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B2C eCommerce Strategy and Market Structure: The Survey Based Approach

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This paper follows two objectives: (i) It demonstrates the merits of the survey based approach to B2C eCommerce characteristics and company strategy, and (ii) it presents empirical evidence of the crucial importance of size and marketing investment in B2C eCommerce markets. It presents econometric estimates of the effects of company characteristics and company strategies on the performance of Viennese B2C eCommerce companies in 2001. We provide econometric analysis of three dependent variables in turn: (i) number of B2C eCommerce customers in 2000, (ii) number of B2C eCommerce employees in January 2001 and (iii) revenue growth rate in 2001. The models do explain the data quite well: Size as well as endogenous sunk costs emerge as the main success factors. Furthermore, the results of nonparametric tests are presented. They mostly confirm the econometric evidence. We also show that the quantitative results are consistent with the qualitative results of the surveys. Finally, we argue that the survey based approach to B2C eCommerce is a method that provides reliable and consistent data, and that it complements the approach based on prices and consumer behavior commonly applied.

Keywords: *B2C eCommerce, empirical evidence, success factors, endogenous sunk costs.* JEL*: L10, L25, L81, L86.*

I. INTRODUCTION[1]

Most studies on alternative strategies in B2C eCommerce focus on market allocation (mostly prices), consumer behavior and derive the implications for B2C eCommerce strategy based on a number of additional assumptions and hypothesis (i.e. market structure and transparency) which are usually very hard to observe (Baylis/Perloff 2002, Brynjolfsson/Smith 2000, Clay/Krishnan/Wolff 2001, Smith/Brynjolfsson 2001, Smith 2001, Ward/Lee 2000). We propose a more direct approach: We base the empirical investigation on data on actual business strategies of B2C eCommerce companies and test their implications for performance. Thus, the results do not rely on additional, unobservable assumptions and hypothesis. Furthermore, we highlight the implications of our findings for the analysis of market structure.

This paper reports the econometric and nonparametric analysis based on the findings of two surveys of Viennese B2C eCommerce companies in January/February 2001 and January/February 2002.[2] The surveys aimed at three interrelated objectives: (*i*) In the first survey the primary objec-

[1] Stefan W. Schmitz acknowledges the hospitality of the German Institute for Economic Research (DIW Berlin) where large parts of the paper were written. The authors are indebted to Johannes Bauer, Brigitte Preissl, Stephan Raab and participants of the DIW seminar as well as the ITS Europe conference 2002 in Madrid for comments. The usual disclaimer applies.

[2] The surveys formed part of a larger project conducted at ICE (Latzer et al. 2002).

tive was to generate data on company characteristics (e.g. number of customers, pure online vs. multichannel company etc.), company strategies (e.g. disintermediation, marketing, outsourcing, cross-promotion, customer acquisition costs, pricing strategy etc.) and the role of deterritorialisation as well as regional economic and technology policy. (*ii*) The second survey aimed at empirical evidence of success and failure, respectively, among the participants of the first survey as well as their subjective explanations for their business situation. The second survey enables us to conduct a longitudinal analysis which links the findings of the first survey with those of the second, notably the realized growth rate of revenue amongst the participating B2C eCommerce companies. (*iii*) In addition to the empirical analysis of B2C eCommerce in Vienna, the methodological objective of the project was to highlight the potential of the survey based approach to the study of B2C eCommerce to generate timely, reliable and consistent data, and to complement the traditional approach.

This paper is structured along the following lines: The first section provides detailed descriptions of the two surveys. The second one presents the findings and tests concerning the relationship between forecasts and realizations of revenue growth rates in Viennese B2C eCommerce. In the third section we discuss the methods of model selection, go through the results of the econometric and nonparametric approaches to model the performance of Viennese B2C eCommerce companies in 2001. The fourth section concludes with the summary and the discussion of the results.

II. The Surveys

There is no complete databank of Viennese B2C eCommerce companies available nor does the available databank of the Viennese Chamber of Commerce (Wirtschaftskammer Wien – WKW) list all B2C eCommerce activities of its members. Furthermore, we included B2C eCommerce companies in our study which were not incorporated in Vienna but had substantial economic activities in Vienna (e.g. HQ of B2C eCommerce activities, Vienna as main target market serviced from the industrial areas outside the city). In addition to the WKW databank we, therefore, consulted numerous "eCommerce guides" of local and national magazines, the book "Das @ Internetverzeichnis 2000 – Suchen und finden: Die wichtigsten Adressen im Web von A-Z" (Public Voice 2000) and the 18 web-sites listed in table 1 in order to identify the relevant population.

In total we identified about 200 companies of which some had to be excluded form the study due to double counting (e.g. companies offered goods under different URLs on the web) so that the population consisted of the remaining 179 companies. Although it is unlikely that this set of companies encompasses the entire population, we conjecture that those companies we could not identify, have a low visibility and are unlikely to attract a large number of customers.

The first standardized questionnaire comprised of 41 questions in three categories (status and dynamics of B2C eCommerce in Vienna, market structure, regional aspects). As 58 questionnaires were returned, the response rate reached 32.4%. The sample is quite heterogeneous so that the differences in strategies, characteristics and performance are likely to be pronounced. The sample comprises of 58% of companies with up to 1000 customers/year (January/February 2001), 27% report between 1000 and 10.000 and a further 16% more than 10.000.[3] Most companies had been active in retail-sales or catalogue-sales before they expanded into B2C eCommerce, only 7% followed a disintermediation strategy.

The second standardized questionnaire was kept very short (4 questions) in order to ensure a high response rate among the participants of the first survey. As 54 questionnaires were returned, the response rate reached 93.1%. Three of the respondents discontinued their B2C eCommerce activities, mainly because their expectations in B2C eCommerce were disappointed. Both questionnaires comprise of questions concerning the provision of data (hard facts, e.g. revenue growth rate, number of customers) and questions asking for subjective interpretations and attitudes (e.g. success factors). The econometric and nonparametric analyses are solely based on the hard facts reported. However, we also show that the quantitative results are consistent with the results of the more subjective questions.

III. Econometric and nonparametric Analysis

Both, the dependent and the independent variables are derived from the first and the second survey. Table 2 presents the three groups of variables (company characteristics/company strategies/measures of performance) and their acronyms in the econometric equations and the statistical tables in the appendix.

Descriptive statistics of each of the variables are presented in table 3 which contain the mean, median, maximum and minimum, standard deviation, skewness, kurtosis, the Jarque-Bera test statistic of normality and the number of observations of each of the variables in table 1. [4]

The variable values are either reported in the survey or derived from the facts reported in the questionnaires. In the second case it was necessary to aggregate the data to reduce the number of independent variables. The method of aggregation assumed linear functional forms for those functions

[3] Rounding can lead to deviations from 100%.

[4] Further data (e.g. variance/covariance matrix, correlations coefficients) will be available at the lead author's homepage.

that relate the answers to the various sub-questions via the aggregated variables to the measures of performance.

The choice of company strategies and characteristics included in the analysis, reflects the major issues discussed in the literature. In most cases, the literature provides conflicting analytical results concerning the signs of the effects of the variables on performance in B2C eCommerce.

- *B2C eCommerce experience*: For companies engaging in B2C eCommerce, it represents a new area of business involving technological, organizational and strategic challenges so that companies usually require some time to acquire the relevant competence. Furthermore, the market features characteristics such as network effects, increasing returns to scale and positive feedback-loops so that first-movers enjoy a distinct competitive advantage (Schmitz/Latzer 2002). In addition, companies that are active in the B2C eCommerce market are likely – ceteris paribus – to have acquired more brand name capital and, consequently, attract more customers. Therefore, we derive from the literature that B2C eCommerce experience should have a positive impact on size in B2C eCommerce, i.e. the number of customers and the number of employees in B2C eCommerce. However, the impact on the growth rate of B2C eCommerce revenue is theoretically more ambiguous. Although experience might have a positive effect on the ability of the company to acquire new customers and, therefore, on growth, the pure size effect must be taken into account. As the growth rate of revenue of a given absolute growth (in terms of new customers or additional revenue) is smaller for larger companies, the impact of experience on size can be responsible for a negative effect on the growth rate. Once one accounts for the pure size effect, we expect the impact of experience on revenue growth to be positive.
- *Customer acquisition costs*: Customer acquisition costs in B2C eCommerce relative to the traditional business area measure the relative effectivness of marketing investments in the two areas of activity. We expect more effective marketing to have a positive impact on the number of customers and the number of employees in B2C eCommerce, as well as on the growth rate of revenue once the pure size effect is accounted for.
- *Number of customers who shop via both distribution channels*: A high value of this variable indicates synergies between local outlets and B2C eCommerce and should, consequently, have a positive impact on performance.
- *Number of customers in traditional business*: This variable is a measure of the size of multichannel companies. Assuming a competitive advantage of multichannel companies (e.g. trust and embeddedness, reputation, brand name capital), the effect of this variable on the number of

customers and employees in B2C eCommerce should have a positive sign. Once the pure size effect is accounted for, the positive impact of size on the growth rate of revenue should become positive as the assumed competitive advantage would – ceteris paribus – translates into a larger number of new customers for mutlichannel companies.

- *Product-Clusters*: The target group of companies in the IT-market is usually more technology affine and more ready to use B2C eCommerce. This argument is supported by surveys among consumers which show that IT-products account for a large share of the total volume of B2C eCommerce in Austria (Latzer/Schmitz 2000). We expect the IT-dummy to have a positive impact in performance in B2C eCommerce.
- *Cross-promotion between local and virtual activities*: Steinfield/Mahler/Bauer (2000) argue that cross-promotion and a local strategy have a positive impact on performance in B2C eCommerce. They emphasize the positive impact of advantages in the areas "(*1*) trust and embeddedness, (*2*) consumer needs and behavior, (*3*) services and applications that capitalize on complementarities between the Web and their physical presence, (*4*) local knowledge, (*5*) local initiatives for economic development" (Steinfield/Mahler/Bauer 2000, 273). Based on their analysis one would expect cross-promotion to have a positive impact on the performance in B2C eCommerce, i.e. on the number of customers and employees, but also on the growth rate of revenue once the pure size effect is accounted for.
- *Disintermediation*: Wigand/Bernjamin (1995) argue that B2C eCommerce reduces transaction costs so that the role of intermediaries diminishes and disintermediation results. In addition to the lower transaction costs, disintermediation further reduces (marginal) costs by eliminating the margins claimed by intermediaries. In a competitive market lower (marginal) costs imply lower prices and higher demand. A more differentiated approach to disintermediation is offered in Sakar/Butler/Steinfield (1995) and Schmitz (2000a). The former provide a number of examples of intermediation services necessary in B2C eCommerce, while the latter emphasizes that the effects of B2C eCommerce on the relative (marginal) costs of vertical integration have to be analyzed rather than the absolute (marginal) costs, that the effects on the structure of intermediation differ between various intermediation services, and that the (marginal) costs of intermediaries are likely to be reduced as well. However, one can summarize the literatur to conclude that disintermediation where it occurs, reduces the relative (marginal) transaction costs in equilibrium, eliminates margins and, in a competitive setting, reduces prices. Consequently, we expect the disintermediation dummy to have a positive impact on performance in equilibrium. As distribu-

tion to consumers is not a core competence of producers and wholesellers, a negative sign would indicate that their decision to integrate vertically was wrong and that equilibrium does not prevail.

- *Lock-in strategies*: Empirical support for the important role of lock-in effects in B2C eCommerce is provided in Johnson/Moe/Fader/Bellman/Lohse (2000). The variable provides a measure for the intensity of use of lock-in strategies. As successful lock-in strategies imply a higher customer rentention rate we expect them to have a positive impact on performance. But lock-in strategies can also have negative effects on the number of new customers who want to avoid being locked in. As market segmentation is frequently argued to be more wide spread in B2C eCommerce so that the negative effect can be mitigated more easily, we expect the positive impact on performance to dominate.[5]
- *Marketing investment*: Brynjolfsson/Smith (2000) and Smith/Brynjolfsson (2001) present empirical results of an analysis of market prices and consumer choice based on shopbot data. They conclude that B2C eCommerce companies with a well-known brand name can charge higher prices and attract more customers. Similar conclusions from their empirical research focusing on consumer choice and attitude are drawn in Clay/Krishnan/Wolff (2001), Smith (2001), Ward/Lee (2000) and Degeratu/Rangaswamy/Wu (1999). Schmitz/Latzer (2002) provide a number of analytical arguments on the role of marketing investment in B2C eCommerce. As we measure marketing as percentage of sales there is no simultaneity and identification problem as that ratio is theoretically exogenous and determined by long-run elasticities of demand with respect to price and marketing expenditure as well long-run elasticities of competitor's reaction to changes in the firm's marketing expenditure.[6] Marketing expenditure is notoriously hard to measure because it includes advertising, promotional events, but also corporate good citizenship (e.g. charity). In this respect, we deem the survey approach particularly well suited as respondents have the relevant tacit knowledge that cannot be extracted from company statistics, balance sheets or profit-and-loss-accounts. We expect marketing investment to have a positive impact on performance in B2C eCommerce, particularly once we account for its relative effectivness in B2C eCommerce vis-à-vis traditional business.
- *Outsourcing*: The effects of outsourcing on employment in B2C eCommerce are expected to be negative. With respect to the number of customers and the growth rate of revenue the analytical

[5] On the relationship between market segmentation and lock-in effects see Klemperer (1995) who also conjectures that the positive effect dominates in equilibrium even without market segmentation.

arguments are less clear-cut. Although we expect outsourcing to reduce (marginal) costs at given quality in equilibrium, its effects on performance depend on the relation between (marginal) costs and prices which in turn depends on the intensity of competition and on market transparency.

- *Pricing strategy*: We expect lower prices in B2C eCommerce relatively to traditional business to have a positive impact on performance, especially with respect to the number of customers and the growth rate of revenue. Prima facie, customers are more likely to switch from traditional retail channels to relatively low price B2C eCommerce companies. However, Smith/Brynjolfsson (2001) report findings that B2C eCommerce companies with lower prices do not always attract the largest number of customers. The retalted arguments usually assume that the B2C eCommerce market is highly transparent with lower (marginal) costs and that goods are homogenous.[7] Both assumptions are contested in Schmitz/Latzer (2002). A relatively good performance of high-price B2C eCommerce companies compared to their lower price rivals indicate that there are substantial frictions in the market. Consequently, we conclude that the results of the analytical literature and the expected sign of the effects of pricing strategy on performance are ambiguous, depending on the assumptions concerning the intensity of competition.
- *Number of customers and of employees in B2C eCommerce*: In the cases in which these variables are independent variables in the econometric analysis, they serve as a measure and a proxy of the size of B2C eCommerce companies, respectively. Once the pure size effect is accounted for, the positive impact of size on the growth rate of revenue should become significant as network effects, increasing returns to scale and positive feedback-loops imply a competitive advantage for larger B2C eCommerce companies over their smaller rivals.

A. Model Selection

Ideally, the reduced form econometric model is derived from a fully specified theoretical model of company performance in B2C eCommerce derived from first principles. That includes a fully specified model of a utility maximizing firm with clearly specified risk- and/or uncertainty-preferences which chooses the various strategies at hand given market prices and its own characteristics. Further, the model has to specify customer reaction to various strategies at hand based on individual utility maximizing behavior given market prices. The model structure outlined assumes a given market structure (firms and customers are price takers). However, to some extent the market struc-

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[6] See Berndt (1991, Chpt. 8).
[7] See inter alia Bakos (2001), Sinha (2000).

ture can depend on the optimal strategies chosen, on the solution of the model and would, therefore, have to be endogenized. To our knowledge, such a complex model is not yet available and certainly beyond the scope of this paper.

Instead, we use three different model selection methods: (*1*) „General-to-specific“, (*2*) stepwise regression based on the Akaike-Informationcriterion (AIC) and (*3*) estimation of all possible variants of a limited number of preselected base specifications consisting of two preselected independent variables each.

Ad (1) The model selection procedure “general-to-specific” starts out from an estimation of the most general specification that contains all potentially significant independent variables. A new specification is estimated based on the model that contains only those variables that were significant at the 90% significance level in the previous specification. The procedure is repeated until all remaining variables are significant which is the most parsimonious specification.[8]

Ad (2) The stepwise regression based on the Akaike-Informationcriterion (AIC), on the other hand, starts out from the smallest possible model containing a constant and a single potentially significant independent variable. In order to determine this significant variable a number of combinations of the constant with an independent variable have to be estimated. The specification with the highest AIC is selected as the base model for the second set of specifications. In each further step, each remaining variable is included in turn. The variables are retained in the consecutive specifications if the corresponding value of the AIC decrease. The procedure is discontinued as no further variable has any effect on the AIC. The AIC is based on the deviation of the estimated distribution of the dependent variable from its empirical distribution and the degrees of freedom of the specification.[9]

Both model selection methods aim at selecting a parsimonious specification with high explanatory power. As not all questions were answered by all 54 respondents, specifications containing large numbers of independent variables can have degrees of freedom too low for reliable statistical tests. In some specifications the number of observations is below 30 and the degrees of freedom are below 20. Consequently, we employed a third method of model selection to complement the results of the general-to-specific and the stepwise regression approaches.

Ad (3) In the base-model-approach we estimate specifications of (combinations of) two preselected independent variables and add a further independent variable in turn. The preselection is based on

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[8] See Hendry (1995).

[9] For a critique of stepwise regression procedures see Studenmund (1992). He points out that the procedure is not very robust with respect to different starting conditions and the arbitrary order in which the variables are included and excluded from the model.

the results of method (*1*). After all eligible independent variables have been combined with the base models the following questions were addressed: (*i*) How robust are the coefficients of the two preselected variables in the various specifications? (*ii*) What effect does the inclusion of a further variable have on the explanatory power (R^2) of the base model? (*iii*) Is the additional independent variable significant at the 90% significance level?[10]

B. Modeling the Number of Customers in B2C eCommerce in 2001

The general-to-specific approach results in a model of the dependent variable *ECOMCUST* consisting of just three independent variables, *TRADCUST* and *IT-PROD*. If *MED-PROD* is included instead of *IT-PROD*, *MKTINV* emerges as significant independent variable. The coefficient of the variable *TRADCUST* is significant at the 99%-significance level and that of the variable *IT-PROD* at the 95%-significance level. The explanatory power of the model is rather high for cross-sectional data with an R^2-value of 43%, i.e. the variation of the independent variables account for 43% of the variation of the dependent variable. The stepwise-regression-approach yields the same specification.

We further employ the base-model-approach to analyze (*i*) the robustness of the significance of the coefficients of the variables *TRADCUST* and *IT-PROD*, (*ii*) the significance of further independent variables, and (*iii*) their effects on the explanatory power of the model. The data shows that the coefficients of the variables *TRADCUST* and *IT-PROD* are highly significant in all specifications, the estimates are robust with respect to further independent variables. Furthermore, no further independent variable is significant in any of the specifications and the their effect on the explanatory power is rather low.

We further analyzed various specifications of a base model consisting of the independent variables *TRADCUST* and *MKTINV*, instead. Again the coefficients of the variable *TRADCUST* are highly significant in all specifications but also the coefficients of the variable *MKTINV* are significant in all but one, namely in the one including the variable *IT-PROD*, so that also the coefficients of the alternative base-model prove to be very robust. The explanatory power of the base-model is quite high with an R^2-value of 41%. Apart from the variable *IT-PROD* no further independent variables are significant in any of the specifications and the explanatory power does not increase markedly in any of the further specifications. The complete neglect of the variable *MKTINV*, as suggested by the general-to-specific approach including *IT-PROD* and the stepwise-regression-approach underestimates the contribution of this variable to a model of the number of customers in B2C eCommerce.

[10] The full set of regression results will be available at the lead author's homepage.

A Ramsey RESET-test of the residuals of both base-models reveals a functional misspecification of the equations, i.e. their relationships might be non-linear. Furthermore, a White-test rejects the hypothesis of the homoscedasticity of the residuals. Consequently, we estimated the following non-linear specification with heteroscedasticity consistent standard errors and covariances based on the results of the previous linear models. In order to confirm the results of the base-model-approach we re-estimated the non-linear specifications with White heteroscedasticity-consistent standard errors and covariance including all the other independent variables in turn. Based on the base-model approach, the results are highly robust and no additional variable turns out to be significant.

ECOMCUST =	*5233.842*	*-0.002733*TRADCUST*	*+0.004535*TRADCUST*MKTINV*	*(1)*
	[0.723]	*[-4.734]****	*[7.866]****	

The explanatory power of the non-linear specification is extraordinarily high (R^2-value of 81% with 48 observations) and it shows that the number of customers in B2C eCommerce is a negative function of *TRADCUST* but a positive function of the interaction term *TRADCUST*MKTINV*. That implies, that – contrary to the interpretation suggested by the linear models – a large customer base in the traditional business area does not automatically lead to a large number of customers in B2C eCommerce. Multichannel-companies have to invest in marketing activities in order to derive a competitive advantage from their existing, off-line customer base. The variable *IT-PROD* fails to be significant in the non-linear specification.

The diagnostics of the non-linear specification with respect to the functional specification and the normality of the residuals improved strongly relative to the linear specifications but failed to be entirely satisfactory. The Ramsey-RESET test points at functional misspecification (F-test: 8.356, Prob. 0.001) and the Jarque-Bera test rejects the hypothesis of normality of the residuals (LM-test: 1066.755, Prob. 0.00) due to high values for the forth moment of the estimated distribution (kurtosis 25.15). In addition to the econometric analysis we present Pearson's correlation coefficient and conduct nonparametric (rank-correlation) tests based on Kendall's-Tau and Spearman's-Rho (table 4). The Pearson's correlation coefficient shows a highly significant positive correlation between *ECOMCUST* and *TRADCUST* as well as the interaction term *TRADCUST*MKTINV*. Both variables, *TRADCUST* and the interaction term *TRADCUST*MKTINV*[11], are also significantly positively correlated with *ECOMCUST* in the rank-correlation tests. The comparative advantage of the large multichannel-companies with high marketing investments in B2C eCommerce cannot be rejected based on the nonparametric tests. As the tests focus only on the pairwise rank correlation, so

[11] Naturally the use of a product as an interaction term brings in some elements of parametrization.

that they cannot control for effects such as the pure size effect, the impact of the variable *TRADCUST* is positive.

C. Modeling the Number of Employees in B2C eCommerce in 2001

Based on the general-to-specific-approach the dependent variable *ECOMEMPL* (number of employees in B2C eCommerce)[12] is modeled as a function of the two independent variables *ECOMCUST* and *MKTINV*. [13] The analysis based on the stepwise-regression-approach produced a very similar result: This model selection procedure suggests a model consisting of the variables *ECOMEMPL* and *MKTINV* but also of the variable *CROSSINTENS* (which turns out to be insignificant but to have a slightly positive impact on the AIC).

The coefficients of *ECOMCUST* and *MKTINV* are very robust with respect to further independent variables, they are significant in all specifications. The data shows that no further variable is significant in any of the specifications and that the explanatory power of the specifications is not increased. Again, the diagnostics of the linear specifications are disappointing. The Ramsey RESET-test indicates that a linear functional form is not optimal. Also the hypothesis of homoscedasticity of the residuals is rejected by a White-test. Consequently, we have estimated the following non-linear specification with heteroscedasticity consistent standard errors and covariances.

$$ECOMEMPL = \underset{[3.325]***}{1.2129} + \underset{[2.701]***}{0.0000714 * ECOMCUST} + \underset{[3.537]***}{0.00000156 * ECOMCUST * MKTINV} + \varepsilon \quad (2)$$

The explanatory power of this specification is even higher at an R^2-value of 93% (with 48 observations). The number of employees in B2C eCommerce is a positive function of the number of customers in B2C eCommerce. The positive impact increases with the companies' marketing investment relative to B2C eCommerce-revenue. The Jarque-Bera test of the normality of the residuals strongly improves (LM-test: 408.1393) but is still not satisfactory due to high values for the forth moment of the extimated distribution (kurtosis 17.04), while the Ramsey-RESET test of functional misspecification deteriorates (F-test: 26.47427, Prob. 0.00).

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[12] The number of employees is modeled as a proxy for size rather than B2C eCommerce-success. A high number of employees can also be a consequence of inefficient production and management.

[13] In the "General-to-specific" and the stepwise-regression approach the independent variables *TRADCUST* and *ECOMCUST* are highly correlated so that they are not included in the same equation as the coefficients might be biased and the statistical inference invalide. The variables *IT-PROD* and *MED-PROD* are not independent as well such that they are not included in the same equation, too. That results in four specifications for the "general-to-specific" approach.

Employing the base-model-approach we further analyzed the robustness of the coefficients in the non-linear specification, the significance of further independent variables and their effects on the explanatory power of the model. No further independent variable has a significant coefficient or increases the explanatory power of the model apart from the variable *LOCK-IN* that is significant at the 90%-significance-level and slightly improves the R^2-value by 0.91% points and the AIC by 0.05 units.[14]

In order to crosscheck the econometric results, we estimated Pearson's correlation coefficient and conducted nonparametric tests (table 4). Both variables, *ECOMCUST* and the interaction term *ECOMCUST*MKTINV* produce highly significant values of positive Pearson's correlation and rank-correlation with the dependent variable *ECOMEMPL*. The results of the econometric approach cannot be rejected by the nonparametric approach apart for the variable *LOCK-IN* for which not positive rank-correlation can be identified.

D. Modeling the Revenue Growth in B2C eCommerce in 2001

The results of the general-to-specific-approach have to be viewed with caution in the case of the revenue growth rate of B2C eCommerce in 2001. We include 13 independent variables in the general model. Based on 25 observations the degrees of freedom are rather low such that the coefficients could be biased and the t-values invalid. Furthermore, the variables are not jointly significant. Based on an F-test the hypothesis that the variation of the entire model does not contribute to the explanation of the variation of the dependent variable cannot be rejected. The only variable that has a significant coefficient is the variable *ECOMEMPL* (in both specifications of the general-to-specific-approach, including only either one of the two highly correlated variables *ECOMCUST* and *TRADCUST*). However, in both cases the explanatory power is very low. The stepwise-regression-approach based on the AIC results in a model that includes only a constant term and the variable *LOCK-IN* without any further independent variable. Both independent variables fail to be signifi-

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The variables *IT-PROD* and *MED-PROD* are not significant in any of the specifications. However, the variable *TRADCUST* is highly significant if included instead of *ECOMCUST* but results in much lower explanatory power.

[14] The coefficients of the variable *ECOMCUST* and the interaction term *ECOMCUST*MKTINV* hardly change as we include the variable *LOCK-IN* in the specification.

ECOMEMPL =	*2.9981*	*+0.0000712*ECOMCUST*	*+0.00000158*ECOMCUST*MKTINV*	*(2')*
	*[2.694]****	*[3.062]****	*[4.038]****	
	*-0.8633*LOCK-IN+*ε			
	*[1.697]**			

The coefficient of the variable *LOCK-IN* is negative, i.e. the more B2C eCommerce companies attempt to lock-in customers, the lower their employment in B2C eCommerce. As the variable *LOCK-IN* has only marginal effects on the explanatory power of the model and fails to be significant in the nonparametric tests, we restrict the discussion to the more parsimonious model.

cant, the hypothesis that they are jointly insignificant annot be rejected by an F-test (2.352 and Prob. 0.13). Consequently, we focus on the third method of model selection – the base-model-approach.

We analyze four base-models including combinations of the variables *ECOMEMPL*, *MKTINV*, *TRADCUST* and *ECOMEXP*. We investigate the robustness of the coefficients of the independent variables of the base model, the significance of the coefficients of further independent variables and their contribution to the explanatory power of the model. The following base models are considered: *ECOMEMPL/ECOMEXP*, *ECOMEMPL/MKTINV*, *ECOMEMPL/TRADCUST* and *ECOMEXP/MKTINV*.

As the hypotheses of a linear functional form (Ramsey-RESET test) and the normality of the residuals (Jarque-Bera test) are rejected for the above specifications, we estimated a non-linear specification. The resulting equation has an R^2-value of 71% which is extraordinarily high for cross-sectional data (with 30 observations) and the hypothesis of heteroscedasticity was rejected (White F-test: 0.261261, Prob. 0.97).

$$\Delta ECOMREV = \underset{[0.799]}{17.0626} \underset{[-2.784]**}{-26.576*ECOMEMPL} \underset{[3.562]***}{+86.2560*ECOMACQ} \underset{[6.5691]***}{+1.8365*ECOMEMPL*MKTINV} + \varepsilon \quad (3)$$

The revenue growth in B2C eCommerce in 2001 is negative function of *ECOMEMPL*, but strongly significantly positively affected by the interaction term *ECOMEMPL*MKTINV* and *ECOMACQ*. We interpret *ECOMEMPL* as a proxy of size, so that the larger B2C eCommerce companies grow more slowly. As growth is measured in percentage points this result is not surprising. Nonetheless, once the negative direct effect of size and relatively ineffective marketing (relative to traditional business) are accounted for, it becomes apparent that large companies that aggressively invest in marketing, experience significantly higher revenue growth in B2C eCommerce in 2001. Furthermore, a high effectivness of the marketing investment relative to the traditional business area has a positive impact of B2C eCommerce growth. The non-linear specification is analyzed with respect to the effects of the inclusion of further independent variables on the robustness of the coefficients, the explanatory power of the model and the significance of the additional variables. No further variable is significant nor does any increase the explanatory power of the model (as measured by either the R^2-value or the AIC). The results of the diagnostics improve markedly in the non-linear specification relative to the linear specifications but they are not entirely satisfactory. The Ramsey-RESET test cannot reject functional misspecification (F-test: 3.306207, Prob. 0.038131) but the Jarque-Bera

test rejects the hypothesis of normally distributed residuals at the 90%-significance level (LM-test: 5.047454, Prob. 0.08). Consequently, we present estimates of Pearson's correlation coefficient as well as nonparametric tests based on Kendall-Tau and Spearman-Rho rank-correlation (table 4). Pearson's correlation coefficient points at a significantly positive correlation of revenue growth in B2C eCommerce in 2001 and *ECOMEMPL* as well as the interaction term *ECOMEMPL/MKTINV*. Notwithstanding, the nonparametric tests fail to confirm a significant positive correlation between revenue growth in B2C eCommerce in 2001 and *ECOMEMPL* and the interaction term *ECOMEMPL*MKTINV*. The results might be explained by the restriction to pairwise analysis so that different contradicting effects cannot be separated and controlled for. However, the rank-correlation between revenue growth in B2C eCommerce in 2001 and low customer acquisition costs is significant at the 90%-level.

The number of B2C eCommerce customers *ECOMCUST* is a better measure of size and it also explains the number of employees very well. We thus reestimate equation *(3)* based on *ECOM-CUST*.[15]

$$\Delta ECOMREV = \underset{[0.754]}{10.9448} \underset{[-4.474]***}{-0.001*ECOMCUST} \underset{[2.611]**}{+59.3843*ECOMACQ} \underset{[8.459]***}{+0.000851*ECOMCUST*MKTINV} + \varepsilon \quad (4)$$

This equation has an even higher explanatory power (R^2-value 77% with 30 observations).[16] The White-heteroscedasticity test fails to reject the hypothesis of the homoscadasticity of the redisuals (F-test statistic 0.407636 and significance 0.98). The Ramsey-RESET test cannot reject the hypothesis of the correct functional specification (F-test: 1.82045, Prob. 0.18). The Jarque-Bera test for the normality of the residuals strongly improves compared to non-linear specifications but still rejects the hypothesis of a normal distribution of the residuals (LM-test: 12.3434, Prob. 0.0021). Consequently, we also crosscheck the results using Pearson's correlation coefficient and nonparametric methods (table 4). The former is positive and highly significant for the interaction term and *ECOMACQ* but not for *ECOMCUST*. The nonparametric results for *ECOMCUST* are also diappointing. However, the rank correlation for the interaction term *ECOMCUST*MKTINV* is strictly speaking not significant at the 90%-level but with a significance level of 89% and 89.5%, respec-

[15] The reason for its insignificance in the linear equations seems to be that the pure size effect cancelled out any other effect.

tively, the results are quite indicative. The rank correlation for the variable *ECOMACQ* is significantly positive at the 90%-level.

Once we control for the pure size effect, large, marketing savvy B2C eCommerce firms grow more quickly than their competitiors. Effective marketing as measured by low relative customer acquisition costs affect the growth rate positively.

IV. Summary, consistency and Discussion of the Results

A. Summary of the Empirical Results

The results of the econometric analysis can be summarized along the following lines:

- The number of customers in B2C eCommerce (January/February 2001) is a negative function of the number of customers in the traditional line of business, but a positive function of the interaction term of the number of customers in the traditional business and the marketing investment relative to B2C eCommerce revenue. Further statistical tests (Pearson's correlation coefficient and nonparametric tests) cannot reject the econometric results. We interpret these findings as strong evidence that the size of the customer base and the size of the marketing investment play a crucial role in determining the number of customers in B2C eCommerce. Large multichannel-companies with a high marketing budget have a comparative advantage over start-ups and SMEs. Nonetheless, the data also show that size on its own is not sufficient to attract customers in B2C eCommerce.
- The number of employees in B2C eCommerce (January/February 2001) is strongly positively affected by the number of customers in B2C eCommerce, as expected. The relationship is not linear, as it increases with the size of the marketing investment (relative to B2C eCommerce revenue). Further statistical tests (Pearson's correlation coefficient and nonparametric tests) cannot reject the econometric results.
- The growth rate of revenue in B2C eCommerce (in 2001) is negatively related to size (whether measured by the number of customers in B2C eCommerce or proxied by the number of employees in B2C eCommerce), but strongly positively affected by the interaction term of size and marketing investment and by the relative effectiveness of marketing as measured by the relative customer acquisition costs in B2C eCommerce (relative to the traditional line of business). As we measure the relative growth rate of revenue, large companies that grow rapidly in terms of

[16] All further variables have been included in the equation on a one-by-one basis but failed to be significant. The only exception being *LOCK-IN* which is significant but reduces the explanatory power of the equation greatly as the other

absolute numbers, feature lower growth rates than small ones which are less successful in absolute terms (pure size effect). Once the pure size effect has been accounted for, the interaction term of size and marketing investment strongly positively affects the growth rate of revenue in B2C eCommerce. The nonparametric tests indicate a positive rank correlation between the growth rate of revenue and the interaction term of the size and marketing investment, albeit the significance level is slightly below 90%. The nonparametric tests also show a significantly positive rank.correlation between the growth rate of revenue and the relative customer acquisition costs. We interpret these findings as evidence that large multichannel-companies that invest in effective marketing grow more rapidly, in addition to the fact that they already have a larger customer base.

In sum, the econometric and nonparametric evidence suggests that large, marketing savvy companies have a comparative advantage relative to their smaller less marketing savvy competitors. The positive effects of size on growth indicate a concentration process in the B2C eCommerce market. Furthermore, the empirical analysis highlights the crucial role of marketing investment in B2C eCommerce, so that the analysis of market structure has to account for the significance of endogenous sunk costs.[17]

B. Consistency of Quantitative and Qualitative Results

The econometric and nonparametric results indicate a competitive advantage for multichannel-companies which are confirmed by the analysis of those questions in the two surveys which focused on subjective interpretation of, or attitude toward different issues rather than purely on data. In the first survey 96% of the respondents argued that a very important or important advantage of the multichannel-companies would be a modern image also for their traditional business. Furthermore, 92% indicated that multichannel-companies profited from higher trustworthiness due to their traditional business. According to the second survey, the most important success factor in B2C eCommerce was “synergies with the traditional business” (74%). Only one fifth of the respondents reported a migration of revenues from their traditional business to their own B2C eCommerce activities, while one half of the respondents experienced extra revenue also in their traditional business. The remaining 40% argued that their expansion into B2C eCommerce did not affect their traditional business at all. At the same time, most of the companies have already been active in either retail or catalogue

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variables cease to be significant.

[17] Most of the literature on the intensity of competition completely neglects this issue, exceptions are Schmitz/Latzer (2002) and (Schmitz 2000b, 206) while Borenstein/Saloner (2001) mention endogenous sunk costs in passing only.

sales before they entered the B2C eCommerce market (93%) and most of them had a very positive attitude towards cross-promotion and regard the following marketing methods as very important: after-sales services in the local stores (83%), pick-up goods bought in B2C eCommerce at local store (67%), exchange goods bought in B2C eCommerce at local stores (66%).

The econometric and nonparametric results emphasize the crucial role of marketing investment to explain the performance of B2C eCommerce companies. In the first survey the respondents ranked a company's reputation in B2C eCommerce first in affecting consumer choice among B2C eCommerce suppliers (71% very important/18% important criterion). The high reputation in the traditional business is the second most important criterion (with 67% very important/31% important). In the second survey respondents ranked the reputation in their traditional business as the second most important success factor (72%). High marketing investment was regarded as a success factor in B2C eCommerce by 28%. At the same time, only 16% reported that lower prices were a success factor. Which is not very surprising as 90% reported similar prices in B2C eCommerce and in their traditional business (± 1.5% incl. p&p, VAT if applicable).

Furthermore, the qualitative results highlight a number of characteristics of for B2C eCommerce that negatively influence market transparency. More than three quarters of the respondents (78%) of the respondents argued that problems with consumer- and privacy-protection were a barrier for consumers to adopt B2C eCommerce. In addition 75% believed that the market was intransparent with respect to products and prices, and 64% reported that it was intransparent with respect to suppliers and their business practices. Overall, these results reject the hypothesis that B2C eCommerce market is highly transparent, confirming the importance of marketing investment, i.e. endogenous sunk costs. Furthermore, the conclusion, that the market is less transparent than widely expected, is also consistent with a survey among more than 1000 B2C eCommerce users in Austria in January/February 2000: The most important criteria users based their choice of B2C eCommerce company on, were the brand name of the B2C eCommerce company (49% very important/important) and the brand name of the company that produces the products offered (40% very important/important). The most important barriers to B2C eCommerce adoption were uncertainty with respect to data- and consumer-protection (75% very important/important), impossibility to examine products sufficiently before the purchase (74% very important/important) and uncertainty with respect to the payment mechanisms in B2C eCommerce (71% very important/important).[18]

[18] See Latzer/Schmitz (2000).

The consistency of the results based on the analysis of the questions focusing on subjective interpretation and attitude, on one hand, and the econometric and nonparametric results, on the other hand, underlines our conclusions with respect to the role of size and endogenuous sunk cost as success factors in B2c eCommerce and their potential to shape the structure of that market. Furthermore, it demonstrates the potential merits of the survey based approach to the empirical study of industry structure and performance in the B2C eCommerce market.

C. Discussion

The reduced form equations have not been derived from a fully specified micro-economic model, as one complex enough to incorporate the entire set of company strategies and characteristics we wanted to test, does not seem feasible (at the moment). Consequently, we restricted the investigation to an explorative, quantitative analysis in order to uncover significant statistical relations and patterns in the large data-set that explain the measures of company performance in Viennese B2C eCommerce. In principle, the sample size (58 – first survey and 54 – second survey) is sufficient for this objective, but a larger sample would have allowed for a more differentiated analysis with respect to a number of dimensions (digital/physical goods, pure B2C eCommerce companies/ multichannel-companies etc.). As the exact structure of the population is unknown, we cannot guarantee that the sample is representative. After the completion of an intensive search for Viennese B2C eCommerce companies we have invited all of them to participate in the survey. However, with a response rate of 32.4% in the first and out of them 93.1% in the second survey we cannot rule out the presence of a self-selection bias.

Despite strong improvements of the Jarque-Bera test statistics concerning the normality of the residuals and the Ramsey-RESET test statistics concerning functional misspecification of the equations due to the non-linear specifications, the diagnostics are still not entirely satisfactory. The results of the Ramsey-RESET tests might also hint at potentially omitted variables such as technical characteristics and consumer- and data-protection standards of the companies' web-sites. An exception is the model of *ΔECOMREV* based on *ECOMCUST* which provides quite satisfactory diagnostics in all but one instance, the Jarque-Bera test. A posteriori the number of variables included in the analysis is restricted by the surveys unless external data sources are available (e.g. web based quality ratings). Unfortunately, this was not the case for our sample. A priori financial resources as well as considerations concerning the effects of the length of the questionnaire on the response rate, place sever limits on the size of the questionnaire. Some interesting questions can hardly be included in a questionnaire without jeopardizing the response rate, such as those regarding absolute

values of revenue in B2C eCommerce or the compliance of the companies with consumer- and data-protection laws. This impedes models which include a richer set of behavioral (e.g. customer satisfaction) and intermediate target (e.g. service quality) variables.

Furthermore, the results are based on survey data. In general, the reported facts and figures can be counter-checked only to the extent that we check for inconsistencies between the quantitative and the qualitative information provided. In order to avoid diverging interpretations of questions, we focused on numbers and abstained from general questions concerning the subjective judgements on market structure and transparency. However, for the questions that focused in qualitative judgement we offered structured multiple choice answers. Test interviews were conducted prior to the surveys to finetune potentially misleading questions, so that we expect potentially remaining misinterpretations of single items of the questionnaires to cancel out across the entire sample. Furthermore, we were aware of the fact that B2C eCommerce (e.g. market structure and transparency) attracted much attention in the popular debate in the years up to the survey. In order to account for the influence public opinion and expectations could have on the Viennese B2C eCommerce companies, we restricted the questions regarding strategy largely to clear and unambiguous facts and figures from which we constructed variables to quantify company strategies.

We conclude that the analysis clearly shows the merits of the survey based method to analyze the effects of company strategies and characteristics on the performance of B2C eCommerce companies and that it is, both, reliable with respect to quality and consistency of the data and promising with respect to the potential insights.

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VI. APPENDIX

Table 1: Web-sites consulted in order to identify the population

Web-site	**Address (URL)**
Austromall	http://www.austromall.at
Austronaut	http://www.austronaut.at
DerStandard	http://www.derstandard.at
e-media	http://www.emedia.at
EUNet	http://www.eunet.at
Fireball	http://www.fireball.at
Gangl	http://www.gangl.com
Google	http://www.google.com
IDG Top 500	http://www.idg.at
kaufrausch.cc	http://www.kaufrausch.cc
Netway	http://www.netway.at
Nextra	http://www.nextra.at
Shopguide	http://www.shopguide.at
Telekom	http://www.aon.at
Vienna Online	http://www.vienna.at
WienerWirtschaftsWeb	http://www.wirtschaftsweb.at
Wirtschaftskammer Wien (WKW)	http://wko.at/wien/
Yahoo	http://www.yahoo.de

Table 2: Company characteristics, company strategies and measures of performance in B2C eCommerce

Company Characteristics (January/February 2000)	***Acronym in Equations***
B2C eCommerce experience: Provides number of years already engaged in B2C eCommerce. Possible values: 0 to 7.	*[ECOMEXP]*
Customer acquisition costs: Captures customer acquisition costs in B2C eCommerce relative to traditional business. Possible values: 1 (lower)/0(otherwise).	*[ECOMACQ]*

Number of customers who shop via both distribution channels: Share of customers that use both sales channels (as share of total number of customers). Possible values: 0% to 100%.	*[2CHANCUST]*
Number of customers in traditional business: Absolute number of customers in traditional business. Possible values: 0 (pure B2C eCommerce companies) to 2.76 Mio.	*[TRADCUST]*
Product-clusters: Based on the products offered by a company; clusters based on statistical cluster analysis; IT-cluster (IT-PROD) comprises of all companies that offer IT and electronic products, Media-cluster (MED-PROD) comprises of all companies which offer consumer electronics but are not included in the IT-cluster; the rest of the companies belongs to neither. Possible values: 0/1.	*[IT-PROD, MED-PROD]*
Company Strategies (January/February 2000)	
Cross-promotion between local and virtual activities: Captures the use of cross-promotion tools such as (1) pick-up, (2) return or exchange goods and (3) after-sales support in traditional store after eCommerce transaction. Possible values: 0 to 3.	*[CROSS-PROM]*
Disintermediation: Dummy variable defined as 1 for B2C eCommerce companies which focused their traditional business exclusively on production and/or whole-sale trade. Possible values: 0/1.	*[DISINT]*
Lock-in strategies: Captures the use of lock-in strategies in B2C eCommerce such as (1) loyalty bonus, (2) easy-to-use transaction procedures for repeat purchases, (3) individualized product suggestions, (4) individualized products, (5) personal accounts, (6) special product promotion for loyal customers, (7) other. Possible values: 0 to 7.	*[LOCK-IN]*
Marketing investment: Captures marketing investment as share of B2C eCommerce revenue based on average values (1%, 3,5%, 7,5%, 12,5%, 20%, 37,5% and 60%) of the different categories in the questionnaire. Possible values: 1%, 3,5%, 7,5%, 12,5%, 20%, 37,5% and 60%.	*[MKTINV]*
Outsourcing: Captures the use of outsourcing by summing over the various activities that are outsourced (1) inventory management, (2) delivery/logistics, (3) product range management, (4) hardware/software installation and maintenance, (5) B2C eCommerce marketing, (6) web-site maintenance/updates, (7) customer relations, (8) other. Possible values: 0 to 8.	*[OUTS]*
Pricing strategy: Measures pricing strategy for product range in B2C eCommerce relative to traditional business based on categories (1) much lower (>-10%), (2) lower (<-10%), (3) roughly the same prices, (4) higher (<+10%), (5) much higher (>+10%). Prices include p&p and sales tax if applicable but exclude special offers. Possible values: 1 (lower)/ 0 (otherwise).	*[PRICE]*
Measures of Performance	
Number of employees in B2C eCommerce in January/February 2001 (in persons/year)*	*[ECOMEMPL]*

Number of customers in B2C eCommerce in January/February 2001*	*[ECOMCUST]*
Realized revenue growth in B2C eCommerce in 2001 (in %)	*[ΔECOMREV]*

* For the purpose of modelling the revenue growth rate in 2001 *[ΔECOMREV]* the variables *ECOMEMPL* and *ECOMCUST* serve as a measure and a proxy of size, respectively, and as independent variables.

Table 3: Descriptive statistics of the variables

	ECOMACQ	*OUTS*	*CROSS-PROM*	*DISINT*	*ECOMEMPL*	*ECOMEXP*	*CUSTRET*	*ECOMCUST*	*2CHANCUST*	*MKTINV*	*MED-PROD*	*IT-PROD*	*PRICE*	*TRADCUST*	*ΔECOMREV*
Mean	1.940000	1.810345	1.931034	0.086207	4.738679	3.037736	1.981818	31451.86	28.97917	11.60185	0.241379	0.206897	2.942308	5801952.	62.10488
Median	2.000000	2.000000	2.000000	0.000000	1.000000	3.000000	2.000000	1000.000	10.00000	3.500000	0.000000	0.000000	3.000000	10000.00	25.00000
Maximum	3.000000	7.000000	3.000000	1.000000	100.0000	7.000000	6.000000	600000.0	100.0000	60.00000	1.000000	1.000000	5.000000	2.76E+08	600.0000
Minimum	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	10.00000	0.000000	1.000000	0.000000	0.000000	1.000000	0.000000	0.000000
Std. Dev.	0.766918	1.616330	1.121748	0.283121	15.06062	1.580680	1.683151	114349.3	33.83470	18.21216	0.431657	0.408619	0.460752	38998511	105.9090
Skewness	0.100473	1.039867	-0.540893	2.948617	5.434267	0.497923	0.734283	4.118651	1.045581	1.850439	1.208734	1.447136	-0.225921	6.853371	3.544350
Kurtosis	1.739990	4.224113	1.872139	9.694340	32.97988	3.182443	2.872556	18.84231	2.744270	5.096248	2.461039	3.094203	15.31563	47.98644	17.57359
Jarque-Bera	3.391674	14.07405	5.902297	192.3462	2245.695	2.263531	4.979621	677.5177	8.876709	40.70418	14.82537	20.26541	329.0711	4607.614	448.6754
Probability	0.183446	0.000879	0.052280	0.000000	0.000000	0.322464	0.082926	0.000000	0.011815	0.000000	0.000604	0.000040	0.000000	0.000000	0.000000
Observations	50	58	58	58	53	53	55	51	48	54	58	58	52	50	41

Table 4:Pearson's correlation coefficients and nonparametric tests of the dependent variables *ECOMCUST*, *ECOMEMPL* and *ΔECOMREV* and the independent variables that are significant in the non-linear specifications

		Pearson's Correlation	Nonparametric Correlation	
			Kendall-Tau-b	Spearman-Rho
ECOMCUST vs. TRADCUST	Corr.	0.593***	0.557***	0.726***
	Sign.	0.000	0.000	0.000
	N	49	49	49
*ECOMCUST vs. (TRADCUST*MKTINV)*	Corr.	0.819***	0.463***	0.646***
	Sign.	0.000	0.000	0.000
	N	48	48	48
ECOMEMPL vs. ECOMCUST	Corr.	0.899***	0.331***	0.430***
	Sign.	0.000	0.002	0.002
	N	50	50	50
*ECOMEMPL vs. (ECOMCUST * MKTINV)*	Corr.	0.893***	0.271**	0.348**
	Sign.	0.000	0.011	0.015
	N	48	48	48
ΔECOMREV vs. ECOMEMPL	Corr.	0.306*	0.072	0.097
	Sign.	0.065	0.574	0.566
	N	37	37	37
ΔECOMREV vsECOMACQ	Corr.	0.325*	0.292*	0.343*
	Sign.	0.065	0.052	0.05
	N	33	33	33
	Corr.	-0.046	0.159	0.231

ΔECOMREV vs. ECOMCUST	Corr.	-0.046	0.159	0.231
	Sign.	0.788	0.364	0.176
	N	36	36	36
*ΔECOMREV vs. (ECOMCUST * MKTINV)*	Corr.	0.567***	0.193	0.275
	Sign.	0.000	0.110	0.105
	N	35	35	35
	Corr.	0.713***	0.040	0.066
	Sign.	0.000	0.741	0.701
	N	36	36	36

*** 99%-significance level, ** 95%- significance level, * 90%- significance level. Further, significant nonparametric correlation is also present between *ECOMEMPL* and *TRADCUST* as well as between *ΔECOMR* and *LOCK-IN* and between *ECOMCUST* and PRICE