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CHAPTER 6

Modelling Internet Diffusion Across Tourism Sectors

Miriam Scaglione and Jamie Murphy

Introduction

Everett M. Rogers' (1962) book, Diffusion of Innovations (DOI), the most cited work in innovation research, discusses innovation adoption and implementation at the individual and organisational level. Rogers (2003, p. 12) defines an innovation as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption". Rogers' book proposes that diffusion follows a normal distribution and therefore, fixed percentages for his five—innovators, early adopters, early majority, late majority and laggards—adopter categories. These fixed percentages, however, rarely hold across countries and innovations. AQ1

This chapter draws on a pedagogical explanation of Bass modelling of Swiss accommodation in (Scaglione, forthcoming), and a first draft of this paper presented at the Annual Conference of International Association of Scientific Experts in Tourism—AIEST 2012 held at Khon Kaen (Thailand).

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Similar to the diffusion of many innovations, internet adoption follows an abnormal distribution due to complex and diverse economic, political, cultural, infrastructural and geographical factors (Andrés et al. 2010; see Kim 2011). Rather than such macro-factors, this study adds communication channels (Bass 1969) and heterogeneous adopter categories (Bemmaor 1994) to improve modelling innovation adoption.

Rogers proposes that at the beginning of the adoption process a few innovators influence others using intrapersonal communication such as word-of-mouth. But if the role of communication channels, such as word-of-mouth, have the same importance along with the adoption process is an open question in the literature (Easingwood et al. 1983).

Incorporating adopter category differences, abnormal diffusion rates and differing adoption drivers improves the diffusion calculations. These calculation results are critical for industry to predict market size and sales of an innovation. This study takes two small steps in modelling the organisational adoption of innovations, adding a threshold due to a critical mass of adopters and heterogeneity adoption propensities. These two factors help compare innovations across countries and tourism sectors.

This modelling story begins by reviewing two improvements to Roger's diffusion model. Bass' (1969) model predicts specific—industry, product and country—new product adoption rates and market sizes. Bemmaor (1994) complements Bass' innovation-specific adoption model by incorporating heterogeneous rather than homogenous adoption factors at the actor level. The results of these two models, across 13 tourism sector datasets, add to a growing body of innovation-specific adoption research and key factors related to internet diffusion in the tourism sector. Based on these two analyses, this paper proposes future research streams related to modelling the DOI.

Literature Review

The tourism sector has been at the forefront of innovation adoption and implementation at least since the dawn of airline reservation systems. A chance meeting of IBM and American Airlines executives in 1953 led to the development of Sabre, an automated system to help manage the link between airline inventory and customer reservations (Sabre, n.d.).

Since that moment, information and communication technologies (ICTs have been a key tool for marketing and distribution in tourism (O'Connor 1999). ICTs offer opportunities information dissemination AQ2

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(24*7*365) on goods and services, pricing strategies and promotions (last-minute, location-based offers, etc.), as well as broaden selling opportunities for tourism suppliers including getting customer feedback from social media sites, no matter the size of the company (O'Connor and Murphy 2004). Therefore, tourism organisations and individuals have been at the forefront of using ICTs such as websites, email and social media.

Understanding and predicting tourism ICT adoption rates, though, remains an ongoing challenge.

Innovation and Imitation

Bass (1969) expanded Rogers' (1962) adoption model by quantifying two factors that drive individual and organisational adoption, ***innovation*** *(p)* driven by external channels such as mass communication and ***imitation*** *(q)* driven by intrapersonal communication such as word-of-mouth. Bass' model (1969) calculates innovation-specific and abnormally shaped distribution and adoption curves. This non-cumulative distribution curve has three important values that set the adopter categories. The inflexion point *T*1 separates the early adopters and early majority categories. Next, the peak of absolute adoption *T* demarcates the early majority and late majority categories. Finally, the second inflexion point *T*2 delineates the late majority and laggards.

Equation (6.1) below, a modified exponential and logistic function (Meade and Islam 2006), shows the Bass function (1969) for adopting an innovation. $N(t)$ is the cumulative number of adopters at time t, m is the total market adoption. Parameters p and q, the coefficients of innovation and imitation, respectively, fuel the adoption.

$$\frac{dN(t)}{dt} = \underbrace{p(m - N(t))}_{\text{adoption due to external influence or independent adoption}} + \underbrace{\frac{q}{m}(m - N(t))}_{\text{adoption due to internal influence or internal adoption}} \tag{6.1}$$

The coefficients p and q, respectively, suggest the propensity to adopt driven by external information and interpersonal communication channels (Mahajan et al. 1990). With pure innovation, $q = 0$ and $p > 0$ and $p = 0$ and $q > 0$ with pure imitation.

Apart from these extreme cases, the sum and ratio of q and p delineate the diffusion curves. Their sum controls the scale of the S-shaped

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cumulative and non-cumulative adoption curve (respectively Figs. 6.1 and 6.2), and the bell-shaped non-cumulative adoption curve. The *q/p* ratio indicates the shape of the cumulative and non-cumulative adoption curves. The bigger the *q/p* ratio, the more prominent the S-shape and slower penetration rates are as shown in Fig. 6.1 (Bemmaor and Lee 2002; Meade and Islam 2006). Comparing the *p* and *q* parameters helps examine adoption across countries and the adoption of different innovations by the same population.

Van den Bulte and Stremersch's (2004) study of individual-level *q/p* ratios for 52 consumer durables across 28 countries found, among other aspects, a positive relationship between the *q/p* ratio and income inequality. The bigger a country's income inequality, the more that internal rather than external influences—respectively imitation and innovation—drove adoption. These authors argue that the adoption of the same product in different countries will show different *q/p* ratios.

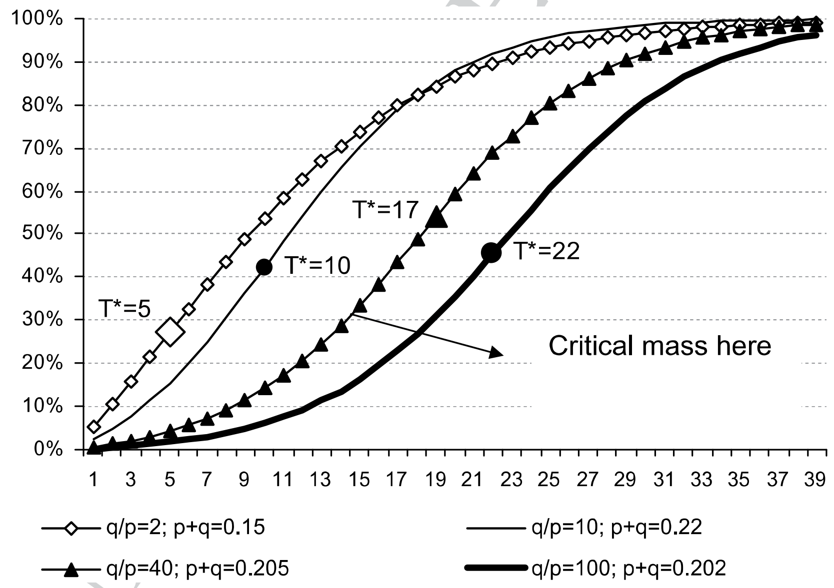

Fig. 6.1 Cumulative bass distribution models with different *q/p* ratios; *T** is the peak rate of adoption, namely the inflexion point of the cumulative distribution (*Source* Authors' computation)

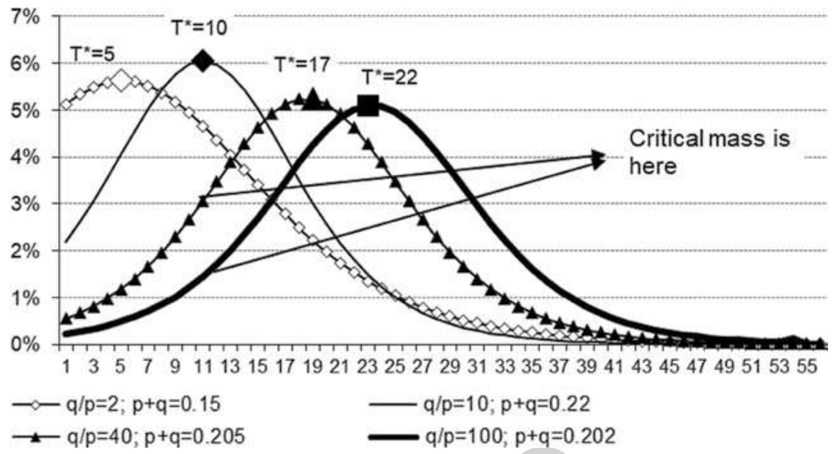

Fig. 6.2 Non-cumulative bass distribution models with different q/p ratios; T^* is the peak rate of adoption, namely the inflexion point of the cumulative distribution (*Source* Authors' computation)

Homogenous and Heterogeneous Adoption

The Bass model as in Eq. (6.1) assumes external communication—e.g. price, advertising and promotion—and intrapersonal communication such as word-of-mouth drive adoption. An extension of Bass' distribution curves helps bridge Rogers' (2003) five adopter categories into the Bass/Rogers or BR model (Mahajan et al. 1990). Rather than using the timing of adoption, the BR categories assume a homogenous likelihood to adopt across the five adopter categories (Bemmaor 1994, p. 203). AQ3

Bemmaor (1994) proposes a general diffusion model with a heterogeneous propensity for the first-adoption (purchase) in order to address these limitations. At the individual adopter level, the propensity to adopt an innovation at time t follows a shifted Gompertz distribution (SG) whereby early adopters take up the innovation in a more random fashion than latter adopters. Under this assumption, Bemmaor and Lee (2002) propose the Gamma/shifted Gompertz (G/SG) model of Eq. (6.2) below,

$$F(t) = \left[1 - e^{-bt}\right] \Big/ \left[1 + \beta e^{bt}\right]^{\alpha} \tag{6.2}$$

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The β parameter of Eq. (6.2) is its scale parameter; b is the scale parameter of the shifted Gompertz prior distribution of the individual propensity model. Bass model parameters, $b = p+q$ and $\beta = q/p$, can replace b and β. For fixed values of b and β, the shape of the Eq. (6.2) gamma distribution function depends on the parameter α, which measures adopter population heterogeneity. The coefficient of variation of a Gamma function is $\alpha^{-1/2}$ (standard deviation $= b\alpha^{1/2}$ over the mean $= b\alpha$).

Homogeneity has a direct relationship with α, and when α tends towards ∞, the population is homogenous. The propensity to adopt is roughly the same across potential adopters. When $\alpha \approx 1$, the model is the Bass model (Eq. 6.1). When $\alpha \approx 0$, potential adopters' acceptance rates differ across strata population. Bemmaor (1994, p. 220) suggests that the propensity to adopt differs across the BR adopter categories.

Critical Thresholds and Exogenous Variables

In addition to ignoring heterogeneous adoption propensities among the population, the Bass model as expressed by Eq. (6.1) ignores the critical threshold necessary to adopt (Van den Bulte and Stremersch 2004). This threshold reflects the requisite critical mass of adopters. Analysis of the q/p ratio gives insights on critical mass' importance for comparing diffusion across countries or comparing innovations across the same adopter population. For example, a qualitative study of German banks showed that relative to non-interactive innovations, the diffusion of interactive innovations (i.e. Electronic Funds Transfers and home banking for private customers) was slow until reaching a critical mass of adopters (Mahler and Rogers 1999). If this finding is the case, then the S-Shape for the non-interactive innovations should be less pronounced and the q/p ratio smaller than for interactive innovations as shown in Fig. 6.1.

The critical threshold can also depend on exogenous, external or environmental factors. At the organisational or aggregate-level, perceived innovation profitability (Jensen 1982) and risk-averse behaviour (Oren and Schwartz 1988) may accelerate or delay adopting an innovation. At the individual level, Chatterjee and Eliashberg (1990) used a micro-modelling approach to show that initial adopter value perceptions, aversion and perceived information reliability were both heterogeneity sources and threshold factors (see Van den Bulte and Stremersch 2004, p. 534).

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The literature review shows that the Bass model (Eq. 6.1) cannot capture heterogeneous adoption dispositions across a given population of adopters or a given sector. Nevertheless, the *q*/*p* ratio helps capture critical mass differences across sectors. These two main facts, namely heterogenous adoption and critical mass, with an innovation's final penetration rate allow comparing adoption processes of an innovation across sectors.

This research compares internet diffusion across tourism sectors/countries, firstly by analysing the Bass parameters (Eq. 6.1), particularly the *q*/*p* ratio, in order to grasp the requisite critical mass for each sector/country and the different adoption curve shapes. Next, the analysis compares heterogeneity across these sectors/countries via the G/SG model.

Data and Methodology

Table 6.1 shows characteristics of the 13 datasets such as the sample and gathering the time of first adoption. Ten studies used the internet Archives' Wayback Machine (archive.org) to gather the website age (Murphy et al. 2007). The other three studies, all related to Swiss accommodation, used a customised softbot, or software robot (Steiner 1999). The softbot gathered the initial domain name registration date, registrant name and location for all Swiss (.ch) domain names registered from December 1995 to February 2004, which contained the keywords "auberge, gasthaus or hotel".

The datasets range in size from 96 to 2467 organisations and range geographically across the globe, Europe and four countries—Austria, Germany, Malaysia and Switzerland. The six tourism sectors in the datasets comprise cable cars/ski lifts, destination management organisations (DMOs), one- to five-star hotels, guesthouses, restaurants and tour operators, The analysis for both the Bass and G/SG model parameters draw on the SAS V9 Nonlinear Least Square Proc Model procedure (SAS Institute Inc. 2011).

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Table 6.1 Study sample

Acronym	*Sector*	*Age source*	*Market size (base year)*	*Source*	*Website age/n (URL)*	Observed *penetration rate respect to 1)*
DMO CH	Swiss DMOs	WM	155 (2005)	myswitzerland.ch	149/155	100%
DMO AU	Austrian DMOs	WM	na	Klimek et al. (2011)	96/96	Na
DMO DE	German DMOs	WM	na	Klimek et al. (2011)	182/188	Na
Restaurant CH	Swiss restaurants	WM	18,867 (2005)**	Swisscom Directories	1573/1858	10%
Cable car CH	Swiss cable car companies	WM	370 (2010)	Seilbahnen Schweiz (seilbahnen.org)	190/190	51%
Hotel Chain	International hotel chains	WM	325 (2010)	hotelsmag.com (July 2006)	267/276	85%
European tour operators	European tour operators	WM	na	etoa.org, european-travel-market.com	117/121	na
Malaysian hotels	Malaysian hotels	WM	530	Hachim et al. (2012)	305/315	60%
No affiliated hotel CH	Unaffiliated Swiss hotels	Softbot	1133 (2003)	Swisscom Directories	780/780	69%
Hotelleriesuisse CH	Affiliated Swiss hotels	Softbot	2122 (2003)*	Scaglione et al. (2010)	1677/1733	82%
Hotel CH	Swiss hotels	WM	3255 (2003)*	Scaglione et al. (2010)	2467/2513	77%
Guesthouse CH	Swiss guesthouses	Softbot	3463 (2003)*	Scaglione et al. (2004)	2250/2269	65%
Travel agencies CH	Swiss travel agencies	WM	272 (2008)	Schweizerischer Reisebüro-verband (www.srv.ch)	244/232	90%

Source Recensement des entreprises 2005, Office fédéral de la *statistique* (*OFS*); Calculated from statistique de l'hébergement touristique (HESTA, OFS)

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Results

Table 6.2 shows the model estimation results, such as the coefficients of innovation and imitation.

Figures 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, and 6.16 in the Appendix show the following cumulative series for each sector: *observed*, i.e. the actual value, *estimated* values namely one-step-ahead estimation and *forecasted* values for the last 24 months of the sample using Bass model for each of the sector under study. Table 6.3 in the Appendix shows the goodness of fit measures for the Bass model estimation and forecasts observations.

Three Swiss sectors—cable cars, guesthouses and DMOs—have a logistic distribution. Only imitation, influence via intrapersonal communication, drives their internet adoption. Both innovation and imitation, respectively, external and intrapersonal communication, drive internet adoption in the ten other sectors with a 10.42 q/p median. The q/p ratio, intrapersonal communication divided by external communication, shows each channel's relative strength in the adoption process.

A high q/p ratio shows that imitation relative to innovation drives adoption. Similar to the three Swiss sectors with a logistic distribution, three additional Swiss sectors have the highest q/p ratios, ranging from 26 to 35. Using two measures of age, domain and website, these six Swiss tourism sectors adopt due to imitation more so than innovation. There seems a general parsimony of Swiss sectors, sensible to the critical mass of adopters and a wait and see behaviour.

At the innovation end of the communication channel ratio, Austrian DMOs are just under three with a $q/p=2.94$. Hotels chains and European TOs also had q/p ratios under six. More so than the other ten sectors, these sectors adopted due to innovation, that is, persuasion via mass communication. The median group—Malaysian hotels, Swiss restaurants, Swiss travel agents and German DMOs—had imitation/innovation ratios towards 10. The effects of channel communication accelerated the adoption process. As an example, Table 6.2 shows that Austrian DMOs had the lowest q/p (2.94) and the time to generate the early majority group was only 21 months against 48 months for the late majority. In contrast, Swiss hotels with the highest (35.03) ratio, took 42 months to generate the early majority against only 17 months for the late majority.

Table 6.2 Estimated Bass and G/SG α parameter with its standard deviations in (parentheses)

	Type of model	*Drivers*	*Final market size*	*Final market size respect to 1) Table 6.1*	*Initial & final obs.' dates*	*Bass model (Eq. 6.1)*						*G/SG*
						T1	*Peak*	*T2*	*p*	*q*	*q/p*	*Alpha*
						Inflection point	*Maximum*	*Inflection point*	*Innovation*	*Imitation*	*q/p*	
DMO CH	Bass $p = 0$ (Logistic)	imitation	150.1 (18.72)	96.77%	Dec-96–Feb-05	Feb-98	Jul-99	Jan-01	0 (na)	0.0661 (0.0113)		0.230 (0.023)
DMO AU	Bass	innov./ imitat.	96.78 (17.02)	na	Dec-96–July-10	Jun-97	Sep-99	Jun-03	0.0079 (0.0021)	0.0232 (0.0171)	2.94	1.97E8 (1.34E7)
DMO DE	Bass	innov./ imitat.	181.63 (21.96)	na	Nov-96–Oct-10	Dec-97	Dec-00	May-04	0.0050 (0.0022)	0.0503 (0.0153)	10.14	0.81 (0.09)
Restaurant CH	Bass	innov./ imitat.	1647.35 (70.04)	8.73%	Nov-96–Jun-08	Apr-99	Nov-01	Jun-04	0.0035 (0.0011)	0.0392 (0.0067)	11.19	171.6 (3.37)
Cable car CH	Bass $p = 0$ (Logistic)	imitation	194.5 (1.30)	52.70%	Dec-95–Feb-05	Jan-00	Jan-01	Jan-02	0	0.0875 (0.0018)		0.61 (0.07)
Hotel chain	Bass	innov./ imitat.	269.2 (38.56)	82.77%	Dec-96–Nov-06	Feb-99	Jan-99	Apr-01	0.0099 (0.0101)	0.0376 (0.0165)	3.80	0.51 (0.056)
European tour operators	Bass	innov./ imitat.	119.18 (9.39)	na	Oct-96–Feb-06	Aug-98	Aug-99	Nov-01	0.0076 (0.0049)	0.0399 (0.0205)	5.28	0.98 (0.28)
Malaysian hotel	Bass	innov./ imitat.	316.9 (12.8)	59.81%	Nov-96–June-08	Oct-98	Jul-01	Apr-04	0.0037 (0.0015)	0.0364 (0.0093)	9.85	0.35 (0.02)
No affiliated hotel CH	Bass	innov./ imitat.	796.4 (12.0)	70.26%	Dec-95–Feb-04	Sep-98	Dec-99	Apr-01	0.0029 (0.0014)	0.0799 (0.0054)	27.39	0.74 (0.04)
Hotelleriesuisse CH	Bass	innov./ imitat.	1716.6 (22.0)	81.93%	Dec-95–Feb-04	Feb-98	Jul-99	Jan-01	0.0028 (0.0007)	0.0718 (0.0035)	25.56	1.16 (0.07)
Hotel CH	Bass	innov./ imitat.	2525.5 (25.2)	77.57%	Dec-95–Feb-04	Jan-97	Jul-99	Nov-01	0.0022 (0.0007)	0.0775 (0.0030)	35.03	1.27 (0.08)
Guesthouses CH	Bass $p = 0$ (Logistic)	imitation	3131.0 (235.5)	90.41%	Dec-95–Dec-03	Jul-01	Oct-03	May-06[a]	0	0.0521 (0.0022)		No convergence
Travel agencies CH	Bass	innov./ imitat.	235.13 (39.04)	98.72%	Nov-96–May-06	Sep-00	Apr-02	Dec-03	0.0063 (0.0033)	0.0676 (0.0563)	10.70	0.60 (0.08)

Source Authors' calculations

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Market Penetration

The median forecasted internet penetration rate (m/total population) for the 10 sectors possible to fix the total market size was 80%. The penetration rate ranges from 9% for Swiss restaurants to over 90% for Swiss travel agents, Swiss guesthouses and Swiss DMOs.

Below the median are Swiss cable cars, Malaysian hotels and non-affiliated Swiss hotels. These sectors tend to comprise small organisations and have low levels of internationalisation, which can help explain their low level of final penetration. The low penetration of the accommodation sector could also be a *leapfrog effect*, whereby late adopters may forego traditional websites in favour of a new technology such as social networks (Hashim et al. 2012).

Close to the median, Swiss hotels (overall and affiliate) and international chain hotels, show a consistent accommodation sector behaviour. In the highest level are Swiss guesthouses, DMOs and travel operators. The Swiss government's push towards internet adoption could help explain the strong DMO adoption (Scaglione and Schegg 2015). Swiss travel agencies seem to follow the general trend of e-tourism. The increasing role of the internet in holiday planning by consumers and businesses may have spurred travel agencies to follow this tendency in order to meet their market.

Homogeneity and Heterogeneity

The α values in the G/SG models reflect homogeneity, with Austrian DMOs followed by Swiss restaurants at the highest levels. Swiss hotels, affiliated and unaffiliated, and European tour operators are $\alpha \approx 1$. The sectors, listed by increasing are German DMOs, Swiss unaffiliated hotels, cable cars, travel agents, and chain hotels, Malaysian hotels and finally Swiss DMOs. Only sectors showing α near 1 follow a Bass model, thus having a similar propensity of first adoption across companies and also among BR categories.

The other Swiss accommodation sector, non-affiliated hotels, shows a greater heterogeneity than overall Swiss hotels and affiliated hotels, in line with the assumption that unaffiliated hotels are smaller than affiliated hotels. The high α value reflects differences within these sectors.

Sectors showing the greatest homogeneity are Swiss restaurants and Austrian DMOs. The underlying reason for Austrian DMOs are

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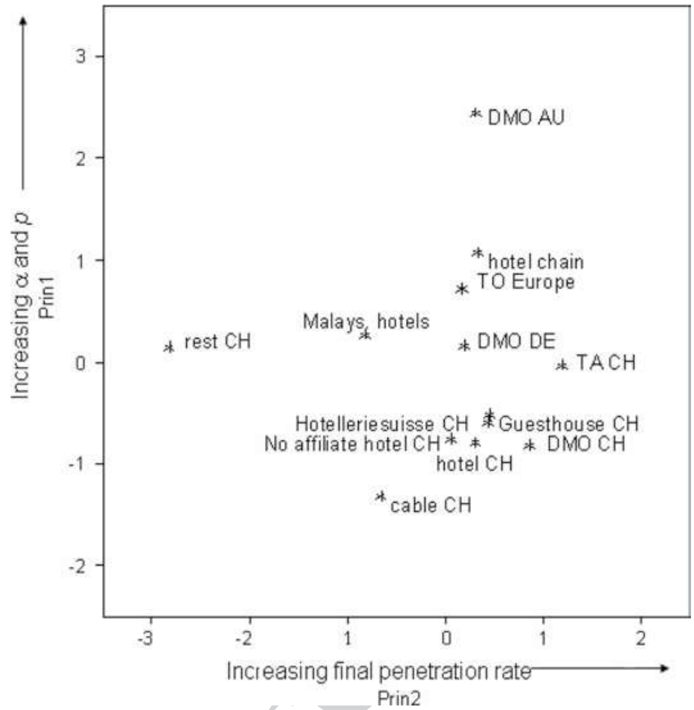

Fig. 6.3 Principal components analysis of Bass parameters, α level of heterogeneity and final penetration rate across tourism sectors/countries (*Source* Authors' computation)

beyond the understanding of the authors but the homogeneity of Swiss restaurants could be explained by the lowest internet penetration level of 9%. A careful study of the restaurant data shows that its homogeneity could be due to location. Swiss regions with high tourism intensity like the cantons of Bern, Vaud and Valais, have more restaurants in comparison to all others cantons.

To shed light on the mixed role of the four values—p, q, penetration rate and α—a principal components analysis using the Proc Princomp of SAS V9.2 yields the graph in Fig. 6.3. The two first components explain a total variation of 77%. Prin1, on the y-axis, shows a 0.59 positive correlation with p, a 0.52 positive correlation with α and a 0.62 negative

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correlation with *q*. This first component seems to capture the diffusion models parameters. Prin2 on the *x*-axis reflects the final penetration rate, showing a positive 0.96 correlation with predicted market penetration. The Swiss sectors clustered in the graph, excluding Swiss restaurants, suggest a possible influence of culture/national factors. Another clustering of international hotels chain and European tour operators suggests a possible influence of internalisation and company size.

Discussion and Conclusion

The analysis shows both the importance of innovation and imitation parameters, homogeneity, critical mass and final market size, and that the 13 tourism sectors varied. Almost all Swiss sectors reflect a high sensibility to critical mass. Possible organisational and cultural factors include resistance to innovation and aversion to risk. Unlike the other Swiss sectors, Swiss DMOs show high heterogeneity. This diverseness aligns with the country's different linguistics/cultural factors and organisational differences such as the size—local, regional or national—budget and intensity of the tourism they represent.

The two international datasets illustrate the importance of testing homogeneity. With near homogenous adoption across categories, European tour operators follow the Bass model of adoption. International hotels chains, however, illustrate the importance of modelling heterogeneity.

As future research streams, quantitative and qualitative studies should continue ferreting out the drivers and barriers to both technology adoption and organisational implementation of that same technology. Qualitative findings can lead to improvements in modelling the diffusion of innovations. The empirical research will enlighten comprehension of the tourism sector and improve diffusion forecasts, particularly the take-off phase that many models ignore.

Limitations of this research are mostly related to the gathering of data process as it uses two different methods, one of them (softbot) only collects the ".ch" domain. Hence the comparison across Swiss accommodations sectors deserves a cautious attitude. Another limitation is that the only parameter reported of G/SG model is heterogeneity (α). This report does not fully address the latter model and future research should make a deeper results analysis.

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Appendix

Cumulative series, Observed, estimated (one-step ahead) and forecasted for the last 24 years using Bass model for all sectors under study.

See Figs. 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, and 6.16.

Residual and forecasting errors statistics.

See Table 6.3.

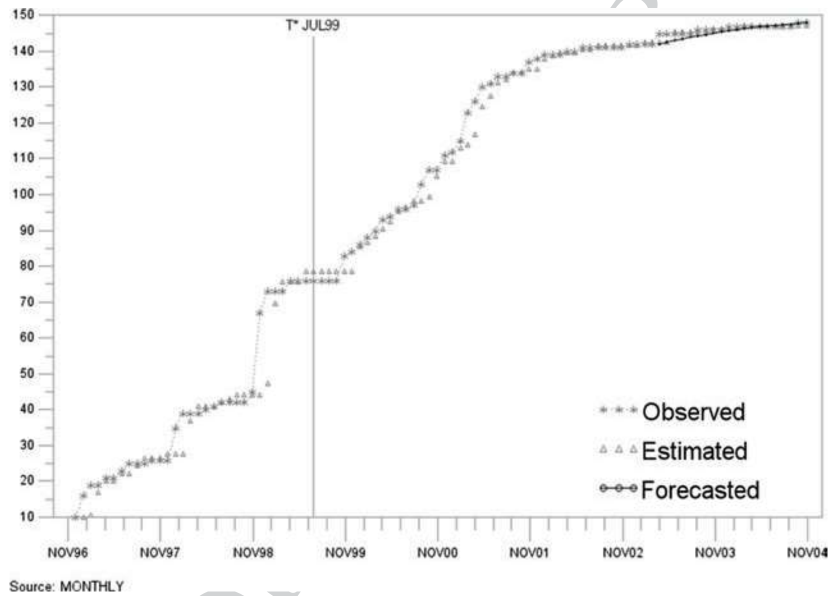

Fig. 6.4 Swiss Destination Managements Organizations (DMOs) (*Source* Authors' computation)

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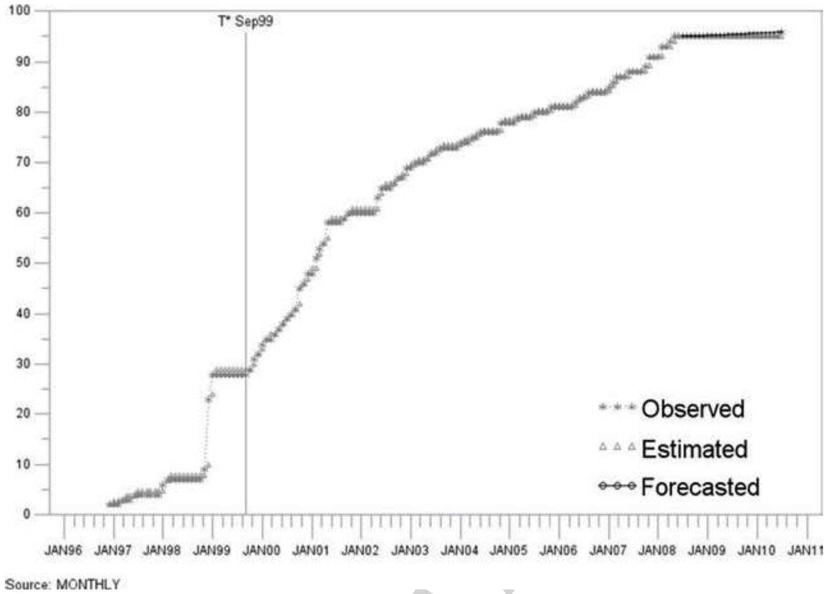

Fig. 6.5 Austrian DMOs (*Source* Authors' computation)

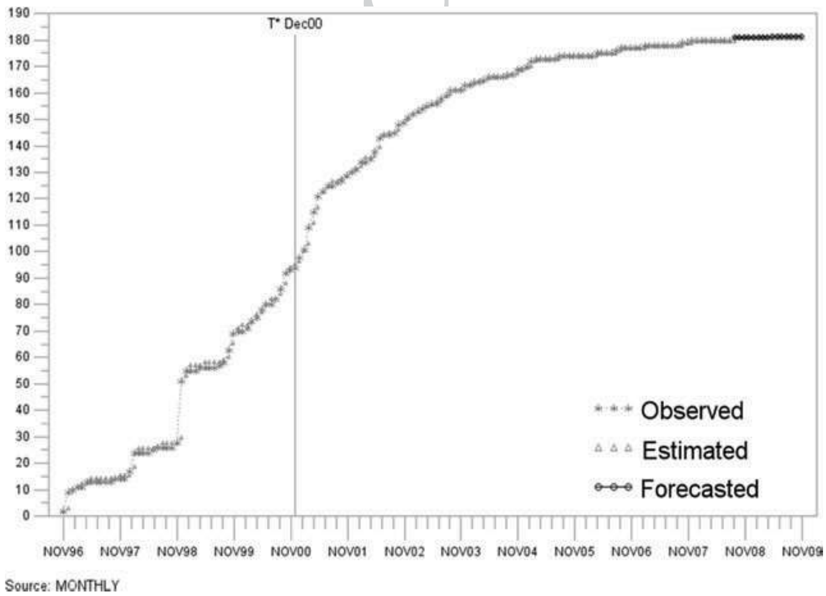

Fig. 6.6 German DMOs (*Source* Authors' computation)

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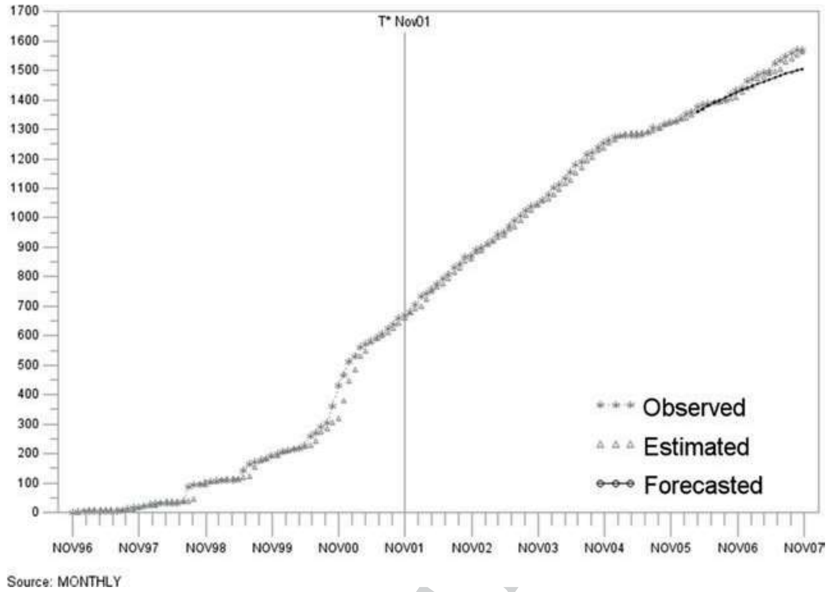

Fig. 6.7 Swiss restaurants (*Source* Authors' computation)

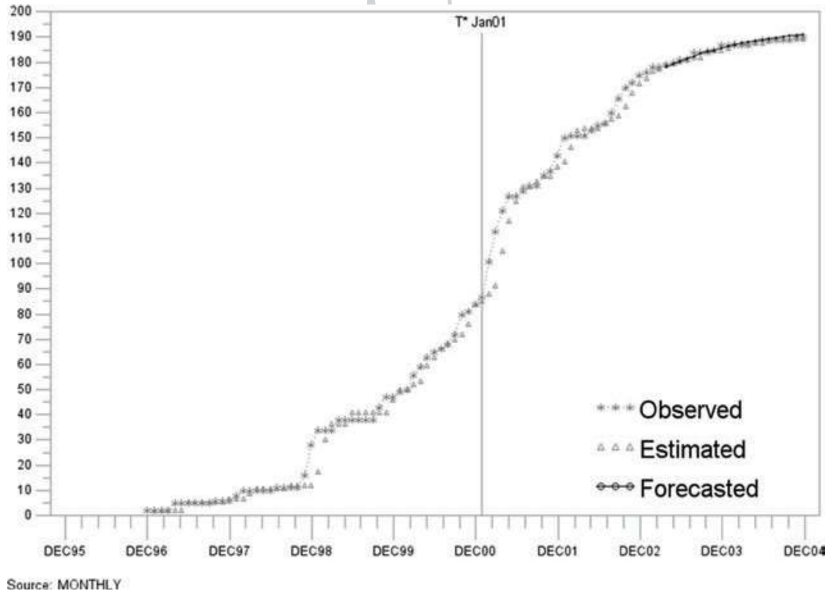

Fig. 6.8 Swiss cable cars companies (*Source* Authors' computation)

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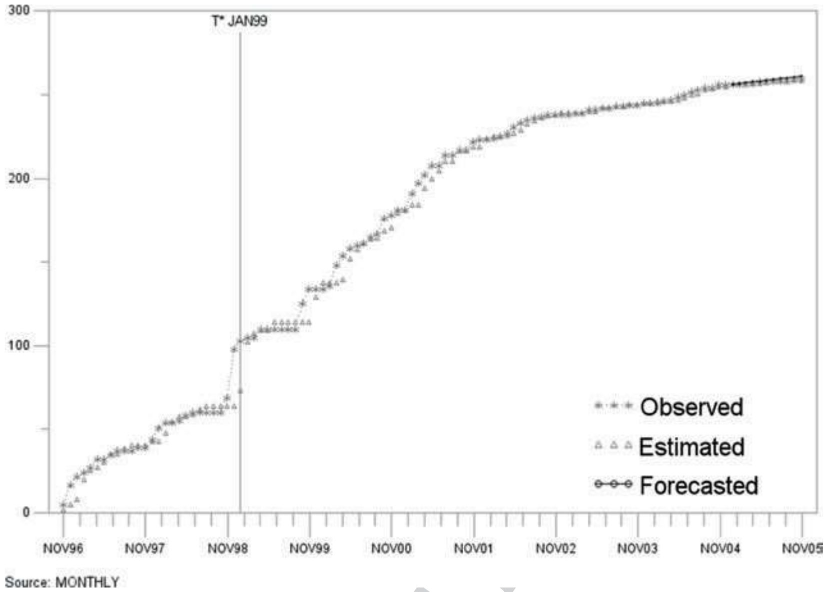

Fig. 6.9 International hotel chains (*Source* Authors' computation)

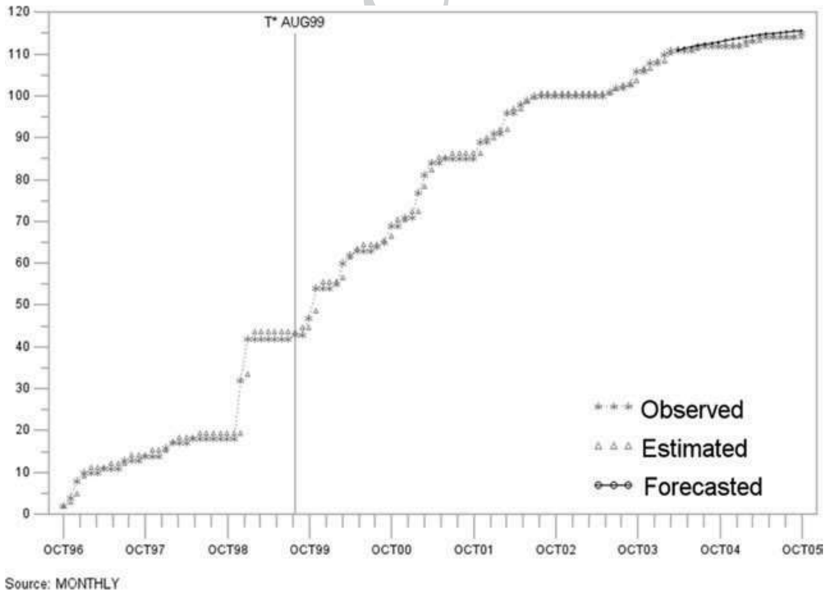

Fig. 6.10 European tour operators (TOs) (*Source* Authors' computation)

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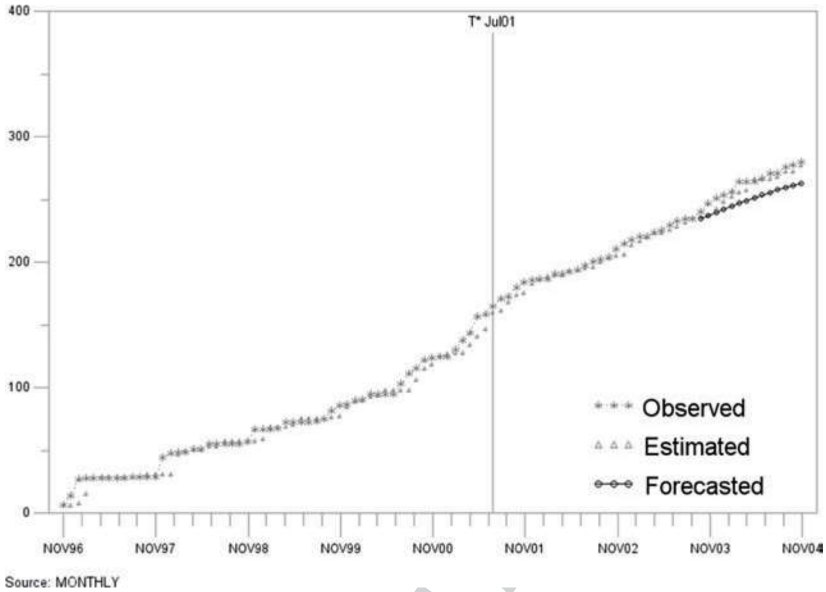

Fig. 6.11 Malaysian hotels (*Source* Authors' computation)

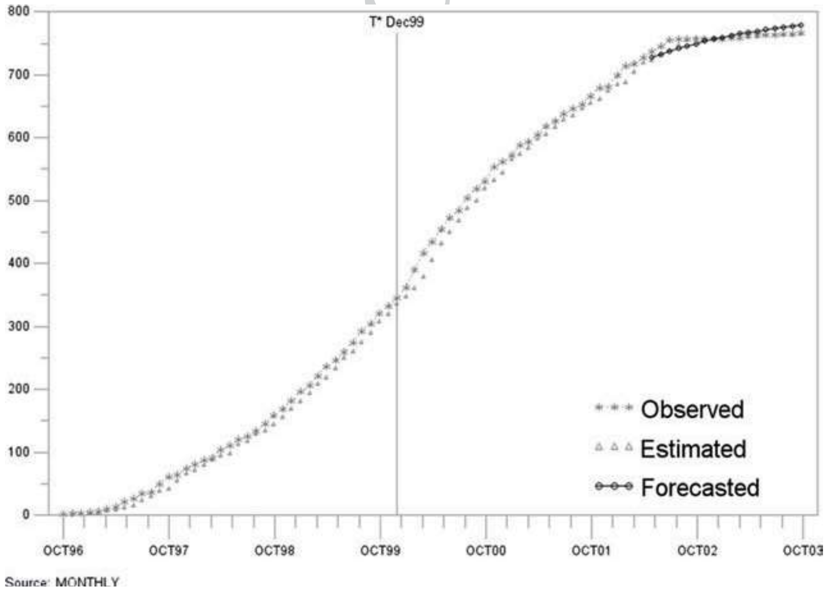

Fig. 6.12 Swiss non-affiliated hotels (*Source* Authors' computation)

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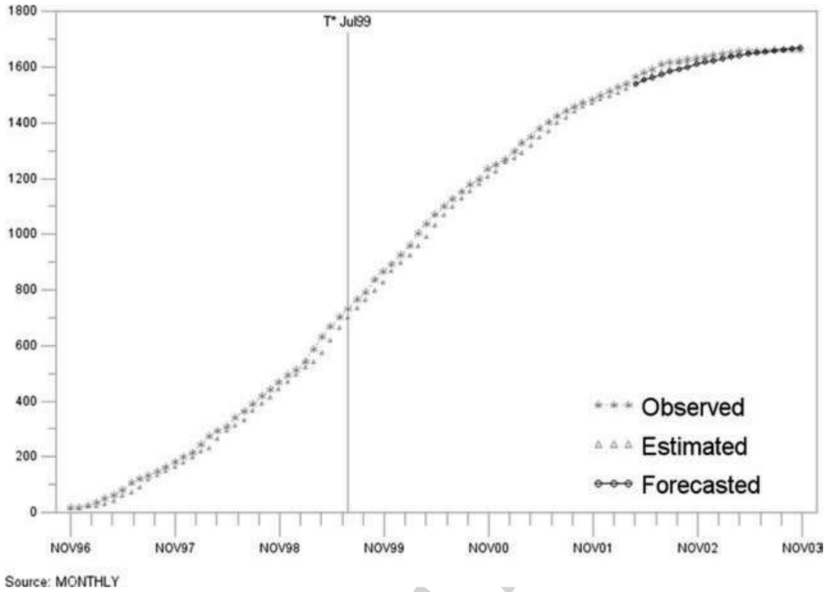

Fig. 6.13 Swiss affiliated hotels (*Source* Authors' computation)

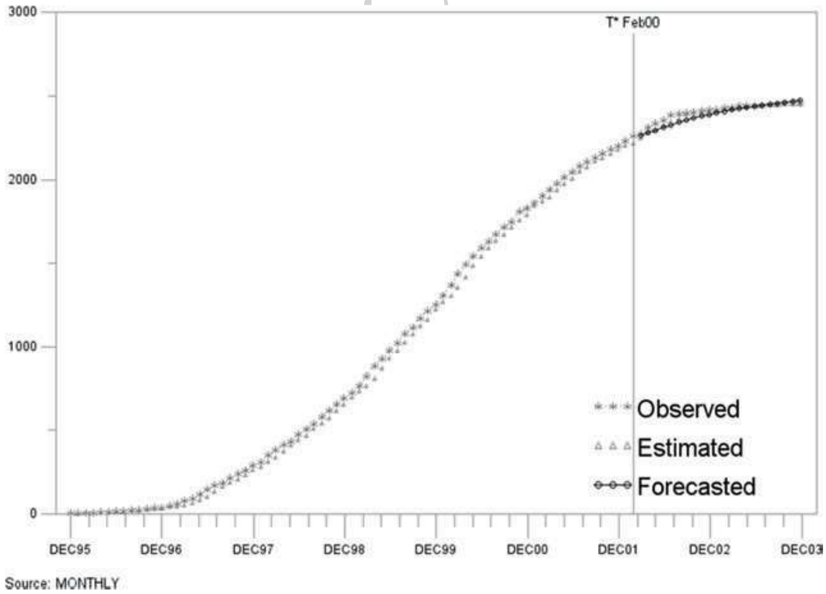

Fig. 6.14 Swiss hotels (*Source* Authors' computation)

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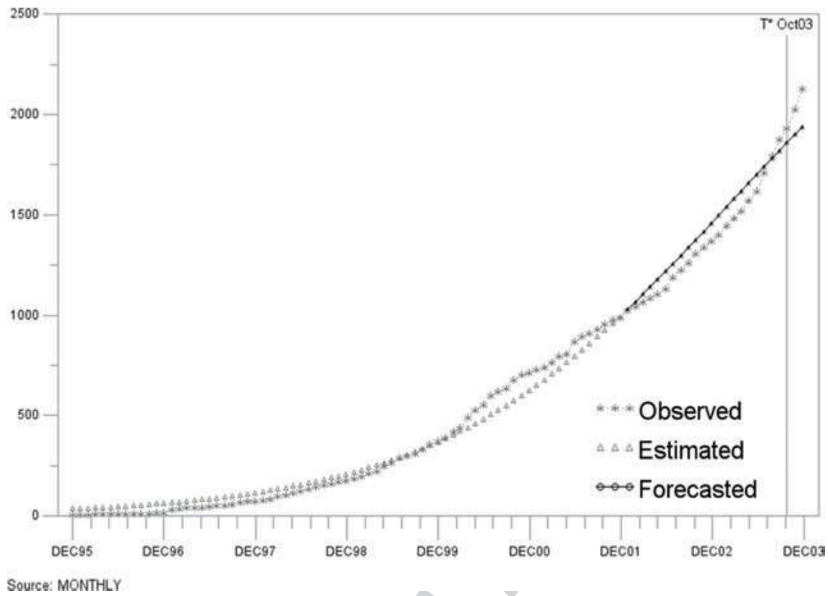

Fig. 6.15 Swiss *gasthouses* (*Source* Authors' computation)

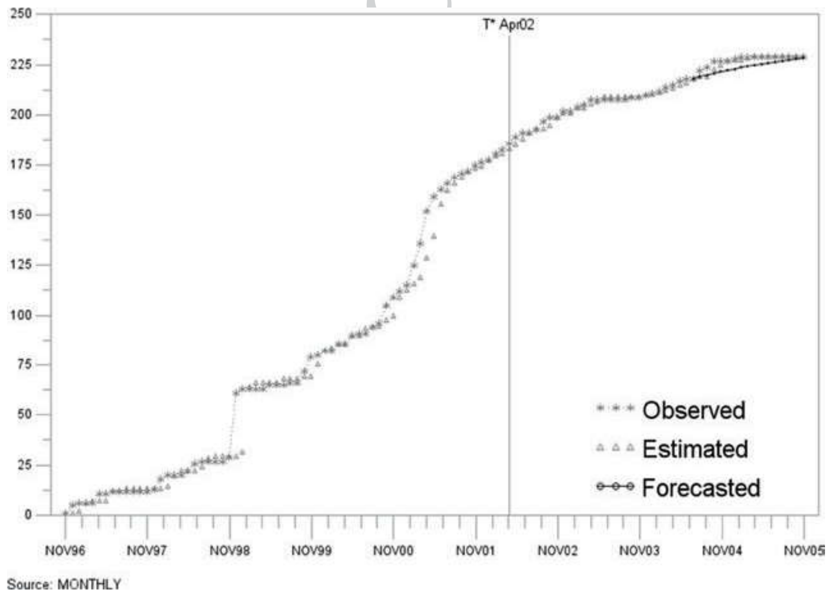

Fig. 6.16 Swiss travel agencies (*Source* Authors' computation)

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Table 6.3 Residual and forecasting error statistics

	Residual error statistics: estimation model Bass reported in Table 6.2			*Forecasting errors statistics-24 last months*				
	MSE	*Root MSE*	*Adj* R^2	*Range of the sample (24 last observations)*	*Mean Abs Error*	*Mean Abs % Error*	*RMS Error*	*RMS % Error*
DMO CH	7.3937	2.7191	0.9966	MAR2003–FEB2005	0.6861	0.4700	0.9199	0.6322
DMO AU	1.754	1.3244	0.9981	AUG2008–JUL2010	0.4610	0.4852	0.5309	0.5589
DMO GE	4.6745	2.162	0.9987	SEP2008–AUG2010	0.3447	0.1904	0.3856	0.213
Restaurant CH	105.5	10.2729	0.9997	MAR2006–FEB2008	26.4983	1.7302	34.5525	2.228
Cable car CH	6.022	2.454	0.9989	MAR2003–FEB2005	0.8279	0.4426	0.9744	0.5199
Hotel chain	12.3322	3.5117	0.9983	DEC2004–NOV2006	1.1229	0.4312	1.305	0.5013
European tour operators	4.0498	2.0124	0.9973	MAR2004–FEB2006	0.9542	0.8447	1.1094	0.9831
Malaysian hotel	7.5925	2.7554	0.9993	SEP2003–AUG2005	10.1686	3.7449	10.8393	3.9852
No affiliated hotel CH	14.2494	3.7748	0.9998	FEB2002–MAR2004	7.2274	0.9499	8.4162	1.1046
Hotelleriesuisse CH	29.2468	5.408	0.9999	MAR2002–FEB2004	11.5324	0.7077	13.5408	0.8346
Hotel CH	54.6344	7.3915	0.9999	FEB2002–JAN2004	16.1906	0.6734	19.8001	0.8263
Gasthouses CH	3922	62.6261	0.9892	JAN2002–DEC2003	67.9966	4.5786	78.837	5.0285
Travel agencies CH	13.1253	3.6229	0.9981	JUN2004–MAY2006	2.2008	0.9664	2.7593	1.2122

Source Authors' calculations

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