# Impact of the Rouble's Depreciation on Russian Overnight Stays in Finnish Regions and Cities

**Martin Falk[1], Markku Vieru[2*]**

[1] Austrian Institute of Economic Research (WIFO), Vienna, Austria.
[2] University of Lapland, Finland

forthcoming in *Tourism Economics* 2017

Abstract:

This paper investigates how the depreciation of the Russian rouble against the euro has affected Russian tourism demand in Finnish regions and cities. Using dynamic panel data models, we find that the elasticity of Russian tourists' overnight hotel stays with respect to exchange rates is significantly larger than one (approximately 1.6) in absolute terms, indicating that Russian tourists are highly sensitive to changes in exchange rates. There is some evidence that the sensitivity of Russian tourism demand increased following the introduction of economic sanctions in August 2014. The sensitivity of tourism demand to exchange rate changes differs highly across regions and cities, with higher elasticities in border regions and cities not too far from the Russian border. These regions and areas attract a significant number of short-stay Russian visitors, who are often motivated by cross-border shopping and other activities.

Keywords: tourism demand, cross-border tourism, regions, cities, exchange rate changes, panel data model

*corresponding author: Address: University of Lapland, Faculty of Social Sciences, Multidimensional Tourism Institute (MTI), Yliopistonkatu 8, FI-96300 Rovaniemi, FINLAND; email: markku.vieru@ulapland.fi, Tel.: + 358 (0)400 377 641.

Acknowledgements: We would like to thank an anonymous referee for helpful suggestions.

## Introduction

The Russian rouble lost significant value against the euro between September 2014 and October 2015 (EUR/RUB 45 to 73). Finland is an interesting country on which to base a study on how exchange rate shocks impact tourism demand. As a neighbouring nation, it traditionally attracts a high share of tourists from Russia: In 2013, the Russian share of total foreign overnight stays in Finland reached 26 per cent, much higher than in any European country[1]. The border regions in Finland are strongly dependent on Russian tourists, with the Russian share in foreign overnight hotel stays ranging as high as 90 per cent (in South Karelia). Between September 2014 and October 2015, however, the number of Russian tourists in Finland declined by around 40 per cent.

The aim of this study is to examine the impact of nominal and real exchange rate changes on Russian tourism demand in Finland. It is based on monthly panel data on 16 provinces and 34 cities. We estimate dynamic panel data models while controlling for seasonal factors and yearly time effects. Studying the heterogeneity of the exchange rate effects is crucial, as Finnish regions are highly heterogeneous in terms of their characteristics and amenities (nature tourism, snow-based winter tourism, lakes, national parks, and cities; see Toivonen, 2002).

This paper contributes to the literature on the sensitivity of international tourism flows to exchange rate fluctuations. Despite the large number of studies, there is still no consensus regarding exchange rate elasticity based on country of origin (see e.g. Meurer, 2010; Cortés-Jiménez and Blake, 2011; and Chi, 2015 for recent studies). Moreover, few studies have

[1] The share of Russian arrivals in total international arrivals in 2013 was highest in Finland (47 per cent), followed by Egypt (25 per cent), Israel and Turkey (11 per cent each), Greece (8 per cent), and Bulgaria and Lithuania (7 per cent each; source: OECD STATS (http://stats.oecd.org/), authors' own calculations). Here, inbound tourism is measured as international arrivals -- unlike in the present study, in which data is based on overnight stays.

investigated the determinants of Russian tourism outflows. Tang et al. (2014) find that Russian tourism to China is highly sensitive to exchange rate volatility. Furmanov et al. (2012) reveal that neither origin country income nor relative prices are significantly related to outbound Russian tourism in the EU countries.

During the time of the Soviet Union, Russian tourism in Finland was very unusual and subject to political controls (Ollus and Simola, 2006). After the country's collapse in 1991, the restrictions previously imposed by the Soviet legislature on personal travel were relaxed. Russians' travel and vacation interests in Finland increased in 2000, when the Finnish property market was finally opened to foreigners. Since then, there have been a noticeable number of Russian second-home (or *dacha*) purchases, especially in the Finnish Lake District in southeast Finland (Pitkänen, 2011). Lipkina's (2013) results reveal a highly positive image of Finland among the main motives for Russian second-home ownership in the country, along with its pristine nature, similar climatic conditions, lake landscape (with personal access to lakeshores), and price rates. In the Karelia region, Russians are also attracted by the local national parks for hiking and recreation, the Saimaa Canal, the region's many Orthodox churches and chapels (or *tsasouna*), and other factors (Jakosuo, 2011).

A number of large Russian cities are located near the Finnish border. For example, the St. Petersburg region alone comprises some five million inhabitants and is now connected to Helsinki by high-speed trains (called Allegro). Murmansk – another major city with a population of around 300,000 – is located in the extreme northwest of Russia on Kola Bay, not that far from Finnish Lapland. The distances from St. Petersburg and Moscow to the Finnish border are about 200 and 900 kilometres, respectively, making Finland the nearest EU neighbour and easily accessible for millions of Russians from the European part of the country, even by car (Furmanov, Balaeva, and Predvoditeleva, 2012).

The structure of this study is as follows. Section two introduces the empirical model and the data. Section three presents the findings, and section four concludes.

**Empirical model and data**

Russian tourism demand in Finland is specified as a function of the income of Russians and the rouble-to-euro exchange rate, monthly dummy variables, and the yearly time trend (see Song and Li, 2008). Since income data is not available for Russia on a monthly basis, we use the retail trade volume of the Russian economy as a proxy. We employ a dynamic specification derived from the autoregressive distributive lag (ARDL) model. After some transformations, the dynamic tourism demand equation is obtained as follows:

$$\Delta \ln ONS_{it} = \alpha_{oi} - \phi_i \ln ONS_{i,t-1} + \alpha_{1,i} \ln Y_t - \alpha_{2,i} \ln ER_t - \alpha_{3,i} \ln ER_t \cdot D14Aug_t + \alpha_{4,i} T + \sum_{j=0}^{K} \beta_{1ij} \Delta \ln Y_{t-J} + \sum_{j=0}^{K} \beta_{2ij} \Delta \ln ER_{t-J} + \lambda_t + \alpha_i + v_{it}, \quad (1)$$

The dynamic tourism demand equation can also be written in the form of an error correction model:

$$\Delta \ln ONS_{it} = -\phi_i \left( \ln ONS_{i,t-1} - \theta_1 \ln Y_t + \theta_2 \ln ER_t + \theta_3 \ln ER_t \cdot D14Aug_t - \theta_4 T \right) + \sum_{j=0}^{K} \beta_{1ij} \Delta \ln Y_{t-J} + \sum_{j=0}^{K} \beta_{2ij} \Delta \ln ER_{t-J} + \lambda_t + \alpha_i + v_{it}, \quad (2)$$

where $\phi$ denotes the error correction coefficient, $i$ stands for region (with $i$=1,..,16, or $i$=1,…,37 for the cities in question), $t$ denotes the time (1995:1 to 2015:7), Δ represents the first difference operator, and $j$ is the lag operator indicator. The natural logarithm is represented by *ln*. *ONS* denotes the number of nights Russian tourists spent in Finnish hotels (or alternatively, in all types of accommodation). $\alpha_i$ denotes the region (or city) effect, and $ER$ is the rouble-to-euro (EUR/RUB) exchange rate. $D14Aug$ is a dummy variable that equals one for the period 2014:8 onwards and zero otherwise. $\lambda_t$ denotes monthly dummy variables, and $T$ is the yearly time trend in years. $Y$ denotes the retail trade volume in Russia, while $\alpha_2$ represents the elasticity of tourism demand with respect to the exchange rate. In order to test the impact of the change in the exchange rate after the introduction of the EU's economic sanctions against Russia, the exchange rate coefficient is allowed to vary from 2014:8 onwards. Since the time period is considerably higher than the number of cross-sectional units ($N$, in regions or cities), the error correction version of the ARDL model is estimated using the pooled mean group (PMG) estimator (Pesaran et al., 1999). The error correction model can be estimated by means of maximum likelihood under the non-linear restrictions $\alpha_{k,i} / \phi_i = \theta_k$. The lag order of the ARDL is determined using the Akaike information criterion for lag selection. Since distinct regions and cities are expected to be affected differently by changes in exchange rates, we also allow the long-run exchange rate coefficient to vary across regions (or cities). To account for heterogeneity, we use the mean group estimator (Pesaran and Smith, 1995).

Data on overnight stays cross-classified by region and guest country of origin[2] and overnight stays by city[3] can be downloaded from the website of Statistics Finland. This estimation sample is based on 16 Finnish regions at the monthly level starting from the period 1999:1 and ending at 2015:7. It consists of about 4,000 observations. Åland and Central Ostrobothnia have to be excluded because of large gaps in the corresponding data. The number of time

[2] http://pxnet2.stat.fi/PXWeb/pxweb/en/StatFin/StatFin__lii__matk/?tablelist=true.
[3] http://visitfinland.stat.fi/PXWeb/pxweb/fi/VisitFinland.

periods in the estimation sample is about 180 on average. In addition, city-level data comprising some 6,800 observations is used. Here, we selected the 37 cities (of the 48 total cities) for which we do not have gaps in the time series due to zero values. Consumer prices indices for Finland and Russia, rouble-to-euro exchange rates, and the relevant data on retail trade volumes were downloaded from OECD STATS (http://stats.oecd.org/). Table 1 lists the descriptive statistics across regions (see Figure 1 for a map of Finland's regions) for Russian overnight stays at all types of accommodation establishments (Panel A) and in hotels in particular (Panel B). Table 2 presents descriptive statistics for total Russian overnight stays at the city level. Figure 2 in the appendix provides information on the evolution of Russian overnight stays for the total sample period. The sharpest peaks in Figure 2 are in December and January, which is when Russians celebrate Orthodox Christmas. Smaller peaks are evident during the summer season.

[insert Table 1 here]

Russian overnight stays increased strongly over the sample period until 2013. Between 2014 and 2015 (measured for the months August to July), the number of Russian overnight stays in hotels decreased by 39 per cent compared to the same season in the previous year, with a slightly higher decline of 40-48 per cent in the border provinces (Kanta-Häme, Kymenlaakso, North and South Karelia, and Lapland).

[insert Table 2 here]

**Estimation results**

Table 3 shows the results of the dynamic panel data model estimated by both the mean and pooled mean group estimator for the period 1999:1 to 2015:7.[4] Panels A and B list the results for 16 Finnish provinces, while the third panel below shows the results based on the city-level data (Panel C). All models include the yearly time trend and monthly dummy variables. The number of lags for the short-run coefficients is restricted to three. The maximum likelihood pseudo R-squared shows that the model accounts for 64 per cent of the variation in the number of nights Russian tourists spent in Finnish hotels. The long-run coefficients for exchange rate and retail trade volume index can be directly interpreted as long-run elasticities. The results show that the number of nights Russian tourists spend in hotels depends significantly and negatively on the exchange rate, and significantly and positively on the demand variable (measured as the retail sales volume). Based on regional data and the pooled mean group estimator, the long-run exchange rate elasticity is -1.58 – quite high in absolute terms (Table 3, Panel B). This indicates that a 10 per cent depreciation of the rouble against the euro will lead to a 16 per cent decline in Russian overnight stays. The exchange rate elasticity is also robust to the definition of overnight stays. Estimates for overnight stays in all types of accommodation lead to similar results (see Panel A in Table 3).

The interaction term between the time dummy variable for the period August 2014 to July 2015 is significant, implying that the sensitivity of Russian tourism demand to shifts in the exchange rate increased after the EU's economic sanctions were introduced. However, the

[4] The dynamic panel data model is estimated using the XTPMG command (Blackburne and Frank, 2007). A unit root test shows that all variables are integrated of order one. A panel cointegration test based on the significance of the error correction term developed by Westerlund (2007) shows that the null hypothesis of no cointegration can be rejected at the 1 per cent level in all cases. Therefore, the standard error correction model and the pooled mean group model can be applied. In addition, the Breusch-Pagan test for heteroskedasticity fails to reject the null hypothesis of homoskedasticity at the 1 per cent significance level.

coefficient of the interaction term between the exchange rate and the dummy variable from 2014:8 onwards is relatively small (but statistically significant) at around -0.04, which indicates that the sensitivity of tourism demand to exchange rate changes has not changed much since the rouble's value began to decline and sanctions were imposed in August 2014.

Interestingly, the results at the city level confirm the strong impact of exchange rates on Russian tourism demand in Finnish regions. Here, the exchange rate elasticity is also 1.6 and significant at the 1 per cent level. The time trend is positive and significant, indicating that Russian overnight stays increased over time. On average, the number of Russian overnight stays increased by 5.4 per cent per year across the regions given the effects of exchange rates and real income. The coefficients of the monthly dummy variables indicate that Russian tourism demand is highest in January, followed by July, December, and August (see Panel A).

[insert Table 3 here]

The exchange rate elasticity exhibited by Russian tourists is relatively high when compared to the related literature. For Swiss communities, Stettler (2016) finds similarly large exchange rate elasticities for German, Dutch, and Belgian visitors. Based on a meta-analysis, Peng et al. (2015) find a price elasticity of 1.3 for European destinations.

Separate estimation results obtained from the mean group estimator for the 16 provinces in question show that there is a significant amount of heterogeneity in exchange rate elasticity across the regions.[5] The highest exchange rate elasticity can be observed for the border provinces of Kainuu, Kymenlaakso, Lapland, and North Karelia, where it ranges between -2 and -2.8; the same statistic is lowest in central Finland and Pirkanmaa, and insignificant in North and South Ostrobothnia. One possible explanation is that the latter regions attract more

[5] Results are available upon request.

business travellers, who are typically less price-sensitive than leisure travellers. For the sample including cities, we again find the highest exchange rate elasticities for Finnish cities located quite close to the Russian border (Heinola, Joensuu, Inari, Mikkeli, Lieksa). This is most likely related to differences in visitors' reasons for travelling. Journeys to these border cities are often secondary trips undertaken in the low season rather than to locations mainly known as holiday destinations.

## Conclusion

This paper has investigated the sensitivity of Russian tourism demand in Finland to the exchange rate between the two countries' currencies. The data is based on overnight hotel stays in 16 Finnish regions or 37 cities at the monthly level for the period 1995:1 to 2015:7. Using dynamic tourism demand models, we find that the elasticity of Russian visitors' overnight hotel stays with respect to the rouble-to-euro exchange rate is significantly greater than unity (approximately 1.6) in absolute terms. The sensitivity of Russian tourism to exchange rate changes is highest in neighbouring provinces or cities close to the border. Given the high price elasticity of Russian tourism demand, hotels in Finland are forced to reduce their prices in order to stay competitive with their counterparts in Russia. Attractive packages, price reductions, and other forms of group discounts will make Finnish destinations more appealing to Russians.

## References

Blackburne, E. F., and Frank, M. W. (2007), 'Estimation of nonstationary heterogeneous panels', *Stata Journal*, Vol 7, No 2, pp 197–208.

Chi, J. (2015), 'Dynamic impacts of income and the exchange rate on US tourism, 1960–2011', *Tourism Economics*, Vol 21, No 5, pp 1047–1060.

Cortés-Jiménez, I., and Blake, A. (2011), 'Tourism Demand Modeling by Purpose of Visit and Nationality', *Journal of Travel Research,* Vol 50, No 4, pp 408-416.

Furmanov, K., Balaeva, O., and Predvoditeleva, M. (2012), 'Tourism flows from the Russian Federation to the European Union', *Anatolia - An International Journal of Tourism and Hospitality Research*, Vol 23, No 1, pp 17–31.

Jakosuo, K. (2011), 'Russia and the Russian tourist in Finnish tourism strategies - the case of the Karelian region', *Procedia Social and Behavioral Sciences,* Vol 24, pp 1003–1013.

Lipkina, O. (2013), 'Motives for Russian Second Home Ownership in Finland', *Scandinavian Journal of Hospitality and Tourism*, Vol 13, No 4, pp 299–316.

Meurer, R. (2010), 'International travel: The relationship between exchange rate, world GDP, revenues and the number of travellers to Brazil', *Tourism Economics*, Vol 16, No 4, pp 1065-1072.

Ollus, S-E., and Simola, H. (2006), 'Russia in the Finnish Economy. Sitra Reports 66', Available at https://www.sitra.fi/julkaisut/raportti66.pdf (accessed 7 October 2015).

Peng, B., Song, H., Crouch, G. I., and Witt, S. F. (2015), 'A Meta-Analysis of International Tourism Demand Elasticities', *Journal of Travel Research*, Vol 54, No 5, pp 611–633.

Pesaran, M. H, Shin, Y., and Smith, R. J. (1999), 'Pooled Mean Group Estimation of Dynamic Heterogeneous Panels', *Journal of the American Statistical Association*, Vol 94, No 446, pp 621–634.

Pesaran, M. H., and Smith, R. J., (1995), 'Estimating Long-Run Relationships from Dynamic Heterogeneous Panels', *Journal of Econometrics*, Vol 68, No 1, pp 79–113.

Pitkänen, K. (2011), 'Contested cottage landscapes: Host perspective to the increase of foreign second home ownership in Finland 1990–2008', *Fennia,* Vol 189, No 1, pp 43–59.

Song, H., and Li, G. (2008), 'Tourism demand modelling and forecasting - A review of recent research', *Tourism Management*, Vol 29, No 2, pp 203–220.

Stettler, C. (2016), 'How do overnight stays react to exchange rate changes?', *Swiss Journal of Economics and Statistics*, forthcoming.

Tilastokeskus (2015), 'Regions in Finland year 2015', Available at

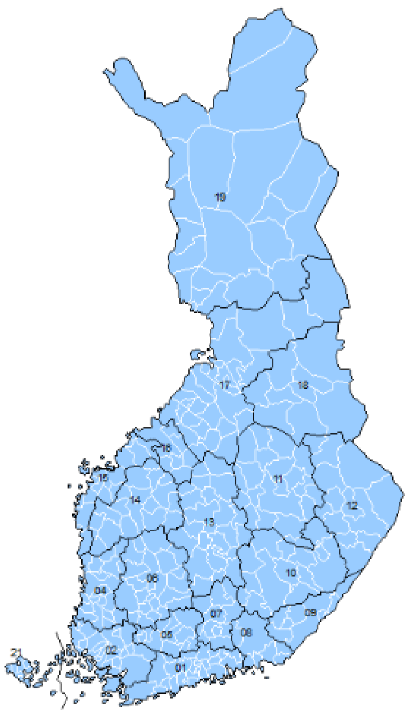
http://www.stat.fi/meta/luokitukset/maakunta/001-2015/index_en.html (accessed 16 October 2015).

Toivonen, T. (2002), 'Regional development of Finnish tourism at the end of the 1990s: Some considerations', *Tourism and Hospitality Research*, Vol 3, No 4, pp 331–342.

Westerlund, J. (2007), 'Testing for Error Correction in Panel Data', *Oxford Bulletin of Economics and Statistics,* Vol 69, No 6, pp 709–748.

# Appendix

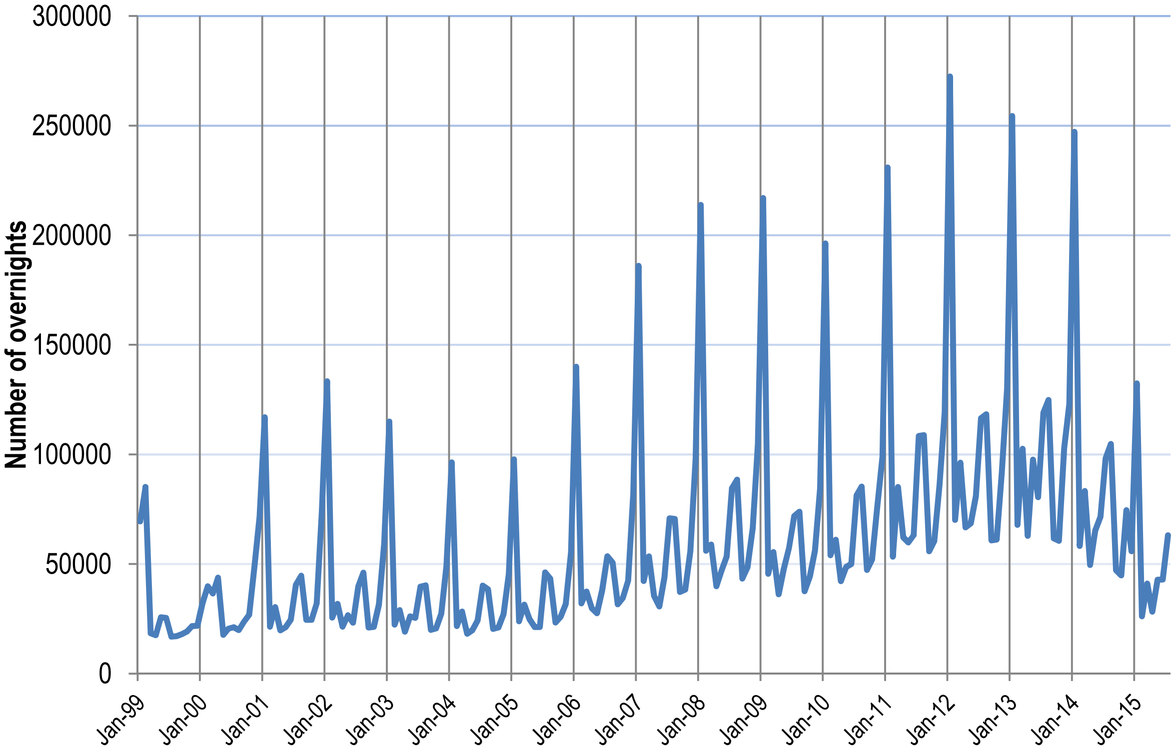
*Figure 1: Regions in Finland year 2015*




Notes: 01=Uusimaa, 02=Varsinais-Suomi, 04=Satakunta, 05=Kanta-Häme, 06=Pirkanmaa, 07=Päijät-Häme, 08= Kymenlaakso, 09= South Karelia, 10= Southern Savonia, 11= Northern Savonia, 12= North Karelia, 13= Central Finland, 14= Southern Ostrobothnia, 15= Ostrobothnia, 16= Central Ostrobothnia, 17= Northern Ostrobothnia, 18=Kainuu, 19=Lapland, 21=Åland.

Source: Tilastokeskus (2015).

*Figure 2: Evolution of Russian overnight stays in hotels*




Source: Statistics Finland.

*Table 1: Descriptive statistics (1999:1 to 2015:7) at the regional level*

| | overnight stays of Russian tourists | | | share of Russian overnights in total foreign night stays | overnight stays of Russian tourists | | |
|---|---|---|---|---|---|---|---|
| | 1999 | 2013 | change in per cent | 2013 | 2013:8 to 2014:7 | 2014:8 to 2015:7 | change in per cent |
| region | Panel A. Overnight stays in all accommodation establishments | | | | | | |
| Total Finland | 400813 | 1620419 | 10.5 | 27.7 | 1515666 | 961617 | -36.6 |
| Main Finland | 399883 | 1614820 | 10.5 | 28.8 | 1510537 | 956402 | -36.7 |
| Uusimaa | 168561 | 439011 | 7.1 | 18.8 | 402733 | 252436 | -37.3 |
| Varsinais-Suomi | 8362 | 32049 | 10.1 | 15.1 | 31745 | 20090 | -36.7 |
| Satakunta | 1682 | 4254 | 6.9 | 7.2 | 4084 | 3453 | -15.5 |
| Kanta-Häme | 4958 | 9420 | 4.7 | 22.3 | 8851 | 5182 | -41.5 |
| Pirkanmaa | 16619 | 34819 | 5.4 | 15.3 | 30815 | 21781 | -29.3 |
| Päijät-Häme | 24693 | 44787 | 4.3 | 50.4 | 47216 | 28860 | -38.9 |
| Kymenlaakso | 11888 | 72050 | 13.7 | 54.7 | 65521 | 39062 | -40.4 |
| South Karelia | 28087 | 352418 | 19.8 | 89.3 | 321211 | 189372 | -41.0 |
| Etelä-Savo | 16792 | 148670 | 16.9 | 69.7 | 146663 | 100873 | -31.2 |
| Pohjois-Savo | 16981 | 56495 | 9.0 | 45.3 | 53096 | 35712 | -32.7 |
| North Karelia | 13878 | 57708 | 10.7 | 62.4 | 58070 | 33974 | -41.5 |
| Central Finland | 28501 | 53759 | 4.6 | 34.4 | 49413 | 30957 | -37.4 |
| South Ostrobothnia | 1273 | 3754 | 8.0 | 12.2 | 3400 | 2412 | -29.1 |
| Ostrobothnia | 1837 | 3704 | 5.1 | 5.1 | 3536 | 2335 | -34.0 |
| North Ostrobothnia | 7230 | 84150 | 19.2 | 29.3 | 89339 | 64648 | -27.6 |
| Central Ostrobothnia | 274 | 1990 | 15.2 | 12.0 | 1855 | 581 | -68.7 |
| Kainuu | 23874 | 65411 | 7.5 | 61.3 | 60346 | 43694 | -27.6 |
| Lapland | 24393 | 150371 | 13.9 | 14.6 | 132291 | 80667 | -39.0 |
| Åland | 930 | 5599 | 13.7 | 2.3 | 5129 | 5215 | 1.7 |
| | Panel B. Overnight stays in hotels | | | | | | |
| Total Finland | 349941 | 1257287 | 9.6 | 26.0 | 1145923 | 703659 | -38.6 |
| Main Finland | 349517 | 1254976 | 9.6 | 26.5 | 1143658 | 701207 | -38.7 |
| Uusimaa | 153284 | 418872 | 7.4 | 18.8 | 376827 | 236932 | -37.1 |
| Varsinais-Suomi | 6259 | 23894 | 10.0 | 14.3 | 22231 | 14487 | -34.8 |
| Satakunta | 1345 | 2872 | 5.6 | 5.9 | 2189 | 1857 | -15.2 |
| Kanta-Häme | 4240 | 7835 | 4.5 | 20.3 | 7136 | 4080 | -42.8 |
| Pirkanmaa | 14206 | 24145 | 3.9 | 14.1 | 21482 | 15616 | -27.3 |
| Päijät-Häme | 23304 | 33333 | 2.6 | 49.2 | 34556 | 21024 | -39.2 |
| Kymenlaakso | 10659 | 50203 | 11.7 | 51.7 | 44188 | 22884 | -48.2 |
| South Karelia | 25895 | 290873 | 18.9 | 90.1 | 263023 | 153059 | -41.8 |
| Etelä-Savo | 10255 | 61562 | 13.7 | 71.3 | 55872 | 36731 | -34.3 |
| Pohjois-Savo | 12091 | 37219 | 8.4 | 42.7 | 34001 | 21852 | -35.7 |
| North Karelia | 10707 | 40274 | 9.9 | 61.7 | 39098 | 20491 | -47.6 |
| Central Finland | 25968 | 47003 | 4.3 | 33.1 | 43366 | 26671 | -38.5 |
| South Ostrobothnia | 1003 | 2021 | 5.1 | 10.2 | 1808 | 1372 | -24.1 |
| Ostrobothnia | 1690 | 3014 | 4.2 | 4.8 | 2628 | 1904 | -27.5 |
| North Ostrobothnia | 6619 | 46325 | 14.9 | 23.3 | 50028 | 34500 | -31.0 |
| Central Ostrobothnia | 137 | 313 | 6.1 | 3.4 | 173 | n.a. | n.a. |
| Kainuu | 21403 | 47527 | 5.9 | 58.2 | 43731 | 28573 | -34.7 |
| Lapland | 20452 | 117691 | 13.3 | 13.9 | 100906 | 58766 | -41.8 |
| Åland | 424 | 2311 | 12.9 | 2.2 | 2265 | 2452 | 8.3 |

Note: The average annual growth rate of overnight stays is calculated as the annual geometric growth rate. Source: Statistics Finland. Own calculations.

*Table 2: Descriptive statistics (1999:1 to 2015:7) at the city level (all accommodations).*

| city | region | Russian overnight stays | | | share of RU overnight stays in foreign stays % | Russian overnight stays | | |
|---|---|---|---|---|---|---|---|---|
| | | 1999 | 2013 | change in per cent | | 2013:8 to 2014:7 | 2014:8 to 2015:7 | change in per cent |
| Espoo | Uusimaa | 20562 | 46483 | 6.0 | 28 | 44719 | 25277 | -43.5 |
| Helsinki | Uusimaa | 127578 | 310243 | 6.6 | 19 | 280354 | 177607 | -36.6 |
| Vantaa | Uusimaa | 7834 | 43042 | 12.9 | 14 | 41027 | 26497 | -35.4 |
| Lohja | Uusimaa | 267 | 4447 | 22.3 | 30 | 5647 | 3539 | -37.3 |
| Porvoo | Uusimaa | 2394 | 12626 | 12.6 | 43 | 10674 | 6785 | -36.4 |
| Salo | Varsinais-Suomi | 380 | 1389 | 9.7 | 10 | 1334 | 1167 | -12.5 |
| Turku | Varsinais-Suomi | 5414 | 22017 | 10.5 | 15 | 20037 | 12514 | -37.5 |
| Pori | Satakunta | 1083 | 2061 | 4.7 | 8 | 1939 | 1579 | -18.6 |
| Hämeenlinna | Kanta-Häme | 1310 | 5237 | 10.4 | 18 | 4692 | 2457 | -47.6 |
| Tampere | Pirkanmaa | 11041 | 18564 | 3.8 | 11 | 16564 | 11646 | -29.7 |
| Heinola | Päijät-Häme | 1321 | 4707 | 9.5 | 52 | 5486 | 4406 | -19.7 |
| Lahti | Päijät-Häme | 12599 | 16537 | 2.0 | 36 | 15647 | 8409 | -46.3 |
| Kotka | Kymenlaakso | 4886 | 34037 | 14.9 | 48 | 29173 | 15745 | -46.0 |
| Kouvola | Kymenlaakso | 4418 | 23495 | 12.7 | 69 | 22298 | 11605 | -48.0 |
| Imatra | South Karelia | 6225 | 156592 | 25.9 | 95 | 136363 | 76239 | -44.1 |
| Lappeenranta | South Karelia | 11358 | 158724 | 20.7 | 86 | 146904 | 85327 | -41.9 |
| Mikkeli | Etelä-Savo | 6706 | 44618 | 14.5 | 72 | 41049 | 27010 | -34.2 |
| Savonlinna | Etelä-Savo | 8203 | 63929 | 15.8 | 75 | 62081 | 43596 | -29.8 |
| Iisalmi | Pohjois-Savo | 244 | 984 | 10.5 | 15 | 804 | 805 | 0.1 |
| Joensuu | Pohjois-Savo | 4594 | 27325 | 13.6 | 57 | 26349 | 13187 | -50.0 |
| Kuopio | Pohjois-Savo | 14316 | 39749 | 7.6 | 43 | 37202 | 23485 | -36.9 |
| Lieksa | North Karelia | 2281 | 7825 | 9.2 | 68 | 9296 | 6215 | -33.1 |
| Jyväskylä | Central Finland | 7065 | 12253 | 4.0 | 17 | 10469 | 7217 | -31.1 |
| Jämsä | Central Finland | 8377 | 23107 | 7.5 | 29 | 20406 | 13226 | -35.2 |
| Seinäjoki | Southern Ostrobothnia | 449 | 845 | 4.6 | 8 | 1052 | 485 | -53.9 |
| Vaasa | Ostrobothnia | 1446 | 2459 | 3.9 | 5 | 2388 | 1971 | -17.5 |
| Oulu | Northern Ostrobothnia | 3034 | 19518 | 14.2 | 18 | 18039 | 10721 | -40.6 |
| Kokkola | Central Ostrobothnia | 255 | 1410 | 13.0 | 7 | 1498 | 790 | -47.3 |
| Kajaani | Kainuu | 2326 | 3551 | 3.1 | 38 | 3413 | 2165 | -36.6 |
| Sotkamo | Kainuu | 18318 | 47830 | 7.1 | 61 | 45950 | 31670 | -31.1 |
| Inari (Saariselkä) | Lapland | 5607 | 15506 | 7.5 | 12 | 15103 | 10585 | -29.9 |
| Kemi | Lapland | 175 | 3728 | 24.4 | 18 | 2995 | 1311 | -56.2 |
| Kittilä (Levi) | Lapland | 3513 | 28890 | 16.2 | 12 | 25541 | 16915 | -33.8 |
| Kuusamo | Lapland | 2458 | 59815 | 25.6 | 51 | 67026 | 51577 | -23.0 |
| Rovaniemi | Lapland | 9036 | 65244 | 15.2 | 26 | 54737 | 29197 | -46.7 |
| Sodankylä | Lapland | 678 | 2767 | 10.6 | 4 | 2430 | 2288 | -5.8 |
| Tornio | Lapland | 292 | 1513 | 12.5 | 20 | 1295 | 691 | -46.6 |

Note: The average annual growth rate of overnight stays is calculated as the annual geometric growth rate. Source: Statistics Finland. Own calculations.

*Table 3: Determinants of the change in Russian overnight stays at the regional and city level*

| | Panel A. Total overnight stays at the regional level | | | | | |
|---|---|---|---|---|---|---|
| | Mean group estimator | | | Pooled mean group estimator | | |
| | coeff. | | z | coeff. | | z |
| ln Rouble per Euro | -1.625 | *** | -9.17 | -1.668 | *** | -10.20 |
| ln Rouble per Euro X D14AUG | -0.039 | ** | -2.21 | -0.046 | ** | -2.51 |
| ln retail trade volume | 0.771 | *** | 2.64 | 0.605 | *** | 8.46 |
| year | 0.065 | * | 1.94 | 0.070 | *** | 274.86 |
| error-correction coefficient | -0.683 | *** | -24.21 | -0.490 | *** | -13.24 |
| constant | -153.78 | *** | -2.79 | -68.49 | *** | -8.59 |
| January | 1.34 | *** | 6.40 | 1.14 | *** | 5.78 |
| February | -0.25 | ** | -2.12 | -0.63 | *** | -3.56 |
| March | 0.31 | ** | 2.23 | 0.28 | * | 1.92 |
| April | -0.25 | ** | -1.96 | -0.35 | ** | -2.17 |
| May | 0.00 | | 0.00 | 0.03 | | 0.18 |
| June | 0.29 | ** | 2.39 | 0.28 | * | 1.89 |
| July | 0.94 | *** | 6.36 | 0.85 | *** | 5.47 |
| August | 0.79 | *** | 6.04 | 0.54 | *** | 3.35 |
| September | -0.19 | * | -1.82 | -0.43 | *** | -2.99 |
| October | -0.10 | | -0.89 | -0.13 | | -1.01 |
| November | 0.19 | * | 1.72 | 0.18 | | 1.34 |
| December | 0.78 | *** | 3.95 | 0.71 | *** | 3.46 |
| No of observations | 2938 | | | 2938 | | |
| No of regions | 16 | | | 16 | | |

| | Panel B. Hotel overnight stays at the regional level | | | | | |
|---|---|---|---|---|---|---|
| | Mean group estimator | | | Pooled mean group estimator | | |
| | coeff. | | z | coeff. | | z |
| ln Rouble per Euro | -1.632 | *** | -8.91 | -1.623 | *** | -10.67 |
| ln Rouble per Euro X D14AUG | -0.048 | *** | -2.95 | -0.028 | | -1.66 |
| ln retail trade volume | 0.821 | *** | 2.59 | 0.738 | *** | 4.81 |
| year | 0.058 | | 1.62 | 0.032 | ** | 2.20 |
| error-correction coefficient | -0.760 | *** | -23.45 | -0.507 | *** | -7.86 |
| constant | -87.195 | | -1.61 | -28.480 | *** | -7.67 |
| monthly dummy variables | yes | | | yes | | |
| No of observations | 2938 | | | 2938 | | |
| No of regions | 16 | | | 16 | | |

| | Panel C. Total stays at the city level | | | | | |
|---|---|---|---|---|---|---|
| | Mean group estimator | | | Pooled mean group estimator | | |
| | coeff. | | z | coeff. | | z |
| ln Rouble per Euro | -1.685 | *** | -10.54 | -1.600 | *** | -13.84 |
| ln Rouble per Euro X D14AUG | -0.061 | *** | -4.40 | -0.060 | *** | -4.62 |
| ln retail trade volume | 0.197 | | 0.68 | 0.626 | *** | 5.35 |
| year | 0.151 | *** | 4.85 | 0.089 | *** | 7.90 |
| error-correction coefficient | -0.795 | *** | -30.14 | -0.595 | *** | -15.89 |
| constant | -281.61 | | -6.82 | -112.26 | | -17.34 |
| monthly dummy variables | yes | | | yes | | |
| No of observations | 6887 | | | 6887 | | |
| No of cities | 37 | | | 37 | | |

Note: ***, ** and * denote significance at the 1, 5 and 10 per cent significance levels. Long-run coefficients can be directly interpreted as long-run elasticities. All regressions include monthly dummy variables and up to three lags for the retail trade volume and the exchange rate that are included in the short-run relationship. Unreported results reveal that serial correlation and heteroscedasticity are not present in the residuals.