The Granger Causality Relationship between FDI, GDP and International Tourist Arrivals – Empirical evidence from 5 countries

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ABSTRACT

The study attempts to test a hypothesis and explore some additional empirical evidences of a causal relationship between International Tourist Arrivals, Foreign Direct Investment (FDI) and Economic Growth (GDP). Although tourism has been regarded as one of the most dynamic economic industries in the world, the previous studies of the causality between three variables are exceptionally rare. In order to narrow the gap of literature, this research presents a methodology for examining the causal relationship among International Tourist Arrivals, FDI and GDP in a group of European countries including Italy, Spain, Germany, Turkey and the United Kingdom. By using annual data for the period of 1980-2012, the results reveal that there is an impact of FDI and GDP on International Tourist Arrivals in Spain. Correspondently, Granger causality analysis finds out the short-run interaction between FDI and International Tourist Arrivals in Italy and Turkey as well as GDP and FDI in the United Kingdom. Major implications are discussed in the study.

Keywords: FDI, GDP, International Tourist Arrivals, Vector Auto-regression, Granger causality.
I. INTRODUCTION

Tourism has been transformed to the prevailing industry in the world for a decade (Lashkarizadeh, Gashti, & Shahrivar, 2010). In various approaches, international tourism is clearly seen to affirmatively influence on the long-term economic growth (Juan Gabriel Brida, 2009). Furthermore, an augmentation of FDI during the 1990s, especially in the developing countries, has revived a stream of literature related to how FDI affects GDP in recipient countries (Karimi & Yusop, 2009). Tourism is the fastest and largest industry in the world, particularly in Europe. For example, in Spain, an increase in tourist arrivals was reported from 52.7 million in 2010 to 56.7 million in 2011. In Italy, tourism contributes nearly 10% to the economy.

According to European Commission’s forecast (2012), real GDP will contract by 1.8% in 2012 and 0.3% in 2013. The government deficit was 8.5% of GDP in 2011 but is expected to fall to 6% in 2012. The reduction in the headline public deficit is due to the consolidation efforts undertaken by the authorities, including a partial reversal of the 2009 stimulus package.

With this intention, This research would seem to be a judicious one for the reason that it would add more practical evidences of the relationship among tourist arrivals, FDI and economic growth in five tourism destinations (Italy, Spain, Germany, Turkey and the UK).

The rest of the paper is organized as follows. Part 2 provides the relationship among GDP, FDI and ITA; part 3 introduces the methodological issues; part 4 examines the overall empirical findings of the research. Concluding remarks are provided in part 5.

II. LITERATURE REVIEW

Because the meaning of tourism in the economy and the tourism is considered as the lead to economic growth and development, an extensive literature of this topic has been utilized. Consequently, there are many publications treating the contribution of tourism to GDP, where the absolute value of tourism GDP, the share of tourism in GDP and their changes over time are argued by Archer & Fletcher, 1996, Sharpley, 2003 and Biçak & Altinary, 1996.

It is widely believed that unidirectional relationship between tourism and GDP was remarked by many researchers. First, according to Lee and Chang’s research, there is only an unidirectional relationship running from tourism towards growth for OECD countries whereas a bidirectional causality relationship exists for non-OECD countries (Lee & Chang, 2008).

Similarly, Zortuk found out the economic force of tourism on Turkey’s economy by applying co-integration method using quarterly data over the period 1990-2008, in which the
research shows the long-run equilibrium relationship between GDP and tourist arrivals. There is a unidirectional causality running from tourist arrivals to economic growth (Zortuk, 2009). Moderately, Yıldırım and Ocal, Gunduz and Hatemi-J stated that it existed unidirectional causality running from tourism towards the GDP in Turkey (Gunduz & Hatemi-J, 2005; Yıldırım & Öcal, 2004).

Likewise, Salleh conducted a study using the trade and growth variables of ASEAN countries. The result proved long-term correlation among foreign tourist arrival, trade and economic growth (Salleh, 2011).

Kim, Chen and Jang evaluated the causal relationship between tourism development and economic growth in Taiwan. A causality test which deploying co-integration method concluded the causality between tourism development and economic growth in Taiwan and results indicated existence of a long-term equilibrium relationship between tourism and economic growth in Taiwan was of mutual causal type (Kim, Chen, & Jang, 2006).

Meanfully, Wan-Chen Po and Bwo-Nung Hung implemented annual data during the period 1995-2005 in eighty eight countries. A non-linear model demonstrated the relationship between tourism and economic growth. Conducted estimation confirmed a positive and significant relationship between tourism growth and economic growth in such countries (Po & Huang, 2008).

Although there are some studies that implied no causality between tourism growth and economic growth such as Oh, 2005, Neves Sequeira & Campos, 2005. In the meantime, short term behavioral analysis explored that tourist arrival has Granger relationship with trade flow to several countries. Similarly, in the short term it is seen that growth in total trade (import and export) and foreign tourist arrival to Malaysia has unidirectional Granger cause in real income and statistically proved that international trade brings in foreign tourist arrival. The analysis indicates that there are unidirectional and bidirectional interactions among three variables in Malaysia and four Asian countries namely Indonesia, Singapore, Thailand and Brunei (Salleh, 2011).

More note-worthily, their research is found to argue on the affiliation between tourism industry development and FDI in China using quarterly time series data from 1985 to 2003. The result illustrated that there was unidirectional causal correlation from FDI to tourism; and this
study explained the rapid growth in tourism for the past decade (Tang, Selvanathan, & Selvanathan, 2007).

Opponents of relationship between GDP and FDI claim that positive one will force economic growth directly.

In addition, Mah used co-integration test to observe the causality between FDI inflows and economic growth in China during 1983-2001. Those empirical results showed that it was due to the economic reform, FDI inflows have not caused GDP, but later has caused the former (Mah, 2010).

Feridun & Sissoko used VAR and Granger causality test to analyze the relationship between GDP and FDI in Singapore. They recognized that no evidence proved GDP and FDI had a unidirectional causality running from FDI to GDP (Feridun & Sissoko, 2011).

Particularly, Argiro Moudatsou and Dimitrios Kyrkilis’s findings confirmed that economic growth of the host country motivates inward FDI in both developed and developing economies. On the contrary, both hypotheses that inward FDI supports the economic growth and that there is a bidirectional correlation between economic growth and inward FDI (Moudatsou & Kyrkilis, 2011). Furthermore, Rudra, P., & Pradhan investigated the relationship between FDI and economic growth of five ASEAN countries during the period of 1970-2007 using co-integration and causality test in both individual and panel data level. Their result suggested that foreign direct investment and economic growth was co-integrated.

Last but not least, some findings are found to be dissimilar from others. Herzer has argued that no effect of FDI on growth was found by examining 28 developing countries data. In fact, no significant unidirectional long-term effect from FDI to GDP was found (Herzer, Klasen, & Nowak-Lehmann D, 2008). In addition, Karimi and Yusop paper’s empirical findings based on the study of Toda & Yamamoto, 1995 suggested a lack of strong evidences on a bi-directional causality between GDP and FDI. According to bounds tests, there is not long-run relationship between FDI and GDP in Malaysia (Karimi & Yusop, 2009). Agrawal and Khan demonstrated that China’s growth is more affected by FDI than India’s growth and FDI is not as much significant as other variables to predict growth (Agrawal & Khan, 2011).

III. METHODOLOGY

Unit root test, Co-integration test, Optimal lag length, Vector Autoregression and Granger causality are major approaches employed in this research in order to investigate the
relationship between GDP, inflation rate and gross government debt. All variables were operated on econometric software EVIEWS 6.

3.1. Unit Root Test

The first step in this study is to investigate whether the time series data contain unit root or not. If they have unit roots, they are non-stationary. It is unquestionably important because if time series data are not stationary, the results may contain what is called a “spurious regression problem” (Granger & Newbold, 1974). The spurious regression has a high $R^2$ and t-statistics appear to be significant, but the results do not have any economic meaning (Enders, 2008). If the data have unit roots, then all the usual regression results might be misleading and incorrect (Koop, 2008). The regression result is likely to be accepted because the least-squares estimates are not consistent and the customary tests of statistical inference do not hold (Enders, 2008). A regression of variables should never been done if they contain unit root (Koop, 2008). With no doubt, it is required to verify whether the data series is stationary or not before examining the correlations among series to avoid the problem of the spurious regression.

Numerous tests have been suggested to perform in order to inspect whether the data series contains unit root or not. The Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1979) and Phillips-Perron (PP) (Phillips & Perron, 1988) unit root tests are generally used in most researches.

According to Greene (2003), the hypothesis to be examined with unit root test is presented below:

$H_0$: There is a unit root (data series are non-stationary)

$H_1$: There is no unit root (data series are stationary)

The unit root hypothesis for non-stationarity was examined using ADF and PP test which both depend on the structure of model (with or without trend and drift). If the $H_0$ is accepted, the series contain unit root and are non-stationary. Transforming non-stationary data to a stationary one could be done by taking difference of the data from the first lag. If a series in level form is non-stationary and its first difference is stationary, this series has integration order of 1, I (1), and the difference would be I (0). The integration order informs how many times the data need to be differenced to become stationary. Once the data are differenced, then become stationary, the data are ready to proceed with regression analysis.
Three different assumptions regarding stationary of time series of the ADF test are examined as follows.

Model I: Trend and drift (Trend $T$ and drift $\mu$ are included in the model)

$$\Delta Y_t = \mu + \rho_0 Y_{t-1} + \eta T + \sum_{t=1}^{p} \rho_t \Delta Y_{t-1} + \varepsilon_t$$

Model II: Drift (Only a drift $\mu$ is included in the model)

$$\Delta Y_t = \mu + \rho_0 Y_{t-1} + \sum_{t=1}^{p} \rho_t \Delta Y_{t-1} + \varepsilon_t$$

Model III: Neither trend nor drift (Neither trend $T$ nor drift $\mu$ are included in the model)

$$\Delta Y_t = \rho_0 Y_{t-1} + \sum_{t=1}^{p} \rho_t \Delta Y_{t-1} + \varepsilon_t$$

Where $Y_t$ is the observation of the data series. In our case, $Y_t$ may represent GDP, inflation or government debt; $\Delta Y_t$ is the first difference of the variable $Y_t$; $\mu$ is intercept; $t$ is trend; $\rho_0$ and $\rho_t$ are coefficients; $p$ is optimal lag length and $\varepsilon_t$ is residual.

Regarding to Enders (1995), the distribution theory supporting the ADF test assumes that the errors are statistically independent and have a constant variance. To employ the ADF test, it is essential to make certain that the error terms are uncorrelated and have constant variance. Phillips and Perron (1988) built up a statistics test which was a modification of the ADF $t$-statistics method agreeing with moderately mild assumptions concerning the distribution of errors. The PP test can be applied to similar mixed procedure as the ADF test.

Comparable to the ADF process, the regression equations of the PP test are presented as below (Enders, 1995):

Model I: Trend and drift (Trend $T$ and drift $\mu$ are included in the model)

$$y_t = \mu + \bar{\alpha}_0 + \bar{\alpha}_1 y_{t-1} + \eta T + \bar{\alpha}_2 \left( t - \frac{Y}{2} \right) + \varepsilon_t$$

Model II: Drift (Only a drift $\mu$ is included in the model)

$$y_t = \mu + \bar{\alpha}_0 + \bar{\alpha}_1 y_{t-1} + \bar{\alpha}_2 \left( t - \frac{Y}{2} \right) + \varepsilon_t$$

Model III: Neither trend nor drift (Neither trend $T$ nor drift $\mu$ are included in the model)

$$y_t = \bar{\alpha}_0 + \bar{\alpha}_1 y_{t-1} + \bar{\alpha}_2 \left( t - \frac{Y}{2} \right) + \varepsilon_t$$
Where $\gamma$ is the number of observations. While the ADF assumes that residuals are independent and homogenous, the PP test supposes that the residual terms are imperceptibly dependent and heterogeneously distributed (Enders, 1995).

This paper applies ADF and PP approach to test GDP, inflation and government debt series separately.

3.2. Co-integration Test

Co-integration method has been developed by Granger (1969) as a tool in order to investigate a long term equilibrium relationships among variables. Later on, Engle and Granger (1987) formed a linear combination of two or more non-stationary series that might be stationary. If such a stationary linear combination exists, the series are considered to be co-integrated and long run equilibrium relationships among them exist. Because of the existence of co-integration, although the series are individually non-stationary, they cannot spread away from each other permanently. Co-integration implies the causality exists between the two variables, but it does not indicate the direction of the causal relationship. The presence of co-integration among the variables rules out the possibility of “spurious regression” (Belloumi, 2009). There are various techniques to test co-integration such as Engle and Granger approach, Johansen approach, ARDL bounds testing approach and Gregory, and Hansen approach (Pesaran, Shin, & Smith, 2001). However, the estimation of variables with ADRL provides very similar result with estimation with co-integration approach (Bentzen & Engsted, 2001).

This paper applied multivariate co-integration approach to examine whether GDP, inflation and government debt have long run equilibrium interaction. Multivariate co-integration test was employed with five different models. If the series do not have co-integration and no long run equilibrium relation among time series, VAR model is applied to measure Granger causality effect. In contrast, if there is equilibrium interrelation among the time series, VECM is used to examine Granger causality.

3.3. Optimal Lag Length Test

For robust estimation of VAR or VECM, optimal lag length is compulsory to capture autoregressive correlation in residuals of the estimated model (Schwert, 1987). The proper optimal lag length should be determined in order to avoid the error as much as possible since Lütkepohl (1993) explained that over fitting (selecting a higher order lag length than the true lag
length) causes an increase in the mean-square forecast errors as well as under fitting the lag length often generates auto correlated errors.

The number of lagged terms is chosen to ensure that the errors are uncorrelated. The number of lags is crucial. If not enough lags are included in the model, the model could contain serial correlation and it would provide biased estimators.

To determine the suitable optimal lag length: the Akaike’s information criterion (AIC), Schwarz information criterion (SC) or Bayesian Information Criterion (BIC), log-likelihood ratio test (LR) Criterion, and the Hannan-Quinn information criterion (HQ). However, two most popular methods are AIC and SC. Their rationales are similar. VAR or VECM with the optimal lag length will make the estimated model have higher explanatory power than using the other lag lengths. The smallest AIC and SC are can be applied for choosing the most efficient and accurate optimal lag length. Hence, this research determines optimal lag length by employing these two criteria AIC and SC.

According to Greene (2003), AIC and SC measures are presented as below:

\[
AIC = \ln|\hat{\Sigma}| + \frac{2}{T} \text{ (Number of freely estimated parameters)}
\]

\[
SC = \ln|\hat{\Sigma}| + \ln \frac{T}{T} \text{ (Number of freely estimated parameters)}
\]

Where \(\hat{\Sigma}\) is the estimated covariance matrix and \(T\) is the number of observations.

3.4. Vector Autoregression

VAR model is an alternative to the large scale macro econometric models. Since it was first introduced, the methodology has gained widespread use in applied macroeconomic research. VAR is facilitated to capture both the dynamic and interdependent relationships among variables.

Based on previous theory, traditional regression model assumes that dependent variable is affected by independent variables, but independent variables may be not affected by a dependent variable (Sims, 1994). However, it is sometimes difficult to point out that one variable in the model is dependent or independent. Therefore, VAR model was proposed for quantitative economic study. The main characteristic of VAR model is to assume all the economic variables to be endogenous variables. By choosing optimal lag length of explanatory variables based on
data, the explanatory variables with appropriate lag length in the model will cover all the related information and better explain the endogenous variable.

According to Koop (2008), the VAR model of order $p$ or VAR ($p$) has three variables $X$, $Y$, $Z$ is presented as follows:

$$Y_t = \alpha_1 + \delta_1 t + \rho_{11} Y_{t-1} + \cdots + \rho_{1p} Y_{t-p} + \beta_{11} X_{t-1} + \cdots + \beta_{1p} X_{t-p} + k_{11} Z_{t-1} + \cdots + k_{1p} Z_{t-p} + \varepsilon_{1t}$$

$$X_t = \alpha_2 + \delta_2 t + \rho_{21} Y_{t-1} + \cdots + \rho_{2p} Y_{t-p} + \beta_{21} X_{t-1} + \cdots + \beta_{2p} X_{t-p} + k_{21} Z_{t-1} + \cdots + k_{2p} Z_{t-p} + \varepsilon_{2t}$$

$$Z_t = \alpha_3 + \delta_3 t + \rho_{31} Y_{t-1} + \cdots + \rho_{3p} Y_{t-p} + \beta_{31} X_{t-1} + \cdots + \beta_{3p} X_{t-p} + k_{31} Z_{t-1} + \cdots + k_{3p} Z_{t-p} + \varepsilon_{3t}$$

Where $X_t, Y_t, Z_t$ correspondingly represent for three dependent variables GDP, inflation and government debt; $\alpha$ is intercept; $t$ is trend; $\rho, \beta$ are coefficients; $p$ is optimal lag length and $\varepsilon_t$ is residual.

### 3.5. Granger Causality

Granger Causality, a statistical hypothesis test, verifies whether one time series is capable of forecasting another (Granger, 1969). Granger causality becomes a powerful tool to investigate the causal effect and functional relation from numerous temporal data which are easy to source today (Luo et al., 2011).

An underlying assumption of Granger causality is that a variable $X$ Granger causes $Y$ if $Y$ can be better predicted using the histories of both $X$ and $Y$ than it can use the history of $Y$ alone. Engle and Granger (1987) explained that if co-integration exists between two variables in the long run, and then there must be either unidirectional or bi-directional Granger Causality between these two variables. As mentioned earlier, if they have one unit root and are co-integrated, then the bivariate VECM is specified and estimated. The Granger causality test is then conducted in the context of the VECM. If the two series have one unit root and are not co-integrated, then the bivariate VAR is specified and estimated. However, in this study, only short run causal relationship was detected, hence, VECM will not be introduced.

**IV. EMPIRICAL ANALYSIS**

**4.1. Data sources**
The time series data of three variables applied in this study cover historical statistics period from 1980 to 2012 which conducted by from Immigration Department of Spain, Italy, Germany, United Kingdom and Turkey, World Bank and World Tourism Organization updated on October 2012 for tourist arrivals, foreign direct investment and Gross Domestic Product. The data length was determined based on the availability of the data values at the time of this research started. All variables were conducting on annual basis which GDP is measured by million US dollar. International tourist arrival is measured by mount of tourism visitors, million people; foreign direct investment is measured by FDI inward, million US dollar. Their trend plots are shown in those figures below.

4.2. Non-stationary and Stationary Test

The ADF tests suggest the existence of unit root or non-stationary in level or I(1) for three variables during the period 1980-2012 in Spain, Italy, Germany, United Kingdom and Turkey. The findings that all variables have a different order of integration allowed us to directly test VAR Granger causality

Notes:*: significant at 10%; **: significant at 5%; ***: significant at 1%;

a: Both drift and time trend is included in the unit root test;
b: Only drift is included in the unit root test;
c: Neither drift nor trend is included in the unit root test

Table 1: Unit root test for Italy

<table>
<thead>
<tr>
<th></th>
<th>Level</th>
<th>1st difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADF</td>
<td>PP</td>
</tr>
<tr>
<td>IT_FDI</td>
<td>0.0098b***</td>
<td>0.0098b***</td>
</tr>
<tr>
<td>IT_GDP</td>
<td>0.5669a</td>
<td>0.4663a</td>
</tr>
<tr>
<td>IT_ITA</td>
<td>0.2254a</td>
<td>0.2254a</td>
</tr>
</tbody>
</table>

The results of Italy in table 1 showed that only FDI demonstrates stationary feature at level. While GDP and ITA are experiences non-stationary with p value than 1% significant at Level. However, they still keep stationary at the first differences (all values less than 1% significant level).

Table 2: Unit root test for Spain
FDI of Spain acquired stationary features right at Level order. On the contrary, Spain’s ITA and GDP were checked non-stationary with p value greater than 1% significant in level but achieved stationary at first different with p value less than 1%.

**Table 3: Unit root test for Turkey**

<table>
<thead>
<tr>
<th>Level</th>
<th>1st difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADF</td>
</tr>
<tr>
<td>SP_FDI</td>
<td>0.0100a***</td>
</tr>
<tr>
<td>SP_GDP</td>
<td>0.0133a</td>
</tr>
<tr>
<td>SP_ITA</td>
<td>0.2359a</td>
</tr>
</tbody>
</table>

GDP and ITA in Turkey were shown non-stationary with p value bigger than 10% at level, However, they brought about stationary at first different at p value smaller than 1%. Beside, FDI’s Turkey reached no unit root when it stayed at level.

**Table 4: Unit root test for United Kingdom**

<table>
<thead>
<tr>
<th>Level</th>
<th>1st difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ADF</td>
</tr>
<tr>
<td>UK_FDI</td>
<td>0.7134a</td>
</tr>
<tr>
<td>UK_GDP</td>
<td>0.0952a</td>
</tr>
<tr>
<td>UK_ITA</td>
<td>0.0061a***</td>
</tr>
</tbody>
</table>
It is obvious that FDI and GDP in United Kingdom were pointed out non-stationary at level while both of them were emphasized at first different with p-value smaller than 1%. On the contrary, International tourist arrival was confirmed stationary at level with trend and constant

**Table 5: Unit root test for Germany**

<table>
<thead>
<tr>
<th>Level</th>
<th>1st difference ADF</th>
<th>1st difference PP</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE_FDI</td>
<td>0.0035b***</td>
<td>0.0035b***</td>
</tr>
<tr>
<td>GE_GDP</td>
<td>0.0136a***</td>
<td>0.0365a***</td>
</tr>
<tr>
<td>GE_ITA</td>
<td>0.9911a</td>
<td>0.9999a</td>
</tr>
</tbody>
</table>

This table indicated that Only ITA did not gained stationary at Level. FDI and GDP of Germany dispatched no unit root at Level with p-value smaller than 1% and 5%. ITA strongly procured stationary at 1st difference with p value approximately 0.0014 which was less than 1%

### 4.3. Optimal lag length

The unit root tests are sensitive to different lag structure. The optimal lag length model must determined to capture autoregressive time series and a residual in the process of ADF unit root test (Schwert, 1987). In this paper, if both results AIC and SIC are the optimal lag length of time series, the result of SIC is chosen because it is more accurate than that from AIC based on the principal parsimony.

With AIC, SIC, LR and HQ criteria model, the results of optimal lag length of the ADF test are all in the second period for GDP, FDI and EC time series of Spain

* indicates lag order selected by the criterion

AIC is Akaike information criterion

SIC is Schwartz Bayesian information criterion

**Table 6: The optimal lag length of ADF test for GDP, FDI and ITA time series of Italy**

<table>
<thead>
<tr>
<th>Criteria model</th>
<th>Lag 0</th>
<th>Lag 1</th>
<th>Lag 2</th>
<th>Lag 3</th>
<th>Lag 4</th>
<th>Lag 5</th>
<th>Lag 6</th>
<th>Lag 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT_AIC</td>
<td>134.75</td>
<td>135.06</td>
<td>135.19</td>
<td>135.67</td>
<td>135.82</td>
<td>135.39</td>
<td>135.14</td>
<td>133.09</td>
</tr>
</tbody>
</table>
Optimal lag length of Italy will be displayed in this table. The outcome spectacled distinctive site of AIC and SIC, AIC faired smallest product at lag 7 with value equal to 133.0964, while SIC paraded at lag 0 which closed to 134.9010. It means lag 7 was suitable choice with Italy.

**Table 7: The optimal lag length of ADF test for GDP, FDI and ITA time series of Spain**

<table>
<thead>
<tr>
<th>Criteria model</th>
<th>Lag 0</th>
<th>Lag 1</th>
<th>Lag 2</th>
<th>Lag 3</th>
<th>Lag 4</th>
<th>Lag 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP_AIC</td>
<td>135.7403</td>
<td>135.4989</td>
<td>135.8202</td>
<td>135.8780</td>
<td>135.8761</td>
<td>134.0906*</td>
</tr>
<tr>
<td>SP_SIC</td>
<td>135.8843*</td>
<td>136.0748</td>
<td>136.8280</td>
<td>137.3178</td>
<td>137.7478</td>
<td>136.3943</td>
</tr>
</tbody>
</table>

This table shows different results of optimal lag length for Spain. AIC has the smallest number at lag 5 equal to 1340906*, while SIC has the smallest figure at lag 0 equal to 135.8843. In the other word, Lag 5 is the best choice for Italy.

**Table 8: The optimal lag length of ADF test for GDP, FDI and ITA time series of Turkey**

<table>
<thead>
<tr>
<th>Criteria model</th>
<th>Lag 0</th>
<th>Lag 1</th>
<th>Lag 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>TU_AIC</td>
<td>131.3472</td>
<td>129.9057*</td>
<td>130.2524</td>
</tr>
<tr>
<td>TU_SIC</td>
<td>131.4873</td>
<td>130.4662*</td>
<td>136.8280</td>
</tr>
</tbody>
</table>

This table demonstrates that AIC and SIC criterion crucially brought the same result of optimal lag length. Both AIC and SC had the lowest selected value at lag 1. AIC has the smallest value equal to 129.9057 and SC has the one equal to 130.4662. As a result, lag 1 was the most suitable lag for further VAR and Granger causality investigation in Turkey’s case.
Table 9: The optimal lag length of ADF test for GDP, FDI and ITA time series of United Kingdom

<table>
<thead>
<tr>
<th>Criteria model</th>
<th>Lag 0</th>
<th>Lag 1</th>
<th>Lag 2</th>
<th>Lag 3</th>
<th>Lag 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK_AIC</td>
<td>140.6463</td>
<td>137.3177</td>
<td>137.2189</td>
<td>137.4743</td>
<td>136.1045*</td>
</tr>
<tr>
<td>UK_SIC</td>
<td>140.7890</td>
<td>137.8887*</td>
<td>138.2180</td>
<td>138.9017</td>
<td>137.9601</td>
</tr>
</tbody>
</table>

The development of this table in United Kingdom was slightly divergent between results of AIC and SIC. AIC has shortest at lag 4 with 136.1045. On the contrary, SIC has limitation with 137.8887 at lag 1. Moreover, due to the conflict of the results between AIC and SIC, further criterion to choose optimal lag length was taken into consideration. Result of SIC is chosen because it is more accurate than that from AIC based on the principal parsimony. Lag 1 is chosen for UK’s situation.

Table 10: The optimal lag length of ADF test for GDP, FDI and ITA time series of Germany

<table>
<thead>
<tr>
<th>Criteria model</th>
<th>Lag 0</th>
<th>Lag 1</th>
<th>Lag 2</th>
<th>Lag 3</th>
<th>Lag 4</th>
<th>Lag 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE_AIC</td>
<td>139.6823</td>
<td>137.4648*</td>
<td>137.7287</td>
<td>137.8555</td>
<td>137.7209</td>
<td>137.5234</td>
</tr>
<tr>
<td>GE_SIC</td>
<td>139.8262</td>
<td>138.0407*</td>
<td>138.7366</td>
<td>139.2953</td>
<td>139.5926</td>
<td>139.8271</td>
</tr>
</tbody>
</table>

AIC and SIC criterion crucially expose the same crop of optimal lag length. Both AIC and SC had the lowest selected value at lag 1. AIC has the smallest value equal to 137.4648 and SIC has the one equal to 138.0407. As a result, lag 1 was the most suitable lag for further VAR and Granger causality investigation in Germany’s case.

4.4. Granger causality analysis

Table 11: The Granger causality of ITA, FDI and GDP time series of Germany

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>P-value</th>
<th>Result</th>
</tr>
</thead>
</table>

It is evident from the table that the result of Granger testing may be summarized as follow. In Germany, foreign direct investment and amount of international tourist have no causality. It is clearly shown with the p values. Second, there is an increase in foreign direct investment will not lead to upward increasing in economic growth. It also explores the non potential contribution of GDP to international tourist arrivals.

It is not the same result with last studies, unidirectional relationship between tourism and economic growth such as Durbarry, (2004), Zortuk,(2009), (Oh, 2005), etc. Moreover, FDI and GDP had many results for significant relationships which proved by unidirectional relation in Turkey’s FDI and GDP (Sekmen, 2007) or co-movement in EU and Asian (Moudatsou & Kyrkilis, 2011).

**Table 11: The Granger causality of ITA, FDI and GDP time series of Italy**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>P-value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT_GDP</td>
<td>ITA</td>
<td>0.9410</td>
<td>ITA←x→GDP</td>
</tr>
<tr>
<td></td>
<td>FDI</td>
<td>0.5564</td>
<td>FDI ←x →GDP</td>
</tr>
<tr>
<td>IT_ITA</td>
<td>GDP</td>
<td>0.2637</td>
<td>GDP←x →ITA</td>
</tr>
<tr>
<td></td>
<td>FDI</td>
<td>0.3350</td>
<td>FDI←x →ITA</td>
</tr>
<tr>
<td>IT_FDI</td>
<td>GDP</td>
<td>0.2010</td>
<td>GDP←x →FDI</td>
</tr>
</tbody>
</table>
Table demonstrated the mutual impacts among the data variables of Italy. As the dependent variable, Italy’s FDI was affected by independent variables GDP. There was a negative relationship running from GDP to at all lag. Notably, only evidence of the influence of ITA on was confirmed. Since its t-value merely had significant result equal to 0.0053.

On the other hand, as GDP was dependent. FDI of Italy had not influenced GDP and ITA also had negative impact GDP which was proved by t-value equal to 0.9410 and 0.5564 while having negative effect at the rest lags. Comparing with review paper, this result was quiet different. There were a lot of studies which proved GDP and FDI had bidirectional relationship such as Liu(2002), Choe(2003), Chowdhury and Marvrotas(2005) and Rudra(2009). Furthermore, Some remarked unidirectional relationship running from FDI to GDP like in Sub-Saharan African of Abdullahi(Abdullahi, D. A., Cheng, E., & Messinis, G, 2011) and vice versa like in India of Chakraborty and Basu(Chakraborty & Basu, 2002)

On the contrary, as ITA was influenced by GDP and FDI. There was no evidence to demonstrate any relationship between FDI and ITA, also between GDP and ITA. It means ITA hadmiscellaneously effects at no lags. Tourism unexpectedly had no push on itself.

*Table 13: The Granger causality of ITA, FDI and GDP time series of Spain*

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>P-value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP_GDP</td>
<td>ITA</td>
<td>0.3934</td>
<td>ITA → GDP</td>
</tr>
<tr>
<td></td>
<td>FDI</td>
<td>0.6873</td>
<td>FDI ← GDP</td>
</tr>
<tr>
<td>SP_ITA</td>
<td>GDP</td>
<td>0.0002</td>
<td>GDP → ITA</td>
</tr>
<tr>
<td></td>
<td>FDI</td>
<td>0.0497</td>
<td>FDI → ITA</td>
</tr>
<tr>
<td>SP_FDI</td>
<td>GDP</td>
<td>0.5435</td>
<td>GDP ← FDI</td>
</tr>
<tr>
<td></td>
<td>ITA</td>
<td>0.4282</td>
<td>ITA ← FDI</td>
</tr>
</tbody>
</table>

It is obviously that the result of Granger testing may be resumed as following. In Spain, foreign direct investment and economic growth had no causality. It was clearly shown with the p
values (0.6873 and 0.5435). This was on the contrary with the past research such as Salleh (2011). Salleh’s finding checked the bidirectional relationship between two variables.

It also explores the positive potential contribution of GDP to international tourist arrivals with p-values smaller than 1%. It is quite same to the study of Mohamn and Najafi in Islamic countries (Mohammadzade and Najafi Nasab, 2009). Moreover, another result indicated that there was one direct impact in foreign direct investment will lead to movement of international tourist arrival since p-values for Granger causality tests were all significant lower than 5% percent (0.0497) It is clearly seen that the outcome in Spain’s case was not entirely satisfactory due to the fact that it has not absolutely supported the literature review. As mentioned above, the former literatures verified the unidirectional relationship from tourism to economic growth (Balaguer & Cantavella Jordá, 2004). However, Spain’s result showed that there is no relationship running from ITA and GDP. The negative coefficient between GDP and tourism means that the increasing or decreasing of amount of tourists had no effects to going up or going down of economic growth.

**Table 14: The Granger causality of ITA, FDI and GDP time series of Spain**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>P-value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>TU_GDP</td>
<td>ITA</td>
<td>0.8700</td>
<td>ITA ← x → GDP</td>
</tr>
<tr>
<td></td>
<td>FDI</td>
<td>0.2662</td>
<td>FDI ← x → GDP</td>
</tr>
<tr>
<td>TU_ITA</td>
<td>GDP</td>
<td>0.6212</td>
<td>GDP ← x → ITA</td>
</tr>
<tr>
<td></td>
<td>FDI</td>
<td>0.0009</td>
<td>FDI → ITA</td>
</tr>
<tr>
<td>TU_FDI</td>
<td>GDP</td>
<td>0.0631</td>
<td>GDP ← x → FDI</td>
</tr>
<tr>
<td></td>
<td>ITA</td>
<td>0.7687</td>
<td>ITA ← x → FDI</td>
</tr>
</tbody>
</table>

The result of Table above indicated that there was no causality relationship running from neither FDI nor ITA to GDP in Turkey because p-values (0.8700 and 0.2662, respectively) were not significant and larger than 10%. This was different with previous studies. The positive coefficient between FDI and GDP means that FDI of last period increased (or decreased), and that GDP will not increase (or decrease) in the next period. Economic growth and tourism had
strong evidences bidirectional relationship from Khalil et al., (2007) and Kim et al., (2006). On the contrary, there was an unidirectional relationship running from FDI to tourism. It is same with previous research, FDI and tourism had relationship not only unidirectional in Turkey (Katircioglu, 2011) but also bidirectional in HongKong (Salleh et al., 2011).

**Table 15: The Granger causality of ITA, FDI and GDP time series of United Kingdom**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>P-value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK_GDP</td>
<td>ITA</td>
<td>0.7171</td>
<td>ITA ← x → GDP</td>
</tr>
<tr>
<td></td>
<td>FDI</td>
<td>0.2128</td>
<td>FDI ← x → GDP</td>
</tr>
<tr>
<td>UK_ITA</td>
<td>GDP</td>
<td>0.1754</td>
<td>GDP → ITA</td>
</tr>
<tr>
<td></td>
<td>FDI</td>
<td>0.9760</td>
<td>FDI → ITA</td>
</tr>
<tr>
<td>UK_FDI</td>
<td>GDP</td>
<td>0.0001</td>
<td>GDP → FDI</td>
</tr>
<tr>
<td></td>
<td>ITA</td>
<td>0.2885</td>
<td>ITA ← x → FDI</td>
</tr>
</tbody>
</table>

Speaking to UK, there is unidirectional causality running from foreign direct investment to international tourist arrival and also from economic growth to tourism and also FDI. Meanwhile, there are unidirectional relationship between foreign direct investment and international tourist arrival, also between economic growth and amount of international tourist.

FDI has a significant impact on economic growth (Abdullahi, D. A., Cheng, E., & Messinis, G, 2011). Excellent economic policies and performance will attract foreign capital. FDI enhances the growth proceeding in Asian developing countries (Tiwari, 2011). Likewise, study of Salleh, Othman, & Sarmidi, 2011 supports the feedback hypothesis in HongKong. Thus, in order to stimulate sustainable economic growth, tourism development that brings in arrivals must be carried out as it has the potential in generating economy as well attracting investments from overseas.

It also explores the potential contribution of GDP to international tourist arrivals. However, the results from this study have conflict with previous literatures about UK case (Othman, Salleh, & Sarmidi, 2012) as the stated that there is bidirectional causality relationship running between tourism and economic growth. The reasons behind this conflict could be the
difference of time series data used to analyze which used the data period from 1978 to 2008 and test is done by using the co-integration method through the ARDL approach for proving. Furthermore, this study showed that GDP lead to increase FDI. By the same token, Moudatsou & Kyrkilis (2011) represents that the growth of the host country attracts FDI.

V. Conclusion

5.1. The Granger causality of Germany, Italy, Spain, Turkey and United Kingdom

Taking everything into consideration, it is can be concluded that there is no causality relationship between FDI, ITA and GDP in Germany. The outcome of the other countries might have optimistic results. The amounts of international tourist arrivals will upward foreign direct investment inbounds in Italy. In addition, it makes an enduring impression on short run relationship and co-movement between economic growth and international tourist arrivals in Spain and United Kingdom. Without doubt, the most dramatic thing is the increasing or decreasing of foreign direct investment will have significant impact to changing of tourism in Spain, United Kingdom and Turkey. The most noticeable feature of it is unidirectional relationship running from economic growth to foreign direct investment in United Kingdom

5.2. Policy implications for five countries and suggestions

The findings convey abundance of empirical implications for Germany, Italy, Spain, Turkey and United Kingdom- Top 10 countries with largest international tourist arrivals.

The result showed that FDI caused GDP in the short-run and versa. It means the increasing of FDI upwards GDP. Historically, the attractiveness of the Italian economy for foreign direct investment (FDI) has been restricted, equated to that of most other European countries and to its own potential. Today, FDI in Italy is concentrated in the services sector, which accounts for more than half of FDI stock, although this proportion fell slightly (Mutinelli & Piscitello, 2011).

The potential of Italy as a host for FDI is much higher than that indicated by the country’s IFDI performance thus far. The current difficulties of the country, the Euro zone crisis and the recent OECD downward revision of growth forecasts certainly do not encourage a recovery in the short term of FDI in Italy (ISTAT, 2013). Hence, increasing the incentives to attract foreign investment in R&D and technology transfer in Italy must be accompanied by market development and rich competition. This can be finished by adjusting the economic structure towards the target economic sectors and speeding up trade liberalization with
neighboring countries to expand market size and hence increase the payback for research and development investment. Subsisting laws should also be improved and better enforced to protect the rights and intellectual properties of investors.

Spain’s results implied that there was a nice causality relationship between Spain’s foreign direct investment and international inbound as p-value significant a smaller than 10 percent. Regarding to VAR estimations, three variables had diverse feedbacks on each other at different lags. Nonetheless, the literatures have explicated the direction of this relationship.

More remarkably, Economic growth and amount of international tourist arrivals had unidirectional causality relationship with great p-value significant less than 10%. It is a positive results with previous research that the positive relationship link was proved by outnumbered studies (Oh, 2005; Tamat and Norlida, 2009; Mohammadzade and Najafi Nasab, 2009). However, there were some optimistic studies that demonstrated same situation such as Balaguer and Cantavella- Jordà; dritsakis, 2004; Durbary, 2001; Lee and Chang, 2008; Redzuan, 2009; Zortuk, 2009, etc.)

In addition, foreign direct investment in Spain has no impact to economic growth of this country with evidence of p-value significant bigger than 10 percent. The negative effect may be made clear. Although Spain’s government attracts investment on infrastructure, production… from other countries, it did not contribute to increase Spain’s economic growth. It was downright with some previous researches: Blomstrom, 1994; Nair Recher and Weinhold, 2001; Wang, 2002; Sekmen, 2007; Mihai 2011, etc. Bleakly, according to Liu, 2002; Choe, 2003; Rudra, 2009, they found a long-term co-movement between GDP and FDI.

The outcome of VAR Granger causality test in Spain is essentially striking because it was corresponding with the prior findings. It again backed up the evidences of the association among GDP, FDI and ITA. Whereas a causality relationship running from either FDI to GDP or GDP to FDI; and another one from economic growth to international tourist arrivals were vigorously found.

REFERENCES


Katircioglu, S. (2011). The bounds test of the level relationship and causality between foreign direct investment and international tourism: The case in Turkey.


