3rd International Conference

on Public Policy (ICPP3)

June 28-30, 2017 – Singapore

Panel T17bP15 Session 2

Public Policy and Entreprenuership

Title of the paper

Is there a Tourism-Employment Nexus in the Philippine Economy? An Empirical Analysis

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Date of presentation

28 June 2017

Abstract

The study focuses on the causal relationship between domestic employment, tourist arrivals, exchange rate, capital formation and economic growth in the Philippines. Time series data was collected from the World Travel Tourism Council and the Philippine Statistics Authority covering more than three (3) decades from 1980 to 2014. The hypotheses were tested using Johansen co-integration test and Granger Causality test. The study found that there is a long-run relationship between domestic employment and its predictors. At the same time, unidirectional causality running from domestic employment to tourist arrivals as well as from domestic employment to tourist arrivals as well as from employment to capital formation was found. Since tourism generates foreign exchange revenues and jobs, it is recommended that the government invest more heavily on tourism-related infrastructures.

***Keywords*:** tourist arrivals, employment, economic growth, exchange rate, capital formation, Granger causality test

I. Introduction

Over the past several decades, international tourism has steadily increased in volume, and the growing importance of the tourism industry in the economies of many countries cannot be overemphasized (Oh, 2015). This phenomenon is widely observed throughout the Asia Pacific Region in recent decades, often at a faster pace than in other regions of the world. According to World Travel and Tourism Council (2015), Travel and Tourism generated US$ 7.6 trillion (10% of global GDP) and 277 million jobs (1 in 11 jobs) for the global economy in 2014. International tourist travels also reached nearly 1.41 billion and visitor spending more than matched that growth.

Visitors from emerging economies now account for approximately 46% share of international tourist arrivals (up from 38% in 2000), providing the growth and increased opportunities for travel from those in these new markets. In addition, tourist spending has served as an alternative form of exports, beefing up through foreign exchange earnings the balance of payments position of many countries. As such, tourism-generated proceeds have come to represent a significant revenue source, increased employment, household income, and government income in countries worldwide.

From 1980 to 1996, the Philippine record exhibited an irregular pattern of tourist arrivals prior to the subsequent slowdown. A record of one million tourist arrivals was followed by a decline from up to 1996, and the numbers peaked at 2.2 million in 1997, thereafter falling as a result of the Asian financial crisis of that year. Recovery was gradually restored by the early 2000s and by 2007 there were over three million arrivals whose foreign exchange contributions reached US$4.8 billion (TTG Asia, 2008; UNWTO, 2007).

In 2008 the increase in visitor arrivals by 1.53% in 2008 (DOT, 2009a) prompted the tourism authority to set a goal of five million tourists by 2010 projecting that tourism employment will have doubled to six million and the value-added contribution of tourism will constitute 13.6% of GDP (NEDA, 2004) in contrast to 7% in 1998 (NSCB, 2008). It was observed that Philippine tourism is largely dependent on a limited number of source markets, and the overall statistics suggest barriers to inbound tourism and its development (Henderson, 2011).

As a developing country, the Philippines is striving hard to improve its economy and generate more employment opportunities particularly with regard to travel and tourism. For instance, in 2015, travel and tourism's total contribution to GDP was PHP1,432.5 billion which is 10.6% of the GDP. This performance has increased the country's ranking by three steps higher from 36th in 2014 to now 33rd out of 184 countries. As to employment, travel and tourism generated 4,004,000 jobs directly in 2015, which is 10.3% of total employment in the economy. This has made the Philippines to be ranked 12th out of 184 countries in terms of impact of tourism on domestic employment. Conversely if you will compare Philippines among the Association of Southeast Asian Nations **(ASEAN)** countries, the country is really behind in terms of unemployment rate and international tourist arrivals which only averages to 8% and 3,046,867, respectively.

However, there remains the lingering question as to whether tourism growth has actually led economic growth, or if it was economic expansion that has induced tourism growth instead. Because of the direct link between economic growth and employment, this implies the question whether tourism growth can be an effective antidote to unemployment in the Philippines and if the country can be one of the best ASEAN countries in terms of tourism.

II. Literature Review

The following discussions present a review of current and previous studies about travel & tourism, employment and economic growth in a number of countries that are deemed relevant to this paper. These related studies, both local and foreign, were obtained from peer reviewed journals while the other materials reviewed were sourced from standard textbooks.

Over the past decades, a growing number of studies on the impact of tourism activity on GDP and the role that tourism has on economic growth in both developed and developing countries have been undertaken. The relationship between tourism and economic growth has generally been addressed by two different approaches in the economic literature. The first was derived from the Keynesian theory of the multiplier. According to the Keynesian approach, international tourism can be accepted as an exogenous component of aggregate demand that has a positive effect on income and employment thus leading to economic growth via the multiplier effect (Suresh and Senthilnathan, 2014).

It is proven that international tourism is recognized as having a positive effect on the increase of long-run economic growth through different channels. First, tourism is a significant foreign exchange earner contributing to capital goods that can be used in the production process (McKinnon, 1964). The objective of many countries is to increase foreign exchange earnings to pay for imports and maintain a certain level of international reserves. Second, tourism plays an important role in stimulating investments in new infrastructure, human capital, and fostering competition in the process. The tourism sector is based on four (4) main production factors: human capital, physical capital, technology, and environmental resources. Human capital is one of the main pillars of tourism and hence this economic resource can be regarded as providing the opportunity to create new jobs. Third, tourism stimulates other economic industries by direct,

indirect induced effects. An increase in tourism expenditure will lead to additional activity in related industries and the overall variation connected with it will be greater than the initial injection in spending. Fourth, tourism contributes to generate employment and hence to increased income. As stated, tourism is a key source of employment that activates income for residents through multiplier effects. Fifth, tourism causes positive economies of scale and scope. It helps businesses reduce their average cost of production as their size or scale increases (Andriotis, 2002). On the other hand, it helps businesses to decrease their average total cost as a result of increasing the number of different goods produced (Croes, 2006).

Tourism also plays a crucial role indirectly by complementing other factors of production in the process of economic growth (Tugcu, 2014). Once tourism receipts increase, a country's competitiveness will tend to improve. Earnings from tourism have systematically compensated a country's trade imbalance (Balaguer and Cantavella-Jorda, 2002). However this approach is static and does not take into account the long-term impact of tourism development (Aslan, 2013).

There is an alternative approach which is adapted from the "New Growth Theory" developed by Balassa in 1978 which is known as the "Export-Led Growth Theory (ELGH)". The theory focuses on the relationship between economic growth and exports which concentrates on the eleven developing countries which are Korea, Singapore, Taiwan, Israel, Yugoslavia, Argentina, Brazil, Colombia, Mexico, Chile and India. The following countries were chosen based on those who have an established industrial base. The study proved that instead of policies favoring import substitution, a country should focus on the policies related to export since it leads to better economic growth performance. It delivers that export-oriented policies provide sales incentives to both domestic and foreign market that leads to a better resource allocation. This allows permitting the exploitation of economies of scale, enhancement to technology that

will compete abroad, bigger capacity to utilization and will contribute to increase employment for the labor-surplus countries. This relationship was measured based on countries export growth and gross national product (GNP) growth.

EXPORT GROWTH ➡ GNP GROWTH

This is the most commonly admitted claim in the literature which elucidates the potential of endogenous growth theory and the new trade theory adapted to the tourism sector. Four hypotheses were identified based on economic growth relationship theory (Bouzahzah and El-Menyari, 2013, Oh, 2005). They are as follows:

1. Tourism-led Growth Hypothesis (TLGH)

The first study of the relationship between international trade and tourism was explored by Shan and Wilson (2001) in China. However, the TLGH was first tested by Balaguer and Cantavella-Jorda (2002) for Spain. It postulates that the main contributing factor of long-term economic growth is tourism. The foreign exchange earnings from tourism receipts can be used to finance more imports (Brida et al., 2014). If the TLG hypothesis is valid for economic growth, effective public policies and institution provide sufficient contribution to physical and human capital investments and help reach economic stability by supporting the infrastructure for international tourism (Kumar et al., 2014).

TOURISM GROWTH ➡ ECONOMIC GROWTH

2. Economic Driven Tourism Growth Hypothesis (EDTG)

The application of well-designed economic policies and international trade policy, governance structures, and investment in physical and human capital are the realization of the development and economic growth strategy of a country, (Antonakakis et al., 2013). An

expansion in tourism will happen when every effort is made to increase the overall economic growth of a country (Lee and Chang, 2008).

ECONOMIC GROWTH  **TOURISM GROWTH**

3. Neutrality Hypothesis (No Causal-NC)

There is no causality between economic growth and tourism. Implementation of development policies and gains obtained from tourism are independent (Antonakakis et al., 2013, Tugcu, 2014). Tourism improvement strategies by tourism managers and decision-makers may not be effective (Oh, 2005).

ECONOMIC GROWTH  **TOURISM GROWTH**

4. Bidirectional Hypothesis (Bi-Causal-BC)

Tourism policy affects economic performance and economic growth in turn affects the tourism sector (Antonakakis *et al*., 2013). Resources should be allocated to tourism and all other related sectors equally (Kim *et al*., 2006)

ECONOMIC GROWTH  **TOURISM GROWTH**

In terms of econometric methodology, most of the studies explain the method used to estimate the contribution of tourism sector to the economic growth then present the impact to each variable. While in order to determine the importance of tourism sector in the long-run in a specific country, they used cointegration techniques to look for a long-run relationship among the relevant variables given that time series are non-stationary. In addition Granger causality test was done to determine the direction of causality among the variables (Brida et al., 2008)

In some countries like Tunisia (Belloumi, 2010), South Africa (Akimboade, 2010), Antigua and Bermuda (Schubert et al., 2010), Chile (Brida and Risso, 2009), Colombia (Brida et al., 2009), Uruguay (Brida et al., 2008a), Mexico (Brida et al., 2008b), Nicaragua (Croes and

Vanegas, 2008), Fiji, Tonga, Salomon Islands and Papua Guinea (Narayan et al., 2010), Trentino Alto Adige and South Tyrol, Italy, (Brida et al., 2010; Brida and Risso, 2010), Italy (Cortés and Pulina, 2010), Turkey (Gunduz and Hatemi-J, 2005), Greece (Dritsakis, 2004), Spain (Balaguer and CantavellaJordà, 2002), OECD, Asia and Africa (Lee and Chang, 2008) proves that tourism-led growth hypothesis is confirmed which means tourism growth cause economic growth.

A bi-directional Granger causality is assessed for the following countries: Malaysia (Lean and Tang, 2009), Taiwan (Kim et al., 2006), Spain (Cortés and Pulina, 2010; Nowak et al., 2007), Malta (Katircioglu, 2009b), Turkey (Demiroz and Ongan,2005), Latin American countries (Lee and Chang, 2008). A unidirectional temporal relationship running from economic development to tourism activity is detected for the following countries: Fiji (Narayan, 2004) and Cyprus (Katircioglu, 2009a).

To visualize how the conditioning variables determine or influence total employment in the Philippines may be illustrated by the below diagram.

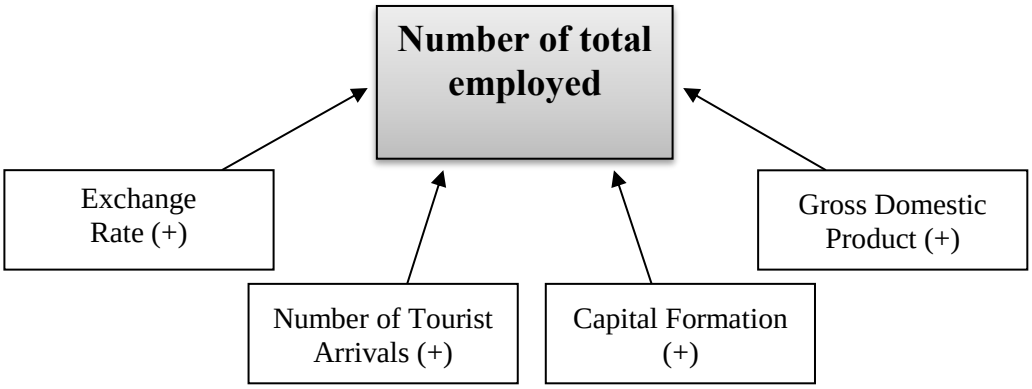

Figure 2

The conceptual framework used was motivated and adapted from the works of Ballaguer (2002) export-led growth and Belloumi (2010) tourism-growth hypotheses but instead of using

economic growth as the dependent variable the study used total employment which supports tourism-employment nexus.

III. Methodology and Data

A combination of descriptive and causal approaches was employed in this study. The descriptive aspect dealt on the historical information provided by the observable trends as to the number of international tourist arrivals, exchange rate, capital formation, output growth, and total domestic employment in the Philippines.

The causal dimension of the research dealt with the empirical testing of hypothesized relationships between the dependent variable, total domestic employment, and its predictors as listed in the foregoing paragraph and using a variety of diagnostic tests to ascertain adequacy of the model designed for this purpose.

This study is about domestic employment in the Philippines and how it is conditioned by tourist arrivals, among other factors. Secondary or time series data were used for this purpose and these were sourced from three (3) different institutions. Data on international tourist arrivals and employment beginning from 1980 up to 2014 were obtained from published statistics of the Philippines' Department of Tourism (DoT) and the World Travel and Tourism Council (WTTC). The data on exchange rate, gross domestic product (GDP), capital formation, and number of total employed were obtained from several issues of the Philippine Statistical Yearbook published by the Philippine Statistics Authority (PSA). The data for the unemployment rate and number of international tourist arrivals of five (5) member countries of the ASEAN were obtained from the Association of Southeast Asian Nation (ASEAN) Statistical Yearbook available from the ASEAN secretariat. No research instrument either in the form of survey or interview questionnaires was used for this study.

The Empirical Model

To provide answers to the specific problem statements raised at the beginning of this study, an economic model in double logarithmic form had to be specified and estimated. The estimating equation is described as follows:

$$\mathbf{LNEMPLOY = \beta_0 + \beta_1 LNARRIVALS + \beta_2 LNEXCH + \beta_3 LNGDP + \beta_4\ LNCAPITAL + \varepsilon} \quad [2]$$

where:

LNEMPLOY	=	logarithm of number of total employed
LNGDP	=	logarithm of real gross domestic product
LNTOURA	=	logarithm of number of international tourist arrivals
LNEXCH	=	logarithm of the peso-dollar exchange rate
LNCAPITAL	=	logarithm of gross fixed capital formation
ε	**=**	error or disturbance term

The original data series for each variable was transformed into natural logarithms to facilitate interpretation of elasticities and to get "smoothly" curves and not "jagged" over due to smaller values. Coefficients in a log function are interpreted as elasticities which measure the percentage change in the dependent variable (DV) given a one percent change in an independent variable (IV), ceteris paribus.

The main tool employed in this research is Multiple Regression Analysis based on Ordinary Least Squares (OLS) procedure. Equation (2) predicts the mean value of the dependent variable, LNEMPLOY, given the value of, say LNARRIVALS, holding the other variables constant (ceteris paribus). The statistical significance of the individual parameters of the model, the significance of the entire model, and its predictive power were estimated and presented in summary tables in the succeeding chapter together with the relevant diagnostic tests.

IV. Results and Discussion

Answers to the main problem and sub-problems of this paper as well as tests of the formulated hypotheses are presented in the section. This also included a descriptive analysis of

the general trends and significant highs and lows of the selected variables comprising the empirical model of this study using data series from 1980 to 2014. The formal analysis and interpretation of results are supported by graphical plots of the data and summary tables of the different diagnostic tests performed.

Presentation of the Data

Prior to investigating the hypothesized relationships specified in this study, a graphical narrative of the historical movement of the time series variables used in this study was presented and discussed as follows.

1. Total Number of Employed

Employment is one of the major economic variables in evaluating Philippine economic performance. According to the data obtained from the Philippine Statistics Authority, during 1980 to 1999 the country's employment level followed a steadily increasing trend. However, a sharp decline was noted between 1999 and 2000 involving a reduction in the number of employed by 1,228,000 workers. As the third millennium began, the country's employment level steadily inched up from 2000 to 2014 registering the highest number of employed at 38,651,000 workers by end of 2014. The uptrend in employment is clearly visible in Figure 4.1 below.

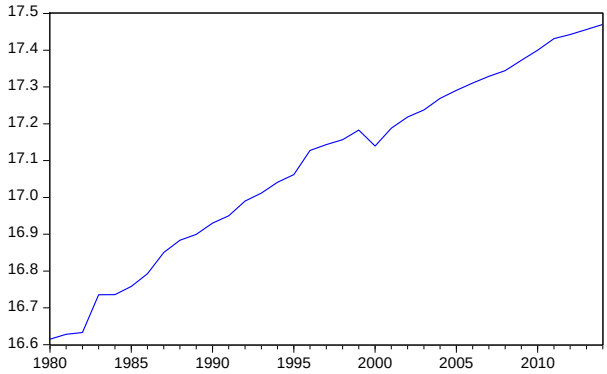

Figure 4.1: Total Number of Employed in the Philippines

The employment prospect for the country as a whole seems to be doing well over the years. However, a comparative survey of the unemployment rate in the ASEAN 5 countries composed

of Indonesia, Malaysia, Philippines, Singapore and Thailand for the last fifteen (15) years would show that the Philippines has also been plagued with the highest incidence of unemployment, averaging about 8 percent annually. Indonesia has the second highest rate of unemployment at 7.8 percent, while Thailand has the lowest rate of unemployment at 1.7 percent among the original five (5) members of ASEAN. This unflattering record for the Philippines is clearly evident in Table 1.

Table 1: Unemployment Rate among ASEAN 5

YEAR	INDONESIA	MALAYSIA	PHILIPPINES	SINGAPORE	THAILAND
2000	6.1	3.6	10.1	6.4	3.6
2001	8.1	3.5	9.8	6.3	3.2
2002	9.1	3.5	10.5	5.6	2.4
2003	9.6	3.6	10.2	5.9	2.2
2004	9.9	3.5	11.0	5.8	2.1
2005	10.3	3.5	7.5	5.6	1.8
2006	10.3	3.3	7.4	3.6	1.5
2007	9.1	3.2	6.3	3.0	1.4
2008	8.4	3.3	6.8	3.2	1.4
2009	7.9	3.7	7.1	4.3	1.5
2010	5.5	3.3	7.1	3.1	1.0
2011	5.0	3.1	6.4	2.9	0.7
2012	6.1	3.0	6.8	2.8	0.7
2013	6.2	3.1	6.4	2.9	0.7
2014	5.94	2.85	6.6	2.0	0.84
Average Rate	**7.84**	**3.34**	**8.00**	**4.23**	**1.67**

Source of Data: ASEAN Statistical Yearbook.

2. Number of International Tourist Arrivals

As far back as the 1980s, the Philippines has been recognized as blessed with excellent tourism resources where the number of international tourist arrivals reached its highest at 1,008,159 arrivals. However, prior to the transition in government from the brutal martial law regime of the Marcos administration to the Aquino administration particularly during the period 1981 to 1985, the Philippines experienced its lowest number of visitor arrivals at 773,074 only. As peace and order was restored after the EDSA Revolution, the number of international tourist arrivals increased from 1986 to 1989. From 1990 to 1991 there was a slight decrease due to the

effects of the Mt Pinatubo volcanic eruption in 1991. Visitor arrivals recovered from 1992 to 1999. From 2000 to 2003 the number of international tourist arrivals again dipped as the country experienced a political turmoil due to the impeachment trial of former President Estrada. When the Arroyo administration took over, the Philippine tourism sector's upward trajectory was regained with increased arrivals from 2004 to 2008. A slight decrease of 122,323 visitors was noted in 2009 as the country reported its first death caused by H1N1. However, after the pandemic flu vanished, tourism recovered. This historical experience of the Philippine tourism sector is evident in Figure 4.2.

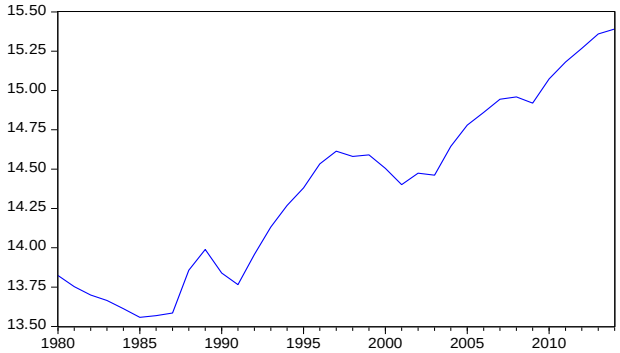

Figure 4.2: Number of International Tourist Arrivals in the Philippines

While the Philippines can boast of world class tourist attractions and resources, these have not been translated into an influx of tourist arrivals that can compete with or match its neighboring countries' experience. Sadly, the Philippines registered the lowest number of tourist arrivals among ASEAN 5 countries averaging only 2.8 million data from 2000 to 2014 as shown in Table 2.

Table 2: International Tourist Arrivals among ASEAN 5 (2000-2014)

YEAR	INDONESIA	%	MALAYSIA	%	PHILIPPINES	%	SINGAPORE	%	THAILAND	%
2000	5,064,000	-	10,272,000	-	1,992,000	-	7,691,000	-	9,509,000	-
2001	5,154,000	1.78	12,775,000	24.37	1,797,000	- 9.79	7,519,000	-2.24	10,062,000	5.82
2002	4,914,000	-4.66	13,292,000	4.05	1,933,000	7.57	7,567,000	0.64	10,799,000	7.32
2003	4,371,000	-11.05	10,577,000	-20.43	1,907,000	-1.35	6,127,000	-19.03	10,082,000	-6.64
2004	5,321,000	21.73	15,703,000	48.46	2,291,000	20.14	8,375,000	36.69	11,737,000	16.42
2005	5,002,000	-6.00	16,431,000	4.64	2,623,000	14.49	8,942,000	6.77	11,517,000	-1.87
2006	4,871,000	-2.62	18,472,000	12.42	2,843,000	8.39	9,752,000	9.06	13,822,000	20.01
2007	5,506,000	13.04	20,236,000	9.55	3,092,000	8.76	10,288,000	5.50	14,464,000	4.64
2008	6,452,000	17.18	22,052,000	8.97	3,139,000	1.52	7,778,000	-24.40	14,597,000	0.92
2009	6,324,000	-1.98	23,646,000	7.23	3,017,000	-3.89	7,489,000	-3.72	14,091,000	-3.47
2010	7,003,000	10.74	24,577,000	3.94	3,520,000	16.67	9,161,000	22.33	15,936,000	13.09
2011	7,650,000	9.24	24,714,000	0.56	3,917,000	11.28	10,390,000	13.42	19,230,000	20.67
2012	8,044,000	5.15	25,033,000	1.29	4,273,000	9.09	11,098,000	6.81	22,354,000	16.25
2013	8,802,000	9.42	25,715,000	2.72	4,681,000	9.55	11,898,000	7.21	26,547,000	18.76
2014	9,435,000	7.19	27,437,000	6.70	4,833,000	3.25	11,858,000	-0.34	24,780,000	-6.66
Average Growth %		**4.94**		**8.18**		**6.83**		**4.19**		**7.52**

Source of Data: ASEAN Statistical Yearbook.

As the data show, Malaysia is the most visited country in the region averaging almost 19.4 million visitors a year while the second most visited country, Thailand, averaged 14.6 million annual visitors.

3. Capital Formation

Capital formation in the Philippines during the last 35 years has been uneven, which is typical of gross investment behavior in most countries whether developed or developing. One thing happening for the Philippines, though, is the evidently upward drift in gross investments in the country as can be seen in Figure 3.3, which clearly shows the steep decline in domestic investments prior to the onset of the EDSA People Power revolution of 1986, and its resurgence thereafter.

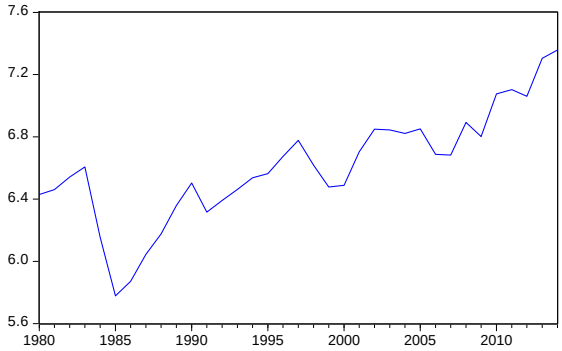

Figure 4.3: Capital Formation in the Philippines

Capital formation activities clearly resumed in 1986 onwards. However, several declines in investments took place which coincided with certain external and internal economic and political events. For instance, the visible dip in the early 1990s could be attributed to several coup attempts against the Aquino administration. The decline noted in late 1990s up to 2000 can be attributed to the impact of the Asian Financial Crisis, which certainly discouraged the inflow of foreign direct investments not only in the Philippines, but in the whole of Asia as well.

4. Gross Domestic Product

Except for the visible decline in Gross Domestic Product in the mid-80s as a result of the brewing economic and political crisis prior to the EDSA Revolution, the country's aggregate output has since been upward trending. This can be visualized from Figure 4.4 below.

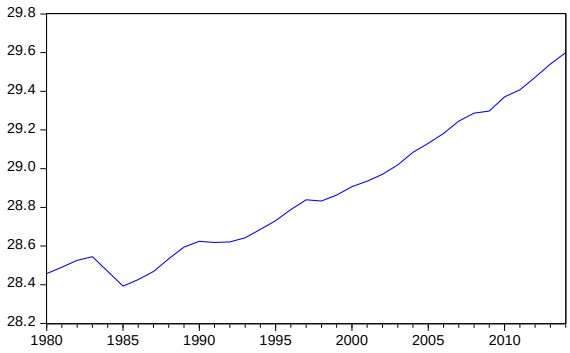

Figure 4.4: Gross Domestic Product in the Philippines

Part of the increasing aggregate output of the Philippines came from its tourism sector. A review of the contributions of the tourism sector to the country's GDP for the last fifteen (15) years compared to the other member countries of ASEAN 5 showed that tourism in the Philippines contributed as high as 13.64% of GDP in 2007, and while its lowest contribution was 8.79% in 2010. The average contribution to GDP of the sector is approximately 10.5%

Table 3: Total Contribution of Tourism to GDP (%) (2000-2014)

YEAR	INDONESIA	MALAYSIA	PHILIPPINES	SINGAPORE	THAILAND
2000	11.5062	12.8468	11.1547	10.2834	17.0476
2001	11.7187	15.1133	11.0959	9.0638	17.0524
2002	10.6235	14.3827	9.9313	9.1346	17.4337
2003	9.8396	12.6963	9.4700	8.0360	16.5290
2004	9.7026	13.1228	10.3093	9.2750	17.2276
2005	9.6219	13.2250	11.3710	8.9480	15.7977
2006	8.9817	13.7258	12.0489	8.3210	16.7028
2007	9.0719	16.4664	13.6394	9.0957	17.5389
2008	9.3728	12.8020	9.0026	8.8651	16.8144
2009	9.4720	14.1157	9.7539	8.8500	15.7197
2010	8.8012	13.7900	8.7855	9.6916	14.0828
2011	8.6702	13.4745	10.0200	9.8891	15.6326
2012	8.8994	13.7347	10.5850	10.1919	17.1220
2013	8.8993	14.4395	10.5463	9.8448	18.3670
2014	9.4283	14.9726	10.3344	10.0554	18.1033
Average Rate	**9.6406**	**13.9272**	**10.5365**	**9.3030**	**16.7448**

Source of Data: World Tourism & Travel Council.

This is comparatively higher than Indonesia's 9.64% and Singapore's 9.31%. This relative performance of the tourism sector across a number of countries also manifests the structure of their respective economies which in the case of the aforecited countries maybe coming from other sectors of their economies such as manufacturing and exports of industrial and primary products.

5. Exchange Rate

For more than a decade from 1980 to 1991, the Philippine peso steadily depreciated against the US dollar, the peso reached P27.4786 to a dollar by 1991. Further decline was observed in 1992 as the transition from the Aquino administration to the Ramos administration took place and when Mt Pinatubo erupted causing widespread destruction in the regional economy of Central Luzon and as far as Metro Manila. As the Philippine economy recovered a steady peso to dollar exchange rate ensued up to 2004. While the peso dollar exchange rate remained volatile during the 2006-2013 period wherein alternating instances of depreciation and appreciation occurred, the depreciation persisted so that by 2014 the rate rose to a high of P44.3952. The

highest exchange rate on record was in 2004 when the peso hit P56.0399 to a dollar while the lowest was in 1980 when the peso exchanged for P7.5114 to a dollar. These movements in the peso-dollar exchange rate are exhibited in Figure 4.5 below.

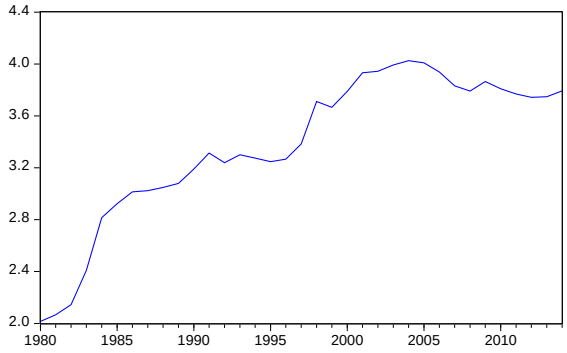

Figure 4.5: Peso-Dollar Exchange Rate in the Philippines

Analysis and Interpretation of Results

To provide answers to the research questions of this study and to validate or reject the formulated hypotheses as presented, an empirical model was designed for the purpose. Prior to the actual estimation of the model, the time series data used must be analyzed for possible non-stationary characteristics which may complicate the estimation process.

Stationarity of the Time Series

The data series on all the variables included in the empirical model was first subjected to unit root test or test of nonstationarity test using the Augmented Dickey Fuller (ADF) procedure. The results of the ADF Unit Root testing are summarized in Table 4.

Table 4: Results of Augmented Dickey Fuller Test

VARIABLE	ADF TEST STATISTIC	MacKinnon Critical Values		
		1%	5%	10%
lnEMPLOY	-7.458885	-3.646342	-2.954021	-2.615817
lnARRIVALS	-3.908329	-3.646342	-2.954021	-2.615817
lnCAPITAL	-4.597361	-3.646342	-2.954021	-2.615817
lnGDP	-6.157718	-3.679322	-2.967767	-2.622989
LnEXCH	-3.776715	-3.646342	-2.954021	-2.615817

At their original level series, the time series data were found to be non-stationary. However, when the individual series was subject ted to first differencing, all the variables were found to be stationary based on the computed Augmented Dickey-Fuller (ADF) test statistics which are more negative than the MacKinnon critical values at all levels of significance.

Since the variables are stationary at first difference, regressing the variables at their original level series is feasible because it implies that the variables have identical unit roots.

Analysis of Regression Results

After ensuring that the variables have identical unit roots, the variable in logarithm, lnEMPLOY, was regressed against lnARRIVALS, lnEXCH, lnCAPITAL, and lnGDP, also in logarithms. The initial results are as follows:

$$\begin{aligned} \textbf{lnEMPLOY} &= \underset{(0.0000)}{\textbf{9.3474}} + \underset{(0.000)}{\textbf{0.1888lnARRIVALS}} + \underset{(0.0000)}{\textbf{0.1966lnEXCH}} \\ &+ \underset{(0.8125)}{\textbf{0.008lnCAPITAL}} + \underset{(0.0201)}{\textbf{0.1492lnGDP}} + \varepsilon \end{aligned}$$

$$\textbf{R}^2 \textbf{ = 0.9893} \qquad \textbf{Fstat = 694.0213} \qquad \textbf{DW = 0.9558}$$

The results would show that all the predictors, with the exception of capital formation, are statistically significant. The R^2 indicates very high predictive power for the model although the Durbin-Watson of 0.9558 indicates the presence of positive autocorrelation that needs to be corrected.

Testing for Multicollinearity

Since the model employed several explanatory variables, testing for multicollinearity was necessary. Using the variance inflating factor (VIF) procedure, the variables lnARRIVALS and lnGDP registered VIFs which exceed 10.0 indicating that they are the source of severe collinearity in the model. This result is shown in Table 5 below.

Table 5: Testing for Multicollinearity

VARIABLE	VIF	After Removal of GDP
lnARRIVALS	18.24698	8.654782
lnEXCH	3.058332	2.826319
lnCAPITAL	6.132613	5.204708
lnGDP	19.81366	-

Since **lnGDP** registered the highest VIF of 19.81366 among the explanatory variables, this variable needed to be excised from the model. A re-computation of VIFs gave the following results.

The removal of GDP shows that the VIFs of **lnARRIVALS**, **lnEXCH,** and **lnCAPITAL** are all less than 10.0 which means that the problem of severe multicollinearity has been satisfactorily addressed. The removal of GDP as a variable improves the goodness of fit for the reason that our country's GDP already includes the other variables presented in the study. One example is the capital formation, which is already part of the GDP of the Philippines when computed.

Test for Autocorrelation

In view of the presence of positive autocorrelation in the residuals of the initial regression, a correction was done in order to adjust for possibly inflated statistical significance of the regression parameters, which could in turn lead to erroneous conclusion.

Therefore, the regression model was re-run which included a first-order correction in the residuals, yielding the following interesting results.

$$\begin{aligned} \textbf{lnEMPLOY} &= \underset{(0.0000)}{\textbf{12.6437}} + \underset{(0.0000)}{\textbf{0.2353lnARRIVALS}} + \underset{(0.0000)}{\textbf{0.1838lnEXCH}} \\ &\quad + \underset{(0.0492)}{\textbf{0.0677lnCAPITAL}} + \boldsymbol{\varepsilon} \end{aligned}$$

$$\textbf{R}^2 \textbf{ = 0.9911} \qquad \textbf{Fstat = 812.6983} \qquad \textbf{DW = 2.3039}$$

The regression coefficients of the explanatory variables were found consistent with theoretical expectations and remained statistically significant at 1 percent level for **lnARRIVALS** and **lnEXCH,** and at 5 percent level for **lnCAPITAL**. The resulting R^2 of 0.9911 has even improved after removing **lnGDP** and correcting for autocorrelation which means that the entire set of explanatory variables explained almost 99.11% of the variation in the dependent variable while unexplained factors accounted for less 1 percent of said variation. The F-statistics confirmed the explanatory power of the predictor variables. The DW statistic of 2.304 indicated that the model has been cured of first order autocorrelation as it exceeded the 5% upper limit of the critical value of DW of 1.653 at 35 d.f. with 3 explanatory variables.

To examine further the improvement in the predictive power of the regressions after removing **lnGDP**, plots of the actual vs. fitted, residual graphs for the model which included gross domestic product (**lnGDP**) are shown in Figure 4.6A, while the actual vs fitted, residual graphs of the revised model which excluded gross domestic product, **lnGDP** are shown in Figure 4.6B.

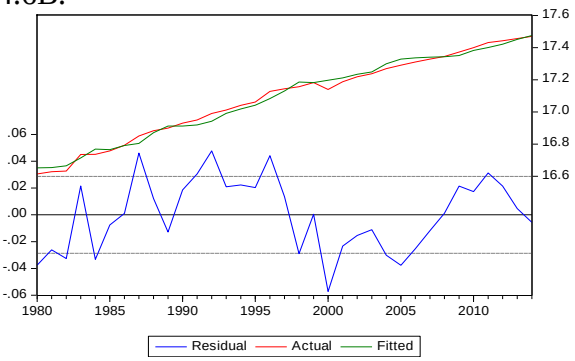

Figure 4.6A: Actual, Fitted, Residual Graph (with lnGDP)

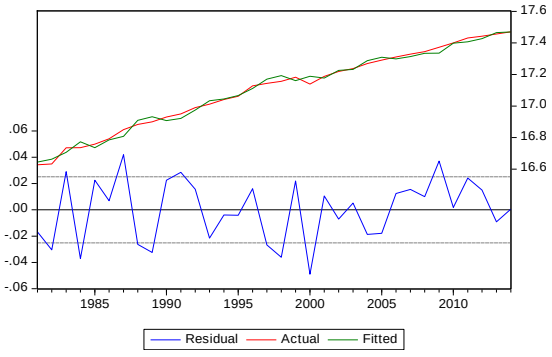

Figure 4.6B: Actual, Fitted, Residual Graph (with lnGDP)

The plot of the regression model which included gross domestic product (lnGDP) as one of the explanatory variables exhibited a relatively closed fit although underestimation and overestimation in some years are more pronounced in the graphical plot.

On the other hand, when GDP was removed from the model due to severe multicollinearity and after correcting for serial correlation, the plots of actual vs. fitted, and residuals established a much closer fit of the estimates to the actual data series of the dependent variable, **lnEMPLOY**. This result suggests that the revised regression model without **lnGDP** is an improvement on the initial results. In addition, the coefficient of **lnCAPITAL** is now statistically significant.

The revised results can also be summed up as follows:

1. The number of international tourist arrivals' (**lnARRIVALS**) exerts a positive and significant effect on domestic employment (**lnEMPLOY**). A one percent increase in tourist arrivals gives rise to a 0.235 percent increase in domestic employment. Therefore, the null hypothesis which states "**that number of international tourist arrivals does not significantly affect the total number of employed**" is REJECTED.

2. Exchange rate (**lnEXCH**), as a predictor, also exerts a positive and significant effect on domestic employment (**lnEMPLOY**). A one percent increase or depreciation of the peso-dollar exchange rate, other things equal, leads to a 0.184 percent increase in domestic employment. Therefore, the null hypothesis which states "**that the exchange rate does not significantly affect the total number of employed**" is REJECTED.

3. Capital formation (lnCAPITAL), or gross investments as a predictor, also exerts a positive and significant effect on domestic employment. A one percent increase in gross investments, other things equal, leads to a 0.07 percent increase in domestic employment. Therefore, the null hypothesis which states "**that capital formation does not significantly affect** the **total number of employed**" is REJECTED.

The results of regression showed that all the predictor variables, taken collectively, exert a significant effect on the dependent variable, **lnEMPLOY**, given an F-stat of 812.698 which

exceeds the critical F-value of 3.32 at 5 percent level of significance and (2,30) degrees of freedom. The entire model therefore is statistically significant.

Table 6: Summary of other Diagnostic Test

TEST	RESULT	DECISION RULE	REMARKS
Normality of Residuals	0.4643	should be greater than 0.05	Residuals are normally distributed
Specification error	0.1004	should be greater than 0.05	No specification error
Heteroscedasticity	0.1209	should be greater than 0.05	No Heteroscedasticity
Structural Stability	0.2759	should be greater than 0.05	Structurally stable

Testing for Cointegration

The fourth statement of the problem which says **"Does it have a genuine or long term equilibrium relationship between the number of international tourist arrivals, total number of employment, GDP, capital formation and exchange rate"** can only be affirmed if the variables are cointegrated. Since this is a multivariate model, the Johansen Cointegration Test was applied yielding test results which are summarized in Table 7 (see Appendix 2).

Both Trace test and Maximum Eigenvalue test results revealed the presence of one (1) cointegrating equation in the model at 1% level of significance. This means that the dependent variable, total number of employed, and its predictors while non-stationary moved in a synchronized fashion and that there exists therefore a genuine or long run, equilibrium relationships among them. This outcome rules out spurious regression results. Therefore, the null hypothesis HO_3 that **"the dependent variable and independent variables have no long term equilibrium relationship"** is **REJECTED**. There is genuine equilibrium relationship among the variables of the model.

Test of Causality

To answer the fifth problem statement **"Do causal links exist between the number of international tourist arrivals, total number of employment, GDP, capital formation and**

exchange rate in the Philippines?", a causality test was performed. The procedure employed is the Granger Causality Test whose results at 1 lag are summarized at Table 8 (see Appendix 3):

Based on their p-values, **LNEMPLOY** Granger causes unidirectional **LNARRIVALS** instead of the other way around as earlier suspected. The variable **LNEMPLOY** also exerts a unidirectional effect on **LNCAPITAL** but not the other way around too. No other predictor variable exhibits Granger causality effect on **LNEMPLOY**. Neither is there bilateral causality.

Because of the sensitivity of the test to lag length, another test at 2 lags was experimented upon. **LNEMPLOY** continues to exert a Granger-causal effect on **LNARRIVALS** and **LNCAPITAL** but not the other way around. On the other hand, **LNEXCH** and **LNEMPLOY** do not have any causal effect on each other.

The results of Granger Causality Test at 1 and 2 lags indicated the presence of unidirectional causality running from **lnEMPLOY** on **lnARRIVALS** and **lnCAPITAL**. Therefore the null hypothesis $\mathbf{HO_4}$ which states that **"there are no causal links among the number of international tourist arrivals, total number of employment, and capital formation"** is **REJECTED**. On the other hand, "**the null hypothesis which states that there are no causal links among total number of employed and exchange rate"** is **ACCEPTED**.

V. Conclusion and Recommendation

Conclusion

Among the explanatory variables considered in the model, the number of international tourist arrivals exhibited the **highest employment elasticity** coefficient of **0.23** compared to **0.18** for exchange rate, and **0.067** only for capital formation. This interesting outcome offers fresh opportunities therefore for Philippine economic policy makers to re-think and perhaps re-design their strategies in the light of the relative importance of tourism in the Philippine economy and

also when viewed in terms of the huge disparity of Philippine tourism performance vis-à-vis other ASEAN countries' tourism performance.

Further, the relatively higher value added contributions of tourism to Philippine GDP, comparatively higher than Indonesia and Singapore, should also occasion a deeper investigation on what emphasis should be given to tourism as an integral component of the country's development plan.

The regression results also revealed that increased capital formation has the least employment elasticity even lower than the employment elasticity of exchange rate changes. This surprising development suggests that capital formation activities in the Philippines do not readily translate to higher employment generation possibly because the country has not grown fast enough on a sustained basis, and possibly because of the continuing bias for capital intensive production methods in the country.

The higher employment elasticity coefficient for the peso-dollar exchange rate at 0.18 also implies that continuing depreciation of the peso maybe beneficial, up to a certain extent, in promoting domestic employment particularly in the export sector of the economy.

The empirical results of the revised model ruled out evidence of first order autocorrelation, multicollinearity among the explanatory factors, non-normal regression residuals, and unstable regression parameters. This makes the model therefore very suitable for policy formulation and forecasting. Aside from satisfying these statistical criteria, the model also proved to be cointegrated thus ruling out possible spurious regressions.

More importantly, on the basis of Granger causality test, evidence on the Tourism-Employment Nexus in the Philippines has been confirmed albeit when done on a pair-wise basis; the direction of causation seems to run from employment to tourist arrivals instead of the other

way around, although longer lags could be explored. But, the results are proof positive that such a nexus exists. The nexus determines that with the improvement in employment, tourism industry will grow gradually.

Recommendation

Even if capital formation activities generate lower employment elasticity, it is still highly recommended that increased public investments be undertaken by the government because of its growth enhancing effect. However, a larger proportion of the annual national budget could be re-channeled towards the tourism sector. This could be in terms of increased infrastructure outlays that will make more accessible and convenient for both domestic and foreign tourists the country's existing tourist sites and those localities that offer similar attractions. In other words, a holistic approach to tourism development involving different agencies of the government should be adopted to complement private initiatives. The improvement to capital formation can be generated through two sectors, first is the government public travel and tourism investment, which focuses on the government spending on the construction of visitor centres, new airports, tourist information offices and government contributions to large resort-based investments with the coordination from the Department of Public Works and Highways (DPWH), the respective Local Government Units (LGUs) and most specially Tourism Infrastructure and Enterprise Zone Authority (TIEZA); second is the private travel and tourism investment this focuses on the residential structures such as vacation houses and non-residential structure such as hotels, and convention centers.

There is probably no question that the safety and welfare of all tourist, both domestic and foreign, must always be secured by all concerned agencies to ensure their continued patronage and promotion of the Philippines as an attractive and reasonably inexpensive destination.

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APPENDIX

Appendix 1: Data Sheet from 1980 to 2014

Year	Int'l Tourist Arrivals (TOURA)	Gross Domestic Product (GDP)	Exchange Rate (EXCHANGE)	No. of Employed (EMPLOY)	Capital Formation (CAPITAL)
1980	1,008,159	2.2845E+12	7.511433	16,434,000	619.8040
1981	938,953	2.3627E+12	7.899650	16,652,000	639.4040
1982	890,807	2.4482E+12	8.540000	16,734,000	693.5190
1983	860,550	2.4941E+12	11.112717	18,543,000	740.2390
1984	816,712	2.3115E+12	16.698708	18,550,000	470.9550
1985	773,074	2.1426E+12	18.607342	18,967,000	322.9290
1986	781,517	2.2158E+12	20.385683	19,631,000	354.6760
1987	794,700	2.3113E+12	20.567675	20,795,000	422.1640
1988	1,043,114	2.4674E+12	21.094675	21,498,000	481.2870
1989	1,189,719	2.6205E+12	21.736683	21,849,000	577.2140
1990	1,024,520	2.7001E+12	24.310500	22,532,000	667.5900
1991	951,365	2.6845E+12	27.478633	22,979,000	553.4530
1992	1,152,952	2.6935E+12	25.512492	23,917,000	596.6770
1993	1,372,097	2.7505E+12	27.119842	24,443,000	640.4470
1994	1,573,821	2.8712E+12	26.417167	25,166,000	690.4780
1995	1,760,163	3.0055E+12	25.714467	25,698,000	708.9760
1996	2,049,367	3.1812E+12	26.216100	27,442,000	791.1640
1997	2,222,523	3.3462E+12	29.470658	27,888,000	878.162
1998	2,149,357	3.3269E+12	40.893050	28,262,000	748.344
1999	2,170,514	3.4294E+12	39.088983	29,003,000	650.557
2000	1,992,169	3.5807E+12	44.192250	27,775,000	657.691
2001	1,796,893	3.6843E+12	50.992650	29,156,000	815.374
2002	1,932,677	3.8187E+12	51.603567	30,062,000	943.085
2003	1,907,226	4.0085E+12	54.203333	30,628,000	938.864
2004	2,291,352	4.2769E+12	56.039917	31,613,000	917.874
2005	2,623,084	4.4813E+12	55.085492	32,312,000	945.023
2006	2,843,345	4.7162E+12	51.314273	32,962,000	802.113
2007	3,091,993	5.0283E+12	46.148391	33,560,000	798.328
2008	3,139,422	5.2371E+12	44.323288	34,089,000	984.810
2009	3,017,099	5.2972E+12	47.679688	35,061,000	899.333
2010	3,520,471	5.7015E+12	45.109664	36,035,000	1,183.650
2011	3,917,454	5.9102E+12	43.313137	37,192,000	1,216.884
2012	4,272,811	6.3052E+12	42.228795	37,600,000	1,164.718
2013	4,681,307	6.7501E+12	42.446185	38,118,000	1,487.902
2014	4,833,368	7.1640E+12	44.395154	38,651,000	1,568.346

Source: Philippine Statistical Yearbook
ASEAN Statistical Yearbook
World Travel and Tourism Council
Department of Tourism

Appendix 2: Johansen Cointegration Test

Unregistered Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob. ****
None *	0.660221	68.3035	54.07904	0.0016
At most 1 *	0.400051	32.68134	35.19275	0.0911
At most 2 *	0.317885	15.82127	20.26184	0.1829
At most 3 *	0.092331	3.196877	9.164546	0.5446
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob. ****
None *	0.660221	35.62215	28.58808	0.0053
At most 1 *	0.400051	16.86007	22.29962	0.2414
At most 2 *	0.317885	12.62439	15.89210	0.1526
At most 3 *	0.092331	3.196877	9.164546	0.5446
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Appendix 3: Granger Causality Test

Pairwise Granger Causality Tests			
Lags: 1			
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
LNARRIVALS does not Granger Cause LNEMPLOY	34	0.31499	0.5787
LNEMPLOY does not Granger Cause LNARRIVALS		**12.2549**	**0.0014**
LNCAPITAL does not Granger Cause LNEMPLOY	34	0.01532	0.9023
LNEMPLOY does not Granger Cause LNCAPITAL		**5.37428**	**0.0272**
LNEMPLOY does not Granger Cause LNEXCH	34	0.08491	0.5171
LNEXCH does not Granger Cause LNEMPLOY		0.42946	0.7727

Pairwise Granger Causality Tests			
Lags: 2			
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
LNARRIVALS does not Granger Cause LNEMPLOY	33	0.19689	0.8224
LNEMPLOY does not Granger Cause LNARRIVALS		**6.24207**	**0.0057**
LNCAPITAL does not Granger Cause LNEMPLOY	33	1.41040	0.2609
LNEMPLOY does not Granger Cause LNCAPITAL		**7.07927**	**0.0032**
LNEMPLOY does not Granger Cause LNEXCH	33	0.92833	0.4070
LNEXCH does not Granger Cause LNEMPLOY		0.07462	0.9283