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The sensitivity of tourism demand to exchange rate changes: an application to Swiss overnight stays in Austrian mountain villages during the winter season

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This paper investigates the impact of the depreciation of the euro against the Swiss franc on tourism demand. The data consist of Swiss overnight stays in West Austrian ski resorts during the winter season. Using a panel error correction model, we found that the elasticity of tourism demand with respect to exchange rates is significantly larger than unity in absolute terms. In particular, the real exchange rate elasticity ranges between −1.5 using the dynamic panel data model and −2.2 for the long difference regression model. This indicates that Swiss winter tourists are highly sensitive to changes in exchange rates and relative prices. High elevation ski resorts benefit most from the depreciation of the euro against the Swiss franc. For Austrian ski resorts, tentative estimates suggest that the depreciation of the euro against the Swiss franc has led to an additional 173,000 overnight stays over the last four winter seasons.

Keywords: tourism demand; exchange rate changes; dynamic panel data model; ski resorts;

JEL Classification: C23

1. Introduction

The euro crisis has led to a strong upward pressure on the exchange rates of some non-euro countries. In particular, the Swiss franc has appreciated significantly against the euro since 2008, with a sharp acceleration in 2011. In 2011, the Swiss National Bank announced that it would introduce a minimum exchange rate target of 1.20 Swiss franc per euro. Overall, between 2008 and 2011, the euro depreciated against the Swiss franc by 25%. Despite the relatively large nominal appreciation of the Swiss franc, prices for tourism services (e.g. hotel prices, lift ticket prices, etc.) have not or have only slightly decreased when measured in the Swiss currency. Thus, the resulting real appreciation of the Swiss franc has led to a loss of competitiveness in the Swiss tourism sector. In fact, the number of overnight stays of Swiss tourists in the Western Austrian mountain regions increased from 868,000 in the winter season of 2007–2008 to 1,187,000 in the winter season of 2011–2012, which is equal to an increase of 319,000 (data is based on the 63 largest ski resorts in Western Austria). All things being equal, this indicates that the appreciation of the Swiss currency has encouraged the travel of Swiss tourists to neighbouring Austria. However, the effect depends on the exchange rate elasticity and may be uneven across ski resorts.

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The aim of this study is to examine the impact of nominal and real exchange rate changes on the winter tourism demand of Swiss tourists in Western Austria. The data is based on monthly panel data for the largest ski resorts in Western Austria. Both static and dynamic panel data models are estimated by controlling for seasonal factors and time effects. The large exchange rate depreciation of the euro against the Swiss franc since 2008 offers an excellent opportunity for the question of to what extent appreciations have a significant impact on tourism demand.

However, different ski resorts may be affected quite differently from the appreciation of the Swiss franc against the euro. It is, therefore, important to test to what extent the exchange rate change has affected various ski resorts differently. To our best knowledge, this is the first study providing evidence on the impact of Swiss currency appreciation on outbound tourism from Switzerland.

Many scholars have examined the effect of exchange rates or real exchange rates on international tourism demand. However, despite the large number of studies that have dealt with this issue, there is still considerable disagreement concerning the magnitude of the relationship between exchange rate changes and foreign tourism demand. Based on a meta analysis, Crouch (1995) finds an exchange rate elasticity of unity with a significantly lower elasticity for northern European destinations. More recently, a number of studies found that the international tourism demand is highly sensitive to the changes of the real exchange rate with long-run elasticities clearly exceeding one (see Cortés-Jiménez & Blake, 2011, for international tourism demand in the UK; Garín Muñoz, 2006, 2007, and Garin Muñoz & Montero-Martin, 2007, both for international tourism demand to Spain; Seetaram, 2010, for international tourism demand to Australia). Other studies find that tourism demand is rather insensitive to real exchange rate changes (Chadee & Mieczkowski, 1987; Cheng, 2012; Schiff & Becken, 2011; Thompson & Thompson, 2010; Webber, 2001).

The structure of this study is as follows. Section 2 introduces the empirical model, while Section 3 presents the data and descriptive statistics. Section 4 presents the empirical results and Section 5 concludes.

2. Empirical model

The tourism demand model is specified as the relationship between outbound tourism demand from Switzerland to income in the source country (i.e. Swiss GDP) and the bilateral real exchange rate (see Song & Li, 2008, for a summary of the recent tourism demand literature). Since the income of Switzerland is not available on a monthly basis, we use yearly dummy variables as a proxy for GDP growth of the source country. We also experimented with monthly business cycle indicators provided by the KOF (Swiss Economic Institute). However, these indicators are not significant at conventional significance levels and are, therefore, not included in the final specification. In the following, overnight stays of Swiss winter tourists are modelled as a function of the bilateral exchange rate, monthly dummy variables and time effects. As a first step, a long difference regression model was specified and fixed effects were eliminated by taking differences to the previous month in the last year. Using first or long differences also reduces the possible problem of a spurious relationship between tourism demand and exchange rates (Rosselló, Aguiló, & Riera, 2005). The long-difference regression model is specified as follows:

$$\Delta \ln Y_{it} = \beta \Delta \ln \mathrm{RER}_t + \sum_{s=1}^{4} \beta_s D_s + \sum_{l=1}^{4} \beta_l t + \varepsilon_i,$$

where i represents the ski resort with ($i = 1,2, \ldots, N$), t is the month in a given year, Δ represents the difference when compared to the same month last year. The natural logarithm is represented by ln and Y_{it} is a measure of tourism demand as overnight stays of Swiss tourists. $\Delta \ln \mathrm{RER}_t$ is the change in the log bilateral real exchange rate between a given month and the same month in the previous year. Alternatively, the nominal exchange rate measured as Swiss franc per unit of euro is used. β is the elasticity of tourism demand with respect to the exchange rate. D_s are seasonal monthly dummies, t is the time trend and ϵ_i is the error term. The real exchange rate is defined as follows:

$$\mathrm{RER}_t = e_t \cdot \frac{P_t}{P_t^*},$$

where P_t is the price level of the services sector (excluding the housing sector) in Austria, P_t^* is the corresponding price level in Switzerland and e is the nominal exchange rate between Switzerland and Austria expressed as the number of Swiss franc per unit of euro. Note that the real exchange rate declines with a depreciation of the euro against the Swiss franc. A real depreciation of the euro against the Swiss franc will make Austrian ski resorts more attractive and, thereby, increase the number of overnight stays of Swiss tourists. In other words, the lower the tourism prices in Austria relative to those of Switzerland, the higher the Swiss tourism demand. Therefore, the real exchange rate coefficient, β_i, is expected to have a negative sign.

Furthermore, additional specifications are estimated where the nominal exchange rate rather than the real exchange rate enters the tourism demand model. The reason is that tourists are more aware of (nominal) exchange rate changes when selecting destinations than that of the relative price changes (Witt & Martin, 1987). Since ski resorts may be affected differently from the exchange rate changes, the coefficients are estimated separately for various subsamples according to several characteristics, such as elevation, size and geographical distance to Switzerland. The long difference regression model can be estimated by ordinary least squares (OLS). In order to account for the possibility that common shocks to tourism demand are correlated across ski resorts within a given year, standard errors are clustered by time. Note that double-clustering makes little sense because the main explanatory variables, namely real exchange rates, do not vary across ski resorts (Thompson, 2011).

In a subsequent step, a dynamic panel data model is applied. The panel error correction model is often used to estimate the dynamic patterns of the tourism demand (see Moore, 2010, for a previous application). The panel error correction model is specified as follows:

$$\Delta \ln Y_{it} = \alpha_i \left[\ln Y_{it-1} - \tilde{\beta} \ln \mathrm{RER}_{it} - \delta t_t - \sum_{s=1}^{4} \beta_s D_s \right] + \sum_{j=1}^{p-1} \eta_{ij} \Delta \ln Y_{it-j} + \sum_{j=0}^{q-1} \kappa_{ij} \Delta \ln \mathrm{RER}_{it-j} + \mu_i + \varphi_t + \varepsilon_{it},$$

where α_i is the error-correction coefficient measuring the speed of adjustment to the long run, β_i is the long-run impact of real exchange rates on the number of overnight stays of Swiss tourists and can be interpreted as the long-run own-price elasticity. η_{ij} and κ_{ij} captures the short-run parameters and t denotes the time trend control. D_s denotes the monthly dummy variables, which are assumed to be deterministic and with February as the reference category. Given the relatively short time dimension − 28 monthly observations for the winter seasons of 2006–2007 through 2011–2012 – we opted for the pooled mean group estimator introduced by Pesaran, Shin, and Smith (1999) rather than the mean group estimator. The reason being that the time period is too short to estimate the tourism demand model for each ski resort separately. Pesaran et al. (1999) suggest that the mean group estimator allowing for heterogeneity of both short and long coefficients is biased when based on small time periods. Since the error correction model is non linear in the parameters, the maximum likelihood technique is used to estimate the long-run parameters using an iterative non-linear procedure. The user written code XTPMG command developed by Blackburn and Frank (2007) is employed to estimate the tourism demand model. Note that the long-run coefficient $\tilde{\beta}$ can be directly interpreted as exchange rate elasticity and has not been divided by the error correction term.

3. Data

This study uses monthly panel data on 63 Austrian ski resorts for the winter seasons starting in 2006–2007 to 2011–2012 with about 1600 observations. The use of monthly data enables a relatively large number of observations to be used. The dependent variable is the number of overnight stays as published by Statistics Austria. In this paper, the number of overnight stays refers to the winter season defined from December to April and covers hotels and similar establishments, private accommodations and apartments. Note that we only include medium and large ski resorts with a minimum bed number of 400. The reason is that very small ski resorts often receive no or very few overnight stays from Swiss tourists. Price data is obtained from the consumer price dataset provided by the OECD. Prices refer to the service sector excluding the housing sector and are internationally comparable across all countries.

Table 1 shows the time evolution of the variables (i.e. number of overnight stays aggregated across the selected resorts and real and nominal exchange rates) (see also Figure A1 in the appendix). One can see that the bulk of the real exchange rate change is due to the change in the nominal exchange rate indicating that prices adjust only slowly due to nominal exchange rate changes. This indicates a large degree of exchange rate pass-through to prices.

Table 1. Evolution of overnight stays and exchange rate changes.

Winter season	No. of overnight stays of Swiss tourists	EUR/CHF	RER (real exchange rate EUR/CHF)
2006–2007	927,580	1.62	1.63
2007–2008	868,210	1.61	1.63
2008–2009	893,237	1.51	1.55
2009–2010	912,326	1.47	1.51
2010–2011	1,047,525	1.29	1.35
2011–2012	1,187,206	1.21	1.30
Change between 2007–2008 and 2011–2012 in per cent	36.7	−24.9	−20.7

Note: The winter season refers to the month from December to April.
Source: Statistics Austria.

4. Estimation results

Table 2 shows the OLS estimation results of the impact of the nominal and real exchange rate using the long difference regression model where growth rates represent the log changes from the same month last year. The log changes of real exchange rates and overnight stays of Swiss tourists are assumed to be stationary. The results are provided for the total sample and three subsamples: (i) high elevation ski resorts, (ii) ski resorts located at a greater distance from Switzerland and (iii) small- and medium-sized ski resorts measured in terms of slope kilometres. All specifications are based on clustered standard errors by time (year + months). The real exchange rate coefficient is negative with a coefficient of −2.17 and statistically significant at the 5% level (see specification i). This indicates that the lower tourism prices in Austria are relative to those of Switzerland, the higher the Swiss demand for winter tourism.

The impact of the real exchange rate on overnight stays of Swiss winter tourists is economically large. Given the real depreciation of the euro of 21% between the winter seasons of 2007–2008 and 2011–2012 and the exchange rate elasticity of −2.17, the real depreciation of the euro has increased the nights spent by Swiss tourists by 45%. For comparison, the coefficient on the nominal exchange rate is −2.4 and almost similar to that of the real exchange rate; see specification (v).

The results based on the subsamples shows that the coefficient on real exchange rates is statistically significant at the 5% level in all cases. In particular, we find larger exchange rate effects on high elevation ski resorts, small and medium sized ski resorts and ski resorts at a greater distance from Switzerland. However, F-tests of the null hypothesis that exchange rate coefficients are similar between the subsamples cannot be rejected at the 5% level in all cases.

Before we presented the dynamic panel data estimates, we investigated the order of integration of the series. The results of the panel unit root test introduced by Im, Pesaran, and Shin (2003) showed that overnight stays and the nominal and real exchanges are I(1) variables.[1] Furthermore, the panel cointegration test developed by Westerlund (2007) is used, which is particularly appropriate for samples with small time series. The null hypothesis of no cointegration can also be tested directly through the error correction term in a conditional error correction model. The cointegration test is applied to seasonally adjusted time series and is performed separately for three subsamples since in this application the number of time periods exceeds the number of groups. Furthermore, the cointegration tests can only be applied to a strictly balanced panel data set. The allowance for cross-sectional dependence makes little sense in our case since each equation contains exactly the same set of explanatory variables. Unreported results show that the null of no cointegration for all groups against the alternative of cointegration for all groups is clearly rejected at the 1% level. However, given the small time series nature in our data set with $T = 28$, results should be interpreted with caution since the results of the test statistics are sensitive to the choice of the length of lags and leads (Westerlund, 2007). In principle, the monthly time series can be extended by including earlier years. However, the EUR/CHF exchange rate is rather stable for the period of 2000–2006.

Table 3 shows the PMG estimates for the 63 ski resorts over the winter seasons of 2006–2007 to 2011–2012 based on monthly data. Note that the long-run coefficients can be directly interpreted as the exchange rate elasticity. For the total sample, the real exchange rate elasticity is −1.53 and is now lower in absolute terms than in the long difference regression model estimated by OLS. The real exchange rate coefficient is statistically significant at less than 1%. A *t*-test shows that the elasticity of tourism demand with respect to overnight stays is significantly larger than unity in absolute terms.

Table 2. OLS estimates of the impact of change in nominal and real exchange rates on the change of Swiss overnight stays.

	Total		average elevation ≥1500 metre		Ski resorts at a greater distance from CH (excluding Vorarlberg)		Small- and medium-sized ski resorts: 100 or less slope kilometres	
	(i)		(ii)		(iii)		(iv)	
	Coeff.	*t*	Coeff.	*t*	Coeff.	*t*	Coeff.	*t*
Specification with real exchange rates								
ln RER	−2.17**	−1.99	−3.25***	−3.55	−2.43***	−2.55	−2.49**	−2.04
December (ref. cat. February)	0.05	0.62	−0.17	−1.12	0.04	0.28	−0.03	−0.15
January	0.31***	5.30	0.28**	2.02	0.31**	2.19	0.29**	1.69
March	−1.01***	−21.31	−1.06***	−8.62	−0.91***	−6.75	−1.12***	−6.83
April	−1.20***	−19.51	−1.37***	−11.14	−1.14***	−8.32	−1.21***	−7.14
2008–2009	−0.13*	−1.84	−0.15**	−2.20	−0.14	−1.66	−0.15	−1.37
2009–2010	0.04	0.61	0.00	0.00	0.01	0.11	0.05	0.40
2010–2011	−0.14**	−2.09	−0.14**	−1.61	−0.17	−1.54	−0.16	−1.20
2011–2012	−0.02	−0.35	−0.05	−0.68	−0.04	−0.52	−0.02	−0.22
constant	0.41***	7.55	0.52***	5.43	0.39***	3.67	0.46***	3.51
Wald tests:								
seasonal dummies (*p*)	0.00		0.00		0.00		0.00	
year dummies (*p*)	0.45		0.21		0.31		0.35	
R^2	0.41		0.52		0.36		0.39	
No. of observations	1467		640		1039		1109	
No. of resorts	63		27		45		48	

	(v)		(vi)		(vii)		(viii)	
	Coeff.	*t*	Coeff.	*t*	Coeff.	*t*	Coeff.	*t*
Specification with nominal exchange rates								
ln EUR/CHF	−2.40**	−2.29	−3.41***	−3.70	−2.62***	−2.76	−2.78***	−2.21
dec (ref. cat. Feb)	0.03	0.19	−0.19	−1.27	0.03	0.19	−0.05	−0.24
January	0.32***	2.15	0.30**	2.16	0.32**	2.29	0.30*	1.77
March	−1.01***	−7.20	−1.05***	−8.56	−0.90***	−6.75	−1.12***	−6.84
April	−1.18***	−8.15	−1.35***	−10.96	−1.12***	−8.20	−1.19***	−7.04
2008–2009 (ref. 2007–2008)	−0.13	−1.45	−0.15**	−2.18	−0.14	−1.66	−0.15	−1.37
2009–2010	0.03	0.34	−0.01	−0.07	0.00	0.05	0.04	0.35
2010–2011	−0.14	−1.30	−0.14	−1.57	−0.17	−1.53	−0.16	−1.20
2011–2012	−0.03	−0.40	−0.07	−0.82	−0.05	−0.64	−0.03	−0.34
Constant	0.41***	3.76	0.51***	5.32	0.38***	3.61	0.45***	3.47
Wald tests:								
Seasonal dummies (*p*)	0.00		0.00		0.00		0.00	
year dummies (*p*)	0.35		0.23		0.33		0.37	
R^2	0.41		0.52		0.36		0.39	
No. of observations	1467		640		1039		1109	
No. of resorts	63		27		45		48	

Notes: The dependent variable is the change in the logarithm of the number of nights spent to that of the previous month. All specifications cluster the standard errors by time to account for the possibility that common shocks to tourism demand are correlated across ski resorts within a given year.
*Statistical significance at the 10% level.
**Statistical significance at the 5% level.
***Statistical significance at the 1% level.

Table 3. Dynamic panel data estimates of Swiss overnight stays (pooled mean group estimator).

	Total sample		Average elevation ≥1500 metre		Ski resorts at a greater distance from CH (excluding Vorarlberg)		Small- and medium-sized ski resorts: 100 or less slope kilometres	
	(i)		(ii)		(iii)		(iv)	
	Coeff.	*z*	Coeff.	*z*	Coeff.	*z*	Coeff.	*z*
Long-run coefficients								
$\tilde{\beta}$	−1.53***	−5.11	−2.10***	−5.17	−1.95***	−5.04	−1.04***	−2.62
Time	−0.01*	−1.66	−0.01***	−2.57	−0.01**	−2.12	0.00	−0.22
December (ref. cat. February)	−1.21***	−23.73	−1.32***	−14.92	−1.17***	−18.59	−1.44***	−21.41
January	−0.40***	−15.01	−0.41***	−11.77	−0.38***	−11.30	−0.55***	−15.09
March	−0.68***	−13.30	−0.71***	−8.75	−0.66***	−10.92	−0.80***	−11.72
April	−1.72***	−20.21	−1.96***	−12.68	−1.75***	−16.71	−1.79***	−17.45
Short-run coefficients								
ln nights ($t-1$)	−0.89***	−20.79	−0.78***	−13.84	−0.85***	−16.99	−0.90***	−16.41
Δ ln nights ($t-1$)	−0.06*	−1.90	−0.13***	−2.63	−0.09**	−2.44	−0.05	−1.44
constant	7.17***	19.27	7.39***	13.02	6.78***	16.01	6.77***	14.90
R^2	0.14		0.12		0.14		0.11	
No. of observations	1693		744		1195		1276	
No. of resorts	63		27		45		48	

Notes: The dependent variable is the change in log number of overnight stays of Swiss tourists in 63 winter resorts in month *t* compared to the previous month.
*Statistical significance at the 10% level.
**Statistical significance at the 5% level.
***Statistical significance at the 1% level.

A 10% decrease in the EUR/CHF exchange rate between 2007–2008 and 2011–2012 is associated with an increase in overnight stays of 15%. Given the real depreciation of the euro at 20% between the winter season of 2007–2008 and 2011–2012, the majority of the increase in overnight stays can be explained by the depreciation of the euro against the Swiss franc. Based on the long-run exchange rate elasticity of −1.53, one can calculate the number of additional overnight stays due to the exchange rate depreciation of the euro. Given the number of Swiss overnight stays of 868,210, the real depreciation of the euro of 20% has led to an additional 173,000 overnight stays between 2007–2008 and 2011–2012 (calculated as 868,210 multiplied by 20%). However, the calculated number should be interpreted with considerable caution and may represent an upper limit of the possible exchange rate effect. The main reason is the extremely short time span of the sample period. In addition, some important factors of winter tourism demand, such as weather conditions and income, are either insignificant or not included.

Overall, both the static and the dynamic panel data model shows that the current strength of the CHF has led to a substantial increase in overnight stays of Swiss tourists in Austrian ski resorts in the winter season. The results are consistent with Cortés-Jiménez and Blake (2011), who find that holiday markets show a high degree of price sensitivity. Based on a meta analysis, Crouch (1995) finds an exchange rate elasticity for Northern European countries of −0.44.

Furthermore, we find that the error correction coefficient is very large in absolute terms. On average, 90% of the gap between the current and long-run tourism demand is closed. The seasonal dummy variables are significant and negative indicating that winter tourism demand is the highest in February (the reference category) followed by January, March, December and April.

In column two, we excluded the group of low elevation ski resorts. The estimate of the exchange rate elasticity increases to −2.1 indicating that the exchange rate effect is larger for the high elevation ski resorts in absolute terms (see specification ii). Furthermore, the difference in the real exchange rate coefficient between high elevation and low elevation ski resorts is significantly different from zero at the 10% level. Column three investigates whether the exchange rate depends on the geographical distance. Here, ski resorts located in Vorarlberg, the neighbouring province of Switzerland, are excluded. Interestingly, the results are stronger once these ski resorts close to the Swiss border are excluded (coefficient of −1.95). Finally, column four excludes the large ski resorts with a length of slopes of 100 kilometres or more. Here, the real exchange rate elasticity is close to unity unlike the OLS estimates.

We conducted several robustness checks in order to validate the results. As a first robustness check we tested for spatial dependence based on the long difference regression model. The Moran test based on residuals from the OLS model showed that there is no evidence of spatial dependence where the spatial weight matrix is based on contiguity (within 10 kilometres of road distance). This is not surprising if one considers that the performance of ski resorts depends on a bundle of factors (e.g. natural factors, such as elevation, size and quality of terrain) rather than the performance of the neighbouring ski resorts. As another robustness check, we used the system general method of moments estimator and the corrected least square fixed effects estimator based on the yearly data for each winter season. Unreported results confirmed a long-run real exchange rate elasticity exceeding unity in absolute terms.[2]

5. Conclusion

This paper sheds new light on the impact of exchange rate changes on tourism demand. In particular, we have investigated the effects of the depreciation of the euro on Swiss overnight stays in West Austrian ski resorts during the winter season. The data is based on monthly panel data for 63 ski resorts over the winter seasons of 2006–2007 to 2012–2011. Using a panel error correction model, we found that the elasticity of tourism demand with respect to exchange rates is significantly larger than unity in absolute terms. The real depreciation of the euro against the Swiss franc by 20% in recent years has increased the number of nights spent by Swiss tourists by 15% during the last four winter seasons. This indicates that the Swiss winter tourists are highly sensitive to changes in prices caused by the appreciation of the Swiss franc. Expressed in absolute terms, the real depreciation of the euro has led to an additional 173,000 overnight stays between 2007–2008 and 2011–2012. However, this number should be interpreted with caution and may represent an upper limit of the possible exchange rate effect. Furthermore, high elevation ski resorts and ski resorts at a greater distance benefit more from the exchange rate depreciation of the euro against the Swiss franc. However, the differences between the groups are only weakly significant at conventional significance levels.

Our results come with several caveats. First, the time period is very short. Second, we were not able to control for the income of the source country, which is commonly regarded as one of the most important determinants of tourism demand. However, since the GDP growth of Switzerland was rather low during the sample period, business cycle movements cannot be responsible for the large increase of Swiss tourists in Austrian ski resorts in the recent years.

Our empirical findings have important implications for policymakers. Own-price elasticities for winter tourism seem to be quite large in absolute values and in the same range as those for tourism demand for sun-sand-sea holidays (see, e.g. Garin-Muñoz, 2007; Garin-Muñoz & Montero-Martin, 2007). Furthermore, the high price elasticity of Swiss tourism demand does not reflect a high degree of market power of the Swiss winter tourism business. Given the high price elasticity of Swiss tourism demand, hotels and ski lift operators in Switzerland are forced to reduce prices in order to stay competitive relative to their competitors. Price reductions or other forms of discounting will make Swiss ski resorts much more attractive for domestic skiers and snowboarders. In fact, in the winter season of 2012–2013, some Swiss cable car operators started to decrease their lift ticket prices in order to attract foreign tourists (source: Südostschweiz.ch). Similar tendencies are observed for accommodation prices.

There are also a number of policy implications for tourism organisations in the destination country. First, in spite of the strong increase in Swiss tourists to ski resorts in the winter season, the share of overnight stays of Swiss tourists is relatively low and represents 4% of the total foreign night stays. Second, the increase of Swiss tourism in Austria is likely to reverse when the euro appreciates against the Swiss franc.

Our analysis is only the first step in the empirical investigation of the impact of the exchange rate appreciation of the Swiss franc against the euro on international inbound and outbound tourism demand. As mentioned above there are some limitations of the study that are worth mentioning. First, the present time period is too small to draw definite conclusions about the impact of the exchange rate changes on the number of overnight stays. Second, tourism demand depends on a large number of other factors that could not be considered here due to the nature of the data. It is well known that neglecting the impact of these factors leads to an omitted variable bias and a very low model fit. As a result of these limitations, the estimated effect of real exchange rate changes on tourism demand is likely to be overestimated and should be interpreted with caution.[3]

There are several interesting directions for future work. First, using the overnight stays for Swiss ski resorts one can estimate the impact of the exchange rate changes on international tourism demand to distinguish between the largest source countries (i.e. Germany, UK, Belgium, the Netherlands and Russia). Doing so would make it possible to investigate the direct effect of Swiss franc appreciation on foreign overnight stays. Between the winter season of 2007–2008 and 2011–2012, the three largest Swiss ski resorts lost 35% of their overnight stays from foreign visitors (data is Swiss Statistical Office). Second, future work should also consider other main destinations of Swiss tourists in the winter season, namely France and Italy.

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Notes

1. Results are available from the author upon request.
2. Detailed results are available upon request from the author.
3. We would like to thank an anonymous referee for this point.

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Appendix

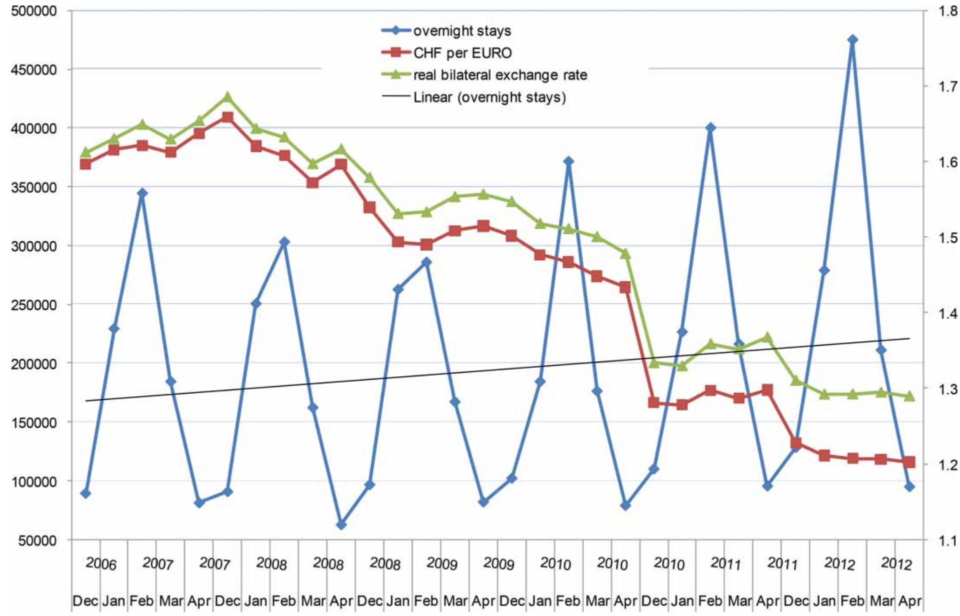

Figure A1. Overnight stays of Swiss tourists in West Austrian ski resorts and exchange rate changes. Source: Statistics Austria, OECD stats.