

STRENGTHEN BANGLADESH ECONOMIC GROWTH & EMPLOYMENT THROUGH TRAVEL & TOURISM CAPITAL INVESTMENT AND VISITOR EXPORT

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THE INDEPENDENT STUDY PAPER SUMMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER IN INTERNATIONAL BUSINESS MANAGEMENT

MASTER OF BUSINESS ADMINISTRATION, SIAM UNIVRSITY, BANGKOK, THAILAND



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The independent study has been approved to be partial fulfillment of the requirement for the Degree of Master of Business Administration in International Business Management.

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May 21, 201-..... (DATE)

ABSTRACT

Travel & Tourism is a developing sector in Bangladesh and it is very imperative to ensure sustainable development goal of Bangladesh and uphold GDP @ 7 %, where Total Travel & Tourism's contribution share near about 4.7 % of total GDP. It will be a challenging task for Bangladesh to maintain GDP growth more than 7% in near future but tourism sector has the potentiality to support GDP growth besides RMG sector. Bangladesh is a land of river & beauty which has world longest sea beach with UNESCO world heritage Sundarbans. Through the paper we will observe the causality between Travel & Tourism's contribution to GDP growth & employment in Bangladesh by formulating an econometrics model. All analyses have been conducted by vector error correction model and Engle & Ganger test of causality with the yearly data on employment in tourism sector, visitor export, and capital investment in tourism sector over the period of 1990 to 2015. Through the analyses we observe that travel and tourism's variables together have long-run significant relationship with GDP growth and employment creation. Our forecasting that in future Bangladesh GDP growth and employment growth in tourism will be strengthened through capital investment and visitor export and in coming years Bangladesh GDP growth will be near to 7% and in 2016 Bangladesh GDP growth rate was 6.9 % and employment generation growth in tourism sector is forecasted to be near to 10%.

Keywords: GDP Growth, Tourism Employment Growth, Econometric Analysis, Vector Error Correction Model, Visitor Export.

ACKNOWLEDGEMENT

I am very much grateful to Dr.Vijit Supinit, the supervisor of my project work for his continuous support and guidance. His valuable suggestions gave me the potency to complete my project and also helps to persist the path in leaning and understanding in real world challenges besides my university study.

I thankful Siam University teachers who shared valuable thought and experience through the class presentation. I am also glad to my office colleagues who always help me to manage my time to pay more attention in my study.

I acknowledge the profound blessings and kindness of the Almighty.

I would like to dedicate this paper to my family members who have given the strength to stay in Thailand for a long period of time and also helps me keep going in improvement of observations in real and academic learning.

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CHAPTER I

1.1 Introduction:

Beauty of Bangladesh defamation is the simplicity. The Bangladeshis are one of the simplest nations in terms of lifestyle. Beauty of Bangladesh lies in the Bangladeshi's sacrificing attitude, struggling mentality and in the ability to adapt. Bangladesh is a developing country with great prospect in future global economy. At present Bangladesh is continuing very steady growth in GDP at 7%. Now Bangladesh is the example for her growth in every sector but Travel and Tourism is still below average. Bangladesh is a county of density population which represents 153 million people where as 65% of between 15 and 64 years old and near about 2.6 million people still unemployed (4.3%). It is massive challenge for Bangladesh to ensure GDP growth rate more than 7% and creating new scope of work for young generation. There are many sectors could be in consideration to solve unemployment & economic growth but tourism could be the one of the biggest sectors for deployment of young workforce. Tourism is related to service industry that needs direct employment that can accelerate GDP growth 2% by only decreasing 1% unemployment rate (Okun's law). On the other hand, Bangladesh foreign currency earning one of the main sources is remittance earnings that will be challenging in near future due to change of global demand of labour supply but visitor earnings could be a way to face the challenges. As Bangladesh already reached in lower- middle income country, it is predictable that domestic spending and people test of choice will change vividly.

Travel & Tourism relates to the activity of travellers on trips outside their usual environment with duration of less than one year. Travel & Tourism is an important economic activity in most countries around the world that directly contributes to GDP generated by industries engage directly with tourists, including hotels, travel agents, airlines and other passenger transport services, as well as the activities of restaurant and leisure industries that deal directly with tourists. It also contributes to employment directly by creating number of direct jobs within the industry.

When the contribution is added with indirect and induce impacts that is total contribution of Travel & Tourism. Bangladesh earns directly from visitor export that is international tourists spend during their travel for business and leisure trips

Indirect contribution includes capital investment by all sectors directly involved in Travel & Tourism. This also from investment spending by other industries on specific tourism assets such as new visitor accommodation and passenger transport equipment, as well as restaurants and leisure facilities for specific tourism use and government collective spending. Induced contribution is broader contribution to GDP and employment of spending by those who are directly or indirectly employed by Travel & Tourism.

Travel & Tourism drives foreign trade, international relationship, business travel that vital contributor to the economy of most countries, developed and developing lowering prices, creating economies of scale, focus on areas of competitive advantage, develop relationships with potential customers and suppliers in overseas locations.

It also enhances foreign direct investments (FDI) that result from business travel introduces capital, technology, skills, people, know-how, demand for local supplies to the domestic economy, and brings improvements in trade balances. On the other hand, infrastructure improvements that collectively benefit tourists, local residents, and the wider economy, improve the quality of life for local residents by expanding the choices available to them in their local community. Travel & Tourism drives the development of collective investments in public utilities and transportation infrastructure including roads, airports, harbours, electricity, sewage, potable water, and communication infrastructure.

It promotes unique cultural heritage has also become a way for countries to differentiate themselves to compete for tourism spending. Travel & Tourism also benefits local economies by enhancing labour mobility. Bangladesh can take more advantage by speeding up this sector.

Through this work we will relate the relationship between travel and tourism's contribution to GDP growth with economic variables like employment growth rate, visitor export, capital investment in travel & tourism by creating an econometric model and we will use vector error correction model to analyse causality between variables and lastly we will forecast future travel & tourism contribution to GDP and employment growth.



1.2 Travel & Tourism's total Contribution's % share of Bangladesh GDP and Total Employment:

Data Source: https://knoema.com/atlas/Bangladesh and author calculation.

This graph shows travel & tourism's share % on GDP and employment in Bangladesh .When GDP share % slightly upward, the total employment share % also in upward and vice versa. So, there is a positive relationship between contribution on GDP and employment. On the other hand employment also contributes to GDP as input in service industry. Here from the trend we realize that Bangladesh tourism has contribution to GDP and employment but that is nominal compare to world average.

WTTC (2015) reported that the total contribution of Travel & Tourism to employment (including wider effects from investment, the supply chain and induced income impacts, was 283,578,000 jobs in 2015 (9.5% of total employment). This is forecast to rise by 2.2% in 2016 to 289,756,000 jobs (9.6% of total employment). By 2026, Travel & Tourism is forecast to support 370,204,000 jobs (11.0% of total employment), an increase of 2.5% pa over the period. Globally tourism sector contribution is creasing immensely.

And WTTC (2015) also reported on global GDP contribution from tourism that the total contribution of Travel & Tourism to GDP (including wider effects from investment, the supply chain and induced income impacts, was USD7, 170.3bn in 2015 (9.8% of GDP) and is expected to grow by 3.5% to USD7, 420.5bn (9.8% of GDP) in 2016. It is forecast to rise by 4.0% pa to USD10, 986.5bn by 2026 (10.8% of GDP)

1.3 Total Travel & Tourism employment and % share of total employment in Bangladesh:



Here, In 1990 Bangladesh total tourism contribution share % of Bangladesh total employment was 2.6 % only but in last decade it improves share percentage and in 2015 it was 4.1 % share of total employment. Here, the blue colour bar shows the employment generated by tourism sector in Bangladesh and the red line shows in share percentage of total employment generated in Bangladesh in that period.



1.4 Capital Investment in tourism and GDP growth:

Source: Data Source: https://knoema.com/atlas/Bangladesh and author calculation.

Money invested in a business venture with an expectation of income, and recovered through earnings generated by the business over several years. It is generally understood to be used for capital expenditure rather than for day-to-day operations (working capital) or other expenses.

The graph shows that Bangladesh investment in travel and tourism is increasing year to year. Investment is tourism sector with the hope of future growth in visitor export and tourist arrival will accelerate. Bangladesh government and private sector have to work together to improve contribution from tourism sector to GDP growth. In 1990 capital investment was only BDT 3.1 bln but in 2015 BDT 61.6 bln that shows the intention to improve this sector. We assume that there is a short-run causality running from capital investment in tourism sector to Bangladesh GDP growth that will be tested in our analysis part.



1.5 Visitor export and GDP growth rate in Bangladesh:

Source: Data Source: https://knoema.com/atlas/Bangladesh and author calculation

Visitor Exports is spending within the country by international tourists for both business and leisure trips, including transportation spending. This is consistent with total inbound tourism expenditure.

Spending by foreign visitors (otherwise known as visitor exports) accounted for over 5% of total global exports in 2013 (WTTC).

Here the bar and line graph show the trend of the two variables, dependent and independent .They are gradually improving in upward trend. Bangladesh visitor export in 1990 was BDT .04 bln and end of year 2015 it was BDT 10.8 bln. On the other hand Bangladesh GDP growth rate from 1190 to 2015 respectively 4.6 & 6.8 percent. There is causality between visitor export and GDP growth that will be tested in our data analysis chapter.



1.6 Visitor export (BDT bn) and total employment (000) in tourism:

Data Source: https://knoema.com/atlas/Bangladesh and author calculation.

The graph shows the trends of tourism employment and tourism visitor export of the period 1990-2015.From the trend we observe both are upward and the gap between the trends minimizing. It shows also that has a positive relationship each other. And visitor export can be cause of employment in tourism sector. This graph also denotes that total employment in tourism and visitor export could have a bidirectional relationship and there is a possibility in short –run they could be a cause of growth for each other.

1.7 Capital Investment (BDT bln) and total employment (000) in tourism:



Data Source: https://knoema.com/atlas/Bangladesh and author calculation

Capital investment has positive impact on employment creation. Through the capital investment a business or enterprise starts their business and tourism sector also same as other sector that is needed huge capital investment to facilitate tourist arrival and ultimately it goes to employment creation.

1.8 Capital Investment (BDT bln) and Visitor Export (BDT bln) in tourism:



Data Source: https://knoema.com/atlas/Bangladesh and author calculation

The graph shows that capital investment in Bangladesh has significant change since 1990 to 2015 and the trend shows the tendency of the sector to be grownup. Simultaneously visitor export also considerably has changed since 1990 to 2015. In 1990 the visitor export was only BDT 0.6 bln and end of the year 2015 it was BDT 7.5 bln.

We assume that there is a unidirectional causality running from capital investment to visitor export that means capital investment could be a cause of visitor export that we will test in our analysis part.

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1.9 GDP and Total Travel & Tourism Employment:

Data Source: https://knoema.com/atlas/Bangladesh and author calculation.

Here the graph shows that Bangladesh GDP data is non-stationary and gradually increasing. So, it does maintain a positive relationship between GDP and Total employment in Travel & Tourism.

Bangladesh unemployment rate is 4.3% that is considerably decreasing with the GDP growth and the employment in tourism sector also increasing that helps to keep unemployment rate steady.



1.10 Direct Contribution of Travel & Tourism to GDP:

Source: Travel and Tourism Economic Impact 2016, Bangladesh, WTTC and author calculation.

Bangladesh has steady growth rate in GDP near about 7% .Total GDP in 2014 & 2015 respectively were BDT 13,436.744 and BDT 15,158.022 billion and direct contribution of Travel & Tourism on GDP was BDT 379.5 & BDT 407.6 billion .In percent of total GDP 2.2 % in 2014 and 2.4% in 2015 and WTTC forecasts to rise by 5.2% in 2016, and to rise by 5.6% pa, from 2016-2026, to BDT738.1bn (2.3% of total GDP) in 2026.



1.11 Direct Contribution of Travel & Tourism to Employment:

Source: Travel and Tourism Economic Impact 2016, Bangladesh, WTTC and author calculation.

In 2014 & 2015 Travel & Tourism directly supported respectively 1,102,700 (2.0% of total employment) 1,138,500 jobs (2.0% of total employment) and WTTC expects to rise by 1.5% in 2016 and rise by 0.8% pa to 1,257,000 jobs (1.8% of total employment) in 2026.

1.12 Domestic Tourism:

UNWTO's economists estimate that at the global level domestic tourism represents 73%

of total over nights 74% of arrivals and 69% of overnights at hotels 89% of arrivals and 75% of overnights in other (non-hotel) accommodations

Domestic Travel & Tourism Spending and Visitor Export:



Source:https://knoema.com/atlas/Bangladesh/topics/Tourism& Author calculation

This graph shows contribution in BDT billion, Domestic tourist spending more than international visitor and Bangladesh domestic tourism is booming due to economic growth. The period 1990 to 2015 domestic tourist spending in average BDT 182.94 billion where as international tourist only BDT 3.9 billion.

According to the RTS three forms of tourism are distinguished

- Domestic tourism, involving residents of the given country travelling only within this country;
- (2) Inbound tourism, involving non-residents travelling in the given country;
- (3) Outbound tourism, involving residents travelling in another country.

Non-residents and residents alike the payment streams are split into

- Domestic tourist consumption (comprises the consumption of resident visitors within the economic territory of the country of reference in their non-usual environment);
- (2) Inbound tourist consumption (comprises the consumption of non-resident visitors within the economic territory of the country and/or that of residents);

(3) Outbound tourist consumption (comprises the consumption of resident visitors outside the economic territory of the country of reference and provided by non-residents).

Forms and categories of tourism Source:



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1.13 Types of Tourism in Bangladesh:

The Bangladesh Parjatan Corporation classifies tourism into six different types: Tourism, Business, Office, Study, Religion, Service and Other purpose. According to statistics reported by Bangladesh Tourism Board, in 2009 majority of tourists came to Bangladesh for tourism purpose (i.e. 46%) which was closely followed by business tourism (41.8%). In addition to these two types of tourism, another popular type is religious tourism (i.e. 3.4%)-where the purpose of the religious visitors to visit the religious sites or events in the country

(i) Site Tourism: Bangladesh is land of river and beauty with world longest connected sea beach and hill tract. It has great scope of work and to attract more tourism by branding and marketing. Bangladeshi people are very keen to travel but due to infrastructure development Bangladesh is below average of domestic contribution on tourism industry.

(ii) Business tourism: All over the world international business is growing up with regional integration and cooperation. Bangladesh

(iii) Office Tourism: Now Bangladesh is the model digital county .Every day lots of expert coming to evaluate and attain seminar and getting huge foreign direct investment form different corner of the world for that office tourism is increasing.

(iv) Education Tourism: In Bangladesh many students are come to attain seminar and presentation as well as exchange student every from neighbouring countries.

(v) Religious Tourism: Bangladesh is a Muslim majority nation and it organises the Bishwa Ijtema which the largest congregation of Muslims after the Holy Pilgrimage to Makkah. This annual event alone attracts a huge number of tourists from Muslim world and constitutes 3.4% of the total tourist inflow into Bangladesh. Other religious groups in the country are relatively much smaller in number; however their events do attract tourists although in a smaller scale.

(vi) Medical Tourism: Medical tourism in Bangladesh is growing day by day.

(vii) Other Tourism: Other forms of tourism includes Bicycle touring, Boat sharing, Cultural tourism, Dark tourism, Rural tourism, River cruise, Nautical tourism, Jihadi tourism, Halal tourism, Sports tourism, Slum tourism, Virtual tour, Walking tour, Wildlife tourism and Water tourism. Very often, people come for short visits to meet relatives, participating sports and international awareness program etc. In 2009, 13,286 tourists visit Bangladesh for these purposes (Das, Chakraborty 2012).

1.14 Institutions of tourism management in Bangladesh:

Bangladesh Parjatan Corporation (BPC) is an autonomous body under the ministry of Civil Aviation and Tourism established in 1972. Basic target of BPC is to expand the tourism sector and provide the service for local and foreign tourist. National Hotel and Tourism Training Institute (NHTTI) is an institute for professional tourism management training. NHTTI was established in 1974 under Bangladesh Parjatan Corporation. This institute offers courses to ensure trained personnel for hotel and tourism industry. NHTTI started a two-year long diploma course in hotel management in 1994. Institute also provides the job training for BPC personnel and arrange special seminar, workshop related to tourism development. Another important institution supporting the development of tourism is Bangladesh Tourism Board. Bangladesh Tourism Board established in 2010 to meet the strong demand for private sector and the tourism professionals. It is affiliated with United Nations World Tourism Organizations (UNWTO).

1.15 Purposes of the study:

Bangladesh economy has strong steady growth and every sector has contribution on GDP but compare to other industry, total tourism industry has only average 4% contributions to GDP. Whereas travel &Tourism generated US\$7.2 trillion (9.8% of global GDP) and 284 million jobs (1 in 11 jobs) to the global economy in 2015. Its growth of 3.1% was faster than the wider economy. Despite challenges, sector is forecast to continue outperforming global GDP growth in 2016. (WTTC, 2016).

In global GDP, Travel & Tourism contributes 9.8% where as in Bangladesh a travel & tourism contribution to GDP is only 4% that is below average. If we look at other Asian countries they have adapted tourism policy and have good contributions on their GDP.

As Bangladesh is a developing country and unemployment rate 4.3 % against the population of 162.8 million that is big challenge for Bangladesh to reduce unemployment rate. Tourism industry has the scope of recruit direct employment.

On the other hand, Tourism also contributes to GDP growth, at present Bangladesh GDP growth rate 7% and has aimed to achieve more than 8% in coming years that won't be easy because they main earning source readymade garments industry that is established industry and output is maximum. That's why Bangladesh has to think alternative source of contribution to GDP that has the potential to strengthen GDP growth rate. Through the analyses we will find out the potentiality of tourism sector in Bangladesh.

Tourism helps to improve a country's impression to all over the word and could be a source of Bangladesh rural people livelihood and also helps people to understand culture and more over it helps to fill in gap of ideas and improvement of ideas and strong boldness.

In all aspects Bangladesh should has to improve in growing tourism sector to contribute more in GDP, service industry and unemployment.

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This study is very result oriented to understand the root cause of slow growth of tourism sector in Bangladesh where she has all the natural resources to attract people from all over the world.

Here in my analysis, try to find out the relationships & nature of variables that is related to GDP and employment and finding a way that will help to focus on the specific point of challenges.

1.16 Scope of the Study:

Here in my working I have collected secondary data from different sources that is mainly Bangladesh Tourism Board, World Bank data base, Knoema data atlas, World Travel & Tourism Council that fully depends on their publication and their data calculation and it is very big challenge to collect information on Bangladesh Tourism Sector from the Bangladesh bureau of Statistic as well as Bangladesh tourism related website. Mostly are not updated on time. For that I have to take help from international organization and from their website and publications.

In my work I have used econometric model analysis suing VECM (Vector Error Correction Model).In this model I didn't consider all the variables that is related to GDP and employment growth. In econometric model we will take some vital variables in consideration and assume other variables are constant.

Employment in an industry related to supply and demand of the goods and service that creates labour demand .In another way we can say employment is related to input and output of industry. Employment growth is difficult to predict but by statistical analyses could be minimise the gap of uncertainty.

Global financial crisis has effect on people earning and expenditure. During recession all economic laws are use less to describe the variables and people are frustrated with the hopes and dreams.

Exchange rate helps people to gain strength on expenditure and as currency is the only monetary unit in financial transaction and tourist currency gains against dollar or host currency, tourists are expected to travel more times as usual. So, currency depreciation and appreciation have importance in tourist export.

Infrastructure development and natural beauty are also being factor of a county tourism employment. Tourists always are looking for safe and comfortable place for leisure. To ensure comfortable, safety, ease of communication, roads and highways as well as entrance and exit point and policy are be needed to consider.

All these variables are not in consideration in this econometric model.

1.17 **Objectives of the study:**

The objectives of this project paper are as follows:

- 1) To evaluate causality between dependant and independent variables.
- 2) To understand Tourism employment growth contributions to GDP growth.
- 3) To observe capital investment impact on Bangladesh GDP growth.
- 4) To estimate the relationship between visitor export and GDP growth.
- 5) Developing an econometric model on travel & tourism contribution.
- 6) Estimating future trend of travel & tourism contribution to GDP and employment.

7) To realize relationship between capital investment and visitor export to employment creation.

1.18 **Conceptual Framework:**



Here, in our conceptual framework Gross Domestic Product Growth (GDPG) is depended variable and Tourism employment growth (EMPG), Capital Investment in Tourism (CIV) and Visitor Export (VEX) are independent variables.

1.19 Hypothesis:

A) H1: There is a long-run association ship between GDPG and EMPG, CIV, VEX.

- B) H2: There is a short –run causality running from VEX to GDPG.
- C) H3: There is a short-run causality running from CIV to GDPG.
- D) H4: There is a long-run relationship between EMPG and VEX, CIV.
- E) H5: There is a unidirectional causality running from CIV to VEX.

Gross domestic product (GDP) is the monetary value of all the finished goods and services produced within a country's borders in a specific time period. Though GDP is usually calculated on an annual basis, it can be calculated on quarterly basis as well. GDP includes all private and public consumption, government outlays, investments and exports minus imports that occur within a defined territory. GDP is a broad measurement of a nation's overall economic activity.

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Visitor exports (VEX) are the spending within a country by international tourists for leisure and business travel. This includes spending on transport. Visitor export is the key of foreign remittance earning that creates opportunity to economic development in import payment that creates job and employment in industries and lastly that contributes to GDP.

Tourism employment (EMPG) has direct contribution to GDP. When GDP growth rate is increased then employment also increases and has positive relationship that flows Okun's Law. Here we consider employment growth is independent variable and GDP growth rate as dependent variable.

Capital Investment in Tourism Sector (CIV): Capital investment is the first initiative to run a business and for tourism sector it is very essential to ensure proper quality and infrastructure and it has big contribution to GDP. Here we consider capital investment as an independent variable.

In another VECM model we consider employment growth rate in tourism is dependent variable where capital investment and visitor export in tourism as independent variable.



CHAPTER II

2. Theory and Related Researches

2.1 Okun's law on GDP and employment:

Okun's law to be called as "Okun's rule of thumb" because it is an estimate based on empirical observation rather than a result derived from theory. Okun's law is approximated because factors has more affect on output than employment (such as productivity).

In Okun's original statement of his law, a 1% decline in the rate of cyclical unemployment due to 2% increase in output corresponds; 0.5% increase in labor force participation; a 0.5% increase in hours worked per employee; and a 1% increase in output per hours worked (Labour Productivity).

Okun's law also mention that a one point creation in the cyclical unemployment rate is connected with two percent of negative growth in real GDP but the relationship varies depending on the country and time period under consideration.

The relationship has been observed by regressing GDP growth on change in the unemployment rate. According to Martin Prachowny, about a 3% decrease in output for every 1% increase in the unemployment rate. That means both have a negative relationship. If unemployment rate is increase then GDP growth is decrease. On the other hand we also could say, GDP growth and employment has positive relationship as when employment is increased the GDP growth also increases vice versa.

He also indicates that capacity development and hours worked both have more influences over out pot other than unemployment. Holding these other factors are constant reduces the association between unemployment and GDP to around 0.7% for every 1% change in the unemployment rate (Prachowny 1993). Abel and Bernanke, (2005) estimates based on data from more recent years give about a 2% decrease in output for every 1% increase in unemployment.

2.2 Keynesian Theory of Employment:

In economics, British economist John Maynard Keynes in his book The General Theory of Employment, Interest and money which was published in 1936 during the Great Depression the Keynesian theory was introduced.

Keynesian economics mentions that in the short-run economic output is influenced by the total spending in the economy (AD)

In accordance with the Keynesian theory, AD (aggregate demand) does not essentially equal the productive capacity of the economy. Keynesian theorists believe that aggregate demand is subjective by a series of factors and responds suddenly. The shift in aggregate demand impacts production, employment, and inflation in the economy.

Source: Boundless. "Keynesian Theory." Boundless Economics Boundless, 26 May. 2016. Retrieved 04 Mar. 2017

The aggregate demand (AD) and aggregate supply (AS) curve are used for determining the equilibrium level employment



GDP and employment rate are in a cyclic interdependent relation according to Keynesian economic theory. When the cycle is at its peak and the production rates grow rapidly, businesses enterprise try to hire as many workers hopping to maximize output that increase employment at the same time decrease unemployment. Keynesian multipliers could be use to analyze the impact of tourism in economy. The actual expenditure by tourists is not the real benefit rather the true impact that this expenditure has on economy. Impact of tourist expenditure is measured by out put multiplier on the other hand income multipliers measure the impact on income and employment multipliers measure the impact on employment.

According to Cooper et al (1998), Keynesian multipliers are unable to address the nature of linkages between sectors and focus on simple combinations that only can give a rather partial and limited perspective on the impact of tourism.



Through the article reviews our understanding that travel and tourism development has been considered as positive contribution to economic growth.

Balaguer and Manuel (2002) observed on tourism-led growth hypothesis and found that the role of tourism in the Spanish economic development has long-run association.

They also mentioned that the last three decades Spanish economic development was rational to persistent expansion of international tourism. On the other hand the increase of this activity has produced multiplier effects over time.

Kadir, N. & Josoft, k.(2010) reported that their causality test on Malaysia tourism sector got unidirectional causality running from imports to international tourist receipts at 5% significance level as well as total trade to international tourism receipts significant at level 10%. They end up by a conclusion that increases in total trade, exports and imports will cause expansion in the tourism sector in Malaysia.

They also claimed there is a unidirectional causality between all the series. They claimed that most of tourists arrivals are related to business tourism and suggested implement more realistic policy to focus on tourism and trade related to enhance

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foreign exchange earnings, keeping sustainable growth in Malaysian's tourism sector. Lastly they concluded to pay more attention to the business tourism as this category has shown higher growth rate.

Liangju, W. & LI, Z. & Wanlian, L (2012) observed on Chinese economic growth and tourism through the causality test based on computational econometrics and ended up by finding a long-run co-integration relationship between economic growth and the development of China's domestic tourism. If China's domestic tourist arrivals increase one percent in long term China's GDP will increase 0.810 percent. Secondly, there is a short-term disequilibrium relationship between the economic growth and development of China's domestic tourism. If China's domestic tourist arrivals add to one percent in short term then GDP will increase 0.229 percent.

Caglayan, N. & Sak, K. & Karymshakov (2013) observed that on existence and directions of causality confirm the importance of tourism for economic growth and the conditionality of this relationship on other possible determinants investigated in tourism revenue and GDP.

Macintosh and Goeldner defined as Tourism is a collection of activities, services and industries which deliver travel experience comprising transportation, accommodation, eating and drinking establishments, retail shops, entertainment businesses and other hospitality services provided for individuals or groups travelling away from home"

Akkemik, K.A (vol.7-1 2007). The Response of Employment to GDP Growth in Turkey: Economic growth precedes employment growth and impacts significantly on adjustments in the labour market with a four-period delay. After this delay, GDP growth and persistence of employment growth lead to further increases in labour demand.

Aynalem, S. (2016) claims that tourism and hospitality industries have creating many job opportunities for millions of people in the world in different areas like

accommodation, food and beverage (restaurants, dining rooms, cafes, fast food outlets, pubs, nightclubs, bed and breakfasts, motels, hotels, resorts, lounges, catering operations; airlines, airports, aircrafts, ships, boats, cruises, land transportations like trail, bus, travel agencies, tour operation companies), natural and cultural attractions such as national parks, caves, monuments, museums and galleries, theatres, concerts, festivals, carnivals, conferences, trade shows, and exhibitions). Political stabilities, reduced working hours, technological advancement, increased income and conducive climate are the major favorable conditions for the development of the stated tourism and hospitality establishments to create millions of jobs.

Onder,K & Durgun,A ,(2008) reported that tourism has had a positive effect on employment, and the co integration test has proved that there is a mutual relationship between the tourist revenue and employment in the long term.

Pavlic, Tolic & Svilokos, (2013) also reported that in Croatia increasing tourism flows can bring many positive economic consequences to host countries, particularly in terms of GDP, employment opportunities, revenues and foreign exchange earnings and they also found through theoretical and empirical studies that tourism has a positive effect on employment.

McCatty, M & Serjuth. P (2006) concluded in their article on Jamaican economy by the findings that tourism sector is one of the most important factors in economic development and growth and the output multiplier for the Jamaican tourist industry is small, at 1.00.

Armstrong (1996) examined that the impact of tourism on the long- run economic growth of Greece. In his causality analysis exchange rate, international tourism receipts & GDP were use as independent variable and found that there is a strong causal relationship between exchange rate and economic growth, a strong Ganger causality relationship between international tourism receipts and economic growth, and sensible causal relationships between economic growth and international tourism receipts as well as between tourism receipts and exchange rate.

Dritsakis, N. (2004) worked on Greece economy and found a relationship among international tourism earnings, real exchange rate and economic growth. It has common trend or long-run relationships among these variables.

His also found that real exchange rate cause international tourism earnings "simply causal" relationship.

Fauzel,S.(2016) investigated on Mauritius, a small island on tourism employment considering tourist receipt ,GDP, investment in tourist sector ,inflation and he also considered global financial crisis a independent variable and reported that employment contribution due to the expansion of the tourism sector is conducive to tourism development in the long run.

In 2010 publication United Nations and World Tourism Organization, Organization for Economic Cooperation and Development, Commission of the European Communities, suggested that the impact of structures in different tourism characteristic industries and tourism flows and expenditures on employment levels are needed to analyse and forecast through statistics.

In 2014 both World Tourism Organization (WTO) and International Labour Organization (ILO) concluded that demand for travel and tourism – both international and domestic – motivates investment. According to them investment growth depends on the demand of local and international demand and claimed that in 2011, USD 650 billion in capital investment, or 4.5% of total, was driven by travel and tourism. They also claimed that individual investments in facilities such as the construction of travel and tourism industries, hotels and resorts also force infrastructure improvements that collectively benefit tourists, the wider economy and local inhabitants.

A review of senior management in the travel industry conducted by Oxford Economics on behalf of the World Travel and Tourism Council provides additional insight and mentioned that nearly 86% of the respondents found that foreign direct

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investments helps in development of local tourism industry had led to an increase in local job creation.

From the above literature review we have observed that most of them have taken in consideration independent variables are import, tourist receipt, visitor arrivals, exchange rate and found a positive relationship to economic growth. On the other hand ignored other important independent variables like visitor export, capital investment and employment generation in tourism sector .In our analysis we will create a model by taking these independent variables to Bangladesh's economic growth and employment. Tourism sector mainly contributes to a country's GDP growth and employment at the end. But in literature review we seen they didn't consider the capital investment as independent variable and its contribution to GDP growth.

As developing countries have lack of infrastructure, skilled manpower to attract international tourism and facilitate their need of entertainment. That's why capital investment should have to include to analysis against a developing country like Bangladesh.

Many researches believe that in the context of developing country capital investment is the one of the key factors to influence foreign visitor.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Augmented Dickey-Fuller Test:

If the autocovariances and mean do not depend on time that is called the time series is stationary. (Dickey and Fuller, 1979).

If a series attains stationary after first difference is said that contains a unit root as well as order one is integrated. As standard statistical assumption measures do not relate to regressions that hold a non-stationary variable, it is recommended to test unit root on all series before employ them for regression assessment.

It is obligatory to check the unit root of the series before testing for Johansen's cointegration.

ADF test out-put is ADF test statistic, % level & Probability %. From the output of ADF test we can interpret the data are stationary or no-stationary.

In this test the null hypothesis is the variables are no-stationary or a unit root at level and at first difference or the variables data are stationary or no unit root.

To interpret the result the of test ADF test statistic is consider as absolute value and If the value ADF test statistic are greater than level 5% value and the probability also less than 5% that reject the null hypothesis and accept the alternative hypothesis that there is no unit root at first difference.

The main objected this test of data to fulfil the requirement of Johansson Cointegration test that the variables should have no unit root at first difference.

3.2 Akaike's Information Criteria (AIC):

In regression analyses it is very important to determine the LAG values of the endogenous variables .On the other hand in technically it is also be called vector autoregression (VAR).In the analysis we will consider GDP and employment is dependent variable and that variables yearly data fluctuation and the determination of how the data of previous year could affect present data and in together. In this consideration it is important to select more lags as necessary. To determine how many lags to use, there are different selection criteria would be used.

The two mostly used are the Schwarz' Bayesian Information Criterion and the Akaike Information Criterion (AIC).

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These rules choose lag length j to minimize: log(SSR(j)/n) + (j + 1)C(n)/n,

Here SSR(j) is the sum or squared residuals for the VAR with j lags

and n is the number of observations; C(n) = 2 for AIC and C(n) = log(n) for BIC.

The LAG value is determine on the basis the value of Akaike Information Criterion (AIC) .In analysis and selection of LAG, the suggestion is to choice that LAG value which represent less AIC value .

In our analysis LAG two shows the less AIC value that why we have selected LAG two in our whole analysis.

3.3 Johansen's cointegration test:

Non stationary series is concluded in experiential economics macroeconomic variables. Treating non stationary variables in experiential analysis is important to avoid the results of false regressing.

According to the model of cointegration, if there is two or more non-stationary time series share a common trend, then it is cointegrated. The hypothetical frameworks are articulated as follows:

The part of the vector Yt = (y1t, y2t, ..., ynt)' are believed to be cointegrated of order d,b, symbolized $Yt \sim CI(d,b)$

if (i) all the part Yt are stationary after n difference, or integrated of order d and noted as $Yt \sim I(d)$.

(ii) Presence of a vector $\beta = (\beta 1, \beta 2, ..., \beta n)$ in such that linear arrangement $\beta Yt = \beta 1y1t + \beta 2y2t + ... + \beta nynt$ whereby the vector β is the cointegrating vector.

if there are n series of variables, there may be as many as n-1 linearly independent cointegrating vectors.

Through the Johansen's (1991) co integration test we can decide whether the variable has log-run association-ship. In 1990 Johansen and Juselius commenced λ tracee and λ max statistics based on the maximum likelihood or logarithm to analyze no-stationary time series data to find out the numbers of significant co-integration vector.

The benefit of this analysis that the test statistic is used to evaluate more than one variables to get at least one co-integration vector in the model.

The testing is initiated by selecting the LAG length that is we has decided to use through the AIC information criteria.

In the Johansen procedure, following a vector autoregressive (VAR) model, it engages the recognition of rank of the n x n matrix \prod in the requirement given by:

$$\Delta Y_t = \mathcal{S} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \Pi Y_{t-k} + \varepsilon_i$$

Where,

Yt - column vector of the n variables,

 Δ - difference operator,

 Γ and \prod are the coefficient matrices,

k indicates the lag length and δ is a fixed.

If there is no cointegrating vector that means \prod is a singular matrix and which denotes that the rank of the cointegrating vector is equal to zero.

On the other hand, the rank of \prod could be anywhere between zero. We could also say that the co-integrating rank is the number that is the number of cointegrating equation is found out by the Johansen cointegration test

The Johansen Maximum likelihood test provides a test for the rank of \prod , namely the trace test (λ trace) and the maximum eigenvalue test (λ max).

Both test statistics are given as follows:

$$\begin{split} \lambda_{trace}(r) &= -T \sum_{i=r+1}^{n} \ln \left(1 - \hat{\lambda}_{i} \right) \\ \lambda_{trace}(r, r+1) &= -T \ln(1 - \hat{\lambda}_{r+1}) \end{split}$$

Where n is the number of separate series to be examined, T is the number of usable observations and estimated eigenvalues.

 λ trace statistic tests is to determine whether the model has co-integration equation or not and the λ max statistic tests whether a single cointegration equation is satisfactory.

Here the null hypothesis, in this model there is no co-integration equation but it could be rejected if the analysis finds out that the probability is less than 5% and

the λ trace statistic is getter than the critical value then it shows that they alternative hypothesis could be accepted and there is at least one cointegration equation in the model.

3.4 Vector Error Correction Model (VECM):

In 1993 Toda & Phillips denoted that testing causality in the VECM framework is presently at the very forefront of econometric research. Engle and Granger (1987) who confirmed that once a number of variables (say, xt and yt) are found to be co integrated, there always be present a correspondent error-correction representation, which involves that changes in the dependent variable are function of the level of disequilibrium in the cointegration relationship that is captured by the error-correction term, ECT.

If we exploit the idea that there may exist co-movements between variables and possibilities that they will trend together in finding a long run stable equilibrium, by Granger representation theorem, we may hypothesize the following testing relationship, which constitute VECM given by equation:

 $\Delta X t = \Sigma Ai \Delta X t - i + \Sigma \xi i \Theta t - i + \upsilon t$

Where the As are parameters, X t is an n x 1 vector of variables cointegrated of order r; Θ contains the r individual ECTs get from r long run cointegrating vectors via the Johansen-Juselius (JJ) maximum likelihood method.

VECM approach also helps in testing Granger causality in long-run and short-run. In the short term, when the variables are cointegrated, variations from this long-run equilibrium will feed back on the alteration in the dependent variable to strength the association towards the long-run stability.

As on our model the equation as below-

$$\label{eq:linear} \begin{split} \Delta LGDPGt &= a0 + \Sigma a1j\Delta \ LGDPGt\mbox{-}j + \Sigma a2j\Delta \ LCIVt\mbox{-}j + \Sigma a3j\Delta \ LEMPGt\mbox{-}j + \\ \Sigma a4j\Delta \ LVEXt\mbox{-}j + \delta ECt\mbox{-}1 + et \end{split}$$

Where- t = Time a0 = Co-efficient of the model ECt-1 = error correction term et = Random error GDPG = Gross Domestic Product Growth. CIV= Capital Investment in Tourism. EMPG = Total employment growth in Travel & Tourism VEX= Visitor Export.

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The main objective of this model to finding the way to minimise the error correction term to make the model more forecasted and set the model in implementation and execution to get expected result in future.

In this model we could set the null hypothesis that there is no log-run association ship between the variables but if the data output shows the that error correction term is negative and the probability is less than 5% that is significant that could reject the null hypothesis and accepted the alternative hypothesis –there is a long-run association ship between variables.

The error correction negative means the model has good force to get equilibrium in near future.

In E-views after getting out put from system we also could understand R-square value that determines how the data is fitted with this model and the better is getting maximum value.

3.5 Testing Granger-Causality

The cointegration method was initiated by Engle and Granger (1987), Granger (1986), and Hendry (1986) made an important role on the way to testing Granger causality.

Granger causality is a system that is used to determine whether one time series is precious in predicts another. In general, regressions reproduce "simple" correlations, but Clive Granger, disagree that there is an understanding of a set of tests as instructive a bit about causality.

It is fruitful when we variables are connected but we don't distinguish which variable causes the other to move.

For example, in our analysis visitor export and capital investment is used as independent variable that variables are to be tested because both could be cause for each other or one can be cause for other. In some observations noted that visitor export can be cause to capital investment and vice versa. Extended to as the two variables have a common trend, Granger causality must be present in at least one direction either bidirectional or unidirectional (Granger, 1986, 1988).

According to Granger, a time series X t is reason by one more time series Y t. if the current value of X t can be superior forecasted from precedent value of X t and Y t. than from the precedent value of X t alone.

Basically, Granger's description of causality is surrounded in terms of expectedness. The test works by first doing a regression of ΔY on lagged values of ΔY . When the lag interval for Y is mentioned significant at t-stat or p-value, following regressions for lagged levels of ΔX are carry out and add descriptive power to the model.

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That can be continual for multiple ΔX 's. (with each ΔX being tested separately of other ΔX 's, but in combination with the established lag level of ΔY). More than 1 lag level of a variable can be added in the ultimate regression model, given it is statistically important and provides suggested command.

The null hypothesis in this analysis, there is no causality between variables at p-value 5% but if the variables causality p-value is less than 5% then the null hypothesis is rejected and the alternative hypothesis is accept that their is a causal relationship between variables.

3.6 Wald Test:

The Wald Test (Wald, 1943) is a coefficient limitations test that enquires whether the regression judgment coefficients jointly give details any of the variation in the dependent variable. The null hypothesis is that all coefficients for explanatory variables are equal to zero.

The Wald Test output two test statistics -

The first one is F-Statistic and the second one is the Chi[^]2 Statistic. They are one the basis of judgment of the unrestricted regression and also determine the relationship between the unrestricted judgment results and restricted estimations. If all coefficients are equal to zero that denote that unrestricted judgement could be close to restricted estimations.

Here in this test the null hypothesis is there is a short-run causality between variables at Chi-square probability and F-statistic 5% and the value of Chi-square probability and F-statistic is less than 5% that all independent variables co-efficient are equal to zero jointly and that has a short-run causality.

On the other hand, if F-statistic and Chi-square probability is greater than the significance level at 5% the null hypothesis is accepted that means there is a long-run causality between variables. We also can say that when if F-statistic and Chi-square probability is greater than the significance level at 5% then it could be accepted that all independent variables co-efficient jointly are zero and maintain a long-run causality.

3.7 Breusch-Godfrey Serial Correlation:

(Godfrey, 1988) time series residuals are repeatedly found to be serially correlated with their own lagged values in Ordinary Least Squares (OLS) regression.

Serial correlation means

- a) Ordinary least square is no longer a well-organized linear estimator,
- b) Standard errors are generally loud and mistaken
- c) Ordinary Least Squares approximations are conflicting and biased.

According to the Breusch-Godfrey test the null hypothesis is that there is no serial correlation in numbers of lags is specified. This test retreats the residuals on the lagged residuals and original regressors up to the particular lag order.

If the Prob chi-Square is getter than 5% at level the null hypothesis is accepted and that remarks there is no serial correlation to the specific number of lags. On the other hand, if the Prob chi-Square is less than 5% then alternative hypothesis is accepted that is there is serial correlation in residuals.



CHAPTER IV

DATA ANALYSIS, FINDINGS & RESULTS

4.1 Scatter presentation of Variables:





Here the graph presents the trends of the variables for the period of 1990-2015. It shows the variables are non-stationary and has steady growth .Here in data we use tourism total employment growth (EMPG) per year, GDP in growth per year, Visitor Export (VEX) in BDT billion & Capital investment in tourism in BDT billion.

4.2 Augmented Dickey-Fuller test (1979): (At first difference)

Here in this test we will consider the value of test data as absolute value that means we will ignore the negative sign.

Variables	ADF test statistic	At 5% level	Probability(P) %	Results
D(GDPG)	-3.43	-3.01	2%	Reject Null, No unit root.
D(EMPG)	-8.64	-2.99	0%	Reject Null, No unit root.
D(VEX)	-4.25	-2.99	0%	Reject Null, No unit root.
D(CIV)	-3.59	-2.99	1%	Reject Null, No unit root.

Here, we have tested our variables with ADF that is precondition to go for Johansson Co-integration test. The null hypothesis is the variables are unit root at first difference but after the test we get in absolute value ADF test statistic are greater than level 5% value and the probability also less than 5%. That reject the null hypothesis and accept the alternative hypothesis that there is no unit root at first difference.

As, Johansson Co-integration test data should have non-stationary at level and at first difference the data converted to stationary or no unit root that we get from the above analyses now our data is ready to go for Johansson Co-integration test.

4.3 Johansson and Juselius Co-Integration Test:

In ADF test we observe that all the variables are stationary at difference and before it was non-stationary.

Date: 03/21/17 Time: 12:13 Sample (adjusted): 1993 2015 Included observations: 23 after adjustments Trend assumption: Linear deterministic trend Series: GDPG EMPG VEX CIV Lags interval (in first differences): 1 to 2

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.762379	69.43194	47.85613	0.0002
At most 1 *	0.564396	36.37915	29.79707	
At most 2 *	0.391045	17.26566	15.49471	0.0268
At most 3 *	0.224827	5.857391	3.841466	

Unrestricted Cointegration Rank Test (Trace)

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Here,

H0 (the null hypothesis) the variables are not Co-integrated at p is 5% level.

But here the probability is 0% that is less than 5%, so can reject the null hypothesis and we accept the alternative hypothesis is the variables are co integrated .On the other hand trace statistic indicates 4 co-integration within the variable .

Here, trace statistic value is greater than critical value for all variables that also note that we can reject null-hypothesis.

Now it is proved that the variables are co-integrated and fit for vector error correction model.

4.4 Vector Error Correction Model (VECM):

Before we go for VECM we have to select LAG, we have selected LAG two as we have observed that lag two has lowest Akaike AIC value in unrestricted Johansson co integration test.

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.957650	0.264699	-3.617881	0.0035
C(2)	0.075976	0.041499	1.830803	0.0921
C(3)	0.518860	0.239031	2.170682	0.0507
C(4)	0.006040	0.219998	0.027455	0.9785
C(5)	-0.076786	0.035478	-2.164323	0.0513
C(6)	-0.040933	0.025503	-1.605014	0.1345
C(7)	0.738713	0.244400	3.022551	0.0106
C(8)	0.576016	0.253992	2.267847	0.0426
C(9)	0.081401	0.043763	1.860051	0.0876
C(10)	0.137925	0.047667	2.893527	0.0135
C(11)	-0.928054	0.285301	-3.252897	0.0069
R-squared	0.758069	Mean depend	lent var	0.086957
Adjusted R-squared	0.556460	S.D. depende	ent var	0.484584
S.E. of regression	0.322727	Akaike info cr	iterion	0.881917
Sum squared resid	1.249836	Schwarz criterion		1.424979
Log likelihood	0.857955	Hannan-Quinn criter.		1.018496
F-statistic	3.760094	Durbin-Watso	on stat	1.942612
Prob(F-statistic)	0.016768	TADD		

As from the Johansson Co-integration test our findings, the variables are cointegrated and has log-run association ship.

Now we go for VECM model after we decide to select LAG two for the variables to run first difference.

After running the VCEM model at first difference we get the data as above that shows out model is well fitted due to R squared value is 75% and adjusted R-squared also 55% and C(1) the error correction term is negative that follows reverse correction mechanism and significant at 5% level.

4.5 Hypothesis Testing:

4.5.1 Hypothesis (H1): Long Run Relationship Test

H0: There is no run-run causality between dependent and independent variable.

From the VECM we can observed that error correction term the probability is 0% that is less than 5%. So the null hypothesis is rejected and alternative hypothesis is accepted that is all the variables have long-run causality running from the three independent variables to dependent variable and here Prob (F-Statistic) is 1.6% that is less than 5%. In long run the three independent variables have influence on dependent variable.

On the other hand the C (1) is negative in sign means that the model is going forward to speed of adjustment.

As the error correction term is negative and p value is less than 5% we can say the variables have log-run association ship and in long run they can go forward.

Wald Test: Equation: Untitled			*10		
Test Statistic	Value	df	Probability		
F-statistic Chi-square	5.142014 10.28403	(2, 12) 2	0.0244 0.0058		
Null Hypothesis: C(7)=C(8)=0 Null Hypothesis Summary:					
Normalized Restr	iction (= 0)	Value	Std. Err.		
C(7) C(8)		0.738713 0.576016	0.244400 0.253992		

4.5.2 Hypothesis (H2): Visitor export short-run causality (VEX) to GDPG:

Restrictions are linear in coefficients.

H0: There is no short run causality between GDPG and VEX.

Here Chi-Square value is 0%.So, reject the null hypothesis and accept alternative hypothesis that is a **short-run causality** between visitor export and GDP growth. So, visitor export Lag1 & Lag2 jointly can cause of GDP growth.

4.5.3 Hypothesis (H3): Capital investment in tourism (CIV) short-run causality to GDP growth:

Wald Test: Equation: Untitled	ł		
Test Statistic	Value	df	Probability
F-statistic Chi-square	4.858515 9.717031	(2, 12) 2	0.0285 0.0078
Null Hypothesis: Null Hypothesis S	C(9)=C(10)=0 Summary:	ยาล้	86
Normalized Rest	riction (= 0)	Value	Std. Err.
C(9) C(10)		0.081401 0.137925	0.043763 0.047667

Restrictions are linear in coefficients.

The Null Hypothesis H0: There is **no short-run** causality between GDPG and capital investment.

Here Chi-Square value is 0 % that is less than 5% so we reject the null hypotheses and we accepted the alternative hypothesis that there is a **short-run causality** (LAG1 & LAG2) running from CIV to GDPG.

4.5.4 Hypothesis (H4): Long run association ship running from VEX and CIV to EMPG.

Here we have created another model to test relationship between employment growth in tourism with capital investment and visitor export after tested all variables through ADF and Johansson co-integration.

De <u>pe</u> ndent Variable: D(EMPG)
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 03/22/17 Time: 00:22
Sample (adjusted): 1993 2015
Included observations: 23 after adjustments
D(EMPG) = C(1)*(EMPG(-1) + 0.497151446956*CIV(-1) - 4.26808463254
*VEX(-1) + 3.57038148016) + C(2)*D(EMPG(-1)) + C(3)*D(EMPG(-2)) +
C(4)*D(CIV(-1)) + C(5)*D(CIV(-2)) + C(6)*D(VEX(-1)) + C(7)*D(VEX(-2))
+ C(8)
Coefficient Std Error t Statistic Brok

N A	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-3.275133	0.795080	-4.119247	0.0009
C(2)	1.638835	0.656375	2.496796	0.0247
C(3)	0.845880	0.421898	2.004938	0.0634
C(4)	-0.992770	0.548032	-1.811517	0.0901
C(5)	-0.201226	0.555102	-0.362504	0.7220
C(6)	-9.779473	4.746973	-2.060149	0.0572
C(7)	-4.867468	4.158584	-1.170463	0.2601
C(8)	7.740374	3.200153	2.418751	0.0288
R-squared	0.791602	Mean depend	lent var	0.365217
Adjusted R-squared	0.694350	S.D. depende	ent var	11.81473
S.E. of regression	6.531851	Akaike info cri	iterion	6.859466
Sum squared resid	639.9762	Schwarz crite	rion	7.254420
Log likelihood	-70.88386	Hannan-Quin	n criter.	6.958796
F-statistic	8.139665	Durbin-Watso	on stat	1.887616
Prob(F-statistic)	0.000365			

Here in this model we observe that capital investment and visitor export has longrun association ship to employment growth .Here VECM shows that C (1) ,error correction term is negative in sign(-3.27) and probability is 0% that makes the model significant and promptly going to get equilibrium.

4.5.5 Hypothesis (H5): Unidirectional causality running from CIV to VEX.

Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
CIV does not Granger Cause EMPG	24	1.36874	0.2784
EMPG does not Granger Cause CIV		1.24558	0.3102
VEX does not Granger Cause EMPG	24	2.00300	0.1624
EMPG does not Granger Cause VEX		7.12481	0.0049
VEX does not Granger Cause CIV	24	0.85325	0.4417
CIV does not Granger Cause VEX		5.45819	0.0134

Patrwise Granger Causality Tests Date: 03/22/17 Time: 16:47 Sample: 1 26 Lags: 2

Here Hull Hypothesis H0: CIV does not Granger cause VEX.

But Probability is 1.34% than is less than 5%. The null hypothesis is rejected and alternative hypothesis is capital investment could cause of visitor export.

4.6 Diagnostic test that is test of residuals:



4.6.1 Residuals Distribution:

Here the Null hypothesis H0: The residuals are normally distributed at P value 5%. From the Jarque-Bera test we get p value is 78% that is more than 5%. So, we accept the null hypothesis that means we can say the residuals are normally distributed that is we expected.

4.6.2 Serial Correlation:

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2 633017	Prob F(2 19)	0 0979
Obs*R-squared	5.425314	Prob. Chi-Square(2)	0.0664

Test Equation: Dependent Variable: RESID Method: Least Squares Date: 03/21/17 Time: 12:46 Sample: 1991 2015 Included observations: 25 Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
с	0.798106	2.206750	0.361666	0.7216
CIV	0.027159	0.275239	0.098675	0.9224
VEX	-0.491581	1.855796	-0.264889	0.7939
EMPG(-1)	0.170354	0.403118	0.422589	0.6773
RESID(-1)	-0.462184	0.433703	-1.065668	0.2999
RESID(-2)	-0.384697	0.290157	-1.325824	0.2006
				2005.45
R-squared	0.217013	Mean depend	lent var	-2.32E-15
Adjusted R-squared	0.010963	S.D. depende	ent var	6.054779
S.E. of regression	6.021497	Akaike info cr	iterion	6.634112
Sum squared resid	688.9101	Schwarz crite	rion	6.926642
Log likelihood	-76.92640	Hannan-Quin	n criter.	6.715247
F-statistic	1.053207	Durbin-Watso	on stat	2.203052
Prob(F-statistic)	0.416226	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		

Here the Null Hypothesis H0: There is no serial correlation.

But the Chi square is 6.64 % that is more than 5% .We accept the null hypothesis that there is no serial correlation that is expected.

4.7 DYNAMIC FORECASTING:

In this chapter we will forecast using tourism related independent variables to GDP growth and employment growth in tourism sector. To forecast here we will create two models.

One is tourism sectors independent variables that are total employment growth in truism sector, visitor export and capital investment in travel and tourism and GDP growth dependent variable.

Another model is to show employment growth contribution from tourism sector considering visitor export, capital investment as independent variable.

As previously we have observed that our model has long-run relationship between dependent and independent variables and also test that there is no serial correlation according to Breusch-Godfery serial co-rrelation LM test and also find that residuals are normally distributed. So, our model has mostly accuracy to predict future trend of GDP growth and employment growth that will generate from travel and tourism sector.

Through the forecasting we use same data that we is used in our VECM model and same time period is used to forecast and we will predict the trend from the period 1990 to 2015 that will show travel and tourism future tendency on Bangladesh GDP growth and total tourism employment growth.

After forecasting we will compare actual GDPG and forecasted GDPG with line graph and we will decide the trend of forecasted GDPG slope upward or downward and we will follow same technique for forecasting total tourism employment growth.

4.7.1 Forecasting GDPG considering travel & tourism contribution:

Before we tested the model with Breuch-Godfery serial co-relation test and got there is no serial correlation in this model.



4.7.2 Comparison GDP growth and forecasted GDP growth in Bangladesh:



Here the green colour curve is GDP growth and red colour curve is forecasted GDP growth. The forecasted GDP growth is upward trend and getting more strengthen with the contribution from travel & tourism.



4.7.3 Forecasting Total employment growth in travel and tourism:

Here the blue curve represent forecasted employment trend that is positive and upward. From this analysis we observe that in future domestic expending and visitor export as well as capital investment will enhance employment in tourism sector.

4.7.4 Comparison Total employment growth and forecasted employment growth in tourism:



Tourism is an important source of job creation and countries are interested in its development for this reason. The tourism labour market has a dynamic nature. In Bangladesh a developing country, there is typically high competition for tourism jobs by a large, often very young and undereducated, population. Being a labour intensive sector, tourism offers opportunities for employment for persons entering the labour market for the first time or having difficulties in finding employment elsewhere. The reason being that tourism employment is often characterised by one or more of the following factors are seasonality, part-time and/or excessive hours of work & low-paid (or unpaid) family labour.

One job in the core tourism industry creates about one and a half additional (indirect) jobs in the tourism-related economy.

It is more difficult to measure employment in the tourism industries than is the case for many other industries. Here our prediction signify that at present Bangladesh travel and tourism contribution to total employment growth will be in continuing in future.



CHAPTER V CONCLUSION & RECOMMENDATION

The main object of this study is to investigate the real relationships between travel & tourism's contribution to Bangladesh GDP growth and employment. This paper arrives at following four conclusions by employing VECM and Granger causality test.

First of all, we find out that there is a long-term and stable equilibrium relationship (co-integration relationship) between the travel and tourism's independent variables and economic growth. The model got error correction term is negative that follows reverse correction mechanism. In long-run they can move forward and will have contribution on GDP. By considering this model that has very positive significant possibility and also forcing variables to get equilibrium.

Secondly, there is short-run relation ship running from capital investment to GDP growth rate. In short-run capital investment will strengthen GDP growth rate.

Nevertheless, visitor export has short-run relationship with GDP growth. Visitor export is the great source of foreign currency earning and meets demand of foreign currency liquidity. In general sufficient earning improves quality of service and goods supply. As visitor export has cause to GDP growth. Bangladesh should have to take more advantage from the relationship.

Furthermore, we also observed our second model tourism employment growth rate (dependent) and visitor export and capital investment as independent. We found that visitor export and capital investment has long-run relationship with GDP growth.

Lastly, there is a unidirectional relationship between capital investment and visitor export. Capital investment in tourism has great influence in visitor export.

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Our forecasting also indicates that travel and tourism's capital investment, visitor export and employment growth has significant and upward trend to GDP growth and employment generation in future. In long-run GDP & employment will be strengthened by the travel & tourism sector contribution that will be significant to help Bangladesh maintaining GDP growth. As our model the forecasting shows that in 2016 Bangladesh GDP growth will be near to 7% and in 2016 Bangladesh GDP growth rate was 6.9 % and employment generation growth in tourism sector is forecasted to be near to 10% in coming years.

In GDP measurement there are four components that is personal consumption, Business Investment, Government spending and export & import. Bangladesh has the possibility to force these four components together to uphold present GDP growth by enhancing tourism sector.

Our recommendation, Bangladesh has to create special zone for international tourist through the participation of national and international partnership organizations by offering special facilities whose have dynamic business model. To ensure foreign direct investment in tourism sector has to boost up confident of international investors by offering tax holiday, incentive & rewarding etc.

In our analysis capital investment has a unidirectional relationship to Visitor export. As Bangladesh tourism sector is just growing stage and lack of infrastructure development. Bangladesh is beautiful by nature that needs to nurture and the investment has to increase in the accommodation, roads & highways and airways facilities that will certainly increase more foreign visitor.

On the other hand, human capital investment is the vital factor for hospitality industry that required more expertise employees who hold the norms, values and manner related to tourism sector as well as representing Bangladesh.

She has to maintain real time data and holistic analysis with forecasting on tourism sector that will help investor as well as international tourist in decision marking. She should be taken in consideration in decision making the guide line of UNWTO.

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Making sure more activities and participations of local government and people awareness helping domestic & international tourist.

Barding and marketing Bangladesh showing positiveness, prospect & future with the commitment of Government and tourism sector to offer.



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APPENDICES

Date: 03/21/17 Time: 12:13 Sample (adjusted): 1993 2015 Included observations: 23 after adjustments Trend assumption: Linear deterministic trend Series: GDPG EMPG VEX CIV Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No.ofCE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.762379	69.43194	47.85613	0.0002
At most 1 *	0.564396	36.37915	29.79707	0.0075
At most 2 *	0.391045	17.26566	15.49471	0.0268
At most 3 *	0.224827	5.857391	3.841466	0.0155

Trace test indicates 4 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	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.762379	33.05279	27.58434	0.0089
At most 1	0.564396	19.11349	21.13162	0.0936
At most 2	0.391045	11.40827	14.26460	0.1349
At most 3 *	0.224827	5.857391	3.841466	0.0155

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

Sines incled Col	ntegrating Coef	ficients (normalized	d by b'*S11*b=l):	
CDBC	EMBC	VEY	CIV	
0.030503	0.501083	2 506700	0.206610	
2 022206	0.391083	-2.500700	0.290010	
4 696463	-0.173855	2 605000	0.116215	
-4.585455	0.196679	2.095000	0.286415	
-2.320400	-0.180078	2.848090	-0.280415	
Unrestricted Adj	ustment Coeffic	ients (alpha):		
D(CDBC)	0.055074	0.242002	0.026521	0.020121
D(GDFG)	5 21 25 25	1 500573	0.030551	1 257901
DUEX	-0.088676	-0.079828	0.206817	-0.113237
D(CIV)	-0.982282	0.856249	-0.291547	0.772464
	A 101	10P		
1 Cointegrating E	Equation(s):	Log likelihood	-124.6918	
Normalized coint	tegrating coeffic	ients (standard erro	or in parenthese	s)
GDPG	EMPG	VEX	CIV	
1.000000	19.32146	-81.93961	9.695648	
	(3.39592)	(16.7225)	(1.82037)	
Adjustment coeff	iciente (etandar	d error in parenthe	(202	
D(GDPG)	0.001712	a chor in parentines		
2,02.07	(0.00286)			
D(EMPG)	-0.162521			
D(LIVII C)	(0.03997)			
DUEX	0.003713			
D(VEA)	-0.002713			
DICINA	(0.00360)			
D(CIV)	(0.01794)			
2 Cointegrating E	Equation(s):	Log likelihood	-115.1351	
Normalized coint	tegrating coeffic	ients (standard erro	or in parenthese	s)
GDPG	EMPG	VEX	CIV	
1.000000	0.000000	-0.356564	0.058095	
		(0.06814)	(0.01305)	
0.000000	1 000000	4 222405	0.498800	
	1.000000	-4.222400		
	1.000000	(0.28317)	(0.05423)	
Adjustment coeff	iciente (standar	(0.28317)	(0.05423)	
Adjustment coeff	icients (standar	(0.28317) d error in parenthe:	(0.05423) ses)	
Adjustment coeff D(GDPG)	icients (standar -0.957650	(0.28317) d error in parenthe: 0.075976	(0.05423) ses)	
Adjustment coeff D(GDPG)	icients (standar -0.957650 (0.25431)	(0.28317) d error in parenthes 0.075976 (0.03987)	(0.05423) ses)	
Adjustment coeff D(GDPG) D(EMPG)	icients (standar -0.957650 (0.25431) -6.418872	(0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434	(0.05423) ses)	
Adjustment coeff D(GDPG) D(EMPG)	icients (standar -0.957650 (0.25431) -6.418872 (4.83709)	4.22403 (0.28317) d error in parenthes 0.075976 (0.03987) -2.860434 (0.75835)	(0.05423) ses)	
Adjustment coeff D(GDPG) D(EMPG) D(VEX)	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706	(0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377	(0.05423) ses)	
Adjustment coeff D(GDPG) D(EMPG) D(VEX)	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479)	4.222403 (0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130)	(0.05423) ses)	
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV)	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914	4,222+003 (0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186	(0.05423) ses)	
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV)	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925)		(0.05423) ses)	
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Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E	icients (standar -0.957650 (0.25431) -6.418672 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s):	(0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068)	(0.05423) ses) -109.4310	
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) <u>3 Cointegrating E</u> Normalized coint	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s):	(0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard error	(0.05423) ses) -109.4310 or in parenthese	s)
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Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E Normalized coint GDPG 1.000000	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): Equation(s): tegrating coeffic EMPG 0.000000		(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) (0.22936)	s)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E Normalized coint GDPG 1.000000	1.000000 Icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): tegrating coefficiency 0.000000 1.000000	(0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard erro VEX 0.000000 0.000000	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 9.666425	\$)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E Normalized coint GDPG 1.000000 0.0000000	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): Equation(s): tegrating coeffic EMPG 0.000000 1.000000	d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard error VEX 0.000000 0.000000	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 (2.64619)	s)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E SOPG 1.000000 0.000000	1.000000 icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): Equation(s): EMPG 0.000000 1.000000	(0.28317) d error in parenthes 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard erro VEX 0.000000 0.000000 1.000000	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 (2.64619) 2.171186 (0.62425)	s)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E Normalized coint GDPG 1.000000 0.000000	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): tegrating coeffic EMPG 0.000000 1.000000	(0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard erro VEX 0.000000 0.000000 1.000000	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.2236) 9.666425 (2.64619) 2.171186 (0.62425)	s)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E SOPG 1.000000 0.000000 0.000000	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): Equation(s): Eterrating coeffic EMPG 0.000000 1.000000 0.000000 icients (standar	(0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard erro VEX 0.000000 0.000000 1.000000 d error in parenthe:	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 (2.64619) 2.171186 (0.62425) ses)	s)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E Normalized coint GDPG 1.000000 0.000000 0.000000 Adjustment coeff D(GDPG)	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): tegrating coeffic EMPG 0.000000 1.000000 0.000000 0.000000 icients (standar -1.125161	(0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard erro VEX 0.000000 1.000000 1.000000 d error in parenthe: 0.067847	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 (2.64619) 2.171186 (0.62425) ses) 0.119111	s)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E SOPG 1.000000 0.000000 0.000000 Adjustment coeff D(GDPG)	1.000000 icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): Equation(s): tegrating coeffic EMPG 0.000000 1.000000 0.000000 icients (standar -1.125161 (0.38577)	(0.28317) d error in parenthes 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard erro VEX 0.000000 0.000000 1.000000 d error in parenthes 0.067847 (0.04186)	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 (2.64619) 2.171186 (0.62425) ses) 0.119111 (0.23877)	s)
Adjustment coeff D(GDPG) D(VEX) D(VEX) D(CIV) 3 Cointegrating E Normalized coint GDPG 1.000000 0.000000 0.000000 Adjustment coeff D(GDPG) D(EMPG)	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): tegrating coeffic EMPG 0.000000 1.000000 0.000000 0.000000 icients (standar -1.125161 (0.38577) -4.004366	(0.28317) d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard erro VEX 0.000000 1.000000 1.000000 d error in parenthe: 0.067847 (0.04186) -2.743249	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 (2.64619) 2.171186 (0.62425) ses) 0.119111 (0.23877) 12.94758	s)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E 3 Cointegrating E 1.000000 0.000000 0.000000 0.000000 Adjustment coeff D(GDPG) D(EMPG)	1.000000 icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): Equation(s): tegrating coeffic EMPG 0.000000 1.000000 0.000000 icients (standar -1.125161 (1.3577) -4.004366 (7.37664)	(0.28317) d error in parenthes 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard erro VEX 0.000000 0.000000 1.000000 d error in parenthes 0.067847 (0.04186) -2.743249 (0.8051)	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 (2.64619) 2.171186 (0.62425) ses) 0.119111 (0.23877) 12.94758 (4.56568)	s)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E Normalized coint GDPG 1.000000 0.000000 0.000000 Adjustment coeff D(GDPG) D(EMPG) D(VEX)	icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): tegrating coeffic EMPG 0.000000 1.000000 0.000000 0.000000 icients (standar -1.125161 (0.38577) -4.004366 (7.37664) -1.265055	d error in parenthe: 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard erro VEX 0.000000 0.000000 1.000000 d error in parenthe: 0.067847 (0.04186) -2.743249 (0.80051) -0.884404	(0.05423) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 (2.64619) 2.171186 (0.62425) ses) 0.119111 (0.23877) 12.94758 (4.56568) 0.832340	s)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E SOPG 1.000000 0.000000 0.000000 Adjustment coeff D(GDPG) D(EMPG) D(VEX)	1.000000 icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): Equation(s): EMPG 0.000000 1.000000 0.000000 icients (standar -1.125161 (7.37664) -1.265055 (0.60649)	(0.28317) d error in parenthes 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood eients (standard erro VEX 0.000000 1.000000 1.000000 d error in parenthes 0.067847 (0.04186) -2.743249 (0.8051) -0.084404 (0.06582)	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 (2.64619) 2.171186 (0.62425) ses) 0.119111 (0.23877) 12.94758 (4.56568) 0.832340 (0.37538)	s)
Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV) 3 Cointegrating E SOPG 1.000000 0.000000 0.000000 Adjustment coeff D(GDPG) D(EMPG) D(VEX) D(CIV)	1.000000 icients (standar -0.957650 (0.25431) -6.418872 (4.83709) -0.316706 (0.45479) 3.337914 (2.10925) Equation(s): tegrating coeffic EMPC 0.000000 1.000000 0.000000 1.000000 0.000000 1.000000 0.000000 1.025161 (0.38577) -4.004366 (7.37664) -1.250555 (0.60649) 4.674790	d error in parenthes 0.075976 (0.03987) -2.860434 (0.75835) -0.038377 (0.07130) -0.731186 (0.33068) Log likelihood ients (standard erro VEX 0.000000 1.000000 1.000000 d error in parenthes 0.067847 (0.04186) -2.743249 (0.80051) -0.86404404 (0.08582) -0.666302	(0.05423) ses) -109.4310 or in parenthese CIV 0.832262 (0.22936) 9.666425 (2.64619) 2.171186 (0.62425) ses) 0.119111 (0.23877) 12.94758 (4.56568) 0.832340 (0.37538) 1.111461	s)

Vector Error Correction Estimates Date: 04/03/17 Time: 12:16 Sample (adjusted): 1993 2015 Included observations: 23 after adjustments Standard errors in () & t-statistics in []

Cointegra	ting Eq:	CointEq1	CointEq2		
GDPC	G(-1)	1.000000	0.000000		
EMPO	6(-1)	0.000000	1.000000		
CIV(-1)	0.058095 (0.01358) [4.27728]	0.498800 (0.05644) [8.83745]		
VEX	-1)	-0.356564 (0.07093) [-5.02730]	-4.222405 (0.29473) [-14.3261]		
C		-5.306257	3.357438		
Error Cor	rection:	D(GDPG)	D(EMPG)	D(CIV)	D(VEX)
Coint	Eq1	-0.957650 (0.26470) [-3.61788]	-6.418872 (5.03460) [-1.27495]	3.337914 (2.19538) [1.52043]	-0.316706 (0.47336) [-0.66905]
Coint	Eq2	0.075976 (0.04150) [1.83080]	-2.860434 (0.78931) [-3.62395]	-0.731186 (0.34419) [-2.12438]	-0.038377 (0.07421) [-0.51712]
D(GDP	G(-1))	0.518860 (0.23903) [2.17068]	-0.649237 (4.54639) [-0.14280]	-1.253317 (1.98249) [-0.63219]	0.276703 (0.42746) [0.64732]
D(GDP	G(-2))	0.006040 (0.22000) [0.02746]	0.066328 (4.18438) [0.01585]	-0.542496 (1.82464) [-0.29732]	0.353766 (0.39342) [0.89920]
D(EMP	G(-1))	-0.076786 (0.03548) [-2.16432]	1.125295 (0.67479) [1.66761]	0.486960 (0.29425) [1.65492]	-0.004716 (0.06345) [-0.07434]
D(EMP	G(-2))	-0.040933 (0.02550) [-1.60501]	0.418694 (0.48507) [0.86316]	0.192675 (0.21152) [0.91091]	-0.021142 (0.04561) [-0.46357]
D(CIV	(-1))	0.081401 (0.04376) [1.86005]	-0.473628 (0.83237) [-0.56901]	-0.210763 (0.36296) [-0.58067]	-0.000509 (0.07826) [-0.00650]
D(CIV	(-2))	0.137925 (0.04767) [2.89353]	0.402940 (0.90662) [0.44444]	-0.141560 (0.39534) [-0.35807]	0.150437 (0.08524) [1.76480]
D(VE>	((-1))	0.738713 (0.24440) [3.02255]	-6.139010 (4.64851) [-1.32064]	-3.167314 (2.02703) [-1.56254]	0.009998 (0.43706) [0.02288]
D(VE)	((-2))	0.576016 (0.25399) [2.26785]	0.879180 (4.83095) [0.18199]	-1.832041 (2.10658) [-0.86968]	0.347247 (0.45422) [0.76450]
C		-0.928054 (0.28530) [-3.25290]	1.904140 (5.42644) [0.35090]	5.124341 (2.36625) [2.16560]	-0.052065 (0.51021) [-0.10205]
R-squared Adj. R-square Sum sq. resic S.E. equation F-statistic Log likelihooc Akaike AIC Schwarz SC Mean depend S.D. depende	d Is I ent nt	0.758069 0.556460 1.249836 0.322727 3.760094 0.857955 0.881917 1.424979 0.086957 0.484584	0.852766 0.730072 452.1444 6.138298 6.950314 -66.88842 6.772906 7.315969 0.365217 11.81473	0.620444 0.304147 85.97406 2.676659 1.961589 -47.79893 5.112950 5.656013 2.565217 3.208739	0.559628 0.192651 3.997046 0.577137 1.524969 -12.51129 2.044460 2.587523 0.456522 0.642315
Determinant r Determinant r Log likelihood Akaike inform Schwarz criter	esid covarian esid covarian I ation criterion ion	nce (dof adj.) nce n	3.534562 0.261908 -115.1351 14.53349 17.10069		

Vector Error Correction Estimates Date: 03/22/17 Time: 00:26 Sample (adjusted): 1993 2015 Included observations: 23 after adjustments Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1		
EMPG(-1)	1.000000		
VEX(-1)	-4.268085		
	(0.25592)		
	[-16.6774]		
	0 407151		
CIV(-1)	0.497151		
	[10.1459]		
C	3 570381		
Error Correction:	D(EMPG)		
			0.000715
CointEq1	-3.275133	-0.052988	-0.608/45
	(0.79508)	(0.00519) [-0.81285]	(0.32719)
	[1.11020]	[0.01200]	[1.0000 1]
D(EMPG(-1))	1.638835	0.009963	0.303854
	(0.65638)	(0.05382)	(0.27011)
	[2.49680]	[0.18513]	[1.12494]
D(EMPG(-2))	0.845880	-0.003775	0.043666
	(0.42190)	(0.03459)	(0.17362)
	[2.00494]	[-0.10914]	[0.25151]
D(VEX(-1))	-9 779473	-0.029048	-2 106647
0(12)(11)	(4.74697)	(0.38920)	(1.95344)
	[-2.06015]	[-0.07463]	[-1.07843]
	4 007400	0.040770	0.007040
D(VEX(-2))	-4.86/468	0.216772	0.02/318
	[-1.17046]	[0.63577]	[0.01596]
D(CIV(-1))	-0.992770	-0.035620	0.145687
	(0.54803)	(0.04493)	(0.22552)
	[-1.01132]	[-0.79275]	[0.04000]
D(CIV(-2))	-0.201226	0.089205	0.164725
	(0.55510)	(0.04551)	(0.22843)
	[-0.36250]	[1.96001]	[0.72111]
С	7.740374	0.267469	2.441189
	(3.20015)	(0.26238)	(1.31691)
	[2.41875]	[1.01940]	[1.85373]
R-squared	0 791602	0.526021	0 521546
Adj. R-squared	0.694350	0.304831	0.298268
Sum sq. resids	639.9762	4.302082	108.3756
S.E. equation	6.531851	0.535542	2.687943
F-statistic	8.139665	2.378138	2.335856
Log likelihood	-70.88386	-13.35704	-50.46184
Schwarz SC	0.009400 7 254420	1.007134 2.252080	0.003030 5.478592
Mean dependent	0.365217	0.456522	2.565217
S.D. dependent	11.81473	0.642315	3.208739
Dotorminant reaid area	rianoo (dof odi)	26 15500	
Determinant resid cova	riance (uoi auj.)	30.40009 10 11227	
Log likelihood		-124.5149	
Akaike information crite	rion	13.17521	
Schwarz criterion		14.50818	

Date: 03/22/17 Time: 00:20 Sample (adjusted): 1993 2015 Included observations: 23 after adjustments Trend assumption: Linear deterministic trend Series: EMPG VEX CIV Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None * At most 1	0.775750	45.46307	29.79707	0.0004
At most 2 *	0.168154	4.234478	3.841466	0.0396

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)

	negration Rank		igenvalue)	
Hupothosizod		Max Eigon	0.05	
	Figenvalue	Statistic	0.05 Critical Value	Proh **
100.010E(3)	Ligenvalue	Otatistic	Ontical value	1100.
None *	0.775750	34.38489	21.13162	0.0004
At most 1	0.257366	6.843703	14.26460	0.5078
At most 2 *	0.168154	4.234478	3.841466	0.0396
0				
Max-eigenvalue	test indicates 1	cointegrating eqn	(s) at the 0.05 lev	<i>i</i> el
* denotes reject	tion of the hypoth	esis at the 0.05 le	evel	
**MacKinnon-H	aug-Michelis (19	99) p-values		
Unrestricted Co	integrating Coef	ficients (normalize	ed by b'*S11*b=l)	
			,	-
EMPG	VEX	CIV		
0.583766	-2.491562	0.290220		
-0.228178	1.935998	-0.129741		
-0.151048	0.116059	0.134851		
Unrestricted Ad	justment Coeffic	ients (alpha):		
D(EMPG)	-5.610353	-2.118075	-0.466607	
D(VEX)	-0.090770	-0.112396	0.150991	
D(CIV)	-1.042789	1.038631	-0.186176	
		///.01		
1 Cointegrating	Equation(s)	L og likelihood	-124 5149	
· oomogramig	Equalon(o).	209	121101110	
Normalized coin	tegrating coeffici	ients (standard er	ror in parenthese	es)
EMPG	VEX	CIV		
1.000000	-4.268085	0.497151		
	(0.25592)	(0.04900)		
Adjustment coef	fficients (standar	d error in narenthe	2929	
D(FMPG)	-3 275133		5363)	
D(LIVII O)	(0.79508)			
	0.052088			
D(VLX)	(0.06510)			
DICINA	-0.608745			
D(CIV)	(0.32719)			
	(0.02110)			
2 Cointegrating	Equation(s):	Log likelihood	-121.0930	
Normalized coin	tearating coeffici	ients (standard er	ror in parenthese	es)
EMPG	VEX	CIV		-,
1.000000	0.000000	0.424833		
	· · · · · · · · · · · · · · · · · · ·	(0.32599)		
0.000000	1.000000	-0.016944		
		(0.07473)		
Adjustment coef	ficients (standar	d error in parenthe	eses)	
D(EMPG)	-2.791834	9.877955		
	(0.78182)	(3.93582)		
D(VEX)	-0.027342	0.008560		
- 15	(0.06759)	(0.34024)		
D(CIV)	-0.845737	4.608960		
	(0.30847)	(1.55290)		

Pairwise Granger Causality Tests Date: 03/21/17 Time: 12:23 Sample: 1990 2015 Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
EMPG does not Granger Cause GDPG	24	0.36077	0.7018
GDPG does not Granger Cause EMPG		0.23693	0.7913
VEX does not Granger Cause GDPG	24	4.82016	0.0203
GDPG does not Granger Cause VEX		0.66051	0.5281
CIV does not Granger Cause GDPG	24	2.22902	0.1350
GDPG does not Granger Cause CIV		2.80670	0.0855
VEX does not Granger Cause EMPG	24	2.00300	0.1624
EMPG does not Granger Cause VEX		7.12481	0.0049
CIV does not Granger Cause EMPG	24	1.36874	0.2784
EMPG does not Granger Cause CIV		1.24558	0.3102
CIV does not Granger Cause VEX	24	5.45819	0.0134
VEX does not Granger Cause CIV		0.85325	0.4417

YEAR	VEX	EMP	EMPG	CIV	GDPG
1990	0.4	1.2	1	3.1	4.6
1991	0.3	1.1	-4.9	2	4.2
1992	0.3	1.08	-4.8	2.6	4.8
1993	0.6	1.05	-3	5.8	4.3
1994	0.8	1.08	2.7	6.9	4.5
1995	1	1.06	-1.7	7.4	4.8
1996	1.3	0.91	-14.1	6.5	5
1997	2.6	1.01	11.7	9.2	5.3
1998	2.4	1.18	15.8	11	5
1999	2.4	1.2	0.6	6.6	5.4
2000	2.5	1.2	4.9	6.6	5.6
2001	2.5	1.3	4.2	7.8	4.8
2002	3.3	1.4	10.4	9	4.8
2003	3.2	1.5	7.9	9.7	5.8
2004	4.3	1.6	6.6	10.4	6.1
2005	4.9	1.8	8.1	11.7	6.3
2006	5.1	2.03	14	16.7	6.9
2007	4.9	2.06	1.4	18.9	6.5
2008	4.7	2.09	1.5	31.6	5.5
2009	4.4	2	-8.3	34.8	5.3
2010	6.1	2.02	5.3	38.8	6
2011	6.2	1.9	-6.4	44.1	6.5
2012	7.5	2	3.8	50.5	6.3
2013	9.1	1.86	-5.2	53.1	6
2014	10.6	2.27	22.1	57.9	6.3
2015	10.8	2.34	3.6	61.6	6.8

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