Research in Economics and Management
ISSN 2470-4407 (Print) ISSN 2470-4393 (Online)
Vol. 3, No. 3, 2018
www.scholink.org/ojs/index.php/rem

Original Paper

Interregional Input-Output Analysis between the Mekong Delta Region (MDR) and the Rest of Vietnam (ROV)

Nguyen Quang Tung[1], Trinh Bui[2*], Nguyen Viet Phong[3], Nguyen Hong Nhung[4] & Nguyễn Thị Lan Anh[5]

[1] Government Office, Hanoi, Vietnam

[2] Development Research Institute, Hanoi, Vietnam

[3] General Statistics Office, Hanoi, Vietnam

[4] Development Research Institute, Hanoi, Vietnam

[5] Thai Nguyen University of Economics and Business Administration, Thai Nguyen, Vietnam

[*] Trinh Bui, Development Research Institute, Hanoi, Vietnam

Received: July 28, 2018 Accepted: August 18, 2018 Online Published: August 20, 2018

doi:10.22158/rem.v3n3p288 URL: http://dx.doi.org/10.22158/rem.v3n3p288

Abstract

The Mekong Delta is an important economic area, located in the southern part of Vietnam. The Mekong Delta has many potential and opportunities for development, but also new challenges in the context of global climate change, sea level rise, as well as the consequences of blocking the river and the Mekong countries also need to increase competition in international integration. In addition to these challenges, the region also has new opportunities when implementing economic restructuring in line with the policy of restructuring the economy in new conditions, including the establishment of special economic zones as PhuQuoc Resort. Besides analysis based on modern economic theory, this paper uses the input-output framework (I/O Inter-sect oral Scope Model) updated in 2016 for two areas: by the Mekong River and the Rest of Vietnam (ROV) to find inter-regional impacts and to calculate some impact assessments of climate change. The study also analyzes some other factors related to the viewpoint of sustainable regional development in new conditions, income distribution and social security.

Keywords

inter-regional, regional, input-output, value added, final demand

1. Introduction

The Mekong Delta has a lot of potential for development, especially the potential for rice, fruit and seafood. This area forms a triangular area of 3.9 million hectares and is home to nearly 18 million people (about 20% of Vietnam's population), with a rapidly increasing urbanization rate, in 2016 reaching about 25%. This is one of the most fertile plains in the world, accounting for 50% of rice production, 65% of aquaculture production and 70% of fruits of the country. Vietnam economy has grown at a rate high in the past three decades. The stability of the Vietnamese economy during this period has contributed greatly to tropical agriculture and the Mekong Delta. At the same time, the impact of floods and storms is increasingly exacerbated by the global climate, creating significant negative impacts on human life, infrastructure and economic activity. The harsh annual weather events cost thousands of billions of dong, as in 2011, which resulted in housing losses of VND 327 billion and infrastructure losses of VND5, 304 billion. At the same time, in 2011, 85 people died in extreme weather events and 138 people died in 2008 for similar reasons. Moreover, floods and storms affect 0.7% of agricultural land, with losses of about 1,020 billion VND. Although the total cost of disaster-related water damage was about VND6, 650 billion in 2011, only VND322 billion was allocated from the public budget for compensation and compensation. Remarkably, the cost of damage in 2011 is four times higher than the value added from water distribution services and accounts for 0.2% of the national GDP. In addition to the economic losses, the associated disasters Floods and typhoons are a constant threat to the lives of people in the Mekong Delta. Droughts and saltwater intrusion often occur in the Mekong Delta region of Viet Nam, as severe droughts and Stalinization occur by 2015 and subsequent years, causing serious economic losses. This situation is complicated by the impact of global climate change and the blockade of upstream of the Upper Mekong. Researchers point out that the 7 dams that China built upstream of the Mekong have led them to reduce sediment flow downstream. At present, there are about 500 landslide sites in the Mekong delta that are severely eroded by tens of kilometers along the river and coastal areas, affecting the cultivated area and the stable life of the people. All these negative impacts will require changes in farming practices and economic structural change, as has been done in some provinces in the region (reducing the number of rice crops for conversion to aquaculture, planting fruit trees, as in Vinh Long, even developing clean industries such as Bac Lieu ....). As a result, the legitimacy of the policy is to change the "old" mode of development, creating a strong and effective change in the adjustment of economic structure.

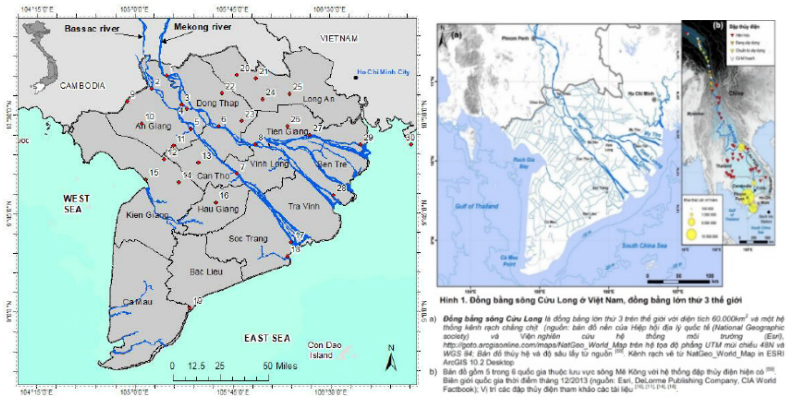

Figure 1. Mekong Delta of Vietnam

According to the Government (Note 1), the Mekong Delta region has an important strategic position in the country, both economically and socially as well as national defense and security, and is home to more than 20 million people. The erosion of river banks, canals, and coasts occurs in most areas of the Mekong Delta, especially in 2017 and early 2018, which directly threatens the safety of many residential areas. Coastal and coastal infrastructure, especially in An Giang, Dong Thap, Ca Mau, Bac Lieu and Can Tho (Note 2). There are 562 coastal areas and landslides with the total length of 786 km, of which 42 landslides are particularly dangerous with a total length of 148 km and itneeds to deal soonto ensure the safety of life and property of the people and state.

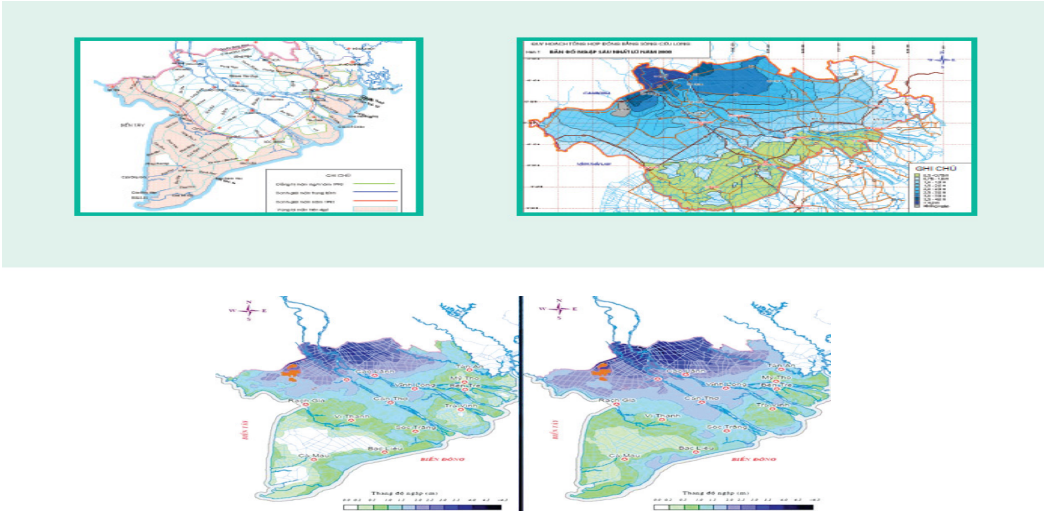

Figure 2. Mekong Delta Flooded and Saline Intrusion Map

Unreasonable exploitation of water resources in the region under multi-dimensional impacts has caused subsidence and erosion in river and coastal areas and increased pollution caused by unplanned industrialization and urbanization. Identifying mixed strategies for regional development,

transformation of the farming model is very important, improving the region's labor productivity and ensuring sustainable development. Over the past years, the Ministry of Agriculture and Rural Development and localities have concentrated drastically on the conversion of crops on rice land, especially the inefficient ones, lack of fresh water. In the winter-spring crop of 2018, over 16,000ha of paddy in the Mekong Delta have been converted to bean, maize, peanut, vegetable, orange, grapefruit, tangerine. Fruit trees that have been converted from rice paddies are very satisfactory. Typically, the orange trees yield more than VND 370 million/ha/year after deducting expenses; rambutan for profit 228 million VND/ha/year; grapefruit reaches VND 660 million/ha/year; VND 460 million/ha/year ... all far exceeded the efficiency of rice. From this basis, in 2018, MARD policy to encourage Mekong Delta farmers to convert about 118,000ha of inefficient rice land into other crops (Note 3). Vinh Long city also converted some areas to flower growing, organic farming. The agricultural sector has built 37 models of orchids in Vinh Long and Binh Minh town with 37,000 pots of seedlings, initially formed the orchid production area focuses on supplying fresh flowers. On the spots, increase the price competitive advantage with the same products from other localities. Moreover, Vinh Long is located between the Tien and Hau rivers, so most of the urban areas of the province are located next to the large waterway transport system, the distance is relatively close, on average 18 km and the city where is farthest from province center only about 45 km. The potential for agricultural development along the urban area is very large, equivalent to about 60% of the agricultural land of the province. Over the past time, the agricultural sector of Vinh Long province has focused on supporting the transfer of scientific and technical advances, helping farmers to shift production towards diversified crops and livestock on the basis of suitable conditions themselves production, level of cultivation and market demand. A series of models of agricultural production in the direction of applying high technology were initially applied effectively and replicated. The Mekong Delta is a dynamic and highly dynamic economic region where economic structural adjustment is in line with global climate change and changes in the international context. Thus, in the context of global climate change as well as the pressures of international integration is required to have more basic policies, suitable to the conditions of the Mekong Delta and also country. Figure 4 below presents the contribution and constraints of water resources to the socio-economic development of the area.

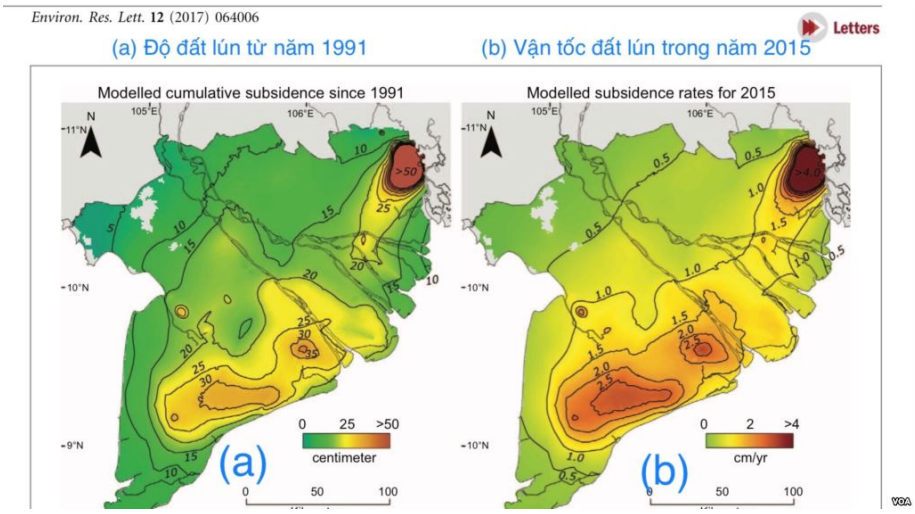

Figure 3. Map of Subsidence in Mekong Delta

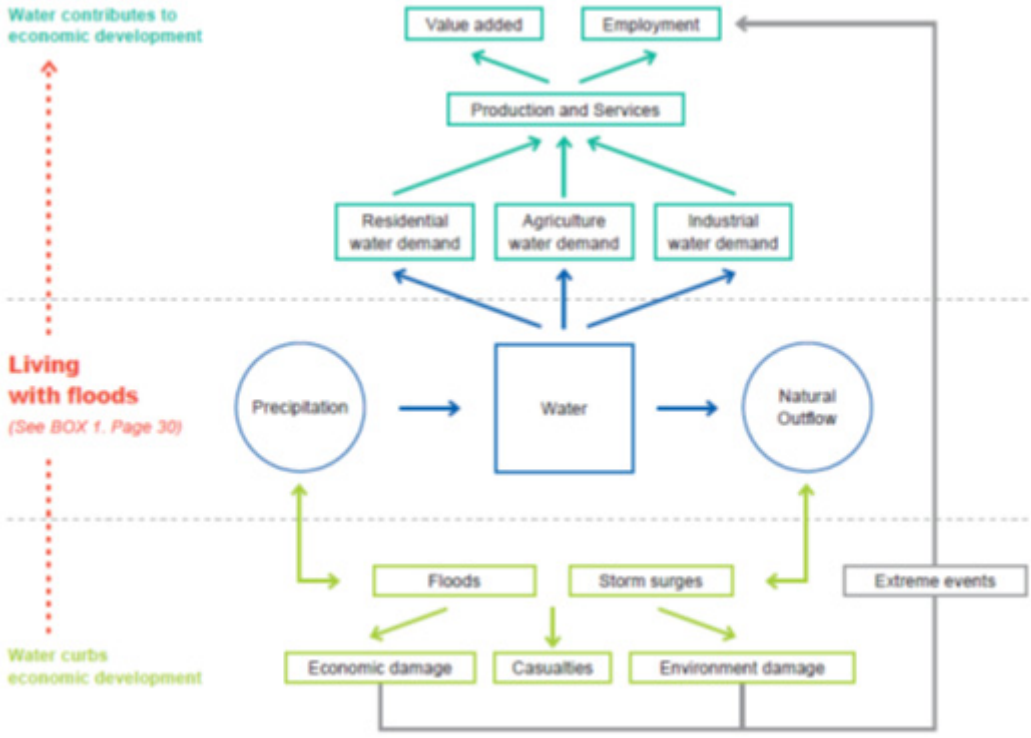

Figure 4. Water Contribution and Constraint to Socioeconomic Development in the Mekong Delta Region

Everyone knows that over the past years, the Party and State leaders have analyzed the ineffective economic situation. Therefore, they have proposed policies to restructure the economy and renovate the growth model. However, the implementation of these policies is not high, including the recent Resolutions before and after the XII Congress of the Party. The program of action has been built not yet

attached to the modern market economy institution and integration transition. In shaping the long-term development of the region, adopting an integrated approach to land and water resource management requires comprehensive analysis and understanding of the systematic relationship between water resources and key elements of socio-economic reality in the Mekong Delta. The Figure below provides a demonstration of the major contributions and challenges posed by water to economic growth and social welfare in the region. In addition to the analysis by macroeconomic instruments, this section also examines in detail the impact of the new development policy of the Mekong Delta, including tourism and special development policies. The research team used the Inter-sectoral Scale model to carry out more specific assessments. This study attempts to use the inter-regional input-output model to study the relationship between the Mekong Delta (including PhuQuoc) and the Rest of Vietnam (ROV). The article not only assesses the damage caused by natural disasters to the Mekong Delta but also affects to other parts of the country. At the same time, this study also takes advantage of previous results to clarify the situation of climate change and the production model that has an adverse impact on the environment and sustainable development. Some issues on income disparities of Resident Groups are also mentioned initially to clarify the need to create high-yield jobs in new conditions.

Leontief's input-output system has been developed into Isard's (1951) inter-regional input-output model; the idea of the inter-regional I-O model has been recognized by Richardson (1972) and Miyazawa (1976) and is considered as an important tool in regional economic research. The inter-regional IO model not only describes inter-sectoral relationships, but also describes interregional relationships through regional trade flows of the region with other regions and regional trade flows with foreigners. The inter-regional model was developed by Chenery-Moses (also known as Chenery-Moses model) and Miller-Blair (1985). Regional economics is based on the application of inter-regional input-output models that were established in the late 1960s and early 1970s. Since then it has been perfected and developed by many famous economists such as Miyazawa, M. Miller (1986); Sonis and Hewing (1998). Inter-regional inputs and outputs have been used by many countries in analyzing regional economic structures, especially in Japan, using this model to assess the impact of the massive Hanshin earthquake in 1995, Japan (Note 4).

This study is based on the inter-regional input-output table between the Mekong Dental and the rest of Vietnam in 2016 with 28 sectors (Appendix 1).

The Vietnam National input-output table in 2016 was updated base on the Vietnam input-output table in 2012 and Vietnam enterprise survey in 2016. The intra-input-output of Mekong Delta region in 2016 was updated base on intra-input-output table of Mekong Delta region of Vietnam in 2012 and data on gross output and intermediate input vectors was estimated base on Vietnam enterprise survey in 2016. The interregional input-output table was updated base Vietnam national input-output and intra-input-output tables in 2016 by SLQ method, Bui (2016).

2. Methodology

To analyze the inter-regional feedback effects and the degree to which change originating in one region has capacity to influence activity levels in another region, Bui, Kim, and Francisco T Secretario (2000) applied an interregional I-O model on a case study of HoChiMinh City and the rest of Vietnam. Harries et al. (1998) separated the Lincoln County into the Caliente area and the rest of Lincoln County. Following procedures outlined by Robinson (1997), Holland (1991), and Robinson and Lark (1993), Harries et al. (1998) used an inter-regional model to give local decision makers an idea of potential socio-economic and fiscal impacts from changes in local economic activity.

The inter-region input-output model is used to analyze economic impacts, describing on products flows between regions that allow estimation of the non-specific in a single input-output model.

Leontief's standard relationship is in the form as follow:

$$A.X + Y = X \quad (1)$$

Where: A is a direct input coefficient matrix, X is vector of output, Y is a vector of final demand. In the interregional input-ouput analysis the matrix A was divided as:

$$A = \begin{bmatrix} A_{cc} & A_{cr} \\ A_{rc} & A_{rr} \end{bmatrix}$$

$$X = \begin{bmatrix} X_c \\ X_r \end{bmatrix}$$

$$\text{And } Y = \begin{bmatrix} Y_{cc} & Y_{cr} \\ Y_{rc} & Y_{rr} \end{bmatrix}$$

Where: A_{ck} is sub-matrix that present region k used products of region c for intermediate input; X_c is vector gross output of region c and X_k is vector gross output of region k; Yck present final demand of region k use products of region c

Call B = (I-A)-1

So we have X =B.Y

And

$$B = \begin{bmatrix} B_{cc} & B_{cr} \\ B_{rc} & B_{rr} \end{bmatrix}$$

In this case x is a matrix of output that induced by each region final demand, X is defined as follow:

$$X = \begin{bmatrix} B_{cc}.Ycc + Bcr.Yrc & B_{cr}.Yrr + Bcc.Ycr \\ B_{rc}.Ycc + Brr.Yrc & B_{rr}Yrr + Brc.Ycr \end{bmatrix}$$

Follow Miyazawa (1976) the matrix B can be divided as:

$B_{cc} = (I - A_{cc} - A_{cr}.(I - A_{cc})^{-1}.A_{rc})$

$B_{rr} = (I - A_{rr} - Arc.\ (I - A_{rr})^{-1}.A_{cr})$

$B_{cr} = B_{cc}.A_{cr}(I-A_{rr})^{-1}$

$B_{rc} = B_{rr}.A_{rc}(I - A_{cc})^{-1}$

In other words:

Bcc includes multipliers effects $(I-Acc)^{-1}$ and interregional feedback effects: Bcc + Brc - $(I-Acc)^{-1}$ B_{rc} represent for Spillover effects from region C to region R.

In the case of research on a sector group in a region related to other sectors in the region and other region, the matrix A can be divided as follow:

$$A = \begin{bmatrix} A^{ii}{}_{cc} & A^{ij}{}_{cc} & A_{cr} \\ A^{ji}{}_{cc} & A^{jj}{}_{cc} & A_{cr} \\ A^{ij}{}_{rc} & A^{ij}{}_{rc} & A_{rr} \end{bmatrix}$$

And

$$X = \begin{bmatrix} X^{i}{}_{c} \\ X^{j}{}_{c} \\ X_{r} \end{bmatrix}$$

$$Y = \begin{bmatrix} Y^{i}{}_{cc} & Y^{i}{}_{cr} \\ Y^{j}{}_{cc} & Y^{j}{}_{cr} \\ Y_{rc} & Y_{rr} \end{bmatrix}$$

From equation (1) we have:

$$X^i c = (I - A^{ii}_{CC})^{-1}.(A^{ii}_{cr}.\ X^j_c + A_{cr}.X_r + Y^i_{cc} + Y^i_{cr}) \quad (2)$$

$$X^j_c = (I - A^{jj}_{cc})^{-1}.(A^{ji}_{cc}.\ X^i_c + A_{cr}.X_r + Y^j_{cr} + Y^j_{cr}) \quad (3)$$

$$Xr = ((I-A^{ii}_{rr})^{-1}.(A^{NR}_{hk}.X^R_c + A_{rr}.X^R + Y_{rc} + Y_{rr}) \quad (4)$$

So, demand of i sectors group in a region is not only depend on final demand of those sector group but also depend on production demand of other sectors in the same region and others.

Put: $v^c_i = V^c_i/X^c_i$

With: V^c_i is a vector value added of sector i, C region; X^c_i is a vector of output, C region

Rewrite follow matrix form, we have:

$$V = v.B.Y \quad (5)$$

Where:

$v= (v^c, v^r)$

$$v.B = (V_c.B_{cc}+V_r.B_{rc},\ V_r.B_{rr} +V_cB_{cr}) \quad (6)$$

Final demand of C region includes products that is produced by itself and the product is produced by region r; C region used products by itself will be induced to value added of C region: Vc.Bcc; and C region used products of R region will be induced to value added of R region: Vr.Brc. Similar to the final demand of the R region.

And:

V = v.BY = [Vc.(Bcc.Ycc + Bcr.Yrc), + Vr.(Brc + Brr.Yrc); Vc.(Bcc.Ycr + Bcr.Yrr) + Vr.(Brc.Yrc + Brr.Yrr)]

3. Some Findings

Appendixes 2, 3 show total output requirements of Mekong Delta River (MDR) region is higher than Rest of Vietnam (ROV), this means the outputs induced by MDR's final uses more than outputs induced by ROV's final used. In which, interregional feedback and spillover effects of MDR region is much higher than ROV region. This means that the product in the MDR transaction channel to the ROV region appears to be raw products. Especially, in MDR region, the fishery sector has interregional feedback effect very high, this means input requirement on fishery of ROV region is very big, Meanwhile, all most other sector of MDR region have low interregional feedback effects counts. For the ROV, 15 sectors in the 28 sectors surveyed in the model has a higher intraregional feedback effects index than the overall average of this region, these sectors are agriculture; fishery; manufacture of food products; manufacture of textiles, clothing, footwear & leather goods; manufacture of furniture & other goods, repair & installation; construction; accommodation & food service activities; real estate activities; mining and quarrying; manufacture of petroleum, chemical, rubber and plastic products, manufacture of metal products, machinery and equipment; electricity; water supply; professional, scientific and technical activities, administrative and support service activities. These sectors has level

high on interregional feedback effects compare with other sectors in ROV region, but, these interregional feedback effects until are small with MDR region.

Appendix 4 shows a unit final demand of MDR region create value added more than a unit final demand of ROV region (0.7 compare with 0.61); value added induced by intra-region's final demand and interregional final demand the products produced by MDR higher than these of ROV region. Appendixes 4, 5 also show agriculture and almost services sectors have level induced impact to value added higher than average.

Figure 5 shows final demand of MDR induced to output and value added better than final demand of ROV at all factors in final demand. Especially fixed gross capital formation and export of ROV induced to value added very low.

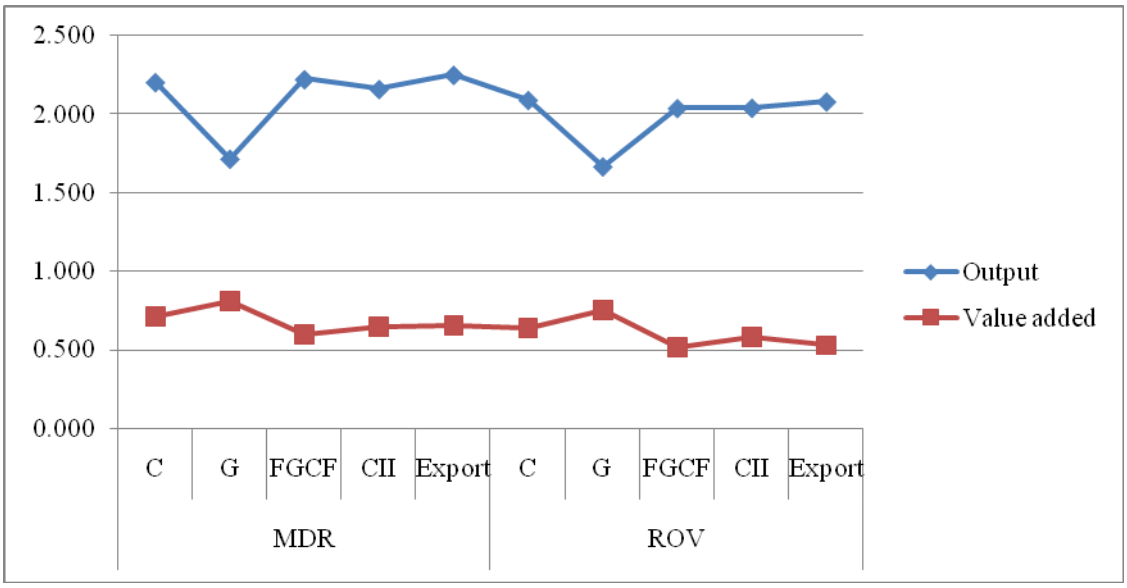

Figure 5. Output, Value Added Induced by Factors of Final Demand

C: Final consumption; G: Government consumption expenditure; FGCF: Fixed gross capital formation, CII: Change in inventory.

Source: Author's Calculation.

The MDR region often encounters droughts and Stalinization, this research tries a attempt to apply inter-regional input-output analysis to estimate intra-regional and inter-regional impacts as natural disasters directly affect agricultural output (5%) in Appendix 6.

4. Conclusions

Although Vietnam has many policies that have proven to have a positive impact on the economy, there are areas where policy seems to have gone wrong. This study shows that an important sector such as agriculture has not received an appropriate policy to develop its potential compatibility.

The study also finds that the inter-regional feedback and spillover effects indexes of Mekong delta river is higher than the rest of Vietnam region, this means production and final uses of Mekong delta river region have has good impacts to the rest of Vietnam. But in the opposite direction, the rest of Vietnam region does not have good spread to the Mekong delta river region, so MDR region seemed "lonely" in inter-regional cohesion.

Acknowledgment

The research team would like to thank Prof. Dr. Kwang Moon Kim, Professor Kiyoshi Kobayashi, Prof. Matsushima from Kyoto University, Japan, Prof. Nguyen Quang Thai, Prof. Pham TheAnh, GS. Professor Nguyen ManhToan of Economics University-Danang University have supported and commented on this research, Ms Nguyen Thu Huong at Vietnam GSO.

References

Batey, P. W. J., & Madden, M. (1983). The Modeling of Demographic-economic Change within the Context of Regional Decline: Analytical Procedures and Empirical Result. *Socio-Economic Plan*, *17*(5), 315-328. https://doi.org/10.1016/0038-0121(83)90038-1

Bui, T., Kiyoshi, K., & Thai, N. Q. (2012). Multi-interregional economic impact analysis based on multi-interregional input output model consisting of 7 regions of Vietnam, 2000. *Journal of Finance and Investment Analysis*, *1*(2), 83-117.

Francisco, T. S. et al. (2007). *Developing an interregional input-output table for cross border economies: An application to Laos people's democratic republic and Thailand* (No. 1). ADB statistics paper.

Geoffrey, J. D., Hewings, M. S., Moss, M., & Yoshio, K. (1999). *Introduction-Understanding and Interpreting Economic Structure*. Heidelberg: Springer-Verlag.

Isard, W. (1951). Interregional and regional input-output analysis: A model of a space-economy. *Review of Economics and Statistics*, *33*(4), 318-328. https://doi.org/10.2307/1926459

Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*. London Macmillan. https://doi.org/10.2307/1927837

Leontief, W. (1936). Quantitive input-output relation in the economic system of the United States. *Review of Economics and Statistic*, *18*, 105-125.

Leontief, W. (1941). *The Structure of American Economy: 1919-1939*. Oxford University Press.

Miller, R., & Blair, P. (1985). *Input-Output Analysis: Foundations and Extensions* (pp. 236-260). Chapter 7, Environmental Input-Output Analysis, Prentice-Hall.

Miyazawa, K. (1976). *Input-Output Analysis and the Structure of Income Distribution*. Lecture Notes in Economics and Mathematical Systems, Berlin: Springer-Verlag. https://doi.org/10.1007/978-3-642-48146-8

Pyatt, G., & Roe, A. N. (1977). *Social Accounting for Development Planning with Special Reference to Sri-Lanka*. Cambridge: Cambridge University Press.

Pyatt, G., & Round, J. I. (Eds.). (1985). *SAMs: A Basis for Planning*. Washington, D.C: World Bank.

http://baochinhphu.vn/Tin-noi-bat/Thu-tuong-chi-dao-tap-trung-khac-phuc-sat-lo-vung-DBSCL/336809.vgp

http://vietnamnet.vn/vn/thoi-su/sat-lo-o-can-tho-nha-do-am-xuong-song-dan-thao-chay-tan-loan-452254.html

http://www.baohaugiang.com.vn/kinh-te/dong-bang-song-cuu-long-hieu-qua-tu-chuyen-doi-cay-trong-68173.html

Richardson, H. W. (1979). *Regional Economic*. Urbana, University of Illinois Press.

Sonis M., & Hewings, G. J. D. (1999). *Miyazawa's contributions to understanding economic structure: Interpretation, evaluation and extension* (pp. 13-51). Understanding and Interpreting Economic Structure, Springer, ISBN 3540660453. https://doi.org/10.1007/978-3-662-03947-2_2

Takeo, I. (1999). *Diagnosis and Therapy of Interregional feedback effect*. *H*eidelberg: Springer-Verlag.

Trinh, B. (2016). *A study on the Input-output System for evaluation of infrastructure development in Vietnam*. Kyoto University,

Yamada. H., & Ihara, T. (n.d.). *Input-output analysis of interreginal repercusion paper and proceeding of the third far East conference of the regional Science Association*, *3*, 3-31.

Notes

Note 1. http://baochinhphu.vn/Tin-noi-bat/Thu-tuong-chi-dao-tap-trung-khac-phuc-sat-lo-vung-DBSCL/336809.vgp

Note 2. http://vietnamnet.vn/vn/thoi-su/sat-lo-o-can-tho-nha-do-am-xuong-song-dan-thao-chay-tan-loan-452254.html

Note 3. http://www.baohaugiang.com.vn/kinh-te/dong-bang-song-cuu-long-hieu-qua-tu-chuyen-doi-cay-trong-68173.html

Note 4. Everyone knows that the measurement of demand and output, income and employment has finally been studied by economists. One of the useful studies was developed by J.M. Keynes on income and currency (1936). Then, the national input-output model was developed by W. Leontief (1936, 1941) at the national level. The Leontief system was extended to study regional economics by Isard (1951),

also known as the Isard model, and the ideas of the inter-regional IO model developed by Miyazawa (1976) and Richardson (1972), and is considered as an essential tool in regional scientific research. The inter-regional input-output model not only shows the interdisciplinary relationship, but also the relationship between regions based on trade flows between this and other regions. The later inter-regional model was developed by Chenery-Moses (also known as Chenery/Moses-1955 model). Input-output models are also used to estimate losses and losses due to unexpected events, such as earthquakes, floods, and other major natural disasters. Okuyama et al. (2002) applied a series of interdisciplinary models to assess the impact of the large Hanshin earthquake in such a way as to permit the transfer into the I-O framework. Other recent studies used inter-regional I-O models include Allan et al. (2004), Zhang (2007), Patrick and Wang (2007), and Rey (1999).

Appendixes

Appendix 1

1	AGRICULTURE
2	FORESTRY
3	FISHING
4	MANUFACTURE OF FOOD PRODUCTS
5	MANUFACTURE OF TEXTILES, CLOTHING, FOOTWEAR & LEATHER GOODS
6	MANUFACTURE OF FURNITURE & OTHER GOODS; REPAIR & INSTALLATION
7	CONSTRUCTION
8	WHOLESALE & RETAIL TRADE; REPAIR OF MOTOR VEHICLES & MOTORCYCLES
9	TRANSPORTATION & STORAGE
10	ACCOMMODATION & FOOD SERVICE ACTIVITIES
11	REAL ESTATE ACTIVITIES
12	MINING & QUARRYING
13	MANUFACTURE OF BEVERAGES & TOBACCO
14	MANUFACTURE OF WOOD, PAPER & RELATED PRODUCTS; PRINTING
15	MANUFACTURE OF PETROLEUM, CHEMICAL, RUBBER & PLASTIC PRODUCTS
16	MANUFACTURE OF NON-METALLIC MINERAL PRODUCTS
17	MANUFACTURE OF METAL PRODUCTS, MACHINERY & EQUIPMENT
18	ELECTRICITY
19	WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT & REMEDIATION ACTIVITIES
20	INFORMATION & COMMUNICATIONS
21	FINANCIAL & INSURANCE ACTIVITIES
22	PROFESSIONAL, SCIENTIFIC & TECHNICAL ACTIVITIES
23	ADMINISTRATIVE & SUPPORT SERVICE ACTIVITIES

24	PUBLIC ADMINISTRATION & DEFENCE; COMPULSORY SOCIAL SECURITY
25	EDUCATION
26	HUMAN HEALTH & SOCIAL WORK ACTIVITIES
27	ARTS, ENTERTAINMENT & RECREATION
28	OTHER SERVICE ACTIVITIES

Appendix 2

Multipliers of Mekong Region

Sector	Output requirements	Multiplier effects	Interregional feed back effects	Spillover Effects	In Which: Average of Output requirements	Average of Multiplier effects	Average of Interregional feed back effects	Average of Spillover Effects
1	2.288	2.018	0.0082	**0.262**	1.0813	1.1141	0.1402	**1.0627**
2	1.806	1.420	0.0055	0.381	0.8537	0.7838	0.0942	1.5469
3	4.000	2.286	1.4184	0.296	1.8904	1.2620	24.3269	1.2003
4	1.923	1.648	0.0110	0.264	0.9090	0.9102	0.1893	1.0707
5	3.165	2.747	0.0128	0.405	1.4957	1.5169	0.2201	1.6419
6	2.235	1.959	0.0093	0.267	1.0564	1.0815	0.1592	1.0841
7	1.981	1.815	0.0059	0.160	0.9361	1.0020	0.1010	0.6494
8	2.560	2.058	0.0075	0.494	1.2096	1.1366	0.1284	2.0020
9	2.328	2.013	0.0094	0.305	1.1001	1.1117	0.1606	1.2367
10	2.297	2.012	0.0093	0.276	1.0858	1.1112	0.1600	1.1184
11	2.146	1.728	0.0201	0.398	1.0143	0.9541	0.3450	1.6152
12	2.291	1.863	0.0103	0.418	1.0827	1.0286	0.1760	1.6949
13	1.593	1.425	0.0066	0.161	0.7529	0.7870	0.1138	0.6531
14	1.821	1.639	0.0061	0.176	0.8607	0.9050	0.1039	0.7139
15	2.283	1.945	0.0137	0.325	1.0791	1.0738	0.2341	1.3177
16	1.788	1.639	0.0049	0.144	0.8449	0.9051	0.0846	0.5825
17	2.092	1.861	0.0067	0.224	0.9886	1.0278	0.1156	0.9079
18	2.378	2.101	0.0084	0.268	1.1238	1.1601	0.1445	1.0881
19	2.159	1.884	0.0118	0.263	1.0202	1.0404	0.2029	1.0653
20	1.806	1.675	0.0032	0.128	0.8534	0.9248	0.0550	0.5178
21	1.609	1.507	0.0035	0.099	0.7605	0.8321	0.0601	0.3997
22	1.923	1.731	0.0076	0.185	0.9090	0.9558	0.1295	0.7499

23	1.899	1.699	0.0064	0.193	0.8973	0.9382	0.1099	0.7827
24	1.648	1.508	0.0047	0.135	0.7788	0.8327	0.0802	0.5481
25	1.555	1.441	0.0038	0.110	0.7351	0.7957	0.0650	0.4480
26	1.943	1.726	0.0063	0.211	0.9182	0.9528	0.1087	0.8553
27	1.874	1.705	0.0039	0.165	0.8856	0.9417	0.0667	0.6673
28	1.855	1.656	0.0073	0.192	0.8769	0.9143	0.1247	0.7796
Average	**2.116**	**1.811**	**0.058**	**0.247**				

Appendix 3

Multipliers of Rest of Vietnam

Sector	**Rest of Vietnam (ROV)**							
		In Which:				In Which:		
	Output requirements	Multiplier effects	Interregional feedback effects	Spillover Effects	Average of Output requirements	Average of Multiplier effects	Average of Interregional feedback effects	Average of Spillover Effects
1	2.174	2.104	0.009	**0.060**	1.1287	1.1298	1.0462	1.1124
2	1.443	1.425	0.003	0.015	0.7492	0.7650	0.3167	0.2741
3	2.490	2.385	0.014	0.092	1.2929	1.2802	1.5315	1.7034
4	1.739	1.676	0.010	0.053	0.9029	0.8995	1.1847	0.9799
5	2.927	2.810	0.015	0.102	1.5199	1.5085	1.7122	1.8934
6	2.101	2.033	0.010	0.058	1.0911	1.0914	1.1106	1.0814
7	1.962	1.866	0.010	0.087	1.0191	1.0015	1.0823	1.6229
8	2.133	2.095	0.006	0.033	1.1079	1.1248	0.6367	0.6078
9	2.120	2.062	0.008	0.049	1.1007	1.1072	0.9117	0.9130
10	2.122	2.054	0.009	0.058	1.1018	1.1028	1.0730	1.0785
11	1.811	1.696	0.020	0.095	0.9407	0.9104	2.3011	1.7743
12	1.945	1.884	0.010	0.052	1.0101	1.0112	1.1124	0.9610
13	1.499	1.457	0.007	0.035	0.7784	0.7820	0.8007	0.6542
14	1.740	1.687	0.008	0.044	0.9035	0.9057	0.9532	0.8246
15	2.081	1.984	0.015	0.082	1.0807	1.0649	1.7245	1.5277
16	1.749	1.703	0.007	0.039	0.9081	0.9144	0.7519	0.7209
17	1.981	1.912	0.010	0.060	1.0290	1.0263	1.1001	1.1151
18	2.275	2.189	0.011	0.075	1.1814	1.1749	1.2829	1.3965
19	2.008	1.934	0.012	0.061	1.0425	1.0384	1.3878	1.1353
20	1.772	1.741	0.004	0.027	0.9202	0.9349	0.4557	0.4942

21	1.632	1.598	0.005	0.029	0.8476	0.8580	0.5710	0.5360
22	1.849	1.792	0.009	0.048	0.9600	0.9619	1.0103	0.8913
23	1.817	1.749	0.010	0.057	0.9434	0.9390	1.1604	1.0669
24	1.614	1.567	0.007	0.040	0.8380	0.8413	0.7751	0.7386
25	1.531	1.496	0.005	0.030	0.7948	0.8030	0.6007	0.5492
26	1.835	1.783	0.007	0.044	0.9530	0.9574	0.8413	0.8241
27	1.805	1.769	0.005	0.031	0.9372	0.9496	0.5652	0.5735
28	1.766	1.706		0.051	0.9172	0.9159	0.0000	0.9498
Average	**1.926**	**1.863**	**0.009**	**0.054**				

Appendix 4

Value Added Multipliers of Mekong Region and Rest of Vietnam

Sector	Value added induced by a unit increase of Mekong region final demand			Value added induced by a unit increase of ROV region final demand		
	Total impacts of Mekong region final demand	Value added receipted by Mekong region	Value added receipted by ROV region	Total impacts of ROV region final demand	Value add of ROV region	Value add of Mekong region
1	0.742	0.674	0.068	0.652	0.637	0.016
2	0.813	0.660	0.153	0.611	0.607	0.004
3	0.662	0.592	0.070	0.579	0.556	0.023
4	0.672	0.605	0.066	0.579	0.566	0.013
5	0.715	0.612	0.103	0.588	0.562	0.026
6	0.737	0.668	0.069	0.646	0.630	0.015
7	0.559	0.517	0.042	0.507	0.483	0.025
8	0.677	0.489	0.188	0.451	0.442	0.009
9	0.556	0.475	0.082	0.457	0.444	0.013
10	0.714	0.637	0.078	0.611	0.594	0.017
11	0.499	0.410	0.089	0.389	0.365	0.024
12	0.646	0.505	0.141	0.471	0.458	0.014
13	0.826	0.784	0.042	0.760	0.750	0.009
14	0.760	0.715	0.045	0.691	0.679	0.012
15	0.629	0.547	0.082	0.531	0.508	0.023
16	0.818	0.778	0.040	0.756	0.745	0.011
17	0.626	0.569	0.057	0.550	0.533	0.017
18	0.728	0.660	0.068	0.640	0.621	0.019

19	0.696	0.632	0.064	0.612	0.596	0.016
20	0.858	0.813	0.045	0.789	0.780	0.009
21	0.887	0.859	0.027	0.838	0.830	0.008
22	0.777	0.729	0.047	0.710	0.697	0.013
23	0.770	0.718	0.052	0.697	0.680	0.016
24	0.839	0.803	0.036	0.786	0.775	0.011
25	0.870	0.840	0.030	0.825	0.816	0.008
26	0.621	0.569	0.052	0.548	0.536	0.012
27	0.850	0.796	0.054	0.779	0.770	0.010
28	0.743	0.693	0.050	0.672	0.658	0.014
1	**0.6997**	**0.6327**	**0.0670**	**0.6112**	**0.5972**	**0.0140**

Appendix 5

Average on Value Added Induced by a Unit Increase of Final Uses: MDR and ROV

Sector	Average of value added induced by a unit increase of final demand, MDR			Average of value added induced by a unit increase of final demand, ROV		
	Total impacts of MDR final demand	Value added receipted by Mekong region	Value added receipted by ROV region	Total impacts of ROV region final demand	Value add of ROV region	Value add of Mekong region
1	1.024	1.029	0.981	1.030	1.030	1.101
2	1.122	1.007	2.208	0.965	0.981	0.275
3	0.914	0.903	1.010	0.915	0.899	1.582
4	0.927	0.923	0.953	0.915	0.915	0.894
5	0.987	0.934	1.487	0.929	0.909	1.789
6	1.017	1.019	0.996	1.020	1.019	1.032
7	0.771	0.789	0.606	0.801	0.781	1.720
8	0.934	0.746	2.713	0.712	0.715	0.619
9	0.767	0.725	1.184	0.722	0.718	0.894
10	0.985	0.972	1.126	0.965	0.960	1.170
11	0.689	0.626	1.285	0.614	0.590	1.651
12	0.891	0.771	2.035	0.744	0.741	0.963
13	1.140	1.196	0.606	1.201	1.213	0.619
14	1.049	1.091	0.649	1.092	1.098	0.826
15	0.868	0.835	1.184	0.839	0.821	1.582

16	1.129	1.187	0.577	1.194	1.205	0.757
17	0.864	0.868	0.823	0.869	0.862	1.170
18	1.005	1.007	0.981	1.011	1.004	1.307
19	0.960	0.964	0.924	0.967	0.964	1.101
20	1.184	1.241	0.649	1.246	1.261	0.619
21	1.224	1.311	0.390	1.324	1.342	0.550
22	1.072	1.112	0.678	1.122	1.127	0.894
23	1.063	1.096	0.751	1.101	1.099	1.101
24	1.158	1.225	0.520	1.242	1.253	0.757
25	1.201	1.282	0.433	1.303	1.319	0.550
26	0.857	0.868	0.751	0.866	0.867	0.826
27	1.173	1.215	0.779	1.231	1.245	0.688
28	1.025	1.057	0.722	1.062	1.064	0.963

Appendix 6

The Change of Output of MDR and ROV When Changing on Output of Agriculture Sector of MDR Region

Sector	Change on output of MDR	Change on output of ROV region	Change on output of national
1	-5.00	-2.99	-4.80
2	0.00	-3.49	-0.01
3	0.00	-2.98	-0.02
4	-3.41	-3.32	-3.41
5	-2.93	-2.90	-2.92
6	-4.13	-3.83	-4.10
7	-1.00	-0.81	-0.91
8	-3.76	-3.40	-3.74
9	-3.34	-3.30	-3.34
10	-4.11	-3.71	-4.08
11	-3.42	-3.38	-3.41
12	-3.83	-3.65	-3.81
13	-3.58	-3.23	-3.57
14	-3.80	-3.25	-3.78
15	-3.36	-3.30	-3.36
16	-3.45	-3.33	-3.44
17	-3.53	-3.41	-3.52

18	-3.84	-3.65	-3.81
19	-3.93	-3.34	-3.91
20	-3.94	-3.45	-3.91
21	-3.93	-3.34	-3.90
22	-3.77	-3.34	-3.74
23	-4.12	-3.63	-4.09
24	-3.67	-3.28	-3.64
25	-3.51	-3.36	-3.49
26	-4.23	-3.53	-4.20
27	-3.84	-3.47	-3.80
28	-4.07	-3.32	-4.01
GVA	**-3.34**	**-3.17**	**-3.24**