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benchmark

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Capital Spending, Human Development And Economic Growth In Maluku Province

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Abstract

Penelitian ini memfokuskan pada belanja modal pemerintah daerah dan pembangunan manusia terhadap pertumbuhan ekonomi di 11 kabupaten/kota. Variabel dependen adalah pertumbuhan ekonomi (Y) sedangkan variabel independen adalah belanja pemerintah di bidang pendidikan (X_1), belanja pemerintah di bidang kesehatan (X_2), belanja pemerintah di bidang infrastruktur (X_3) dan pembangunan manusia (X_4). Sumber data adalah BPS dan Dinas Pendapatan Daerah Provinsi Maluku. Metode yang digunakan dalam penelitian ini adalah metode regresi data panel dinamis (*dynamics panel data method*). Hasil penelitian dengan data panel dinamis menunjukkan bahwa pengujian panel kointegrasi dengan pendekatan parametrik menghasilkan nilai *group rho-statistic* 7,55 sedangkan *group PP-statistic* memiliki koefisien kointegrasi 4,94. Probabilitas masing-masing pengujian mengindikasikan bahwa variabel dengan aplikasi kointegrasi signifikan pada level 1 persen. Dari tujuh model panel, didapatkan hasil bahwa semua variabel dalam penelitian berkointegrasi baik jangka pendek maupun jangka panjang dan keseluruhan variabel memiliki arah positif serta signifikan terhadap pertumbuhan ekonomi yang berarti bahwa peningkatan belanja modal pemerintah daerah di bidang pendidikan, kesehatan dan infrastruktur serta pembangunan manusia secara signifikan berdampak terhadap pertumbuhan ekonomi daerah.

Key Words :
Belanja modal, Pertumbuhan Ekonomi dan Panel Dinamis

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INTRODUCTION

Laws number 32 and 33 Year 2004 about decentralization, given a real opportunity to repair mechanism change between central government and local government. This indicates a renewal in decentralize. The point of decentralize in line with autonomy concept which representing a policy that have implication of applying governance decentralization and fiscal decentralization. If governance decentralization tend to interpreted as policy where the central government give authority to local government to manage their own domestic administratively bureaucracy, the fiscal decentralization more focused at ability to arrange their finance by finding a way to a new source of budget earnings self-supporting and expend it according to priority which have been specified.

Mardiasmo (2004), having a notion that gift of wide autonomy and the present decentralization enjoyed by local government, will make a way for local government to conduct a renewal in system of finance management and local budget.

Improvement or reinforcement of budget should include an effectiveness of earnings and also an efficiency of expenditure. From earnings side, require to thought an alternative of new source in local defrayal of which have a low externality expense and give an effect of distortion which do not high to the balance of economics previously. While from expenditure side, efficiency conducted should reckon benefit target in allocation of expenditure post that used in defraying routine budget, development budget, and other expenses.

Fiscal decentralization represent alternative of an answer from demand of local autonomy, and decentralize shouldering of especial mission in the form giving the authority from central government to local government, and some authority of governance to private sector in the form of privatization. Decentralization policy will assignation for local society to sharing in determining priority and preferences by them self in improving level of live as according to the opportunity and challenge that faced by local society in national boundary. Fiscal decentralization expected to gives three benefits. First, local government can determine framework of design public policy and development according to potency owned by local area. Second, local government can improve allocation of productive resource through friction role of public decision making to lowest governmental, because local government has complete information about local potency. Third, local government will be able to determine priority scale in determination of development program, so that reachable in autonomy implementation.

Conceptually, fiscal decentralization target is to lessen central government responsibility in the field of service to local society, more efficient in use resources, development planning stabilization, and also the improvement

participate society. In public service context, development expense become especial starting point because direct in touch at service quality improvement. Before fiscal decentralization, local government expense most determined by central government but in fiscal decentralization era, allocation transfer fund from center government to local government have the character of free (block grant) or not defined specific in use.

The mentioned generate governance management responsibility improvement in this case the public goods supply and economic development in local area level that very big, specially at educational representing essential element in local development which become the one of a part of especial society requirement. But, local ability to maintain and improve the education management could be told very finite, considering role PAD still lower in earnings of APBD local sub province and the readiness of human resources (SDM) also the ability of management education sector in local level still limited.

Generally believed the fiscal decentralization will improve prosperity socialize. This opinion based on statement that requirement local society to education and public goods generally will be reached with a better way compared when arranged directly by central government. But the tendency toward not clearly seen because till this time most local government of sub-province in Indonesia responding of fiscal decentralization by pushing the increase of PAD through tax and retribution without made balance to improvement of effectiveness of APBD expenditure. A kind of policy step like this could give a negative effect on education management level in local area and also prosperity of society (Isdijoso, 2002).

Education sector in human development is a very important and realized by central government, so the government release a policy in the form of Law Number 20 Year 2003 (UU No. 20 Tahun 2003) about National Education System (Sisdiknas) which instruct that value of minimum budget development of education sector equal to 20 percentage of totalize APBN/APBD. Seems the euphoria of decentralize education not shown the fact. Allocation of APBD for the education sector is a long under 20 percent such as those which commended by national education system. All executive and legislative give more attention to another sector, for example allocation to society organization or political society, functionary subsidy, subsidy of council member, and other. Education decentralization represents the part of autonomy framework of local area which has implication to the balance of central and local finance, from the earning side and expenditure side. As according to autonomy direction, source of routine and development expenses of education have to coming from APBD sub-province.

However, its minimum allocation of education budget in local area represents one of the weak evidence governmental siding of education. From 370 sub-

provinces in Indonesia, almost entirely give a portion of budget equal to 73 percent for the routine expenditure officer, functionary, and DPRD. Only 27 percent of budget for development, from totalize budget of education development sector only get shares 3 percent.

Education role in development is a very importance in order to effort preparation of human resource which with quality, able to competition in global life and future. In globalization, education facing a various challenge of change that demand of existence socialize to get a better education facility in best quality.

With the complicated problems, the interesting question to be checked is how the pattern of correlation and how big the influence of capital spending of local government in education, health and infrastructure and also human development toward economic growth at each region of sub-province in Maluku Province?

Aim of this research is to know how the pattern of correlation and how big the influence of capital spending of local government in education, health and infrastructure and also human development toward economic growth.

RESEARCH METHOD

Data used in this research is type of data in the form of panel data; covering eleven (11) region which consist of two town and nine sub-province in periods 2004-2011. Source of data are Statistical Center Institute (BPS), DISPENDA.

Estimation conducted using of method panel data dynamics approach. Processing data using program E-views 7. Definition operational of variables shall be as follows: Dependent variable is Economic Growth variable (Y) which proxy by gross domestic regional product (GDRP = PDRB) year on year which published by Statistical Center Institute (BPS) set of Rupiah (Rp). Independent variables are Capital Spending of Local Government in Education (X_1), representing amount of government expenditure in which the allocation for education (Rp); Capital Spending of Local Government in health (X_2), representing amount of government expenditure in which the allocation for health; Capital Spending of Local Government in infrastructure (X_3), representing amount of government expenditure in which the allocation for infrastructure; Human Development Index (X_4), representing process of improvement the quality of human in educational, health and infrastructure and also the earnings measured from level of human development index.

Model Specification

Cross sectional estimation methods may capture the long-run relationship between the variables concerned they do not take the advantage of the time-series variation data, which could increase the efficiency of estimation. It is, there for, preferable to estimates equation using dynamics panel data technique.

Model that used in this research is panel data and using natural log model [Dees, (1998); Fung, et.al (2000 & 2002);

and Sun, et.al. (2002)] which can written as follows:

$$\mathbf{lnY_{it} = \beta_i + \Sigma\, \beta_k\, lnXk_{it} + \varepsilon_{it}} \ldots\ldots. (1)$$

Where Y_{it} is economic growth, X_{it} is determinant of economic growth, ε_{it} is individual effect that constant between time of *t* and specific to each unit of cross section *i*. i = 1,2,….,n referring at unit of cross section, and t = 1,2,…..,t referring at set of time. While determinant of economic growth, X_{it} consist of capital spending of local government in education, capital spending of local government in health, capital spending of local government in infrastructure and human development index. So that determinant of economic growth with input all variable can be written as:

$$\mathbf{lnY_{it} = \beta_0 + \beta_1 lnX_{1it} + \beta_2 lnX_{2it} + \beta_3 lnX_{3it} + \beta_4 lnX_{4it} + e_{it}} \ldots. (2)$$

Where:

t = Time (2004-2011)
i = Sub-Province/City (11 sub-prov./city)
Y = Economic Growth
X_1 = Capital Spending of Local Government in Education
X_2 = Capital Spending of Local Government in Health
X_3 = Capital Spending of Local Government in Infrastructure
X_4 = Human Development Index
e = *error term*

Theoretically, there are some advantages obtained by using pooling data. First, more amount of observation owned for importance estimate parameter of population causing positive ever greatly degree of freedom and degrade co-linearity independent variable. Second, enable estimation of each individual characteristic and time characteristic separately. Thereby analysis result of estimation will be more be comprehensive and near reality (Hsio, 1995).

In regression of panel data, difference model, like one-way or two-way of error correction model can formed by attention in structure of error term. In one-way regression model error of component only one effect, namely individually effect or time effect. But in two-way of regression model error component of model there are two of the effect individual effect and also time effect.

In this research examination to determine whether there are component of time effect and individually effect or only individually effect will be conducted through Hausman test (Baltagi, 2005).

Panel Root Test

Recent literature suggest that panel-based unit root test have higher power than unit root test based on individual time series, see Levin, Lin and Chu (2002); Im, Persaran dan Shin (2003). This research focus on three types of panel unit root test such as Fisher-Type test using ADF and PP test [(Maddala and Wu (1999) and Choi (2001)]; Levin, Lin and Chu (2002); Im, Pesaran and Shin (2003).

Maddala and Wu (1999) and Choi (2001) proposed the used of the Fisher (P_λ) test which is based on combining the P-value of the t-statistics for unit root in each cross-sectional unit. Let p_i are U (0,1) and independent, and $-2\log_e p_i$

has a χ^2 distribution with 2N degree of freedom and can be written in equation 3 as follow:

$$P_\lambda = -2\Sigma_{i=1}^{N} \log_e p_i \ldots\ldots (3)$$

Where:

P_λ = Fisher (P_λ) panel unit root test
N = all N cross-section
$-2\Sigma^{N}_{i=1}\log_e p_i$ = it has a χ^2 distribution with 2N degree of freedom.

In addition, Choi (2001) demonstrates that: (equation 4)

$$Z = \left(\frac{1}{\sqrt{N_{i=1}}}\right)\left[\Sigma_{i=1}^{N} \phi_i^{-1}(p_i)\right] \rightarrow N(0,1)$$

..(4)

Where:

Z = Z-statistic panel data unit root test
N = all N cross-section in panel data
ϕ_i^{-1} = the inverse of the standard normal cumulative distribution function
p_i = it is the P-value from the i^{th} test

Both Fisher (P_λ) Chi-square panel unit root test and Choi Z-statistics panel data unit root test have non-stationary as null hypothesis as well as to show below that:

H_0 : null hypothesis as panel data has unit root (assumes individual unit root process)
H_1 : panel data has no unit root

If both Fisher (P_λ) Chi-square panel unit root test and Choi Z-statistics panel unit root test are significant then conclusion that reject null hypothesis or panel data has not unit root. Otherwise both if Fisher (P_λ) Chi-square panel unit root test and Choi Z-statistics panel data unit root test are not significant then conclusion that accept null hypothesis or panel data has unit root.

Panel Co-integration Test

There are difference methods in testing co-integration panel data. First method by null hypothesis is not happened by co-integration (no co-integration) and use value residual obtained from regression panel, after this method is recognized with method Engle and Granger (1987), Pedroni (1995 and 1997), McCoeskey and Kao (1998) testing co-integration panel data with this method. Another approach by null hypothesis is not happened by co-integration and base on test developed by Harris and Inder (1994) and also Kwiatowski et.al. (1992). Test co-integration of all panel data follows heterogeneity in coefficient co-integration. Important matters which deal with this examination method is null hypothesis have a meaning of all co-integrating form or all relation form do not co-integrating.

Kao (1999) uses both DF and ADF to test for co-integration in panel as well as this test similar to the standard approach adopted in the EG-step procedures. Also this test start with the panel regression model as set out in equation 5.

$$Y_{it} = X_{it}\beta_{it} + Z_{it}\gamma_0 + \varepsilon_{it} \ldots\ldots (5)$$

Where Y and X are presumed to be non-stationary and: (see equation 6)

$$e^{\wedge}_{it} = \varrho\, e^{\wedge}_{it} + v_{it} \ldots\ldots (6)$$

Where $e^{\wedge}_{it} = (Y_{it} - X_{it}\beta_{it} - Z_{it}\gamma^{\wedge})$ are the residuals from estimating equation 5. To test the null hypothesis of no co-integration amounts to test $H_0 : \varrho = 1$ in equation 6 against the alternative that Y and X are co-integrated (i.e., $H_1 : \varrho < 1$). Kao (1999) developed both DF-Type test statistics and ADF test statistics were used to test co-integration in panel also both DF-Type test statistics and ADF test statistics can present below that:

$$ADF = \frac{t_{ADF} + \sqrt{6N}\sigma_v/2\sigma_{0v}}{\sqrt{\sigma^2_{0v}/2\sigma^2_v + 3\sigma^2_v + 10\sigma^2_{0v}}} \ldots\ldots (7)$$

Pedroni (1995) provides a pooled Phillips and Perron-Type test and these test have the null hypothesis of no co-integration. The panel autoregressive coefficient estimator $\gamma^{\wedge}N,T$ can be constructed as follow:

$$\gamma^{\wedge}N,T^{-1} = \left[\sum_{i=1}^{N}\sum_{t=2}^{T}\left(\theta^{\wedge}_{it-1}\Delta\theta^{\wedge}_{it-1} - \lambda^{\wedge}_i\right)\right]/\sum_{i=1}^{N}\sum_{t=2}^{T}\left(\theta^{\wedge 2}_{it-1}\right)$$

…...(8)

Where : N = cross section data
T = time series data
e_{it-1} = error term of model
$\lambda^{\wedge}_i$ = a scalar equivalent to correlation matrix

And also Pedroni (1995) provides the limiting distributions of two test statistics as well as can be written in equation 9:

$$\textbf{PP-statistic} = [T\sqrt{N}(\gamma^{\wedge}_{N,T}{}^{-1})] / \sqrt{2} \rightarrow \mathbf{N(0,1)} \ldots\ldots (9)$$

And this research focus on ADF test statistic based on residual-based test follow concept of Kao (1999) to test co-integration in panel and also this research focus on PP-test statistic based on concept of Pedroni (1995) to test co-integration in panel. Both ADF-statistics and PP-statistic have same null hypothesis of no co-integration in panel.

EMPIRICAL RESULT

Estimate Panel Data Model

Panel data regression to estimate economic growth by sub province/city in Province of Maluku using three approaches to estimate panel data model, that are common effect, fixed effect and random effect.

The most appropriate technique to regress panel data used three tests. First, statistical test of F to chosen between common effect method and fixed effect method. Second, Lagrange Multiplier test (LM test) used to chosen between technique common effect and random effect. Third, to chosen between fixed effect and random effect used a test proposed by Hausman.

The result by using F-test obtained value of F-result 582.9 > value of F-table 3.31 so that test fixed effect more pre-eminent. By using of LM test obtained result of LM test is equal to 118.2601 > 57.4983 critical value tables of distribution of chi-square at $\alpha = 1$ percent, so that model random effect more pre-eminent. By using Hausman test to look for the best model between fixed effect and random effect, obtained by result that Hausman statistical value is 551.27. Critical value of chi-squares is 20.0902. Because statistical value of Hausman test is bigger than its critical

value hence the most appropriate model to analysis panel data is fixed effect method.

Result of estimation with panel data using method of fixed effect approach shall be as follows (table 1 in appendix).

As shown in table 1, estimation result that indicator capital spending of local government in education representing amount of government expenditure in which the allocation for education has an effect on by significant 5 percent and has a positive direction. This indicates that high rates of capital spending by local government to the educational will guarantee to push high labor absorbs. The capital spending of local government in health indicator representing amount of government expenditure in which the allocation for health has an effect on at level of significant 5 percent, meaning that amount allocation for health will yield or conduct a good quality of labor and has a capability and availability to do more innovation to push the engine growth of economic has a significant influence of and has a positive direction. The capital spending of local government in infrastructure has an effect and significant at 5 percent and also has a positive direct of movement. Human development index has a positive direction and significant at 1 percent, meaning that human development index is the power full indicator to economic growth. If one region needs to grow faster then local government expenditure as an investment must be aimed to the right target of indicators especially in develop human resources.

Unit Root Test of Panel Data

Panel data unit root test to variables used in this research is seen at tables 2 in appendix, as follow.

Tables 2 shows result of panel data stationary use LLC (Levin, Line & Chu), IPS (Im, Pesaran & Shin), ADF Fisher and PP Fisher. Seen by all method used to indicate that data have stationary at level because has a value of probability smaller than 5%.

Tables 3 showing one of method (Fisher-test → ADF Fisher) units root test with more specific variables. Stationary indicates that variable of economic growth has a coefficient equal 121.784 meanwhile X1 (capital spending for education) coefficient equal to 32.3743 with probability smaller than 0.05 reject null hypothesis. X2 (capital spending for health) and X3 (capital spending for infrastructure) has a level of the coefficient 71.1859 and 55.5141 with probability smaller than 5 percent, thereby reject null hypothesis. X4 (human development index) has a level of coefficient 34.0523 and probability smaller than 5 percent. So conclusion of all variable used in this research have a stationary at level (I0) or has same degree.

Pedroni Co-integration Test

After all variable in this research have stationary or same degree of integration, the examination existence of long-term (co-integration) conducted with a Pedroni of panel co-integration method.

Result of panel co-integration test with approach of non-parametric

indicates that panel of v-statistic coefficient of co-integration is 11.541177 meanwhile panel of rho-statistic coefficient of co-integration equal to 2.911783. Coefficient of co-integration by using panel of PP-Statistic equal 8.949647 and coefficient of panel of ADF-Statistic equal 4.818014. Probability of each method of examination indicates that variable that used co-integrated at level of significant 1%.

Result examination of panel co-integration with approach of parametric indicates that group rho-statistic has a coefficient of co-integration 7.557942 while group PP-Statistic coefficient of co-integration equal to 4.947500. Meanwhile coefficients of co-integration using group ADF-Statistic equal to 9.469901. Probability of each method of examination indicate that variable used co-integrated at level with 1% significant. While Kao Co-integration test result seen in table 5 as follow (see appendix).

Kao co-integration panel data test using ADF-statistic method shows that the test has the same result as Pedroni test result, from 12 panel data test indicates that there is no co-integration or reject null hypothesis at level 1 percent.

Overall independent variable that used in this research has the same positive correlation to dependent variable which means that increase capital spending of local government for education, health and infrastructure and also improvement of human development.

According to Lowenberg D. Anton dan Yu T. Ben (1992) in paper "The Role of The Intellectual in Economic Development: A Constitutional Perspective", that intellectual clan (people) systematically brought a different influence in economic growth performance in different type of socialize.

Jones Patricia (2001), in the research "Are Educated Workers Really More Productive?" using nation of Ghana database and the result shows that education has a positive correlation with industrial manufacture productivity. Growth of human resources quality could generate difference of productivity and affecting of different earnings.

Williamson (using data of Jones C, 1998, Introduction to Economic Growth, W. W. Norton and Co., New York, table B.2), education shows relationship which are positive with gross domestic regional product (GDRP) among nations (Stephen D. Williamson, 2005:229).

CONCLUSION & SUGGESTION

Conclusion

Analysis result with fixed effect method shows that from all variable that used toward economic growth, namely capital spending of local government in education, health, infrastructure significant at 5 % and has a positive direction and human development index significant at 1 % and has a positive direction. Meanings that capital spending of local government in education, health and infrastructure has be more stimulated to gain best improvement

which is given the opportunity in supporting development human resources, health absolutely needed to build a good quality and people performance which is finally has an effect on economic growth.

Suggestion

Local government expected to give a special attention to develop human resources, taking a new policy that supporting and pushing capital spending of local government for education, health and infrastructure to improvement quality of resources positively.

Local government also required to conduct law and regulation coordination in vertical level (central government - province–sub. province/city) and the horizontal level (inter department and related department), that can obtain information in bearing elementary reform for capital spending.

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Table 1

Fixed Effect Method Result

Dependent Variable: LN_Y
Method: Pooled Least Squares
Included observations: 8
Cross-sections included: 11
Total pool (balanced) observations: 88

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.088423	0.110924	1.247604	0.06518*
LN_X1	0.576036	0.743800	4.552108	0.0213**
LN_X2	0.539511	0.694788	3.992610	0.0284**
LN_X3	0.199302	0.427833	2.002900	0.0450**
LN_X4	0.950618	1.018442	8.112740	0.0057***

Fixed Effects (Cross)		Fixed Effects (Period)	
MTB--C	0.755208	2004--C	0.367701
MBD--C	0.103661	2005--C	0.200910
MTGGR--C	0.421877	2006--C	0.446820
TUAL--C	0.814003	2007--C	0.515309
ARU--C	0.323301	2008--C	0.717090
MTNGH--C	0.551009	2009--C	0.799648
SBB--C	0.662401	2010--C	0.890131
SBT--C	0.499830	2011--C	0.924463
BURU--C	0.649098		
BRUSEL--C	0.705440		
AMBON--C	1.244509		

Effects Specification

Cross-section fixed (dummy variables)
Period fixed (dummy variables)

R-squared	0.741103	Mean dependent var	12.475322
Adjusted R-squared	0.715670	S.D. dependent var	1.246122
S.E. of regression	4.11E+09	Akaike info criterion	2.655211
Sum squared resid	0.240056	Schwarz criterion	2.897723
Log likelihood	122.0181	Hannan-Quinn criter.	-2.421155
F-statistic	49.50508	Durbin-Watson stat	1.760310
Prob(F-statistic)	0.000000		

Resource: data processed
Enclosure: ***significant 1%; ** significant 5%; * significant 10%

Table 2

All Method Unit Root Tests of Panel Data

Pool unit root test: Summary
Newey-West bandwidth selection using Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	6.04291	0.0000	11	77
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	2.95013	0.0201	11	77
ADF - Fisher Chi-square	36.2121	0.0026	11	77
PP - Fisher Chi-square	60.9791	0.0000	11	77

Resource: data processed

Table 3

Unit Root Test of Panel Data Using Fisher-test Method

Panel Unit Root Method: Fisher-test*

Variable	ADF-Fisher Chi-Square		ADF-Choi Z-stats	
	Stats.	Prob.**	Stats.	Prob. **
LN_Y	121.784	0.0000	-8.34138	0.0000
LN_X1	32.3743	0.0127	-1.97622	0.0208
LN_X2	71.1859	0.0000	-4.31877	0.0000
LN_X3	55.5141	0.0001	-3.08014	0.0010
LN_X4	34.0523	0.0105	-2.04878	0.0176

Resource: data processed

Table 4

Result of Pedroni Co-integration Test

Pedroni Residual Co-integration Test
Sample: 2004 2011
Included observations: 8
Cross-sections included: 11
Null Hypothesis: No co-integration
Newey-West bandwidth selection with Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	11.541177	0.0000	8.431005	0.0000
Panel rho-Statistic	2.911783	0.0009	2.901388	0.0007
Panel PP-Statistic	8.949647	0.0000	8.949075	0.0000
Panel ADF-Statistic	4.818014	0.0001	4.801212	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	7.557942	0.0000
Group PP-Statistic	4.947500	0.0003
Group ADF-Statistic	9.469901	0.0000

Resource: data processed

Table 5.

Kao Co-integration Test Result

Kao Residual Cointegration Test		
Series: LN_Y? LN_X1? LN_X2? LN_X3? LN_X4?		
Sample: 2004 2011		
Included observations: 8		
Null Hypothesis: No cointegration		
Trend assumption: No deterministic trend		
Lag selection: fixed at 1		
Newey-West bandwidth selection using Bartlett kernel		
ADF	t-Statistic	Prob.
	-5.676630	0.0001
Residual variance	0.000325	
HAC variance	0.000047	

Resource: data processed