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# RESEARCH NOTE

## EFFECTS OF PRICE MODEL COPYCATS IN THE SKI INDUSTRY

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This article investigates the impact of the introduction of a greatly reduced seasonal ski pass for overnight stays in winter destinations. The analysis covers 59 winter sports destinations in Switzerland for the winter seasons 2012/2013 to 2017/2018, of which 11 introduced the "Magic Pass." Winter destinations without the reduced ski pass constituted the control group. Panel difference-in-differences estimates show that the Magic Pass in 2017/2018 led to an increase in domestic overnight stays in the winter season of 31%. However, foreign overnight stays in the same period were not affected by the price discount. Overall, the magnitude of the discount price effect was lower than that of a previous attempt. Control variables such as average snow depth and temperature for the winter months of December to March were not or only marginally significant. Since the positive effects of price reductions were limited to domestic overnight stays, price reductions should be viewed critically.

**Key words: Price discounts; Ski resort; Overnight stays; Switzerland; Difference-in-differences model; Panel data methods**

### Introduction

Price promotions in the form of discounts are common in the tourism sector such as hospitality and outdoor recreation activities (Christou, 2011; Yang et al., 2016). The stagnation of the ski business in Switzerland has prompted some ski lift operators to introduce high price discounts. In the winter season 2016/2017, Saas-Fee introduced a heavily discounted seasonal ski pass (Falk & Scaglione, 2018). Subsequently, in the 2017/2018 winter season around 25 ski resorts in western Switzerland launched a similar price model. Steenkamp et al. (2005) stated that similar price promotions can be expected from competitors because they are easy to introduce. Little is known about the demand effects of subsequent discount campaigns by competitors.

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The aim of this study was to empirically examine the short-term effects of introducing the Magic Ski Lift Pass on the number of domestic and foreign overnight stays using difference-in-differences models (DiD) in a dynamic panel data model setting. The data consisted of 59 ski resorts in Switzerland for the winter seasons 2012/2013 to 2017/2018. The control group consisted of winter sport resorts that have not adopted this type of reduced seasonal ski pass.

This article contributes to the literature on the demand effects of price reductions and advertising campaigns on purchase intentions and demand in the tourism industry (Steenkamp et al., 2005). A methodological innovation of the study is the use of the DiD approach combined with a dynamic panel data model. The advantage is that time invariant characteristics of the ski resort are controlled for, as well as persistence in tourism demand. Since the price action is not carried out by a single destination but by a group of ski resorts, the results can be generalized.

## Conceptual Background and Empirical Model

In the winter season 2017/2018 around 25 ski resorts in Western Switzerland—in the Romandie region—offered a common ski pass, the so-called Magic Pass, for CHF 399 (=EUR 359) (*https://www.magicpass.ch/*). The discount was considerable as the full price for the pass was CHF 1,299 for adults. The discount campaign was probably influenced by a similar campaign 1 year earlier, when the Saas-Fee ski resort introduced a super low season ski pass (CHF 222) for the first time. Falk and Scaglione (2018) found that the introduction of the reduced seasonal ski pass in Saas-Fee led to a considerable increase in domestic overnight stays (50%) but not to more foreign overnight stays.

This price promotion can be seen as an imitation or copycat strategy, which are common marketing campaigns (McCole, 2004). This means that someone “steals” a marketing strategy from another company. According to the theory of tourism demand, price changes directly affect tourism demand (Dogru et al., 2017). It can be expected that the effects of the seasonal ski pass discount would be greater for Swiss residents than for foreigners, as they have lower travel costs and better knowledge of the price campaign. For many foreign guests, who do not normally spend more than a week in ski resorts, the season pass is less rewarding. Since the price discount is not new and the season ski pass is more expensive than that of previous attempts (Saas-Fee), it is likely that the strength of the price effect on overnight stays is lower.

To estimate the effects of the price discount on the number of overnight stays a DiD approach combined with a dynamic panel data model was used. Dynamic panel data models are standard nowadays to analyze the determinants of tourism demand (Durbarry et al., 2009). The advantage of this is that unobserved time-invariant individual heterogeneity (here “fixed destination effects such as location, elevation and size”) can be controlled for. To account for the possible persistence in overnight stays a partial adjustment model was employed. Tourism and transport prices are not available at the detailed regional level and were therefore proxied by annual dummy variables. The demand for winter tourism depends not only on prices and real income but also on snow depth and temperatures (Falk, 2013). The dynamic panel data model determining the number of overnight stays (either domestic or foreign) is specified as:

$$lnY_{it} = \alpha_i + \theta lnY_{it-1}, + \Sigma_{j=0}^{6} \beta_j\, DYEAR_t + \delta MAGICPASS_{it} + \gamma_1 Temp_{it} + \gamma_2 Snow_{it} + \epsilon_{it},$$

where $i$ denotes the winter sport destination, $t$ year (winter season), and ln( ) the natural logarithm. The dependent variable ln$Y$ is the number of domestic or foreign overnight stays in the winter season. The time effects, *DYEAR*, control for macroeconomic factors that are common to all winter sport destinations, including business cycle effects and general price inflation. The treatment variable, *MAGICPASS*, is equal to 1 if the ski resorts have introduced the magic pass in 2017/2018 and zero otherwise. The coefficient $\delta$ measures the average short-run treatment (DiD) effect and $\epsilon$ is the error term. The control variables consist of average temperatures (*Temp*) and snow depth (*Snow*) for the winter months December to March.

The partial adjustment model can be estimated using the Fixed Effects Quasi maximum likelihood estimator with robust standard errors (Hsiao et al., 2002). Like other dynamic panel data methods, the equation in levels is transformed into first differences. Here the econometric problem of the correlation of the lagged dependent variable with the error term (so-called Nickell bias) is solved by modeling the initial observations of the lagged dependent variable as a function of the changes in the future values of the exogenous variables (measured in changes). This method is particularly suitable for short dynamic panel data with very persistent variables, as should be the case with the number of domestic or foreign overnight stays. Given that price effects are likely to be different between foreign and domestic overnight stays separate estimations are provided. The DiD approach relies on the assumption of a common trend in the average outcomes of the treated and non-treated groups over time. This assumption does not hold if neighboring ski resorts are affected. To account for the possible substitution effect, four ski resorts closely related to the Magic pass ski resorts are excluded.

*Data*

Overnight stays at the village level were provided by the Swiss FSO. Temperature and snow depth were provided by the MeteoSwiss. Each weather station was assigned to the nearest ski resort. The sample consisted of 59 ski resorts for the period 2012/2013 to 2017/2018. Sass-Fee was excluded from the sample because the corresponding ski lift operator introduced a discounted seasonal ski pass in the winter season 2016/2017. Table 1 shows that destinations affected by the Magic Pass experienced a 23% increase in domestic overnight stays in the winter season 2017/2018 compared to the previous year. By contrast, foreign overnight stays of the Magic Pass ski resorts did not change much (−1.2%).

## Empirical Results

The results based on the dynamic panel data model show that the magic price discount effect was negative and statistically significant at the 1% level. This indicates that ski resorts that introduced the Magic Pass at the beginning of the 2017/2018 winter season showed a 27% higher rate of change in domestic overnight stays than those that did not (Table 2). However, foreign overnight stays were not significantly affected. The finding supports our main hypothesis that the strength of the price effect was lower than that of a previous attempt (Saas-Fee) where a 50% increase in domestic overnight stays can be observed (Falk & Scaglione, 2018). The control variables average temperatures and snow depth were only weakly or not statistically

Table 1
Evolution of Domestic and Foreign Overnight Stays

| | | | | Annual Change | | |
|---|---|---|---|---|---|---|
| | Total No. | Ski Resorts Offering Magic Pass | Other Ski Resorts | Total | Ski Resorts Offering Magic Pass | Other Ski Resorts |
| **Domestic overnight stays** | | | | | | |
| 2012/2013 season | 3,072,560 | 359,766 | 2,712,794 | | | |
| 2013/2014 season | 3,099,730 | 370,425 | 2,729,305 | 0.9% | 3.0% | 0.6% |
| 2014/2015 season | 3,137,018 | 364,336 | 2,772,682 | 1.2% | −1.6% | 1.6% |
| 2015/2016 season | 3,155,419 | 375,455 | 2,779,964 | 0.6% | 3.1% | 0.3% |
| 2016/2017 season | 3,289,912 | 375,686 | 2,914,226 | 4.3% | 0.1% | 4.8% |
| 2017/2018 season | 3,453,512 | 461,442 | 2,992,070 | 5.0% | 22.8% | 2.7% |
| **Foreign overnight stays** | | | | | | |
| 2012/2013 season | 3,299,092 | 488,982 | 2,810,110 | | | |
| 2013/2014 season | 3,306,321 | 454,021 | 2,852,300 | 0.2% | −7.1% | 1.5% |
| 2014/2015 season | 3,163,352 | 427,932 | 2,735,420 | −4.3% | −5.7% | −4.1% |
| 2015/2016 season | 2,826,211 | 399,143 | 2,427,068 | −10.7% | −6.7% | −11.3% |
| 2016/2017 season | 2,837,032 | 391,271 | 2,445,761 | 0.4% | −2.0% | 0.8% |
| 2017/2018 season | 3,066,542 | 386,610 | 2,679,932 | 8.1% | −1.2% | 9.6% |

*Note*. Magic Pass ski resorts include Anzere, Chandolin, St Luc, Crans Montana, Grimentz, Gstaad Sannen, Leysin, Nax Montnoble, Ovronnaz, Vercorin, Villars, Gryon, and Zinal. Source: Swiss Federal Statistical Office.

Table 2
Dynamic Panel Data Estimations of the Effect of the Price Discount Strategy

| | Domestic Overnight Stays | | Foreign Overnight Stays | |
|---|---|---|---|---|
| | Coeff. | *Z* Value | Coeff. | *Z* Value |
| ln overnight stays ($t - 1$) | 1.021*** | 20.39 | 0.604*** | 7.98 |
| Winter season 14_15 (WS 13_14) | −0.074 | −0.91 | −0.010 | −0.26 |
| Winter season 15_16 | 0.016 | 0.25 | −0.133*** | −3.98 |
| Winter season 16_17 | 0.008 | 0.12 | −0.086** | −2.53 |
| Winter season 17_18 | −0.084 | −0.75 | 0.036 | 0.46 |
| Magic pass resorts WS 17/18 | 0.266*** | 3.08 | −0.100 | −1.23 |
| Temperatures | −0.081* | −1.83 | 0.012 | 0.38 |
| Snow depth | −0.001 | −1.33 | 0.002 | 1.48 |
| Constant | −0.216 | −0.45 | 3.601*** | 5.18 |
| No. of groups (ski resorts) | 59 | | 59 | |
| No. of Magic Pass ski resorts | 11 | | 11 | |
| No. of observations | 287 | | 287 | |
| Pseudo $R^2$ | 0.96 | | 0.98 | |

*Note*. Estimations are conducted using stata's xtdpdqml command with robust standard errors that implements the ML method of Hsiao et al. (2002).
**Significant at 5% level; ***significant at 1% level.

significant. This is in line with recent studies which showed that the relationship between demand for winter tourism and both snow depth and temperatures is relatively low (Falk, 2013).

As a robustness checks a simple fixed effects model is estimated with clustered-adjusted standard errors at the level of ski resorts. Results show that the Magic Pass leads to an increase in domestic overnight stays by 23%, calculated as [exp(0.204) − 1)*100], which is slightly lower than the dynamic panel data results (see Table 3). However, the standard fixed effects model likely suffers from serial correlation as shown by the panel serial correlation tests.

## Conclusions

Evidence based on the dynamic panel data shows significant positive short-run effects of the introduction of the heavily discounted Magic Pass on the number of overnight stays. On average, affected ski resorts observed a 27% higher rate of change in domestic overnight stays. However, foreign overnight stays

Table 3
Fixed Effects Model of the Effect of the Price Discount Strategy

| | Domestic Overnight Stays | | Foreign Overnight Stays | |
|---|---|---|---|---|
| | Coeff. | *Z* Value | Coeff. | *Z* Value |
| Magic pass resorts WS 17/18 | 0.204* | 1.99 | −0.090 | −1.01 |
| Temperature | −0.029* | −1.81 | −0.004 | −0.15 |
| Snow depth | 0.000 | 0.08 | 0.000 | −0.08 |
| Yearly dummy variables | yes | | Yes | |
| Constant | 9.762*** | 164.3 | 9.339 | 91.68 |
| No. of groups (ski resorts) | 59 | | 59 | |
| No. of Magic Pass ski resorts | 11 | | 11 | |
| No. of observations | 346 | | 346 | |
| Wooldridge test for autocorrelation in panel data ($p$ value) | 0.00 | | 0.00 | |
| Modified Bhargava et al. Durbin–Watson | 1.35 | | 1.12 | |
| $R^2$ within | 0.06 | | 0.19 | |

*Note*: Z-stat based on standard errors adjusted across ski resorts.
*Significant at 10% level; ***significant at 1% level.

were not affected. The other main result of the study is that the magnitude of the price discount effect was considerably lower than previous actions by a competitor (Saas-Fee) conducted 1 year earlier.

Several policy implications can be drawn from these findings. Since gains of the price discount are limited to domestic nights, price discounts should be seen critically. The positive effects could be temporary and could only have a significant effect if the remaining competitors do not introduce a similar measure. Since the domestic ski market is stagnating, the subsequent price reduction by competitors will reduce the gains in overnight stays by the initial inventors of the price strategy. The strategy of focusing on domestic tourism could be desirable from the point of view of sustainable tourism, but this is not a sustainable strategy from an economic point of view, as foreign tourists spend more than domestic tourists. What is required is a long-term strategy that leads to better quality and a broader product range. Instead of lowering prices, diversification is needed with new offers and attractions for both the winter and summer seasons. The extension of the Magic Pass for the summer use of cable cars is a promising first step. Further measures to make ski resorts more attractive in the summer season should follow.

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