Chapter 5
Blended Traditional and Virtual Seller Market Entry and Performance

T. Randolph Beard, Gary Madden and Md. Shah Azam

5.1 Introduction

The past decade has produced much research investigating online market entry, both by blended traditional and by virtual sellers. A primary focus of these analyses is the identification of factors that determine entry and survival (e.g., Dinlersoz and Pereira 2007; Nikolaeva 2007; respectively). Some strategic reasons explaining why firms enter online markets include the following: cost reduction (Garicano and Kaplan 2001; Lucking-Riley and Spulber 2001); market experimentation and expansion (e.g., Lieberman 2002 examines potential first-mover advantages); quality of service improvement (Litan and Rivlin 2001); and preemption of rival entry (Dinlersoz and Pereira 2007). By contrast, there is a paucity of empirical work on the impact of firm entry on performance. When postentry performance is assessed, available data typically limit analysis to a specific industry, and more importantly, do not enable analysts to adequately "match" performance with entry strategy (e.g., DeYoung 2005).

The MIT Center for Digital Business and the Columbia Institute for Tele-Information provided support during the time this paper was revised. Helpful comments were provided by participants in seminars at Columbia University and Curtin University. Bill Greene was generous in his assistance on the econometric method. We are grateful to Warren Kimble and Aaron Morey for excellent research assistance. The authors are responsible for all remaining errors.

T. Randolph Beard (✉)
Auburn University, 232, Marion Circle, Auburn, AL 36830, USA
e-mail: beardtr@auburn.edu

G. Madden
Curtin University, 65 Redfern Street, North Perth, WA 6006, Australia
e-mail: G.Madden@curtin.edu.au

Md. S. Azam
University of Rajshahi, 4/53 Chapman Road, Bentley, WA 6102, Australia
e-mail: mdshah.azam@yahoo.com.au

J. Alleman et al. (eds.), *Demand for Communications Services - Insights and Perspectives*, The Economics of Information, Communication, and Entertainment,
DOI: 10.1007/978-1-4614-7993-2_5,

To address this shortcoming, this study considers firms' post entry revenue and cost performance using data from a unique sample of 1,001 Australian small blended and virtual online firms. These survey data contain information on firm and industry control variables, web site investment and (strategic) reasons for entry. In particular, through interaction variables, the study examines whether performance varies systematically by industry and firm size. While online markets appear to provide small firms an opportunity to pioneer new and innovative business models, entry is skewed toward larger firms. For instance, the Business Council of Australia highlights the relatively low online business activity by Small and Medium Enterprises (SMEs) compared with large companies (Dunt and Harper 2002).

Furthermore, the analysis considers whether learning effects (location-based, network-based or enterprise-based), scale effects, or strategic action effects impact performance. These data also suggest several related questions: How do traditional blended and virtual sellers differ in their performance? What can be said about the relationship between postentry performance and the strategic motivation for online market entry?

Importantly, the analysis recognizes that the online market entry decision is in part based on the expected revenue and cost responses. Under such circumstances particular "reason for entry" variables (depending on whether revenue or cost responses are being modeled) are potentially endogenous, that is, not independent from the disturbances of the response (performance) functions. Allowing for endogeneity is especially important for cross section data in which the use of a fixed effects model with individual-specific effects is not possible.

The empirical approach used here differs from previous work: potential endogeneity of the "reason for entry" variables in the response functions is accommodated by using an ordered probit response function with an endogenous ordered regressor, rather than the conventional Heckman (1978, 1979) two-step method. The nonlinearity of the probit model is an essential difficulty for the two-step correction which often makes the bias worse (Freedman and Sekhon 2008).

The paper proceeds as follows. The next section describes strategic reasons for online market entry by both traditional blended and virtual sellers. Aside from strategy (reason for entry) variables, the manner in which performance may be impacted by experience and/or scale effects are considered. Next, the sample data are described, and variables used in the empirical analysis are defined. The following section presents the statistical models, and the results from the regressions are then provided. A penultimate section explores firm online performance with respect to the impact of various arguments. The last section concludes.

5.2 Strategic Entry and Postentry Performance

Much of the empirical literature analyzing market turbulence (entry, exit, and survival) focuses exclusively on firm population cohort data (e.g., Segarra and Callejón 2002; Disney et al. 2003). A consistent finding is that entry is relatively easy, but survival is not. The most palpable consequence of entry is exit. As most entry attempts ultimately fail, and as most entrants require up to ten years to become capable of competing on a par with incumbents, incumbents find costly attempts to deter entry unprofitable.

Furthermore, entry is often a vehicle to introduce an innovation, particularly in the early phases of industry evolution (Geroski 1995: 436). At some point, consumer preferences become reasonably well formed and coalesce around a subset of products. At this stage, competitive rivalry shifts from competition between or among product designs to competition based on prices and costs of a particular design (Geroski 1995: 437).

Studies of survivor performance report that small firms often effectively compensate for scale and other size-related disadvantages. For instance, Reid and Smith (2000) find that small entrant firm growth (in employment, rate of return, and productivity) is higher than for large entrants. Interestingly, Audretsch (1995) argues that survivor employment growth is systematically greater in highly innovative industries relative to that in less innovative industries.

Since the mid-1990s, researchers have sought to understand why firms enter online markets, and in particular, whether early entry provides sustainable first-mover gains (including an enhanced prospect for survival). Dinlersoz and Pereira (2007) indicate that efficiency improvement, customer loyalty and market expansion (via an additional marketing channel and wider geographic reach) are the principal economic reasons for entry. The roles of transaction, sales, inventory and distribution cost savings are identified by Garicano and Kaplan (2001), Litan and Rivlin (2001) and Lucking-Riley and Spulber (2001). First-mover advantage is tied to firm or brand loyalty in online markets by Smith and Brynjolfsson (2001) while the extension of geographic markets and product mix is modeled by Dinlersoz and Pereira (2007).

However, it is important to recognize these entry motivations are often quite mixed. For instance, blended and virtual environments exhibit different market structures, demand curves, and customer segments. Therefore, price competition is probably stronger in online markets, and the corresponding price elasticity of demand higher. To compensate, the size and reach of the online market must be greater so that adequate returns are realized. As a result, firms entering online markets often intend to augment their geographic customer reach to gain a larger demand pool. However, to do so, firms must improve their efficiency and reduce prices relative to those dominating the blended market. Schmalensee (1982) establishes that early movers can benefit from customer uncertainty over product quality. What is unresolved for online markets is the durability of any such first-mover advantage.

5.3 Data and Variables

The present analysis explicitly allows for potential endogeneity in the statistical modeling through systems estimation. Additionally, the consideration of strategic entry is broadened to include meeting the goals of market expansion, cost reduction, introduction of a new good, and anticipation of rival entry, customer requests, and supplier requirements. Naturally, the source of endogeneity varies by performance goal. Finally, several size-related hypotheses are empirically examined.

First, various size metrics are introduced through arguments related to firm size (number of employees), market size (geographic location), and network size (number of stores). Second, interactions are included in both the strategic and performance response equations to allow for the presence of learning effects, scale effects (location, network size, and enterprise size), and strategic anticipation and supplier effect variables. In particular, learning (years established online) is interacted with initial investment (commitment) and firm orientation (retail and business) variables. These commitment and orientation variables are also interacted with the above measures of internal and external sources of scale economies. Anticipating entry and suppler requirement variables are similarly interacted.

A unique profile of Australian small and medium enterprises (SME) online market activity was obtained from an Australian Research Council funded survey.[1] In this survey, the manager of each enterprise is interviewed by telephone. Sampling is exogenously stratified through screening questions that require that the firm employs less than 200 persons, and conduct online business via a web site. The 1,001 sample observations thus obtained are comprised of firms located in Melbourne (201), Sydney (201), Brisbane (101), Adelaide (100), Perth (99), Canberra (50), Darwin (50) and Hobart (50), and the regional centers of Albury-Wodonga (50), Townsville (50) and Newcastle (49).

Information collected includes: whether the firm conducts only online activity or is a blended firm (BLENDED); elapsed years the firm has conducted online activity (ESTAB); geographic location of the head office and number of branches (LOCATION, STORES); number of fulltime employees (SMALL); industry classification, viz., whether primarily RETAIL or BUSINESS

[1] The survey field work is conducted by the *Interviewer Quality Control Australia* (IQCA) quality accredited market research firm McGregor Tan Research. The telephone interview software used to initiate the contact with respondents is the CATI (computer aided telephone interviewing system). The sample units are selected at random from the Telstra *Yellow Pages*. Three screening questions are asked prior to the conduct of the survey. Funding for survey is provided by Australian Research Council Large Grant No. A00105943. The questionnaire contains 59 questions. The questionnaire is comprised of the sections: (a) Respondent and Firm Profile; (b) Reasons for Entering Online Markets and Initial Investment; (c) Initial Online Market Outcomes; and (d) Online Market Futures.

Table 5.1 Firm characteristics

	Sample (%)	ABS (%)
ANZSIC single-digit division		
Retail trade	17.7	14.2
Accommodation, cafes, and restaurants	16.8	4.1
Property and business services	10.5	24.0
Personal and other services	9.2	7.4
Manufacturing	6.7	12.5
Transport and storage	6.6	4.5
Cultural and recreational services	6.2	6.2
Finance and insurance	5.6	2.5
Wholesale trade	5.1	9.1
Construction	4.7	9.4
Other	10.9	6.1
Full-time equivalent employees		
1–4	57.7	63.9
5–19	29.7	29.3
20–99	11.8	6.2
100–199	0.8	0.6

Note Auxiliary office location applies to firms with more than one office. *Source* ABS (2009) Table 2.1, businesses with web presence. ABS (2010) Table 3.4, employer size group by industry division

orientated[2]; and the initial web site investment (INITIAL). The reasons for entry are also sought. Managers are asked whether entry is to introduce a new good (NEWGOOD); respond to customer requests (CUSTOMER); respond to supplier requirements (SUPPLIER) or anticipates rival entry (ANTICIPATE). Importantly, these entry reasons are treated as exogenous to subsequent REVENUE and COST performance. Conversely, information collected to determine whether entry is intended to increase sales (EXPAND) or reduce costs (EFFICIENCY) is treated as potentially endogenous to firms' REVENUE and COST performance, respectively. Finally, REVENUE and COST performance data are collected for firm activity during the previous 12 months.

Table 5.1 profiles the sampled firms by Australian and New Zealand Standard Industrial Classification (ANZSIC) single-digit division. The distribution of firms is similar to that of the Australian Bureau of Statistics (ABS) *Businesses with a web Presence at 2008* (ABS 2009, Table 2.1). Casual inspection, however, suggests an under-sampling of the "Manufacturing" and "Property and Business Services" categories, and oversampling of the "Accommodation, Cafes and Restaurants" category occurred. "Retail Trade" is the most represented industry (17.7 %). Further, the distribution by fulltime employees is similar to that reported by the ABS for 2001 (ABS 2010: Table 3.4).

[2] BUSINESS is comprised of the ANZIC single-digit divisions: "Finance and Insurance"; "Property and Business Services"; and "Wholesale Trade."

Table 5.2 Response and strategic equation dependent variables

Variables	Definition	Mean	Standard deviation
Response variables			
REVENUE	Revenues since entry; = 4 (increased > 10 %); = 3 (increased 6–10 %), = 2 (increased 2–5 %); = 1 (stable ± 1 %); = 0 (decreased)	2.11	1.31
COST	Unit costs during the past year; = 4 (increased > 10 %); = 3 (increased 6–10 %), = 2 (increased 2–5 %); = 1 (stable ± 1 %); = 0 (decreased)	2.13	1.07
Strategic variables			
EXPAND	Entered online market to increase sales; = 4 (most important); = 3 (somewhat important), = 2 (some consideration); = 1 (slight consideration); = 0 (not relevant)	2.51	1.52
EFFICIENCY	Entered online market to reduce costs; = 4 (most important); = 3 (somewhat important), = 2 (some consideration); = 1 (slight consideration); = 0 (not relevant)	1.72	1.50

Tables 5.2 and 5.3, respectively, present the definition, mean and standard deviation of the dependent and independent variables used in the regressions. Answers to survey questions are mostly coded either binary (0, 1) or categorical (0, …, 4). The exception is ESTAB. Table 5.2 contains the REVENUE and COST performance response variables to be modeled.[3] Furthermore, EXPAND is treated as a potentially endogenous argument in the REVENUE performance equation, while EFFICIENCY is treated in a similar manner for the COST response equation. These paired response and strategy equations are to be estimated as a system.

The independent variables contained in Table 5.3 are classified variously as: describing the firm or industry; measuring the commitment to online market entry (initial web site investment); and reasons for entry. These entry reasons are treated as exogenous strategic variables in the response equations and were designed to align with the motivations identified by the literature. The inclusion of ESTAB in Table 5.3 is intended to allow for the presence of standard learning effects, that is, that performance improves with experience.

[3] These variables are often considered by economists as objectives of agent optimization. Steinfield et al. (2002) argue that innovation is based on the search for synergistic opportunity. That is, aligning goals across physical and virtual channels suggests that the "parent" firm benefits from sales stemming from either channel. Higher revenues can arise from geographic and product market extension, thus adding revenue streams otherwise not feasible from physical outlets. Synergistic benefits also arise from lower costs (savings may occur through improved labor productivity, and reduced inventory, advertising and distribution costs).

Table 5.3 Independent variables, levels

Variables	Definition	Mean	Standard deviation
Firm			
BLENDED	1, if operate in physical and online market; = 0, otherwise	0.89	0.31
ESTAB	Years since online market entry	3.85	3.00
SMALL	1, if firm employs less than 20 persons; = 0, otherwise	0.87	0.33
LOCATION	1, if head office in Sydney or Melbourne; = 0, otherwise	0.40	0.49
STORES	1, if more than one store; = 0, otherwise	0.27	0.44
Industry			
BUSINESS	1, if "Business Oriented Services"; = 0, otherwise	0.21	0.40
RETAIL	1, if "Retail"; = 0, otherwise	0.17	0.38
web site			
INITIAL	1, if initial web site investment exceeded $20,000; = 0, otherwise	0.11	0.31
Entry reason			
NEWGOOD	1, if firm entered online market to introduce a new product; = 0, otherwise	0.40	0.49
CUSTOMER	1, if firm entered on-line market in response to customer request; = 0, otherwise	0.44	0.49
SUPPLIER	1, if firm entered online market in response to supplier requirement, = 0, otherwise	0.23	0.42
ANTICIPATE	1, if firm entered online market in response to rival entry threat; = 0, otherwise	0.42	0.49

Note ESTAB is a continuous variable measured in years. All other independent variables are coded binary or categorical. Costs of entry (INITIAL) in Australian dollars

In Table 5.4, several interactions are included to test whether either commitment-based (INIT*EST) or firm orientation-based (RET*EST and BUS*EST) learning effects are present.[4] Additionally, with scale potentially an important reason to enter online markets, SMALL (number of employees), LOCATION (large city location), and STORES (number of outlets) are all included in Table 5.3 to provide for the alternative sources of scale economies. Table 5.4 also includes the scale interactions INIT*LOC, RET*LOC, and BUS*LOC to allow for location-based scale effects. Similarly, network-based (INIT*STOR, RET*STOR, BUS*STOR) and enterprise-based (INIT*BIG, RET*BIG and BUS*BIG) scale effect interaction arguments are included in Table 5.4.

Furthermore, Table 5.4 contains several strategic variable interaction arguments. Specifically, INIT*ANTI, RET*ANTI, and BUS*ANTI are intended to test whether commitment-based or firm orientation-based entry driven by the firm's anticipation of rival entry matters for subsequent performance. If firms enter the online marketplace in an attempt to "front-run" a potential rival, what

[4] Although the firms comprising the sample are "small", the potential for scale economies arises as the employee range is [1, 200]. Also, 400 firms are located within (the large cities) of Melbourne and Sydney. Finally, only 72.4 % of the sample firms operate a single site.

Table 5.4 Independent variables, interactions

Variables	Definition	Mean	Standard deviation
Learning effects			
INIT*EST	INITIAL*ESTAB	0.47	1.71
RET*EST	RETAIL*ESTAB	0.59	1.63
BUS*EST	BUSINESS*ESTAB	0.87	2.20
Location scale effects			
INIT*LOC	INITIAL*LOCATION	0.05	0.22
RET*LOC	RETAIL*LOCATION	0.06	0.23
BUS*LOC	BUSINESS*LOCATION	0.10	0.31
Network scale effects			
INIT*STOR	INITIAL*STORES	0.05	0.21
RET*STOR	RETAIL*STORES	0.05	0.22
BUS*STOR	BUSINESS*STORES	0.08	0.27
Enterprise scale effects			
INIT*BIG	INITIAL*BIG	0.03	0.17
RET*BIG	RETAIL*BIG	0.01	0.12
BUS*BIG	BUSINESS*BIG	0.03	0.18
Strategic anticipation effects			
INIT*ANTI	INITIAL*ANTICIPATE	0.05	0.22
RET*ANTI	RETAIL* ANTICIPATE	0.08	0.27
BUS*ANTI	BUSINESS* ANTICIPATE	0.09	0.29
Strategic supplier effects			
INIT*SUP	INITIAL*SUPPLIER	0.03	0.17
RET*SUP	RETAIL*SUPPLIER	0.03	0.18
BUS*SUP	BUSINESS*SUPPLIER	0.05	0.23

Note BIG = 1 − SMALL, viz., = 1, if firm employs more than 20 persons; = 0, otherwise

Table 5.5 REVENUE and COST sample frequencies

	Frequency	Percent
REVENUE		
Increased by > 10 %	232	23.1
Increased by 6–10 %	158	15.8
Increased by 2–5 %	166	16.6
Remained stable at ± 1 %	381	38.1
Decreased	64	6.4
COST		
Increased by > 10 %	126	12.6
Increased by 6–10 %	239	23.9
Increased by 2–5 %	305	30.4
Remained stable at ± 1 %	298	29.8
Decreased	33	3.3
Total	*1,001*	*100.0*

consequences accrue for the subsequent performance? Finally, the arguments INIT*SUP, RET*SUP, and BUS*SUP allow a similar effects based on supplier-driven entry.

Table 5.6 Conditional performance probabilities

Probability	Revenue (% change)					Cost (% change)				
	>10	6–10	2–5	±1	Fall	>10	6–10	2–5	±1	Fall
P(·|NEWGOOD = 1)	0.10	0.08	0.07	0.14	0.03	0.05	0.10	0.12	0.12	0.01
P(·|CUSTOMER = 1)	0.10	0.07	0.08	0.17	0.03	0.05	0.11	0.14	0.13	0.01
P(·|SUPPLIER = 1)	0.06	0.04	0.04	0.09	0.01	0.03	0.05	0.07	0.06	0.01
P(·|ANTICIPATE = 1)	0.10	0.08	0.07	0.15	0.03	0.06	0.10	0.13	0.13	0.02

Table 5.5 reports REVENUE and COST sample frequencies. The responses concern firm performance by category since entry. The firms' revenue and cost performances fall into five mutually exclusive and exhaustive categories: increased substantially, increased modestly, increased slightly, remained steady (unchanged), or decreased. The reported frequencies suggest online market entry is associated with improved or steady REVENUE (93.6 %) and COST (33.1 %) performance. However, COST increases are reported by 66.9 % of sampled firms.

The conditional performance probabilities reported in Table 5.6 show postentry REVENUE and COST performance variations by entry reason. Interestingly, the implied REVENUE and COST performance responses are identical whether entry is to introduce a new good (NEWGOOD), comply with customer requests (CUSTOMER), or anticipate rival entry (ANTICIPATE). Not surprisingly, the REVENUE increase is smaller when entry occurs to comply with supplier requirements (SUPPLIER). A similar pattern is reported for the COST performance responses.

5.4 Bivariate-Ordered Probit Model

The bivariate probit model with endogenous dummy variables belongs to the general class of simultaneous equation models with both continuous and discrete endogenous variables introduced by Heckman (1978). Maddala (1983) lists the model among recursive models of dichotomous choice. The recursive structure is comprised of structural performance and reduced form (for the potentially endogenous dummy) equations:

$$\begin{aligned} I_{1j}^{o} &= \beta_1^T x_{1j} + \varepsilon_{1j} \\ I_{2j}^{o} &= \beta_2^T x_{2j} + \varepsilon_{2j} = \delta_1 I_{1j} + \beta_2^T x_{1j} + \beta_3^T z_{2j} + \varepsilon_{2j} \end{aligned} \tag{5.1}$$

where I_{1j}^{o} and I_{2j}^{o} are latent variables, and I_{1j} and I_{2j} are discrete variables.[5] The polychotomous observation mechanism for I_{1j}^{o} is the result of complete censoring of the latent dependent variable with the observed counterpart:

[5] Maddala (1983: 122) states that the parameters of the second equation are not identified if there are no exclusion restrictions on the exogenous variables. Wilde (2000) demonstrates, for multiple

$$\begin{aligned} I_{1j} &= 0 \ \text{ if } \ I_{1j}^0 < \mu_0, \\ &= 1 \ \text{ if } \ \mu_0 < I_{1j}^0 \leq \mu_1, \\ &= 2 \ \text{ if } \ \mu_1 < I_{1j}^0 \leq \mu_2, \\ &= 3 \ \text{ if } \ \mu_2 < I_{1j}^0 \leq \mu_3, \\ &= 4 \ \text{ if } \ I_{1j}^0 > \mu_3. \end{aligned} \tag{5.2}$$

The potentially endogenous polychotomous variable I_{2j} is observed following the rule:

$$\begin{aligned} I_{2j} &= 0 \ \text{ if } \ I_{2j}^0 < \lambda_0, \\ &= 1 \ \text{ if } \ \lambda_0 < I_{2j}^0 \leq \lambda_1, \\ &= 2 \ \text{ if } \ \lambda_1 < I_{2j}^0 \leq \lambda_2, \\ &= 3 \ \text{ if } \ \lambda_2 < I_{2j}^0 \leq \lambda_3, \\ &= 4 \ \text{ if } \ I_{2j}^0 > \lambda_3. \end{aligned} \tag{5.3}$$

where x_1 are the included exogenous regressors, z_2 are the excluded exogenous regressors (instruments), and I_2 is the endogenous dummy regressor. μ, β_1, β_2 and β_3 are parameter vectors, and δ_1 is a scalar parameter.[6] The error terms are assumed to be independently and identically distributed as bivariate Normal:

$$\begin{pmatrix} \varepsilon_{1j} \\ \varepsilon_{2j} \end{pmatrix} \sim \text{IIDN}\left(\begin{bmatrix} 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \rho \\ \rho & 1 \end{bmatrix} \right). \tag{5.4}$$

The bivariate model is analogous to the seemingly unrelated regressions (SUR) model for the ordered probit case with the equations linked by $\text{Cor}(\varepsilon_{1j}, \varepsilon_{2j}) = \rho$ (Greene 2008: E22-78). In this setting, the exogeneity condition is stated in terms of the polychoric correlation coefficient ρ, which can be interpreted as the correlation between the unobservable explanatory variables in the equations. When $\rho = 0$, I_{1j} and ε_{2j} are uncorrelated, and I_{2j} is exogenous for the second equation of (5.1). Conversely, $\rho \neq 0$ implies that I_{1j} is correlated with ε_{2j} and therefore is endogenous.

5.5 Empirical Results

Estimation is conducted via LIMDEP version 9.0. Full efficiency in estimation and an estimate of ρ are achieved via full information maximum likelihood estimation. LIMDEP's implementation of the model uses Full Information Maximum

(Footnote 5 continued)
equation probit models with endogenous dummy regressors, that no restrictions are needed if there is sufficient variation in the data, viz., each equation contains at least one varying exogenous regressor.

[6] For all probabilities to be positive requires $0 < \mu_0 < \mu_1 < \mu_2 < \mu_3$ and $0 < \lambda_0 < \lambda_1 < \lambda_2 < \lambda_3$.

Likelihood (FIML), rather than Generalized Method of Moments (GMM). The Lagrange multiplier test for heteroskedasticity is applied to the individual equations that comprise the bivariate probit system. In all tests the null hypothesis is rejected, so the error process is heteroskedastic.

Marginal effects are defined as the probability-weighted average of the effect of the variable on the joint probability for the observed outcome. Terms for common variables are the sums of two effects. The LIMDEP bivariate probit model does not compute the standard errors for the partial effects.[7] Standard errors for the partial effects are obtained with single equation estimates by using the bivariate-ordered probit coefficients and thresholds as starting values for each of the single equation estimators, while adding the options MAXIT = 0 and MARGINS to the commands. Importantly, there is no cross effect in the partial effects; that is, they would be computed an equation at a time anyway.

For all model specifications, the estimated polychoric correlation coefficients between I_{1j} and I_{2j} are significantly different from zero (see Table 5.7). With a nonzero ρ in place, the strategic argument EXPAND is endogenous. Furthermore, the correlations between the REVENUE and EXPAND equation errors are positive suggesting, for example, that unobservable factors which increase the probability of the EXPAND motive also increase the probability of higher REVENUE postentry. Finally, all threshold parameters are significantly different from zero and satisfy the order conditions.

Firms form their strategies based on the expected responses from customers postentry. Under such circumstances, the strategy variables are endogenous, that is, they are not independent of the disturbances in the response function. In particular, firms that decide to enter an online market to expand sales, necessarily form an assessment of future sales. Furthermore, managers typically allocate better or more resources to an online market for which they expect higher sales. Models that ignore this endogeneity will likely overestimate the effects of the resources on subsequent performance.

The results for the ordered probit-relating entry into online markets to expanded sales (EXPAND) contain few surprises: see Table 5.8. As expected, when the strategic objective is to expand the market, competing strategic objectives that do not align well with this have a negative impact on EXPAND, viz., NEWGOOD, CUSTOMER, and ANTICIPATE. The negative impact of SUPPLIER appears only in the $F + S$ specification and vanishes thereafter with the introduction of learning (L), scale (SL, NS, ES), and strategic interaction (SA, SS) variables. Firms that are orientated toward retail rather than business services appear less likely to enter online markets to expand sales. This may reflect a belief that, ultimately, online entry leads to the cannibalization of other channel sales. The network (stores) and enterprise (employees) scale interactions are positive and commitment (initial investment) based. The anticipatory interaction has identical characteristics.

[7] The standard errors of the coefficients for the bivariate model are not correct because of the scaling effect.

Table 5.7 REVENUE Equation threshold parameters and disturbance correlations

Variable	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
Response equation							
μ_1	1.047	1.011	1.012	1.001	1.009	1.012	1.001
	(12.41)	(13.35)	(13.24)	(13.28)	(13.29)	(13.24)	(13.24)
μ_2	1.427	1.382	1.382	1.380	1.380	1.383	1.378
	(12.98)	(14.39)	(14.25)	(14.34)	(14.31)	(14.28)	(14.26)
μ_3	1.916	1.866	1.867	1.865	1.863	1.927	1.861
	(12.35)	(14.99)	(13.85)	(13.97)	(13.95)	(13.90)	(13.88)
Strategic equation							
λ_1	0.285	0.414	0.410	0.412	0.413	0.416	0.412
	(7.99)	(8.25)	(8.24)	(8.25)	(8.23)	(8.17)	(8.25)
λ_2	0.943	1.189	1.184	1.185	1.186	1.194	1.184
	(16.48)	(17.36)	(17.36)	(17.32)	(17.34)	(17.00)	(17.27)
λ_3	1.654	1.921	1.915	1.918	1.919	1.927	1.914
	(23.87)	(24.65)	(24.57)	(24.65)	(24.65)	(24.20)	(24.56)
Disturbance correlation							
ρ	0.323	0.344	0.345	0.346	0.345	0.344	0.345
	(9.74)	(14.10)	(14.24)	(14.33)	(14.12)	(14.16)	(14.22)

Note t ratios in parentheses. *significant at 10 %. **significant at 5 %. Effect: *F* firm, *S* strategic, *B* blended, *L* learning, *SL* location scale, *NE* network scale, *ES* enterprise scale, *SA* strategic anticipation, *SS* strategic supply

Table 5.8 EXPAND equation estimates, partial effects

Variables	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
BLENDED		−0.33949	−0.34612	−0.37240	−0.34461	−0.39390	−0.32838
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ESTAB	−0.00127	0.00107	0.00008	0.00014	0.00012	0.00017	0.00008
	(0.56)	(0.91)	(0.07)	(0.12)	(0.11)	(0.14)	(0.08)
SMALL	0.00292	−0.00327	−0.00412	−0.00312	−0.00031	−0.00513	−0.00390
	(0.27)	(0.69)	(0.87)	(0.61)	(0.05)	(0.96)	(0.83)
LOCATION	−0.00715	−0.00278	−0.00314	−0.00295	−0.00347	−0.00278	−0.00288
	(1.06)	(0.90)	(0.78)	(0.89)	(1.13)	(0.79)	(0.94)
STORES	0.01175	0.00521	0.00491	0.00580	0.00472	0.00528	0.00479
	(1.48)	(1.44)	(1.37)	(1.14)	(1.32)	(1.29)	(1.34)
BUSINESS	0.00284	0.00699	−0.00169	0.00319	0.00172	0.00040	−0.00002
	(0.34)	(1.11)	(0.33)	(0.64)	(0.42)	(0.07)	(0.01)
RETAIL	−0.02493**	0.00149	−0.00873*	−0.00975**	−0.01056**	−0.01624**	−0.01021**
	(2.78)	(0.22)	(1.75)	(1.96)	(2.49)	(2.59)	(2.26)
INITIAL	0.02472**	0.01276	0.00906	0.00065	0.00221	−0.00541	0.00908
	(2.33)	(1.56)	(1.35)	(0.09)	(0.39)	(0.70)	(1.57)
NEWGOOD	−0.05348**	−0.01805**	−0.01807**	−0.01967**	−0.01813**	−0.02008**	−0.01809**
	(7.50)	(5.73)	(5.74)	(5.81)	(5.79)	(5.59)	(5.76)
CUSTOMER	−0.05732**	−0.01781**	−0.01764**	−0.01914**	−0.01779**	−0.02023**	−0.01757**
	(8.23)	(5.75)	(5.71)	(5.74)	(5.77)	(5.73)	(5.68)
SUPPLIER	−0.01782**	−0.00473	−0.00502	−0.00509	−0.00487	−0.00547	−0.00498
	(2.15)	(1.31)	(1.39)	(1.31)	(1.36)	(1.33)	(1.05)
ANTICIPATE	−0.05633**	−0.01876**	−0.01850**	−0.01999**	−0.01819**	−0.02705**	−0.01851**
	(8.05)	(6.04)	(5.98)	(5.99)	(5.89)	(5.83)	(5.98)
EST*EST	0.00016	0.00004	0.00003	0.00004	0.00003	0.00003	0.00003
	(1.13)	(0.48)	(0.41)	(0.47)	(0.46)	(0.35)	(0.44)
INIT*EST		−0.00131					
		(0.86)					

(continued)

Table 5.8 (continued)

Variables	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
RET*EST		−0.00326**					
		(1.98)					
BUS*EST		−0.00164					
		(1.32)					
INIT*LOC			−0.00266				
			(0.28)				
RET*LOC			−0.00378				
			(0.44)				
BUS*LOC			0.00465				
			(0.61)				
INIT*STORE				0.02074**			
				(1.96)			
RET*STORE				−0.00302			
				(0.31)			
BUS*STORE				−0.00985			
				(1.13)			
INIT*BIG					0.02116**		
					(1.96)		
RET*BIG					0.01160		
					(0.83)		
BUS*BIG					−0.00742		
					(0.73)		
INIT*ANTI						0.03374**	
						(3.10)	
RET*ANTI						0.01244	
						(1.35)	
BUS*ANTI						−0.00020	
						(0.02)	

(continued)

Table 5.8 (continued)

Variables	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
INIT*SUP							−0.00418
							(0.40)
RET*SUP							0.00276
							(0.27)
BUS*SUP							0.00129
							(0.15)
Log likelihood	−1293.1	−1170.6	−1171.1	−1172.0	−1170.7	−1169.5	−1171.1
Predicted correctly	48.9 %	49.9 %	51.1 %	50.2 %	50.2 %	50.4 %	50.3 %

Note t ratios in parentheses. *significant at 10 %. ** significant at 5 %. Effect: *F* firm, *S* strategic, *B* blended, *L* learning, *SL* location scale, *NE* network scale, *ES* enterprise scale, *SA* strategic anticipation, *SS* strategic supply

Table 5.9 REVENUE response equation estimates, partial effects

Variables	F + S	F + S+ B + L	F + S+ B + SL	F + S + B + NS	F + S+ B + ES	F + S+ B + SA	F + S+ B + SS
BLENDED		−0.05796**	−0.05484**	−0.05651**	−0.05737**	−0.05902**	−0.05852**
		(5.31)	(5.39)	(5.43)	(5.36)	(5.45)	(5.37)
ESTAB	0.00096	0.00171	0.00097	0.00093	0.00099	0.00100	0.00104
	(0.33)	(0.86)	(0.59)	(0.56)	(0.58)	(0.58)	(0.60)
SMALL	0.00935	0.00197	0.00244	0.00242	0.00345	0.00085	0.00172
	(0.64)	(0.22)	(0.30)	(0.29)	(0.31)	(0.10)	(0.20)
LOCATION	0.01903**	0.01138**	0.00903	0.01068**	0.01047*	0.01140**	0.01112**
	(2.05)	(2.04)	(1.32)	(2.01)	(1.96)	(2.07)	(2.00)
STORES	0.00187	0.00142	0.00139	0.00157	0.00099	0.00079	0.00106
	(0.17)	(0.22)	(0.23)	(0.19)	(0.15)	(0.12)	(0.16)
BUSINESS	−0.01200	−0.00536	−0.00346	−0.00018	−0.00532	−0.00866	−0.00820
	(1.05)	(0.48)	(0.40)	(0.02)	(0.73)	(0.97)	(1.03)
RETAIL	−0.01320	−0.00062	−0.01160	−0.01052	−0.00739	−0.01926**	−0.00887
	(1.07)	(0.05)	(1.38)	(1.28)	(0.98)	(1.98)	(1.08)
INITIAL	0.01410	0.01113	0.00237	−0.00238	0.00016	−0.00849	0.00372
	(0.96)	(0.77)	(0.21)	(0.22)	(0.02)	(0.74)	(0.37)
NEWGOOD	−0.05245**	−0.02748**	−0.02523**	−0.02672**	−0.02708**	−0.02663**	−0.02753**
	(5.13)	(4.48)	(4.41)	(4.57)	(4.50)	(4.38)	(4.50)
CUSTOMER	−0.04708**	−0.02250**	−0.02106**	−0.02177**	−0.02232**	−0.02258**	−0.02256**
	(4.71)	(3.73)	(3.76)	(3.79)	(3.78)	(3.78)	(3.76)
SUPPLIER	−0.01573	−0.00755	−0.00674	−0.00698	−0.00746	−0.00740	−0.01051
	(1.39)	(1.12)	(1.07)	(1.08)	(1.12)	(1.10)	(1.18)
ANTICIPATE	−0.04019**	−0.01944**	−0.01829**	−0.01897**	−0.01895**	−0.02915**	−0.01959**
	(3.97)	(3.19)	(3.23)	(3.28)	(3.18)	(3.78)	(3.23)
EST*EST	0.00007	0.00000	0.00001	0.00001	0.00001	0.00001	0.00001
	(0.40)	(0.01)	(0.13)	(0.15)	(0.15)	(0.08)	(0.11)
INIT*EST		−0.00125					
		(0.45)					

(continued)

Table 5.9 (continued)

Variables	F + S	F + S+ B + L	F + S+ B + SL	F + S + B + NS	F + S+ B + ES	F + S+ B + SA	F + S+ B + SS
RET*EST		−0.00199 (0.66)					
BUS*EST		−0.00061 (0.28)					
INIT*LOC			0.00685 (0.42)				
RET*LOC			0.01454 (1.01)				
BUS*LOC			−0.00721 (0.56)				
INIT*STORE				0.02351 (1.39)			
RET*STORE				0.01203 (0.77)			
BUS*STORE				−0.02169 (1.55)			
INIT*BIG					0.02407 (1.22)		
RET*BIG					0.00385 (0.15)		
BUS*BIG					−0.01310 (0.71)		
INIT*ANTI						0.03498** (2.03)	
RET*ANTI						0.02808** (1.96)	
BUS*ANTI						0.00245 (0.18)	

(continued)

Table 5.9 (continued)

Variables	F + S	F + S+ B + L	F + S+ B + SL	F + S + B + NS	F + S+ B + ES	F + S+ B + SA	F + S+ B + SS
INIT*SUP							0.00934
							(0.49)
RET*SUP							0.00759
							(0.42)
BUS*SUP							0.00310
							(0.20)
EXPAND	0.07858**	0.05057**	0.04716**	0.04859**	0.04980**	0.05059**	0.05063**
	(21.29)	(20.51)	(20.53)	(20.66)	(20.58)	(20.65)	(20.61)
Log likelihood	−1458.7	−1451.8	−1450.3	−1452.3	−1453.0	−1449.3	−1452.3
Predicted correctly	38.6 %	39.3 %	40.0 %	39.9 %	39.5 %	39.7 %	39.6 %

Note t ratios in parentheses. *significant at 10 %. ** significant at 5 %. Effect: *F* firm, *S* strategic, *B* blended, *L* learning, *SL* location scale, *NE* network scale, *ES* enterprise scale, *SA* strategic anticipation, *SS* strategic supply

The results for the corresponding ordered probit model predicting REVENUE responses are reported in Table 5.9. First, we discuss the effect of strategic entry to EXPAND markets on sales and revenue. The influence of entry for other strategic purposes is then discussed. Finally, the results for the control variables are discussed.

Does strategic entry to expand sales increase revenue? Based on the results in Table 5.9, the answer is an emphatic "yes." The term correcting for endogeneity bias in strategic entry to expand sales has the expected positive sign with the coefficient significant at the 1 % level. Compared with the magnitudes of other variables, the size of the payoff is quite large.

In a manner similar to what we find in the strategic entry equation, strategic objectives that do not necessarily align with increasing revenue (i.e., NEWGOOD, CUSTOMER, and ANTICIPATE) are negative in their impact. Unsurprisingly, the SUPPLIER objective has no impact on REVENUE, consistent with the earlier finding.

Contrary to expectations, traditional blended seller status appears to have a negative impact on revenue, other things equal. This is consistent with the possibility that cannibalization of demand occurred upon entry. Furthermore, while several potential sources of scale economies are considered, only location-based scale effects are significant. Positive effects appear in all specifications except $F + S + B +$ SL, which is probably due to the inclusion of location interaction variables.

Interestingly, none of the learning or scale interaction variables is significant. There are several possible explanations for this finding. The potential sources of scale effects considered here are major city location (i.e., Sydney or Melbourne), the number of outlets, and the number of employees. All of these potential drivers of cost savings are implicitly based on traditional factors (i.e., physical sources of scale economies). Perhaps the appropriate focus should be on "virtual," rather than physical, economies, viz., potential virtual or blended market reach. A second possibility is that the ranges of variation of the interaction terms are simply too compressed due to the SME status of the sampled firms for substantial scale economies to be available.

For all COST and EFFICIENCY specifications, the estimated polychoric correlation coefficients are positive (see Table 5.10). With a nonzero ρ, the strategic argument EFFICIENCY is endogenous. Finally, all threshold parameters are significantly different from zero and satisfy the order conditions.

The results for the ordered probit predicting strategic efficiency-based entry are contained in Table 5.11. In a finding similar to that noted for the EXPAND equation, competing strategic objectives that do not align with the efficiency motive negatively influence EXPAND.

INIT*LOC and IBIT*STOR are the only significant interaction variables. Their reported negative signs suggest that potential scale economies are not sufficient to overcome the negative influence of the required financial commitment for entry.

The results for the ordered probit COST response models are detailed in Table 5.12. Somewhat surprisingly, the answer to the question of whether strategic entry to improve efficiency reduces costs is "no"! The terms that correct for

Table 5.10 COST equations threshold parameters and disturbance correlations

Variables	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
Response equation							
μ_1	1.150	1.170	1.164	1.164	1.166	1.167	1.163
	(12.66)	(13.69)	(13.58)	(13.74)	(13.68)	(13.68)	(13.60)
μ_2	1.859	1.893	1.883	1.886	1.887	1.887	1.881
	(14.57)	(16.38)	(16.27)	(16.51)	(16.41)	(16.39)	(16.32)
μ_3	2.720	2.772	2.758	2.760	2.763	2.765	2.758
	(14.69)	(16.93)	(16.78)	(17.09)	(16.98)	(16.92)	(16.91)
Strategic equation							
λ_1	0.397	0.439	0.440	0.442	0.439	0.440	0.439
	(11.71)	(11.81)	(11.77)	(11.79)	(11.23)	(11.80)	(11.82)
λ_2	0.989	1.054	1.056	1.061	1.056	1.055	1.054
	(19.94)	(20.22)	(20.14)	(20.31)	(20.24)	(20.26)	(20.13)
λ_3	1.688	1.758	1.762	1.768	1.761	1.760	1.758
	(26.65)	(26.67)	(26.72)	(26.87)	(26.79)	(26.75)	(26.78)
Disturbance correlation							
ρ	0.279	0.274	0.276	0.277	0.275	0.277	0.275
	(6.80)	(7.32)	(7.40)	(7.64)	(7.42)	(7.57)	(7.42)

Note *t* ratios in parentheses. *significant at 10 %. **significant at 5 %. Effect: *F* firm, *S* strategic, *B* blended, *L* learning, *SL* location scale, *NE* network scale, *ES* enterprise scale, *SA* strategic anticipation, *SS* strategic supply

Table 5.11 EFFICIENCY equation estimates, partial effects

Variables	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
BLENDED		−0.49219	−0.49750	−0.47708	−0.48757	−0.49559	−0.48765
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ESTAB	−0.00142	−0.00090	−0.00057	−0.00080	−0.00061	−0.00072	−0.00063
	(0.62)	(0.51)	(0.34)	(0.50)	(0.38)	(0.44)	(0.38)
SMALL	0.00277	−0.00313	−0.00414	−0.00401	0.00715	−0.00323	−0.00273
	(0.26)	(0.44)	(0.58)	(0.58)	(0.79)	(0.46)	(0.39)
LOCATION	−0.00106	−0.00047	0.00066	−0.00126	−0.00050	−0.00037	−0.00070
	(0.15)	(0.10)	(0.11)	(0.28)	(0.11)	(0.08)	(0.15)
STORES	−0.00778	−0.00593	−0.00666	0.00134	−0.00613	−0.00627	−0.00592
	(0.97)	(1.10)	(1.23)	(0.20)	(1.12)	(1.17)	(1.10)
BUSINESS	0.01275	0.00564	0.00376	0.01134*	0.00263	0.01077	0.00533
	(1.50)	(0.59)	(0.48)	(1.65)	(0.42)	(1.35)	(0.78)
RETAIL	−0.00098	−0.00276	−0.00016	0.00089	−0.00240	0.00507	0.00309
	(0.11)	(0.27)	(0.02)	(0.13)	(0.38)	(0.60)	(0.45)
INITIAL	−0.00803	−0.01793	0.00146	0.00540	−0.00946	−0.01484	−0.01019
	(0.75)	(1.47)	(0.15)	(0.57)	(1.11)	(1.42)	(1.16)
NEWGOOD	−0.04210**	−0.02021**	−0.02098**	−0.02035**	−0.02008**	−0.02017**	−0.02001**
	(5.94)	(4.32)	(4.47)	(4.48)	(4.36)	(4.32)	(4.29)
CUSTOMER	−0.04389**	−0.01952**	−0.01948**	−0.01946**	−0.01949**	−0.01950**	−0.01923**
	(6.26)	(4.19)	(4.18)	(4.30)	(4.25)	(4.21)	(4.15)
SUPPLIER	−0.02549**	−0.01353**	−0.01305**	−0.01277**	−0.01354**	−0.01378**	−0.01325*
	(3.11)	(2.54)	(2.43)	(2.46)	(2.57)	(2.59)	(1.89)
ANTICIPATE	−0.04597**	−0.02183**	−0.02210**	−0.02093**	−0.02164**	−0.01980**	−0.02187**
	(6.57)	(4.71)	(4.76)	(4.65)	(4.74)	(3.28)	(4.74)
EST*EST	0.00013	0.00004	0.00005	0.00006	0.00006	0.00006	0.00006
	(0.87)	(0.35)	(0.48)	(0.52)	(0.54)	(0.57)	(0.51)
INIT*EST		0.00192					
		(0.84)					

(continued)

Table 5.11 (continued)

Variables	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
RET*EST		0.00111 (0.46)					
BUS*EST		0.00028 (0.15)					
INIT*LOC			−0.02465* (1.68)				
RET*LOC			0.00294 (0.23)				
BUS*LOC			0.00552 (0.48)				
INIT*STOR				−0.03403** (2.35)			
RET*STOR				−0.00020 (0.02)			
BUS*STOR				−0.01239 (1.04)			
INIT*BIG					0.00057 (0.04)		
RET*BIG					0.03231 (1.54)		
BUS*BIG					0.02384 (1.58)		
INIT*ANTI						0.01139 (0.79)	
RET*ANTI						−0.00750 (0.62)	
BUS*ANTI						−0.00879 (0.77)	

(continued)

Table 5.11 (continued)

Variables	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
INIT*SUP							0.00087
							(0.06)
RET*SUP							−0.00981
							(0.68)
BUS*SUP							0.00405
							(0.32)
Log likelihood	−1439.8	−1366.2	−1365.4	−1362.5	−1364.7	−1365.5	−1365.6
Predicted correctly	38.5 %	38.7 %	39.2 %	39.7 %	38.4 %	38.8 %	38.3 %

Note t ratios in parentheses. *significant at 10 %. **significant at 5 %. Effect: *F* firm, *S* strategic, *B* blended, *L* learning, *SL* location scale, *NE* network scale, *ES* enterprise scale, *SA* strategic anticipation, *SS* strategic supply

Table 5.12 COST response equation estimates, partial effects

Variables	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
BLENDED		−0.03220**	−0.03298**	−0.03218**	−0.03247**	−0.03239**	−0.03302**
		(4.33)	(4.44)	(4.43)	(4.39)	(4.45)	(4.42)
ESTAB	−0.00265*	−0.00243*	−0.00197	−0.00204*	−0.00194	−0.00194	−0.00206
	(1.69)	(1.65)	(1.51)	(1.65)	(1.49)	(1.52)	(1.57)
SMALL	−0.01001	−0.01062*	−0.01048	−0.01034*	−0.00195	−0.01066*	−0.01008
	(1.27)	(1.65)	(1.59)	(1.65)	(0.23)	(1.66)	(1.53)
LOCATION	0.00814*	0.00788**	0.00938*	0.00732*	0.00720*	0.00727*	0.00709*
	(1.64)	(1.96)	(1.72)	(1.81)	(1.74)	(1.80)	(1.71)
STORES	−0.00264	−0.00300	−0.00239	−0.00428	−0.00230	−0.00254	−0.00225
	(0.45)	(0.62)	(0.49)	(0.68)	(0.48)	(0.53)	(0.46)
BUSINESS	0.00972	0.01706**	0.01104	0.00948	0.00557	0.00576	0.00819
	(1.58)	(2.04)	(1.57)	(1.55)	(1.01)	(0.88)	(1.38)
RETAIL	0.01065*	−0.00082	0.00925	0.00546	0.00926*	0.00021	0.01067*
	(1.65)	(0.09)	(1.38)	(0.88)	(1.65)	(0.03)	(1.74)
INITIAL	0.00038	−0.00414	0.00090	−0.00319	−0.00634	−0.00964	−0.00565
	(0.05)	(0.38)	(0.10)	(0.39)	(0.85)	(1.14)	(0.74)
NEWGOOD	−0.01644**	−0.00935**	−0.01016**	−0.00991**	−0.00988**	−0.00952**	−0.01016**
	(3.06)	(2.07)	(2.25)	(2.25)	(2.20)	(2.16)	(2.24)
CUSTOMER	−0.02348**	−0.01490**	−0.01499**	−0.01464**	−0.01533**	−0.01492**	−0.01511**
	(4.44)	(3.32)	(3.35)	(3.34)	(3.44)	(3.41)	(3.36)
SUPPLIER	−0.01499**	−0.01050**	−0.01074**	−0.01105**	−0.01130**	−0.01073**	−0.01224*
	(2.46)	(2.07)	(2.11)	(2.22)	(2.23)	(2.16)	(1.83)
ANTICIPATE	−0.01095**	−0.00549	−0.00494	−0.00489	−0.00475	−0.01202**	−0.00493
	(2.07)	(1.23)	(1.11)	(1.12)	(1.07)	(2.16)	(1.10)
EST*EST	0.00014	0.00013	0.00009	0.00009	0.00009	0.00009	0.00009
	(1.44)	(1.61)	(1.20)	(1.21)	(1.20)	(1.15)	(1.24)
INIT*EST		0.00072					
		(0.35)					

(continued)

Table 5.12 (continued)

Variables	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
RET*EST		0.00333 (1.48)					
BUS*EST		−0.00230 (1.40)					
INIT*LOC			−0.00542 (0.42)				
RET*LOC			0.00245 (0.21)				
BUS*LOC			−0.00769 (0.75)				
INIT*STOR				0.00527 (0.41)			
RET*STOR				0.01522 (1.27)			
BUS*STOR				−0.00552 (0.52)			
INIT*BIG					0.02024 (1.35)		
RET*BIG					0.00674 (0.35)		
BUS*BIG					0.01335 (0.94)		
INIT*ANTI						0.01972 (1.56)	
RET*ANTI						0.02254** (2.11)	
BUS*ANTI						0.00388 (0.39)	

(continued)

Table 5.12 (continued)

Variables	F + S	F + S + B + L	F + S + B + SL	F + S + B + NS	F + S + B + ES	F + S + B + SA	F + S + B + SS
INIT*SUP							0.01646
							(1.14)
RET*SUP							−0.00275
							(0.20)
BUS*SUP							−0.00193
							(0.17)
EFFICIENCY	0.03322**	0.02754**	0.02771**	0.02715**	0.02757**	0.02725**	0.02786**
	(18.22)	(17.58)	(17.66)	(17.64)	(17.64)	(17.77)	(17.69)
Log likelihood	−1426.0	−1423.9	−1424.8	−1422.5	−1423.9	−1422.0	−1425.2
Predicted correctly	32.7 %	33.1 %	32.3 %	31.9 %	32.8 %	32.2 %	30.7 %

Note *t* ratios in parentheses. *significant at 10 %. **significant at 5 %. Effect: *F* firm, *S* strategic, *B* blended, *L* learning, *SL* location scale, *NE* network scale, *ES* enterprise scale, *SA* strategic anticipation, *SS* strategic supply

endogeneity bias exhibit unexpected positive signs, with the coefficients significant at the 1 % level. Also, the magnitudes of the coefficients are quite large. Perhaps, respondents find greater difficulty in identifying cost reductions as opposed to revenue increases. Another explanation is that the small firms in the sample are really "too small" to reap any efficiency-induced cost reductions suggested by the literature to arise from entry.

Interestingly, entry for other strategic reasons (i.e., NEWGOOD, CUSTOMER, SUPPLIER, and ANTICIPATE) are seen to reduce COSTS. In some cases, the explanation is not hard to find: sales of a digital equivalent good will almost always reduce costs compared to its physical equivalent. Similarly, customer requests are often posited to lower selling costs, whereas supplier-driven entry clearly could produce cost efficiency gains. The negative sign on ANTICIPATE could derive from a brand effect, although this is unclear.

Traditional blended seller status appears to have a negative influence on costs, other things equal. These cost advantages may arise through synergies that are realized on entry. For example, costs savings may occur through improved labor productivity, or reduced inventory, advertising and distribution costs. Additionally, while several sources of scale economies are considered, only location-based scale effects are significant. We observe unintuitive positive signs for the effect of urban location on costs. One rationalization for this finding is that major urban centers typically report higher costs, and any efficiency gains are overwhelmed by the general trend in input prices for which we lack adequate controls.

5.6 Conclusions

The modeling approach employed in this study is based on the premise that firms enter online markets with a view to pursue specific strategic goals. In particular, this study addresses the questions: How do virtual firms differ in their online market entry? In what type of environments is post online market entry performance by virtual and established firms likely to succeed? What can be said about the relationship between postentry performance and the reasons for entry? Importantly, the study focus on smaller firms allows us to assess whether the purported entry gains identified in the previous literature apply to this important class of enterprises.

The shortest answer to these questions is that *the reasons for entry matter for performance*, but the effects vary by the type of performance measured. In particular, strategic entry to expand the market increases sales revenue. Indeed, the payoff is relatively quite large. Traditional blended sellers do not appear to have any inherent advantage in revenue growth after entry. Demand channel cannibalization is proposed as a partial explanation for this finding. Furthermore, only location-based scale effects are positive. First-mover status (years established online) provides no source of advantage in terms of revenue response to entry.

Also, none of the learning or scale interaction variables appears to matter statistically.

For the cost response models, we find that strategic entry intended to improve efficiency does not typically reduce costs! Perhaps the small firms contained in the sample are really "too small" to reap any of the efficiency-induced cost reductions cited in the literature. However, entry for other strategic reasons is associated with lower costs postentry. Evidently, entry does reduce costs so long as that is not its ostensible purpose. Interestingly, blended sellers enjoy cost advantages arising through synergies that are realized on entry. Finally, we find no evidence of significant scale effects, except that cost increases are associated with urban locations. Apparently the vaunted locational economies are overwhelmed by the more usual phenomenon of high urban prices.

A limitation of the analysis is that only the mapping from the stated purpose of entry to the observed success of entry is analyzed. No structural model which identifies and allows measurement of the actual mechanisms by which revenues and costs change is feasible given this data. In particular, a more thorough analysis might consider potential impacts on employment, prices, and the sources of cost improvement, for example, whether via advertising, inventory or distribution cost reductions. The analysis might also have addressed firms' initial web site capability, whether online market performance cannibalized B&M store sales, and the empirical magnitude and pattern of market expansion.

References

ABS (2009) Business use of information technology, 2007–2008, Catalogue 8129.0, Australian Bureau of Statistics, Canberra

ABS (2010) Small business in Australia, Catalogue 1321.0, Australian Bureau of Statistics, Canberra

Audretsch D (1995) Innovation, growth and survival. Int J Ind Org 13:441–557

DeYoung R (2005) The performance of internet-based models: evidence from the banking industry. J Bus 78:893–947

Dinlersoz E, Pereira P (2007) On the diffusion of electronic commerce. Int J Ind Organ 25:541–547

Disney R, Haskel J, Heden Y (2003) Entry, exit and establishment survival in UK manufacturing. J Ind Econ 51:91–112

Dunt E, Harper I (2002) E-Commerce and the Australian economy. Econ Record 78:327–342

Freedman D, Sekhon J (2008) Endogeneity in Probit Response Models, Working Paper, University of California, Berkeley

Garicano L, Kaplan S (2001) The effects of business-to-business E-commerce on transactions costs. J Ind Econ 49:463–485

Geroski P (1995) What do we know about entry? Int J Ind Organ 13:421–440

Greene W (2008) Econometric analysis, 6th edn. Prentice Hall, New Jersey

Heckman J (1978) Dummy endogenous variables in a simultaneous equation system. Econometrica 46:931–959

Heckman J (1979) Sample selection bias as a specification error. Econometrica 47:153–196

Lieberman M (2002) Did first mover advantage survive the Dot.com crash?'. Working Paper, University of California, Los Angeles
Litan R, Rivlin A (2001) Beyond the Dot.coms: The economic promise of the internet. Brookings Internet Policy Institute
Lucking-Riley D, Spulber D (2001) Business-to-business electronic commerce. J Econ Perspect 15:55–68
Maddala, GS (1983) Limited-Dependent and Qualitative Variables in Economics. Cambridge University Press, New York
Nikolaeva R (2007) The dynamic nature of survival determinants in E-commerce. J Acad Mark Sci 35:560–571
Reid G, Smith J (2000) What makes a new business start-up successful? Small Bus Econ 14:165–182
Schmalensee R (1982) Product differentiation advantages of pioneering brands. Am Econ Rev 72:349–365
Segarra A, Callejón M (2002) New firms' survival and market turbulence: new evidence from Spain. Rev Ind Organ 20:1–14
Smith M, Brynjolfsson E (2001) Consumer decision-making at an internet shopbot: brand still matters. J Ind Econ 49:541–558
Wilde J (2000) Identification of multiple Equation probit models with endogenous dummy regressors. Econ Lett 69:309–312