Post-shakeout Performance, Survivor Bias and the Meaning of Success

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Abstract

A new market poses many questions for potential entrants. Among the most pertinent ones are which factors contribute to firm's survival. But whether the same factor is equally beneficial at the time of entry and at a later stage has been rarely addressed. Consequently, we explore the dynamism of firm-controlled survival determinants and their correspondence to sales drivers. Our contributions are twofold – exploring the time-varying effect of survival determinants and comparing them to sales determinants after a shakeout in the market. We demonstrate the dangers of generalizing about success factors without considering their dynamic nature or the firm's strategic objectives.

Keywords: *dynamic effects, e-retailing, survivor bias*

JEL codes: M13

1. Introduction

The creation of new market is always froth with entrepreneurial activity both by new ventures and existing entrants from other markets. Past research has focused on survival determinants as well as differences between de novo and de alio entrants (Ganco & Agarwal, 2009). Some of the empirical generalizations have been that a shakeout or the rapid drop in the number of firms is associated with the decline of an industry. Other shakeouts have been associated with consolidations in an industry (e.g. automobiles, breweries). Few studies have looked at the performance of post-shakeout entry cohorts (Horvath, Schivardi, & Woywode, 2001). However, since most studies have associated shakeouts with the decline of the industry, not much thought has been given to the success of survivors after the shakeout. Precisely, what makes firms succeed after the shakeout? Are the same factors contributing to their survival as well as to their post-shakeout success? Can entrepreneurs be aware of these factors at the time of entry?

There has been an implicit assumption in survival studies of constant effects over time. While there are studies that have considered the effects of factors on different cohorts of entrants (Agarwal, Sarkar, & Echambadi, 2002), the underlying question of whether the same factor is equally beneficial to a new venture at the time of entry and at a later stage has been rarely addressed. Of particular interest would be to find out whether the same factors that lead to surviving the shakeout translate into success after the shakeout. Some authors have indicated that the shakeout is a result of a regime change in an industry (Jovanovic and MacDonald 1994, Anderson & Tushman, 2001). If this is the case, then it would make sense to expect that success drivers would change after a shakeout.

The online B2C retail market or e-commerce is an interesting setting to study the above questions. First, the shakeout occurred in the growth phase of the market and not in the maturity/decline stage as described by empirical generalizations (Agarwal & Tripsas, 2008). The massive exit of firms so widely publicized not only did not mark the decline of the industry, but triggered a growth of approximately 20% per year in the next 10 years. Second, the shakeout was not the result of a technological wave of destruction, but rather of speculative financial markets. Can we still expect that certain firm factors that were important for survival would still be so post shakeout?

To answer these questions, we explore the role of survivor bias by tracking a subsample of an existing study of e-tailing survival determinants (Nikolaeva, 2007) and investigating how firm factors affect sales and market share in the year following the shakeout. The contributions of the study are twofold – it demonstrates the time-varying effect of firm factors affecting survival and compares the effect of these factors on sales and market share after the shakeout in the industry. By comparing the similarities and differences of these effects, the study demonstrates the dangers of generalizing about success factors without taking into account the strategic objectives of a firm and the changing nature of success factors.

2. Theoretical Framework

The industry life cycle view has been developed by Gort and Klepper (1982) and later refined by numerous studies by Rajshree Agarwal and her co-authors. The idea is that a technological breakthrough gives birth of an industry, which starts by

attracting a few new entrants, followed by a big wave of entry followed by a shakeout and a stabilization of the number of firms in the industry. This empirical generalization has been observed in many industries. The stylized facts in these studies stipulate that during the growth phase many entrepreneurs are attracted to the industry without having a clear idea whether they have what it takes to succeed. The shakeout phase weeds out the ones who do not have the capabilities for success (Jovanovic, 1982).

Helfat and Lieberman (2002) state that when firms enter a new market, they need to develop new capabilities. Thus, before entry, entrepreneurs should have some anticipation about the necessary capabilities for success in the new market. As found by the authors, entrepreneurs or existing firms who enter/diversify into new markets that require capabilities they already have or are able to develop rapidly are more likely to succeed in these markets. Contrary to the stylized facts cited by economists above, Helfat and Lieberman (2002) suggest that firms do possess pre-entry knowledge of their capabilities and this determines their entry and post-entry success.

However, a fact that has not been quite recognized by the life cycle literature is that the capabilities necessary for success may change over time as the industry evolves. Helfat and Lieberman (2002) hint at this idea by the illustration of ATM and e-commerce diffusion where complementary resources proved to be more important than the core resources thought to be crucial in the beginning stages of the industries. As the authors point out, the problem of predicting which resources and capabilities would turn into key success factors is especially acute for new industries. Arora and Nandkumar (2012) provide another proof of the change of capabilities' effect on firm performance with the change of environmental conditions.

Nikolaeva (2007) demonstrates that few survival determinants stay constant over the course of e-tailers' lives from the beginning of the industry until post-shakeout. This finding makes it difficult to talk about key success factors, because it puts on them an expiration limit. Consequently, such a notion must be of special interest to entrepreneurs as entry to a new market requires planning of capability development leading to competitive advantage.

The purpose of the current study is to test whether factors affecting the survival of firms during the period leading to the shakeout are relevant as sales determinants in the post shakeout period of the industry. We concentrate on what organizational ecologists refer to as "founding conditions" (Agarwal et al., 2002) specific to the firm as these are in control of management at the time of entry into a new market and they can shape future expectations about the viability and growth of the venture. It has been already established in the organizational ecology literature that firms entering during high competitive conditions (i.e. high density at founding) have initially higher mortality rates, but those that survive the precarious period have lower mortality rates because of their increased fitness (Swaminathan, 1996). This means that the effect of founding density changes over time. In a similar fashion, we ask whether other effects change over time and specifically, what the extent of this change is in the post shakeout period. We consider the following factors: order of entry, new venture, ownership, and product categories – quasi-commodity products and search vs. experience goods. We explore the correspondence of the survival determinants on the biased sample of survivors post the shakeout period. This would allow us to see to what extent findings based on cross sectional studies suffering from survival bias can be used as prescriptions of success factors for new ventures. As there are no specific enough theories addressing the empirical questions we pose

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(duration of effects, post-shakeout performance), we prefer to not develop hypotheses, but rather state the questions and test for their answers.

One factor that deserves special attention, because of the contradictory findings in the existing literature, is the order and timing of entry. The entry decision is heavily dependent on timing. Since most firms are followers, rather than pioneers, the strategically important question is whether a delayed entry would put them at a disadvantage compared to earlier entrants. The existing literature has explored the first mover advantage topic from different angles. Among the major considerations about the empirical studies (Kerin et al. 1992, Szymanski et al. 1995, and VanderWerf and Mahon 1997) are the censored sample bias and timing of market share measurement. Moreover, Lieberman (2002) points out that the development of e-commerce provides a unique laboratory to study the effects of entry timing on firm performance.

2.1 Order of entry

In traditional economic terms, first mover advantage refers to the long-term benefits associated with a firm entering a new market. Capturing market share, establishing barriers to entry, developing consumer preferences and subsequently raising switching costs all contribute to the establishment of a monopolistic opportunity for the pioneer. This in turn enables the first-mover to gain financial and strategic advantages and secures its market domination (Schmalensee 1982; Telser 1964).

In spite of studies (Robinson & Fornell, 1985; Urban et al., 1986) finding market pioneers are rewarded by long term market share advantages and that earlier

entrants survive longer (Klepper, 2002), the findings on the topic are far from conclusive. Golder and Tellis (1993) were among the first to question the very definition of a market pioneer. The debate of whether the "first to market is the first to fail" boils down to the absolute and comparative views of entry-order advantages (Garcia-Sanchez, Mesquita, & Vassolo, 2013; Lieberman & Montgomery, 2013). On the other hand, Lilien and Yoon (1990) shift the focus on the durability of pioneer advantages. While it is true that late entrants have to overcome barriers to entry and high consumer switching costs, they can also capitalize on the first movers' mistakes. Experience with consumer tastes might well outdo the disadvantages associated with entering a mature market.

The above arguments raise valid questions for the case of e-tailers. The internet is characterized by lowers switching costs (Bakos, 1997), decreasing information asymmetry (Varadarajan & Yadav, 2002), short time periods between entries, which has been shown to shorten first mover advantages (Huff & Robinson, 1994). All these factors suggest that early mover advantages in online retailing may be limited and dissolve quickly (Nikolaeva, 2007). To the above list we can add the framework of influences enhancing order of entry advantages outlined by Lieberman and Montgomery (1988). As discussed below, their effects are reversed in the online retailing setting. First, the factors that may contribute to order of entry advantages on the Internet are consumer switching costs and network effects. Consumers may find it problematic to switch to other retailers' sites once they familiarize themselves with the navigation of the site and have their personal information stored by the retailer. Further, retailers who have entered earlier might be attracting more consumer traffic thus projecting greater reliability and trustworthiness attracting even more traffic resulting in network externality effects. These two characteristics may help early

entrants gain some advantages. However, the transparency of the Internet business models and the irrelevance of preemption of physical resources make early entry advantages hard to sustain on the Internet. Thus, we expect a confirmation of Nikolaeva's (2007) finding that not only early entry advantages dissipate, but they may actually reverse signs. Of particular interest, though is when the reversal takes place, i.e. when early entrants become vulnerable. This question, of course, is industry-specific. Different industries have varying life-cycles and we cannot expect a universal answer.

Q1a: Do early entry advantages become disadvantages? If yes, when?

On one hand, a cross-sectional sample would be subject of survivor bias, because it excludes the retailers that have exited the sample earlier. In addition, studies using market share as the dependent variable are more likely to find first-mover advantages (VanderWerf and Mahon 1997). That would cause an upward bias towards order of entry advantages. On the other hand, prior empirical findings indicate that the order of entry effect is less prominent over time (Kalyanaram, Robinson, & Urban, 1995). Therefore, we would expect to see a greatly reduced effect on sales and market share after the shakeout. The idea is that the farther we go in time from the entry of the pioneer, other factors come into play and the first-mover advantage becomes less relevant and less pronounced. Then, the empirical question is whether the effect persists or it is wiped out after the shakeout.

Q1b: Is there any order of entry effect on market share (sales) post shakeout?

2.2 New ventures

From a theoretical perspective, e-tailers with parent companies are expected to perform better than new ventures. Various studies in economics (Geroski, 1995),

management (Klepper & Simons, 2000), and marketing (Robinson & Min, 2002) point out that across different industries entrants who have existing parent companies are more successful. Helfat and Lieberman (2002) relay that the finding of diversifying entrants being more successful than new ventures is consistent among several studies using different performance measures. The same authors summarize findings that many new ventures would disappear during the industry shakeout. But that raises the possibility that the ones who remain will be formidable competitors. Reversely, there would be some retailers that survived the shakeout because of the support of their parent companies, which puts them in less competitively strong positions. Consequently, the effect on market share and sales would not be so pronounced after the shakeout. Then the empirical questions concern the diminishing survival advantage for diversifying entrants and the evidence of such advantage in market share and sales after the shakeout.

Q2a: Do new ventures improve their survival chances over time vis-à-vis diversifying entrants? If yes, when?

Q2b: Do diversifying entrants maintain market share/sales advantages compared to new ventures post shakeout?

2.3 Products Categories

De Figueiredo (2000) classifies books, video and CDs as quasi-commodity products. They are of uniform quality, easy and cheap to ship, standardized, and information can be easily provided, which made them favorites for the early start of online retailing. However, these characteristics obstruct e-tailer differentiation. For this reason the advantages of the quasi-commodity product e-tailers is likely to

dissipate with time. Further, is survival linked to the volume of sales? While the quasi-commodity category attracted many buyers in the initial years of e-commerce, there is no theoretic reason to expect that these sellers would continue maintaining higher level of sales with the maturation of the industry. In fact, we might observe the opposite result as they register smaller average tickets. Overall, there is no reason to expect that these retailers can enjoy sustainable competitive advantage versus other online categories. Thus, the empirical questions address whether we see confirmation of this logic in the data. In this section we ask the post shakeout question only in relation to sales as the questions refer to the whole product category, i.e. we cannot measure market share.

Q3a: Do quasi-commodity sellers diminish their survival chances over time compared to other sellers? If yes, when?

Q3b: Do quasi-commodity sellers differ from other sellers in sales volume post shakeout?

Nelson (1970) classifies products into search and experience goods in relation to the consumer information search process. Search goods do not need to be examined before purchase, because they can be fully described, whereas experience goods have to be tried by consumers before they are fully evaluated. Most products lie on a continuum between search and experience goods. Mahajan et al. (2002) argue that search goods should have an advantage in the online environment. On the other hand, Varadarajan and Yadav (2002) suggest that the opportunity to convey more information over the internet is likely to benefit the sales of experience products. Nikolaeva (2007) finds that e-tailers of search goods fare marginally better in terms of

survival. As both e-tailers and e-commerce mature, however, we expect the effect to disappear. Thus, we do not expect any post shakeout sales effect. Thus, we repeat the above research questions in relation to search products categories.

Q4a: Do search products sellers diminish their survival chances over time compared to other sellers? If yes, when?

Q4b: Do search products sellers differ from other sellers in sales volume post shakeout?

2.4 E-tailer Ownership

A publicly-traded company has a higher probability of survival than a privately-owned one mainly because of its ability to raise capital quickly if necessary. However this would matter more in the initial years. Once the companies establish themselves, the difference in survival rates between public and private companies should disappear. Private companies that have survived the initial period should not be less resilient than public companies. Nikolaeva (2007) observes such a diminishing survival advantage for public companies. In the case of e-tailers, the shakeout period is closely linked with the crash of the stock market. Consequently, it is difficult to imagine that public e-tailers would hold any advantages in terms of market share or sales compared to private ones.

Q5a: Do publicly traded e-tailers diminish their survival chances over time compared to privately owned e-tailers? If yes, when?

Q5b: Do publicly traded e-tailers differ from privately owned e-tailers in market share/sales post shakeout?

3. Method

The data for the survival study is borrowed from Nikolaeva (2007)[1]. The sample consists of 460 e-tailers taken from the Bizrate portal in 1998 including all the major retailers within product categories and smaller ones that received any media mentions. The observation period covers 1994-2003. The cross-sectional data set includes sales and web site traffic data on 93 e-tailers – a subsample of the original database – that were part of the *Internet Retailer* Top 300 e-tailing guide in 2003. The categories are as defined by *Internet Retailer*: Apparel; Books, Music, Videos; Computers/Electronics; Health & Beauty; Food & Drink; Gifts & Flowers; Hardware/Home Improvement; Home Furnishings; Mass Merchandising; Office Supplies; Sporting Goods; Toys/Hobbies. Table 1 defines the variables. We include several control variables: e-tailer age, publicity, competitive density, market growth, and NASDAQ growth. These variables vary by time and, with the exception of age, do not vary by firm. Consequently, they cannot be used in the cross-sectional estimation. For this case, we include web site traffic as a control variable. Table 2 lists the 4-firm concentration ratios in product categories after the shakeout.

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[1] Descriptions of the data are found in Nikolaeva (2007) and Nikolaeva et al. (2009).

Table 1

Dependent variables	
Survival – 1 if the company was still in business in September 2003, 0 otherwise.	
Ln (Sales) – Log of annual e-tailer online sales in 000s	
Ln (MS ratio) – Log of the ratio of the market share of the nth entrant compared to the first entrant in the category in the post shakeout sample	
Independent Variables	
Time of Entry – time in fraction of the year after the first entrant in a category.	
New Venture – 1 for Internet pure players, 0 otherwise.	
Quasi-commodity Products – 1 for quasi-commodity categories, 0 otherwise.	
Search goods – scale from 1 to 10, 1 – search, 10 – experience	
Public – 1 for publicly owned companies, 0 otherwise.	
Controls	
E-tailer Age – quarter-years since time of entry; 2004-entry date	
Publicity – number of press articles mentioning e-tailer during its life	
Web site traffic – number of unique visits	
Competitive Density – number of e-tailers in each quarter relative to the peak number of e-tailers in a category	
Market Growth – change electronic and mail-order sales from previous quarter in millions $	
ΔNASDAQ – change in average NASDAQ values from previous quarter	

Table 2

Category	4-firm concentration ratio
Apparel	47.67%
Books, Music, Videos;	84.3%
Computers/Electronics;	69.29%
Health & Beauty;	88.57%
Food & Drink;	76.79%
Gifts & Flowers;	52.24%
Hardware/Home Improvement;	87.8%
Home Furnishings;	54.45%
Mass Merchandising;	68.29%
Office Supplies;	100%
Sporting Goods;	40.74%
Toys/Hobbies	55.15%

The time to exit the online market space is censored at the end of the observation period. This requires the use of a duration model since standard regression techniques would produce biased results. The data are grouped into quarters. This makes a discrete hazard model a good choice. For the purposes we

estimated a logit and a complimentary log-log (cloglog) regressions. The complementary log-log specification is known as the discrete time alternative of the Cox proportional hazards regression. The discrete hazard models also allow the easy incorporation of time-varying covariates, which is not trivial under continuous time specifications.

The hazard rate is the probability that a firm exits at time t, given that the firm is still at risk at time t, i.e. it has not exited up to that time:

$$h(t_j) = \Pr(T = t_j \mid T \geq t_j)$$

(1)

As the hazard rate is essentially a probability, it can be reparameterized in the logistic form (Allison 1982). It is a function of a vector of explanatory variables: x – constant over time and $x(t)$ – variables that vary for each time period. However, the probability can vary between 0 and 1, whereas the explanatory variables can have any value. For this reason we need to transform the equation. Using the logit transformation, we have:

$$h(t) = \frac{1}{1 + e^{-(\beta X_i + \gamma X_i(t) + \alpha(t))}}$$

(2)

$$\log\left(\frac{h(t)}{1 - h(t)}\right) = \beta X_i + \gamma X_i(t) + \alpha(t)$$

(3)

where $\alpha(t)$ is the baseline hazard that can be expressed as a step time function or a continuous time variable.

Similarly, using a cloglog transformation, we have:

$$\log[-\log(1 - h(t))] = \beta X_i + \gamma X_i(t) + \alpha(t)$$

(4)

The cloglog method estimates continuous time hazard rates from discrete time failure data. The interpretation of the coefficients is the same as in the more familiar Cox proportional hazards regression.

Apart from the theoretical considerations about the time variability of the coefficients of the fixed covariates, there is also a methodological requirement to test for these variations. In proportional hazards regression the coefficients of the hazard function are restricted to be constant over time. This may not always be true and sometimes it may be unreasonable from a theoretical point of view (McCall 1994). This assumption can be easily tested based on Schoenfeld residuals. The test retrieves the residuals and tests whether there is a relationship with a function of time (Cleves et al. 2002). Running these tests on our original model without time interactions showed highly significant results indicating that the residuals are time dependent. After the inclusion of time interactions, the test was not significant. This reassured us in building a model with both time-varying covariates and time-varying coefficients. The next step was to decide what function of time to use. A flexible method when there are no strong theoretical foundations favoring a particular time function is to let it be a step function determined by the data. Plotting the empirical hazard function (Fig. 1) shows the following pattern. For the first two years the hazard of exit increases, then between the second and approximately the fourth year the hazard of exit decreases, then it increases again for about a year and after the fifth year it decreases again. This prompted us to specify the following step function of time: I (age 0-2 yrs), I (age 2.08-4 yrs), I (age 4.08-5 yrs), and I (age > 5 yrs).

Figure 1
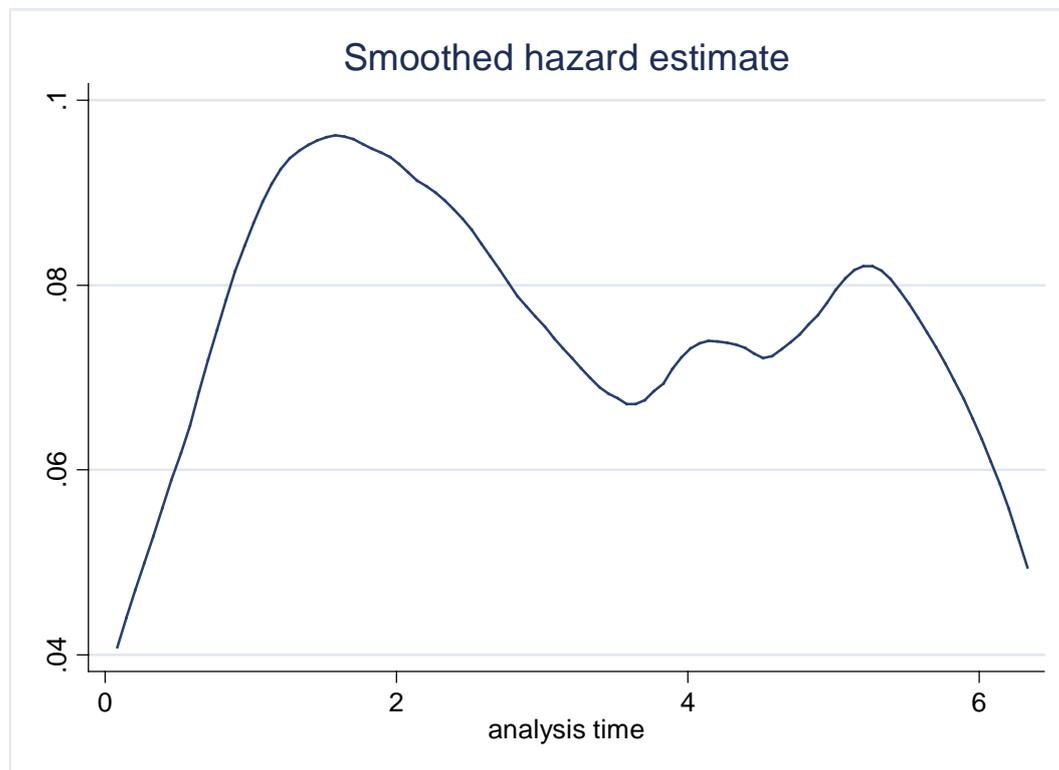
Finally the right hand side of the above equations becomes:

Baseline hazard – age, age^2, age^3, age^4

Hypotheses – time of entry interacted with time, new entry, quasi-commodity products interacted with time, search products interacted with time, public ownership interacted with time

Controls – publicity, competitive density, market growth rate, NASDAQ growth rate

– Time steps – I [0,2], I (2,4], I (4,5], I (5, more)

The time variable in the model is the e-tailer age – it is identical with the life span variable. The parameters are estimated by maximizing the likelihood functions. The

STATA option "cluster" was used for the estimation of robust standard errors to account for dependency of firm-year observations.

After estimating the effect of survival determinants, we need to estimate the effects of sales and market share determinants. Web site traffic or unique visits is endogenous and for this reason we need to use two stage least squares estimation. If Y is the market share and Ln (Unique Visits) = X_1 is the endogenous variable, then let $\{x_2,...x_k\}$ = {public, age, time of entry, new venture} be the exogenous variables and let $\{z_1,...,z_m\}$ = {quasi-commodity, search, publicity}. Consequently, the set of instruments is $\{z_1,...,z_m, x_2,...x_k\}$. We have the following equations:

Stage 1

$$X_1 = \pi_0 + \pi_1 z_1 + ... + \pi_m z_m + \pi_{m+1} X_2 + ... + \pi_{m+k-1} X_k + v \rightarrow \hat{X}_1 \qquad (5)$$

Stage 2

$$y = \beta_0 + \beta_1 \hat{X}_1 + \beta_2 X_2 + ... + \beta_k X_k \qquad (6)$$

4. Results

Table 3 provides the results for the three estimated models regarding survival determinants and Table 4 lists the results from the 2SLS estimation of sales and market share determinants. A detailed discussion about all groups of hypothesized effects appears below.

Table 3

Variables	Cloglog coefficient estimates (robust st. err.)		Logit coefficient estimates (robust st. err.)	
Constant	-8.820	0.721***	-8.962	0.743***
Order of entry = x:				
x* I (age 0-2 yrs)	0.163	0.093*	0.164	0.096*
x* I (age 2.08-4 yrs)	0.036	0.103	0.032	0.105
x* I (age 4.08-5 yrs)	-0.360	0.238	-0.041	0.244
x* I (age > 5 yrs)	-1.280	0.340***	-1.295	0.347***
New venture	1.685	0.247***	1.725	0.250***
Quasi-commodity = y:				
y* I (age 0-2 yrs)	-1.004	0.303***	-1.038	0.313***
y* I (age 2.08-4 yrs)	0.408	0.333	0.422	0.342
y* I (age 4.08-5 yrs)	-1.341	0.734*	-1.373	0.738*
y* I (age > 5 yrs)	0.897	0.722	0.982	0.777
Search = z:				
z* I (age 0-2 yrs)	0.136	0.070*	0.140	0.073*
z* I (age 2.08-4 yrs)	0.043	0.076	0.043	0.079
z* I (age 4.08-5 yrs)	0.048	0.116	0.050	0.117
z* I (age > 5 yrs)	-0.074	0.188	-0.071	0.193
Public = u:				
u* I (age 0-2 yrs)	-0.774	0.327**	-0.809	0.330**
u* I (age 2.08-4 yrs)	-0.201	0.371	-0.206	0.379
u* I (age 4.08-5 yrs)	0.205	0.620	0.229	0.631
u* I (age > 5 yrs)	0.750	0.770	0.709	0.819
E-tailer age	1.455	0.831*	1.497	0.855*
E-tailer age^2	-0.936	0.631	-0.954	0.647
E-tailer age^3	0.240	0.156	0.243	0.160
E-tailer age^4	-0.019	0.012*	-0.019	0.012
Publicity	-0.001	0.001**	-0.001	0.001**
Competitive density	2.554	0.631***	2.703	0.629***
Market growth	0.727	0.353**	0.716	0.351**
NASDAQ growth	-1.108	0.353***	-1.112	0.341***
LL	-580.236		-580.333	
LR	257.132		256.937	
AIC	1212.471		1212.666	
BIC	1383.020		1383.214	

Table 4

		Dependent Variable Ln(MS Ratio) Model 1		Dependent Variable Ln (Sales) Model 2	
		Coeff.	St.Errors	Coeff.	St.Errors
Stage 1	Constant	5.615	0.355***	5.615	0.355***
	Order	-0.094	0.089	-0.094	0.089
	New venture	0.133	0.127	0.133	0.127
	Publicity	0.223	0.038***	0.223	0.038***
	Quasi-commodity	0.403	0.160**	0.403	0.160**
	Search	-0.205	0.164	-0.205	0.164
	Public	0.082	0.129	0.082	0.129
		Adj R-sq = 0.395		Adj R-sq = 0.353	
Stage 2	Const	-15.928	3.370***		
	Ln(Traffic)	2.630	0.552***	1.220	0.137***
	Order	-0.246	0.334	-0.214	0.073***
	New venture	0.844	0.468*	0.072	0.102
	Quasi-commodity	--	--	-0.231	0.127*
	Search	--	--	-0.329	0.141**
	Public	-0.339	0.489	-0.062	0.108
		Adj R-sq = 0.313		Adj. R-sq = 0.773	

Order of entry

In the hazard rate regressions the dependent variable is the hazard rate, that is the probability of exit given no exit has occurred in the previous time period. Consequently any order of entry advantages would be expressed with a positive coefficient – the later the entry, the higher the probability of exit. Looking at the results we can see that in the first two years after entry, there is a slightly significant effect in the hypothesized direction (p<10%). For the next two year period the sign is in the same direction, but the coefficient is not significant and after 5 years of age the coefficient changes sign and becomes highly significant (p<1%) indicating that later entrants have a lower probability of exit. Part of the explanation of this phenomenon may be that by the fifth year of their lives early entrants have burnt through their

initial capital and they find it more difficult to compete with the higher number of competitors. On the other hand, the firms who entered later and survived did so in a more competitive environment, which made them stronger. What about sales and market share? The order of entry effect is not significant in the market share equation confirming the hypothesis that if any order of entry advantages existed, they dissipate quickly after the first two years in business. Early entrants do register more sales, but this may be category related.

New venture

New ventures have higher hazard rates. Nikolaeva (2007) finds that multiple channel e-tailers' higher survival is helped by the availability of a broader resource base and alternative channels. The new ventures who survived, however, seem to hold a slight market share advantage. This is in contrast to the expectation that the survival advantage translates into market share advantage. The coefficient in the 2SLS estimation is significant only at the 10% level, so we cannot draw any strong conclusions. Nevertheless, the finding that e-tailers with traditional parent companies do not hold any market share advantages post shakeout is surprising and contrary to theoretical expectations.

Product Characteristics

In answer to Q3a, quasi-commodity product categories tend to have lower exit rates in the initial stages after entry. This result is not surprising, because books, music, video, and software were the categories that laid the foundations of e-commerce. However, as customers become more comfortable with the Internet channel, the distinction disappears. From the results we can see that the coefficient for years 2 to 4 after entry is not significant, between years 4 and 5 is negative and slightly significant (10% level) and after 5 years it is positive, but not significant.

These results show that the advantage for sellers of digital products is most important in the first two years after entry, but after that it diminishes. In terms of post shakeout estimations, we find that these categories attract significantly more traffic, which does not translate in sales. On the contrary, sellers of quasi-commodity products have a slight disadvantage in sales (10% level significance). It looks like the difficulty of differentiating the offering results in less category concentration and more even distribution of sales revenues across competitors.

Regarding Q4, the results indicate that retailers in product categories that score higher on the search-experience continuum (meaning that they are more experience goods rather than search goods) have slightly higher probability of exit in the first two years after entry. Later the effect disappears. The effect is quite strong, though, in the post shakeout sales equation. Retailers of search goods definitely attract more sales.

Firm Ownership

The results show that public e-tailers have lower exit rates in the first two years, but with age the effect disappears. It seems that the private companies, which manage to overcome the initial difficulties and accumulate sufficient capital do not suffer from any disadvantages compared to public companies. They may be even more flexible with their strategies since they do not have to respond to pressures from shareholders, who usually demand fast growth in the short term. This effect is evident also from the insignificant coefficient in the 2SLS estimation – publicly traded retailers do not register any market share advantages.

Control Variables

The effect of competitive density on the hazard rate is positive. The increasing number of e-tailers did not help legitimize the industry, but mostly

intensified the competitive environment making survival more difficult. The market growth covariate is positive and significant indicating an increasing probability of exit with market growth. This is due to the opposing forces associated with market growth rate – while the market is expanding, the competition is growing as well, which requires higher marketing expenses thus decreasing the survival chance of e-tailers. The results indicate a fluctuating effect of e-tailer age. Older e-tailers do not seem to register higher market shares either. These results lead to the conclusion that the more experienced e-tailers do not seem to register any obvious advantages. Higher publicity also helps indirectly to build more market share. The coefficient of publicity is positive and highly significant in the first stage equation in the 2SLS estimation indicating that higher publicity leads to higher web site traffic.

5. Summary and Conclusion

The current study tracks the survival rates of a sample of 460 online retailers over a time period of almost 10 years and then compares survival determinants with market share determinants from a subsample of 93 e-tailers of cross-sectional sales data from the last year of the survival study. The main contributions of the study are the following. . First, it investigates the dynamic effect of firm-controlled covariates at the time of market entry over several periods in the lifespan of e-tailers. Second, we compare these with market share determinants from a biased survivor subsample after the shakeout. This allows us to draw conclusions about the link between factors that help firms survive and factors that build market share among survivors. By outlining similarities and differences between these factors, the study can help managers in their strategic planning by prioritizing strategies given their final

objective. We show how some factors that can offer strategic advantages in the beginning years after entry can dissipate over time. Therefore firms should take adequate steps in overhauling the change in strategic positions. The study clearly demonstrates that there are very few factors that do not change with time. Moreover, these rarely translate in market share/sales advantages after a shakeout.

Among survivors, order of entry does not seem to affect market share advantages. Through the course of their lives, multiple channel retailers have higher survival chances versus pure players. However, this advantage does not translate in market share. Surprisingly, our results show that new ventures register slight advantages in terms of market share. Looking at product characteristics, e-tailers selling books, music, video, and software registered higher survival rates in their first two years after entry. However, as customers' acceptance of the online channel increased, these e-tailers found it more and more difficult to establish their own niches. The advantages for e-tailers selling search goods are even weaker and also disappear fast. Companies whose stock was publicly traded benefited more, but the effect was not long lasting either. And the effect of firm age is ambiguous.

Studying the evolution of an industry illuminates important strategic implications. From a managerial standpoint, it highlights how some factors that can offer strategic advantages in the beginning years after entry can dissipate over time. Therefore firms should take adequate steps in overhauling the change in strategic positions. The study clearly demonstrates that there are very few factors that do not change with time that can be used as a sustainable competitive advantage.

In addition, the study reconciles two somewhat contradictory views on pioneering in the empirical literature– order of entry advantages are observed, but they are short-lived and e-tailers cannot rely on early entry as a strategic move. It

appears that it was more difficult to develop sustainable early mover advantages in online retailing than in traditional consumer and industrial goods industries. This is partly due to the transparency characteristic of the Internet environment and the inability to safeguard and assure any long lasting advantages. Being first helps only in the first years after entry, but strategies aiming at sustainability cannot rely on first-mover advantages.

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