

# Causality between Act East Policy and Economic Growth: Empirical evidence from a South East Asian country

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**Abstract:** This study seeks to examine empirically the relationship between Act east policy and Economic Growth and their causality in the context of India. The objective of this paper is to investigate the dynamics of the causal relationship between Act East policy and economic growth in India for the period spanning from 1991 to 2016. The study uses time series data for the time period ranging from 1991 to 2016 (annual data sets) on variables Gross Domestic Product (GDP) which measures the overall economic growth of the country, and Export, Imports and Foreign exchange reserves (FER) as measures of Act East policy expansion indicator(IAEP). The results indicate existence of the cointegration between them. There have a long-run equilibrium relationship between both policy implications and economic growth, although they may be in disequilibrium. The study also clarifies the existence of a long-run unidirectional causality running from act east policy to GDP in the long-run.

**Keywords:** Act-East-Policy, South-East-Asia, India, Economic Growth, Causality etc.

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## 1. INTRODUCTION

The Act East Policy earlier known as Look East Policy is an effort to cultivate substantial economic and prudent relations with the nations of Southeast Asia with a view to strengthen its standing as a regional power. Now it is considered as an effective tool for boosting economic growth of the south East Asian countries. Since last few decades it exhibits immense potentialities for increasing exports and obtaining huge amount of foreign exchange besides giving a boost to these countries overall economic and socio-cultural developments. It is thus vital to examine the dynamics of the relationship between act east policy expansion and economic growth of south East Asian countries. In this study it has been taken India for empirical studies. As we know that India's engagement with Southeast Asia accelerated after the announcement of the Look East Policy (LEP) in the early 1990s. This study seeks to examine empirically the relationship between Act east policy and Economic Growth and their causality in the context of India.

The Look East policy has appeared as a major foreign policy initiative of India after the Cold War period. It was initiated in 1991 by the Narasimha Rao government with the intention of developing political contacts, enhancing economic integration and forging security cooperation with the nations of Southeast Asia. The policy manifests a shift in India's perspective of the world, with the deliberate and economic importance of Southeast Asia to India's national interests being recognized.

## 2. REVIEW OF LITERATURE

There exists a lot of literature about India's Look East policy but the literature on whether it really influences on economic growth is limited especially for countries like India. But the empirical studies and evidences in this aspect are rare.

The researchers and analysts hold the view that Act east policy causes an increase of the cooperation and integration of both political and economic among the south East Asian nations.

In India's look East policy and Northeast India, Haokip, Thongkhohal (2010) examines the economic potentials of the Look East policy linked to the economic interests of the Northeastern region. He also examines the possible fallout of such policy in terms of ethnic integration of the communities of the northeast with the rest of Indian states.

Sridhar Behera (1993) in his research work on *Import policy and economic development of India since 1950* examines some problems of import liberalization and its possible contribution to the economic development and growth of the country. His main objectives of the study is assessment of import policy in India during the plan period with respect to structure and growth of imports, balance of payments position, import liberalization and its impact on economic development.

The paper is mainly an empirical study rather theoretical one. So the literatures also concentrate mainly on empirical studies relating to economic growth and other issues of a nation. Saikia Hemanta (2010) also studied different measure to enhance economic cooperation among India and south East Asia through Look East Policy.

Similarly other a few scholar such as Alokesh Barua and Santosh Kumar Das (2008), Roluahpuia (2012) etc also studied about different aspects of Look east policy.

It is at least inferred from the literature review that south east Asian nations mainly India have started act east policy considering it as an important and integral part of their economic growth and development strategies. It is in this context worthwhile to mention that the literature is almost silent about a causality study between act east policy and economic growth in case of India. The current study is an attempt to bridge this research gap.

### 3. OBJECTIVE

The objective of this paper is to investigate the dynamics of the causal relationship between Act East policy and economic growth in India for the period spanning from 1991 to 2016.

### 4. HYPOTHESIS OF THE STUDY

There exists a significant relation between Act East policy and economic growth of India.

### 5. METHODOLOGY

The study uses time series data for the time period ranging from 1991 to 2016 (annual data sets) on variables Gross Domestic Product (GDP) which measures the overall economic growth of the country, and Export, Imports and Foreign exchange reserves (FER) as measures of Act East policy expansion indicator (IAEP). IAEP is measured by a composite indicator of three different act east policy expansion related variables used in the study, following the exports, imports and foreign exchange reserve which involve principal component analysis (PCA) to combine the measures of this variable. A composite indicator has been constructed out of these multiple indicators of Act east policy development by using Principal Component Analysis. The Principal Component Analysis (PCA) is a mathematical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of uncorrelated variables called principal components. This transformation is defined in such a way that the first principal component has as high a variance as possible (that is, accounts for as much of the variability in the data as possible), and each succeeding component in turn has the highest variance possible under the constraint that it be orthogonal to (uncorrelated with) the preceding components (Farah Hussain and Deb Kumar Chakraborty 2012). The time-series data of GDP, export-import and FER variables on annual basis have been collected from the statistical hand book of Assam and web sources of IMF. The study adopts the Vector Autoregressive Model (VAR) to analyse the relationship between financial development and economic growth in India. The analysis is carried out in three steps.

- I. First, the stationarity of the variables have been tested by Augmented Dickey-Fuller unit Roots Test.
- II. In the second step, the Johansen's cointegration test has been performed to assess whether a long-run equilibrium relationship holds between the research variables.
- III. Finally, the Granger causality test has been applied in the vector error correction framework to find out the direction of causal relationship between the cointegrated variables.

## 6. RESULTS & DISCUSSION

The following formula is used to normalize the variables of IAEP.

$$NV_{ij} = 1 - \frac{[best\ X_{ij} - observed\ X_{ij}]}{R}$$

Where NV= Normal value, R=best Xij – worst Xij, i= ith observation and j=jth district

Normalised values always lie between 0 and 1.

The following formula is used to determine the index

$$I = \frac{\sum X_i (\sum |L_{ij}| E_j)}{\sum (\sum |L_{ij}| E_j)} \dots\dots\dots (1)$$

Where I is the index,

$X_i$  is the *i*-th Indicator;

$L_{ij}$  is the factor loading of the *i*-th variable on the *j*-th factor;

$E_j$  is the Eigen value of the *j*-th factor.

**Table 6.1: Results of the Principal Components analysis**

Principal components	Eigen values	% of variance	Cumulative variance
1	2.874	95.791	95.791
2	0.122	4.076	99.867
3	0.004	0.133	100.00

Source: Computed by the scholar

**Table 6.2: Results of the Principal Components analysis**

Variables	Factor score coefficients
<b>Export</b>	<b>0.988</b>
<b>Import</b>	<b>0.990</b>
<b>FER</b>	<b>0.958</b>

Source: Computed by the scholar

The Eigen values in Table 6.1 indicate that the first principal component explains about 96% of the standardized variance. Hence, the first principal component is a more relevant measure of Act East policy development, as it explains the variations of the dependent variable better than any other linear combination of explanatory variables. Therefore, only information related to the first principal component is considered to form a composite indicator. For each year in the analysis here, the factor scores are obtained by multiplying the standardized values by the corresponding factor score coefficients using equation 1. Thus a composite act east policy development indicator is obtained.

### 6. A. Unit root test:

The pre-requisite of a time series analysis is the stationarity of each individual time series over the sample period. The study uses ADF unit root test to investigate stationarity of each time series as proposed by Dickey and Fuller (1981). The ADF unit root test requires the estimation of the following regression

$$X_t = \alpha + \beta t + \rho X_{t-1} + \varepsilon_t$$

Where,  $\alpha$  is the intercept,  $\beta$  is the co-efficient of lagged term,  $\rho$  is the number of lagged term chosen to ensure that  $\varepsilon$  is white noise. The optimal lag length is chosen by using the Akaike Information Criteria (AIC). Based upon this estimate the hypotheses of the test are

$H_0: \rho=1$ , i.e., there is a unit root – the time series is non-stationary.

$H_1: \rho<1$ , i.e., there is a no unit root – the time series is stationary.

When the probability value of the stationary test is less than 0.05,  $H_0$  is rejected and it is decided that the series are stationary. The Augmented Dickey-Fuller unit root test has been used for this purpose and the results of such test are reported in Table-6.A.1.

#### 6. A.1: Unit Root Test Results

series	ADF test statistics	probability values	Accept/Reject	stationarity
GDP	-5.372871*	0.0002	reject	stationary
IAEP	-5.279259*	0.0003	reject	stationary

\*indicates significance at 5% level. It represents rejection of null hypothesis of unit root at 5% of the critical values.

It is clear from the table that null hypothesis of no unit roots for all the time series are rejected since the ADF test statistic values are less than the critical values at 5% levels of significances. Thus, the variables are stationary and integrated. After confirming stationarity of the two series, the study proceeds to conduct co-integration test to ascertain that the variables are cointegrated.

#### 6. B. Co-integration test:

Co-integration analysis is performed to investigate long term relationship between Act east policy and economic growth. For this VAR based co-integration test, the methodology developed by Johansen (1988) and Johansen and Juselius (1990) are deployed. It involves two steps- “trace test” and “maximum Eigen value test”. The results of these tests are shown in Table-6.b.1. The Trace test indicates the existence of one cointegrating equation at 5% level of significance. And, the maximum eigenvalue test makes the confirmation of this result. Thus, the three variables of the study have long-run equilibrium relationship between them.

**Table-6.B.1: Results of the cointegration test**

Null hypothesis	Eigen values	Trace statistics	5% critical value (p value)
$\lambda$ trace test			
$r=0$	1.0000	395.2211	15.09471(0.00)*
$r \leq 0$	0.252485	3.201014	3.841466(0.03)*
$\lambda$ max test			
$r=0$	1.0000	392.0210	14.26460(0.00)*
$r \leq 0$	0.252485	3.201014	3.841466(0.03)*
* Implies rejection of the null hypothesis of no cointegration at 5% critical level			

The results of the cointegration tests show that the null hypothesis of “no cointegration” is rejected using both trace test ( $\lambda$ trace) and maximum Eigen-value test ( $\lambda$ max). This means that the two variables are cointegrated. It suggests the presence of a long term relationship between GSDP and IAEP.

### 6. C. Granger Causality tests:

This study uses Granger Causality Test suggested by C. W. J. Granger (1969) for testing the causality between Act east Policy and economic growth in India, in the VAR framework. A time series, X, is said to Granger-cause another time series, Y, if using past values of X improves the prediction of current values of Y. This can be tested by running a regression of Y on past values of Y and X. The null and alternative hypotheses of the test are:

$H_0$ : No causal relation between Act East policy development (IAEP) and economic growth

(GDP)

$H_1$ : Causality between AEP development (IAEP) and economic growth (GDP)

The above hypothesis are tested in the context of the VAR of the following form of bivariate linear auto-regressive model of variables

$X_t$ (GDP) and  $Y_t$ (IAEP)

$$y_t = \sum_{i=1}^n \alpha_i x_{t-i} + \sum_{j=1}^n \beta_j y_{t-j} + u_{1t}, \dots \dots \dots (1)$$

$$x_t = \sum_{i=1}^n \alpha_i x_{t-i} + \sum_{j=1}^n \beta_j y_{t-j} + u_{2t}, \dots \dots \dots (2)$$

Where, it is assumed that the disturbances  $U_{1t}$  and  $U_{2t}$  are uncorrelated.

**Table6.c.1: Results of Granger Causality test**

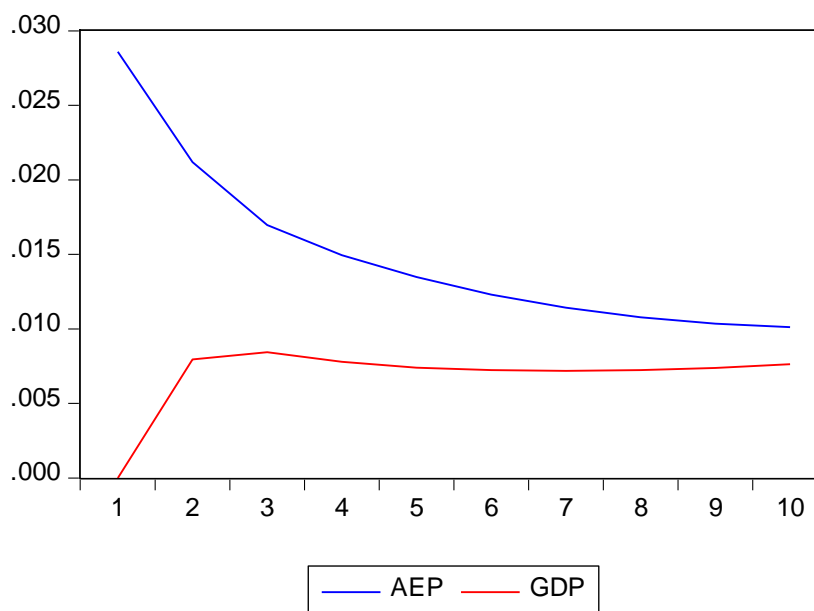
Lag	Null hypothesis IAEP to GDP	F statistics	Prob.	Results
1	IAEP does not Granger cause GDP	2.26790	0.1463	Accept
	GDP does not Granger cause IAEP	.28301	0.6001	Accept
2	IAEP does not Granger cause GDP	1.18106	0.3285	Accept
	GDP does not Granger cause IAEP	1.54330	0.2393	Accept
3	IAEP does not Granger cause GDP	1.74276	0.1986	Accept
	GDP does not Granger cause IAEP	0.60126	0.6235	Accept
4	IAEP does not Granger cause GDP	3.43531	0.0399	Reject
	GDP does not Granger cause IAEP	0.98081	0.4515	Accept

The test result suggests lag order of 4 as optimal lag based on Akaike information criterion. The null hypothesis ‘IAEP do not granger-cause GDP’ is rejected at 5% level of significance. However, there is no evidence of causation from GDP to IAEP as the null hypothesis cannot be rejected. Thus, the results suggest a unidirectional causal linkage between AEP and economic growth. The nature of the causal relation may be stated as ‘Act East Policy (AEP) Granger causes Economic Growth (GSDP).

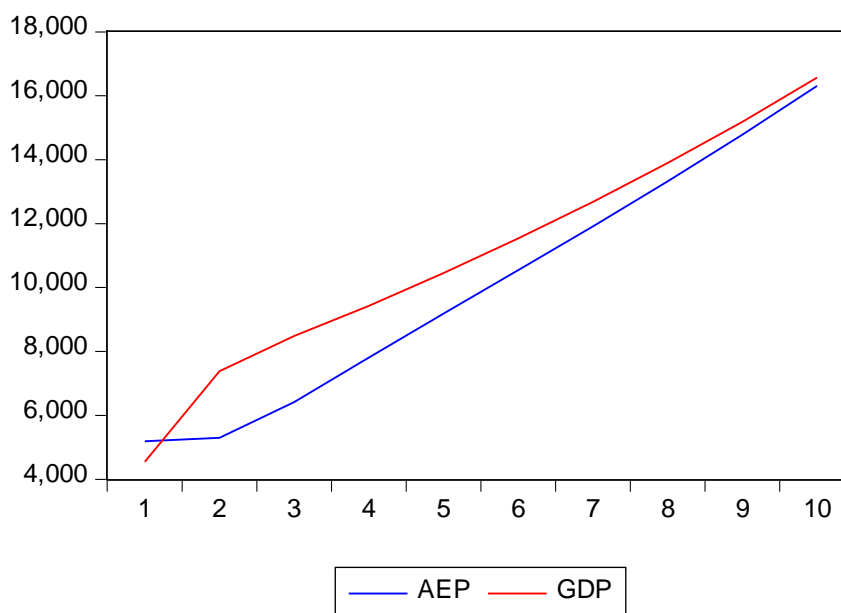
### 6. D. Impulse Response Function:

The impulse response function is a shock to a VAR function. It identifies the responsiveness of dependent variables (endogenous variables) in the VAR when a shock is put to the error term. A unit shock is applied to each variable and sees its effects on the VAR system. Innovation means residuals. Here we assume that all the variables are endogenous.

Response of AEP to Innovations



Response of GDP to Innovations



In the diagram the blue line is the impulse response function and red line is for GDP from the second diagram we have seen that response of GDP as a result of Act east policy is increasing. When the Act is policy has a positive shock GDP continuously increasing.

## 7. SUMMARY AND CONCLUSION

In this paper, the relationship between Act east policy performance and growth of GDP in a developing country like India has been investigated using popular time series methodologies. The data properties are analyzed to determine the stationary of time series using the Augmented Dickey-Fuller unit root test which indicates that both the series are stationary. The results of the Cointegration test based on Johansen's procedure indicate the existence of the cointegration between them. Therefore, the variables have a long-run equilibrium relationship between both policy implications and economic growth, although they may be in disequilibrium. The estimation of VAR indicates the existence of long-run unidirectional causality running from act east policy to GDP in the long-run.

The study also validates the stable long-run relationship between AEP activities and GDP growth rate of India. It means that if the policy activities increase, the GDP growth rate improves via increase in exports, imports and foreign exchange. It provides the rationale of government role for providing and generating the AEP environment in India. Fortunately, India has its geographical location specially NER which is surrounded by international boundaries of ASEAN member countries and made it a business hub.

Some of the recent initiatives taken by the Government of India to boost AEP include grant of export, incentives for promoting private investment in the form of income tax exemptions, interest subsidy and reduced import duty. The hotel and tourism-related industry has been also declared a high priority industry for foreign investment which entails automatic approval of direct investment up to 51 per cent of foreign equity and allowing cent per cent nonresident Indian investment.

## 8. SUGGESTIONS

So the following suggestions may be put forward for the economic growth in India:

First, the Government of India should concentrate on the means of transportation, communication and power for the promotion of industry in the country;

Second, to attract the foreign investors, the security issues should be handled in the best possible manner;

Third, as the tax structure plays a vital role in industrialization process, the government should give tax incentives to the air investors and other member nations;

Fourth, the cultural and traditional festivals should be organized to create attractions for foreign tourists;

Fifth, the journals, brochures with maps and proper guidance should be placed in all important hotels and tourists gateways so that the tourist from any corner of the world can benefit from it without any communication barrier;

Sixth, both the electronic and print media should be encouraged to play an important role in enhancing the demand for Indian products through aggressive advertisement (P K Mishra, Himanshu B. Rout, Smita S. Mohapatra, (2011),

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