Interregional Structure Analysis Based On Three Regions Of Vietnam

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Abstract

The Leontief's input-output system was developed to the inter-regional input-output model by Isard in 1951. The idea of the inter-regional input-output model was specified and extended by Miyazawa, Richardson, Yamada H, T. Ihara... and it is considered as an important tool in researching of regional economy. This article try to attempt description and analyzing three regions (Mekong Delta region, South East region and rest of Vietnam – ROV) based on multi interegional input-output table of Vietnam, 2005

INTRODUCTION

The national input-output models was developed by W. Leontief (1936, 1941) at national levels. Leontief's Standard model was extended for regional level by Isard (1951) called Isard model, the ideas of the inter-regional input-output model was advanced by Miyazawa and it was considered as an important tool in researching on region science. The multi-regional input-output model describes not only the intersectoral structure but also measure the relationship between regions that created by trading flows of this region to other regions. The multi-regional model also has been developed by Chenery-Moses (1955). The contributes nearer are Miller-Blair (1985), Hewings and Jensen (1986).

In the multi – interregional model, Miyazawa was broken down original Leontief inverse to internal and external matrix multipliers to analyze the relationship endogenous and exogenous of each region. The main purpose of this study is to show how to use of the convention input – output framework in an effective approach so as to evaluate the changes in spatial interaction due to trade and transport margins. As a result, how to measure multiplier effects, interregional feedback effects and spillover effects

This paper based on the Vietnam multi regional input-output table, 2005 with three regions (Mekong Delta region, South East region and rest of Vietnam – ROV). This table was compiled by Francisco T. Secretario, Kwwang Moon Kim and Bui Trinh)..

METHODOLOGY

In the multi inter-regional I-O model shows the domestic final demand of this regional dose not only induce to production and value added in intra region but also induce to production and value added to other regions, the indued impacts occurred by production of a region will effect to production of other regions due to use output of other region as input of region throud trade flows. An product's final demand increase in region i will be not only creat output and income themselves but also increase output and income of other regions in economic activity. Due to increased output in region i will lead to to necessitate new flows on good and services

from other regions. These effects are referred to as the spillover effects when increasing final demand of a region to output of other regions. In order to meet region i's new demand of goods and services, industries in other regions will have to expand their production. This may, in turn, create new demand for goods and services produced in "region i". As a result, output in "country i" may increase again as a result of increased activity in the first place. So, In the inter-regional I-O model, the production depends not only on the final demand factors of the region, but also on the final demand factors of other regions. This could be understandable by the economic theory, any changes in the final demand factors of a specific region will lead to the changes of production value of that region. These changes are followed by changes in other regions because the production of one region uses the products of the others as the input costs. These impacts are shown by input-output multipliers. These ideas seem to be like "The Law of Cause and Effect" in the Buddha theory.

The equation of Leontief system as below:

$$X = (I - A)^{-1}.Y \hspace{4cm} (1)$$

In case of interregional input – output (three regions) X is column vector with X_1, X_2, X_3; A include sub-matrix: A_{ij} (I,j = 1,3) region j use products of region i as intermediate input; Y is final demand matrix with sub-matrix Y_{ij} (I,j = 1,3) shows region j use products of region i for final demand

Put: $B = (I-A)^{-1}$ \hspace{4cm} (2)

We have:
B_{ii} includes multiplier effects and feed back efects of region i, the multiplier effects B_1 was occurred á below:

$$B_i = (I - A_{ii})^{-1} \hspace{4cm} (3)$$

And interregional feeed back effects of region i (F_i) shows output requirment created by production of other regions, it was occurred as below:

$$F_i = B_{ii} - B_i \hspace{4cm} (4)$$

B_{ij} (i≠j) are spillover effects of region i that was created by a unit increase of final demand products of region i.

Total interregional effects of region i = Multiplier effects + interregional Feedback effects + interregional spillover effects.

Spillover and feedback effects arise due to inter-regional (-national) trade in products to sustain regional (-national) final demands. Spillover effect is the direct or the first round effect of inter-regional product flows, while feedback effect is the indirect or the second round impact arising from the inter-regional spillovers. From the IRIO equations, these are calculated, as follows:

EMPIRICAL STUDY RESULTS

Table 1 shows that the dispersion effect from final demand[1] to output of the Southeast region is highest (1,62), followed by The Mekong Delta region (1,4) and the rest of Vietnam (1,38). Interestingly, the dispersion effect from final demand to output of the Mekong Delta region is not highest but the dispersion effect from final demand to value added is highest among three regions (0,653). The final demand of Mekong Delta also spread quite well to output of other regions (6%). Although, it is lower than the Southeast region (10%), but higher than the rest of Vietnam (5,6%).

Table 1. The interregional effects

	Reg 1	Reg 2	Reg 3
Multipliers effects	1.339	1.514	1.325
Feedback effects	0.001	0.002	0.002
Spillover Effects Reg1		0.041	0.018
Spillover Effects Reg 2	0.020		0.038
Spillover Effects Reg 3	0.040	0.065	
Spread to output	1.400	1.623	1.383
Spread to income	0.653	0.634	0.627

REG1: The Mekong Delta region; REG2: The Southeast region; REG 3: the rest of VN

Calculating by sector (three sectors: Agriculture, Industry and Service), the results show that the feedback effects and slipover effects of The Mekong Delta region are not impressive, while the Southeast region is stimulated significantly from production of other regions and spread the highest to other regions.

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[1] The Domestic Final Demand includes Final Consumption, Gross Capital Formation and Export

Table 2. Interregional effects by sector

	Reg 1			Reg 2			Reg 3		
	1	2	3	1	2	3	1	2	3
Internal multiplier Effects	1.2012	1.4844	1.1906	1.2656	1.5632	1.3838	1.214	1.387	1.264
Feedback effects	0.0007	0.0012	0.0009	0.0012	0.0019	0.0009	0.0010	0.0028	0.0015
Spillover Effects	0.0438	0.0695	0.0574	0.0824	0.1168	0.0453	0.0273	0.0719	0.0442

1: Sector group of Agriculture, Forestry, Animal Husbandry& Fishery; 2: Sector group of Mining and Manufacturing; 3: Services sector group

The spread of final demand elements to the output of the Mekong Delta is not as high as the southeast region but the spread of final demand elements to the value added of the Mekong Delta is highest, especially exports. This suggests that the rate of processing or value added content in the value chain of the Mekong Delta region is highest among three regions.

Table 3. The spread of final demand elements to the output and income of three regions

	Reg 1			Reg 2			Reg 3		
	C	I	E	C	I	E	C	I	E
Output	1.309	1.456	1.447	1.470	1.641	1.648	1.338	1.424	1.411
Value added	0.750	0.619	0.622	0.744	0.621	0.618	0.720	0.574	0.581

C: Final consumption; I: Gross capital formation, E: Foreign Ẽport

Besides, the interregional input output model (28 sectors – Appendix 1) shows that the index of sensitivity of agriculture sectors in the Mekong delta is nearly double the average sensitivity of the economy. In recent years Mekong delta region (Reg 1) catch drought and saline intrusion caused by climate change, The output of Agriculture, Forestry, Animal Husbandry& Fishery declines, therefore this study estimate the influence of this region to other regions and whole economy. The result shows as table 4 below::

Table 4. Change of agriculture output of the Mekong delta region impact on value added

		Change Reg 1's outputs (decrease 10%)	Change Reg 1's outputs (decrease 15%)	Change Reg 1's outputs (decrease 20%)
Reg 1				
1	Agriculture, Forestry, Animal Husbandry& Fishery	-1.20%	-1.79%	-2.39%
2	Mining and Manufacturing	-0.14%	-0.21%	-0.28%
3	Services	-0.33%	-0.49%	-0.66%
Reg 2				
1	Agriculture, Forestry, Animal Husbandry& Fishery	-0.07%	-0.10%	-0.13%
2	Mining and Manufacturing	0.00%	0.00%	-0.01%
3	Services	-0.01%	-0.01%	-0.02%
Reg 3				
1	Agriculture, Forestry, Animal Husbandry& Fishery	-0.05%	-0.07%	-0.09%
2	Mining and Manufacturing	-0.03%	-0.04%	-0.06%
3	Services	-0.01%	-0.02%	-0.03%
	Gros value added	-1.84%	-2.75%	-3.67%

CONCLUSIONS

In the past two decades, Vietnam's economy has modernized and sustained high growth. Living standards in Vietnam have rapidly increased as the result of the transition policy towards a market economy and of the integration into the world economy. The government has focused heavily on industrialization and modernization process and the aim is for Vietnam to be an industrialized economy in 2020. While many policies proved to have positive impact on the economy, there are still areas in which the policy seemed to have gone in the wrong direction. This study, with the help of the multipliers from the interregional input-output approach showed that one important area, agriculture, has been not received an adequate policy in order for it to develop to fully meet with its potentiality and:

+ The spread of final demand elements to the output of the Mekong Delta is not as high but the spread of final demand elements to the value added is impressive.

+ The feedback effects and slipover effects of The Mekong Delta region are not high. It means that this region is relatively isolated from the rest of Vietnam.

ACKNOWLEDGMENTS

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Apendix 1. Intersectoral structur of three regions of Vietnam economy.

Numerical	Sectors	Reg 1			Reg 2			Reg 3		
		Power of Disperson	Sensitivity of disperson	Power of disoerson on import	Power of Disperson	Sensitivity of disperson	Power of disoerson on import	Power of Disperson	Sensitivity of disperson	Power of disoerson on import
1	Paddy	0.85	1.85	0.49	0.96	0.81	0.45	0.89	1.69	0.44
2	Other crops	0.76	0.91	0.38	0.84	0.86	0.33	0.79	1.15	0.34
3	Livestocks & Poultry	0.94	1.01	0.94	**1.08**	**0.84**	0.78	0.97	1.14	0.69
4	Forestry	0.79	1.11	0.28	0.98	0.77	0.50	0.79	1.47	0.22
5	Fish Farming	0.99	1.17	0.42	**1.04**	**0.74**	0.41	0.99	0.85	0.39
6	Fishery	0.79	1.16	1.46	1.06	0.90	1.07	0.89	1.02	1.40
7	Oil & gas	0.70	0.70	0.00	0.90	0.74	0.35	0.70	0.70	0.00
8	Mining	0.83	0.72	0.91	0.99	0.80	0.75	1.02	1.08	0.95
9	Processed seafood	**1.40**	**0.84**	**1.13**	**1.45**	**0.81**	**1.14**	**1.37**	**0.80**	**1.11**
10	Processed Rice	**1.45**	**0.86**	0.53	**1.51**	**0.84**	0.49	**1.48**	**0.80**	0.47
11	Other Agricultural Processing	**1.12**	**0.92**	1.19	**1.29**	**1.06**	0.96	**1.17**	**0.90**	0.95
12	Textiles	0.81	0.74	2.15	1.28	1.22	1.94	0.91	0.80	2.12
13	Paper	**1.02**	**0.85**	1.71	**1.31**	**1.18**	1.50	**1.15**	**0.97**	1.43
14	Wood	**1.02**	**0.72**	0.79	**1.25**	**0.73**	0.84	**1.15**	**0.76**	0.86
15	Rubber	0.86	0.74	1.36	1.22	0.97	1.46	1.02	0.85	1.27
16	Non-Metallic Mineral Products	0.81	0.75	2.28	1.00	0.95	2.24	0.91	0.78	2.22
17	Transport Equiqment	0.80	0.73	1.57	1.38	1.89	1.58	1.05	1.31	1.64
18	Metal Products	0.83	0.71	1.99	1.25	0.71	1.73	1.01	0.71	1.78
19	Other Manufacturing	0.80	1.05	1.37	1.27	4.54	1.74	1.00	2.00	1.70
20	Electricity & Water	0.83	0.92	1.11	0.94	1.40	0.63	0.84	1.63	0.69
21	Construction	0.80	0.70	1.95	1.13	0.70	1.59	0.92	0.70	1.73
22	Transport	0.85	0.84	1.10	1.08	1.00	0.91	0.96	0.93	0.99
23	Comunication	0.80	0.80	0.63	0.89	0.91	0.53	0.83	0.92	0.60
24	Trade	0.84	0.98	0.92	1.06	1.12	0.72	0.92	1.08	0.67
25	Financial servies	0.87	0.90	0.41	0.93	0.89	0.42	0.91	0.80	0.48
26	Public Administration	0.93	0.70	0.90	1.07	0.70	0.81	0.96	0.70	0.76
27	Hotels & Restaurants	1.00	0.81	0.84	1.07	0.80	0.60	1.02	0.79	0.80
28	Other Services	0.83	1.11	0.72	0.98	1.18	0.68	0.88	1.26	0.64