Impact of Selected Macroeconomics Variables on Tourism Demand in the Czech Republic

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Abstract: Article aims to provide an in-depth exploration of the key elements that contribute to shaping tourism demand, offering insights for practitioners, researchers, and policymakers. Tourism is a dynamic and multifaceted industry sensitive on changes. Forecast of demand in this part of tertiary sector is a key element for future. Investigation was directed to the impact of selected macroeconomic variables as the nominal exchange rate, inflation ratio, GDP per capita and renumeration of employees on tourism demand represented by number of overnights in hotels and similar accommodation. We used squared model based on Gauss-Markov theorem and our analysis encompasses a dataset covering Czech Republic, Slovakia, Germany, Austria, and Poland from 2000 to 2022. With the model we tried to evaluate the impact of inflation, renumeration of employees as well as nominal exchange rate on tourism in Czech Republic. Given the economic instability wage earnings and asset-based income are susceptible to fluctuations, consequently influencing individuals' purchasing power. The relationship between the exchange rate, inflation ratio, and tourism demand was recognized as significant whereby the statement took into the consideration share of wages and tourism industry on the GDP results.

Keywords: tourism; demand; tourists' arrivals; GDP; inflation; income

JEL Classification: L21; L26; M3

1. Introduction

Understanding tourism demand, the driving force behind the industry, is crucial for effective destination management, marketing strategies, and policy development. This scientific article delves into the intricate world of tourism demand by investigating the factors that influence consumer behavior and shape travel preferences. Drawing from established economic theories and empirical research, is presented a comprehensive analysis of the various dimensions of tourism demand, and shed light on the interplay between consumer attributes, external influences, and destination characteristics. Tourism demand encompasses the desire and ability of individuals to travel to different destinations for leisure, business, or other purposes. Black swan, as Covid-19 was, strengthen the need to predict future trends. Forecast of demand in this part of tertiary sector is a key element. The aim is to investigate the determinants of changes in Tourism demand in Czech Republic. The findings may contribute to further research endeavoring in several dimensions. Our focus is on exploring the macroeconomic determinants of tourism demand at a global level. The supply side was

not taken into consideration. Investigation is focused on three key factors: the nominal exchange rate, inflation ratio, GDP per capita as renumeration of employees per country. Evaluation of tourism demand has been based on two factors: the number of tourists, the number of overnights in hotels and similar accommodations. Our analysis encompasses a dataset covering Czech Republic, Slovakia, Germany, Austria, and Poland from 2000 to 2022. Usage of these data will lead us to conclusions about the importance of these macroeconomic variables as key factors of tourism demand.

2. Theoretical Background

Central to understanding tourism demand is the application of consumer theory, which considers how consumers make choices based on utility maximization, basically how consumer preferences, income levels, prices of goods and services, and related factors influence the decision to embark on a travel experience. Alfred Marshall in fundamental theory of microeconomics refers to the interplay between the quantity of goods or services that producers are willing to offer (supply) and the quantity that consumers are willing to purchase (demand). Marshall's scissors highlight the complex relationship between relative prices and income distribution, emphasizing that changes in prices can have varying effects on different factors of production, leading to shifts in the distribution of income within an economy. The Marshallian demand function provides a solution to the problem of maximizing consumer utility given a specific income and prices. It is also known as the uncompensated demand function because it does not involve compensating the consumer for changes in real income when prices rise, unlike the Hicksian demand function. Marshall's theory capitalizes on the idea that the demand curve reflects an individual's diminishing marginal value of a good. According to this theory, a consumer's purchasing decision hinges on the utility gained from a good or service in relation to its price. The reservation price represents the maximum price a buyer is willing to pay (WTP) or the minimum price a seller is willing to accept (WTA) for a particular good or service in the marketplace. These values reflect the potential prices at which buyers and seller age in transactions (Inoua & Smith, 2022). On macroeconomic level through perspective of Keynesian economy it has been introduced the fact that demand creates its own supply hence changes in aggregate demand cause changes in real GDP and employment.

2.1. Development Stage of the Country

Modelling of supply and demand is dependent partially on development stage of country. The measuring the relationship and correlation between tourism and country development is matter of many studies. During the period spanning the late 19th century to the mid-20th century, Modernization Theory (MT) arose as a prominent popular developmental paradigm that garnered significant attention. It is often perceived as an outgrowth of another theoretical framework known as growth theory, firmly rooted in the principles of Keynesian economics (Friedmann, 1997). Modernists framed four main theories of development and described factors influencing demand and supply: modernization, dependency, world-systems, and globalization (Reyes, 2019). Dependency theory as response on Modernization Theory,

formulated premise that, historically disadvantaged nations have been systematically denied development opportunities by wealthier and more developed countries (Willis, 2020). The theory of neoliberalism based on noneconomic and fiscal barriers became very relevant and its core principle advocates for the unrestricted movement of capital and global trade. According to neoliberal development and general modernization theories, the standard of living is measured by economic growth (Manzoor et al., 2019). Sustainable theories are going beyond economic factors and take into the consideration sustainable approach of all parties of economy. This study will concentrate on the economic determinants influencing tourism demand and its correlation with chosen macroeconomic variables.

2.2. Economic Cycle

The concept of tourism demand is based on the classic definition of demand in the economy. The specificity of tourism represents a specific product or service – in this case, we are talking about the so-called tourism product, which represents a group of mutually complementary goods and services (Song et al., 2023). Business entities in tourism make decisions about public procurement, investment, and employment based on the expected values of future demand as well as the expected consequences in the demand for tourism determinants (Jeřábek, 2019). Tourism demand is influenced by the economic cycle period and the concept of rational expectations. While major business cycle fluctuations strongly influence consumer demand for goods and services, such as in times of economic recession and boom, the response of tourism demand is not necessarily immediate and straightforward because of substitution effects between types of destinations and lags between decision making and the actual holiday (Guizzardi & Mazzocchi, 2010). An increase in tourism flow and demand can bring positive economic outcomes to the nations, especially in GDP and employment opportunities (Manzoor et al., 2019). According to data from the World Tourism Organization (UNWTO), the development of international tourism was significantly affected by the manifestations of the economic crisis in 2008. The year saw a notable slowdown in the year-on-year growth of visitor arrivals, dropping to 1.8% from 6.9% in 2007. This deceleration continued into 2009. These declines are more pronounced in the European region, as well as in Central and Eastern Europe. The implementation of lockdown measures has interrupted travel opportunities and production chains, leading to a shortage in the availability of goods and services. This disruption has coincided with individuals enduring periods of non-employment, and companies grappling with non-productive phases, resulting in a disjunction between the demand and supply dynamics resulting to a situation where demand exceeds the supply. Prior to the Covid-19 pandemic, the growth rate of the global Travel & Tourism sector outpaced the growth of the global economy for nine consecutive years. After a 50.4% fall in the contribution of the sector to the global economy, Travel & Tourism recovered by 21.7% in 2021 – Figure 1. In comparison, the global economy bounced back by 6.7%. Travel & Tourism's pace of recovery was slowed down by the spread of the Omicron variant in the second half of 2021, this forced governments to reinstate restrictions on international travel (WTTC). The impact in tourism demand of Czech Republic measured in tourists' overnights is aligned with global changes - shown in Figure 2. Length of the stay is one of the parameters which is correlating with trend weekly – Figure 3.
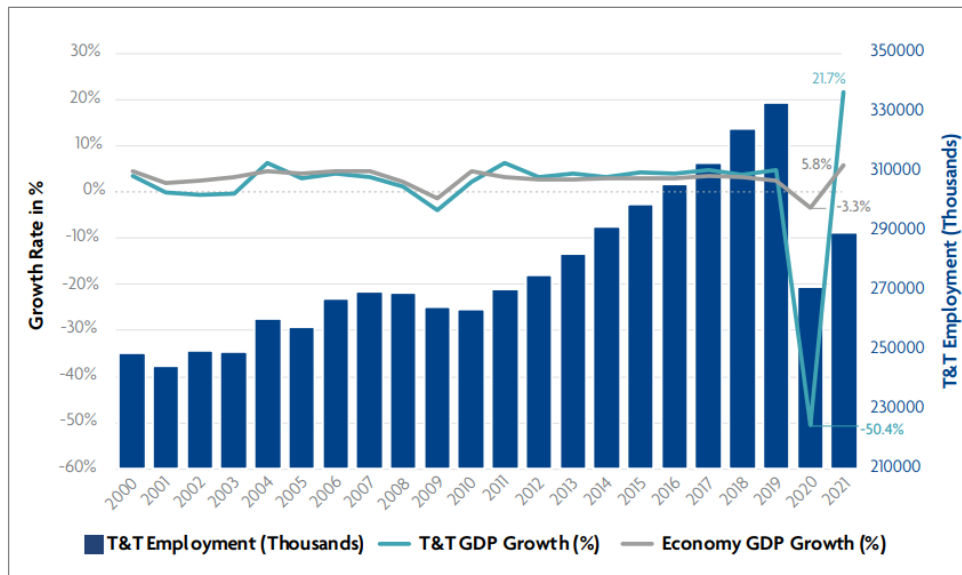
Figure 1. World Economic Impact Timeline, 2000–2021 (WTTC, 2022)
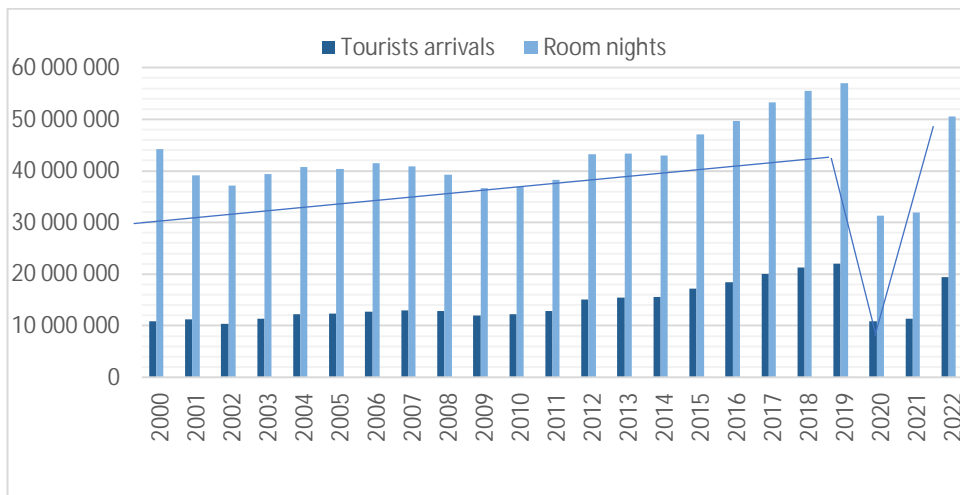

Figure 2. Arrivals and nights spent at tourist accommodation establishments Czech Republic, 2000–2022 (Eurostat, 2023b, 2023c)
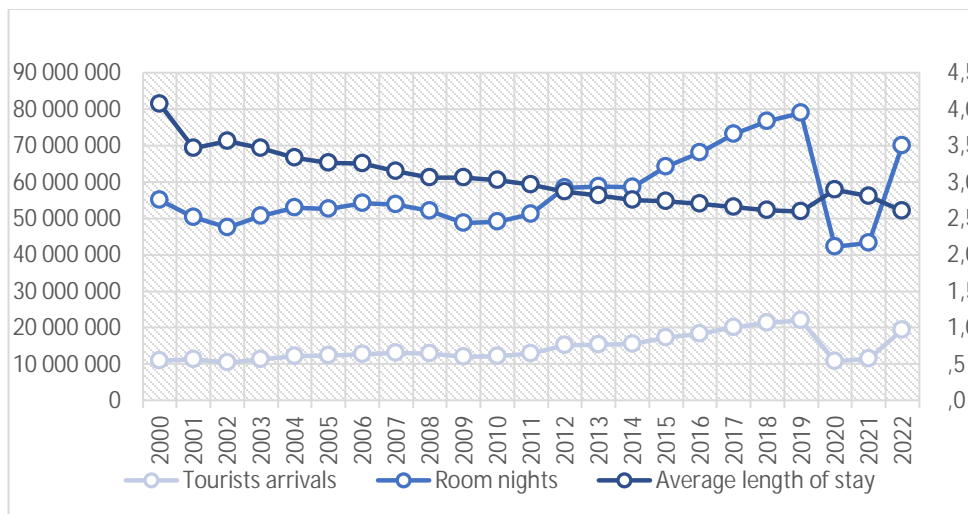

Figure 3. Average length of stay at tourist accommodation establishments in the Czech Republic, 2000–2022 (Eurostat, 2023c)

The pursuit of generating tourism demand stands as a primary goal for destinations aiming to attract visitors and maximize the advantages offered by the tourism industry. The challenge lies in understanding how to generate tourism demand (Song et al., 2023). In past studies has been proposed four criteria that can be utilized for this purpose. These criteria include: the number of arrivals; the monetary aspect, such as the amount of travel expenditure; the temporal aspect, such as the duration of stay in the destination: and the distance to the destination, which refers to the distance travelled in kilometers (Jeřábek, 2019). Factors such as technological advancements, geopolitical shifts, and environmental concerns might be potential drivers of change. Tourism spending is significantly dependent on the disposable income available to households and consequently disposal income is influenced by level of taxes and inflation ratio in the source country. There are four distinct hypotheses concerning the relationship between tourism and economic growth. Firstly, the tourism-led growth hypothesis (TLGH or TLEG) asserts that tourism plays a pivotal role in driving economic expansion. Conversely, the growth-led tourism hypothesis (GLTH or EDTG) posits that economic growth contributes to the advancement of the tourism sector. The third perspective suggests a bidirectional link between the two (bidirectional causality hypothesis – BC), while the fourth viewpoint adopts a neutral stance (no causality hypothesis – NC) (Badulescu et al., 2020).

3. Aim of the Research

The tourism sector is under the sway of two primary categories of influences: rational and irrational factors. For the scope of this research, we will intentionally omit the examination of psychological elements like trends, perception, and the sense of safety associated with the destination in question. In the literature, there are at least two classes of tourism models, those explaining the distribution of outward flows from a single source market - outbound modelling and those explaining aggregate tourism flows into a single destination - inbound modelling. (Zhou et al., 2007). The ambition of this paper is to investigate the effects that the real exchange rate, inflation ratio, GDP per capita as renumeration of employees per country have on inbound tourism demand (number of tourist and their overnights) from Germany, Austria, Poland, and Slovakia to Czech Republic over the period 2000–2022 measured in number of arrivals and overnights in hotels and similar accommodation establishments. We examine the relationship between growth of tourism demand represented by two factors: the number of tourists and overnights in hotels and similar accommodations and macroeconomic variables: the real exchange rate, inflation ratio, GDP per capita as renumeration of employees per country.

4. Data Collection and Methodology

4.1. Data Collection

To study the impact of chosen macroeconomic variables on growth of tourism demand in Czech Republic, the annual time series data from 2000 to 2022 was taken for analysis. In this study, the real exchange rate, inflation ratio, GDP per capita as renumeration of

employees per country were taken as an independent variable and the annual growth of tourism demand represented by the number of arrivals/overnights in hotels and similar accommodations were used as dependent variables. For data collection, different sources were used, i.e., Czech Statistical Office, Eurostat, MMR, World Travel and Tourism Council, and Tourism Economic Impact annual reports and used were data provided by The World Bank database. Given the limited availability and accessibility of the data, this study refers to the period 2000–2022. The data in Figure 4. - Number of guests in collective accommodation establishments by country in the Czech Republic, 2000–2022, (CZSO, 2023b), specific to various tourist-originating countries, reveals the quantity of tourists arriving from different nations and their subsequent accommodation over the period spanning 2000 to 2022. The data shows surge of visitors to Czech Republic originating from Slovakia, Poland, Germany, and Austria. Figure 5. describes Number of overnight stays in collective accommodation establishments by country in the Czech Republic, 2000–2022, (CZSO, 2023a) and provides a graphical representation of the evolution of tourist overnights by the nationalities mentioned earlier, tracing the timeline from 2000 to 2022. These figures show characteristic seasonal fluctuations commonly associated with patterns of tourism demand. During the crisis periods, there's a noticeable drop in tourist numbers, whereas a subsequent increase in visitor arrivals is evident in the post-crisis phases, commencing the year 2009 and 2022. Considering explanatory factors, the research includes considerations of income (measured by GDP per capita) and price-related variables (inflation rate specific to each country). While the income factor typically relies on quarterly GDP data, to maintain consistency in the analysis, the study opts for the Industrial Production Index (IPI) as a proxy for GDP (Jeřábek, 2019). In the context of this study, the IPI is utilized in its fundamental index form (Base 2015 = 100). Contrary to its name, the industrial production index doesn't aim to quantify production itself; rather, it theoretically mirrors the progress of value addition across various industrial sectors. To achieve this, the contributions received by one sector from another need to be subtracted from its overall output. This approach prevents duplicative counting of production, ensuring that the level of vertical integration among sectors doesn't sway the outcomes of the indicator. The price dimension of tourism is gauged using the real exchange rate (RER). This rate is defined as the ratio between the price level abroad Czech Republic and the domestic price level, wherein the foreign price level is converted into domestic currency units using the prevailing nominal exchange rate. For purpose of this study was used the Harmonised Index of Consumer Prices (HICP) as inflation indicator. This statistical estimate is subject to sampling errors because it is based on a sample of consumer prices and household expenditure, only. HICP is a set of consumer price indices (CPIs) calculated according to a harmonized approach.

4.2. Methodology

In this study, we study the impact of domestic inflation in the Czech Republic, Austria, Germany, Poland and Slovakia on the tourist activity of residents of these countries and tourists flow from these countries to the Czech Republic. The model is set to study hypothesis:
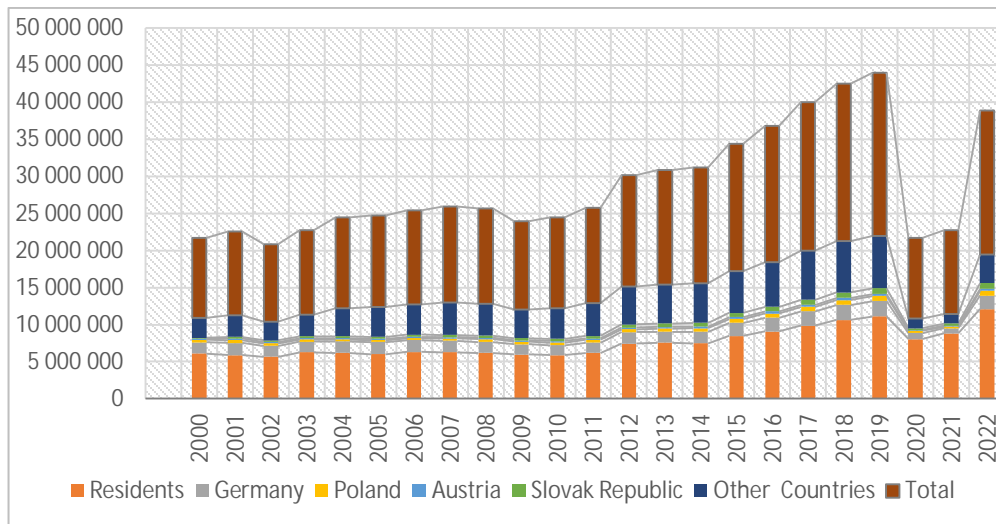
Figure 4. Number of guests in collective accommodation establishments by country in the Czech Republic, 2000–2022 (CZSO, 2023b)
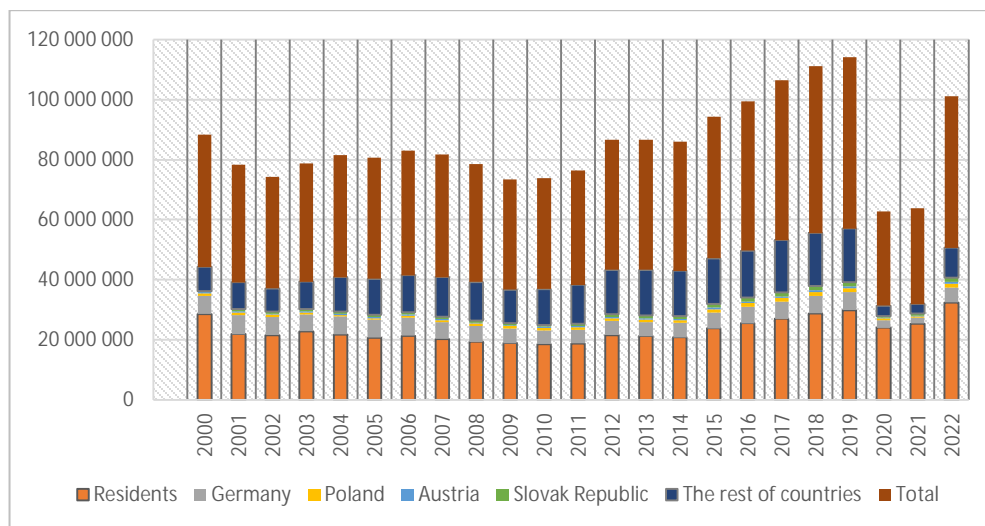

Figure 5. Number of overnight stays in collective accommodation establishments by country in the Czech Republic, 2000–2022 (CZSO, 2023a)

Hypothesis 1 (H1): There is a positive association between annual tourism demand and GDP/IPI. The higher disponible income has positive influence on tourism demand represented by number of tourists and their overnights.

Hypothesis 2 (H2): There is a negative association between annual tourism demand and inflation ratio. Higher inflation in destination negatively influences tourism demand at all, including residents.

According to the Gauss-Markov theorem, the use of the least squares method is advisable if the following conditions are met:

1. Data model X_i has the correct specification
2. $\forall X_i$ they are not equal to each other and are deterministic
3. All errors have the same variance equal to σ^2
4. All errors are not systematic $E(\varepsilon_i) = 0, \forall i$
5. Errors do not correlate with each other $Cov(\varepsilon_i, \varepsilon_j) = 0, \forall\, i, j$

There is no proof that conditions 3, 4, 5 are met for our problem, we will not use a regression model of the type in our calculations: $Y_i = \beta_0 + \beta_1 * X_1 + \beta_2 * X_2 + \cdots + \beta_n * X_n$

(1) In case of functional dependency $y = f(x)$, then ε elasticity is a quotient of the division of the relative change in function $f(x)$, on the relative change of the argument x: $\varepsilon = \frac{\Delta y}{y} : \frac{\Delta x}{x} = \frac{\Delta y}{\Delta x} * \frac{x}{y} = \frac{dy}{dx} * \frac{x}{y} = \frac{dln(y)}{dln(x)}$

(2) We used formula for finding the derivative of a parametric function, in our case, we can take time as a parameter: $\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}} = \frac{\dot{y}}{\dot{x}}$

(3) Where the dot above the variable means the time derivative. Considering (3) and (2), we can write: $\varepsilon = \frac{\frac{dln(y)}{dt}}{\frac{dln(x)}{dt}}$

(4) Initial data for calculations number of guests in Czech hotels in 2000-2022 NOG (CZSO, 2023b), Harmonized Index of Consumer Prices on 2000-2022 HICP (Eurostat, 2023a), Industrial Production Index (IPI) on 2000-2022 (Eurostat, 2023d) were used. Number of guests (NOG) characterizes the activity of tourists, HICP characterizes the rate of inflation, IPI characterizes the activity of the economy in 2020-2022.

Numerical series characterizing the natural logarithm of the number of guests in Czech hotels in 2000-2022 (NOG) in Table 1, natural logarithm Harmonized Index of Consumer Prices (HICP) in 2000-2022 in Table 2 and Industrial Production Index (IPI) in 2000-2022 in Table 3 interpolate using Fermi-Torricelli points (Yekimov, 2021).

Table 1. Natural logarithm of the number of guests in Czech hotels in 2000-2022 (NOG), Ln(NOG)

Year	Czech Republic	Germany	Austria	Poland	Slovakia
2000	62.4833	82.5	70.35	47.6167	40.5917
2001	66.6667	82.75	72.7583	47.9167	41.9667
2002	68	81.85	73.2417	48.7083	44.925
2003	70.5	82.275	74.7583	52.7917	51.8833
2004	77.075	84.775	79.25	59.2333	53.7583
2005	79.5167	87.6583	82.6167	62.1917	53.4333
2006	85.95	92.7	88.9167	69.8917	61.7667
2007	94.475	98.3167	94.2083	76.5	71.9917
2008	92.075	98.3333	95.5917	78.1583	82.8667
2009	80.1833	82.2417	84.6917	74.925	71.5333
2010	86.9333	91.1667	90.2417	83.2667	80.1167
2011	91.9333	97.8	96.3583	89.325	85.3333
2012	91.1167	97.4833	96.55	90.3667	88.1
2013	91.15	97.6083	97.0167	92.75	89.4583
2014	95.8	98.9167	97.9833	95.75	92.425
2015	100.15	99.75	100.0083	99.9917	99.9833
2016	103.1583	100.575	102.15	103.1583	103.4917
2017	110.1083	103.7167	108.0333	110.25	108.1333
2018	113.525	104.75	113.375	116.6333	114.3
2019	113.1	101.2833	113.4083	121.6417	115.15
2020	105.25	91.5917	106.75	119.0667	105.2583
2021	111.7667	95.825	118.575	136.6917	115.9833
2022	114.8	95.4917	126.9583	151.7333	111.5333

Table 2. Natural logarithm harmonized Index of Consumer Prices (HICP) on 2000-2022, Ln (HICP)

Year	Czech Republic	Germany	Austria	Poland	Slovakia
2000	4.3012458	4.37	4.3177436	4.25	4.1190914
2001	4.3455355	4.39	4.3404774	4.30	4.1881764
2002	4.3598023	4.40	4.3571574	4.32	4.2226034
2003	4.3590565	4.41	4.3700911	4.33	4.3035695
2004	4.3846274	4.43	4.3895503	4.36	4.3756417
2005	4.4001939	4.45	4.4103610	4.38	4.4031458
2006	4.4209468	4.47	4.4270896	4.40	4.4449036
2007	4.4498800	4.49	4.4488574	4.42	4.4636258
2008	4.5107679	4.52	4.4805985	4.46	4.5022327
2009	4.5167032	4.52	4.4846114	4.50	4.5114454
2010	4.5286490	4.53	4.5014102	4.53	4.5183679
2011	4.5500098	4.55	4.5363023	4.57	4.5583668
2012	4.5847123	4.57	4.5616971	4.60	4.5951030
2013	4.5985651	4.59	4.5826519	4.61	4.6096352
2014	4.6026671	4.60	4.5971548	4.61	4.6086142
2015	4.6052535	4.61	4.6051702	4.61	4.6051702
2016	4.6117319	4.61	4.6148317	4.60	4.6003419
2017	4.6356994	4.63	4.6368949	4.62	4.6141547
2018	4.6550708	4.64	4.6578733	4.63	4.6391690
2019	4.6805868	4.66	4.6726731	4.65	4.6665083
2020	4.7128281	4.66	4.6864583	4.69	4.6864506
2021	4.7453668	4.69	4.7136733	4.74	4.7142563
2022	4.8835592	4.78	4.7963414	4.86	4.8287137

Table 3. Natural logarithm Industrial Production Index (IPI) on 2000-2022, Ln(IPI)

Year	Czech Republic	Germany	Austria	Poland	Slovakia
2000	4.3012458	4.37	4.3177436	4.25	4.1190914
2001	4.3455355	4.39	4.3404774	4.3	4.1881764
2002	4.3598023	4.40	4.3571574	4.32	4.2226034
2003	4.3590565	4.41	4.3700911	4.33	4.3035695
2004	4.3846274	4.43	4.3895503	4.36	4.3756417
2005	4.4001939	4.45	4.410361	4.38	4.4031458
2006	4.4209468	4.47	4.4270896	4.40	4.4449036
2007	4.4498800	4.49	4.4488574	4.42	4.4636258
2008	4.5107679	4.52	4.4805985	4.46	4.5022327
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2012	4.5847123	4.57	4.5616971	4.60	4.5951030
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2015	4.6052535	4.61	4.6051702	4.61	4.6051702
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2022	4.8835592	4.78	4.7963414	4.86	4.8287137

The possibility of interpolation of numerical series by series of exponents was proved (Leontiev, 2017). This was implemented using the example of the numerical series of Hungary's GDP for 1992-2002 (Yekimov, 2022).

Functions are differentiated by time. Using formulas below the elasticity coefficients were determined:

$$\varepsilon_{NOG_{CZ};IPI_{CZ}}=\frac{d/dt\,(CZ\_NOG\_LN)}{d/dt\,(CZ\_IPI\_LN)} \quad \text{and} \quad \varepsilon_{NOG_{CZ};HICP_{CZ}}=\frac{d/dt\,(CZ\_NOG\_LN)}{d/dt\,(CZ\_HICP\_LN)}$$

$$\varepsilon_{NOG_{SK};IPI_{SK}}=\frac{d/dt\,(SK\_NOG\_LN)}{d/dt\,(SK\_IPI\_LN)} \quad \text{and} \quad \varepsilon_{NOG_{SK};HICP_{SK}}=\frac{d/dt\,(SK\_NOG\_LN)}{d/dt\,(SK\_HICP\_LN)}$$

$$\varepsilon_{NOG_{PL};IPI_{PL}}=\frac{d/dt\,(PL\_NOG\_LN)}{d/dt\,(PL\_IPI\_LN)} \quad \text{and} \quad \varepsilon_{NOG_{PL};HICP_{PL}}=\frac{d/dt\,(PL\_NOG\_LN)}{d/dt\,(PL\_HICP\_LN)}$$

$$\varepsilon_{NOG_{DE};IPI_{DE}}=\frac{d/dt\,(DE\_NOG\_LN)}{d/dt\,(DE\_IPI\_LN)} \quad \text{and} \quad \varepsilon_{NOG_{DE};HICP_{DE}}=\frac{d/dt\,(DE\_NOG\_LN)}{d/dt\,(DE\_HICP\_LN)}$$

$$\varepsilon_{NOG_{AT};IPI_{AT}}=\frac{d/dt\,(AT\_NOG\_LN)}{d/dt\,(AT\_IPI\_LN)} \quad \text{and} \quad \varepsilon_{NOG_{AT};HICP_{AT}}=\frac{d/dt\,(AT\_NOG\_LN)}{d/dt\,(AT\_HICP\_LN)}$$

5. Results

The results of the calculations are shown in the Figures 1., 2., 3., 4., 5.

- Elasticity coefficients $d_{NOG_{CZ}}/d_{HICP_{CZ}}$, $d_{NOG_{CZ}}/d_{IPI_{CZ}}$, $d_{NOG_{DE}}/d_{HICP_{DE}}$, $d_{NOG_{DE}}/d_{IPI_{DE}}$, $d_{NOG_{AT}}/d_{HICP_{AT}}$, $d_{NOG_{AT}}/d_{IPI_{AT}}$, $d_{NOG_{PL}}/d_{HICP_{PL}}$, $d_{NOG_{PL}}/d_{IPI_{PL}}$, $d_{NOG_{SK}}/d_{HICP_{SK}}$, $\frac{d_{NOG_{SK}}}{d_{IPI_{SK}}}$ are not constant values, but fluctuate relative to the line $\varepsilon = 0$

- Elasticity coefficients $d_{NOG_{CZ}}/d_{HICP_{CZ}}$, $d_{NOG_{CZ}}/d_{IPI_{CZ}}$, $d_{NOG_{PL}}/d_{HICP_{PL}}$, $d_{NOG_{PL}}/d_{IPI_{PL}}$, $d_{NOG_{SK}}/d_{HICP_{SK}}$, $d_{NOG_{SK}}/d_{IPI_{SK}}$ they fluctuate in different directions.

- Elasticity coefficients $d_{NOG_{DE}}/d_{HICP_{DE}}$, $d_{NOG_{DE}}/d_{IPI_{DE}}$, $d_{NOG_{AT}}/d_{HICP_{AT}}$, $d_{NOG_{AT}}/d_{IPI_{AT}}$ they fluctuate unidirectionally.
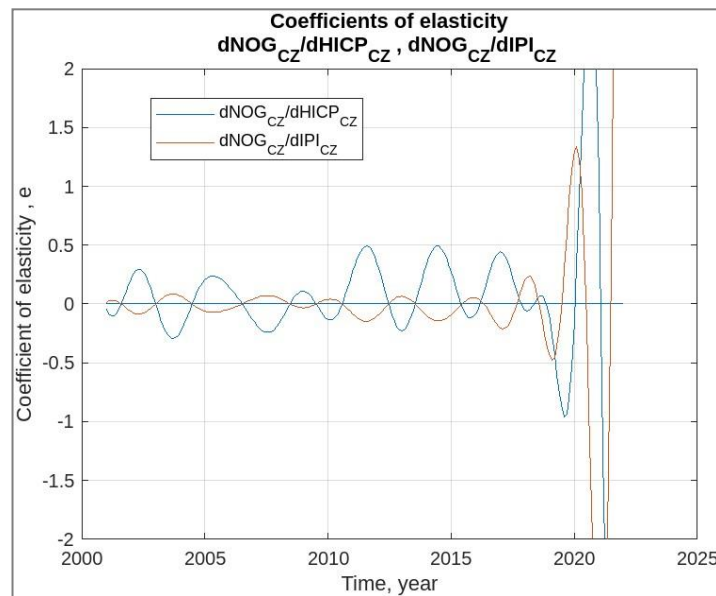

Figure 6. Coefficients of elasticity $d_{NOG_{CZ}}/d_{HICP_{CZ}}$, $d_{NOG_{CZ}}/d_{IPI_{CZ}}$
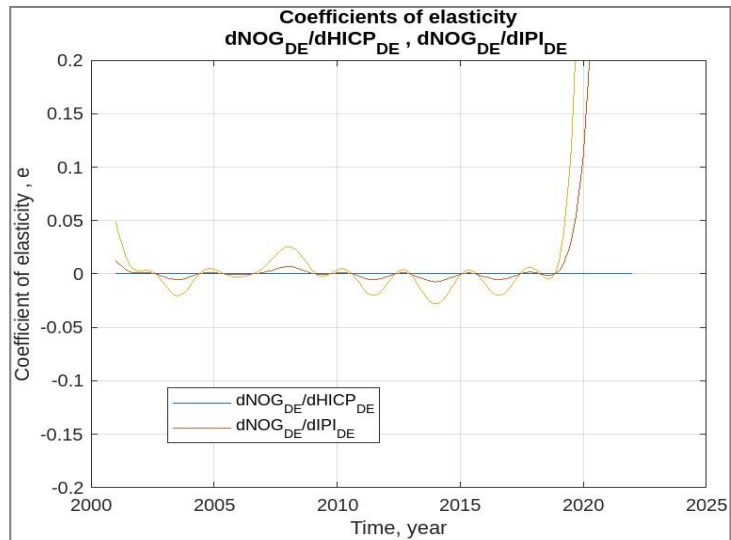
Figure 7. Coefficients of elasticity $d_{NOG_{DE}} / d_{HICP_{DE}}$, $d_{NOG_{DE}} / d_{IPI_{DE}}$
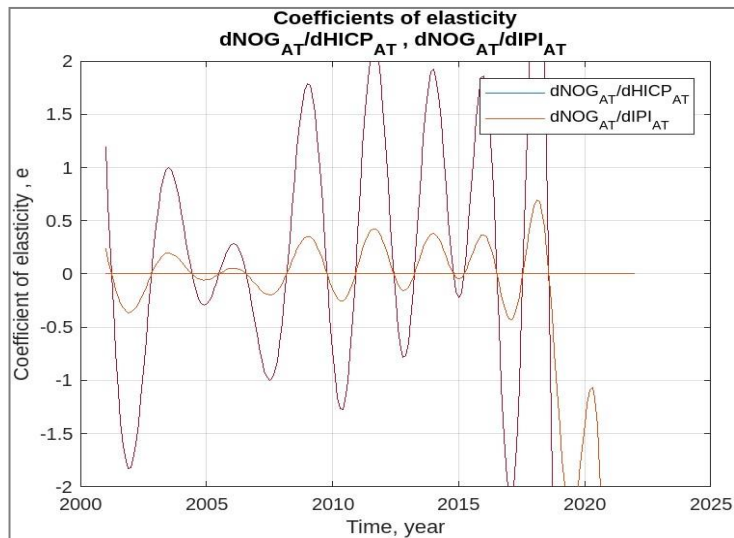

Figure 8. Coefficients of elasticity $d_{NOG_{AT}} / d_{HICP_{AT}}$, $d_{NOG_{AT}} / d_{IPI_{AT}}$
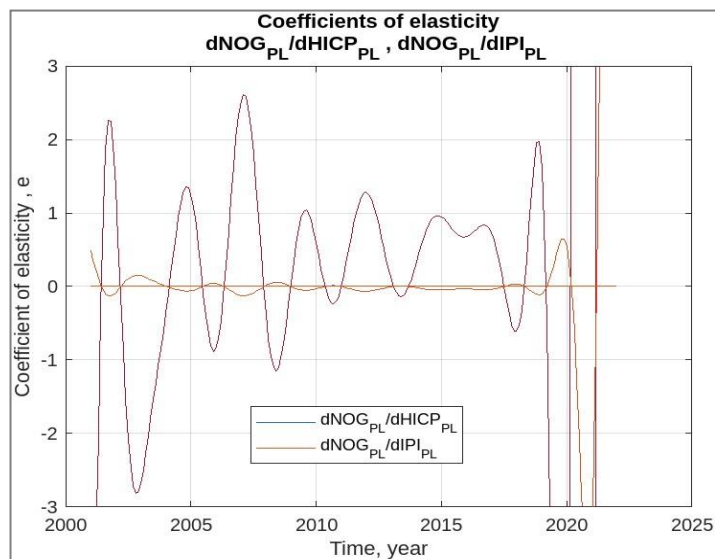

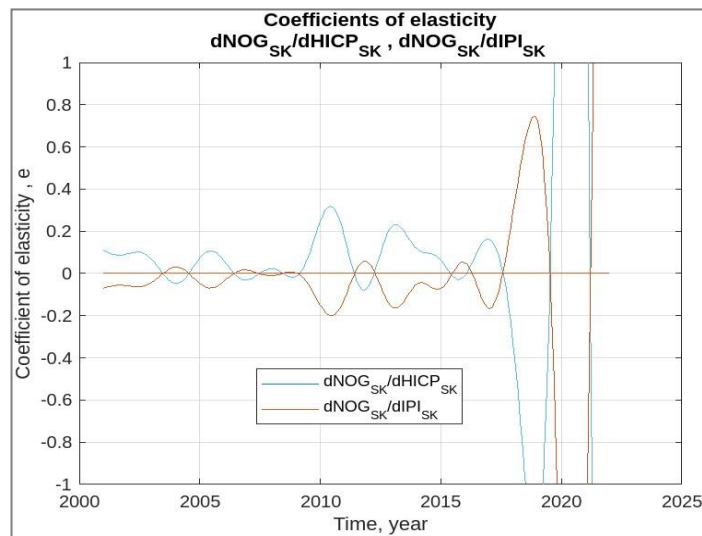Figure 9. Coefficients of elasticity $d_{NOG_{PL}} / d_{HICP_{PL}}$, $d_{NOG_{PL}} / d_{IPI_{PL}}$

Figure 10. Coefficients of elasticity $d_{NOG_{SK}} / d_{HICP_{SK}}$, $d_{NOG_{SK}} / d_{IPI_{SK}}$

The evidence of above-mentioned results supports the fact that Hypothesis 1 and 2 are more complex and we can state following:

- An increase in the rate of inflation in Poland, Slovakia and the Czech Republic reduces the number of tourists from these countries staying in Czech hotels.
- A decrease in the rate of inflation in Poland, Slovakia and the Czech Republic increases the number of tourists from these countries staying in Czech hotels.
- The increase in the rate of inflation in Germany and Austria increases the number of tourists from these countries staying in Czech hotels.
- A decrease in the rate of inflation in Germany and Austria reduces the number of tourists from these countries staying in Czech hotels.

These statements are based on a higher percentage share of wages in GDP in Germany and Austria, compared with Poland, Slovakia, and the Czech Republic shown in Figure 11. and Figure 12. Additional influencing factor is higher share of the tourism industry in the GDP in Germany and Austria, compared to Poland, Slovakia, and the Czech Republic as well as higher renumeration in Germany and Austria compared to Poland, Slovakia, and the Czech Republic. Residents of Germany and Austria have large incomes compared to residents of Poland, Slovakia, and the Czech Republic. Residents of Germany and Austria pay more for various services compared to residents of Poland, Slovakia, and the Czech Republic, at the same time, these services are of higher quality. More expensive tourist services should be of higher quality, to be able to compete. Thus, residents of Germany and Austria are used to paying dearly for a better service. The tourism industry in Germany and Austria is more developed than in Poland, Slovakia, and the Czech Republic. The exchange rate of the euro against the Czech crown has been relatively stable over the past two decades. On tourist trips, tourists pay not only the cost of staying in hotels, but their payments are related to meals in restaurants, concerts, and other entertainment events. In case of inflation rate increases in Austria and Germany, the residents of these countries prefer to enjoy their

touristic trips to the Czech Republic instead of in their homeland, since they will be able to purchase more of tourism services in comparable quality in Czech Republic than in their country of origin. In opposite case, the residents of Austria and Germany prefer higher-quality tourist services at home, therefore, the number of accommodations in Czech hotels for residents of Austria and Germany is decreasing. Residents of Poland, Slovakia, and the Czech Republic, having a lower income, prefer to save more with an increase in the rate of inflation, and this also applies to tourist services. In this case, tourists from Poland, Slovakia and the Czech Republic stay less in Czech hotels. On contrary, a decrease of inflation rate growth of residents of Poland, Slovakia, and the Czech Republic, encourages new consumer spending, among which is also the receipt of tourist services on the territory of the Czech Republic, including accommodation in Czech hotels.
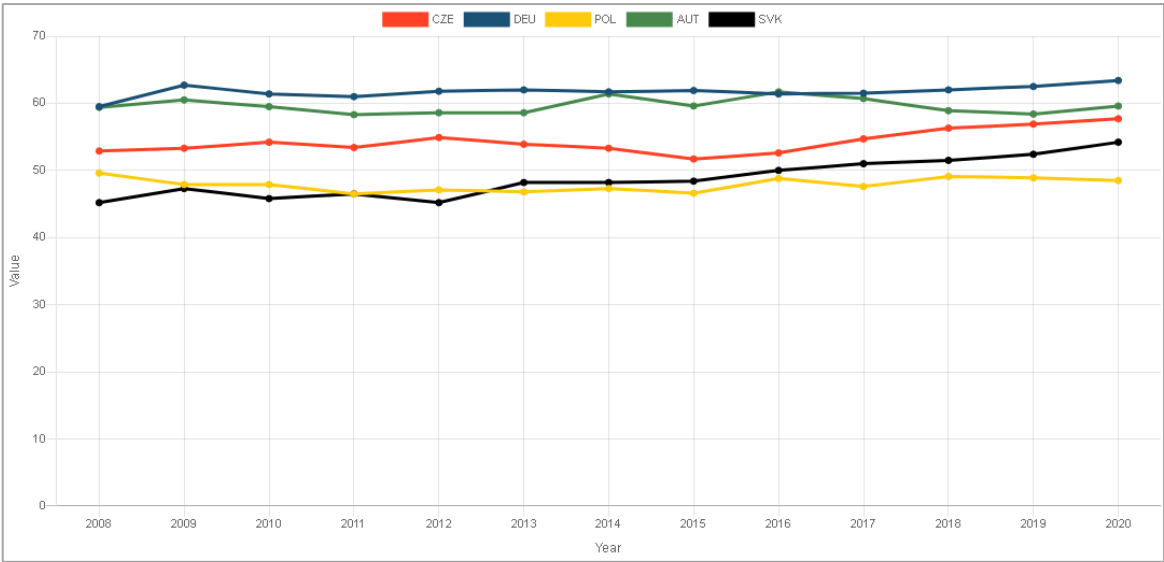

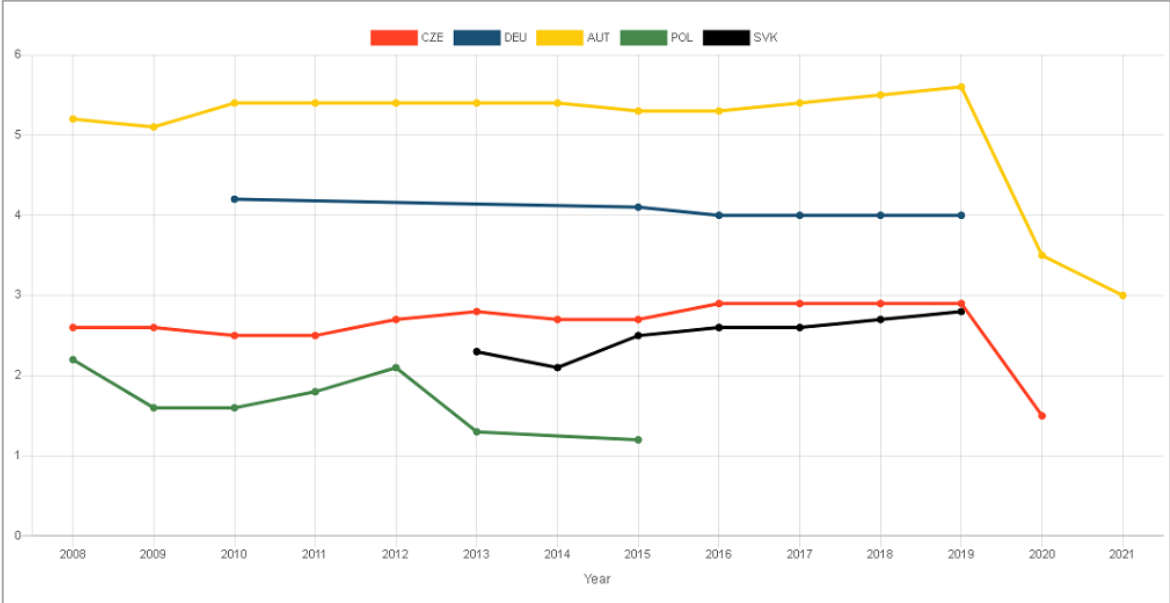Figure 11. Labor share of GDP, comprising wages and social protection transfers (UNECE, 2022)

Figure 12. Tourism direct GDP as a proportion of total GDP percentage (UNECE, 2022)

6. Comparing Results

In the following section, we examine the outcomes from the preceding subsection. Investigation was directed to the impact of selected macroeconomic variables as the nominal exchange rate, inflation ratio, GDP per capita and renumeration of employees on tourism demand represented by number of overnights in hotels and similar accommodation. Song et al. (2023) supports these findings by estimating the principal factors influencing tourism demand. They utilized data for both arrivals and expenditures as proxies for tourism demand in their analysis. Although tourism in Czech Republic garners considerable attention from local researchers and sporadically from international scholars, comprehensive investigations into the correlation between macroeconomic variables and tourism demand influencing economic growth remain relatively rare. Contemporary research employs econometric models to explore causal connections, frequently selecting number of arriving tourists or number of overnights often being chosen as the dependent variables and factors as GDP per capita, inflation ratio or exchange rate as independent variables or using empirical and descriptive methods sourcing panel data. In Babecká's study (2013), an examination of tourism demand for the Czech Republic is conducted, focusing on chosen European Union nations via a geographical gravity model. The findings of the analysis indicate a favorable impact of the gross domestic product on tourism demand. In contrast, real exchange rates demonstrate adverse effects. Indrova (2015) provides an empirical analysis of the determinants of international tourism demand to Czech Republic from 38 countries representing the largest share of all foreign arrivals into the country. The paper investigates the period between 2000 and 2012 band is based on the estimation of a dynamic panel data model which accounts for the effects of previous consumption (repeated visits). The results show that tourism demand to Czech Republic is income and price inelastic both in the short and long run (Indrova et al., 2015). Vojtko (2018) founding's in the thematic of exchange rates influence on tourism demand stated that exchange rates can be considered as one of the important determinants in tourism demand analysis especially at the national level, although sensitivity of demand to exchange rate changes may also vary by destination. A generalized linear model was used for data analysis and hypothesis testing. The results showed that there are significant differences in sensitivity of international tourism demand from Eurozone to Czech Republic (Vojtko et al., 2018). Tomáš Jeřábek (2019) investigated the effects of income as gross domestic product, tourism price as the real exchange rate, and travel cost as the price of Brent crude oil have on inbound tourism demand (tourist arrivals) from Poland, Slovakia, Germany, and Austria in the South Moravian Region of the Czech Republic. To achieve this aim, cointegration analysis under the VECM approach was applied. The study of Falk et al. (2023) investigates the short-run impact of the Covid-19 pandemic on the number of domestic overnight stays at the regional level in the summer season 2020. Official data for 65 regions in four countries for the analysis (Austria, the Czech Republic, Germany, and Switzerland). Evidence based on dynamic panel data estimations showed significant negative short-run effects of the Covid-19 pandemic on domestic tourism demand (Falk et al., 2023). The careful selection and definition of variables play a pivotal role in analytical

outcomes. Deciding between the real exchange rate and the nominal exchange rate combined with relative prices, as well as choosing between levels or per capita values, can lead to diverse results. Different choices may yield varied outcomes, and reliance on a specific model's results may result in suboptimal decision-making for policymakers. Furthermore, the choice of the variable serving as the proxy for tourism demand, whether arrivals or expenditures, is of utmost importance due to their distinct relationships with explanatory variables. In the case of Arrivals, GDP per capita emerges as the most influential factor, followed by the exchange rate and inflation. While the first variable is exogenous for most countries, it may indicate significant dependence on specific origin countries. Implementing economic policies to diversify destinations for origin countries could prove effective in reducing reliance on specific sources. Despite expenditures showing a decline, both in per capita and per GDP, policies focusing on influencing expenditures become more critical. Specifically, measures to enhance price competitiveness are crucial, strongly impact spending decisions in Czech Republic.

7. Conclusion

This work analyses the influence of some key macroeconomic determinants, such as the nominal exchange rate, inflation ratio, GDP per capita, and remuneration of employees, on tourism demand, specifically represented by the number of overnight stays in hotels and similar accommodations. To carry out this analysis, we employed a squared model based on the Gauss-Markov theorem, utilizing a dataset covering the years 2000 to 2022 and encompassing data from the Czech Republic, Slovakia, Germany, Austria, and Poland. The primary objective of our model was to assess the influence of inflation, employee remuneration, and the nominal exchange rate on tourism in the Czech Republic. Recognizing the economic instability, we considered wage earnings and asset-based income, both susceptible to fluctuations, which consequently impact individuals' purchasing power. The relationship between the exchange rate, inflation ratio, and tourism demand was identified as significant. In our analysis, we took into consideration the share of wages and the tourism industry in the GDP results, recognizing their importance in shaping the overall economic landscape. We cannot reject the hypothesis 1 of a GDP/IPI impact on annual tourism demand neither Hypothesis 2. about a negative association between annual tourism demand and inflation ratio. Results differs depending on the demand´s country of origin. An increase in the rate of inflation in Poland, Slovakia and the Czech Republic reduces the number of tourists from these countries staying in Czech hotels. A decrease in the rate of inflation in Poland, Slovakia and the Czech Republic increases the number of tourists from these countries staying in Czech hotels. The increase in the rate of inflation in Germany and Austria increases the number of tourists from these countries staying in Czech hotels. A decrease in the rate of inflation in Germany and Austria reduces the number of tourists from these countries staying in Czech hotels. There is evidence that the relationship between the exchange rate, inflation ratio, and tourism demand was identified as significant. In our analysis, we took into consideration the share of wages and the tourism industry in the GDP results, recognizing their importance in shaping the overall economic landscape. The findings

from this study contribute to a deeper understanding of the intricate dynamics between macroeconomic variables and tourism demand, offering practical insights for stakeholders involved in the planning and management of the tourism sector.

Conflict of interest: none.

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