The Empirical Econometrics and Quantitative Economics Letters
ISSN 2286 – 7147
Volume 1, Number 2 (June 2012), pp. 47 – 58.

Analysis of border trade impacts on economic growth of Yunnan and the Greater Mekong Sub-region (GMS) countries

Menglei Zhang*, Kunchon Wattanakul, Nisit Panthamit and Chukiat Chaiboonsri

Faculty of Economics, Chiang Mai University
**E-mail: waiyouna@gmail.com*

ABSTRACT

The aim of this paper is to analyze the relationship between border trade and economic growth of Yunnan province, China and Greater Mekong Sub-region (GMS) Countries, which is represented by border import, border export and real GDP. We use annual data of Yunnan province and GMS countries from 1999 to 2010. This paper includes three steps: first, tests the panel unit root, second examines the panel co-integration and third investigates the Granger causality relationship among border export, border import and economic growth. There are four conclusions. First, the data of border import, border export and real GDP have a unit root at the level. Second, the time and entity fixed model is the best model to test the panel co-integration. Third, the border imports have long-run negative relationship with economic growth based on time and entity fixed effects model and the border export have long-run positive effects on economic growth based on entity fixed effects model. Last, the relationship between economic growth and border imports, which has only one-way granger causality relationship that means border imports effects on economic growth in long-run and short-run.

KEYWORDS: GMS countries, panel data, border trade, economic growth

JEL Classification: A11, B17, C63

1. Introduction

Border trade is a special form apart from international trade, which means that a country does trade between neighboring countries. This research aims to test the border trade effects on the economic growth. Furthermore, to examine the relationship between the border trade and economic growth is bi-direction relationship or not.

Since 1992, the Greater Mekong Sub-region (GMS) Economic Cooperation was created, the regional economic developed with high speed. The annual average growth rate of gross domestic product (GDP) in the Greater Mekong Sub-region (GMS) was about 7.6% from 1999 to 2010. The ranks of GDP growth rate are showed as follows: Myanmar is the first with growth rate 19.96%; Laos is the second with growth rate 9.24%; Vietnam is the third with growth rate 6.88%; Cambodia 5.26% the fourth; Thailand 2.53% the fifth; and the last one is Yunnan 2.14%. We take Myanmar as an example: the real GDP in 1999 is about 4140 billion USD. In 2010 the real GDP had already increased to 27585 billion USD which was about 6.66 times of the real GDP in 1999 (source: World Bank and China Statistical Yearbook).

Yunnan shares international borders 4060 km with Myanmar (1997 km) in the west, Laos (710 km) in the south, and Vietnam (1353 km) in the southeast. It is close to Thailand, Cambodia, Malaysia and Singapore. The five GMS countries have the closest economic relationship with Yunnan. In recent years, especially since 2004, Myanmar and Vietnam have been Yunnan's No.1 and No. 2 trader partners, respectively, based on trade volume. Thailand ranks the third, Laos the fourth and Cambodia the fifth. Unfortunately, many years' data of Cambodia was not investigated in Yearbooks of Yunnan and China or any other statistic books. So in this paper we just study of Yunnan's border trade with Myanmar, Vietnam, Thailand and Laos.

First we come to export and import sides. Both sides of Yunnan and the GMS countries export and import tend to increasing since 1999. For the GMS countries, the average growth rate of export was bigger than the average growth rate of import. But the average growth rate of export was smaller than the average growth rate of import in Yunnan. Here, we use Myanmar and Yunnan as the example: For Myanmar, the average import growth rate was 15.54% and the average export growth rate was 28.70%. The biggest growth 43.27% of import was in 2010 and the biggest growth 99.71% of export was in 2008. For Yunnan, the average import growth rate was 27.83% and the average export growth rate was 20.41%. The biggest growth 49.74% of import was in 2010 and the biggest growth 55.03% of export was in 2007. On the other hand, we pay attention to the balance of border trade of Yunnan and the GMS countries. Overall, Yunnan enjoys the favorable balance in doing border trade with the GMS countries from 1999 to 2010. But the other GMS countries are suffering the trade deficit, Especially Myanmar, Vietnam and Thailand, during 1999 to 2010 (source: Yunnan Statistical Yearbook).

The remainder of this paper is organized as follows: in section 2, we briefly describe earlier studies on the relationship between border trade and economic growth. In section 3, we present the empirical model, as follows: general growth model, panel unit test, panel co-integration test, and the granger causality test and error-correction model. In section 4, we describe the data. In section 5, we present the result of our research. At last, we conclude our research in the section 6.

2. Literature review

Economists have long tried to understand the relationship between the border trade and economic growth. For example: “The Balance of Trade Theory” in Mercantilism by Thomas Mun and W. Stafford (in 15 Century), “International Trade Theory” by Keynes (in 19 Century 30s), “Vent for Surplus” by Adam Smith (1723-1790), “Comparative Advantage” by David Ricardo (1817), “Heckscher-Ohlin Theorem” (1960s-1970s), “National Competitive Advantage Theory” by Michael E. Porter (1990), “Engine for Growth” by D.H.Roberson (in 20 Century 30s) and R.Nurkse (in 20 Century 50s), and “ New Growth Theory” by Paul Romer (in 20 Century 80s) were implied that trade have a positive effects on economic growth.

Helpman and Krugman (1985) pointed out that the exports have direct one-way causation to economic growth. Tong Jiadong (1995) use OLS model to found out that import growth has positive effects on economic growth in China from 1953 to 1990. Shan and Sun (1998) used Granger Causality Test in VAR model and showed that the relationship between real industrial output and export in China is bi-direction Granger causalities. Shen Chengxiang (2000) used Granger Causality Test and Co-integration Test to learn the relationship between China’s export and China’s industrial output is bi-directional Granger causalities. Liu Xiaopeng (2001) used Co-integration Test to describe that the growth rate of import has more powerful to push economic growth than the growth rate of export in China. Lin Yifu and Li Yongjun (2001) used Macroeconomic model to prove that the growths of export have positive effects on economic growth. But the growths of import have negative effects on economic growth. Wang Yafei and Wang Ke (2001) used Co-integration Test and Error-Correction Model to examined the relationship among export, import and GDP from 1952-2000 and proved that in short-run, export can push economic growth but import does not have obvious effects on economic growth. In long-run, export and import both have positive effects on economic growth. Li Jin (2005) used the Co-integration Test and Granger causality Test to show that among export, import and GDP have long-run stable relationship. Export growth and import growth have significantly positive effect on the national economic growth. Lai Mingyong(2006), Du Jiang(2007) and Zhang Zhenqiang (2009) also studied the relationship between the border trade and economic growth. Moreover, Pack (1992), Helleiner(1996) and Bleaney(1997) considered that between the export and the economic growth do not have any effects on economic growth.

3. Methodology

This research studies the relationship among border export, border import and economic growth of Yunnan and GMS countries. This research will approach the Panel Data Unit Test, Co-integration Test in Panel Data, Granger Causality Test in Panel Data and Error Correcting Model (ECM) to examine the data.

3.1 General Growth Model between Border Trade and Economic Growth

Generation and estimation all parameters without resulting into unnecessary data, the growth model can be written as:

$$GDP_{it}= f\,(BT_{it}) \qquad (1)$$

Equation (1) is treated as a Cobb-Douglas function with border trade as the only explanatory variable. It can be expressed in liner form:

$$LnGDP_{it}=\beta_0+\beta_1 LnBT_{it}+\varepsilon_{it} \qquad \beta_0,\ \beta_1 >0 \qquad (1.1)$$

Where GDP_{it} is gross domestic product, BT_{it} is the border trade value which can depart to import and export value. Then the equation (1.1) should be written as:

$$LnGDP_{it}=\beta_0+\beta_1 LnIm_{it}+\beta_2 LnEx_{it}+\varepsilon_{it} \qquad \beta_0 and \beta_2>0, \quad \beta_1 <0 \qquad (1.2)$$

In here, GDP_{it} is gross domestic product, Im_{it} is the import value, Ex_{it} is the export value, ε_{it} is the error term, β_0 represents the slope, β_1 andβ_2 are coefficient of regression. The coefficient of regression, β_1 shows that a unit changes in the independent variable Im_{it} affects the dependent variable GDP_{it}, and β_2 indicates that a unit changes in the independent variable Ex_{it} affects the dependent variable GDP_{it}. The error term ε_{it} is explanted the other factors that may influence GDP_{it}. In Gauss-Markov assumptions the dependent and independent variable are linear correlated, the estimators are unbiased with an expected value zero. E $(\varepsilon_{it})=0$, which means that on average the error terms can canceled with each other.

3.2 The Panel Unit Root Test

Recent literature suggests that panel-based unit root tests have higher power than unit root tests based on individual time series. Panel data unit test normally have six methods: Levin, Lin and Chu (2002), Im, Peasaran and Shin (2003), Breitung (2000), Fisher-type ADF (1999), Fisher-type PP (2001) and Hadri (2000). This research focused on 5 methods which are: Levin, Lin and Chu (2002), Im, Peasaran and Shin (2003), Breitung (2000), Fisher-type ADF (1999), Fisher-type PP (2001) to test the panel unit root of data.

3.3 Panel Co-integration Test

The Various (Casually single equation) approach to estimate a co-integration vector using panel data such as Pedroni (1999, 2004) approach, Chiang and Kao (1999) approach and Breitung (2002) approach. For this research we use Pedroni (1999, 2004) approach and Chiang and Kao (1999) approach to estimate panel co-integration.

3.4 Estimating Panel Co-integration Model

A panel is a set of observations on individuals, collected over time. An observation is the pair of $\{y_{it}, x_{it}\}$, where i subscript represent the individual and t subscript shows the time. In this research we use balanced panel. Balanced panel written as $\{y_{it}, x_{it}\}$: t=1,…, T; i=1,…,N.

3.4.1 Fixed effects regression model

Fixed effects regression model (Zhang Xiaotong 2008) is the most common technique for estimation of non-dynamic linear panel regression which has 3 kinds: 1. Entity fixed effects model, 2. Time fixed effects model and 3. Time and entity fixed effects model. General fixed effects model can written as

$$y_{it}= \alpha_i+x_{it}'\beta+ \varepsilon_{it} \quad , \quad i=1,2,\dots,N;\ t=1,2,\dots,T \tag{2}$$

where α_i is arbitrary correlated with x_{it}. x_{it} and β are matrixes with k x 1. ε_{it} is the error term. And $E(\varepsilon_{it} \mid \alpha_i, x_{it}) =0$, i=1,2,…,N.

1) Entity fixed effects model

$$y_{it}= \alpha_1 D_1+ \alpha_2 D_2 +\dots+\alpha_N D_N+x_{it}'\beta+ \varepsilon_{it} \quad , t=1,2,\dots,T \tag{3}$$

where $Di = \begin{cases} 1, & if\ i = 1,2,\dots,N \\ 0, & else \end{cases}$,

Then the model can be written as

$$\begin{cases} y_{1t}=\alpha_1+X_{1t}'\beta+\varepsilon_{1t}, & i=1,\ t=1,2,\dots,T \\ y_{2t}=\alpha_2+X_{2t}'\beta+\varepsilon_{2t}, & i=2,\ t=1,2,\dots,T \\ \dots & \\ y_{Nt}=\alpha_N+X_{Nt}'\beta+\varepsilon_{Nt}, & i=N,\ t=1,2,\dots,T \end{cases}$$

2) Time fixed effects model

$$y_{it}= \gamma_0+ \gamma_1 W_1+ \gamma_2 W_2 +\dots+ \gamma_T W_T+x_{it}'\beta+ \varepsilon_{it} \quad , \quad i=1,2,\dots,N \tag{4}$$

where $Wi = \begin{cases} 1, if\ i = 1,2,\dots,T \\ 0, else \end{cases}$,

Then the time fixed effects model described as

$$\begin{cases} y_{i1}= (\gamma_0+ \gamma_1) +X_{1t}'\beta+\varepsilon_{i1}, & t=1,\ i=1,2,\dots,N \\ y_{i2}= (\gamma_0+ \gamma_2) +X_{2t}'\beta+\varepsilon_{i2}, & t=2,\ i=1,2,\dots,N \\ \dots & \\ y_{ir}= (\gamma_0+ \gamma_r) +X_{Nt}'\beta+\varepsilon_{ir}, & t=N,\ i=1,2,\dots,N \end{cases}$$

3) Time and entity fixed effects

$$y_{it}= \alpha_0+ \alpha_1 D_1+ \alpha_2 D_2 +\ldots+\alpha_N D_N+ \gamma_1 W_1+ \gamma_2 W_2 +\ldots+ \gamma_T W_T+x_{it}'\beta+ \varepsilon_{it} \quad (5)$$

where $Di = \begin{cases} 1, & if\ i = 1,2,\ldots,N \\ 0, & else \end{cases}$

and $Wi = \begin{cases} 1, if\ i = 1,2,\ldots,T \\ 0, else \end{cases}$

3.4.2 Individual effects model (random effects model)

$$y_{it}= \alpha_i+x_{it}'\beta+ \varepsilon_{it} \quad , \quad i=1,2,\ldots,N;\ t=1,2,\ldots,T \quad (6)$$

Where α_i is arbitrary which uncorrelated with x_{it}. x_{it} and β are matrixes with k x 1. ε_{it} is the error term. We have two assumptions: $\alpha_i \sim iid\ (\alpha, \delta_\alpha^2)$ and $\varepsilon_{it} \sim iid(0,\delta_\varepsilon^2)$. And $E\ (x_{it}\alpha_i) =0$.

3.5 The Granger Causality Test and Error-Correction Models

Causality is a kind of statistical feedback concept which is widely used in the building of forecasting models. In this study we emphasize on the case of three variables y, x_1 and x_2 the Granger causality approach that is developed by Granger C.W.J (1969). The traditional Granger causality test is based on a vector auto-regression model (VAR), given by:

$$y_{i,t}=c_0+\sum_{j=1}^{P}\alpha_{11}y_{i,t-i} +\sum_{k=1}^{n}\beta_{11}x_{1i,t-k} +\sum_{L=1}^{m}\gamma_{11}x_{2i,t-L} +\varepsilon_1 \quad (7)$$

$$x_{1i,t}=c_1+\sum_{k=1}^{n}\alpha_{12}x_{1i,t-K}+\sum_{L=1}^{m}\beta_{12}x_{2i,t-L} +\sum_{j=1}^{p}\gamma_{13}y_{i,t-J} +\varepsilon_2 \quad (8)$$

$$x_{2i,t}=c_2+\sum_{k=1}^{n}\alpha_{13}x_{1i,t-k} +\sum_{L=1}^{m}\beta_{13}x_{2i,t-L} +\sum_{j=1}^{p}\gamma_{13}y_{i,t-i} +\varepsilon_3 \quad (9)$$

In 1988, Granger pointed out that if there is co-integrating vector among variables, there must be at least one unidirectional Granger-causality among these variables. Moreover, when the series are co-integration at I (1), the Granger-causality test should be carried out in the ECM estimation, the VAR equation (7), (8) and (9) should be given as (10), (11), and (12).

$$\Delta y_{i,t}=C_0+\sum_{j=1}^{P}\alpha_{11}\Delta y_{i,t-i}+\sum_{k=1}^{n}\beta_{11}\Delta x_{1i,t-k}+\sum_{l=1}^{m}\gamma_{11}\Delta x_{2i,t-l}+\lambda_1 ecm_1+\varepsilon_1 \quad (10)$$

$$\Delta x_{1i,t}=C_1+\sum_{j=1}^{P}\alpha_{12}\Delta y_{i,t-i}+\sum_{k=1}^{n}\beta_{12}\Delta x_{1i,t-k} +\sum_{l=1}^{m}\gamma_{12}\Delta x_{2i,t-l}+\lambda_2 ecm_2+\varepsilon_2 \quad (11)$$

$$\Delta x_{2i,t}=C_2+\sum_{j=1}^{P}\alpha_{13}\Delta y_{i,t-i}+\sum_{k=1}^{n}\beta_{13}\Delta x_{1i,t-k} +\sum_{l=1}^{m}\gamma_{13}\Delta x_{2i,t-l}+\lambda_3 ecm_3+\varepsilon_3 \quad (12)$$

Where Δ is first difference, n, m and p is the lag time. λ is the coefficient of error correcting term. If the null hypothesis is λ=0 is rejected, the long-run equilibrium is existed for all ECM model. In the equation (10), if the null hypothesis is $\beta_{11}=\gamma_{11}=0$ is rejected, it shows that have the short-run causality relationship from $x_{1i,t}$ and $x_{2i,t}$ to yi,t. In the equation (11), if the null hypothesis is $\beta_{12}=\gamma_{12}=0$ is rejected, it means that have the short-run causality relationship from $x_{2i,t}$ and yi, t to $x_{1i,t}$. In the equation (12), if the null hypothesis is $\beta_{13}=\gamma_{13}=0$ is rejected, there is short-run causality relationship from $x_{1i,t}$ and $y_{i,t}$. to $x_{2i,t}$.

4. Data

The research examines the secondary data of Yunan and the GMS countries during the period of 1999-2010. Secondary data of Yunan: according to the availability of data, data are based on a panel of 12 years of Yunnan's border trade. All the data and information need to have been collected from China Statistical Yearbook and Yunnan Statistical Yearbook published by the National Bureau of Statistics of China from 1998-2011, and the website of Yunnan Commerce Department. Secondary data of the GMS countries: All data and information needed have been collected on the website of World Bank and Yunnan Statistical Yearbook.

5. Results

5.1 The empirical results of the panel unit root test

This research used 5 methods to examine the panel unit root of the variables which are: Levin, Lin and Chu (2002), Im, Peasaran and Shin (2003), Breitung (2000), Fisher-type ADF (1999), and Fisher-type PP (2001). Most of the results indicate the presence of unit root as Levin, Lin and Chu (2002), Im, Peasaran and Shin (2003), Breitung (2000), Fisher-type ADF (1999), and Fisher-type PP (2001) method tests indicate that $lnGDP_{it}$, $lnIm_{it}$ and $lnEx_{it}$ fails to reject the null of the panel unit roots. So, all variables should take first difference or second difference, as well as when taking the first difference in all variables, all variables accepts the null of the panel unit roots.

TABLE 1. Results of panel unit root tests

Results of Panel Unit Root Test						
Methodology	level			1st difference		
	None	Trend	Trend &Intercept	None	Trend	Trend &Intercept
Variable	LnGDPi,t					
LLC	5.6599 (1.0000)	-0.0546 (0.4782)	-3.4105 (0.0003)	-2.3553 (0.0092)	-6.9894 (0.0000)	-7.59756 (0.0000)
IPS		3.0231 (0.9987)	-0.3145 (0.3766)		-4.35876 (0.0000)	-2.74595 (0.0030)
Continuous Table1						
Variable	LnImi,t					
LLC	8.2494 (0.0000)	-0.0640 (0.4745)	-4.7569 (0.0000)	-3.6773 (0.0001)	-7.7430 (0.0000)	-9.2294 (0.0000)
IPS		2.7401 (0.9969)	-1.5537 (0.0601)		-6.0299 (0.0000)	-3.74718 (0.0003)
Breitung			-0.4022 (0.3438)			-2.5092 (0.0061)
ADF-Fisher	0.03908 (1.0000)	1.71625 (0.9981)	17.2874 (0.0682)	27.6011 (0.0021)	46.1197 (0.0000)	40.0477 (0.0000)
PP-Fisher	0.0008 (1.0000)	2.91318 (0.9834)	27.6704 (0.0020)	26.9773 (0.0026)	55.6539 (0.0000)	69.7434 (0.0000)
Variable	LnExi,t					
LLC	5.5601 (1.0000)	0.32581 (0.6277)	-4.1239 (0.0000)	-4.3243 (0.0000)	-7.2926 (0.0000)	-7.4843 (0.0000)
IPS		2.6907 (0.9964)	-2.2851 (0.0112)		-5.5394 (0.0000)	-2.9336 (0.0017)
Breitung			-0.2948 (0.3841)			-2.2918 (0.0110)
ADF-Fisher	0.1907 (1.0000)	1.4664 (0.9990)	21.9806 (0.0152)	34.1353 (0.0002)	44.4136 (0.0000)	33.3415 (0.0017)
PP-Fisher	0.0449 (1.0000)	1.52972 (0.9988)	17.0131 (0.0741)	34.5846 (0.0001)	46.4586 (0.0000)	48.0808 (0.0000)

Source: computed

5.2 The empirical results of panel co-integration test

Table 2 presents the results of the panel co-integration test of modeling growth model between border trade and economic growth of Yunnan and the GMS countries based on Pedroni Residual Co-integration tests and kao Residual Co-integration test. Most of these methods used to test for this model indicate that all variables are significant for rejecting the null hypothesis (no co-integration). The empirical results imply that all variables in growth model between border trade and economic growth of Yunnan and the GMS countries are co-integrated with each other.

TABLE 2. Results of panel co-integration test

Test Name	Test Statistic	Null Hypothesis (no co-integration)
1)Pedroni Test		
Panel v -statistic	-1.679546	0.9579
Panel ρ -statistics	0.403214	0.7868
Panel PP-statistic	-1.197853	0.2801
Panel ADF-statistic	-0.392952	0.3998
Group ρ -statistics	0.704460	0.7594
Group PP-statistic	-2.818208	0.0024
Group ADF-statistic	-1.822104	0.0342
2)Kao Test		
ADF-statistic	-1.565894	0.0587

Source: computed

5.3 The empirical results of estimating panel co-integration model

Table 3 presents the modeling results of the long-run relationship for growth model between border trade and economic growth of Yunnan and the GMS countries according to fixed effects model and random effects model ($lnGDP_{it}$ is the dependent variable). The results of all variables used in this research showed border trade impacts on the economic growth between Yunnan and the GMS countries during 1999-2010.

The entity fixed effects model suggests that $lnEx_{it}$ has a positive effect on economic growth between Yunnan and the GMS countries at the 1% level of statistical significance. The time and entity effects model suggests that $lnIm_{it}$ has a negative effect on economic growth between Yunnan and the GMS courtiers at the 1% level of statistical significance.

Because the entity random effects model and time fixed effects model show the bad regression, so we rejected both. Comparing the entity fixed effects model with the time and entity fixed effects model by redundant fixed effects tests, we found that the time and entity fixed effects model is better than entity fixed model.

TABLE 3. Results of panel co-integration estimation

	C	$LnIm_{it}$	$LnEx_{it}$
Entity fixed model	14.2045*** (31.0085)	-0.0379 (-0.3543)	0.2936*** (3.3214)
Time fixed model	-3.759 (-1.6459)	2.252*** (6.7504)	-0.1608 (-0.7142)
Time and entity fixed model	23.8577*** (21.1838)	-0.7995*** (-7.2698)	0.03156 (0.4581)
Entity fixed random model	14.1638*** (12.1749)	-0.0298 (-0.2793)	0.2894*** (3.2883)

Note: *** denotes statistical significance at 1% level.
Source: computed

5.4 The empirical results of granger causality test and Error-correction models (ECM)

Table 4 shows the bi-direction relationship and one-way relationship among border export, border import and economic growth of Yunnan and the GMS courtiers based on granger causality test and ECM. The results of granger causality test and ECM suggest that import has one-way granger causality relationship with economic growth in long-run and short-run. In GDP function we can see that ECM term is negative. It means that the recovery rate from non-equilibriums to equilibriums is 25.26% each year.

TABLE 4. The results of granger causality test and ECM

Dependent variables	Independent variables			
	Short-run			Long-run
	$\Delta LnGDP_{i,t-1}$	$\Delta LnIm_{i,t-1}$	$\Delta LnEx_{i,t-1}$	$ECM_{i,t-1}$
ΔLnGDPi,t	0.6615*** (7.2767)	0.0800* (1.9529)	0.0183 (0.6871)	0.2526*** (-3.3087)
ΔLnImi,t	0.4716 (1.6366)	0.4220*** (3.1282)	0.1359 (1.5838)	1.2986*** (-4.9500)
ΔLnExi,t	0.5731 (1.1114)	0.0997 (0.4537)	0.3138* (1.8514)	0.7789*** (-3.8005)

Note: *** denotes statistical significance at 1% level, * denotes statistical significance at 10% level.

Source: computed

6. Conclusion and Recommendations

This paper was motivated by the empirical analysis of border trade impacts on economic growth of Yunnan and the GMS countries. In this paper, 5 kinds of standard panel unit root test (Levin, Lin and Chu (2002), Im, Peasaran and Shin (2003), Breitung (2000), Fisher-type ADF (1999), and Fisher-type PP (2001)) were used to test all variables. Panel co-integration test based on Pedroni residual co-integration and Kao residual panel co-integration were be applied. Furthermore in this paper estimator the fixed effects model and random effects model in panel data were used to investigate long-run equilibrium relationship between border trade and economic growth of Yunnan and the GMS countries. Granger Causality test and Error-correction Model (ECM) were used to find out the bi-direction relationship among the variables. And ECM term pointed out the recovery rate from unequilibrium to equilibrium.

There are two conclusions and recommendations that draw from the empirical analysis of this research. Two conclusions: 1.The negative coefficients between border imports and economic growth, which suggest that the border imports, have negative effects on economic growth. When border import increased 1%, the economic should be decreased 0.7995% based on time and entity effects model. 2. The positive coefficients between border exports and economic growth, which suggest the border exports have positive effects on economic growth but the effects are too non-obvious. When border export increased 29.36%, the economic just increased 1% according to entity effects model. Two recommendations: 1. Border trade not the only one way to motivate the economic growth. The governments of GMS countries need do more activities to make the economic growth, such as foreign direct investment, education, techniques innovation and so on. 2. Import is not just import. All the GMS countries need to study the different new techniques when they are doing border import with each other. Then the border import can transfer positive side to light up the economic growth.

ACKNOWLEDGMENT

The first author would like to thank Liu Jianxu, all classmates and parents for their supports.

REFERENCES

Asian Development Bank. 2004. The GMS Beyond Borders Regional Cooperation Strategy and Program, 2004- 2008

Asian Development Bank. 2010. The Greater Mekong Sub-region Economic Cooperation Program Strategic Framework 2012-22: Background Paper

Asian Development Bank. 2012. GMSE-UPDATES, Recent and Upcoming GMS Events and Initiatives, vol. 5, issue No.4

Breitung, J. 2000. The local power of some unit root tests for panel data Advances in Econometrics, Volume 15: Non-stationary Panels, Panel Co-integration, and Dynamic Panels, ed., B.H.Baltagi, Amsterdam JAY Press, 161-178

Breitung, J., and S. Das. 2005. Panel Unit Root Tests under Cross-sectional Dependence, Statistica Neerlandica 59:414-433

China Statistical Year Book 1998-2010

Charles, J. Bullock. 2011. "The Theory of the Balance of Trade", The North American Review published by: University of Northern Lowa, 111-133

Choi, I. 2001. Unit Root Test for Panel Data, Journal of International Money and Finance 20: 249-272

Choi, I. 2002. Instrumental Variables Estimation of Nearly Nonstationary, Heterogeneous Error Component Model, Journal of Econometrics 109: 1-32

Engle, R. and Granger, C.W.J. 1987. Co-integration and Error Correction: Representation, Estimation and Testing, Econometrica, 35, 251-276

Granger, C.W.J. 1969. Investigating Causal Relations by Econometric Model and Cross-spectral Methods, Econometrica, 37,424-438

Helpman, E. and P. Krugman. 1985. Market Structure and International Trade, MIT Press

H. Myint. 1971. Economic Theory and the Underdeveloped Countries, New York, Oxford University Press, 125

Im, K.S., M.H. Pesaran, and Y.Shin. 2003. Testing for Unit Root in heterogenous panels, Journal of Econometrics 115: 53-74

Jones, Ronald, W. 1987. "Hecksher-Ohlin Trade Theory", The New Palgrave Dictionary of Economics, 2nd Ed.

John Wslah. 2011. The Contribution of International Business to the Economic Development of Yunnan Province, International Business Research, Vol.4,No.1 112-118

Kao, C. 1999. Spurious Regression and Residual- Based Tests for Co-integration in Panel Data, Journal of Econometrics 90: 144

Levin, A., C.F. Lin, and C.S.J. Chu. 2002. Unit Root Tests in Panel Data: Asymptotic and finite-sample properties, Journal of Econometrics 108: 1-24

Medhi Krongkaew. 2004. The Development of the GMS Real Promise of False hope? Journal of Asian Economics 15(2004): 977-998

Myint, Hla. 1977. Adam Smith's Theory of International Trade in the Perspective of Economic Development. Economica, n.s., 44(175): 231-248

Porter, M. 1998. Clusters and the new economics of competition, Harvard Business Review, November/ December, 77-90

Porter, M. 1990. The Competitive Advantage of Nation, The Free Press, New York

Porter, M. 1980. Competitive Strategy: Techniques for Analyzing Industries and Competitors, The Free Press, New York

Pesaran, M.H. 2007. A Simple Panel Unit Root Test in the Presence of Cross Section Dependence, Journal of Applied Econometrics 27: 265-312

Pedroni, P. 1999. Critical Values for Cointegration Test in Heterogeneous Panel with Multiple Regresses, Oxford Bullrtin of Economics and Statistics 61: 653-670

Pedroni, P. 2004. Panel Cointegration, Asymptotic and Finite Sample Properties of Pooled Time Series Tests with an Application to the PPP hypothesis, Econometric Theory 20: 597-625

Pedroni, P. 2004. Social Capital, Barriers to Production and Capital Shares: Implications for the Importance of Parameter Heterogeneity from a Non-sationary Panel Approach, mimeo, Williams Collage

Ricardo, David. 1817. On the Principles of Political Economy and Taxation, London: J. Murray

Sim, C. 1992. Money, Income and Causality, American Economic Review, 62: 251-266

Shelby, D. Hunt and Robert, M, Morgan. 1995. The Comparative Advantage Theory of Competition, Journal of Marketing, Vol. 59(1995), 1-15

Smith, Adam. 1776. An Inquiry into the Nature and Causes of the Wealth of Nations, The Glasgow edition of the works and correspondence of Adam Smith, edited by R.H. Campbell and A.S.Skinner,1981, Liberty Press, Starting point of economics as a science, using a coherent system of analysis favoring free trade.

Stephen, J. Turnovsky. 2001. Old and New Growth Theories: A Unifying Structure, University of Wahigton, Seattle WA 98195

Yunnan Statistical Year Book 1998-2011.

The Reports of National Economy and Social Development of Yunnan Province. 2010. Yunnan Bureau of Statistics

Tong Jiadong. 1995. Analysis of the Relationship between National Income and China's Imports and Exports, International Trade

Shen Chengxiang. 2000. Analysis of the Relationship between Export and Industrial Output in China, Press Economic Study

Lin Yifu, Li Yongjun. 2001. Re-inspection of the Foreign Trade and Economic Grewth (J), International Trade

Liu Xiaopeng. 2001. A Study of the Relationship Among GDP, Import and Export in China since 1952 by Using Co-integration Test, Econometrics

Shi Chuanyu. 2003. Empirical Analysis of Foreign Trade and Economic Growth in China, Nan Kai Economics Study

Li Jin. 2005. Analysis of the Relationship between Foreign Trade and Economic Growth by Using Co-integration test and Granger Causality Test (J), Statistical of Education

Lai Mingyong. 2006. Study of the Border Trade and Regional Economic Growth in China , Economics Study

Du Jiang. 2007. Analysis the Relationship between China Import and Export and Economic Growth, International Trade

Zhang Zhenqiang. 2009. Analysis the relationship between Pingxiang border trade with Vietnam and its economic growth, Econometrics

Zhang Xiaotong. 2008. Analysis of Model, Theory and Applications of Panel Data. http://202,113,23,180:70500

Zhang Xiaotong. 2006. A Guide to Using Eviews, China Machine Press.