

Economic Integration of Yunnan with the Greater Mekong Subregion*

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This paper examines the process of economic integration between the Chinese province of Yunnan and its riparian areas of the Mekong region. The gravity model of trade is used to investigate the evolution of Yunnan's international trade integration between 1988 and 1999. Although Greater Mekong Subregion cooperation efforts have had a positive effect on trade, trade has progressively decreased from an above-standard level to a normal level, according to the gravity model of trade. During this process, Yunnan's trade has increased with other countries such as Singapore, Indonesia and Malaysia. This evolution is in line with Yunnan's development and indicates a progressive re-orientation of its trade toward more developed partners. The results suggest that the Mekong cooperation project has to broaden its perspective, taking into consideration Yunnan's expanding trade relations with countries outside the Greater Mekong Subregion.

Keywords: economic integration, gravity model, Greater Mekong Subregion, Yunnan.

JEL classification codes: F14, F15.

I. Introduction

Yunnan is China's seventh biggest province. This southwestern region's neighbors to the east are Guizhou and Guangxi, with Sichuan and Tibet to the north. It also shares international borders spanning 8800 km with Myanmar to the west and Laos and Vietnam to the south-east. A landlocked province, it is often considered to be inaccessible and backward, especially given that its terrain is 94 percent mountainous. Yunnan's apparent lack of economic potential is reinforced by China's strategy of international opening that had long been limited to the coastal region. Although noted by D'Hooghe (1994) as having a long tradition of foreign relations and trade with its neighboring countries, until the 1980s Yunnan remained a backwater province in an isolated Communist China. Border trade between Yunnan and Southeast Asia revived with China's 1978 open door policy and especially after the improvement of diplomatic relations in 1984, following decades of unsettled relations.

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Since the mid-1990s, Yunnan has emerged as an international gateway to the dynamic economies of Southeast Asia. The Yunnan Government has recently highlighted export-oriented economic strategy as a priority. The province has developed border trade with neighboring countries; namely, Myanmar, Laos and Vietnam. It has also promoted relations with other countries of the region, such as Thailand. Yunnan has played an active role in the Golden Quadrangle (comprising Yunnan, Myanmar, Laos and Thailand), now engulfed by the Greater Mekong Subregion (GMS). The GMS comprises Yunnan and the 5 riparian countries of the Mekong River: Myanmar, Laos, Thailand, Vietnam and Cambodia. The GMS Economic Cooperation Program was initiated in 1992, initiated by the Asian Development Bank, and aims at promoting economic cooperation in terms of trade, foreign direct investment and tourism, linking countries that already share common borders, natural resources, and a long history.

The present paper examines Yunnan's integration with the GMS over the period 1988–1999. The gravity model of trade reveals a high degree of trade integration between Yunnan and its neighbors (Laos, Myanmar and Vietnam). Moreover, the evolution of trade flows seems to suggest that GMS cooperation will encourage broader international integration. Results seem to follow this trend, emphasizing the rapid increase of imports with outside countries such as Japan, the USA and even Singapore.

This paper proceeds as follows. Section II reviews the trade history and trade pattern of the region. The gravity model is presented in section III, followed by a description of the data in section IV. Section V conveys the results of an empirical analysis of Yunnan's international trade. The final section provides concluding remarks.

II. Yunnan's Trade History and Trade Pattern

Despite deep cultural and historical similarities, economic cooperation and trade between Yunnan and its riparian countries had been obliterated by difficult diplomatic relations. Since the 1990s, the Yunnan Government has given priority to the promotion of trade with its 5 riparian countries of the Mekong Region. The Mekong River, also the 'mother of waters' or the Lancang, flows 4200 km from the mountains of Central China, through Yunnan, Laos, Thailand, Cambodia and Vietnam, before merging into the South China Sea (see Figure 1).

As Than (1997) points out, 'the history of the Mekong is the history of the relationships among these countries'. Before border lines were imposed by French and British colonizers, the Mekong served as the boundary line between the people of the federated Tai Kingdoms.¹ The Tai confederation was split into

1. Four Tai Kingdoms, each with its own supreme overlord, operated together in a 'Tacit Alliance' (Berman, 1998): Kengtung Kingdom of today's Burmese Shan State, Lan Zhang Kingdom in current north-western Laos, Lan Na Kingdom in today's northern Thailand and Sipsong Panna in today's Yunnan.

Figure 1 Greater Mekong Subregion



5 different nations: China, Thailand, Burma, Laos and Vietnam. Culturally and linguistically, Yunnan (and especially the Xishuangbanna Autonomous Prefecture) is closely related with its neighbors through Tai and minority groups straddling national boundaries and, increasingly, moving between national territories (Hinton, 1998). It is only since the mid-1980s and the normalization of Chinese relations with its Southeast Asian neighbors that Yunnan has started working to establish subregional economic cooperation.

Yunnan's regional engagement genuinely started in 1991 when China agreed to join and establish a network called the Mekong Development Research Network, initiated by the Canadian International Development Research Centre. This network brought together Yunnan and its 5 riparian countries of the Mekong River. Economic cooperation was promoted further through the GMS Economic Cooperation Program. Tables 1 and 2 outline the evolution of Yunnan's engagement in international markets. Annual rates of export and import growth rose above the Chinese average after 1992. The province's imports grew 2.4-fold over the 1992–1997 period compared with a 1.4-fold increase in the rest of China's imports over the same period. Export evolution in Yunnan converges to that of other provinces after 1992 (with a 31 percent average annual growth rate between 1993 and 1997), whereas before it was well below them.

Table 1 Yearly evolution of trade in Yunnan and the rest of China

	1988–1992 (%)	1993–1997 (%)	1998–2002 (%)
Yunnan's exports	9.1	31.0	5.5
Rest of China's exports	19.8	24.8	19.4
Yunnan's imports	25.0	35.3	2.3
Rest of China's imports	11.4	9.2	27.8

Note: Average annual growth rates over the sub-periods.

Sources: Chinese State Statistical Bureau (various years) and Yunnan Province Statistical Bureau (various years).

Table 2 Shares of exports and imports in GDP

	Yunnan (%)	National average (%)
Exports		
1988	4.2	11.8
1992	5.8	17.8
1995	9.2	21.3
1999	4.6	19.3
2002	5.3	26.0
Imports		
1988	1.3	13.8
1992	2.8	16.7
1995	5.5	18.9
1999	2.8	16.8
2002	3.0	23.6

Sources: Chinese State Statistical Bureau (various years) and Yunnan Province Statistical Bureau (various years).

When openness is measured by the share of exports and imports in GDP, Yunnan remains quite closed compared to the national average. The export to GDP ratio increased from 5.8 percent (approximately one-third of the national average) in 1992 to 9.2 percent (approximately half the national average) in 1995 before falling back to 4.6 percent in 1999, which might be largely attributed to the Asian crisis. It reached 5.3 percent in 2002, only one-fifth of the national average (Table 2).

Despite its lower openness ratio, international trade is an especially strategic engine for growth in Yunnan because it is deeply landlocked. Gallup et al. (1999) highlight three reasons why landlocked countries might be at a disadvantage: cross-border migration of labor is more difficult than internal migration; infrastructure development is more challenging to coordinate across borders than domestically; and, coastal economies might have military or economic incentives to impose costs on landlocked countries. Yunnan's prospects and

Table 3 Relative Importance of Greater Mekong Subregion countries in Yunnan's Exports, 2002 (% of total)

	<i>Yunnan</i>	<i>Rest of China</i>	<i>Ratio (Yunnan/ rest of China)</i>
Vietnam	9.4	0.6	15.1
Thailand	2.6	0.9	2.9
Laos	0.7	0.0	54.5
Cambodia	0.1	0.1	1.1
Myanmar	20.7	0.1	156.6
Japan	9.1	14.9	0.6
Hong Kong	17.0	18.0	0.9
USA	5.0	21.6	0.2

Sources: Chinese State Statistical Bureau (various years); Yunnan Province Statistical Bureau (various years).

opportunities could, however, be on its borders. The long borderline that it shares with its neighbors could help the province overcome its geographic difficulties through the shared historical and cultural ties mentioned above.

Yunnan's entry in the GMS agreement is consistent with the argument made by MacKellar et al. (2000) that regional trade arrangements significantly mitigate the negative effects of being landlocked on trade. The privileged ties that link Yunnan and its neighbors appear regularly in the international trade profile of the province. In Table 3, data from 2002 comparing Yunnan with the rest of China highlights that the riparian countries of Yunnan are overrepresented in trade relations.

Trade between Yunnan and Myanmar, Laos and Vietnam is significantly greater than trade between those countries and other Chinese provinces (ratios reported in the last column of Table 3 equal 157, 55 and 15 times, respectively). Myanmar and Laos export primary goods, such as agricultural products (e.g. rice, corn and seafood), timber and minerals (e.g. jade and rubies), and import mainly low-priced consumer goods and machinery, such as electrical appliances and equipment from Yunnan. D'Hooghe (1994) stresses that these countries are the main export outlets for Yunnan's products, which are not yet suitable for the world market because of packaging and design.

The magnitude of these statistics justifies the need to quantify the impact of Yunnan's economic integration through the GMS initiative, which can be estimated by a gravity equation. The next section presents the gravity model of trade that is used to investigate the evolution of Yunnan's trade integration with the GMS.

III. The Methodology

The gravity model is the most commonly used analytical framework to examine bilateral trade. It is largely inspired by the 'Law of Universal Gravitation'

proposed by Newton in 1687. It holds that the attractive force between two objects i and j is a positive function of their respective masses (Y_i and Y_j) and a negative function of the distance (D_{ij}) between them. Therefore, the attraction force, T_{ij} , is given by:

$$T_{ij} = G \frac{Y_i Y_j}{D_{ij}^2}, \quad (1)$$

where G is the gravitational constant depending on the units of measurement.

Tinbergen (1962) proposes that roughly the same functional form could be applied to international trade flows. The trade flow from origin i to destination j , T_{ij} , is expressed as $T_{ij} = G \frac{Y_i^\alpha Y_j^\beta}{D_{ij}^\theta}$, with Y_i and Y_j representing the relevant economic sizes of the two locations and D_{ij} the distance between them. Taken from Equation (1), the expected unit production elasticities of trade are $\alpha = \beta = 1$ and the anticipated distance elasticity θ is 2.² Despite the absence of theoretical foundations until the late 1970s, the gravity model turned out to be a successful and robust approach to explaining international trade. Some of the important steps towards its formalization include Anderson (1979) showing that the gravity model can be derived from expenditure share equations (assuming commodities are distinguished by place of production), followed by Helpman's (1984) and Bergstrand's (1985) demonstration that the gravity model can be derived from models of trade in differentiated products. Deardorff (1998) later establishes that the gravity model is consistent with the Heckscher–Ohlin model that includes transport costs. As Helliwell (1998) notes, the gravity model has gone from being a theoretical orphan to being the favored child of all main theories of international trade.

Therefore, the gravity equation of trade explains aggregate bilateral flows, T_{ij} , between 2 countries, i and j , by including both attractive and repulsive elements. The attraction aspect corresponds to the importer's and the exporter's economic sizes (both proxied by GDP). The repulsion component is the geographical distance: a proxy for trade costs, including transport and transaction costs.

A linear relationship between trade flows, economic sizes and distance can be obtained by taking the natural logarithm of the gravity expression. The equation to be estimated, in its most basic form, is:

$$\ln T_{ij} = c + \alpha \ln (Y_i Y_j) - \theta \ln D_{ij} + \varepsilon_{ij}, \quad (2)$$

where c is a constant term, T_{ij} denotes trade flows between country i and country j , Y_i and Y_j are, respectively, the GDP of the importing and the exporting countries, D_{ij} is the distance between the capital cities of the 2 trading partners, and ε_{ij} is the disturbance term. As explained by Head (2000), the inclusion of the error term, ε_{ij} , delivers an equation that can be estimated by OLS.

2. The value of 2 is derived from the Newtonian formula.

The successful empirical performance of the gravity model is well known and is commonly invoked to assess trade patterns both between countries and within preferential trade areas. In particular, it makes the model a useful tool to analyze the evolution of regional trade integration. The intensity of non-standard trade relations is measured by dummy variables for specific partners. A positive and statistically significant coefficient for a dummy variable implies that trade flows exceed the normal level; that is, the level predicted by the countries' economic sizes and the distance between them. Therefore, it describes preferential trade relations. By contrast, a negative and statistically significant coefficient implies that the trade flows fall short of the predicted level.

Using this method to illustrate Yunnan's international trade, the effect of *GMS* cooperation on trade flows is assessed by introducing a dummy equal to one if the partner is located in the *GMS* and zero otherwise. The positive and significant coefficient of the dummy variable underlines above-standard trade volume (therefore, greater economic integration) between Yunnan and the other riparian countries of the Mekong. This attests to the effectiveness of preferential trade in boosting regional trade. Furthermore, countries of the *GMS* are differentiated to identify the privileged trade partners of Yunnan. Yunnan's trade relations with others countries are also investigated, including *ASEAN* members not located in the *GMS*, Japan and the USA.

The time dimension of the dataset makes it possible to assess the evolution of Yunnan's economic integration over the years. The inclusion of country dummies by year underlines the re-orientation process of Yunnan's trade. Imports and exports are analyzed separately.

IV. Description of the Data

The data presents bilateral trade flows between Yunnan and approximately 80 of its international trade partners between 1988 and 1999. Table 4 shows the list of countries included in the regression. The countries for which Yunnan either does not declare trade flows or with which Yunnan does not trade are both indicated by a missing value. The endogeneity of which country pairs have positive trade has the potential to generate selection bias. The Heckman two-stage procedure will address this matter.

The dataset covers 230 non-zero observations. All data on trade flows and GDP for Yunnan are extracted from the Chinese Ministry of Foreign Economic Relations and Trade (various years) and the Yunnan Province Statistical Bureau (various years). It is necessary to acknowledge that these statistics understate the value of total transactions. Indeed, they include neither the small-scale free trade between border residents nor informal border trade (smuggling). Despite the process of trade liberalization, smuggling (mainly of drugs, arms, automobiles, motorcycles, electrical and electronic equipment) is recognized by local governments as a means to circumvent prohibition, high duties and red tape (Hendrischke, 2000; Hinton, 1998). The potential understating of economic transitions' value

Table 4 List of countries covered in the trade flow dataset

Afghanistan	Mexico
Algeria	Morocco
Argentina	Myanmar
Australia	Nepal
Austria	Netherlands
Bangladesh	New Zealand
Belgium	Niger
Brazil	Nigeria
Brunei	North Korea
Bulgaria	Norway
Canada	Oman
Chile	Pakistan
Cuba	Panama
Czech Republic	Papua New Guinea
Denmark	Paraguay
Dominica Republic	Peru
Egypt	Philippines
El Salvador	Poland
Ethiopia	Portugal
Fiji	Romania
Finland	Russia
France	Saudi Arabia
Germany	Singapore
Hong Kong	South Africa
Hungary	South Korea
India	Spain
Indonesia	Sri Lanka
Iran	Sweden
Ireland	Switzerland
Israel	Syria
Italy	Taiwan
Japan	Thailand
Jordan	Togo
Kazakhstan	Turkey
Kenya	Ukraine
Kuwait	United Arab Emirates
Laos	UK
Lebanon	USA
Macao	Uruguay
Malaysia	Venezuela
Malta	Vietnam
Mauritius	Yugoslavia

might lead to underestimating the impact of Yunnan's economic integration with the GMS. However, smuggling practices as a proportion of total trade are expected to decline in the face of growing trade liberalization and deepening regional integration. On the one hand, findings of the positive and statistically significant effect of the GMS cooperation efforts on transaction volume would

likely be more robust if smuggling practices had also been included. On the other hand, a reduction in regional trade flows from the above-standard level to the normal level would not be moderated.

No statistics for trade between Cambodia and Yunnan are available, preventing the assessment of their level of economic integration. Data on GDP and population of most countries comes from the World Bank's *World Development Indicators* (various years). Missing data for some Asian countries (Taiwan, Myanmar) is taken from the Asian Development Bank's *Key Indicators of Developing Asian and Pacific Countries* (various years). The distance between Yunnan and each trading partner is measured using the 'greater circle' distance formula between Kunming (the capital of Yunnan) and the capital city of each country. This formula approximates the shape of the earth as a sphere and calculates the minimum distance along its surface. As emphasized in various studies (e.g. Head and Mayer, 2000), 'greater circle distance' is an effective measurement tool in an international context. One should bear in mind that the distance term might not reflect real transaction costs, as some other studies have suggested. Most studies have difficulties estimating real transport costs between cities; using the distance variable can help avoid these obstacles. It should be emphasized that the introduction of a term expressing economic size of partner countries allows the existing heterogeneity between trade partners to be taken into account (e.g. how Laos is a relatively small economy compared to Vietnam). Moreover, results are robust when using Ho Chi Minh instead of Hanoi as the city of reference when computing the distance between Yunnan and Vietnam.³

V. The Findings

Equation (2) is the simplest form of the gravity equation. However, there is reason to believe that GDP per capita has a positive effect on trade flows of a given size. As argued by Frankel et al. (1995), as countries become more developed they tend to specialize more and trade more. Consequently, in using the gravity model to describe trade flows between Yunnan and its trade partners, joint per capita income of partners is included in addition to Y_i , Y_j , D_{ij} and various dummy variables. Therefore, the following equation is estimated:

$$\ln T_{kj} = c + \alpha \ln (Y_k Y_j) + \beta \ln [(Y_k/pop_k)(Y_j/pop_j)] - \theta \ln D_{kj} + \varepsilon_{kj}, \quad (3)$$

where subscripts k and j denote Yunnan and its trading partner j , respectively.

Equation (3) is estimated separately for imports and exports on pooled cross-section and time-series panel data. Yearly fixed effects are introduced to appropriately take into account the panel nature of the dataset. As a preliminary measure, estimations are verified to be robust given a potential selection bias based on the Heckman selection model (full maximum-likelihood)

3. Results not reported in the present paper are available from the author upon request.

procedure to account for the existence of missing trade flows.⁴ The results are presented in Table 5. Heteroskedasticity is accounted for by applying White's (1980) method. Columns 1–4 of the table present the impact of integration on Yunnan's exports and columns 5–8 show the impact on its imports. Results in columns 2 and 6 rely on the Heckman selection model. The lack of significance of the inverse of the Mills ratio suggests that our results do not suffer from a selection bias.

The gravity model gives a reasonably good explanation of Yunnan's trade patterns, evidenced by the relatively high values of R^2 (approximately 70 percent for exports and 30 percent for imports). The two basic explanatory variables (GDP and distance) have the expected signs and are statistically significant at the 1-percent level. The coefficient of joint GDP is reasonably close to 1 while the coefficient of distance is negative and close to its predicted value of -2 . The coefficient on joint GDP per capita, however, is not statistically significant. One possible explanation is that Yunnan's trade is largely of an inter-industry rather than an intra-industry type.⁵

Baseline estimations appear in columns 1 and 5 (exports and imports, respectively). In columns 3 and 7, a dummy variable that takes the value of one when the partner is Myanmar, Laos, Vietnam or Thailand is introduced to measure the impact of GMS cooperation. It turns out that the coefficient of this dummy variable is positive for both export and import flows. In the latter case it is significant at the 10-percent level, underlining the above-standard import trade flows between Yunnan and these 4 countries. This result illustrates one of the positive effects of the regional collaboration. Yunnan's imports from the 4 neighbors are 2.45 times greater than the *normal* level [$\exp(0.90) = 2.45$] predicted by the gravity model.

To obtain more detailed results, the aggregate Mekong region is decomposed into four terms for the individual countries (columns 4 and 8). Examining the estimated coefficients of the dummy variables for the 4 riparian countries of the Mekong River, it is found that Yunnan's trade with Myanmar (both for exports and imports) and Laos (for imports) is significantly greater than the normal level, whereas that with Thailand is significantly lower. The insignificant coefficient of the Vietnam dummy indicates that Yunnan's trade with Vietnam is in line with the relative size of and distance between the 2 partners.

These regression results indicate that on average, over the period 1988–1999, Yunnan had close and privileged trade relations with at least 2 of its neighboring countries (Myanmar and Laos), confirming the successful influence of this case of regional cooperation. Trade integration in terms of Yunnan's imports from Laos and Myanmar appears slightly greater than its exports to these countries.

4. The unbalanced sample can be subject to a non-ignorable selection rule; that is, the probability of a partner country being included in the sample is not independent of model error and, in particular, to the yearly specific effects.

5. This explanation is consistent with that of Kawai and Urata (1998).

Table 5 Estimation of the impact of integration within GSM on Yunnan's exports and imports (within estimator, fixed effects by year)

<i>Dependant variable</i>	<i>Yunnan's exports to partners</i>				<i>Yunnan's imports from partners</i>			
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
Joint GDP	0.69***	0.64***	0.69***	0.71***	0.62***	0.59***	0.62***	0.72***
$\ln(Y_k Y_j)$	(0.08)	(0.09)	(0.08)	(0.06)	(0.08)	(0.11)	(0.09)	(0.09)
Joint GDP per capita	-0.01	0.01	0.02	0.01	-0.10	-0.10	-0.01	-0.03
$\ln[(Y_k/pop_k)(Y_j/pop_j)]$	(0.08)	(0.08)	(0.10)	(0.08)	(0.11)	(0.11)	(0.12)	(0.12)
Distance	-1.72***	-1.73***	-1.64***	-1.66***	-0.82***	-0.79***	-0.66***	-0.75***
	(0.12)	(0.12)	(0.15)	(0.14)	(0.16)	(0.18)	(0.18)	(0.19)
GSM (Myanmar, Laos, Vietnam and Thailand)			0.41 (0.37)				0.90* (0.49)	
Myanmar					1.47*** (0.31)			2.28*** (0.54)
Laos					0.57 (0.59)			2.08*** (0.68)
Vietnam					-0.23 (0.52)			-0.33 (0.68)
Thailand					-1.15** (0.36)			-1.64*** (0.59)
Inverse Mills ratio	NA	-0.20 (0.14)	NA	NA	NA	-0.08 (0.15)	NA	NA
Fixed effects by year					Yes			
Number of observations	229	229	229	229	230	230	230	230
R^2	0.67	NA	0.68	0.70	0.28	NA	0.30	0.41

Notes: Heteroskedasticity-consistent standard errors are given in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. GMS, Greater Mekong Subregion; NA, not applicable.

This result is consistent with the trade structure arising from the poverty and underdevelopment of Yunnan's neighbors combined with the industrial underdevelopment of the province. As noted above, Myanmar and Laos mainly export competitive primary goods and import cheap consumer goods from Yunnan that are not yet suitable for the world market. The inability of Yunnan to meet international standards and compete with alternative sources explains why export integration lags behind import integration, despite border trade being significantly greater than the level predicted by Yunnan and its neighbors' distance, relative economic size and development.

Although Thailand, the most developed nation in the region, would appear to be the only riparian country capable of supplying Yunnan with know-how and technology, trade between Yunnan and Thailand is lower than would be expected after taking into account distance and other gravity variables. Trade potential is clearly underexploited, particularly in terms of imports from Thailand, as the import volume over the period is only 20 percent of the normal level [$\exp(-1.64) = 0.19$]. Nevertheless, the estimated coefficient on the dummy variable for Thailand in the import equation increased at the end of the 1990s. The lack of significance of the GMS dummy for export flows suggests that increased trade with Myanmar (as a result of the effectiveness of preferential trade in boosting regional trade) is counterbalanced by lower than expected trade with Vietnam.

It is worthwhile to scrutinize more closely the evolution of Yunnan's integration with neighboring countries and to compare it with the province's relations with other partners. To do this, the export and import equations are re-estimated by introducing time-varying country dummies for each of Yunnan's 11 major trading partners, Hong Kong, Indonesia, Japan, Laos, Malaysia, Myanmar, Singapore, Thailand, the UK, the USA and Vietnam. Owing to missing data, this procedure adds 91 variables to the export equation and 92 variables to the import equation. Although this leads to a significant reduction in the degrees of freedom available to estimate each equation, the degrees of freedom is still above 130 because there are a total of 229 and 230 observations for the export and import equations, respectively. For any 1 trade partner, the estimated coefficients on its dummies can indicate how its trade with Yunnan has evolved over time.

Yunnan's trade integration with the main ASEAN countries, Japan, the USA and the UK is investigated. Figures 2 and 3 present the evolution of the estimated coefficients on the partner dummies. They correspond to the deviation from the average norm over the entire time period. This norm can be defined as the average trade intensity with countries other than the ones accounted for by the partner dummies (Soloaga and Winters, 2001). The specificity of the reference norm (all partners but Laos, Myanmar, Thailand, Vietnam, Indonesia, Malaysia, Singapore, Hong Kong, Japan, the USA and the UK) induces that only a relative meaning (over time and cross-country) can be attached to the estimated coefficients. However, the estimated coefficients on the partner dummies are useful to assess the hierarchy of partners and its evolution over time.

Figure 2 Coefficients on country dummies for exports

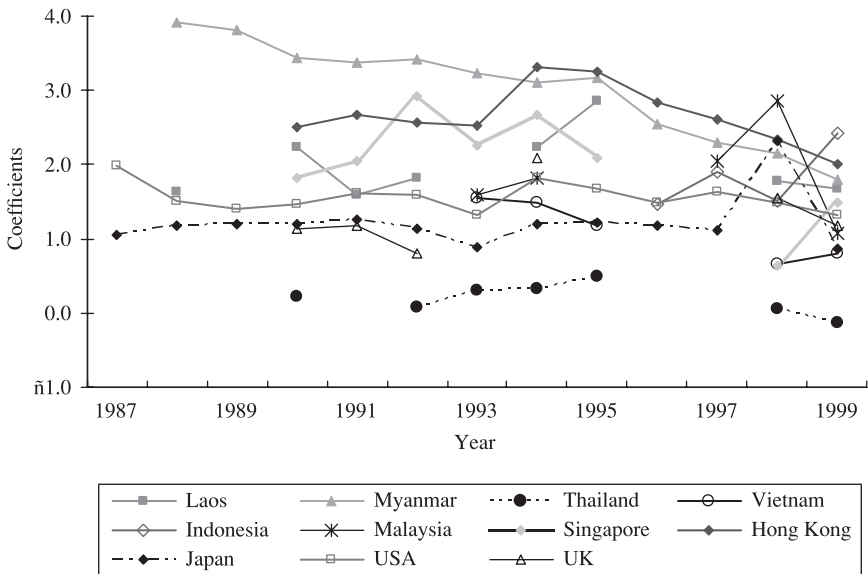
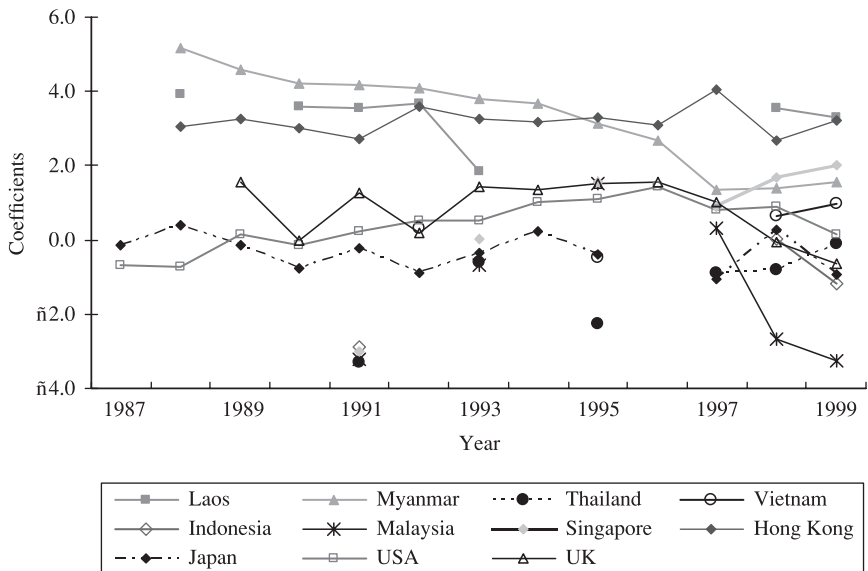


Figure 3 Coefficients on country dummies for imports



The findings highlight the rapid growth of Yunnan's imports from outside countries like Japan, the USA and even Singapore.

In terms of imports, Yunnan's trade with Myanmar declined over the 1988–1999 period, converging to the *normal* level. From the mid-1990s, trade with Myanmar fell below trade with Hong Kong. The re-orientation of Yunnan's trade towards more developed export markets corresponds to the shift in the province's production of export commodities away from agricultural goods and towards more profitable industrial products.

Indonesia and Malaysia emerged as potential markets, with exports to Indonesia and Malaysia becoming 8–10 times greater than the normal level on average over the 1998–1999 period. Concerning imports, Yunnan maintains above-standard levels with Laos and Myanmar. Yunnan still imports 27 times [$\exp(3.3) = 27$] more from Laos than predicted by the gravity equation in 1999. Preferential trade integration between Yunnan and Myanmar continuously declined over the 1990s. In 1988, Yunnan exported 50 times more to Myanmar than the expected level. This ratio decreased to 6 in 1999. In terms of imports, the evolution is even more dramatic. The relative intensity of Yunnan's imports from Myanmar declined from 176 times to 5 times over the norm over the same period. One important evolution is the rapid increase in imports from the USA and Singapore from a below-normal level in the late 1980s to an above-normal level in the late 1990s. In 1999, Yunnan's exports to these 2 countries were approximately 4 times greater than the level predicted by distance, relative economic size and development.

V. Conclusion

This paper scrutinizes the impact and evolution of Yunnan's economic integration with the GMS between 1988 and 1999. The gravity model of trade is used to assess trade relations between Yunnan and the riparian countries of the Mekong and compare them to relations with other trade partners. Export and import equations are estimated separately.

A large degree of trade integration between Yunnan and Myanmar is observed for both exports and imports. Yunnan's imports from Laos also significantly exceed the level predicted by distance, relative economic size and development. This exceptional amount of trade is a result of the GMS cooperation efforts. The positive bias towards Myanmar, however, steadily decreased over the 1988–1999 period. Despite their potential complementarity, trade between Yunnan and Thailand is lower than what is expected given their distance and other gravity variables. The simultaneous decrease in trade between Yunnan and its closest neighbors and increase in relations with the original members of ASEAN, such as Singapore, Indonesia and Malaysia are in line with Yunnan's development and indicate a progressive re-orientation of its trade toward more developed partners. The results suggest that Yunnan's cooperation efforts with its Mekong partners have to be considered within the broader extent of its trade relations with countries outside the GMS.

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