The Effects of Company Characteristics and Strategy on the Performance of Viennese B2C eCommerce Companies: Survey Based Econometric and Non-Parametric Approaches
(FIRST DRAFT)

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The Effects of Company Characteristics and Strategy on the Performance of Viennese B2C eCommerce Companies: Survey Based Econometric and Non-Parametric Approaches (FIRST DRAFT)[1]

In January and February 2001 we conducted an in-depth-survey among 58 B2C eCommerce companies in Vienna. It aimed at generating 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. One year later a second short questionnaire was circulated to gather data on success factors and revenue growth in 2001. This paper presents econometric estimates of the effects of company characteristics and company strategies on the performance of Viennese B2C eCommerce companies in 2001. We provide an 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 and size and endogenous sunk costs emerge as the main success factors. Furthermore, the results of non-parametric 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 complements the approach based on prices and consumer behavior commonly applied.

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Introduction

Most studies on alternative strategies in B2C eCommerce focus on market allocation (mostly prices), consumer behavior and derive the implications for strategy based on a number of additional assumptions and hypothesis (i.e. market structure and transparency) which are usually very hard to observe.[2] We favor 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 non-parametric analysis based on the findings of two surveys of Viennese B2C eCommerce companies in January/February 2001 and January/February 2002. The surveys aimed at three interrelated objectives: (*i*) In the first survey the primary objective was to generate data on company strategies and characteristics in Viennese B2C eCommerce. (*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 non-parametric 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.

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[2] Brynjolfsson/Smith 2000, Clay/Krishnan/Wolff 2001, Smith/Brynjolfsson 2001, Smith 2001, Ward/Lee 2000.

1. 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"[3] and the 18 web-sites listed in table 3 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. Most companies had been active in retail-sales, whole-sale 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 non-parametric analysis are solely based on the hard facts

[3] Public Voice 2000.

reported. However, we also show that the quantitative results are consistent with the results of the more subjective questions.

2. Revenue Growth in B2C eCommerce: Forecast and Realization

The following table (table 1) summarizes the results of the first and the second survey concerning the forecasts (rows *E(ΔECOMREV)* and the realizations (columns (*ΔECOMREV*) of the growth rate of revenue in B2C eCommerce in Vienna in 2001. The responses are grouped in 6 categories.

Table 1: Revenue Growth Rate in B2C eCommerce in Vienna 2001: Forecast and Realization (N=37)

	Revenue Growth Rate in B2C eCommerce in Vienna 2001: Realization							
Revenue Growth Rate in B2C eCommerce in Vienna 2001: Forecast		0%	<10%	<20%	<50%	<100	>=100%	Sum
	0%	**2.7%**	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%
	<10%	2.7%	**10.8%**	5.4%	2.7%	2.7%	2.7%	27.0%
	<20%	0.0%	2.7%	**2.7%**	5.4%	5.4%	0.0%	16.2%
	<50%	2.7%	0.0%	2.7%	**8.1%**	0.0%	0.0%	13.5%
	<100%	2.7%	5.4%	2.7%	5.4%	**5.4%**	8.1%	29.7%
	>=100	0.0%	0.0%	0.0%	0.0%	5.4%	**5.4%**	10.8%
	Sum	10.8%	18.9%	13.5%	21.6%	18.9%	16.2%	100.0%

- The interpretation based on the 6 categories and 37 responses shows that 35.1% of the respondents met their forecasts for 2001 exactly (bold in diagonal), 32.4% overestimated (light gray cells) and 32.4% underestimated (dark gray cells) their revenue growth rate in 2001.

- The categories are relative broad, so that the precision of the interpretation concerning the differences between the forecasts and realizations is smaller relative to a comparison of the individual responses. Instances of under- and overestimation that occur with the categories are not captured by the approach based on the categories.

- Notwithstanding, an analysis based on the exact values reported in the two surveys provides a similar picture: 10.8% of the 37 respondents exactly met their forecasts, 48.7% overestimated and 40.5% underestimated their revenue growth rate in 2001. The pronounced reduction in the share of respondents that met their forecasts exactly (from 35.1% to 10.8%) corresponds to expectations as the analysis is now based on exact values rather than on broad categories. While the analysis based on the first approach tends to underestimate differences between forecasts and realizations, the second approach tends to overestimate them, as it does not distinguish between minor and substantial differences between the two values.

- The congruence of the interpretation of both approaches, nonetheless, is striking: Even tough, the number of companies the met their forecasts exactly differs, it is still substantial. Furthermore, the two groups that either over- or underestimated their revenue growth rate are quite similar in both cases. Consequently, both methods of analysis confirm that the Viennese B2C eCommerce companies have not systematically overestimated the growth rates of revenue in B2C eCommerce despite the B2C eCommerce hype and bust.

- In order to analyze the relative extent of over- and underestimation we conducted statistical tests of the equality of the means and variances of the two subsamples of the absolute values of $E(\Delta ECOMREV) > \Delta ECOMREV$ and $E(\Delta ECOMREV) \leq \Delta ECOMREV$, respectively. Figure 1 shows the frequency distribution of the differences between forecasts and realizations. Table 16 provides the descriptive statistics of the entire data set of absolute values of over- and under-estimation. (For the purpose of the statistical analysis the latter also includes the 10.8% of the companies that met their forecasts exactly. Although the means and the variances are not identical, the differences are not significant as the test for equality of means of the subsample (table 17) clearly fails to reject the hypothesis of equal means. The Levene-test for equality of variances cannot reject the hypothesis of equal variances of the two subsamples.

Based on the analysis of, both, the number of companies that over- or underestimate the growth rate of revenue in B2C eCommerce and the extent of divergence between forecasts and realizations, we conclude that the Viennese B2C eCommerce companies did not systematically over-estimate growth rates despite the end of the B2C eCommerce hype.

3. Econometric Analysis of the Number of Customers, Employees and the Rate of Revenue Growth in Viennese B2C eCommerce

Both, the dependent and the independent variables are derived from the first and the second survey. The following table (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.

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) to 3 (higher).	*[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	*[LOCK-IN]*

suggestions, (4) individualized products, (5) personal accounts, (6) special product promotion for loyal customers, (7) other. Possible values: 0 to 7.	
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 (much lower) to 5 (much higher).	*[PRICE]*
Measures of Performance	
Number of employees in B2C eCommerce in January/February 2001 (in VZÄ?)*	*[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.

Descriptive statistics of each of the variables are presented in table 14 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 2.

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 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.[4] 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 multi-channel 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 - translate 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-

[4] See Schmitz/Latzer 2002.

products account for a large share of the total volume of B2C eCommerce in Austria.[5] 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 advanatges 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/Bejamin (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. Sakar/Butler/Steinfield (1995) and Schmitz (2000a) take a more differentiated approach to disintermediation. The former provide a number of examples of intermediations 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 distribution 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*: Johnson et al. (2000) provide empirical support for the important role of lock-in effects in B2C eCommerce. 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 eCom

[5] See Latzer/Schmitz 2000.

merce so that the negative ffect can be mitigated more easily, we expect the positive impact on performance to dominate.[6]

- *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. Clay/Krishnan/Wolff (2001), Degeratu/Rangswamy/Wu (1999), Smith (2001) and Ward/Lee (2000) draw similar conclusions from their empirical research focusing on consumer choice and attitude. Schmitz/Latzer (2002) provide a number of analytical arguments on the role of marketing investment in B2C eCommerce. 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 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. 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 most customers. The 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

[6] 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.

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.

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 structure 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 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 variable 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

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[7] See Bakos 2001 and Sinha 2000.

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.

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.[9]

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 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?

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 two independent variables, *TRADCUST* and *IT-PROD*. Table 4, columns 1 and 2, table 5, column 6 present the coefficients, their t-statistics, the R^2-values and the number of observations of the specifications. The stepwise-regression-approach yields the same specification. 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.

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[8] See Hendry ????.

[9] See ????.

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 columns of table 5 present the coefficient estimates and the respective t-values of the independent variables in various specifications based on the base model derived above. In each specification we add a single further independent variable to the base-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, table 5 reveals that no further independent variable is significant in any of the specifications and the their effect on the explanatory power is rather low. In some specifications it increases to 46%. The following equation presents the coefficients, the respective t-values and the significance levels for the base model (*** 99%-significance level, ** 95%- significance level, * 90%- significance level).

$$\begin{array}{lllll} ECOMCUST = & 3283.306 & +0.001821*TRADCUST & +75736.67*IT\text{-}PROD + \varepsilon & (1) \\ & [0.219] & [5.517]^{***} & [2.530]^{**} & \end{array}$$

The data in table 4 presents the analysis 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 proof 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 following equation presents the coefficients, the respective t-values and the significance levels for the alternative base model.

$$\begin{array}{lllll} ECOMCUST = & 4949.636 & +0.000339*TRADCUST & +1546.819*MKTINV + \varepsilon & (2) \\ & [0.313] & [5.341]^{***} & [2.148]^{*} & \end{array}$$

The complete neglect of the variable *MKTINV*, as suggested by the general-to-specific and the stepwise-regression-approach underestimates the contribution of this variable to a model of the number of customers in B2C eCommerce .

A Ramsey RESET-test of the residuals of both base-models reveals a functional miss-specification 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 including the other independent variables. Based on the base-model approach, the results are highly robust and the only additional vari

able which turns out to be significant is *ECOMACQ* (customer acquisition costs in B2C eCommerce relative to the traditional business).

ECOMCUST =	*47544.15*	*-0.002942*TRADCUST*	*+0.004848*TRADCUST*MKTINV*	*-23745.06*ECOMACQ + ε*	*(3)*
	[1.658]	*[-6.076]****	*[10.139]****	*[-1.825]**	

The explanatory power of the non-linear specification is extraordinarily high (R^2-value of 83%) and it shows that the number of customers in B2C eCommerce is a negative function of *TRADCUST* and *ECOMACQ* 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. However, the marketing investment has to be effectively allocated as high customer acquisition costs (relative to the traditional business are) have a negative impact on the number of customers in B2C eCommerce. 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 (graph 1). In addition to the econometric analysis we present Pearson's correlation coefficient and conduct non-parametric (rank correlation) tests based on Kendall's-Tau and Spearman's-Rho (table 15). The Pearson's correlation coefficient shows a highly significant positive correlation between *ECOMCUST* and *TRADCUST* as well as the interaction term TRADCUST*MKTINV, but not for the variable *ECOMACQ*. Both variables, *TRADCUST* and the interaction term *TRADCUST*MKTINV* 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 non-parametric tests. As the tests focus only on the pairwise rank correlation, so that they cannot control for effects such as the pure size effect, the impact of the variable *TRADCUST* is positive.

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) is modeled as a function of the two independent variables *ECOMCUST* and *MKTINV* (table 6, columns 2, 3 and 4)[10]. The analysis based on the stepwise-regression-approach produced the same results.

In tables 6 and 7 we analyze the robustness of the coefficients, the significance of further independent variables and their effects on the explanatory power of the model based on the base-model-approach. 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 in tables 6 and 7 and that the explanatory power of the specifications is not increased. The explanatory power of the model is very high for cross-sectional data with an R^2-value of 83%.

ECOMEMPL =	*-0.4494*	*+0.000117*ECOMCUST*	*+0.1156*MKTINV + ε*	*(4)*
	[-0.387]	*[13.852]****	*[2.210]***	

Again, the diagnostics 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 =	*1.2129*	*+ 0.0000714* ECOMCUST*	*+0.00000156* ECOMCUST * MKTINV + ε*	*(5)*
	*[3.325]****	*[2.701]****	*[3.537]****	

The explanatory power of this specification in even higher at an R^2-value of 93%. 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, but the Ramsey-RESET test of functional misspecification deteriorates (graph 2).

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* which is significant at the 90%-significance-level and slightly increases the R^2-value by

[10] The specification in table 6, column 1 is not considered any further as the two independent variables *TRADCUST* and *ECOMCUST* are highly correlated (table 12) so that the coefficients might be biased and the statistical inference invalide.

0.91% points and the AIC by 0.05 units.[11] As the variable *LOCK-IN* has only marginal effects on the explanatory power of the model, we prefer the more parsimonious model.

In order to cross-check the econometric results, we estimated Pearson's correlation coefficient and conducted non-parametric tests (table 15). Both variables, *ECOMCUST* and the interaction term *ECOM*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 non-parametric approach apart for the variable *LOCK-IN* for which not positive rank-correlation can be identified.

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* (both specifications of the general-to-specific-approach, including only 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 without any further independent variable. Consequently, we focus on the third method of model selection – the base-model-approach.

In the tables 8, 9, 10 and 11 we present the results of the analysis of 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

[11] 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*	-0.8633**LOCK-IN*+ε	
	[2.694]***	[3.062]***	[4.038]***	[1.697]*	*(6)*

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 is. As the variable *LOCK-IN* has only marginal effects on the explanatory power of the model, we prefer the more parsimonious model with a more straightforward interpretation.

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*.

Table 8 summarizes the results of various specifications of the base model *ECOMEMPL/ECOMEXP.* The data shows that these two variables are significant in eight and seven specifications, respectively, and that the explanatory power of the model increases up to an R^2-value of 33%. Furthermore, the additional independent variables *TRADCUST* and *MKTINV* are significant in the respective specifications (table 8, columns 7 and 10).

In table 9 we present the results of the analysis of the base model *ECOMEMPL/MKTINV* and find that the variables are significant in five and seven specifications, respectively. The following equation presents the base model including the additional independent variable *ECOMACQ* with the highest explanatory power amongst the specifications in table 9 (R^2-value 40%).

$$\Delta ECOMREV = \underset{[2.295]^{**}}{106.81364} + \underset{[1.877]^{*}}{23.0545 * ECOMEMPL} + \underset{[2.809]^{***}}{2.9171 * MKTINV} - \underset{[-2.733]^{**}}{67.3709 * ECOMACQ} + \varepsilon \quad (7)$$

The results of the analysis of the base model *ECOMEMPL/TRADCUST* are detailed in table 10, the two independent variables of the base model are significant in eleven and twelve specifications, respectively. Further significant independent variables are *ECOMEXP* and *LOCK-IN* but the specification including the latter has an explanatory power of only 12%. The following specification has an explanatory power of 46%.

$$\Delta ECOMREV = \underset{[-0.121]}{-12.3594} + \underset{[4.152]^{***}}{82.5933 * ECOMEMPL} - \underset{[-0.571]}{14.690 * ECOMACQ} - \underset{[-2.037]^{*}}{0.0000608 * TRADCUST} + \varepsilon \quad (8)$$

The results of the base model *ECOMEXP/MKTINV* are displayed in table 11 which are significant in six and ten specifications, respectively. The following equation has an R^2-value of 38%.

$$\Delta ECOMREV = \underset{[3.154]^{***}}{164.8000} - \underset{[-0.954]}{10.9620 * ECOMEXP} - \underset{[-2.32]^{**}}{56.8316 * ECOMACQ} + \underset{[3.262]^{***}}{3.4447 * MKTINV} + \varepsilon \quad (9)$$

Finally, we estimate a specification which includes all those independent variables that are significant in at least one specification. The exercise results in a model including two significant independent variables *ECOMEMPL/MKTINV* with an R^2-value of 56% (table 10, column 13).

As the hypotheses of a linear functional form (Ramsey-RESET test), of the homoscedasticity (White test) and the normality of the residuals (Jarque-Bera test) are rejected for the above specifications, we estimated a non-linear specification with heteroscedasticity consistent standard errors and covariances. The resulting equation has an R^2-value of 70% which is extraordinarily high for cross-sectional data.

$$\Delta ECOMREV = \underset{[3.886]^{***}}{142.8680} - \underset{[-2.784]^{***}}{22.7971 * ECOMEMPL} - \underset{[-2.655]^{*}}{53.8809 * ECOMACQ} + \underset{[6.5618]^{***}}{1.8538 * ECOMEMPL * MKTINV} + \varepsilon \quad (10)$$

The revenue growth in B2C eCommerce in 2001 is negative function of *ECOMEMPL* and *ECOMACQ*, but strongly significantly positively affected by the interaction term *ECOMEMPL*MKTINV*. 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. 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 (graph 3). Consequently, we present estimates of Pearson's correlation coefficient as well as non-parametric tests based on Kendall-Tau and Spearman-Rho rang-correlation (table 15). 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 non-parametric tests fail to confirm a significant positive correlation between the revenue growth in B2C eCommerce in 2001 and the variables in the model, in particular the interaction term. The results might be explained by the restriction to pairwise analysis so that different contradicting effects cannot be separated and controlled for.

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 *(10)* based on *ECOMCUST*.[12]

$\Delta ECOMREV =$	*98.307*	*-0.001*ECOMCUST*	*--35.554*ECOMACQ*	*+0.000875*ECOMCUST*MKTINV* + ε	*(11)*
	*[3.328]****	*[-4.380]****	*[-2.400]***	*[8.623]****	

This equation has an even higher explanatory power (R^2-value 76%).[13] The White-heteroscedasticity test fails to reject the hypothesis of the homoscadasticity of the redisuals (F-test statistic 0.537 and significance 0.83). The Ramsey-RESET test cannot reject the hypothesis of the correct functional specification (figue 5). The Jarque-Bera test for the nomrality of the residuals strongly improves compared to non-linear specifications but still rejects the hypothesis of a normal distribution of the residuals (figure 5). Consequently, we also cross-check the results using Pearson's correlation coefficient and non-parametric methods (table 15). The former is positive and highly significant for the interaction term but not for *ECOMCUST* or *ECOMACQ*. The non-parametric results for *ECOMCUST*

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

are also diappointing. However, the rank correlation for the interaction term *ECOM*MKTINV* is strictly speaking not significant at the 90%-level but with a significance level of 89% and 89.5%, respectively, the results are quite indicative. Once we control for the pure size effect, large, marketing savvy B2C eCommerce firms grow more quickly than their competitiors. High relative customer acquisition costs affect the growth rate negatively.

4. Summary and Discussion of the Results

We analyzed the forecasts and the realizations of the growth rate rates B2C eCommerce revenue in Vienna in 2001. The data has not revealed any systematic bias towards over- or underestimation of expectations despite the considerable changes of attitude towards the New Economy in the public opinion and, in particular, the worsening sentiment of investors as mirrored in the development of financial markets during 2001.

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 and the customer acquisition costs in B2C eCommerce (relative to 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 non-parametric tests) cannot reject the econemtric 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 and that ineffective marketing (higher customer acquisition costs in B2C eCommerce than in the traditional line of business) has a negative effect on the number of B2C eCommerce customers.

- The number of employees in B2C eCommerce (January/February 2001) is strongly positively affected by the number of customers in B2C eCommerce. The relationship is not linear, as it increases with the size of the

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[13] 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 variables cease to be

marketing investment (relative to B2C eCommerce revenue). Further statistical tests (Pearson's correlation coefficient and non-parametric tests) cannot reject the econemtric 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) and the customer acquisition costs in B2C eCommerce (relative to the traditional line of business), but strongly positively affected by the interaction term of size and marketing investment. As we measure the relative growth rate of revenue, large companies that grow rapidly in terms of 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 non-parametric 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%. 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.

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 $\Delta ECOMREV$ 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.

The econometric and non-parametric evidence suggests that large, marketing savvy companies keep growing 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

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significant.

marketing investment in B2C eCommerce, so that the analysis of market structure has to account for the significance of endogenous sunk costs.[14]

Consistency of Quatitative and Qualitative Results

The econometric and non-parametric 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/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 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 as a (83%), pick-up goods bought in B2C eCommerce at local store (67%), exchange goods at local stores (66%).

The econometric and non-parametric results further 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). On the other hand, 78% of the respondents argued that problems with

[14] Most of the literature on the intensity of competition completely neglects this issue, exceptions are Schmitz (2000b, 206), Schmitz/Latzer 2002. Borenstein/Saloner (2001, 11) mention endogenous sunk costs in passing only.

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).[15]

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 non-parametric results, on the other hand, underlines the potential merits of the survey based approach to the empirical study of industry structure and performance in the B2C eCommerce market.

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. 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 contacted all of

[15] See Latzer/Schmitz 2000.

them to participate in the survey. However, with a response rate of 32.4% in the first and 93.1% in the second survey we cannot rule out the presence of a self selection bias.

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 geral 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 mislieading 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 indices regarding to quantify company strategies.

We conclude that the analysis clearly shows that 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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Data Appendix

Table 3: 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 4: Results of various specifications to model *ECOMCUST*

Independent Variable	1	2	3	4	5	6	7	8	9	10	11	12	13 (=2)
Constant	53025.17 (0.383)	-3955.632 (-0.248)	12149.75 (0.587)	-5175.317 (-0.198)	6660.820 (0.417)	15777.15 (0.439)	-5461.401 (-0.254)	4949.636 (0.313)	1359.177 (0.034)	-19664.86 (-0.827)	-12978.78 (-0.131)	6689.753 (0.348)	-3955.632 (-0.248)
OUTS	-16253.39 (-1.380)		-3711.715 (-0.465)										
CROSS-PROM	10499.02 (0.586)			5619.210 (0.489)									
DISINT	-107770.0 (-1.442)				-47546.49 (-0.847)								
ECOMEXP	-12459.58 (-1.442)					-3032.646 (-0.301)							
2CHANCUST	925.29 (1.500)						290.6761 (0.696)						
TRADCUST	0.002318 (4.710)***	0.001843 (5.605)***	0.001798 (5.240)***	0.001807 (5.281)***	0.0019760 (5.041)***	0.001803 (5.009)***	0.001846 (5.255)***	0.000339 (5.341)***	0.001795 (4.737)***	0.001897 (5.494)***	0.001832 (4.843)***	0.001805 (5.232)***	0.001843 (5.605)***
ECOMACQ	-2947.07 (-0.111)								2680.187 (0.124)				
CUSTRET	12393.82 (1.028)									10735.49 (1.339)			
MKTINV	3174.42 (2.270)**	967.325 (1.280)	1552.715 (2.137)**	1522.920 (2.092)**	1659.368 (2.260)**	1752.981 (2.184)**	1930.226 (2.398)**	1546.819 (2.148)**	1502.228 (1.800)*	1858.68 (2.374)**	1848.419 (2.212)**	1512.992 (1.999)*	967.325 (1.280)
PRICE	-22107.25 (-0.520)										5870.259 (0.180)		
MED-PROD	13652.81 (0.292)											-5289.678 (-0.163)	
IT-PROD	88502.06 (1.764)*	66455.06 (1.993)*											66455.06 (1.993)*
Observation	35	48	48	48	48	43	45	48	43	46	43	48	48
R^2	0.65	0.461	0.415	0.415	0.421	0.422	0.434	0.412	0.408	0.448	0.423	0.412	0.461

*Coefficients (t-statistics in parenthesis) based on OLS-estimates; *** 99%-significance level, ** 95%- significance level, * 90%- significance level.*

Table 5: Results of various specifications to model *ECOMCUST*

Independent Variable	1	2	3	4	5	6	7	8	9	10	11	12
Constant	6091.876 (0.282)	297.8091 (0.0120)	4970.071 (0.323)	16932.87 (0.507)	-6572.341 (-0.322)	3283.306 (0.219)	-13794.63 (-0.358)	-11939.46 (-0.525)	-3955.632 (-0.248)	-28987.21 (-0.298)	2175.723 (0.117)	11315.02 (0.564)
OUTS	-1403.930 (-0.182)											
CROSS-PROM		1706.3470 (0.152)										
DISINT			-30552.75 (-0.566)									
ECOMEXP				-4452.219 (-0.463)								
2CHANCUST					313.5527 (0.775)							
TRADCUST	0.001816 (5.424)***	0.001819 (5.450)***	0.001925 (5.064)***	0.001819 (5.189)***	0.001855 (5.407)***	0.001821 (5.517)***	0.001776 (4.957)***	0.001875 (5.462)***	0.001843 (5.605)***	0.001858 (5.029)***	0.001825 (5.432)***	
ECOMACQ							9654.025 (0.500)					
CUSTRET								7443.237 (0.922)				
MKTINV									967.325 (1.280)			670.9229 (0.716)
PRICE										10774.15 (0.337)		
MED-PROD											3320.629 (0.103)	
IT-PROD	75270.59 (2.479)**	74883.7000 (2.434)**	76542.55 (2.536)**	83620.42 (2.506)**	85048.93 (2.642)**	75736.67 (2.530)**	97066.81 (2.713)***	71082.91 (2.270)**	66455.06 (1.993)*	92495.30 (2.666)**	76842.18 (2.395)**	59462.41 (1.413)
Observation	49	49	49	44	46	49	43	47	48	43	49	49
R^2	0.432	0.432	0.435	0.439	0.447	0.431	0.461	0.441	0.461	0.450	0.431	0.075

*Coefficients (t-statistics in parenthesis) based on OLS-estimates; *** 99%-significance level, ** 95%- significance level, * 90%- significance level.*

Table 6: Results of various specifications to model *ECOMEMPL*

Independent Variable	1 (#)	2	3	4	5	6	7	8	9	10 (#)
Constant	9.5887	16.2937	9.5578	-0.4494	1.5444 (1.013)	2.6817	1.1087	2.4094	0.1292	0.7457
	(0.830)	(0.784)	(0.846)	(-0.387)		(1.451)	(1.072)	(0.297)	(0.090)	(0.737)
OUTS	-1.224	-3.2106	-1.2832		-0.3349					
	(-1.210)	(-1.832)*	(-1.301)		(-0.572)					
CROSS-PROM	-0.3010	0.9567	-0.5144			-0.9640				
	(-0.201)	(0.356)	(-0.375)			(-1.152)				
DISINT	-7.5882	-20.7550	-8.6531				-3.4943			
	(-1.178)	(-1.867)*	(-1.652)				(-0.946)			
ECOMEXP	0.1150	-1.413	-0.1372					0.0484		
	(0.114)	(-0.795)	(-0.143)					(0.070)		
ECOMCUST	0.000122 (6.958)***	-	0.000114 (9.335)***	0.000117 (13.852)***	0.000120 (13.996)***	0.000121 (14.300)***	0.000123 (13.993)***	0.000121 (13.241)***	0.000121 (13.552)***	0.000134 (12.913)***
2CHANCUST	0.0588	0.1727	0.0769						0.0236	
	(1.094)	(1.871)*	(1.568)						(0.759)	
TRADCUST	-0.00000004	0.000000242	-							-0.000000065
	(-0.735)	(3.278)***								(-2.123)**
ECOMACQ	2.0765	1.6018	1.3896							
	(0.830)	(0.384)	(0.643)							
CUSTRET	-1.2648	0.2658	-0.8895							
	(-1.237)	(0.147)	(-0.942)							
MKTINV	0.2018	0.5929 (2.810)**	0.2276 (2.194)**	0.1156 (2.210)**						
	(1.556)									
PRICE	-3.3121	-6.0304	-3.1488							
	(-0.939)	(-0.953)	(-0.911)							
MED-PROD	0.1861	1.7167	0.9186							
	(0.047)	(0.240)	(0.240)							
IT-PROD	-1.5784	9.2173	-0.0689							
	(-0.357)	(1.234)	(0.987)							
Observation	34	34	35	48	50	50	50	45	46	48
R^2	0.882	0.598	0.876	0.827	0.809	0.813	0.811	0.807	0.811	0.826

*Coefficients (t-statistics in parenthesis) based on OLS-estimates; *** 99%-significance level, ** 95%- significance level, * 90%- significance level. (#) The variables ECOMCUST and TRADCUST are highly correlated (correlation-Coefficient 0.829) so that the estimated coefficients and the standard errors might not be unbiased and the t-statistic invalid (Green 1993). Consequently, the results of these specifications are not further interpreted.*

Results of various specifications to model *ECOMCUST* (cont'd)

Independent Variable	13	14	15	16	17	18
Constant	-2.5223 (-0.871)	2.1479 (1.301)	-0.4494 (-0.387)	-2.9118 (-0.405)	0.9542 (0.810)	0.7811 (0.688)
OUTS						
CROSS-PROM						
DISINT						
ECOMEXP						
ECOMCUST	0.000118 (12.748)***	0.000121 (13.874)***	0.000117 (13.852)***	0.000122 (13.051)***	0.000121 (13.931)***	0.000120 (13.615)***
2CHANCUST						
TRADCUST						
ECOMACQ	1.8699 (1.290)					
CUSTRET		-0.6503 (-1.088)				
MKTINV			0.1156 (2.210)**			
PRICE				1.2589 (0.529)		
MED-PROD					-0.2361 (-0.102)	
IT-PROD						0.5329 (0.226)
Observation	44	47	48	50	50	50
R^2	0.814	0.814	0.827	0.809	0.801	0.808

*Coefficients (t-statistics in parenthesis) based on OLS-estimates; *** 99%-significance level, ** 95%- significance level, * 90%- significance level*

Table 7: Results of various specifications to model *ECOMEMPL* based on the base-model *ECOMCUST/MKTINV*

Independent Variable	1	2	3	4	5	6	7(#)	8	9	10	11	12
Constant	0.3286 (0.202)	1.6089 (0.868)	-0.2347 (-0.200)	-0.8045 (-0.306)	-04494 (-0.387)	-1.6076 (-1.036)	-0.2444 (-0.211)	-2.0166 (-0.696)	0.8300 (0.483)	-3.9060 (-0.559)	-0.6872 (-0.500)	-0.3044 (-0.252)
OUTS	-0.4009 (-0.690)											
CROSS-PROM		-1.167 (-1.416)										
DISINT			-3.9694 (-1.098)									
ECOMEXP				0.0931 (0.128)								
ECOMCUST	0.000117 (13.625)***	0.000118 (14.070)***	0.000120 (13.771)***	0.000117 (12.788)***	0.000117 (13.852)***	0.000116 (13.356)***	0.000128 (11.911)***	0.000117 (12.663)***	0.000117 (13.506)***	0.000118 (12.748)***	0.000118 (13.693)***	0.000118 (13.544)***
2CHANCUST						0.0312 (1.040)						
TRADCUST							0.000000051 (-1.645)					
ECOMACQ								0.8675 (0.581)				
CUSTRET									-0.6283 (-1.079)			
MKTINV	0.1172 (2.226)**	0.1222 (2.353)**	0.1193 (2.281)**	0.1260 (2.141)**	0.1156 (2.210)**	0.1460 (2.507)**	0.0956 (1.746)*	0.1085 (1.801)*	0.1240 (2.141)**	0.1265 (2.072)**	0.1199 (2.200)**	0.1244 (2.226)**
PRICE										1.1140 (0.482)		
MED-PROD											0.7784 (0.321)	
IT-PROD												-1.2147 (-0.477)
Observation	48	48	48	43	48	45	47	43	46	43	48	48
R^2	0.829	0.835	0.832	0.828	0.827	0.836	0.838	0.829	0.832	0.828	0.828	0.828

*Coefficients (t-statistics in parenthesis) based on OLS-estimates; *** 99%-significance level, ** 95%- significance level, * 90%- significance level. (#) The variables ECOMCUST and TRADCUST are highly correlated (correlation-Coefficient 0.829) so that the estimated coefficients and the standard errors might not be unbiased and the t-statistic invalid (Green 1993). Consequently, the results of these specifications are not further interpreted.*

Table 8: Results of various specifications to model *ΔECOMREV* based on the base-model *ECOMEMPL/ECOMEXP*

Independent Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Constant	105.0653 (2.286)**	119.2188 (2.392)**	104.5043 (1.866)*	98.9811 (2.122)**	64.8819 (1.245)	64.973 (1.212)	62.9393 (1.169)	124.9288 (1.944)*	68.6095 (2.140)**	74.6147 (1.656)	26.6374 (0.327)	120.5282 (2.224)**	106.9403 (2.174)**
OUTS		-8.7719 (-0.765)											
ECOMEMPL	23.0496 (1.853)*	23.9124 (1.902)*	23.0288 (1.814)*	25.5022 (1.995)*	49.2348 (2.689)**	42.680 (2.355)**	54.5464 (2.840)***	29.1739 (2.038)*	-3.8677 (-0.446)	15.9251 (1.296)	-0.927 (-0.109)	20.8951 (1.587)	23.101 (1.827)*
CROSS-PROM			0.3149 (0.018)										
DISINT				-52.4293 (-0.887)									
ECOMEXP	-23.6413 (-2.040)**	-23.5904 (-2.022)*	-23.6377 (-2.007)*	-21.1017 (-1.762)*	-19.8912 (-1.685)	-20.452 (-1.565)	-19.4668 (-1.597)*	-14.297 (-1.042)	-8.7389 (-1.167)	-19.210 (-1.726)*	-3.5168 (-0.472)	-25.446 (-2.093)**	-23.891 (-1.999)*
ECOMCUST					-0.000482 (-1.321)								
2CHANCUST						0.2011 (0.318)							
TRADCUST							-0.0000549 (-1.719)**						
ECOMACQ								-33.511 (-1.149)					
CUSTRET									7.2209 (-1.103)				
MKTINV										2.1358 (2.089)**			
PRICE											10.9612 (0.397)		
MED-PROD												-25.8321 (-0.555)	
IT-PROD													-5.5970 (-0.122)
Observation	34	34	34	34	32	32	31	27	32	33	29	34	34
R^2	0.193	0.209	0.193	0.214	0.293	0.252	0.327	0.239	0.090	0.289	0.015	0.202	0.194

*Coefficients (t-statistics in parenthesis) based on OLS-estimates; *** 99%-significance level, ** 95%- significance level, * 90%- significance level.*

Table 9: Results of various specifications to model *ΔECOMREV* based on the base-model *ECOMEMPL/MKTINV*

Independent Variable	1	2	3	4	5	6	7	8	9	10	11	12
Constant	20.8098 (0.691)	15.5870 (0.429)	8.1342 (0.336)	74.6147 (1.656)	-20.9413 (-0.738)	-17.2221 (-0.512)	-25.0297 (-0.8949)	106.8136 (2.295)**	30.2731 (1.641)	25.8191 (0.327)	-3.440 (-0.110)	10.4606 (0.407)
OUTS	-8.7758 (-0.837)											
ECOMEMPL	18.2815 (1.513)	18.2759 (1.496)	21.351 (1.808)*	15.9251 (1.296)	47.339 (2.631)**	41.2889 (2.366)**	53.9478 (3.000)***	23.0545 (1.877)*	-2.3262 (-0.324)	-0.1393 (-0.017)	19.764 (1.573)	18.2844 (1.508)
CROSS-PROM		-5.0682 (-0.335)										
DISINT			-92.4844 (-1.763)*									
ECOMEXP				-19.210 (-1.726)*								
ECOMCUST					-0.000312 (-0.901)							
2CHANCUST						-0.0233 (-0.044)						
TRADCUST							-0.00039 (-1.331)					
ECOMACQ								-67.3709 (-2.733)**				
CUSTRET									6.7592 (1.287)			
MKTINV	2.0323 (2040)**	1.8929 (1.912)*	2.2073 (2.290)**	2.1358 (2.089)**	1.3036 (1.304)	1.4977 (1.495)	1.5083 (1.538)	2.9171 (2.809)***	-0.0186 (-0.031)	-0.1653 (-0.262)	2.0033 (1.985)*	1.9767 (1.990)*
PRICE										6.0159 (0.235)		
MED-PROD											22.032 (0.5556)	
IT-PROD												-30.7208 (-0.690)
Observation	36	36	36	33	34	36	33	30	34	32	36	36
R^2	0.223	0.209	0.277	0.289	0.310	0.277	0.361	0.396	0.055	0.005	0.214	0.218

*Coefficients (t-statistics in parenthesis) based on OLS-estimates; *** 99%-significance level, ** 95%- significance level, * 90%- significance level.*

Table 10: Results of various specifications to model *ΔECOMREV* based on the base-model *ECOMEMPL/TRADCUST*

Independent Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Constant	5.3831 (0.157)	-28.5203 (-0.689)	-6.2514 (0.198)	62.9393 (1.169)	-11.4393 (-0.377)	-1.4339 (-0.041)	-12.3594 (-0.212)	49.6406 (2.011)*	-25.0297 (-0.8949)	26.2890 (0.313)	-14.530 (-0.395)	-12.6217 (-0.412)	66.4603 (0.832)
OUTS	-10.1870 (-0.960)												
ECOMEMPL	62.4985 (3.402)***	61.6124 (3.330)***	59.7680 (3.189)***	54.5464 (2.840)***	61.3282 (3.288)***	60.0930 (3.189)***	82.5933 (4.152)***	-22.1541 (-1.265)	53.9478 (3.000)***	-9.3510 (-0.571)	62.191 (3.170)***	60.7999 (3.261)**	52.1163 (2.058)*
CROSS-PROM		9.9862 (0.607)											
DISINT			-31.6247 (-0.505)										-64.8702 (-0.986)
ECOMEXP				-19.4668 (-1.597)*									-5.5596 (-0.439)
ECOMCUST					-0.0000561 (-0.090)								
2CHANCUST						-0.2603 (-0.473)							
TRADCUST	-0.0000483 (-01.543)	-0.0000547 (-1.665)	-0.0000499 (-1.576)	-0.0000549 (-1.719)**	-0.0000452 (-0.834)	-0.0000504 (-1.571)	-0.0000608 (-2.037)*	0.00000648 (-0.304)	-0.00039 (-1.331)	-0.00000118 (-0.059)	0.0000489 (-1.541)	-0.0000513 (-1.565)	-0.0000492 (-1.540)
ECOMACQ							-14.690 (-0.571)						-37.2310 (-1.196)
CUSTRET								12.3576 (1.778)*					
MKTINV									1.5083 (1.538)				2.5957 (1.976)*
PRICE										9.6343 (0.348)			
MED-PROD											6.4948 (0.158)		
IT-PROD												11.8379 (0.261)	
Observation	34	34	34	31	34	33	28	32	33	29	34	34	25
R^2	0.291	0.278	0.276	0.327	0.270	0.274	0.456	0.124	0.361	0.023	0.270	0.271	0.560

*Coefficients (t-statistics in parenthesis) based on OLS-estimates; *** 99%-significance level, ** 95%- significance level, * 90%- significance level.*

Table 11: Results of various specifications to model *ΔECOMREV* based on the base-model *MKTINV/ECOMEXP*

Independent Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Constant	107.4802 (2.517)**	74.6147 (1.656)	96.5424 (1.932)*	84.2070 (2.138)**	91.3630 (2.320)**	96.5690 (2.133)**	94.2145 (2.164)**	99.9665 (2.104)**	164.8000 (3.154)***	47.4623 (1.827)*	23.4962 (0.322)	97.7930 (2.107)*	99.0004 (2.460)**
OUTS	-10.3905 (-0.978)												
ECOMEMPL		15.9251 (1.296)											
CROSS-PROM			-2.6792 (-0.173)										
DISINT				-69.2456 (-1.282)									
ECOMEXP	-18.1471 (-1.713)*	-19.2102 (-1.726)*	-18.3074 (-1.703)*	-14.7463 (-1.361)	-18.2717 (-1.726)*	-19.1634 (-1.593)	-22.2010 (-1.746)*	-19.1411 (-1.524)	-10.9620 (-0.954)	-4.8861 (-0.760)	-4.9876 (-0.721)	-19.1100 (-1.710)*	-18.9304 (-1.782)*
ECOMCUST						-0.000073 (-0.208)							
2CHANCUST							0.4398 (0.721)						
TRADCUST								-0.0000189 (-0.608)					
ECOMACQ									-56.8316 (-2.232)**				
CUSTRET										5.2492 (0.932)			
MKTINV	2.7850 (2.893)***	2.1358 (2.089)**	2.5831 (2.706)**	2.9234 (3.021)***	2.5842 (2.750)***	2.5753 (2.521)**	2.6913 (2.650)**	2.6801 (2.506)**	3.4447 (3.262)***	0.1367 (0.214)	0.0486 (0.073)	2.5044 (2.510)**	2.7340 (2.864)***
PRICE											13.1035 (0.514)		
MED-PROD												-11.1074 (-0.272)	
IT-PROD													-41.6422 (-0.951)
Observation	35	33	35	35	35	32	32	31	29	33	31	35	35
R^2	0.274	0.2886	0.252	0.289	0.251	0.247	0.259	0.260	0.375	0.043	0.024	0.253	0.273

*Coefficients (t-statistics in parenthesis) based on OLS-estimates; *** 99%-significance level, ** 95%- significance level, * 90%- significance level.*

Table 12: Matrix of correlation-coefficients of the variables

	ECOMACQ	*OUTS*	*CROSS-PROM*	*DISINT*	*ECOMEMPL*	*ECOMEXP*	*CUSTRET*	*ECOMCUST*	*2CHANCUST*	*MKTINV*	*MED-PROD*	*IT-PROD*	*PRICE*	*TRADCUST*	*ΔECOMREV*
ECOMACQ	1.000000	0.360579	-0.216925	0.150027	-0.193232	0.176511	0.147742	-0.240828	0.018582	0.498353	-0.163693	-0.126796	-0.113026	-0.047917	-0.171720
OUTS	0.360579	1.000000	-0.238824	-0.104497	-0.030461	-0.054960	0.309728	0.057757	-0.118612	0.265467	-0.101577	0.191084	-0.665583	0.066971	-0.124635
CROSS-PROM	-0.216925	-0.238824	1.000000	0.295400	0.181228	-0.155558	0.095588	0.271013	0.052835	-0.040051	-0.023749	0.275939	0.339675	0.342929	0.287250
DISINT	0.150027	-0.104497	0.295400	1.000000	-0.253286	0.165298	-0.292770	-0.100434	0.311897	0.358352	-0.218218	0.169031	0.107624	-0.148569	-0.234876
ECOMEMPL	-0.193232	-0.030461	0.181228	-0.253286	1.000000	-0.202840	0.404622	0.469058	-0.074653	-0.120936	-0.386900	0.414467	-0.004060	0.544245	-0.122612
ECOMEXP	0.176511	-0.054960	-0.155558	0.165298	-0.202840	1.000000	0.150359	-0.135180	0.376274	0.075276	-0.341613	-0.011505	0.344291	-0.211793	-0.085990
CUSTRET	0.147742	0.309728	0.095588	-0.292770	0.404622	0.150359	1.000000	0.330499	0.129861	-0.084040	-0.176175	0.220443	0.113624	0.295228	0.237440
ECOMCUST	-0.240828	0.057757	0.271013	-0.100434	0.469058	-0.135180	0.330499	1.000000	0.006978	-0.138578	-0.070004	0.458196	0.083050	0.828813	-0.078076
2CHANCUST	0.018582	-0.118612	0.052835	0.311897	-0.074653	0.376274	0.129861	0.006978	1.000000	-0.135327	-0.194715	-0.201101	0.219990	-0.104224	0.120656
MKTINV	0.498353	0.265467	-0.040051	0.358352	-0.120936	0.075276	-0.084040	-0.138578	-0.135327	1.000000	-0.193284	0.314292	0.000728	-0.051826	-0.067759
MED-PROD	-0.163693	-0.101577	-0.023749	-0.218218	-0.386900	-0.341613	-0.176175	-0.070004	-0.194715	-0.193284	1.000000	-0.258199	0.164399	-0.138389	0.057361
IT-PROD	-0.126796	0.191084	0.275939	0.169031	0.414467	-0.011505	0.220443	0.458196	-0.201101	0.314292	-0.258199	1.000000	-0.127343	0.418045	0.073279
PRICE	-0.113026	-0.665583	0.339675	0.107624	-0.004060	0.344291	0.113624	0.083050	0.219990	0.000728	0.164399	-0.127343	1.000000	0.121137	0.101082
TRADCUST	-0.047917	0.066971	0.342929	-0.148569	0.544245	-0.211793	0.295228	0.828813	-0.104224	-0.051826	-0.138389	0.418045	0.121137	1.000000	-0.111063
ΔECOMREV	-0.171720	-0.124635	0.287250	-0.234876	-0.122612	-0.085990	0.237440	-0.078076	0.120656	-0.067759	0.057361	0.073279	0.101082	-0.111063	1.000000

Table 13: Variance/covariance-matrix of the variables

	ECOMACQ	*OUTS*	*CROSS-PROM*	*DISINT*	*ECOMEMPL*	*ECOMEXP*	*CUSTRET*	*ECOMCUST*	*2CHANCUST*	*MKTINV*	*MED-PROD*	*IT-PROD*	*PRICE*	*TRADCUST*	*ΔECOMREV*
ECOMACQ	0.539931	0.439236	-0.161458	0.036458	-0.103733	0.210069	0.192708	-10574.75	0.475694	5.970486	-0.052083	-0.034722	-0.036458	-23950.69	-7.498437
OUTS	0.439236	2.748264	-0.401042	-0.057292	-0.036892	-0.147569	0.911458	5721.727	-6.850694	7.175347	-0.072917	0.118056	-0.484375	75521.53	-12.27865
CROSS-PROM	-0.161458	-0.401042	1.026042	0.098958	0.134115	-0.255208	0.171875	16404.66	1.864583	-0.661458	-0.010417	0.104167	0.151042	236289.6	17.29115
DISINT	0.036458	-0.057292	0.098958	0.109375	-0.061198	0.088542	-0.171875	-1984.870	3.593750	1.932292	-0.031250	0.020833	0.015625	-33422.92	-4.616146
ECOMEMPL	-0.103733	-0.036892	0.134115	-0.061198	0.533746	-0.240017	0.524740	20478.01	-1.900174	-1.440538	-0.122396	0.112847	-0.001302	270470.0	-5.323307
ECOMEXP	0.210069	-0.147569	-0.255208	0.088542	-0.240017	2.623264	0.432292	-13083.59	21.23264	1.987847	-0.239583	-0.006944	0.244792	-233341.0	-8.276563
CUSTRET	0.192708	0.911458	0.171875	-0.171875	0.524740	0.432292	3.151042	35058.31	8.031250	-2.432292	-0.135417	0.145833	0.088542	356485.4	25.04740
ECOMCUST	-10574.75	5721.727	16404.66	-1984.870	20478.01	-13083.59	35058.31	3.57E+09	14527.48	-135017.6	-1811.406	10204.20	2178.620	3.37E+10	-277263.1
2CHANCUST	0.475694	-6.850694	1.864583	3.593750	-1.900174	21.23264	8.031250	14527.48	1213.826	-76.87153	-2.937500	-2.611111	3.364583	-2470026.	249.8094
MKTINV	5.970486	7.175347	-0.661458	1.932292	-1.440538	1.987847	-2.432292	-135017.6	-76.87153	265.8316	-1.364583	1.909722	0.005208	-574791.0	-65.65260
MED-PROD	-0.052083	-0.072917	-0.010417	-0.031250	-0.122396	-0.239583	-0.135417	-1811.406	-2.937500	-1.364583	0.187500	-0.041667	0.031250	-40762.50	1.476042
IT-PROD	-0.034722	0.118056	0.104167	0.020833	0.112847	-0.006944	0.145833	10204.20	-2.611111	1.909722	-0.041667	0.138889	-0.020833	105977.8	1.622917
PRICE	-0.036458	-0.484375	0.151042	0.015625	-0.001302	0.244792	0.088542	2178.620	3.364583	0.005208	0.031250	-0.020833	0.192708	36172.92	2.636979
TRADCUST	-23950.69	75521.53	236289.6	-33422.92	270470.0	-233341.0	356485.4	3.37E+10	-2470026.	-574791.0	-40762.50	105977.8	36172.92	4.63E+11	-4489609.
ΔECOMREV	-7.498437	-12.27865	17.29115	-4.616146	-5.323307	-8.276563	25.04740	-277263.1	249.8094	-65.65260	1.476042	1.622917	2.636979	-4489609.	3531.522

Table 14: 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 15: Pearson's correlation-coefficients and non-parametric tests of the dependent variables *ECOMCUST*, *ECOMEMPL* and *⊿ECOMREV* and the independent variables that are significant in the non-linear specifications

		Pearson's Correlation	Non-parametric 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. ECOMACQ	Corr.	0.203	0.017	0.023
	Sign.	0.181	0.883	0.879
	N	45	45	45
*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
⊿ECOMREV vs. ECOMEMPL	Corr.	0.306*	0.072	0.097
	Sign.	0.065	0.574	0.566
	N	37	37	37
⊿ECOMREV vs. ECOMACQ	Corr.	-0.240	-0.184	-0.233
	Sign.	0.178	0.196	0.192
	N	33	33	33
⊿ECOMREV vs. ECOMCUST	Corr.	-0.046	0.159	0.231
	Sign.	0.788	0.184	0.176
	N	36	36	36
*⊿ECOMREV vs. (ECOMCUST * MKTINV)*	Corr.	0.567***	0.193	0.275
	Sign.	0.000	0.110	0.105
	N	35	35	35
*⊿ECOMREV vs. (ECOMEMPL * MKTINV)*	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 non-parametric correlation is also present between *ECOMEMPL* and *TRADCUST* as well as between *⊿ECOMREV* and *LOCK-IN*.

Figure 1: Histogram of differences between expected and realized revenue growth in B2C eCommerce in 2001: [*E(ΔECOMREV)* ≤ *ΔECOMREV*] under- and [*E(ΔECOMREV)* > *ΔECOMREV*] over-estimation

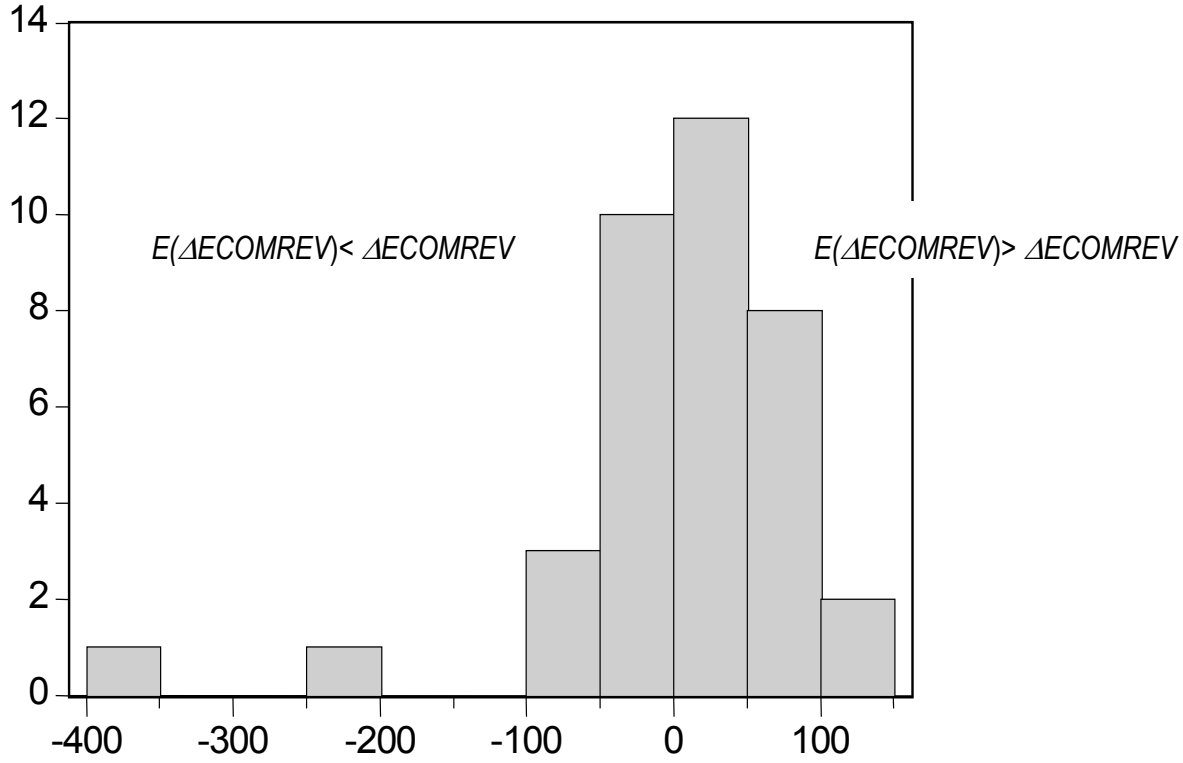


Table 16: Descriptive statistics of absolute values of differences between expected and realized growth rate of B2C eCommerce revenue in 2001, of the absolute values of subsamples of under- [$E(\Delta ECOMREV) \leq \Delta ECOMREV$] and over-estimation [$E(\Delta ECOMREV) > \Delta ECOMREV$]

	Total	$E(\Delta ECOMREV) \leq \Delta ECOMREV$	$E(\Delta ECOMREV) > \Delta ECOMREV$
Mean	53.5	57.7	49.1
St. Dev.	75.4	99.7	38.4
St. Error	12.4	22.9	9.0

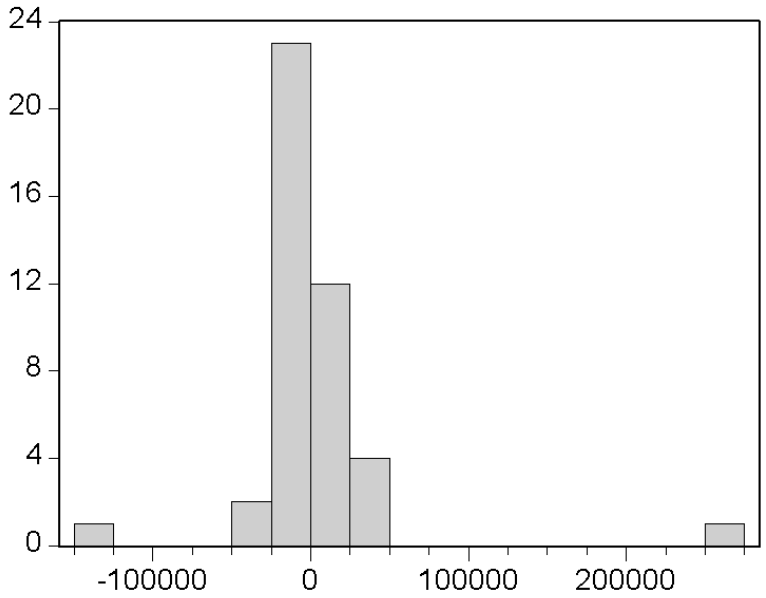
Table 17: Test for equality of means of total sample and subsamples: H_0 cannot be rejected

H_0	t	df	Sign	$mean_{E(\Delta ECOMREV) \leq \Delta ECOMREV} - mean_{E(\Delta ECOMREV) > \Delta ECOMREV}$
$E[E(\Delta ECOMREV) \leq \Delta ECOMREV] = E[E(\Delta ECOMREV) > \Delta ECOMREV]$	-0.342	35	0.734	-8.6

Table 18: Levene-test for equality of variances of total sample and subsamples: H_0 cannot be rejected

H_0	F	Prob
$Var[E(\Delta ECOMREV) \leq \Delta ECOMREV] = Var[E(\Delta ECOMREV) > \Delta ECOMREV]$	1.828	0.185

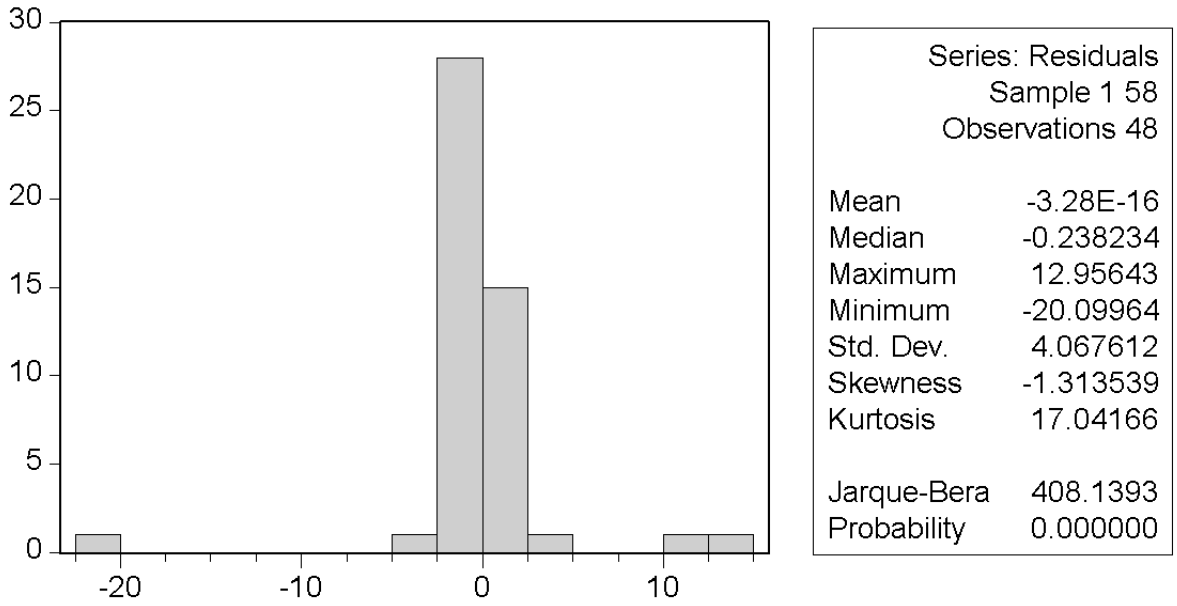
Figure 2: Histogram and Jarque-Bera test statistic convcerning the normality of the residiuals and the Ramsey-RESET test statistic concerning the specification and omitted variables based on the non-linear model of *ECOMCUST* and heteroscedasticity consistent standard errors and covariances



Series: Residuals	
Sample 1 58	
Observations 43	
Mean	-7.59E-12
Median	-175.9717
Maximum	270484.0
Minimum	-144038.5
Std. Dev.	51010.95
Skewness	3.043758
Kurtosis	20.87488
Jarque-Bera	638.8533
Probability	0.000000

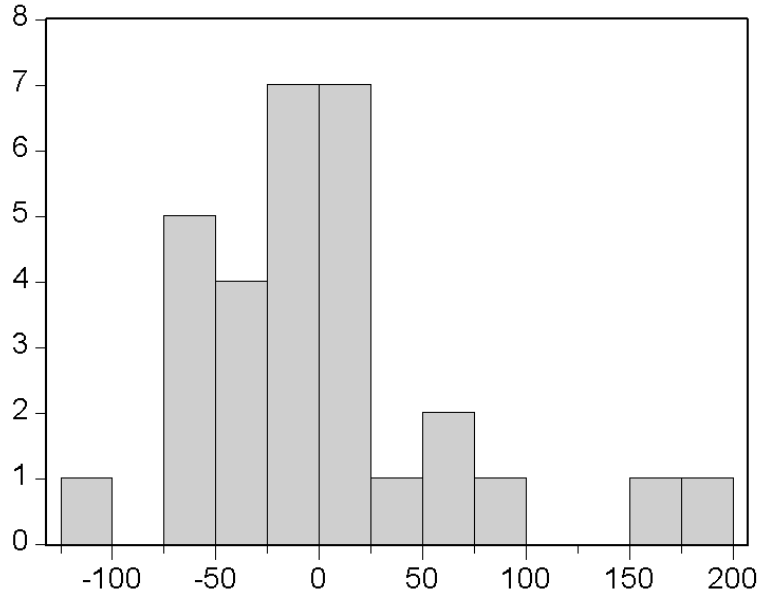
Ramsey-RESET Test: F-Statistik 11.18725 (Prob. 0.001862)

Figure 3: Histogram and Jarque-Bera test statistic convcerning the normality of the residiuals and the Ramsey-RESET test statistic concerning the specification and omitted variables based on the non-linear model of *ECOMEMPL* and heteroscedasticity consistent standard errors and covariances



Ramsey-RESET Test: F-Statistik 26.47427 (Prob. 0.000006)

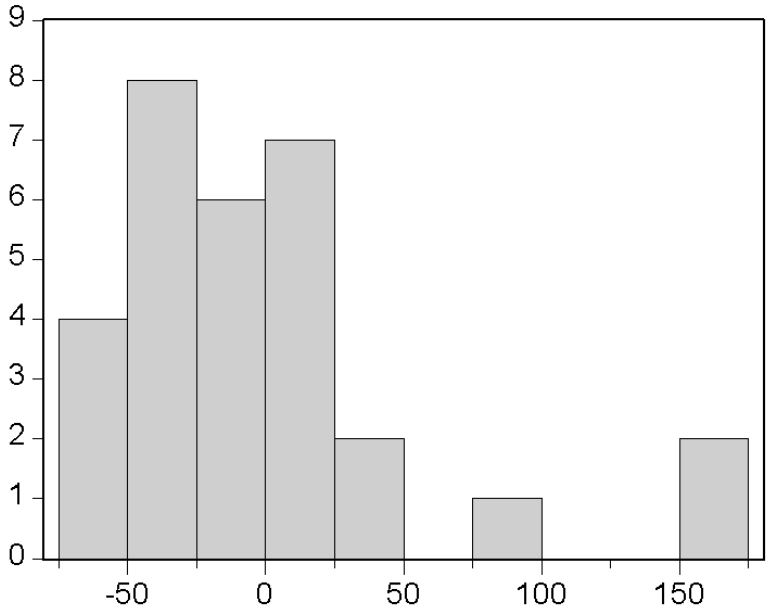
Figure 4: Histogram and Jarque-Bera test statistic convcerning the normality of the residiuals and the Ramsey-RESET test statistic concerning the specification and omitted variables based on the non-linear model of *ΔECOMREV* and heteroscedasticity consistent standard errors and covariances (equation (*11*) based on the number of employees in B2C eCommerce as measure of size)



Series: Residuals	
Sample 1 54	
Observations 30	
Mean	6.63E-15
Median	-11.90974
Maximum	189.0836
Minimum	-103.5376
Std. Dev.	63.55343
Skewness	1.372292
Kurtosis	5.159355
Jarque-Bera	15.24444
Probability	0.000489

Ramsey-RESET Test: F-Statistik 9.722342 (Prob. 0.004539)

Figure 5: Histogram and Jarque-Bera test statistic convcerning the normality of the residiuals and the Ramsey-RESET test statistic concerning the specification and omitted variables based on the non-linear model of $\Delta ECOMREV$ (equation (*11*) based on the number of customers in B2C eCommerce as measure of size)



Series: Residuals	
Sample 1 53	
Observations 30	
Mean	0.000000
Median	-15.61015
Maximum	174.5010
Minimum	-74.83202
Std. Dev.	56.97529
Skewness	1.691767
Kurtosis	5.833906
Jarque-Bera	24.34915
Probability	0.000005

Ramsey-RESET test F-Statistik 1.8565 (Prob. 0.178)