

The Shared Economy in the Czech Republic in 2017 and Resulting Problems in Short-Term Housing Rentals

Sdílená ekonomika v ČR v roce 2017 a problémy vyplývající z krátkodobých pronájmů ubytování

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Abstract

In the article we present a pilot study about most prominent problem of the shared economy – the increase in short-term housing rentals (through the Airbnb platform) and its impact on original accommodation services. We observe many advantages and disadvantages resulting from applications of shared economy. Traditional producers are afraid of the new “online” non-regulated competition. Many others highlight the positive economic effects such as the elimination of transaction costs and the appearance of a new economic sector (in contrast with the negative effects of the contemporary crises). We empirically tested the relationship between traditional producers and new online shared accommodation producers (Airbnb). Moreover we provide an analysis of the traditional accommodation services producers within the segments. These segments are Guesthouses, Hotel*, Hotel**, Hotel*** and “Prague stayed overnight.” We verified the enormous growth of short-term housing rentals (the most prominent shared economy topic). Nowadays, additional problems are appearing, for example Uber taxi services in competition with original taxi providers.

Key words

short-term rentals, regulation, transaction costs, Airbnb

JEL Codes

H26, O35

Abstrakt

V článku představujeme pilotní studii o nejproblematictějším okruhu sdílené ekonomiky – nárůstu krátkodobých pronájmů (přes portál Airbnb) a jeho dopadu na tradiční ubytovací služby. Pozorujeme mnoho výhod i nevýhod aplikací sdílené ekonomiky. Tradiční producenti se obávají nové neregulované konkurence využívající konkurenční výhody prostřednictvím on-line platformy. Další vyzdvihují pozitivní efekt na ekonomiku v důsledku snížení transakčních nákladů a vznik úplně nových sektorů podnikání (ve srovnání s efekty proběhlých ekonomických krizí). V článku jsme empiricky otestovali vztah mezi tradičními poskytovateli ubytovacích služeb a novými on-line poskytovateli krátkodobých pronájmů (Airbnb). Dále jsme tuto analýzu doplnili informací o vztahu napříč sektory tradičního ubytování (penziony, hotel*, hotel**, hotel*** a položka „přespání v Praze na jednu noc“). Potvrdili jsme enormní nárůst krátkodobých pronájmů v Praze. V současnosti se objevují

nové problémy, například konkurence nového on-line systému sdílené dopravy Uber vůči tradičním taxislužbám.

Klíčová slova

krátkodobé pronájmy, regulace, transakční náklady, Airbnb

1 Introduction

The existence of a shared economy has created a very interesting social science phenomenon in recent years, which carries great economic opportunities (Heinrichs, 2013). The principle of incompatibility or inequality in consumption is traditionally described in the theory of market failure. This part of economic theory is gaining importance in the context of the globalization and liberalization of the economy. So-called “start ups” are interesting in economic theory. In general, we find there new principles and technological possibilities in the exchange and payment for goods or services. Here we see a very significant reduction of transaction costs (practically zero). This is also interconnected with the idea of “collaborative consumption” (Hamari et al., 2016). Of course, we must not abstain from technological innovation. A modern, shared economy makes it possible to eliminate transaction costs for sellers and buyers of goods or services.

There is another interconnection which arises in terms of what effects a shared economy brings to public administration and public budgets (this is not the main focus of this article). Motivation is gained from the public administration not only at the level of the Czech Republic but also the EU level.

The aim of this paper is to verify or falsify the conclusion about the negative impact of the increasing amount of short-term rentals on traditional accommodation services in the Czech Republic in the period 2016/2017 (monthly data). We used this short time period due to the problems which appeared recently in the Prague municipality (mainly due to complaints against Airbnb and Uber). We purchased data for the period analyzed from the Airbnb database.

The shared economy as a sharing of group goods by different users who contribute to their financing by the owner is defined in Czech theory for instance by Vorlíček (2016). According to Böckmann (2013), the rapid development of the shared economy is mainly seen in the sharing of ever smaller things (drilling) or things that we have not been able to imagine until now (our own flat). Such sharing is possible only through the creation of online platforms for bidders.

At present, we are seeing the following main areas of shared economy, given here with their main business representatives:

- a) **Accommodation services** – short-stay accommodation agents (Airbnb),
- b) **Transport services** – car rentals (Zipcar, Drivenow),

- c) **Joint transport** – connecting providers and customers of both passenger and freight transport using a mobile application (Uber, Mitfahrgelegenheit, carpooling.com, BlaBlaCar, Rokola bicycle rental),
- d) **Marketplace** – lending or buying / selling of goods and services (Sharetribe, Etsy, Aukro),
- e) **Financial services** – linking financial loans between people without the participation of banks (Zonky, Benefi, “První klubová pojišťovna”),
- f) **Housekeeping** – Housekeeping or Home Repair (“SuperSoused”, Hourly Spouse),
- g) **Labor markets, Job Agencies** – linking supply with demand for work on Internet platforms (Jobs.cz).

2 Literature review

In the next chapter, we will present feedback on the shared economy from the public authorities, but also from the media. The article “Perspectives of the Shared Economy” (Benda, 2016) is available in the Ministry of Finance Library (issue 6/2016). Here, a shared economy is defined within the “Gig” economy, which is a transition from fixed labor to time and local flexibility, and within a “circular” economy. The concept of the circular economy highlights the rise in raw material prices in the 21st century, while in the 20th century we witnessed a fall in raw material prices. This simple fact leads to a need for the efficient use of existing resources and waste. “Peer to peer” markets in times of peak demand are defined as a form of the sharing economy (Zervas et al., 2014).

The US labor market has so far resisted moving toward a shared economy, although according to JP Morgan’s analysis (Farrell, Greig, 2016), there is a risk of wage dumping that does not limit the introduction of a minimum wage. In addition, there is one more problem around the fall of the rental market and the liquidation of jobs. In the context of the development of the shared economy, it is emphasized that it is primarily a cultural shift (Financial Times, 2014). Young people prefer to engage with friends and neighbors rather than corporations. Such a model reduces rental or drilling prices, leading to traditional industry lobbying for greater regulation.

In the article, “They Want to Pay Taxes, But They Cannot”, Chovanculiak (2016) deals with the motivation of homeowners doing business through Airbnb not to pay tax on the profit they make from their accommodation. This tax applies in small amounts, yet is a tough regulation for producers. For instance, the building reconstruction authority must approve a change in the use of the building, which amounts to an average of €30. Additional modifications to fire protection and building approval in the land register may cost up to €50. The whole procedure lasts for at least 60 days. However, the hygiene requirements of the Regional Public Health Authority (€50) must be taken into account, as well as the complications related to the change in the operating rules. In addition, the entrepreneur must register with the Czech Trade Inspection. In contrast, the market solution is based on the reputation system, and in itself ensures high quality. So we have alternatives that do not only take the form of regulation or a dangerous free market environment. There is also an alternative in the form of private mechanisms to ensure consumer protection and quality of service.

The European Commission is working with the document “European Agenda for a Collaborative Economy” (European Commission, 2016). There are instructions for consumers, for businesses, but mainly for public administration. The public administration in the EU countries is supposed to see above all the positive effects of the shared economy. Paradoxically, some EU countries or specific cities have begun to regulate and also ban certain manifestations of the shared economy. The document itself states that these new models can make a significant contribution to the growth of employment in the EU, if supported and developed responsibly.

According to the guidelines, Member States should distinguish between those providing service on a casual basis and professional providers, for example by setting a threshold based on their activity level. Professional service providers should be required to obtain business licenses or licenses where this is strictly necessary to meet the objectives of the public interest. Platforms should not be subject to a license where they act only as an intermediary between consumers. Absolute prohibitions of activity should only be an extreme measure.

The consulting firm PriceWaterhouseCoopers (PwC, 2015) published a shared economy analysis in the US with the following results: Only 44% of the respondents were familiar with the shared economy and 19% had practical experience. Most respondents were concerned about the shared economy, but 72% expected to be involved in it. Typical clients are younger people aged 18–24, households with an annual income of \$50,000–75,000, or families with children. A similar PwC analysis for the UK market (PwC, 2016) described the effect of a shared economy on the GDP in 2025 of up to £140 bn. The five most important sectors of the shared economy – finance, housing, transport, small household services and professional services – could increase twenty-fold compared to 2015. The shared economy in the UK is growing fastest across Europe, but the study also predicted a significant increase from the current €28 bn to €570 bn. It cannot be overlooked that this rate of growth is greater compared to other sectors of the economy.

The Wharton University of Pennsylvania study broadly agreed with the findings, confirming that for more than 80% of respondents, sharing is now more convenient and effective. The study also came with the statement that a shared economy is a force that will affect a number of industries, not only travel, taxi services, car rentals, and bicycles. It will also affect finance, show business, and employment.

3 Methodology and data

Firstly, during the identification of a database for the analysis of the shared economy, we tried to analyze revisions to national accounting records. Revisions of national accounting records were conducted to provide a more credible picture of reality. This revision was made on the sample of 2010 according to the Eurostat plans. Secondly, we tried to analyze shared economy short-term rentals and their relationship to traditional accommodation providers. That is why we used the monthly dataset analyzing the 2016 to 2017 period (Tourism CZSO). The Airbnb data (from May 2016 to March 2017) had to be purchased.

In particular, we went through a document describing the nature and impacts of changes in methods and data sources within the Main Revision of Annual National Accounts – GNI Inventory (Czech Statistical Office, 2011). In the following text, we also follow this reference, that is why we do not cite in particular. This basic revision was published by the Czech Statistical Office on 30 September 2011 and preceded the main revision in 2014. The main motivation for the revisions was to ensure greater comparability of the macro-aggregates of the Czech Republic with regard to the transition to the NACE classification. The most important conclusion of the revisions is the underestimation of the performance of the Czech economy (2–3% absolute in terms of GDP) in the past.

Shared economy insight could be found thank to:

A) *Dwelling services*, the estimation of the impact of accommodation services on GDP. The problem so far has been to capture housing in a person's own apartment through so-called "imputed rent." At present the item certainly includes roommates, Airbnb, etc. According to the EU 1722/2005 regulation, privately leased accommodation must not exceed 10% of the accommodation volume. In addition, it is mentioned that the volume of accommodation through the traditional market is at least three times higher. In this case, it is necessary to use the stratification method of imputed rent estimation rather than the unit cost method (UCM). Currently, the CZSO (Czech Statistical Office, 2011) is in a state of transition between the two methods and is estimating the impact and size of imputed rents through their combination.

B) *FISIM*, Financial Intermediation Services Indirectly Measured; in this area, the revision problems mainly concerned the determination of the IRR (Internal Rate of Return).

C) *Capitalization of software produced on own account*, gross capital formation before revisions included only purchased software (even at zero price); everything else was classified as mediatory consumption. After revisions, software is also part of the gross creation of capital.

D) *Producers deliberately not registering*. For shared economy issues, the group of illegal unregistered producers is certainly the most fundamental reflection in the national accounts. Of course, the emerging networks of unregistered individuals have to be registered (in the Czech Republic, there are issues of VAT reporting). However, across Europe and the US, environmentally friendly milieus are beneficial for the savings generated by collaborative consumption (Widener, 2015) due to the socio-economic environment after 2008.

Unregistered entrepreneurs running small and micro enterprises are an existing phenomenon. Such entrepreneurs affect the basis of labor market estimates on the basis of the disparity between supply and demand. These create differences in the results of the LFS (the CZSO Labor Force Survey) and in the Labor Office statistics. The shared economy is, in our opinion, particularly strong in the following two areas of the previous list of areas in the CZSO's statements.

Dwelling services – imputed rents

As regards accommodation services, the CZSO looked at the reassessment of the method of estimating the impact on GDP. The UCM method was fully utilized, with the criterion of the volume of privately leased accommodation not exceeding 10% of the volume of the accommodation. It was necessary to engage in a stratification method. This determines the size of the imputed rent according to a) the size of the municipality, b) the type of the building, c) the size of the dwelling, d) the equipment. The estimated value of accommodation services in GDP in 2010 (total imputed rent) was CZK 1,398.9 bn in the Czech Republic. We observe a very interesting dynamic over the last decade in the context of the development of imputed rent, market rent and regulated rent and their mutual comparison.

Estimation of illegal unregistered producers

The estimate of illegal unregistered producers was based on the pilot study “Exhaustiveness of the Czech National Accounts.” The results were presented in the GNI Inventory. This was a Eurostat and CSO project, based on the answers given to a questionnaire with 249 questions. Moreover, the impact of the answers was stratified by the weight of the answers. Interesting knowledge can be traced through the comparison of official outputs.

Table 1: Deviation rate of credible image in national accounts year (2010)

Revenues								
Number of employees/CZ-NACE	A+B	D	F	G	H	I	K	M+N
1–19	6.67	2.78	9.59	4.26	21.31	1.25	0.68	6.77
20–99	1.80	0.20	7.23	0.35	1.75	1.77	0.14	1.43
Materials								
Number of employees/CZ-NACE	A+B	D	F	G	H	I	K	M+N
1–19	4.50	2.88	7.61	4.26	5.92	1.65	0.41	4.09
20–99	0.45	0.83	5.45	0.23	1.15	1.35	0.17	1.65
Services								
Number of employees/CZ-NACE	A+B	D	F	G	H	I	K	M+N
1–19	1.50	2.53	8.63	4.26	6.79	4.30	0.66	4.09
20–99	0.45	1.17	7.39	0.14	0.70	2.02	0.40	3.99
Non-reported wages								
Number of employees/CZ-NACE	A+B	D	F	G	H	I	K	M+N
1–19	4.47	1.68	8.61	9.33	15.12	14.10	2.11	4.99
20–99	0.45	2.00	9.13	4.14	7.75	11.00	1.66	5.16
Wages as a part of other operating costs								
Number of employees/CZ-NACE	A+B	D	F	G	H	I	K	M+N
1–19	4.20	6.68	8.83	4.26	7.14	30.83	0.39	3.90
20–99	0.00	0.23	9.08	0.25	1.23	1.15	0.20	2.04

Source: GNI Inventory, CZSO

For our purposes, the most important areas are NACE – H (transport and storage), I (accommodation) and K (finance). For transport and storage (H), the degree of discrepancy between reality and national accounts is estimated for the CZSO in the following structure: Income, material, services, unrecognized wages, wages and other operating expenses broken down by number of employees.

For transport and storage, this is 21.31% of the compliance deviation for smaller businesses on revenue. For medium-sized businesses, the revenue gap is 1.75. For accommodation services, the rate of inconsistency is 1.25% for smaller businesses and 1.77% for medium-sized businesses.

The relative decline in non-registered producers is linked to the decline in small and medium-sized enterprises (businesses). Their volume objectively declines with respect to corporations. Those large companies are not the subject of a labor force sample survey. It is clear from the previous table that the area of K is very small.

The estimation of the volume of illegally registered producers was done in two steps (according to the “old” method). Firstly, we included the percentages of non-registered producers by sector based on the LFS (previous table). Secondly, unofficial unemployment was estimated on the basis of the labor market disparity (according to the average labor productivity in the sector). In 2010, the estimate of the deviation of 2.8% (full-time equivalent employees) was CZK 78,513 mn.

Table 2: Illegally unregistered producers

	Surveyed/ gross up data	Deliberately misreporting			TOTAL	% of adjustment
		1 st step	2 nd step	TOTAL		
P.1 Output	7 234 789	56 609	7 990	64 599	7 299 388	0.9%
P.2 Intermediate consumption	5 260 198	-36 791	-4 553	-41 344	5 218 854	-0.8%
B.1g Gross value added	1 974 591	93 400	12 543	105 943	2 080 534	5.4%
D.1 Compensation of employees	1 120 143	14 356	4 835	19 191	1 139 334	1.7%
Other taxes on production, net	-29 369				-29 369	0.0%
B.2g Gross operating surplus	883 817	79 044	7 708	86 752	970 569	9.8%
Employees (persons in FTE)	2 843 398	47 136	31 377	78 513	2 920 911	2.8%

Source: GNI Inventory, CZSO

The results of the “new” method were also obtained in two phases. Firstly, a comparison of general productivity and productivity that businesses achieve credibly leading accounting was made. Second, this was done again, according to labor market disparities. The results of the second method were surprising. The deviation was reported at 35.5% (CZK 103,639 mn) for employers and 13.4% (CZK 110,846 mn) for self-employed persons.

Table 3: Illegally unregistered producers – a new method

	Surveyed/ gross up data	Deliberately misreporting			TOTAL	% of adjustment
		1 st step	2 nd step	TOTAL		
P.1 Output	681 962	86 830	81 710	168 540	850 502	24.7%
P.2 Intermediate consumption	379 056	-34 476	47 032	12 556	391 612	3.3%
B.1g Gross value added	302 906	121 306	34 678	155 984	458 890	51.5%
D.1 Compensation of employees	60 778	0	12 087	12 087	72 865	19.9%
Other taxes on production, net	4 368				4 368	0.0%
B.2g Gross operating surplus	237 760	121 306	22 591	143 897	381 657	60.5%
Employees (persons in FTE)	292 267	36 366	67 323	103 689	395 956	35.5%
Self-employed persons (persons in FTE)	825 188	110 846		110 846	936 034	13.4%

Source: GNI Inventory, CZSO

The case study connected to this paper was undertaken according to correlation analysis. The “Exhaustiveness of National Accounts” document was analyzed because we tried to identify the amount of the short-term rentals in the Czech economy and moreover we tried to identify the potential gray economy increase due to the modern shared economy applications. The previous output was unsatisfactory. That is why we needed to provide an additional case study.

4 Discussion

The common feature of the shared economy is that its producers operate non-traditional provision of services, which in a large number of cases is associated with non-compliance. Here, however, it is not just about a misdemeanor in terms of financial management. It may be the absence of a taxi license for the transport of persons, violation of sanitary regulations for accommodation, or violation of the rules of order. Furthermore, the absence of a general license moves the shared economy into a gray economy. However, most shared economy areas are not socially harmful activities that should be prohibited by law (for example, prostitution or drugs).

On the contrary, a shared economy could be a reason for economic development and growth. This potential opportunity is the reason for the lukewarm approach of the European Commission or the US administration to rejecting forms of shared economy. However, many EU countries or cities are already banning Airbnb or Uber services (Berlin, Budapest or Madrid). Even in the Czech Republic, the city of Brno has banned Uber (Veber et al., 2016).

The above considerations advocate for the need to quantify both the positive and negative impacts of the shared economy on the national economy. The existence of a platform for research into the shared economy that systematically studied this complex socio-economic

entity would greatly benefit knowledge about and the potential regulation of the shared economy. Based on such studies, we could use the benefits of a shared economy while limiting its negative manifestations. Short-term rentals, for example, are provided for by the real estate registry. Property that is not permanently occupied by its owner would fall under a higher rate of property tax or be more controlled. Nowadays, many unit owner associations (SVJ) prohibit short-term apartment rentals in their statutes, which is evidence of a functioning non-public regulatory mechanism.

Here we would analyze the deployment, forms and impacts of the shared economy. In addition, we would discuss the extent to which the sharing of private persons is free of charge (or a certain threshold of financial performance), as well as business licensed or unlawful. All of these spheres of the shared economy are currently finding that there are no clear guidelines for producers and service providers, who might manage their economic affairs very differently. Finally, it should be added that the pressure from traditional producers against the shared economy is significant. It will be difficult to convince these companies of the benefits of developing a shared economy. Likewise, we must add that the shared economy is unwittingly upgraded due to customer benefits, which mainly consist in saving transaction costs.

5 CASE STUDY: Statistical evidence on short-term rent services in competition with traditional accommodation businesses

We were interested in the extent to which the increase in services through Airbnb has been accompanied by a decline in standard accommodation facilities in the Czech Republic and Prague. For comparison, we use the time series from the CZSO "Number of guests in collective accommodation establishments by category of equipment and countries in the Czech Republic" (in the structure of Hotel***, Hotel**, Hotel*, Pension) and "Number of overnight stays in collective accommodation establishments in the Czech Republic and regions (NUTS III)" (only the number of overnight stays in Prague). We avoided the luxury hotels whose clients really do not move from them to private bookings or Airbnb.

Given the nature of the "quick" analysis, we were looking at a monthly time series from May 2016 to March 2017. The elements of the time series are always percentage changes. The output of the analysis itself is therefore whether the monthly increase in the volume of Airbnb services was accompanied by a percentage increase or decrease in the services sold by the traditional providers of the accommodation (in the prescribed structure). Methodologically, we relied on a correlation analysis, which will always be presented graphically (for simplicity, we will not present the values of correlation coefficients whose interpretation corresponds to the output from the graph, but only the t-statistics and p-values). It is necessary to note that the basic tested hypothesis is H0: an absence of correlation between the time series. The most important point is the comment on the usability of the output. The correlation analysis only tells us whether there is a relationship between two variables (positive or negative), but it does not give

information in dependence. In essence, when two variables develop equally dynamically, they are correlated. All the data respond to the amount of people accommodated.

In the analysis, the data used was obtained from the CZSO database (tourism statistics) and the Airbnb database. We could not convert the values of the time series into a relative percentage change (with respect to some high percentages) by logarithmic differentiation (which would be desirable with respect to linearity assumptions in regression and correlation analysis), but we transformed them by traditional calculation. The input data for the analysis are in Table 4.

Table 4: Input data for the analysis (%)

	Airbnb	Prague overnight stay	guesthouses	hotel*	hotel**	hotel***
201605	0.066695	0.166475	0.369024	0.201752	0.253502	0.185618
201606	0.060374	-0.055009	0.055427	0.070059	-0.026194	0.006909
201607	0.076103	0.201665	0.354342	0.440766	0.365374	0.152334
201608	0.032131	0.015980	0.041740	0.004848	-0.021248	0.036133
201609	0.024694	-0.137192	-0.259010	-0.206329	-0.268041	-0.108816
201610	0.032902	-0.032569	-0.351630	-0.376687	-0.211625	-0.092840
201611	-0.016183	-0.240983	-0.254232	-0.251274	-0.347958	-0.272004
201612	0.016877	0.180648	0.001881	0.026854	0.033277	0.031137
201701	-0.020057	-0.396432	0.184208	0.358832	0.047200	-0.136340
201702	-0.012015	-0.048372	0.169771	0.048059	0.082519	0.075118
201703	0.007226	0.342281	-0.140202	-0.041302	0.052694	0.150664

Source: own calculation based on data from CZSO and Airbnb

6 Results of case study

Methodologically, we built our results on the output of the correlation analysis. We used monthly data for the last year. This was a quick pilot study case study. Moreover, we were unable to obtain a longer time series from Airbnb. The outputs are in the form of graphs. We do not associate the specific values of the correlation coefficients in this analysis in the form of correlation tables (this does not bring any more significant information than the graph itself), and only comment on the p-values in the text of the chapter itself. The commentary on the analysis will be mainly about the direction of dependence on Airbnb services (this is an indication of the month-on-month relative change in volume in Airbnb capacity in Prague) on the time series of occupied accommodation capacities (traditional in structure).

As regards the dynamics of Airbnb services in % versus the number of overnight guests in Prague in % for 2016/2017, we concluded a positive correlation observed in the time

series (Figure 1). The H0 hypothesis of no correlation was tested by the resulting t-score of 1.823758 with a p-value of 0.1015. At a 5% level of statistical reliability, we cannot reject H0. We are able to reject the assumed hypothesis with a probability of "failure" of 10.15%. Once again, we emphasize that we cannot confirm any direction of dependence. The conclusion is only a statement of the correlation status.

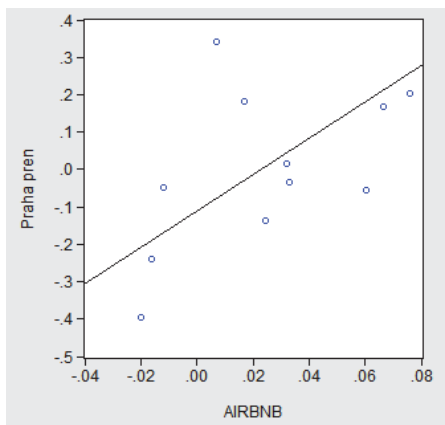
In the following consideration, we will structure the growth of services into the economy of traditional hotel service providers. Here we considered a time series of traditional accommodation capacities structured across the Czech Republic (CZSO database). We began by analyzing Figure 2, the dynamics of Airbnb services in % versus the number of overnight guests in the Czech Republic – hotel*** category in % for 2016/2017. Again, we are following a positive relationship. The strength of this relationship demonstrates a value of the t-statistics of 2.072558 with a p-value of 0.0681. The H0 hypothesis of the absence of correlation cannot be rejected at a 5% confidence level; however, we can reject H0 "failure" of 6.81% for the aggregate volume of overnight guests.

Figure 3 represents the dynamics of Airbnb in % versus the number of overnight guests in the Czech Republic – hotel** category in % for 2016/2017, providing information on the correlation in the dynamics between Airbnb and the volume occupied in Hotel**. We again observe a positive correlation in the time series investigated, although this correlation is the weakest. The output from the analysis was a t-value of 1.670131 and p-value of 0.1292. Again, we cannot reject H0 for a lack of correlation with a 5% statistical significance.

Figure 4 shows the Airbnb dynamics in % versus the number of overnight guests in the Czech Republic – Hotel* category in % for 2016/2017. Here we again see a positive correlation, which again shows a weaker strength. The correlation power was tested by a t-statistic of 0.891357 with a p-value of 0.3959. Thus, clearly, we cannot reject H0 for the absence of correlation.

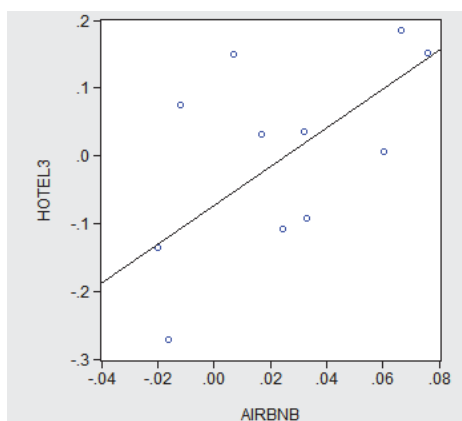
Finally, we present a correlation analysis for Airbnb dynamics in % versus the number of overnight guests in the Czech Republic – Pensions category in % for 2016/2017. The results are evident from Figure 5. In short, we see a positive correlation that is stronger than that of aggregated hotels* but not weaker than aggregated hotels**. The strength of the relationship was characterized by t-statistics of 1.247914 and p-value of 0.2436. Again, we are not in a position to reject the H0 hypothesis under the absence of a correlation between the dynamics of the Airbnb capacity and the number of guests in boarding houses.

Figure 1: Dynamics of Airbnb services in % versus number of overnight guests in Prague in % 2016/2017



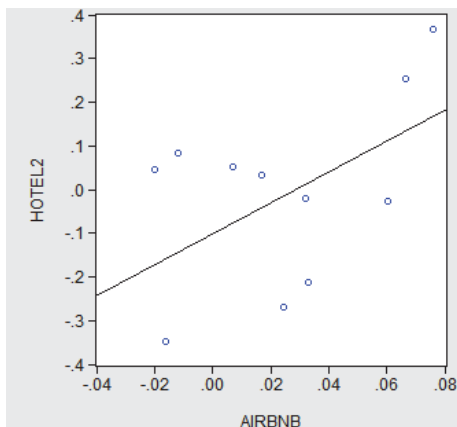
Source: own analysis in Eviews based on input data

Figure 2: Dynamics of Airbnb services in % versus number of overnight guests in the Czech Republic – hotel category*** in % 2016/2017



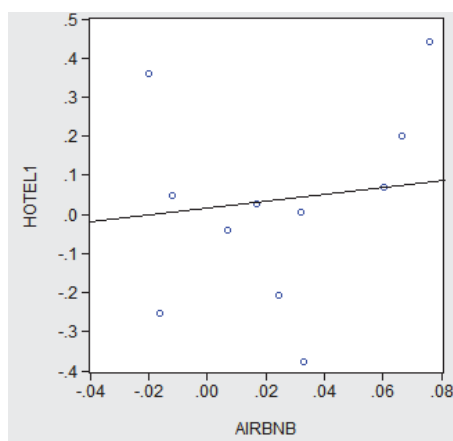
Source: own analysis in Eviews based on input data

Figure 3: Dynamics of Airbnb services in % versus number of overnight guests in the Czech Republic – hotel category** in % 2016/2017



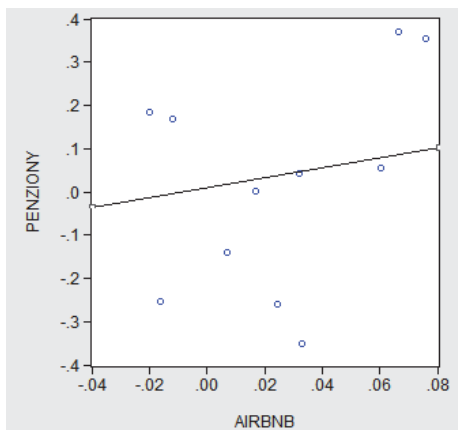
Source: own analysis in Eviews based on input data

Figure 4: Dynamics of Airbnb services in % versus number of overnight guests in the Czech Republic – hotel category* in % 2016/2017



Source: own analysis in Eviews based on input data

Figure 5: Dynamics of Airbnb services in % versus number of overnight guests in the Czech Republic – Guesthouses in % 2016/2017



Source: own analysis in Eviews based on input data

Table 5: Results of the Airbnb dynamics correlation analysis in contrast with traditional hotel providers in the Czech Republic and Prague

Airbnb	Pragueovernight stay	Guesthouses	hotel*	hotel**	hotel***
t-statistics	1.823758	1.247914	0.891357	1.670131	2.072558
p-value	10,15%	24.36%	35.59%	12.92%	6.81%

Source: own calculations based on input data

Conclusions

We have provided a case study of short-term rentals (Airbnb) in which we claimed that the interconnection between original accommodation services and short-term housing rentals is positive.

We have empirically verified that there is a positive correlation between the rate of growth of Airbnb services and the rate of growth of traditional accommodation services. So we conclude that in the Czech Republic there is no “trade off” between demand for traditional accommodation services and the “new” shared economy accommodation applications. There is no more intensive competition resulting from the option to produce in a less costly manner (except for the transaction costs). But we did observe the new market segment in the Czech time series and then the growth of the total accommodation services sector.

In addition, we have empirically verified the correlation between the rate of growth of Airbnb and the rate of growth of particular groups of accommodation services suppliers. These groups are guesthouses, hotel*, hotel**, hotel*** and “Prague stayed overnight.” The

results were that a positive correlation was observed within all the groups. The highest statistical significance of positive correlation appeared with the group Hotel***.

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