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# ANALYSIS OF A MARITIME VERSUS A LAND-LOCKED TOURISM DEPENDENT ECONOMY: CROATIA AND THE CZECH REPUBLIC

Filip Kokotovic<sup>1</sup>

## Abstract

The relevance of tourism revenue to their respected GDP is comparable in Croatia and the Czech Republic. Aside from having comparable levels of tourism dependency in respect to the percentage of tourism revenue in GDP, there are very few significant structural similarities between the economies of Croatia and that of the Czech Republic. The simple geographic difference of a land-locked versus a maritime economy does not seem to be the most dominant feature in differentiating these two economies. Rather, through Impulse Response Functions (IRFs) and variance decompositions, this paper examines the relationship between the economic growth, public debt-to-GDP ratio, tourism revenue and the unemployment rate by implementing a Vector Autoregressive (VAR) framework. Through this framework, this paper detects structural differences between the economies of Croatia and the Czech Republic. Most notably, this paper concludes that tourism revenue is unable to combat the difficulties presented by macroeconomic imbalances in Croatia. It further concludes that Croatia should strive towards a more diversified economy and attempt to contain the difficulties it faces regarding its public debt and budget deficit.

**Keywords:** VAR, Impulse Response Functions (IRFs), macroeconomic imbalances, public debt-to-GDP ratio, sustainable growth.

*Jel Classification:* H63; Z32

## INTRODUCTION

Tourism can and should be a highly significant segment of any economy that has traits which allow it to prosper. The difference to the approaches to tourism between Croatia and the Czech Republic goes far deeper than the, perhaps obvious, difference of a land-locked versus a maritime economy. There are some differences that one can theoretically easily assume and empirically easily confirm. One such assumption would be that a maritime economy is more dependent on environmental conditions and that variation in environmental conditions are far more likely to hurt a maritime economy in comparison

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to a land-locked tourism-dependent economy. Another would be that land-locked tourism-cantered economies probably have a more balanced number of tourist arrivals throughout the years and are therefore less dependent upon favorable environmental conditions during the summer. There is sufficient research on the various impacts of climate conditions on Croatian tourism, Sverko Grdic and Kristinic Nizic (2016) even went a step further and estimated that in the next ten years there will be no significant negative outcome from the rising temperatures in the Croatian coastal area, while with the assumption of diversification it may allow the increase of tourism arrivals in the mountainous parts of Croatia.

The goal of this paper is to assess whether there are more significant structural changes in the two selected economies, that of Croatia and the Czech Republic. Rather than just analysing factors that impact tourism arrival, this paper will attempt to understand the relationship around several significant macroeconomic indicators. An interesting fact to take note of is that in the aftermath of the 2008 Global Economic Crisis, the countries that had perhaps the most lasting economic effects were the PIGS<sup>2</sup> countries. It is also interesting to note that Croatia is one of the countries that, along with the PIGS countries, has both the strongest youth unemployment rate, as well as one of the strongest growth levels of the public debt-to-GDP ratio (Eurostat 2016). The reason why this is significant is that there is clearly a pattern amongst maritime, tourism dependent economies that clearly face structural challenges in paving a way for a more balanced and sustainable economic system. This paper will examine these imbalances by using a relevant empiric approach in order to determine whether there are any differences between Croatia and the Czech Republic in regards to how tourism impact relevant economic variables. The initial hypothesis of this paper is that there will be significant differences because Croatia's constant change of its legal framework and lacking structural reforms will likely have less success in achieving a spillover effect from tourism revenue.

## 1. LITERATURE REVIEW

Altaras Penda (2015) emphasizes two highly significant points regarding Croatian tourism, primarily that politicians constantly emphasize and brand Croatia as a “tourist country” and the lack of connectivity between the tourist sector and the rest of the real sector which is most clearly seen through the fact that the CROBEXtulist index exclusively deals with the Croatian hotel industry. Bartoluci, Hendija and Petravic (2015) further emphasize the need for a diversification of Croatian tourism, especially taking note of the fact that currently there is a significant lack of emphasis on rural tourism. Mervar and Payne (2007) utilise an Autoregressive Distributed Lags (ARDL) approach in order to confirm that the when viewing the long-run effects, there is no statistical significance of transportation costs and the real exchange rate, although they emphasize that the conflict in the 1990s has had a statistically significant negative impact on the number of tourist arrivals. Pavlic, Portolan, and Puh (2017) emphasize the necessity of finding a balance between sustainable tourism activity and the satisfaction of permanent residence, which is especially problematic for cities such as Dubrovnik.

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<sup>2</sup> These countries are: Portugal, Italy, Greece and Spain.

According to Malec and Abrham (2016), who have implemented a Partial Least Squares (PLS) framework, the Czech and other central European economies are highly dependent upon the functioning of the world economy and are sensitive to significant occurrences in the international community such as the 2008 Global Economic Crisis. Heryan and Kajurova (2016) have determined, by implementing a General Method of Movements (GMM) approach, that there is a positive and statistically significant relationship from working capital towards hotels returns. Tkalec and Vizek (2016) examine the “new economies”<sup>3</sup> of the EU, by examining the relationship from the following equation:

$$PL_{it} = \alpha_1 + \beta_1 TOURISM_{it} + \beta_2 GDP_{it} + \beta_3 PRODUCTIVITY_{it} + \beta_4 EU_{it} + \beta_5 OPENNES_{it} + \beta_6 DEBT_{it} + \epsilon_{it} \quad (1)$$

PL	Price level of country
TOURISM	Measure of Tourism activity
GDP	Gross Domestic Product
PRODUCTIVITY	Productivity
EU	EU entry
OPENNES	Measure of trade openness
DEBT	Public debt-to-GDP ratio
$\alpha_1$	Constant
$\epsilon_{it}$	Error term

Based on this approach, Tkalec and Vizek (2016:106) estimate that, on average, a 1% increase of tourism dominance in the economy is associated with a 0.75% increase with the general level of prices, which led them to the conclusion that tourism dominance in the economy may have a negative impact for the overall stability and functioning of the economy of the “new EU” member-states. Lamparska (2016) emphasizes that although a transition to a sustainable tourism strategy is important, a significant aspect of that strategy could be restoration of old industrial plants in Central Europe and their restauration as tourist attractions. It is possible to conclude from the conducted literature review that there is no clear answer regarding the effect of tourism revenue, although the majority of the reviewed studies argue that a sustainable long-term tourism strategy is necessary.

## 2. METHODOLOGY AND DATA

Data was extracted from Eurostat (2016) and the World Travel and Tourism Council (2016) for the Czech Republic and Croatia for the period of 1995–2015. The purpose of the paper was to analyse how two highly different tourism dependent economies respond to impulse changes in certain variables. The variables observed are described in Table 1.

**Table 1.** Variables considered

Name of the variable	Abbreviated	Measurement	Source
Gross domestic product*	GDP	In real 2010 million euros	Eurostat
Total tourism revenue*	TOURISM	In real 2010 million euros	World Travel and Tourism Council
Unemployment rate	UNEMPLOYMENT	Percentage of total population	Eurostat
Public debt-to-GDP ratio	DEBT	Percentage of GDP	Eurostat

Note: \* these variables are in the form of their natural logarithms

<sup>3</sup> They define these member-states as the countries that have acceded to full membership in the past three instances when the EU accepted new member-states.

By analysing these variables, it will be possible to determine the effects of tourism revenue on significant macroeconomic variables. In order to conduct this analysis the first step is conducting unit root tests, in order to ensure that the variables are stationary. The stationarity of the variables is important in avoiding a "spurious" or statistically insignificant regression. The concept of stationarity essentially means that the variables have constant or "stationary" means and variances which ensures us that the results are statistically stable and significant. The tests used to ensure the stationarity of the variables will be the tests originally introduced by Dickey and Fuller (1979) and the test designed by Kwiatkowski et al. (1992).

The reason for performing two unit root tests is that it is sometimes possible for the test to falsely provide the result of stationarity and thus using two tests decreases the chances of such an outcome. The null hypothesis of the ADF test is non-stationarity and thus the value of the test statistic must reject the null hypothesis. The null hypothesis of the KPSS test is stationarity, meaning that in order to be considered stationarity, the value of the test statistic must fall within the margins where it fails to reject the null hypothesis. Upon determining the level in which the variables are stationary, a Vector Autoregressive (VAR) framework will be conducted with the primary goal of understanding the Impulse Response Function (IRF) of the observed variables to a shock of tourism. The IRF's are based on the work of Sims (1980), while the lag length will be determined based upon the information criterion originally introduced by Akaike (1974). The VAR framework can thus best be described by the following set of equations:

$$GDP_t = \alpha_0 + GDP_{t-1} + \dots + GDP_{t-n} + TOURISM_{t-1} + \dots + TOURISM_{t-n} + DEBT_{t-1} + \dots + DEBT_{t-n} + UNEMPLOYMENT_{t-1} + \dots + UNEMPLOYMENT_{t-n} + \epsilon_t \quad (2.1)$$

$$TOURISM_t = \alpha_0 + GDP_{t-1} + \dots + GDP_{t-n} + TOURISM_{t-1} + \dots + TOURISM_{t-n} + DEBT_{t-1} + \dots + DEBT_{t-n} + UNEMPLOYMENT_{t-1} + \dots + UNEMPLOYMENT_{t-n} + \epsilon_t \quad (2.2)$$

$$DEBT_t = \alpha_0 + GDP_{t-1} + \dots + GDP_{t-n} + TOURISM_{t-1} + \dots + TOURISM_{t-n} + DEBT_{t-1} + \dots + DEBT_{t-n} + UNEMPLOYMENT_{t-1} + \dots + UNEMPLOYMENT_{t-n} + \epsilon_t \quad (2.3)$$

$$UNEMPLOYMENT_t = \alpha_0 + GDP_{t-1} + \dots + GDP_{t-n} + TOURISM_{t-1} + \dots + TOURISM_{t-n} + DEBT_{t-1} + \dots + DEBT_{t-n} + UNEMPLOYMENT_{t-1} + \dots + UNEMPLOYMENT_{t-n} + \epsilon_t \quad (2.4)$$

GDP	Gross domestic product
TOURISM	Total tourism revenue
UNEMPLOYMENT	Unemployment rate
DEBT	Public debt-to-GDP ratio
t	Time
n	Lag length
$\epsilon_t$	Error term
$\alpha_0$	Constant

The lag length is determined based upon the Akaike information criterion and this empiric framework is central to the analysis of the paper.

### 3. DISCUSSION AND RESULTS

The stationarity of all the variables considered in the model is confirmed, with a summary of the conducted tests presented in Table 2. The variables are tested automatically with

the lag length determined by the Akaike information criterion. As was previously mentioned, in order for the variable to be considered stationary it must fail to reject the null hypothesis of the KPSS test and reject the null hypothesis of the ADF test. This paper requires that this is achieved at the 5% level of statistical significance in order for the variable to be considered stationary.

**Table 2.** Stationarity tests

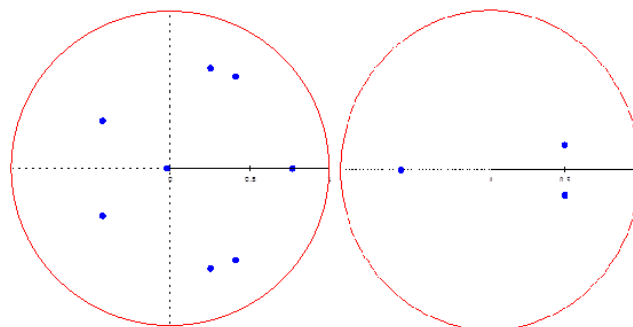
	TOURISM	GDP	UNEMPLOYMENT	DEBT
Croatia ADF t-statistic	-1.484 (0.5184)	-1.81 (0.3756)	-4.342** (0.003)	-3.689* (0.0125)
In first $\Delta$	3.4789* (0.0226)	-3.621** (0.0048)	/	/
Croatia KPSS test statistic	0.496*	0.526*	0.157	0.231
In first $\Delta$	0.209	0.128	/	/
Czech Republic ADF t-statistic	-1.781 (0.3796)	-0.6509 (0.8375)	-2.788 (0.0598)	-0.7979 (0.0018)
In first $\Delta$	-5.4802** (0.0002)	-3.102* (0.0212)	-3.765** (0.0033)	-4.1055** (0.8192)
Czech Republic KPSS t-statistic	0.6507*	0.764**	0.1901	0.746**
In first $\Delta$	0.2405	0.111	0.1785	0.082

Note: values in the parenthesis represent the p value. \* and \*\* indicate statistical significance at the respected 0.05 and 0.01 levels of significance.

As is clear from the results of the stationarity tests, for the Czech Republic the variables are stationary in their first difference. For the majority of the results of the test statistics, both of the tests conducted suggested the same result. The results for Croatia suggest that tourism and the public debt are stationary in level, while tourism revenue and GDP are stationary in the first difference. Thus, upon understanding in which level the variables are stationary, it is possible to conduct the IRFs, as well as the variance decomposition.

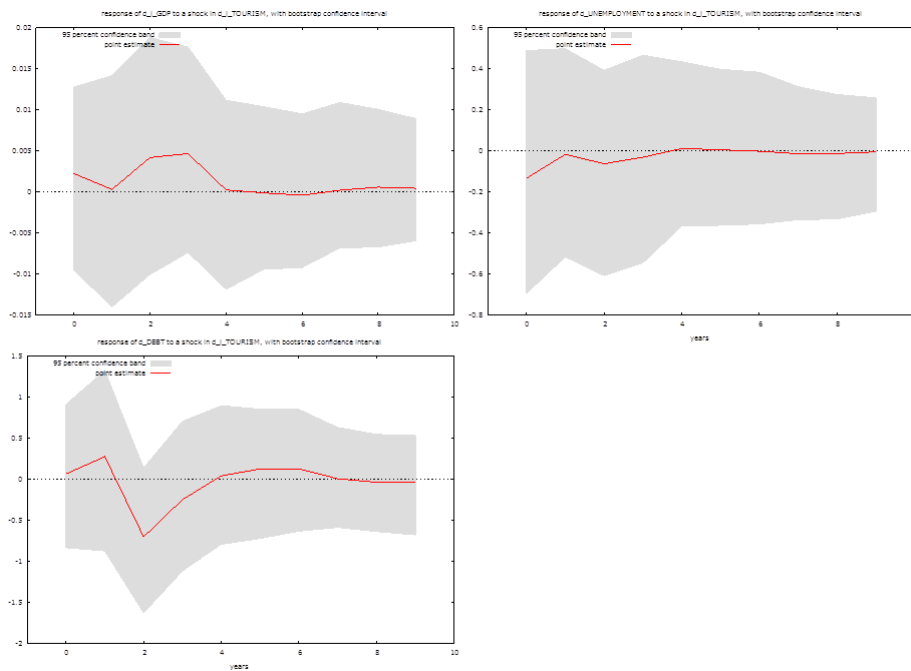
### 3.1. IRF and variance decomposition for the Czech Republic

In order to determine that the models were adequately specified, tests for autocorrelation, the ARCH effect, the normality of the distribution of the residuals and the stability of the structural stability of the parameters were conducted. The model is ideally specified, based on the Akaike criterion, at the lag length of 2. The stability of the VAR inverse roots is confirmed in Figure 1 for both models.



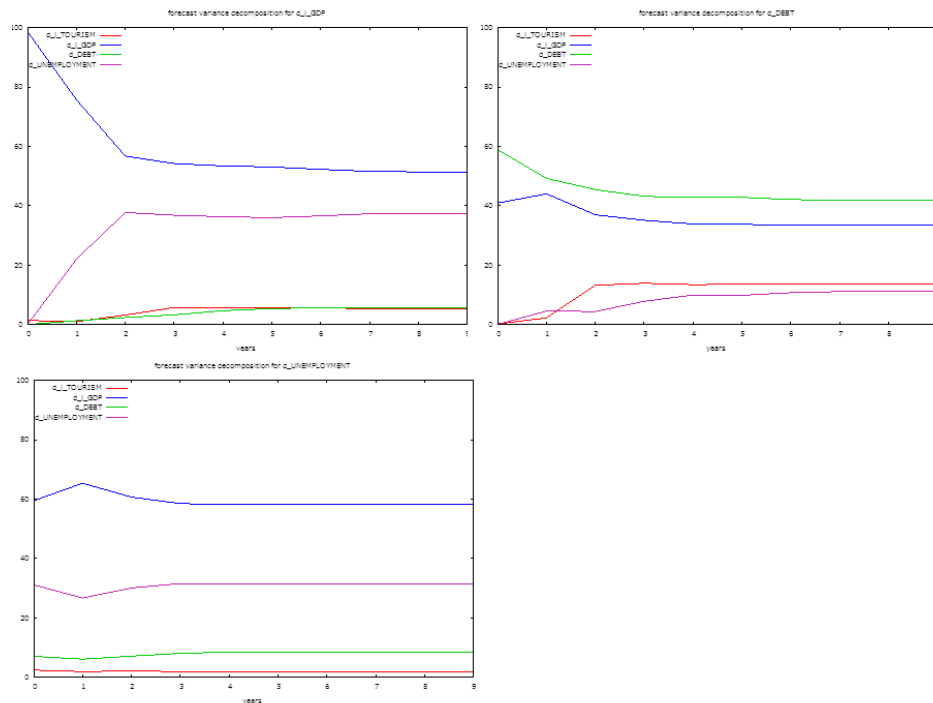
**Figure 1.** VAR models inverse roots

These results clearly confirm that the model conforms with the structural stability condition. To the left the inverse roots for the Czech VAR model are displayed, while the right model displays the inverse roots for Croatia. Upon satisfying the stability condition, the analysis further focuses on the IRF results for the Czech Republic.



**Figure 2.** IRF's for the Czech Republic

The results of the IRF's for the Czech Republic indicate that although tourism revenue does not have a very high positive impact on the economic growth of the country, there is a continuous positive trend that persists up to 5 periods after which the results of the IRFs seems to be neutral or statistically insignificant. The impact of tourism revenue on the public debt-to-GDP ratio seems to be initially negative after which it becomes statistically insignificant after several periods. The initial response of the unemployment rate to tourism revenue is just slightly positive, but negative after 2 periods and appears to be statistically insignificant in the long-term. Meaning that in the Czech Republic there is a tendency of tourism revenue to increase economic growth, decrease the public-debt-to GDP ratio, while the finding regarding the unemployment rate suggest a short-term increase which becomes negative in the medium-term and is not statistically significant in the long-term. Such conclusions are logical for an economy that, although dependent on tourism revenue, is highly diversified and has significantly managed to profit from EU membership and has a steady flow of foreign investment that aids its economic growth. This is further supported by the research of Arnold, Javorcik and Mattoo (2011), who have concluded that foreign acquisitions increased labour productivity in the Czech Republic, thus increasing the overall level of competitiveness.



**Figure 3.** Variance Decomposition for the Czech Republic

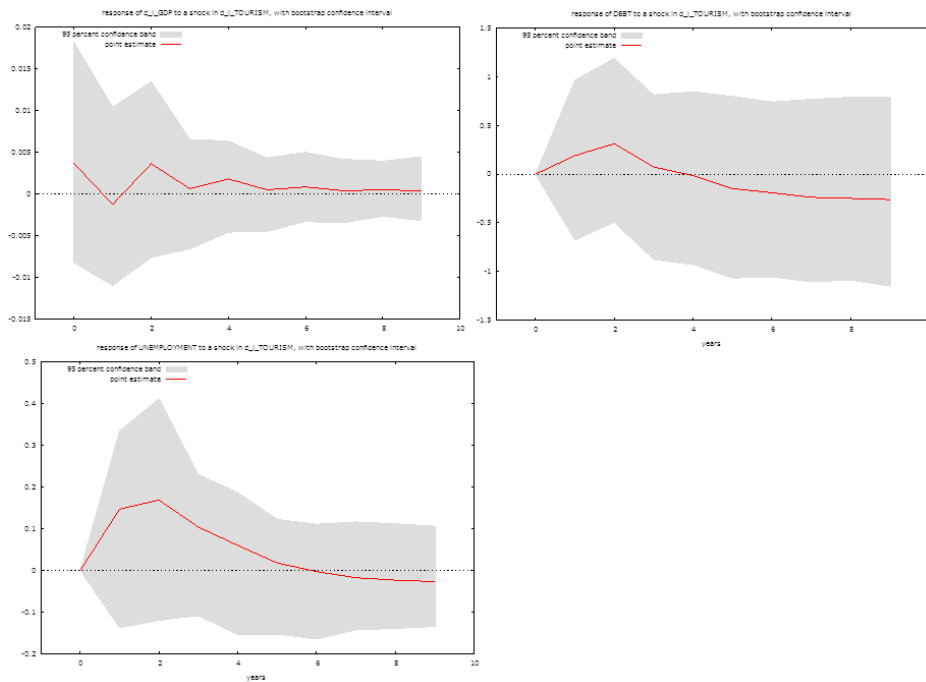
The variance decompositions, presented in Figure 2, displays that tourism revenue is equally as significant to predicting the decomposition of economic growth as the public debt is. It further suggests that mid to long term, tourism revenue can account for roughly the prediction of 15% of the variance decomposition of the public debt-to-GDP ratio. Results of the variance decomposition confirm the initial findings of the IRF that tourism revenue does not significantly predict the unemployment rate. While taking into note the findings of Malec and Abrham (2016), it would seem that Czech tourism revenue does succeed, at least to a degree, in combating negative macroeconomic trends.

### 3.2. IRF and variance decomposition for Croatia

The results for Croatia are significantly different to those of the Czech Republic and indicate potential structural differences. Notably, the impact of tourism revenue is not as strong and consistent in increasing economic growth as it was in the case of the Czech Republic. The impact of tourism revenue on economic growth tends to fluctuate far more in the case of Croatia. Further on, the initial response of the Croatian public debt-to-GDP ratio is positive, while only in the long-term does it appear to be neutral. This could have been predicted, taking into account the constant rise of the Croatian public debt-to-GDP ratio in the past 10 years, regardless of either the economic growth or any other macroeconomic indicator. Similarly, there is a persistent increase of the unemployment rate caused by tourism revenue. This is perhaps similar to the IRF for the Czech Republic,



where it is unlikely that tourism directly causes unemployment, but seems to be insignificant in containing it. Such a situation is far more important for Croatia that does not have an economy as diverse as that of the Czech Republic and that is far more dependent upon tourism revenue.



**Figure 4.** IRF's for Croatia

The results of the variance decomposition strangely suggest that tourism revenue is not highly significant to determining any of the 3 variables observed. The only time where tourism revenue predicted more than 10% of the variance response is in the case of Croatian economic growth. All of these results are presented in Figure 4.

This largely conforms to the findings of Altaras Penda (2015), that although Croatia is constantly branded as a tourist country, there are still significant aspects that it is not taking advantage of. Steps need to be taken in order to ensure that Croatia fully profits from its strong tourism potentials. These findings are also complementary to those of Bartoluci, Hendija, and Petracic (2015) which suggest that there is an obvious need to diversify the Croatian economy.

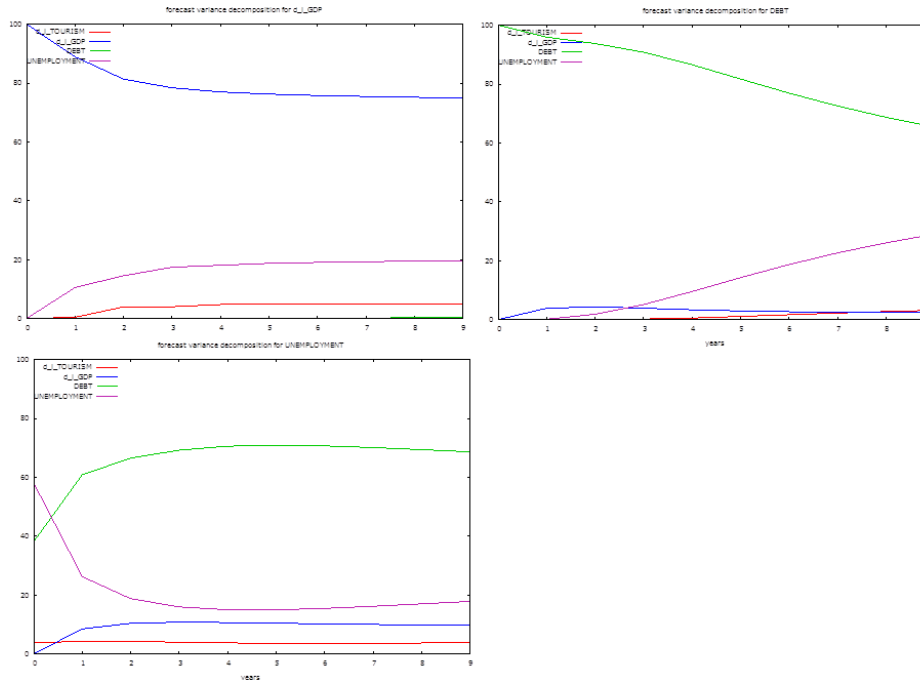


Figure 5. Variance Decomposition for Croatia

## CONCLUSION

Croatia and the Czech Republic are economies that are to a degree dependent upon tourism. Based upon the empiric results of this paper that is where the similarity of these two economies ends. Croatia seems to be unable to curb its rise of macroeconomic imbalances and tourism revenue is not helping combat neither the public debt-to-GDP ratio nor the unemployment rate. Completely different results were detected in the case of the Czech Republic where tourism revenue significantly impacts the decrease of the public debt. It is important to note that the Czech economy is far more diverse and is actually less dependent upon tourism revenue, meaning that this paper also finds evidence of structural abnormalities in the Croatian economy. This should not be perceived as a surprising fact, as Croatia is one of the economies that, aside from the PIGS countries, currently has the most negative perspective in regard to several key macroeconomic variables.

The key policy proposal is containing the Croatian public debt, as well as encouraging the diversification of the economy to make it less dependent on tourism. Aside from diversifying the economy, further steps need to be taken in order to ensure that Croatia is fully taking advantage of all of its tourism capacities and comparative advantages. While Croatian tourism revenue has constantly been rising throughout the years, there seem to be difficulties in transforming that input into the output of rising economic growth.

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