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Martin Falk, Dr

Tourism and Hospitality Research published online 23 January 2014
DOI: 10.1177/1467358413519262

Article

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Tourism and Hospitality Research
0(0) 1–12

DOI: 10.1177/1467358413519262
thr.sagepub.com

Martin Falk
Austrian Institute of Economic Research (WIFO), Vienna, Austria

Abstract

This paper investigates the impact of the appreciation of the Swiss franc on international tourism in Swiss Alpine resorts, city and lake destinations using annual data for winter seasons 2007/2008 to 2010/2011. Using median regression models, we find that the nominal and real appreciation of the Swiss franc has a large and significantly negative impact on international tourism demand in Alpine destinations during winter months. The elasticities of the relative price (to those of competing countries) range between −3.0 for foreign hotel nights and −2.1 for foreign hotel arrivals. In contrast, the real exchange rate effect is much lower in absolute terms for city and lake destinations. The results are not sensitive with respect to different measures of international tourism demand (arrivals, hotel nights and the length of stay). Income elasticities are also significant and large with values of two and higher. In general, these findings are robust to alternative estimation methods (i.e., median regression, robust regression method and ordinary least squares in first differences).

Keywords

Winter tourism demand, Swiss Alps, relative prices, exchange rates

Introduction

According to Swiss tourism, the combination of the strong Swiss franc and the tough economic situation in Europe has been the greatest challenge for Swiss tourism in recent years (Switzerland Tourism (ST), 2012). From 2009 onwards, the Swiss franc has appreciated strongly against the euro. The euro crisis has been the key factor for Swiss appreciation in recent years. This appreciation has led to increased concerns of the impact of the strong Swiss franc on the tradable sector and particularly on the tourism sector.

In fact, between winter seasons 2007/2008 and 2010/2011, 28 out of the 30 largest Swiss Alpine resorts experienced a decline in the number of foreign hotel overnight stays during the winter months of December to April (see Table 2). Overall, the 30 largest Alpine resorts experienced a decline of 18% in terms of international hotel nights and 10% in international arrivals. It is interesting to note that the decline can also be observed for world-class ski resorts, such as Zermatt, Davos and St. Moritz. Furthermore, there is a reduction in the length of stay in hotels. However, there is a general decline in the average length of stay of visitors in most of the destinations around the world. This can be explained by the fall of relative prices for airline tickets, increased supply of air travel, the rapid diffusion of information and communication technologies (ICT) in the tourism industry, and the growing popularity of second and third trips.

The negative trend in tourism can be summarized as follows: ‘We have fewer guests and those who visit stay for a shorter period’. (Mr. Gaudenz Thoma director of the marketing organization in Graubünden as cited in Meier and Wille, 2011). At the same time, Swiss ski resorts are losing visitors to neighbouring competitors, in particular, to Austria (see Falk, 2013) and to a lesser extent, France.

Corresponding author:
Martin Falk, WIFO, Arsenal Objekt 20, Vienna, 1030 Austria.
Email: martin.falk@wifo.ac.at

However, the strong franc has affected Swiss destinations differently. While mountain destinations have experienced a strong decline, city and lake destinations have experienced little change in the number of hotel nights or hotel arrivals (see Table 3). Therefore, it is not surprising that managers of tourism organization in Alpine resorts are particularly concerned with the decline in price competitiveness.

This paper employs Swiss community data to study the impact of exchange rate changes on tourism demand of the hotel industry in the winter months. We use various estimation methods, such as the median regression models and robust regression methods, to account for the possible effect of influential observations. Data are based on the 60 largest Alpine and non-Alpine destinations for winter seasons 2007/2008 to 2010/2011. Few tourism demand studies provide separate results according to the geographical location of the destinations, such as mountain and non-mountain destinations. Knowledge of the price sensitivity of international tourists of different destinations is important for policy makers in order to be able to give recommendations on price setting adjustments.

Switzerland is an interesting country case because its tourism competitiveness ranks first among 140 countries according to the Travel & Tourism Competitiveness Index 2013. In fact, Swiss destinations can be generally characterized by a high-quality tourism infrastructure. International tourism represents an important part of the Swiss economy, accounting for 3% of the gross domestic product (GDP) (Swiss Tourism Federation (STF), 2013). Tourism is the most important sector in some Alpine regions. For instance, in the cantons, Graubünden and Valais, the GDP share is about 30% or more (Swiss Tourism Federation (STF), 2013). However, in recent years, there has been a general decline in the number of hotel beds (Nicod, Mungall and Henwood, 2007).

The literature shows that currency exchange rate movements play a main role in a destination's overall price competitiveness. Dwyer, Forsyth and Rao (2002) show that changes in relative prices are largely caused by changes in nominal exchange rates rather than changes in relative inflation rates. Numerous studies have examined the impact of relative prices and real exchange rates on tourism demand in developed destinations. Based on a meta-analysis, Crouch (1995) finds a mean exchange rate elasticity of −1.0. More recently, using data for 11 mainly developed tourist destinations, Eilat and Einav (2004) also find an own-price elasticity of −1.0. For US tourists visiting European destinations, Han, Durbarry and Sinclair (2006) find even higher price elasticities in absolute terms. However, Crouch (1995) reports large differences in the price elasticities between Northern and Southern European destinations (−0.44 and −1.3, respectively). This indicates that the relative price elasticity of demand for travel to Northern Europe is significantly lower than that for Southern Europe/Mediterranean destinations. Crouch (1995) concludes that tourism demand for sun, sea and sand destinations is likely to be more price sensitive than other types of holiday tourism. For instance, recent studies for Spanish sun and sea destinations find price elasticities of about −2 (see Garín-Muñoz, 2006; Garín-Muños and Montero-Martín, 2007).

However, the results of more recent studies for developed and mature destinations are not clear-cut. For New Zealand, Schiff and Becken (2011) find that foreign tourists coming from traditional markets (e.g., UK, USA and Australia) are not price-sensitive, with price elasticities of about −0.5. In contrast, for Australia, Seetaram (2010) finds a real exchange rate elasticity of −2.54. Using data for Hong Kong hotel rooms, Song et al. (2011) find price elasticities close to unity. For Alpine countries, few studies are available. For Switzerland, Ferro-Luzzi and Flückiger (2003) find low or even insignificant price elasticities. In contrast, using data for 116 Alpine destinations in South Tyrol, Brida and Risso (2009) find very high-price elasticities of about −1.05 in the short-run and 4.36 in the long-run. This indicates that mountain tourism is highly sensitive to price variations.

Previous studies on tourism demand for different market segments primarily focus on tourism demand by purpose of visit (holiday, business, visiting families and friends) or country of origin of the visitors. For instance, Cortés-Jiménez and Blake (2011) find that business tourism is rather insensitive to exchange rate changes, whereas holiday tourism is strongly price sensitive. However, few studies are available that apply the tourism demand model to different geographical locations within a destination country. An exception is the study by Corgel, Lane and Walls (2013) who study the impact of exchange rate change on the demand for US hotel rooms using disaggregated data at the city level. The authors find a relatively low-exchange rate elasticity in absolute terms in general, but significantly higher exchange rate elasticities for luxury and upscale hotels.

In summary, to the best of our knowledge, no study is currently available that examines how currency exchange rates affect the foreign demand for hotel bed nights in mountain and non-mountain destinations. The distinction between mountain and non-mountain destinations is interesting for several reasons. One reason is that the type of tourists differs significantly between both types of destinations. Cities are often visited for their cultural and historic heritage and may thus attract wealthy foreigners. In addition, larger towns also receive a higher number of business tourists. In contrast, winter sport destinations are much more homogeneous in terms of tourism motivation.

The structure of this paper is as follows: The 'Previous literature and empirical model' section presents the theoretical background and the empirical model. In the 'Data and descriptive statistics' section, we present various summary statistics and a description of the data before providing the empirical results in the 'Empirical results' section. The 'Conclusions' section contains concluding remarks.

Previous literature and empirical model

The impact of exchange rates on international tourism is widely documented. Exchange rate movements are generally considered an important determinant of tourism demand. In particular, it is well known that exchange rate fluctuations dominate the overall price movements of relative tourism prices over time (Chang, Hsu and McAleer, 2013; Schiff and Becken, 2011). The discussion on the impact of the Swiss franc appreciation and economic stagnation of the main visitor countries on Swiss tourism is not new. It was also a topic of discussion in the mid-1990s (Marvel and Johnson, 1997; Jaeger et al., 1996). The authors suggest that exchange rate movements and the weak economic growth were the primary factors influencing foreign hotel nights in Switzerland in the first half of the 1990s. Warburg (1996) (cited in Marvel and Johnson, 1997) has estimated exchange rate elasticities for Switzerland for the period 1973 to 1995 and found that exchange rate sensitivity depends on the country of origin of the visitors. In particular, the author finds that the exchange rate elasticities are large in absolute terms with values exceeding unity for visitors from the Netherlands, Belgium, France, Italy and the USA. For visitors from the UK, Spain and Austria, the author finds elasticities close to one. The exception is Germany and the Northern European countries with elasticities between 0.6 and 0.4 (Warburg 1996 cited in Marvel and Johnson, 1997). Jäger, Minsch and Abrahamsen (1996) also find that the real exchange rate elasticities depend on the visitor countries. For the period 1980 to 1993, a real appreciation of the Swiss franc by 1% led to a fall in the number of foreign nights spent between 0.4% and 2%, depending on the country of origin. However, these studies are based on aggregate data and do not distinguish between different locations.

It is well known that tourism prices are difficult to measure directly. In particular, leisure trips generally consist of a bundle of heterogeneous physical and intangible attributes, some of which do not have a price (Brida and Scuderi, 2013; Laesser and Crouch, 2006). Given that tourism price indices are not generally available, the consumer price index is used as a proxy. In particular, the most frequently used indicator for prices is the consumer price index ratio of the origin and destination countries adjusted for exchange rates (this is refereed to as real exchange rates). Note that local (destination specific) prices have to be converted into visitor currency prices when included in a tourism demand model for foreign visitors. In addition, the two components of relative prices, namely exchange rate and relative consumer price, can be included separately (Martin and Witt, 1987). It is well known that exchange rate movements often reflect differences in inflation rates between the origin and destination country. Therefore, exchange rates should not be used alone as an explanatory variable (Song and Witt, 2000). However, this argument may be less relevant for low-inflation countries, such as Switzerland and its neighbouring countries.

In this paper, we use the price of the substitute destinations rather than those of the origin countries to measure relative prices. We argue that prices of the main competitor countries are more relevant than that of the origin countries when choosing to travel to winter sport destinations. This is due to the lack of winter sport destinations in the corresponding origin countries.

The standard tourism demand model based on disaggregated data for communities can be specified as follows:

$$\ln X_{it} = \beta_0 + \beta_1 \ln Y_{ijt} + \beta_2 \ln RP_{ikt} + \beta_3 T + \mu_i + \varepsilon_{it}$$

Here, i denotes the destination (community) and t denotes the winter seasons for the period 2007/2008 to 2010/2011. ln is the natural logarithm, k denotes competitor countries and j represents visitor countries. μ_i is the individual (community effect), T is the time trend and ε_{it} is the error term. The left-hand side variable, X_{it}, is a measure of international tourism demand in subsequent winter months (i.e., international overnight stays in hotels, international arrivals in hotels and length of stays in hotels). Y_{ijt} denotes weighted GDP in constant prices of the visitor countries j in destination i while RP_{ikt} are relative prices (i.e., the ratio of prices in Swiss destinations i converted into euro prices to prices in the main competitor countries k). The parameters β_1 and β_2 can be interpreted as long-run income and price elasticities of tourism demand with positive income elasticities and negative price elasticities. However, estimating the static fixed-effects model is problematic given that both foreign hotel nights and arrivals, and real GDP are likely to be non-stationary. Note that non-stationary time series can often be transformed into stationary ones after applying the first difference transformation to the data. However, using relationships where the variables are expressed in differences leads to a loss of long-run information. Thus, the first difference regression model makes it only possible to estimate short-run elasticities. Given the short time period, we use first differences on both sides of the equation

$$\Delta \ln X_{it} = \alpha_0 + \alpha_1 \Delta \ln Y_{ijt} + \alpha_2 \Delta \ln RP_{ikt} + \nu_{ti}.$$

Here, the new error term, $\tilde{\nu}_{it} = \varepsilon_{it} - \varepsilon_{it-1}$, has a zero mean and constant variance. Δ is the first difference operator, and $\Delta \ln X_{it}$ refers to the change in tourism demand as compared to the previous winter season. Time differencing of the time trend generates the constant α_0. Taking 'first differences' also eliminates community-fixed effects, and so we can estimate this model using ordinary least squares (OLS). The main research question to be examined is whether income and price elasticities vary between mountain destinations and the remaining destinations. Therefore, tourism demand will be estimated for two subsamples

$$\Delta \ln X_{it} = \tilde{\alpha}_{0m} + \tilde{\alpha}_{1m} \Delta \ln Y_{ijt} + \tilde{\alpha}_{2m} \Delta \ln RP_{ikt} + \tilde{\nu}_{it}.$$

Here, $m = 1$ stands for mountain destinations and $m = 2$ for non-mountain destinations. Gray (1966) and Martin and Witt (1987) state that tourists are more likely to be aware of exchange rates than relative price changes when selecting a destination. Therefore, the tourism demand model is also specified with the nominal bilateral exchange rates as the proxy for prices.

$$\Delta \ln X_{it} = \tilde{\tilde{\alpha}}_0 + \tilde{\tilde{\alpha}}_{1m} \Delta \ln Y_{jit} + \tilde{\tilde{\alpha}}_{2m} \Delta \ln ER_{it} + \tilde{\tilde{\nu}}_{it}$$

Here, ER is the Swiss franc to euro exchange rate. The tourism demand model is estimated by three estimations methods: OLS, median regression technique and robust regression method. The latter regression technique is used in order to reduce the impact of influential observations and/or errors in the tourist outcome variables. The median regression minimizes the sum of the absolute residuals rather than the sum of the squares of the residuals as in the OLS regression. This regression technique has the advantage that it is consistent and robust when the error term is heteroscedastic and non-normally distributed. For the median regression model, we apply the bootstrap method illustrated in Buchinsky (1995) to obtain standard errors for the coefficients. This method performs well for a relatively small sample size.

The price elasticity is the key parameter of interest. A relatively large number of substitutes will imply high-price elasticity (Brons et al., 2002). In contrast, a lack of substitutes will likely lead to an inelastic price elasticity of demand. For instance, if Austrian and Swiss ski resorts are strong substitutes, each will have a high-price elasticity of demand. Therefore, a high-price elasticity in absolute terms can be interpreted as an indicator to what extent Swiss tourist destinations compete with other tourist regions (Quayson and Vat, 1982).

Data and descriptive statistics

The dependent variables consist of (annual) foreign tourist arrivals in hotels, hotel nights and length of stays in hotels for winter months (December to April). The data are downloaded from the Website of the Swiss Federal Statistics Office based on 'Hotels und Kurbetriebe: Gäste nach Inland-Ausland und nach Gemeinden').[1] The data is available on a monthly basis for about 470 communities. The different indicators of tourism demand at the monthly level are aggregated to annual data for each winter season from 2007/2008 to 2010/2011, which leads to four data points for each community. We use data on foreign hotel arrivals and hotel nights and length of stays for the 30 largest Swiss Alpine destinations. As a control group, we use data for the 30 largest destinations in agglomeration areas and lake destinations. The 60 communities represent about 80% of total foreign hotel arrivals or hotel nights spent by foreign visitors.

Data for real GDP, consumer price index and exchange rates are drawn from OECD stats. To construct weighted GDP in constant prices, we use the share in hotel arrivals and hotel nights by 13 tourism regions for the sample midpoint value, that is, the winter season 2010. The underlying cross tables can be downloaded from the website of BFS.[2]

Visitors from Germany, the United Kingdom, France and the Netherlands account for more than 60% of total hotel nights and hotel arrivals in the winter season. Other important visitor countries are Belgium, Italy and the United States. However, the visitor share varies according to the destination communities. The share of visitors from Germany is highest in the regions of Graubünden and Ostschweiz, whereas the share of British tourists is highest in Wallis and Berner Oberland. As expected, French tourists are overrepresented in the Western part of the country.

We use service prices (less prices of the housing sector) as a proxy of tourism prices. The price variable is defined as relative prices to the main competitors, namely, France and Austria. Italy is also an important competitor in the ski business. However, Italian ski resorts are less comparable to Austrian and French ski resorts in terms of climate conditions given that they are located south of the Alpine divide. The price index for Germany is not used because German ski resorts are usually small and located in low-elevation ski areas and are thus not comparable with those in the neighbouring countries.

Table 1 shows summary statistics for the two subsamples. Tables 2 and 3 show the change in tourist arrivals in hotels and hotel nights for the two subsamples at the community level. It could be seen that there is a downward trend in international tourist arrivals and international hotel nights. However, the decline of international hotel nights and arrivals is much more pronounced in Alpine destinations than in non-Alpine destinations.

Empirical results

Table 4 shows the regression results of the determinants of international tourism demand for Swiss communities in the winter months for the two subsamples, i.e., mountain (Alpine) destinations and non-mountain destinations (cities and/or lake destinations), and two different measures of international tourism demand, namely, change in log hotel overnight stays of foreign visitors and change in log international arrivals in hotels. For each of the two subsamples, we have 30 communities and 4 winter seasons resulting in a total of 120 observations. For each sample and measure of tourism demand, we provide results using three estimation methods, namely OLS, median regression technique and robust regression method. The two latter estimation methods make it possible to test the robustness of the results. The robust regression method reduces the impact of extreme observations. Median regressions are robust to non-normality and influential observations of the dependent variable. As a first step, we test for normality of residuals by testing the cumulative distribution of the residuals against that of the theoretical normal distribution. The kewness/kurtosis chi-square test for normality shows that the null hypothesis is rejected at the 1% level indicating that the residuals are non-normally distributed. Similarly, a heteroscedasticity test also rejected the null hypothesis of homocedastic residuals. Therefore, the interpretation of the regression results is based on the results obtained from the median regression model, which is consistent in case of non-normally distributed error terms.

The tourism demand model estimated by OLS can explain between 17 and 32% of the variation in the change in the number of international hotel nights in Swiss communities. The explanatory power of the model is acceptable, given that the model is estimated in first differences. The results for international arrivals and hotel nights of foreign tourists show that income and price elasticities have the expected signs and are significant at the 1% level. This also holds for both Alpine destinations and non-Alpine destinations. In general, the results are not sensitive with respect to the estimation method. However, we find that price elasticities in absolute terms are significantly higher for mountain resorts. The real exchange rate coefficient is -3 for mountain resorts and is significant at the 1% significance level using the median regression model. For non-mountain communities, we find a coefficient of -2 (p-value < 0.01). We use a chow test to assess the differences in the relative price elasticites across the two subsamples. We find that the null hypothesis of no difference in the price elasticities is rejected at the 1% level. This indicates that the price sensitivity of winter sport tourism is significantly larger than that of non-winter tourism activities. Furthermore, the coefficient of relative prices does not change when using the robust regression technique that controls for the effects of influential observations.

Overall, the findings clearly indicate that price sensitivities vary significantly between mountain and non-mountain destinations. These differences are larger when tourism demand is measured by foreign hotel nights than by foreign hotel arrivals.

Table 5 shows the corresponding results for the length of stays in hotels for international tourists. When length of stay is used as a measure of tourism demand, we find that real exchange rates have a significantly negative impact on the length of stay in mountain destinations ($p < 0.05$). However, for non-mountain destinations, we find that the length of stay in hotels is independent of real exchange rates.

The finding of a high-price elasticity of tourism demand stands partly in contrast to the previous literature. Using aggregate data for Switzerland, Ferro-Luzzi and Flückiger (2003) find that the coefficient on the relative price in Switzerland in relation to other competitors is not significantly different from zero. When prices are measured by the exchange rate, the authors find an exchange rate elasticity of -0.52. However, these results are difficult to compare because elasticities are estimated based on aggregate data. In contrast, Warburg (1996) (cited in Marvel and Johnson, 1997) also finds high-price elasticities of tourism demand in absolute terms.

Studies using disaggregated data for mountain destinations also find high-price elasticities in absolute terms. For instance, using data for 116 Alpine destinations in South Tyrol, Brida and Risso (2011) find price elasticities of -1.05 in the short-run and -4.36

in the long-run. Similarly, for Swiss overnights stays in Austrian mountain destinations, Falk (2013) finds real exchange rate elasticities of about −2.2 using a similar regression approach. Studies based on sun, sand and sea destinations also report high-price elasticities close to −2 (see, e.g., for Spanish Garín-Muñoz, 2006; Garín-Muños and Montero-Martín, 2007). Overall, one can conclude that the price sensitivity of tourism demand for Alpine destinations in the winter season is similar to that of sun, sea and sand destinations.

The income variable is positive and significant at the 1% level for both international arrivals and international hotel nights. The income elasticities for hotel nights of foreign visitors for mountain and non-mountain destinations are 2.3 and 2.8, respectively. The income elasticity is greater than one, indicating that foreign demand for Swiss hotels can be regarded as a luxury service. It is interesting to note that the income elasticity is larger for city and lake destinations than for Alpine destinations. Again, a possible explanation of differences in income elasticities is the different structure of tourists with a higher share of business and cultural tourists in city and lake destinations. The finding of a high-income elasticity is consistent with Ferro-Luzzi and Flückiger (2003) and Ferro-Luzzi, Fluckiger and Markov (2011) who also find income elasticities of almost two.

We conducted several robustness checks. First, we replace relative prices by the nominal exchange rate. Table 6 shows results for the tourism demand model, where relative prices are replaced by the nominal exchange rate (Swiss franc to euro exchange rate). When relative prices are replaced by the nominal Swiss franc to euro exchange rate, we find quite similar price elasticities. Second, the results are not sensitive when a weighted basket of foreign currencies is used instead of the Swiss franc to euro exchange rate. Note that the British pound is the second most important in the currency basket after the euro.

Conclusions

This paper has presented new empirical insights into the price sensitivity of international tourism demand. We have estimated a standard tourism demand model for a sample of the 60 largest tourist destinations in Switzerland for the winter season 2007/2008 to 2010/2011. A key feature of our analysis is the use of disaggregated data at the community level enabling us to study the difference in the price sensitivity of international visitors between Alpine and non-Alpine destinations. We find relatively high income and price elasticities for foreign arrivals and overnight stays. In particular, we find a strong unfavourable impact of the real appreciation of the Swiss Franc to the euro on winter tourism in Swiss Alpine resorts. Specifically, price elasticities measured as relative euro prices to the competitors Austria and France, range between −3.0 for international hotel nights and −2 for international hotel arrivals. In contrast, for non-mountain destinations, there is a much lower price sensitivity. The results are robust not only to different estimation techniques (median regression and robust regression methods), but also to different measures of tourism demand, namely, international arrivals, international overnight stays or length of stay. Furthermore, the length of stay in hotels located in city and lake destinations is not affected by the real and nominal exchange rate changes.

There are several possible explanations for the lower price sensitivity of international tourism demand in cities and lake destinations in the winter months. One reason is the higher share of business, cultural and event tourists in larger cities. Swiss cities host many international art festivals not only in the summer, but also in the winter period. The other reason is that cities have a higher share of business tourists and tourists from BRIC countries that are less affected by the strong Swiss franc.

Overall, the results show that winter sport tourists from abroad are very price-sensitive with price elasticities close to those of sun, sand and sea destinations. The high-price sensitivity of Swiss mountain resorts for international visitors may indicate a highly competitive market for winter sport destinations with a number of substitutes nearby. In fact, Austrian and French winter sport destinations offer similar products and services, and in some respects, they are even more attractive. For instance, French ski resorts are larger on average, while Austrian ski resorts have a higher average snow-making capacity and a higher share of fast lifts combined with a higher lift capacity in general.

The findings have some implications for policy makers. In order to retain the market share of Swiss winter sport destinations, it is necessary to improve prices competitiveness relative to neighbouring destinations. Therefore, prices have to be adjusted in order to hold the market share. Other measures are the active targeting and concentration of marketing efforts on the tourist segments that are relatively insensitive to exchange rates (Marvel and Johnson, 1997). However, the success of such a measure is questionable since winter sport participation rates in growth markets, such as Chinese and Arab tourists, are very low.

There are some limitations in this study that should be mentioned. First, in Alpine regions, tourist demand in the winter months is also determined by weather factors, such as snow and temperatures (Gonseth, 2013). However, official data for snow and weather factors at the community level are difficult to obtain, so such an impact cannot be examined. Note that the winter seasons between 2007/2008 and 2010/2011 can be characterized as normal winter seasons with regard to average temperatures and natural snowfall. Second, the short time period only made it possible to estimate short-run relationships. However, disaggregated data for foreign hotel nights at the community level are only available from 2005 onwards and for 2002 and earlier, resulting in a gap for 2003 and 2004. Third, tourism in Alpine destinations also depends on investment in infrastructure, such as new lifts and snow-making equipment.

Finally, the present paper points to some potentially interesting questions for future research. One interesting research question is to what extent there are differences in price sensitivity between world-class Alpine destinations and the remaining destinations. The availability of monthly data would make it possible to investigate the heterogeneity of the exchange rate effects in more detail by random coefficient models. Furthermore, the inclusion of other major determinants of winter tourism demand, such as changes in lift capacity, merits further investigation. Furthermore, the approach in this paper can also be used for tourism demand in the summer season. Summer holidays in Switzerland are increasingly popular among visitors from growing markets, such as the UAE and China, which might be less affected by the strength of the Swiss franc. Therefore, one can expect lower price elasticities of tourism demand in the summer months. However, their share is still small and cannot offset the decline in hotel overnight stays by visitors from Western European countries.

Notes

1. Statistik Schweiz, http://www.bfs.admin.ch/bfs/portal/de/index/themen/10/03/blank/data/01.html.
2. Statistik Schweiz, Hotels und Kurbetriebe: Gäste nach Herkunftsland und Tourismusregion, http://www.bfs.admin.ch/bfs/portal/de/index/themen/10/03/blank/data/01.html.

Acknowledgements

We thank Jessica Sloan and Tyler Schaffner for excellent proofreading of the manuscript.

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Author Biography

Martin Falk is a senior researcher fellow at the Austrian Institute of Economic Research (WIFO). He received his MS degree in Economics at Kiel University in 1995 and his PhD in Economics from the University of Regensburg in 2002. His research focuses on applied economics, tourism economics and economics of innovation at the firm level. He has been engaged in several scientific projects prepared for the European Commission. He was a visiting researcher at the Business School of the University of Birmingham.

Appendix

Table 1. Annual percentage changes in foreign tourism demand, relative prices and real GDP of the visitor countries (means).

Year	Foreign hotel nights	Foreign hotel arrivals	Length of stay of foreigners in hotels	Relative prices	Swiss Euro exchange rate	Real GDP
Mountain destinations						
2008	9.1	8.3	0.8	2.5	3.4	0.5
2009	−6.4	−5.7	−0.6	3.8	5.0	−4.2
2010	−3.6	−2.2	−1.3	8.2	9.0	3.2
2011	−8.5	−2.5	−6.0	9.8	11.3	2.3
City and lake destinations						
2008	5.7	6.9	−1.3	2.5	3.4	0.4
2009	−7.4	−6.0	−1.4	3.8	5.0	−3.9
2010	2.7	3.8	−1.1	8.2	9.0	3.0

Source: Swiss Federal Statistics Office based on Hotels und Kurbetriebe: Gäste nach Inland-Ausland und nach Gemeinden, OECD STATS.

Table 2. Evolution of foreign arrivals and foreign hotel nights in the winter months (Alpine destinations).

	International arrivals (Dec to April)			International hotel nights (Dec to April)		
	2007/2008	2010/2011	Change	2007/2008	2010/2011	Change
Adelboden	8,190	7,540	−7.9	40,461	36,935	−8.7
Andermatt	6,058	5,728	−5.4	21,060	18,003	−14.5
Arosa	27,611	21,535	−22.0	168,853	127,106	−24.7
Bagnes Verbier	20,884	19,407	−7.1	101,676	83,821	−17.6
Beatenberg interlaken	7,605	7113	−6.5	22,209	21,383	−3.7
Brig-Glis	11,192	10,170	−9.1	31,963	31,253	−2.2
Celerina/Schlarigna St. Moritz	7,858	6,456	−17.8	38,970	31,876	−18.2
Champéry	6,351	5,191	−18.3	26,861	22,921	−14.7
Davos	59,235	47,788	−19.3	286,408	223,736	−21.9
Engelberg	29,979	25,753	−14.1	108,199	82,185	−24.0
Flims	17,199	15,643	−9.0	84,469	64,421	−23.7
Grindelwald	34,737	31,735	−8.6	160,794	128,255	−20.2
Hasliberg	3,528	4,423	25.4	16,673	17,545	5.2
Ingenbohl vierwaldstättersee	7,862	8,499	8.1	12,023	11,522	−4.2
Interlaken Jungfrau, Mürren, Schilthorn	64,246	72,942	13.5	143,237	137,870	−3.7
Klosters-Serneus	19,140	14,173	−26.0	96,542	67,209	−30.4
Laax	13,784	19,382	40.6	64,235	87,111	35.6
Lauterbrunnen Wengen	38,234	32,420	−15.2	212,587	174,238	−18.0
Leysin	10,117	10,079	−0.4	55,058	45,692	−17.0
Martigny	9,015	6,632	−26.4	20,008	16,107	−19.5
Meiringen	5,255	5,039	−4.1	25,307	18,030	−28.8
Montana	8,858	6,215	−29.8	52,211	29,240	−44.0
Saanen Gstaad	19,502	16,467	−15.6	91,394	73,277	−19.8
Saas-Fee	29,432	24,642	−16.3	161,566	118,012	−27.0

(continued)

Table 2. Continued

	International arrivals (Dec to April)			International hotel nights (Dec to April)		
	2007/2008	2010/2011	Change	2007/2008	2010/2011	Change
Samnaun	14,932	12,625	−15.5	79,312	63,954	−19.4
Sils im Engadin/Segl	10,523	9,426	−10.4	65,390	57,287	−12.4
St. Moritz	70,993	58,408	−17.7	362,566	293,323	−19.1
Täsch	8,245	7,053	−14.5	36,826	25,855	−29.8
Unterseen Interlaken	11,498	10,856	−5.6	22,884	20,450	−10.6
Zermatt	91,958	82,604	−10.2	517,666	427,513	−17.4
Total	674,021	605,944	−10.1	3,127,408	2,556,130	−18.3

Source: BSO, own calculations.

Table 3. Evolution of foreign arrivals and foreign hotel nights in the winter months (lake and city destinations).

	International arrivals (Dec to April)			International hotel nights (Dec to April)		
	2007/2008	2010/2011	Change	2007/2008	2010/2011	Change
Ascona	8,889	7,807	−12.2	35,273	32,478	−7.9
Bad Ragaz	8,332	7,774	−6.7	31,676	31,858	0.6
Baden	8,807	8,446	−4.1	22,204	20,004	−9.9
Basel	123,767	136,207	10.1	272,013	291,850	7.3
Bern	66,149	58,803	−11.1	135,142	112,796	−16.5
Biel/Bienne	9,010	9,555	6.0	18,934	18,044	−4.7
Chur	17,447	16,532	−5.2	34,678	32,439	−6.5
Egerkingen	6,636	6,501	−2.0	10,910	10,407	−4.6
Genève	295,027	277,044	−6.1	650,502	609,943	−6.2
Horgen Zürich	5,638	4,486	−20.4	11,663	8,788	−24.7
Kloten Zürich	20,032	40,768	103.5	31,693	60,010	89.3
Kriens/Luzern	5,323	7,000	31.5	7,721	10,455	35.4
Lausanne	77,498	81,397	5.0	187,175	184,746	−1.3
Locarno	8,003	7,915	−1.1	21,490	20,053	−6.7
Lugano	48,075	45,319	−5.7	93,981	91,495	−2.6
Luzern	126,133	135,125	7.1	224,065	227,443	1.5
Meyrin Geneve	58,350	60,814	4.2	108,657	111,068	2.2
Montreux	28,365	29,334	3.4	71,359	65,890	−7.7
Neuchâtel	10,832	9,882	−8.8	24,075	20,785	−13.7
Nyon	6,496	5,322	−18.1	14,803	12,789	−13.6
Opfikon Zürich	82,978	88,909	7.1	125,474	133,205	6.2
Paradiso Lugano	18,456	14,940	−19.1	35,969	28,500	−20.8
Regensdorf Zürich	8,247	10,113	22.6	14,856	17,520	17.9
Schaffhausen	9,439	8,325	−11.8	17,728	15,184	−14.4
St. Gallen	15,772	15,244	−3.3	32,678	30,780	−5.8
Vernier Geneve	20,152	14,190	−29.6	32,506	26,802	−17.5
Vevey	11,903	10,412	−12.5	28,552	26,051	−8.8
Winterthur	16,485	14,915	−9.5	33,893	31,326	−7.6
Zug	12,539	15,845	26.4	28,951	36,244	25.2
Zürich	404,799	388,028	−4.1	776,386	742,146	−4.4
Total	1,539,579	1,536,952	−0.2	3,135,007	3,061,099	−2.4

Source: BSO, own calculations.

Table 4. Estimates of the international tourism demand in the winter months.

	Foreign hotel nights				Foreign hotel arrivals			
	Mountain		Non-mountain		Mountain		Non-mountain	
	Destinations		Destinations		Destinations		Destinations	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Median regression with bootstrapped standard errors								
Log change in relative prices	−3.02***	−7.24	−1.49***	−3.97	−2.10***	−4.92	−1.49***	−2.98
Log change in real GDP	2.34***	5.96	2.80***	7.15	2.13***	5.37	2.93***	7.61
Constant	0.14***	5.09	0.08***	3.27	0.10***	3.61	0.09***	3.43
Pseudo R^2	0.27		0.18		0.17		0.19	
OLS with robust standard errors								
Log change in relative prices	−2.99***	−8.69	−1.16***	−3.00	−2.16***	−4.97	−1.41***	−3.48
Log change in real GDP	2.23***	5.63	2.40***	4.36	2.08***	3.51	2.42***	5.00
Constant	0.15***	7.22	0.07***	2.88	0.12***	4.64	0.09***	3.79
R^2	0.33		0.17		0.13		0.18	
Robust regression methods								
Log change in relative prices	−3.04***	−9.38	−1.39***	−4.38	−2.46***	−6.53	−1.50***	−4.73
Log change in real GDP	2.11***	6.21	2.76***	7.82	2.39***	6.05	2.81***	7.95
Constant	0.15***	7.48	0.07***	3.76	0.12***	5.35	0.09***	4.57

Note: ***, ** and * denote significance at the 1, 5 and 10% levels, respectively. The number of observations for each subsample is 120 based on 30 communities for the winter seasons 2007/2008 to 2010/2011.

Table 5. Estimates of the determinants of length of stay in the winter months.

	Mountain destinations		Non-mountain destinations	
	Coef.	t	Coef.	t
Median regression with bootstrapped standard errors				
Log change in relative prices	−0.41***	−2.10	0.22	1.19
Log change in real GDP	−0.15	−0.74	0.09	0.39
Constant	0.01	0.72	−0.02	−1.39
Pseudo R^2	0.05		0.02	
OLS with robust standard errors				
Log change in relative prices	−0.83***	−2.86	0.26	0.96
Log change in real GDP	0.15	0.36	−0.01	−0.05
Constant	0.03	1.95	−0.02	−1.43
R^2				
Robust regression methods				
Log change in relative prices	−0.51**	−2.32	0.11	0.58
Log change in real GDP	−0.20	−0.89	0.03	0.17
Constant	0.01	0.96	−0.01	−1.13

Note: ***, ** and * denote significance at the 1, 5, and 10% levels, respectively. The number of observations for each subsample is 120 based on 30 communities for the winter seasons 2007/2008 to 2010/2011.

Table 6. Estimates of the impact of Swiss Franc euro exchange rate for winter tourism based on Swiss community data.

	International hotel nights				International hotel arrivals			
	Mountain Destinations		Non-mountain Destinations		Mountain Destinations		Non-mountain Destinations	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Median regression with bootstrapped standard errors								
Log change in Swiss Franc euro exchange rate	−2.71***	−6.78	−1.43***	−4.26	−2.04***	−5.47	−1.42***	−2.96
Log change in real GDP	2.18***	6.79	2.65***	6.65	1.99***	5.35	2.79***	7.56
Constant	0.16***	5.24	0.09***	3.53	0.12***	4.29	0.10***	3.25
Pseudo R^2	0.26		0.16		0.16		0.19	
OLS with robust standard errors								
Log change in Swiss Franc euro exchange rate	−2.71***	−8.44	−1.01***	−2.86	−1.90***	−4.73	−1.26***	−3.36
Log change in real GDP	1.98***	5.11	2.27***	4.29	1.86***	3.22	2.27***	4.94
Constant	0.16***	7.13	0.07***	2.77	0.12***	4.42	0.10***	3.68
R^2	−2.71***	−8.44	−1.01***	−2.86	−1.90***	−4.73	−1.26***	−3.36
Robust regression methods								
Log change in Swiss Franc euro exchange rate	−2.74***	−9.06	−1.25***	−4.29	−2.24***	−6.48	−1.33***	−4.55
Log change in real GDP	1.84***	5.59	2.63***	7.84	2.18***	5.79	2.65***	7.84
constant	0.16***	7.39	0.08***	3.76	0.14***	5.40	0.10***	4.45

Note: ***, ** and * denote significance at the 1, 5 and 10% levels, respectively. The number of observations for each subsample is 120 based on 30 communities for the winter seasons 2007/2008 to 2010/2011.