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Government Size and Economic Growth. An analysis between China and India.

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Abstract
Over the period from 1961 to 2018, a new Smooth Transition Autoregressive model was used to examine how the size of the government affected GDP growth in India and China. Economic growth and government size appear to have a strong and positive correlation. In other words, as these countries' governments expand, so does their economies. China's government size is unlikely to have a greater impact on economic growth than India's, based on the findings. Economic growth is positively and significantly affected by both China's and India's government sizes. China's government size had a larger effect, but India's was also highly significant. Finally, it makes no recommendations for reducing government spending. The issue is one of resource allocation. Crowding-out impacts and costs result from poor resource allocation.

Key Words: Smooth Transition Autoregressive model, China, India, government size, economic growth.

1. Introduction

The impact of government size on economic growth has been a major focus of educational research for many years (Barro (1990), Karras (1997), Dincer and Gunalp (2010)). Following the current sovereign debt crisis, many political discussions, such as the implementation of the Euro Plus Pact in 2011, which is one of its main goals to sustain the EU's public finances, have taken place over the last ten years. A very large government's section could have negative overflowing causes printing money, or money borrowing. On the other side, if the government is spending very small, or something equivalent to zero, the economic growth because of the issues regarding public goods provision is very limited. Therefore, a favorable measure of government spending due to which growth increase exists.

The rapidly-growing economies of the BRIC, China, and India occupy a noteworthy position in the observer's mind, in the OECD and somewhere-else. Their swift growth has the power to make their standards of living significantly better for one-third population of the world, with the difference in the population of 60 million population respectively. In the recent last ten years, growth has increased as structural reform of market orientation and as liberalization of trade have escalated in India as well as China. In the path of reforms of both countries, there are a number of similarities that suggest a glance at the experience of both countries. A reform path is followed by both countries, despite having a difference in their political system that is reducing the

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government's role remarkably in economic activity and allowing foreign trade to greater extent. The beginning of trade in China has progressed at a much fastest growing rate. Surely, India was yet considered as the most secured world's economies from the beginning of this decade. India has always had a powerful private sector also. In the early 1990s, when the private sector on its investment planning was subject to substantial restraints ended. In the last ten years, only China has emerged the private sector has, because ofthe sale of government-owned assets and a more favorable legal framework. A watchful illustration of a sequence of reforms of both countries is explained somewhere else and here we will not harp on the details of the policy. However, China's transitions started earlier and included significant differences than India as it was, overall, farther from the market's economy. Moreover, reforms in both China and India are still in progress. Therefore it would be untimely to judge the past progress only.

There has been a noticeable doubtfulness specifically about the durability of China's growth. Regardless of the substantial reforms and remarkable growth. When growth has raised to double-digit rates, particularly over the last few years. Questions are frequently heard in the press, about what extent it can be endured without causing cost-pull inflation or suffer large batches of new non-performing loans. The situation is changed for India because many observers believe that India could grow more rapidly than the average point of 6% that it achieved during the last decade. In investment, current marked increases recommend that if the increase in investment is not just a periodical aspect then the economy grows undeniably more rapidly than this on a supportable basis about 8 and a half percent yearly. For sure, many political rulers have feuded that India must be able to grow over the average period of time even more rapidly. Although, China has reached at a higher potential growth rate in contrast to India. There is no lack of academic work that have completed accounting growth analyses of both China and India independently. Why?

Modern collective academic work for China append Li and Chow (2002), IMF (2003), Holz (2006), furthermore our preceded evaluation in OECD (2005). Dougherty (2004) sums up various kinds of such work in China. Recent collective studies for India involve Subramanian and Rodrik (2004), Pallikara (2004), Berry and Singh(2004), Virmani (2004),Sivasubramonian (2004), Naryana and Gosh (2005), and Collins and Bosworth (2007). By using a direct comparable framework or given sufficient heed to the measurement problems, some studies have clearly differentiated China from India. A literature review found only one modern extensive work of this kind, Felipe and Fan (2005) though subsequently Collins and Bosworth (2007) have produced to that an identical growth decomposition given in this study as their pivot was on the effect of productivity of sectorialre-allotment of labor.

To add the current literature by reporting the size of government size which is no linear and connection between the growths of GDP that signifies an inefficiency of the size of government above the value of the threshold is importance of this study.

2. Literature review

For a long time, researchers have been curious about the impact of specific variables on the macroeconomic developments of countries. Money supply, interest, and inflation exchange rates on the growth of the economy of developing countries, as influenced by specific macroeconomics researchers, have piqued researchers' interest. From 1994 to 2000, the importance of the rate of interest in determining a business cycle was highlighted. An investigation into the empirical relationship between macroeconomic growth and interest rates in emerging economies such as Korea, Brazil, Mexico, the Philippines, and Argentina (Perri & Neumeyer, 2001). The link between

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economic growth and inflation in India, Pakistan, and Bangladesh Silence by Chowdhury and Malik (2001) verified a prolonged positive link between the rate of GDP growth and inflation as well as the relation between economic growth and inflation. An extensive study of 183 developing countries on the impact of rates of exchange on the growth of economy raised that the less pliant exchange-rate authorities are correlated to the gradual growth, and greater volatile output as well (Sturzenegger & Yeyati, 2003). Particular interest has been shown by researchers towards the economic growth of China and India, the two big Asian countries, in the last ten years. India and China's story of growth Hanna and Huang (2003) highlight an analysis of entirely contrasting policies of development followed by China and India comparatively; in long-term development, it emphasize the main role played by India's homegrown entrepreneurship on the FDI dependent approach of China. Yunhiu and Lin (2005) examined the link between China's inflation, a supply of money, and growth of economy additionally. They summarized that Inflation blocks economic growth when the economic growth and the long-run money elevate one another. The remarkable story of the growth of India between the period of 1950s to 2005, a complete analysis by Martens and Basu (2007). The research enlightens the outstanding imports, exports, and India's growth of GDP as well as sheds light on the causes for its emersion in the global economy as a powerful country. A study about the effect on the economic growth by real exchange rates outlines that economic growth arises via the underestimation of currency (Rodrik, 2008). Internationalization has a settling impact on economies that are individual and encourage the growth of economy. A study related to economic growth and impact of globalization on economic growth was found. (Mishkin, 2009). Studies regarding economic growth as well as financial development have been an area of great interest.

When development of financial system and growth of economy are bidirectional, growth of economy and development of stock market are the developments which are one-directional, according to an analysis on growth of economy and development of financial system of India including development of stock market found (Pradhan, 2011). An association between growth of economy and development of financial system of China, a similar study concluded that most financial development's traditional indicators are positively related to growth of economy (Wang, Wang, & Zhang, 2012). Nevertheless, various works have investigated the macroeconomics development in different rising economies involving China and India independently, a comparative analysis of development in macroeconomic of China and India is fairly narrow. Over the last decade, in the global economy, both India and China have become vital powers. China and India both are Asian countries, very vast geographically, and are more than 1/3rd population of the world. Over the past ten years, both China and India have maintained a growth rate exceeding 6% steadily. However, there is a great distinction in the growth path of both countries, over the next couple of decades, they both are predicted to be the world's leading economies due to this, and in the current situation of the world's economy, and their comparison is very contrasting.

Barro (1990), in his endogenous growth model, provided a theoretical ground to the link between economic growth and the government sector. The endogenous growth model suggests continuous returns to capital and productive public services are related as inputs in production, and hence have an important stance on growth. Barro enlightened that more public spending will negatively or positively affect the growth relying on whether these services are overproviding or underproviding currently by the government. Hence Barro approaches an ideal provision of productive government services. However, the direction of runs causation from productive expenditures to

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growth is presumed. On the other side, Wagner's (1890) Law suggests that increased government spending on public services is a natural result of economic growth instead of its cause. The relation between growth of economy and size of government, several studies, have gone into the empirical assessment, cross-section mainly.

Sadly, as will be seen below, there is no agreement because the findings of these investigations are rather contradictory or ambiguous. Government spending as a percentage of GDP has been shown to be negatively correlated with increases in per capita income. Landau (1983) discovered this in his survey of 104 nations. Using government spending as a surrogate for government size, Kormendi and Meguire (1985) found no significant cross-country connection between government size and economic growth. Through Feder's (1983) model, Ram (1986) discovered a positive correlation between economic growth and the size of government.

Wagner's view on government spending was influenced by the demand-following response, law, and growth theory. Bohl (1996) investigated in the G7 countries the link between economic development and government spending. Unidirectional connections have been accounted for to stretch out from economic improvement to government expenditure in the United Kingdom and Canada, where Wagner's Rule prevails. Three African countries were studied by Ansari et al. (1997), who used evidence from 1957 to 1990 using the standard Granger connection test to examine the link between public salaries and government spending (Ghana, Kenya, and South Africa). A temporary approval of Wagner's Rule for Ghana was granted even though the inquiry found no evidence of a link between public salary and government spending in South Africa and Kenya. Abizadeh and Yousefi (1988) conducted an observational test of Wagner's Law in South Korea between 1961 and 1992. Using the Granger-type connection analysis, their views confirmed the veracity of Wagner's Theorem, from economic progress to government spending, using the Granger-type connection analysis. Real GDP per capita as a proxy for government spending was also examined by Islam (2001), who looked at the relationship between economic events and government spending. Based on annual data from 1929 to 1996 and the blunder adjustment technique, it was discovered that economic growth triggered government expenditure when proxied by real GDP per capita. These findings confirmed Wagner's Law for the period 1929 to 1996. T. C. Tang (2001) empirically tested the relationship between Malaysia's economic progress proxies and government spending from 1960 to 1998. Using Johansen multivariate co-reconciliation tests and the Granger connection method, the investigation concluded that temporary increases in government expenditure are caused by public pay, confirming the importance of Wagner's Law in the research country..

The Gulf Cooperation Council's (GCC) economic development and government expenditure linkage was revisited by Al-Faris (2002) after a year, employing multivariate co-ordination and Granger-connection considerations for the GCC nations. Keynesianism was replaced by the Wagner Rule once it was recognized that most inlet nations had a one-way Granger relationship linking economic development to government expenditure. Abu-Bader and Abu-Qarn (2003) examined the economic and government expenditure trends in Israel, Syria, and Egypt over the course of 30 years. To support Wagner's Rule, researchers employed multivariate co-integration and difference degradation to find a single-direction relationship between economic growth and government spending. Greece and Turkey were studied by Dritsakis a year later, looking at the connection between economic development and government spending in both countries (2004). The study's findings show that government investment on economic growth is motivated by the ideology of progress, which emphasizes notoriety. ECM was used to examine the relationship between government size and economic

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development in Greece, the United Kingdom, and Ireland in a Granger-connection framework by Loizides and Vamvoukas in 2005. The Granger-reason was able to link changes in the overall size of government in Greece and the United Kingdom to economic progress despite the fact that both nations saw government expansion as a minor issue. In accordance with Wagner Law, the conclusions of the investigation were maintained. It was shown that government expenditure and economic development had a positive correlation in a study of industrialized countries conducted by Akitoby, Clements, Gupta, and Inchauste (2006) According to their findings, they concluded that the Wagner Rule is virtually overviewed in the newly constituted nations because of the unidirectional Granger link between economic progress, and government expenditure. Similar research was done in Greece between 1833 and 1938 by Sideris (2007) to determine the validity of Wagner's Law. In Sideris' view, Wagner's Law will profit from the evaluation era since it coincided with a period of rapid economic expansion and industrialization. There were Granger-connection checks used to ratify Wagner's Law I Greece during an investigation. Experimental trials have been carried out in China by Narayan, Nielsen, and Smyth on this hypothesis (2008). Even after employing a board unit root and co-combination and Granger-connection technique, Wagner's Law was determined to be present exclusively in the focal and western areas.

3. Methodology and Data

Specifically, in the territory of logical examination and dynamic, information assumes a critical function in science. Exact information has a pivotal task to carry out in each judgment in the territory of economics and quantitative investigation. Chiefs and lawmakers need to depend on subtleties, so information credibility is vital. For the handling of information, different sources are accessible, for example, nearby or worldwide data associations and workplaces. A large part of the examination in the worldwide gathering depends on proof from the IMF, the World Bank, and China and India's economies. The information assortment measure depends on one or the other essential or auxiliary information viable. The consistency and genuineness of information anyway are basic for the cycle of estimation and dynamic. The questionable and bogus informational collection prompts errors for leaders and produces provisos. Similarly, this sort of inconsistent information makes the whole technique for examination and count flawed. The preparation of primary and auxiliary information is dependent upon various prerequisites. For each kind of information that is time arrangement, board or cross-sectional information, the method, and count measure contrasts. The ebb and flow concentrate basically utilized the information from the board arrangement and further investigated the techniques applicable to this factor of this part of the examination. To find the effect of government scale on economic turn of events. From the period from 1981 to 2018, we utilized board arrangement information from China and India, and the information sources and exactness are additionally considered in the remainder of the current fragment.

3.1 Source of Data

The reason for the examination is to choose the impact of government size on economic turn of events. We utilized board arrangement information from both China and India from 1981 to 2018 hence. The based economic development variable and spending on government’s last utilization ascertain the size of the government and it is our free factor. Such factors are likewise discrete factors, for example, fares and all-out capital arrangement. Variable information was assembled from the World Bank.

3.2 Model Specification

This part illustrates some problems regarding research writing within a graduate

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degree program. Illustrated by studies conducted in related fields, it was realized that such dissertations often faced three key challenges during the writing process. These three major aspects comprised the key components of my dissertation problem. The first problem could be the research design which includes the economic model of the research that determines the success or failure of the whole dissertation. Another important aspect of this research is data collection and analysis. Collecting the right data and access to it is very important. The final aspect consists of the data analysis and expressing the results clearly. Technology-related skills should be at an advanced level.

Our specific model is

$$Yt = \beta o + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon \quad (3.7)$$

$$GDP = \beta o + \beta 1GS + \beta 2GCF + \beta 3EXP + \varepsilon \quad (3.8)$$

GDP = Gross Domestic Product
GS = Government size
GCF = Government Size
EXP = Exports of goods and services

4. Results and Discussion

Study's main objective is to determine how government size affects economic growth. Over the course of more than 30 years, panel data was gathered in China and India. The GDP growth rate is the study's dependent variable, and the GDP growth rate is used to measure economic growth. The government's final consumption expenditures are used to calculate its size. Other independent variables include the creation of new capital, as well as the export of goods and services. The panel data of 58 years from 1981 to 2018 of the countries China and India will be estimated to find the study's analysis.

4.1 Variables Movement

The data is collected on a yearly basis. The study's main goal is to determine the influence of government size on economic growth. There are four factors utilized to measure the analysis in this study. Gross domestic product (GDP), capital formation (GCF), government final consumption, and exports of commodities and services are the factors in question. The trend of the variable is depicted in the graphs that follow,

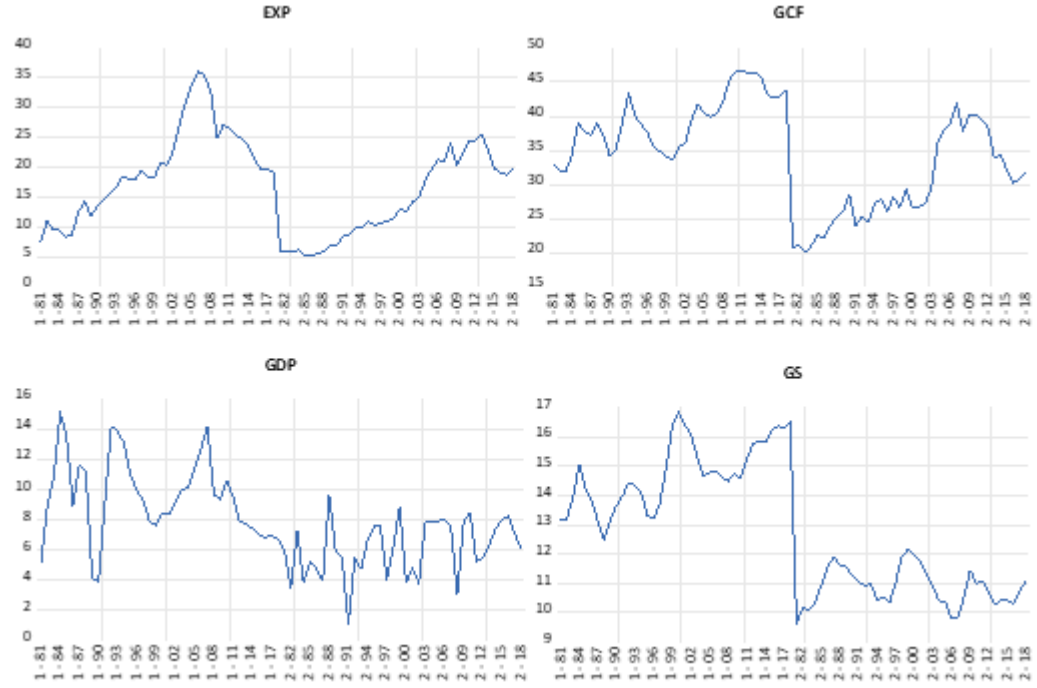

Figure 1 Trend of four variables

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Data from China and India are shown in this graph. Chinese and Indian GDP growth from 1961 to 2018 is depicted graphically in the first graph. China's GDP is growing faster than India's, which is reflected in the country's GDP trend. The second chart shows that exports of goods and services from China and India are increasing in lockstep. Due to China's larger population and faster growth rate, the third diagram shows a higher trend in government spending in China than in India. There is a rising and a falling trend in both countries' capital formation in the last diagram, which is shown.

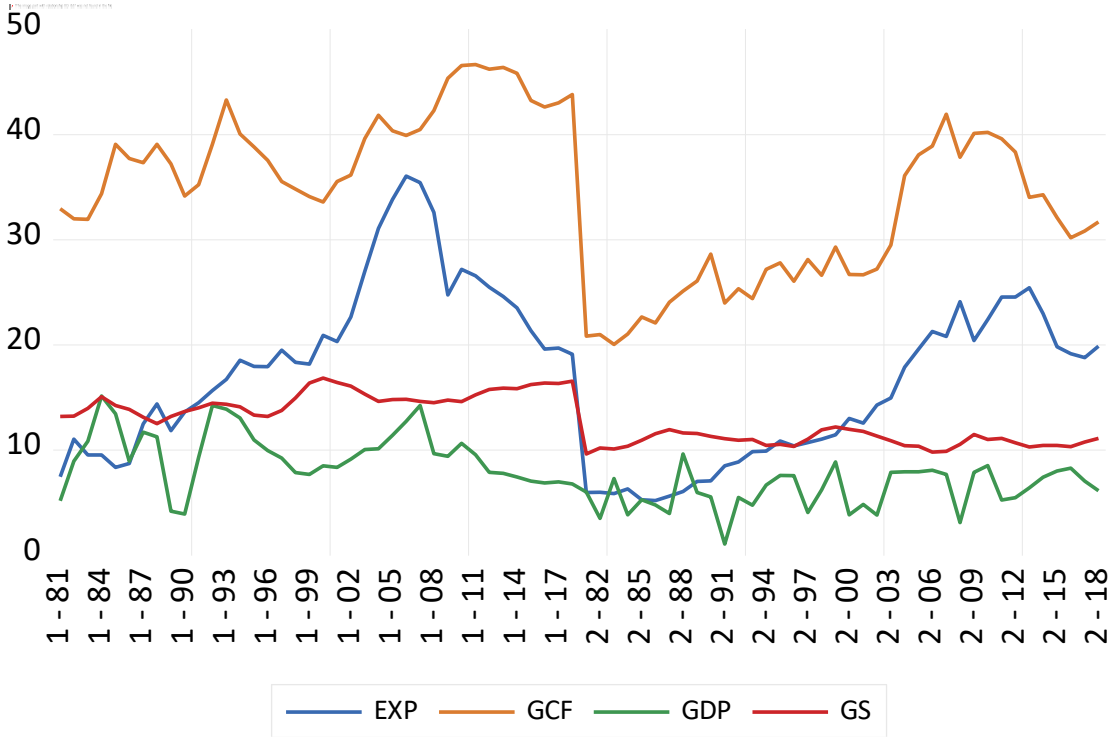

Figure 2Combinations of all variables

In our estimating procedure, we take into account all of the following variables' trends. It illustrates that China's gross domestic product (GDP) is lower than all other variables at the beginning of the country's history. In India, capital formation is larger than the growth rate, which demonstrates the same trend and influence of the factors..

4.2 Descriptive Statistics

Table 4 explains Descriptive Analysis in great detail. There are 116 data points in Table 4. EXP, GDP, GS, GCF, and GS are all factors to be taken into account while analyzing the economy. GDP is the dependent variable, whereas GS, GCF, and EXP are the independent variables. Gross domestic product (GDP) is 7.85, and government size is 12.80, with a standard deviation of 2.1, respectively. For capital creation, the average value is 34.44; for exports, the average value is 16.89. The standard deviation is 7.31..

The detail is given below in the table 4.

Table 4 Descriptive Analysis

	EXP01	GCF	GDP	GS
Mean	16.81098	34.44896	7.855800	12.60020
Median	17.90716	35.37865	7.805115	12.73668
Maximum	36.08503	46.66412	15.12917	16.73843
Minimum	5.199222	20.04417	1.046831	9.676166

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Std. Dev.	7.819485	7.314455	2.902731	2.171573
Skewness	0.380601	-0.234041	0.363800	0.271608
Kurtosis	2.508274	2.038050	2.938887	1.676708
Jarque-Bera	2.610563	3.624170	1.745216	6.476164
Probability	0.268879	0.163221	0.401639	0.079436
Sum	1253.714	2618.097	594.9648	972.8148
Sum Sq. Dev.	4568.791	4012.603	635.3002	351.4299
Observations	76	76	76	76

4.2.1 Correlation Matrix

The correlation matrix is given below table 5.

Table 5 Correlation Matrixes

	GDP	GS	GCF	EXP01
GDP	1.000000			
GS	0.464189	1.000000		
GCF	0.519108	0.633032	1.000000	
EXP01	0.376720	0.418369	0.759563	1.000000

4.2.2 Unit Root Analysis

Table 7 ADF-Fisher (1999) Unit Root Test

Unit Root Test (Based on ADF-Fisher (1999))					
Variables	***Level***		***1st Difference***		***Conclusion***
	Intercept	***Intercept with Trend***	***Intercept***	***Intercept with Trend***	
GDP	26.185 (1.000)	3.607 (1.000)	123.583 (0.000)	371.873 (0.000)	I(1)
GCF	14.074 (0.948)	2.219 (1.000)	33.762 (0.115)	321.652 (0.000)	I(1)
GS	2.112 (1.000)	26.506 (0.997)	421.028 (0.000)	126.68 (0.000)	I(1)
EXP01	12.034 (0.618)	3.1309 (1.000)	412.786 (0.004)	211.920 (0.000)	I(1)

4.3.3 Regression Analysis

It is the primary goal of this research to examine the relationship between government size and economic growth. Between 1961 and 2018, we calculated the size of the governments of China and India. We used panel data and the panel regression results are shown in the table below.

Table 8 Panel OLS Regression

Dependent Variable: GDP Growth Rate				
Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GCF	0.1524	0.0713	2.1354	0.0361
EXP01	0.0030	0.0060	2.1719	0.0267
GS	0.3036	0.0713	2.7559	0.0049
C	0.2307	0.0828	2.9486	0.0060
R Square	0.3001			

The results of the panel OLS regression are shown in Table 8. The findings show that economic growth and government size have a positive and substantial relationship. Increasing the size of government in these nations is linked to an increase in economic growth. Economic growth in these nations improves by 30 percent for a 1% increase in government size. To put it simply, exports have a positive and measurable effect on

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economic growth. China and India's economic growth will accelerate if their exports of commodities and services expand. The results show that if exports of products and services rise by 1%, the economy grows by 3%. Every factor has a favorable and very significant effect on economic growth, according to our findings. The R square demonstrates that these independent variables affect economic development by 30%.

4.2.4 Estimation of the Model of star analysis

The estimation of the model is done by the VAR because variables are at first different. The VAR model performed two steps, first consists of the model which has two lag models and consists of three models. These steps are given below,

Table 9 Model Lag Criteria

VAR Lag Order Selection Criteria
Endogenous variables: GDP EXP01 GCF GS
Sample: 1981 2018
Included observations: 108

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1214.591	607.9808	74235.69	22.56651	22.66584	22.60678
1	-791.1742	807.6289	39.27161	15.02175	15.51844*	15.22314*
2	-774.1903	31.13730*	38.61206*	15.00352*	15.89757	15.36603
3	-761.5384	22.25799	41.21113	15.06553	16.35692	15.58914
4	-754.0825	12.56452	48.55995	15.22375	16.91250	15.90848

* indicates lag order selected by the criterion

Before going to VAR model selection, we predict the lag selection by the VAR lag order selection criteria. The above table indicates that our model lag selection is 2 lag model according to the AIC and SC.

4.3.5 VAR model

The VAR models are discussed in below the tables,

Table 10 Vector Auto-Regression Estimates

Vector Autoregression Estimates				
Sample (adjusted): 1983 2018				
Included observations: 72 after adjustments				
Standard errors in ( ) & t-statistics in [ ]				
	GDP	EXP01	GCF	GS
GDP(-1)	0.599402	-0.009629	0.191106	-0.013462
	(0.13083)	(0.10914)	(0.12244)	(0.02807)
	[4.58144]	[-0.08823]	[1.56083]	[-0.47960]
GDP(-2)	-0.051158	-0.161692	-0.153780	0.014262
	(0.12320)	(0.10277)	(0.11529)	(0.02643)
	[-0.41525]	[-1.57332]	[-1.33381]	[0.53959]
EXP01(-1)	0.276515	1.087216	0.208909	0.006778
	(0.14732)	(0.12290)	(0.13787)	(0.03161)
	[1.87693]	[8.84657]	[1.51525]	[0.21445]
EXP01(-2)	-0.237010	-0.159903	-0.143776	-0.008135
	(0.14371)	(0.11988)	(0.13449)	(0.03083)
	[-1.64924]	[-1.33384]	[-1.06906]	[-0.26385]
GCF(-1)	-0.104607	0.287396	0.910606	-0.014930
	(0.14477)	(0.12076)	(0.13548)	(0.03106)

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	[-0.72260]	[2.37983]	[6.72145]	[-0.48071]
GCF(-2)	0.074604	-0.239780	-0.071963	0.027397
	(0.13767)	(0.11484)	(0.12883)	(0.02953)
	[0.54192]	[-2.08793]	[-0.55857]	[0.92761]
GS(-1)	1.264908	-0.345402	0.506189	1.387518
	(0.56650)	(0.47258)	(0.53016)	(0.12154)
	[2.23283]	[-0.73089]	[0.95479]	[11.4165]
GS(-2)	-0.977766	0.485563	-0.241341	-0.439349
	(0.59712)	(0.49811)	(0.55881)	(0.12810)
	[-1.63748]	[0.97480]	[-0.43189]	[-3.42964]
C	0.162375	-0.630258	0.996479	0.288188
	(1.74424)	(1.45505)	(1.63233)	(0.37420)
	[0.09309]	[-0.43315]	[0.61046]	[0.77014]
R-squared	0.501993	0.950085	0.927249	0.958365
Adj. R-squared	0.438754	0.943746	0.918011	0.953078
Sum sq. resids	301.0424	209.4929	263.6537	13.85583
S.E. equation	2.185967	1.823536	2.045722	0.468971
F-statistic	7.938027	149.8918	100.3710	181.2668
Log likelihood	-153.6646	-140.6124	-148.8905	-42.83702
Akaike AIC	4.518462	4.155901	4.385847	1.439917
Schwarz SC	4.803045	4.440484	4.670431	1.724500
Mean dependent	7.963555	17.40733	34.88134	12.86980
S.D. dependent	2.917877	7.688436	7.144445	2.164989
Determinant resid covariance (dof adj.)		10.72691		
Determinant resid covariance		6.287921		
Log likelihood		-474.8450		
Akaike information criterion		14.19014		
Schwarz criterion		15.32847		
Number of coefficients		36		

The above are the results of the VAR model in lag 2 order selection. It indicates that there is total VAR model coefficient is 36. And then there are four model selection criteria. These models are also written in the below table where we find the p-value of a model by summary system of the least square method. In the first model, GDP is a dependent variable, in the second model Exports of goods and services, the third model is the dependent variable is GCF and in the fourth model dependent variable is GS. The results of these models show that GDP,GCF, GS, EXP have a dependent variable that has a positive impact on all the variables but a negative impact on 2nd lag of exports of goods and services and the first lag of GCF. The significance of the variables are shown in the below table,

Table 11 Least Squares

Estimation Method: Least Squares Sample: 1983 2018 Included observations: 72 Total system (balanced) observations 248				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.387926	0.100496	3.860100	0.0001
C(2)	-0.305733	0.074456	-4.106219	0.0000
C(3)	0.385283	0.217334	1.772770	0.0770
C(4)	-0.335771	0.214807	-1.563133	0.1188
C(5)	1.769155	0.626322	2.824671	0.0050

P-ISSN: 2204-1990; E-ISSN: 1323-6903
DOI: 10.47750/cibg.2021.27.06.137

C(6)	-1.071093	0.629290	-1.702066	0.0895
C(7)	-0.020134	0.174793	-0.115185	0.9084
C(8)	0.007475	0.166240	0.044966	0.9642
C(9)	-2.255234	1.898356	-1.187993	0.2355
C(10)	-0.047855	0.044522	-1.074845	0.2831
C(11)	-0.016456	0.032986	-0.498885	0.6181
C(12)	1.148300	0.096284	11.92616	0.0000
C(13)	-0.193800	0.095165	-2.036475	0.0423
C(14)	-0.180140	0.277476	-0.649211	0.5166
C(15)	0.281649	0.278791	1.010252	0.3130
C(16)	0.195566	0.077438	2.525460	0.0119
C(17)	-0.167498	0.073648	-2.274298	0.0235
C(18)	-0.882178	0.841018	-1.048941	0.2948
C(19)	0.002390	0.015335	0.155867	0.8762
C(20)	-0.012764	0.011362	-1.123460	0.2619
C(21)	-0.028602	0.033164	-0.862458	0.3889
C(22)	0.025365	0.032778	0.773844	0.4395
C(23)	1.041137	0.095573	10.89366	0.0000
C(24)	-0.108077	0.096026	-1.125505	0.2610
C(25)	-0.006106	0.026672	-0.228915	0.8190
C(26)	0.024808	0.025367	0.977950	0.3287
C(27)	0.411044	0.289677	1.418973	0.1567
C(28)	0.145830	0.058696	2.484498	0.0134
C(29)	-0.126613	0.043487	-2.911508	0.0038
C(30)	0.131045	0.126936	1.032367	0.3025
C(31)	-0.095539	0.125460	-0.761507	0.4468
C(32)	0.098728	0.365811	0.269888	0.7874
C(33)	0.249585	0.367544	0.679060	0.4975
C(34)	0.821508	0.102090	8.046887	0.0000
C(35)	0.040691	0.097094	0.419089	0.6754
C(36)	-0.176568	1.108757	-0.159249	0.8736
Determinant residual covariance		20.31591		

The above table results are indicated the significant and insignificant impact of the VAR selected models. The results indicate that when the dependent variable is GDP then the lag of GDP and GDP has a significant relationship and also the first lag of government size is a significant impact on GDP. In the second model when the dependent variable is EXP than lag of EXP and GCF variables are significant impact on it. In the third model when dependent variable is GS than first lag of GDP, the first lag of GCF variables are significant impact on it. In the fourth model when the dependent variable is GCF than the second lag of EXP, GCF and first lag of GS variables are significant impact on it. All other variables in these models are insignificant.

4.3.6 Diagnostic Tests

Table 12 Diagnostics Tests

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.

P-ISSN: 2204-1990; E-ISSN: 1323-6903
DOI: 10.47750/cibg.2021.27.06.137

1	13.70413	16	0.6207	0.855335	(16, 171.7)	0.6213
2	20.86841	16	0.1836	1.329288	(16, 171.7)	0.1842
3	12.85662	16	0.6832	0.800515	(16, 171.7)	0.6837

Table 12 shows the diagnostic tests of VAR model and it has no autocorrelation and heteroscedasticity.

4. Conclusion

Government size and economic growth are not new issues to be studied. Even while GDP growth has decreased and government spending has risen, the issue has become a constant one in recent years. Modeling this link has been tried by several authors using a variety of approaches and datasets. The results are a little confusing. A new Smooth Transition Autoregressive model is used to analyses the non-linear connection between GDP growth and government size in this study. No one knows for sure if the size of China's government influences economic growth more than that of India, according to research. Although China's government size has a greater impact on economic growth than India's, both nations' governments have a positive and significant impact on economic growth. Finally, it makes no recommendations for reducing government spending. The issue is one of resource allocation. Crowding-out impacts and costs result from poor resource allocation. As a result, we must pay close attention to the government's effective resource usage in order to boost productivity, which will lead to increased economic growth.

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