA- and AT-specific variables
t5.3			
t5.4	Number of variables ^a	7	11 ^b
t5.5	–2 Log Likelihood	183.806	173.953
t5.6	Model χ^2	115.633	125.487
t5.7	(<i>df</i> /significance)	(7/0.000)	(11/0.000)
t5.8	Improvement χ^2 test of the –2LL-change against the total model if theory-specific variables are added		Improvement χ^2 : 9.854; significance 0.043
			Improvement χ^2 : 0.380; significance 0.827

t5.9 ^a We considered only variables from our full model that had a coefficient in the hypothesized direction and a Wald statistic larger than 1.t5.10 ^b The four TCA-specific variables added are ‘Transaction specific assets’, ‘Travel requirements’, ‘Products can easily be explained’, and ‘Substitutability of products’.t5.11 ^c The two AT-specific variables added are ‘Selling experience’ and ‘Average industry income’.

840 variables are included. In other words, while the TCA-
841 specific variables add significantly explanatory power
842 to the investigation of the vertical integration issue, the
843 Agency Theory variables have no such effect. This
844 suggests that the investigation of the direct vs. rep
845 decision can adequately be addressed through the TCA
846 framework.

847 We now report the findings of a similar inves-
848 tigation for the design of compensation plans.
849 Similarly to the vertical integration issue, we consid-
850 ered only those variables from our full model that had
851 a coefficient in the hypothesized direction and a *t*-
852 value larger than 1. In this case, we first tested the
853 impact of Agency Theory-specific constructs over a
854 null model with only control variables and constructs
855 for which both theories derived identical hypotheses.
856 The null model consists of ‘financial services’
857 (dummy) and ‘total income of average salesperson’
858 as control variables and ‘output is a bad performance

measure’, ‘high costs of measuring selling outcomes’ 859
and ‘precise reports on activities available’ as 860
variables that are not theory-specific. Then we added 861
the following five AT-specific constructs: ‘time 862
devoted to selling’, ‘travel requirements’, ‘selling 863
experience’, ‘tenure’, and ‘education’. Finally, we 864
tested whether ‘substitutability of products’ as the 865
only remaining TCA-specific variable contributes 866
significantly to the explanation of the dependent 867
variable. The results of this analysis are displayed in 868
Table 5b. It is clear that while the *F*-value for the 869
change in the sum of errors is highly significant if 870
Agency Theory-specific variables are included, the *F*- 871
value for the change in the sum of errors is not 872
significant if TCA-specific variables are included. In 873
other words, while the Agency Theory-specific 874
variables add significant explanatory power to the 875
investigation of the design of compensation plans, 876
TCA-specific variables do not. This suggests that the 877

t6.1 Table 5b

t6.2 Explanatory power of TCA and AT specific variables for salary as a percentage of total compensation

	Null model	Null model plus AT-specific variables	Null model plus AT- and TCA-specific variables
t6.3			
t6.4	Number of variables ^a	5	10 ^b
t6.5	R^2	0.093	0.245
t6.6	Adjusted R^2	0.062	0.193
t6.7	Partial <i>F</i> -test of the R^2 change against the total model if theory-specific variables are added		<i>F</i> -to-change: 5.857; significance of <i>F</i> -to-change <0.0005
			<i>F</i> -to-change: 2.378; significance of <i>F</i> -to-change 0.125

t6.8 ^a We considered only variables from our full model that had a coefficient in the hypothesized direction and a *t*-value larger than 1.t6.9 ^b The five AT-specific variables added are ‘Travel requirement’, ‘Time devoted to selling’, ‘Selling experience’, ‘Tenure’, ‘Education’.t6.10 ^c The one TCA-specific variable added is ‘Substitutability of products’.

878 study of the proportion of salary in the compensation
879 plan can adequately be addressed through the Agency
880 Theory framework. Thus, one may conclude that in
881 our study of salesforce management decisions, the
882 two theories, Agency Theory and TCA, are less likely
883 to be viewed as complementing each other.

884 Our results should be interpreted in the German
885 context, where we find strong legal differences
886 between the nature of compensation plan and termi-
887 nation clauses for direct and representative sales-
888 people (as compared to the USA, where the
889 differences may not be as strong). Therefore, the
890 interchangeability of TCA and AT in other countries
891 may decrease when we observe strong structural
892 differences between reps and direct salespeople.

893 7. Summary and directions for future research

894 This study provides the first test of an integrated
895 set of factors from Transaction Cost Analysis and
896 Agency Theory, through a data set collected outside
897 the USA. We thereby provide the first test of both
898 these frameworks within a single database. Moreover,
899 by collecting the data in Germany, we are able to
900 address the issue of the generalizability of the findings
901 in the USA. Indeed, since many of our findings are
902 consistent with those reported in studies based on
903 USA data, we are the first researchers to provide
904 evidence that these frameworks may also be applied to
905 situations outside the USA.

906 Among the new findings in our study, we
907 document the impact of some new variables and
908 provide evidence disconfirming some effects
909 reported in the literature. More specifically, we find
910 that as predicted, increasing explainability of prod-
911 ucts and travel requirements increase the likelihood
912 of employing a rep organization, while the avail-
913 ability of precise input reports favors employed
914 salesforces. With respect to the design of compensa-
915 tion plans, we find that ‘high costs of measuring
916 selling outcomes’, ‘precise reports on activities
917 available’, ‘travel requirements’, and ‘products can
918 easily be explained’ exert a direct positive impact on
919 the proportion of salary in the total compensation
920 plan. While the first three variables confirm our AT-
921 based hypotheses, the last one is contrary to our
922 TCA-specific hypothesis.

923 We also find disconfirmatory evidence for several
924 hypotheses that were either supported or not discon-
925 firmed in recent studies. For example, we report that
926 compensation plans include a higher fraction of salary
927 when salespeople are easily replaceable. This is in
928 contrast to the insignificant effects found by [John and](#)
929 [Weitz \(1989\)](#). Similarly, the hypothesized effect of
930 uncertainty (as measured by number of customers per
931 salesperson) is rejected in our data set, while the
932 results from the USA are mixed. With respect to the
933 direct vs. rep decision, we find significant disconfirm-
934 ing effects for ‘salespeople easily replaceable’, ‘size
935 of the salesforce’ as well as ‘uncertainty’ and
936 significant confirming effects of ‘travel requirements’.
937 This is in direct contrast to non-significant results
938 reported by [Anderson \(1985\)](#) with respect to each of
939 the last three variables.

940 We further investigated the complementary nature
941 of AT and TCA in Germany, by assessing the
942 explanatory power of these two theories for the two
943 decisions, direct vs. reps and proportion of salary in
944 the compensation plan. We find that while one theory
945 is better for explaining one phenomenon, the other is
946 adequate in explaining the second phenomenon. More
947 precisely, while TCA-specific variables do not add to
948 explanatory power of the Agency Theory-specific
949 variables in the salary decision, the Agency Theory-
950 specific variables do not add to the explanatory power
951 of the TCA-specific variables in the decision to
952 employ a direct vs. independent salesforce. We
953 therefore believe that one has to be cautious in
954 treating AT and TCA as complementary theories.

955 With respect to directions for future research, this
956 is the first study to assess the generalizability of the
957 findings in the USA to other countries and cultures.
958 Given our findings, it is useful to investigate further
959 the impact of differences in legal environments,
960 communication styles and work ethics on the general-
961 izzability of the TCA and AT frameworks. With
962 respect to the usefulness of Agency Theory to study
963 the design of compensation plans, we find that the
964 existing analysis based on a model of homogeneous
965 salesforces needs to be extended. In environments
966 where salespeople differ along several dimensions,
967 the interaction between the choice of compensation
968 plan and the hiring decision can no longer be
969 neglected. In other words, the choice of compensa-
970 tion plan needs to take into account not only the

971 motivational aspects of this decision, but also the
 972 kind of salespeople that will be attracted to the
 973 company by the design of the compensation plan. A
 974 first such attempt has been offered in Lal and Staelin
 975 (1986) and Rao (1990).

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 978 many helpful comments which improved the paper.

979 **Appendix A. Description of dependent variables**

980

t7.2 **Dependent variable**, Operationalization, Remarks

Kind of salesforce

t7.4 (direct salespeople or manufacturer representatives)

How many salespeople (employed and independent
 representatives) work primarily for your sales
 organization (without sales management)?

t7.6 salespeople

Number of independent sales representatives
 working in your sales organization

t7.8

(A comparison of the first and second question
 reveals, whether a company uses representatives
 only, a direct salesforce or a hybrid)

t7.10

t7.12

t7.14

Proportion of salary to total pay^a

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

t7.16

t7.18

•Straight salary(%)

t7.20

•Straight commission(%)

t7.22

•A combination plan, such as

t7.24

–Salary plus commission (SALCOM)(%)

t7.26

–Commission and drawing account(%)

t7.28

–Salary plus bonus (SALBON)(%)

t7.30

–Commission plus bonus(%)

t7.32

–Salary plus commission plus bonus

(SACOBO)(%)

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

t7.34

(The variable proportion was computed via the
 following formula: (VARPERC*(SALCOM+SALBON+
 SACOBO)/100)). The dependent variable is
 then the complement to 100%.

t7.36

^a There is no single company in the ‘direct salesforce’ sub-
 sample that uses ‘commission and drawing account’ or ‘commission
 plus bonus’ plans. Therefore, the formula has been simplified and
 contains only combination plans with some sort of salary.

t7.37

Appendix B. Description of independent variables

981

982

Construct, Operationalizations, Source
 Remarks

Market (market failure) t8.4

Salespeople easily replaceable t8.6

It is very difficult for us to hire
 good salespersons. (reversed) similar to John and Weitz
 (1989) t8.8

It is easy for us to replace good
 salespeople if they quit. similar to John and Weitz
 (1989) t8.10

The loyalty of our accounts is
 tied primarily to the
 salesperson. (reversed) adapted from Anderson (1985) t8.12

Transaction-specific assets t8.14

(product of ‘total costs’ and
 ‘percentage of customer-
 product- and company-
 specific know-how’) What are the total costs for
 training new salespersons adapted from John and Weitz
 (1989) t8.16

(costs of training,
 compensation of the
 salesperson)? About EURO per
 salesperson t8.18

How much time of the training
 is needed for(%) customer-specific
 know-how, t8.20

.....(%) product-specific
 know-how, t8.22

.....(%) company-specific
 know-how, t8.24

.....(%) know-how of general
 selling techniques, t8.26

.....(%) other t8.28

.....? t8.30

**Products can easily be
 explained** t8.32

The products offered by our
 salespeople are complex. adapted from Anderson (1984) t8.34

Our products can be explained
 easily to our customers, such
 that salespeople could sell all
 of our products already after a
 short training time. adapted from Anderson (1984) t8.36

Substitutability of products t8.38

Many of the products our
 salespeople offer are
 substitutable, such that
 overall sales of one product
 reduce those of other
 products. motivated by Coughlan and Sen
 (1989) t8.40

t8.42

t8.44	Appendix B (<i>continued</i>)	Appendix B (<i>continued</i>)	t8.80
t8.46	Construct, Operationalizations, Source <i>Remarks</i>	Construct, Operationalizations, Source <i>Remarks</i>	t8.82
t8.48	Substitutability of products Our products are unique, so that overall sales of one product usually do not affect those of other products. <i>(reversed)</i>	Time devoted to selling Of their total working time your salespeople use (%) for sales calls	t8.84 t8.86
	Output is a bad performance measure	Travel requirements How many nights do your salespersons spend in a hotel in a typical month? about nights	t8.88 t8.90
t8.50	Using outcome measures (i.e. overall sales) how precisely do they represent the actual effort? (precisely–imprecisely)	Selling environment	t8.92
t8.52	How precisely can you infer the actual individual selling effort from the outcome measures? (totally–not at all)	Environmental uncertainty How often do you or one of your competitors introduce competitive new products? (seldom–often)	t8.94 t8.96
t8.54	How many factors beyond the control of your salespersons, influence the selling outcome? (few–many)	How fast does the environment of your company change (i.e. technology, intensity of competition)? (slowly–fast)	t8.98
t8.56	High costs of measuring selling outcomes The costs of measuring selling outcomes are (very low–very high).	Sales volatility How much did the market volume of your industry vary on average over the last five years? (MVVARIAT) (±0–5%, ±5–10%, ±10–15%, ±15–20%, >±20%)	t8.100 t8.102
t8.60	Difficulty of measuring inputs It is not possible to supervise our salespeople closely.	How much did your actual overall sales differ from your expected overall sales? (GOALDEV) (±0–5%, ±5–10%, ±10–15%, ±15–20%, >±20%)	t8.104
t8.62	It is difficult to evaluate how much effort our salespeople really devote to selling.	The scale was computed as (2*MVVARIAT+GOALDEV)/3	t8.106
t8.64	Our salespeople travel so much that close supervision is impossible.	Diversification of risk One salesperson is on average responsible for about accounts	t8.108 t8.110
t8.66	It would be easy for our salespeople to turn in better than actual calling reports if they wanted to.	Salespeople characteristics <i>Effectiveness</i>	t8.112 t8.114
t8.70	Precise reports on activities available We have precise reports on the activities of all salespersons.	Selling experience: How many of your salespeople did prior to the job in your company have	t8.116
t8.72	Company (frequency of transaction)	•less than three years(%) (EXPER_3)	t8.118
t8.74	Size of the salesforce How many salespeople (employed and independent representatives) work primarily for your sales organization (without sales management)?	•three to seven years(%) (EXPER_37)	t8.120
t8.76		•more than seven years(%) (EXPER_7) experience in selling?	t8.122
t8.78			

(continued on next page)

t8.124	Appendix B (continued)	
t8.126	Construct , Operationalizations, <i>Remarks</i>	Source
t8.128	Salespeople characteristics Effectiveness The scale was computed as (1.5*(EXPER_3/100))+ (5*(EXPER_37/100))+ (10*(EXPER_7/100))	
t8.130		
t8.132	Minimum utility requirement Tenure : What percentage of 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 10 years, resp.(%) 10 years or longer The scale was computed as: (0.5*(TENURE_1/100))+ (2*(TENURE13/100))+ (4*(TENURE35/100))+ (7.5*(TENURE5_/100))+ (15*(TENURE10/100))	Coughlan and Narasimhan (1992)
t8.134		
t8.136		
t8.138		
t8.140		
t8.142		
t8.144		
t8.146		
t8.148		
t8.150	Education : What percentage of your sales people have received their highest degree from(%) Hauptschule (9 years high school),(%) Mittlere Reife (10 years high school), (SCHOOL10)(%) Abitur (13 years special track of high school), (SCHOOL13)(%) college degree, (COLLEGE)(%) university degree? (UNIVERSI) The scale was computed as (1*SCHOOL10)+ (2*SCHOOL13)+ (3*COLLEGE)+ (4*UNIVERSI)	Coughlan and Narasimhan (1992)
t8.152		
t8.154		
t8.156		
t8.158		
t8.160		
t8.162		
t8.164	Average industry income : What is the annual income (salary+variable income) that you pay for an average salesperson? _____ EURO (we have computed the average value across 17 sub-industries)	

Appendix B (continued)		t8.166
Construct , Operationalizations, <i>Remarks</i>	Source	t8.168
Control variable Total income of average salesperson : What is the total annual income (salary+ variable income) that you pay for an average salesperson? _____ EURO		t8.170 t8.172

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