

Multi-interregional economic impact analysis based on multi-interregional input output model consisting of 7 regions of Vietnam, 2000

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Abstract

I/O models have been widely used to assess the impacts of many changes in an economy. An I/O model is also an important tool to make forecasts and the results from an I/O model are very helpful in many policy-making processes. Many scientific findings in economics have to give credit to the I/O approach developed by Leontief and this study is none of the exceptions. This study has gone one step further to develop a new concept, economy-wide multipliers in order to come up with practical results to assess the modernization process in Vietnam's economy. In the following pages, the Vietnam's economy will be analyzing based on the economy-wide multipliers, calculated from the multi-regional input output model of 7 regions and 10 aggregated sectors in Vietnam.

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1 Introduction

This study presents the multi-interregional input output model of Vietnam using data from the 2001 Input-Output survey conducted by the System of National Accounts Department of Vietnam General Statistical Office. The multi-interregional input output framework covers 7 regions and 10 aggregated sectors, as follows:

Table 1: Description of sectors in inter-regional

REGIONS	SECTORS
Reg 1: Red river Delta	1. Crops
Reg 2: Northern Uplands	2. Other Agricultural activities
Reg3: North central coast	3. Mining
Reg 4: Central Coast	4. Food processing
Reg 5: Central high-land	5. Light manufactures
Reg 6: Southeast	6. Heavy manufactures
Reg 7: Mekong River Delta	7. Machinery
	8. Utility
	9. Construction
	10. Services

Up to this date, Vietnam has already constructed three benchmark inter-industry I-O models for 1989, 1996 and 2000. These tables are official I-O tables reflecting the structure of Vietnam's national economy. The methodology used in these models was developed by Wassily Leontief in the 1930s, for which he was awarded Nobel Prize in Economics in 1973.

At the regional level, compilation of IO tables has not yet been developed officially in Vietnam, although a few IO-based research studies have been recently conducted by private organizations/institutions. Among these is the two-region (HoChiMinh City & Rest of Vietnam) interregional IO table, covering 3 regions: HoChiMinh-Danang-Rest of Vietnam), first compiled by Bui Trinh, Francisco T. Secretario and Kwang Moon Kim (1996) and later elaborated by Bui Trinh et al. (2000). These studies followed the conventional inter-regional I-O framework, notably of Isard (1951, 1960), Richardson (1972), Miller and Blair (1985) and Francisco T. Secretario (1999).

This study is an attempt of a private research group to extend the use of the official Vietnam National I-O tables. The National I-O tables provide information on inputs and outputs of goods and services among industries, final demand and value added. In this study, domestic trade flows and foreign trade flows, the flows of goods and services between various economic sectors within each region and among different regions must be estimated as these flows are not reflected in the national I-O table. These flows are the attributes differentiating an inter-regional I-O model from a single-region model.

Inter-regional I-O model has number of advantages over a state or single-region model:

- An inter-regional I-O model includes I-O models of each region within the larger inter-regional structure. The intermediate and final demand structure of each region allows the user to calculate the differences underlying production and consumption structure among regions.

- The effects quantified by the model are the inter-regional spillover and feedback effects, as depicted in Figure 1.
- The inter-regional model eliminates the need of an additional mechanism to forecast in individual regions.

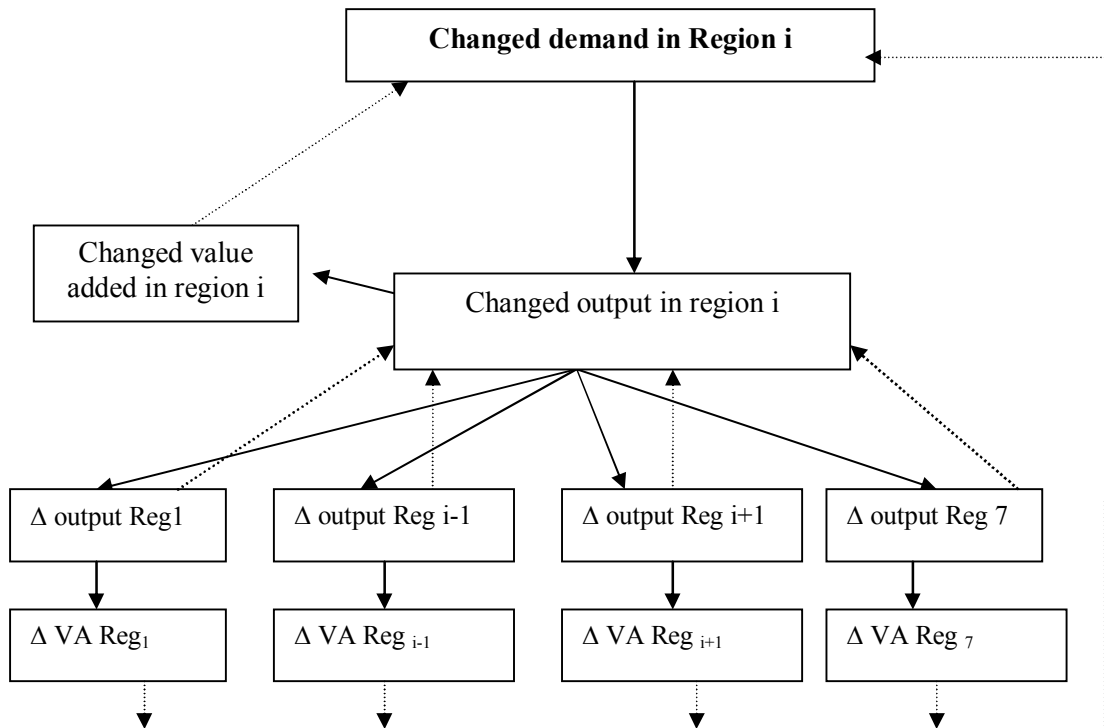


Figure 1: Spillover and feedback effects in a 7-regions model of Vietnam

2 Methodology

2.1 Economy – wide multipliers

In the development of more general or economy-wide models, the initial addition to standard input-output systems has been viewed as the social accounting matrix most closely associated with Richard Stone (Pyatt and Round,

1985; Sonis, Hewing and Madden 1995). A parallel development was proposed and empirically implemented by Miyazawa (1960, 1966, 1968, and 1971); however, these contributions were not widely appreciated outside Japan until Miyazawa brought them to the attention of modelers on regional science in 1976.

Miyazawa's major contributions are the notions of internal and external multipliers, which can be used to explain the role of interregional trade and interrelation between income and consumption.

This study will show *internal multipliers* in each region and *external multipliers* induced by other regions. This means when final demand in region *i* has changed, it will lead to the change in output of that region. The change in output of that region will also necessitate additional flows of goods and services from other regions, resulting in changed output in those regions. These effects are referred to as the induced impacts. In order to meet region *i*'s new demand of goods and services, industries in other regions will have to expand their production, which again may lead to another change in output of region *i*. These additional effects are known as the *interregional feedback effects*. It also shows the impacts of final consumption of goods and services of each region on output of that and other regions; moreover, it has spillover effect to components of the value added.

The results of this study will show type I and type II multipliers from national, single, and inter-regional I-O models. Type I multiplier (the direct and indirect impacts) shows the economic activity induced by the initial change in final demand *and* the purchases of inputs from local industries to supply the change in final demand. Type II multiplier includes the direct effect, the indirect effect, the induced effect by the household consumption expenditure resulting from the income induced by the direct and indirect impacts of final demand change. Type II in the inter-regional I-O model includes two kinds of induced effects, both by consumption and production of other regions; type II multiplier is interpreted as enlarged Leontief inverse, the elementary of this type includes direct

impact, indirect impact and induced impacts; they contain elements which are larger than those of type I multiplier, because they include extra output required to meet the consumption and the production of other regions.

3 Analytical results

3.1 Regions' contributions to output multipliers

Tables 1 and 2 show type I and type II multipliers, in other words these two tables together show inter-industrial and inter-regional relationships. They quantify how one industry in one region affects other industries in this region as well as many other industries in many other regions plus the effect of consumption on production and on value added.

For example, from table 1 it is evident that in almost all regions type I multiplier is highest for *food processing and light manufacturing*. But it is interesting that for type II multiplier, *agriculture and food processing* are the industries with the highest multiplier. All this means that without the induced impact, food processing and light manufacturings are the sectors which have the largest influences on other industries.

On the other hand, when the induced impact is taken into account, agriculture and food processing are the two sectors that have the largest influence. Taken together, it is evident that food processing is the most important sector in the economy. It could be explained by the fact that the import of food in Vietnam is rather limited, Vietnamese people still prefer food 'made in Vietnam' to import food, which are much more expensive due to the fact that the import tariffs imposed on this kind of products have been rather high. Further, the export of processed food has become increasingly a large part of the export as a whole.

3.2 Regions' contributions to output multipliers in percentage induced by final demand

Table 3 shows the impact of final demand elements on production. The interpretation of the multipliers in table 2 is basically the same as with table 1 and 2 with the difference that Table 3 goes into detail and breaks down the final demand into separate elements: private consumption, government consumption, capital formation (fixed and change in inventory) and export. Thus the multipliers for each element of the final demand for every region can be calculated. The result of the multiplier is very important in economic policy making process as it helps the policy makers to come up with the right decision in which element of final demand to stimulate. It can be seen from the table, for both type I and type II multipliers that gross fixed capital formation and export are two components in final demand that contribute most greatly to stimulate production in almost all regions. This is in compliance with the characteristics of Vietnam's economy, in which not unlike in China's economy, the underlying factors of the growth are investment and export. It is evident that export is by far the most important stimulator and this is understandable as Vietnam's economy is one of the most open economies in the world (see box I, in Appendix.). Investment has for long time been important but the role of this factor could have been even more effective. Government and private consumption also have high multipliers in both types, meaning a good fiscal policy can be vital for the economy.

3.3 Output multipliers for the national, inter-regional and single I-O models

This paper is focused on the interregional model but it is not out of question to take into account also the calculations of the multipliers in national and the single model.

The national model provides a picture of the Vietnam's economy as a whole and the single model is a snapshot of every single region, while every region is taken as an independent economy itself.

The results of the multipliers from all three models do not come in conflict with each other, only gives better explanation of the economy.

So far from all the results it is evident that the food processing and light manufactures are two sectors most positively influencing the economy. The below table is not an exception either. Although it is certain that for all the 7 regions in all three models, the multipliers are highest in food processing and light manufactures, though the levels are quite different across the regions. This is in compliance with the characteristics of each region. Northern Vietnam containing regions 1, 2 and 3 is rather poorer than southern Vietnam. As it can be seen from the table, multipliers of these three regions are also lowest. In the northern part of the country, region 2, which is the Red River Delta in the recent years has been rapidly industrialized with many industrial zones opened. Other regions of the northern part also followed the industrialization process in Red River Delta and changed towards opening more and more industrial zones on account of agricultural land. The industrial zones in these regions are more or less rather for 'decoration' than an effective way to a more sustainable and quality high growth. The multipliers in the table show that for the northern part of the country, except for other agricultural activities and food processing, the multipliers of all other sectors are higher than of regions 4-7. This is not in contrary with the comment above that the policies of the southern part of the country focus much more on industrialization while agriculture in the recent years has not been treated with adequate interest though it is evident from the multipliers that agricultural related sectors like food processing have the highest multipliers.

It is well known that the southern part of the economy including regions 4-7 is wealthier than the northern part. From the table, it is evident that in the southern part industry does not play such a big role as in the northern part. Thus we can

come up with the conclusion that at this point of time; heavily focus on industrialization is not the best thing for Vietnam. Rather, the policy makers should think of getting the best from the agricultural sector, especially in modernization the agricultural sector. Vietnam's economy is best characterized as an agricultural economy and this is the sector where Vietnam has competitive advantage over many other countries in the world. Focus blindly on the industrialization process would be fatal for the economy as agriculture will be neglected while it is notable that the structure of Vietnam's export is made from a big part of agricultural products.

Table 2: Output multipliers for the national, inter-regional and single I-O models

		National model	Inter-regional model							Single model						
			Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	Reg 7	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	Reg 7
1	Crops	1.297	1.248	1.273	1.268	1.336	1.450	1.332	1.327	1.248	1.293	1.278	1.356	1.459	1.330	1.330
2	Other agricultural activities	1.436	1.443	1.385	1.453	1.439	1.645	1.423	1.448	1.442	1.406	1.464	1.457	1.633	1.421	1.450
3	Mining	1.254	1.270	1.564	1.324	1.349	1.399	1.216	1.254	1.270	1.582	1.329	1.354	1.375	1.214	1.254
4	Food processing	2.011	1.983	1.982	1.989	2.019	2.023	2.027	2.016	1.981	2.007	1.999	2.044	2.033	2.025	2.019
5	Light manufactures	1.738	1.666	1.935	1.823	2.010	1.812	1.651	1.783	1.664	2.025	1.862	2.085	1.824	1.646	1.791
6	Heavy manufactures	1.497	1.560	1.511	1.505	1.487	1.176	1.485	1.367	1.561	1.532	1.514	1.496	1.154	1.482	1.368
7	Machinery	1.422	1.372	1.490	1.548	1.454	1.394	1.411	1.402	1.372	1.520	1.576	1.472	1.375	1.410	1.404
8	Utility	1.341	1.323	1.410	1.384	1.426	1.273	1.339	1.323	1.323	1.433	1.395	1.443	1.266	1.337	1.324
9	Construction	1.556	1.607	1.644	1.684	1.697	1.599	1.455	1.521	1.607	1.691	1.712	1.732	1.570	1.450	1.525
10	Services	1.374	1.390	1.423	1.414	1.454	1.410	1.343	1.348	1.390	1.440	1.422	1.465	1.391	1.341	1.349

3.4 VA multipliers

It can be seen from the table that the production of Agricultural sector (consisting of agriculture, forestry and fishery) has the most positive impact on VA in most regions. Both types of multipliers confirm this evidence. Services are the second best sector and industries are the last sector that stimulates VA. This means the industrialization process that has been taken for almost two decades in Vietnam now is not effective. Investment, resources have flowed heavily into this sector but have not gained much value. Vietnam's economy's advantage remains in the agricultural sector. Comparing with agriculture of other economies, Vietnam's agriculture is not in the best shape but whether one likes it or not, agriculture still has a pivotal role in Vietnam's economy, agriculture still employs more than 60% of the total labour force. Modernization and industrialization of the economy is a good policy but this all should not happen at the expense of agriculture. Again, the result of the table shows that agriculture has not been given the adequate concern and thus the activity in the agricultural sector is not as effective as it should be. The VA of the agriculture remains lower than of the other sectors, which means land is still too much wasted.

Table 3: Value added multiplies by region

	Intermediate Consumption - Region I			Intermediate Consumption - Region II			Intermediate Consumption - Region III			Intermediate Consumption - Region IV		
	1	2	3	1	2	3	1	2	3	1	2	3
	Agriculture	Industries	Services	Agriculture	Industries	Services	Agriculture	Industries	Services	Agriculture	Industries	Services
Type II VA multiplier	1.271	0.813	1.113	1.612	1.122	1.423	1.594	1.155	1.466	1.59	1.164	1.413
1	1.086	0.639	0.954	0.117	0.115	0.115	0.151	0.145	0.147	0.101	0.102	0.089
2	0.031	0.028	0.025	1.157	0.682	0.974	0.02	0.025	0.02	0.029	0.025	0.028
3	0.017	0.015	0.013	0.045	0.043	0.043	1.254	0.782	1.123	0.049	0.06	0.038
4	0.014	0.012	0.012	0.046	0.042	0.046	0.031	0.03	0.031	1.283	0.834	1.132
5	0.006	0.006	0.005	0.012	Code	0.01	0.003	0.004	0.003	0.004	0.004	0.004
6	0.08	0.08	0.07	0.18	0.18	0.19	0.1	0.13	0.11	0.09	0.1	0.09
7	0.04	0.03	0.03	0.05	0.05	0.05	0.03	0.04	0.03	0.03	0.03	0.03
Type I VA multiplier	0.785	0.5	0.688	0.82	0.586	0.73	0.822	0.61	0.759	0.809	0.603	0.72
1	0.754	0.442	0.663	0.015	0.037	0.023	0.021	0.046	0.026	0.016	0.033	0.014
2	0.006	0.01	0.004	0.766	0.45	0.644	0.002	0.008	0.003	0.001	0.004	0.003
3	0.003	0.004	0.002	0.005	0.012	0.007	0.774	0.481	0.693	0.008	0.022	0.004
4	0.001	0.002	0.001	0.004	0.01	0.007	0.003	0.007	0.005	0.764	0.495	0.674
5	0.001	0.002	0.001	0.002	0.004	0.002	0	0.001	0	0	0.001	0
6	0.011	0.03	0.014	0.023	0.061	0.04	0.018	0.054	0.026	0.016	0.038	0.023
7	0.008	0.01	0.003	0.004	0.011	0.006	0.004	0.013	0.005	0.004	0.01	0.003

Code	Intermediate Consumption - Region V			Intermediate Consumption - Region VI			Intermediate Consumption - Region VII		
	1	2	3	1	2	3	1	2	3
	Agriculture	Industries	Services	Agriculture	Industries	Services	Agriculture	Industries	Services
Type II VA multiplier	1.317	0.95	1.249	1.235	0.942	1.143	1.18	0.781	1.021
1	0.132	0.123	0.116	0.043	0.044	0.042	0.044	0.04	0.042
2	0.013	0.018	0.014	0.026	0.028	0.021	0.009	0.01	0.007
3	0.03	0.027	0.026	0.029	0.029	0.023	0.014	0.012	0.01
4	0.098	0.084	0.084	0.019	0.018	0.017	0.013	0.012	0.011
5	0.877	0.518	0.856	0.013	0.015	0.008	0.005	0.005	0.004
6	0.12	0.14	0.12	0.94	0.67	0.93	0.07	0.07	0.06
7	0.04	0.04	0.04	0.16	0.14	0.1	1.03	0.63	0.89
Type I VA multiplier	0.754	0.546	0.716	0.753	0.572	0.696	0.754	0.496	0.652
1	0.028	0.045	0.019	0.006	0.011	0.008	0.005	0.011	0.007
2	0.002	0.006	0.002	0.005	0.01	0.003	0.002	0.004	0.001
3	0.005	0.007	0.003	0.006	0.009	0.002	0.003	0.003	0.001
4	0.019	0.026	0.012	0.003	0.004	0.003	0.002	0.004	0.002
5	0.656	0.387	0.64	0.004	0.007	0.001	0.001	0.002	0.001
6	0.037	0.063	0.033	0.676	0.475	0.667	0.013	0.031	0.013
7	0.008	0.013	0.006	0.052	0.056	0.012	0.727	0.442	0.628

4 Concluding remarks

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 I/O based 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. The authors of this study strongly hope the findings above will help the policymakers to come up with ever more effective policies to help the economy reach high and quality growth.

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Appendix 1. Contribution of regions to output multiplier in inter-regional I-O model (cont.)

	Crops	Other agricultural activities	Mining	Food processing	Light manufactures	Heavy manufactures	Machinery	Utility	Construction	Services
Type I										
Reg 1	1.248	1.443	1.27	1.983	1.666	1.56	1.372	1.323	1.607	1.39
Reg 1	1.186	1.35	1.231	1.808	1.476	1.491	1.31	1.273	1.489	1.329
Reg 2	0.009	0.013	0.006	0.033	0.018	0.008	0.005	0.006	0.012	0.007
Reg 3	0.005	0.008	0.002	0.01	0.009	0.005	0.003	0.003	0.006	0.004
Reg 4	0.003	0.004	0.002	0.009	0.007	0.002	0.002	0.003	0.004	0.003
Reg 5	0.002	0.003	0.001	0.008	0.003	0.002	0.002	0.001	0.002	0.002
Reg 6	0.033	0.046	0.025	0.077	0.138	0.049	0.046	0.034	0.089	0.038
Reg 7	0.012	0.018	0.002	0.038	0.015	0.003	0.003	0.003	0.005	0.006
Reg 2	1.273	1.385	1.564	1.982	1.935	1.511	1.49	1.41	1.644	1.423
Reg 1	0.039	0.053	0.078	0.07	0.183	0.078	0.08	0.062	0.116	0.061
Reg 2	1.145	1.204	1.291	1.735	1.361	1.23	1.198	1.2	1.256	1.204
Reg 3	0.009	0.011	0.019	0.029	0.032	0.009	0.014	0.013	0.018	0.013
Reg 4	0.01	0.013	0.024	0.019	0.041	0.012	0.018	0.016	0.024	0.017
Reg 5	0.006	0.006	0.003	0.008	0.026	0.004	0.007	0.006	0.012	0.004
Reg 6	0.057	0.086	0.134	0.105	0.26	0.152	0.154	0.101	0.191	0.109
Reg 7	0.007	0.012	0.015	0.016	0.032	0.027	0.018	0.012	0.026	0.015
Reg 3	1.268	1.453	1.324	1.989	1.823	1.505	1.548	1.384	1.684	1.414
Reg 1	0.052	0.077	0.046	0.141	0.187	0.07	0.097	0.069	0.134	0.071
Reg 2	0.003	0.006	0.005	0.017	0.014	0.013	0.035	0.006	0.021	0.007
Reg 3	1.16	1.272	1.193	1.731	1.363	1.25	1.211	1.219	1.298	1.237
Reg 4	0.006	0.009	0.009	0.023	0.022	0.007	0.011	0.01	0.015	0.011
Reg 5	0	0	0	0.001	0.001	0	0.001	0	0.001	0
Reg 6	0.04	0.079	0.067	0.065	0.213	0.154	0.14	0.07	0.184	0.08
Reg 7	0.007	0.009	0.004	0.011	0.025	0.01	0.054	0.011	0.031	0.008

Appendix 1. Contribution of regions to output multiplier in inter-regional I-O model (cont.)

	Crops	Other agricultural activities	Mining	Food processing	Light manufactures	Heavy manufactures	Machinery	Utility	Construction	Services
Reg 4	1.336	1.439	1.349	2.019	2.01	1.487	1.454	1.426	1.697	1.454
Reg 1	0.055	0.058	0.023	0.066	0.213	0.05	0.06	0.055	0.112	0.043
Reg 2	0.002	0.003	0.006	0.007	0.01	0.006	0.003	0.01	0.01	0.004
Reg 3	0.015	0.013	0.002	0.074	0.031	0.004	0.007	0.006	0.013	0.006
Reg 4	1.228	1.306	1.26	1.764	1.628	1.295	1.302	1.299	1.429	1.33
Reg 5	0	0	0	0.002	0.001	0	0	0	0	0.001
Reg 6	0.031	0.057	0.056	0.079	0.121	0.13	0.08	0.053	0.129	0.069
Reg 7	0.004	0.004	0.001	0.028	0.006	0.002	0.002	0.002	0.003	0.002
Reg 5	1.45	1.645	1.399	2.023	1.812	1.176	1.394	1.273	1.599	1.41
Reg 1	0.091	0.104	0.042	0.136	0.232	0.015	0.062	0.046	0.117	0.061
Reg 2	0.003	0.005	0.022	0.013	0.02	0.006	0.004	0.002	0.016	0.007
Reg 3	0.012	0.012	0.003	0.011	0.03	0.002	0.007	0.008	0.015	0.005
Reg 4	0.041	0.063	0.025	0.083	0.08	0.019	0.059	0.022	0.066	0.037
Reg 5	1.199	1.273	1.196	1.604	1.224	1.038	1.13	1.123	1.152	1.177
Reg 6	0.087	0.169	0.107	0.156	0.185	0.095	0.122	0.062	0.213	0.115
Reg 7	0.017	0.018	0.004	0.02	0.041	0.003	0.01	0.009	0.02	0.007
Reg 6	1.332	1.423	1.216	2.027	1.651	1.485	1.411	1.339	1.455	1.343
Reg 1	0.011	0.013	0.011	0.043	0.023	0.012	0.018	0.018	0.018	0.015
Reg 2	0.008	0.008	0.006	0.045	0.011	0.009	0.004	0.006	0.013	0.005
Reg 3	0.009	0.008	0.002	0.045	0.006	0.002	0.002	0.006	0.003	0.003
Reg 4	0.005	0.007	0.005	0.012	0.01	0.005	0.005	0.005	0.007	0.006
Reg 5	0.008	0.006	0	0.045	0.003	0	0	0.001	0.001	0.001
Reg 6	1.199	1.289	1.185	1.523	1.54	1.448	1.372	1.292	1.398	1.292
Reg 7	0.091	0.092	0.008	0.315	0.058	0.009	0.01	0.011	0.015	0.02

Reg 7	1.327	1.448	1.254	2.016	1.783	1.367	1.402	1.323	1.521	1.348
Reg 1	0.015	0.017	0.009	0.03	0.049	0.012	0.033	0.025	0.031	0.016
Reg 2	0.006	0.006	0.001	0.006	0.019	0.003	0.005	0.004	0.009	0.003
Reg 3	0.004	0.006	0.001	0.008	0.004	0.001	0.006	0.001	0.003	0.002
Reg 4	0.005	0.007	0.003	0.008	0.015	0.003	0.005	0.004	0.007	0.004
Reg 5	0.002	0.002	0.001	0.005	0.002	0.001	0.007	0.001	0.003	0.001
Reg 6	0.037	0.045	0.029	0.074	0.133	0.045	0.06	0.036	0.089	0.035
Reg 7	1.259	1.365	1.21	1.886	1.561	1.302	1.285	1.251	1.379	1.287

Appendix 1. Contribution of regions to output multiplier in inter-regional I-O model (cont.)

	Crops	Other agricultural activities	Mining	Food processing	Light manufactures	Heavy manufactures	Machinery	Utility	Construction	Services
Type II										
Reg 1	2.984	2.92	2.812	3.336	2.517	2.578	2.045	2.868	2.469	2.751
Reg 1	1.578	1.684	1.579	2.113	1.668	1.721	1.462	1.622	1.683	1.637
Reg 2	0.137	0.122	0.12	0.133	0.08	0.083	0.055	0.12	0.076	0.108
Reg 3	0.134	0.117	0.117	0.111	0.072	0.081	0.053	0.118	0.07	0.105
Reg 4	0.135	0.117	0.119	0.112	0.072	0.08	0.054	0.12	0.07	0.107
Reg 5	0.044	0.039	0.039	0.042	0.024	0.027	0.018	0.039	0.023	0.035
Reg 6	0.6	0.529	0.529	0.518	0.416	0.382	0.266	0.539	0.37	0.483
Reg 7	0.356	0.312	0.309	0.307	0.184	0.205	0.137	0.31	0.176	0.277
Reg 2	3.082	3.023	2.89	3.456	2.97	2.622	2.147	2.976	2.588	2.838
Reg 1	0.448	0.422	0.378	0.403	0.417	0.329	0.228	0.416	0.329	0.38
Reg 2	1.279	1.325	1.389	1.844	1.437	1.312	1.247	1.316	1.326	1.308
Reg 3	0.143	0.133	0.117	0.139	0.108	0.092	0.063	0.13	0.088	0.118
Reg 4	0.148	0.138	0.125	0.132	0.12	0.096	0.068	0.136	0.096	0.125
Reg 5	0.05	0.046	0.035	0.044	0.052	0.031	0.023	0.044	0.035	0.039
Reg 6	0.648	0.621	0.567	0.586	0.599	0.515	0.369	0.612	0.5	0.571
Reg 7	0.366	0.338	0.278	0.309	0.238	0.248	0.148	0.323	0.214	0.297
Reg 3	3.091	3.074	2.911	3.457	2.99	2.777	2.516	3.032	2.745	2.896
Reg 1	0.463	0.443	0.404	0.472	0.45	0.357	0.315	0.44	0.374	0.405
Reg 2	0.138	0.126	0.122	0.125	0.1	0.107	0.106	0.128	0.099	0.116
Reg 3	1.295	1.392	1.311	1.84	1.449	1.345	1.283	1.341	1.377	1.347
Reg 4	0.145	0.133	0.13	0.135	0.11	0.104	0.084	0.135	0.096	0.123
Reg 5	0.045	0.04	0.039	0.037	0.029	0.031	0.024	0.041	0.027	0.037
Reg 6	0.636	0.609	0.585	0.545	0.594	0.57	0.456	0.608	0.531	0.564
Reg 7	0.369	0.331	0.319	0.303	0.257	0.263	0.247	0.338	0.242	0.303

Reg 4	3.14	3.088	2.914	3.486	3.134	2.732	2.262	3.018	2.701	2.898
Reg 1	0.462	0.43	0.376	0.397	0.467	0.331	0.243	0.414	0.338	0.369
Reg 2	0.135	0.124	0.122	0.115	0.093	0.098	0.062	0.128	0.085	0.111
Reg 3	0.149	0.135	0.119	0.183	0.114	0.096	0.067	0.125	0.088	0.113
Reg 4	1.366	1.431	1.379	1.876	1.713	1.39	1.364	1.421	1.506	1.44
Reg 5	0.044	0.041	0.038	0.037	0.028	0.031	0.02	0.039	0.025	0.036
Reg 6	0.621	0.596	0.568	0.558	0.488	0.537	0.344	0.573	0.457	0.541
Reg 7	0.363	0.331	0.312	0.319	0.23	0.249	0.162	0.318	0.202	0.289
Reg 5	3.099	2.998	2.785	3.347	2.818	2.741	2.219	2.938	2.488	2.765
Reg 1	0.463	0.409	0.354	0.435	0.459	0.368	0.248	0.422	0.318	0.367
Reg 2	0.124	0.105	0.124	0.111	0.094	0.121	0.064	0.125	0.082	0.107
Reg 3	0.135	0.113	0.106	0.11	0.105	0.118	0.068	0.132	0.081	0.106
Reg 4	0.167	0.167	0.131	0.184	0.157	0.138	0.122	0.149	0.134	0.14
Reg 5	1.24	1.306	1.23	1.636	1.248	1.076	1.15	1.164	1.174	1.211
Reg 6	0.625	0.611	0.559	0.588	0.514	0.606	0.392	0.607	0.503	0.558
Reg 7	0.345	0.287	0.28	0.283	0.241	0.313	0.174	0.34	0.197	0.277
Reg 6	2.977	2.892	2.799	3.354	2.494	2.472	2.153	2.839	2.297	2.73
Reg 1	0.383	0.345	0.368	0.343	0.213	0.235	0.185	0.357	0.208	0.328
Reg 2	0.13	0.116	0.123	0.143	0.073	0.081	0.059	0.117	0.075	0.107
Reg 3	0.131	0.117	0.119	0.143	0.068	0.075	0.057	0.117	0.065	0.106
Reg 4	0.131	0.119	0.125	0.113	0.074	0.08	0.062	0.12	0.071	0.112
Reg 5	0.048	0.042	0.039	0.078	0.024	0.025	0.019	0.038	0.021	0.035
Reg 6	1.737	1.769	1.702	1.956	1.815	1.77	1.614	1.781	1.673	1.746
Reg 7	0.418	0.384	0.322	0.578	0.225	0.205	0.157	0.309	0.182	0.296
Reg 7	3.028	2.878	2.706	3.335	2.666	2.294	2.006	2.805	2.301	2.647
Reg 1	0.398	0.34	0.337	0.327	0.248	0.221	0.169	0.359	0.207	0.309

Reg 2	0.131	0.111	0.109	0.103	0.084	0.071	0.05	0.113	0.067	0.099
Reg 3	0.131	0.112	0.108	0.106	0.07	0.07	0.051	0.111	0.061	0.098
Reg 4	0.135	0.116	0.113	0.108	0.082	0.074	0.051	0.117	0.067	0.103
Reg 5	0.043	0.037	0.036	0.037	0.024	0.024	0.022	0.038	0.022	0.033
Reg 6	0.593	0.513	0.504	0.504	0.421	0.348	0.258	0.521	0.344	0.46
Reg 7	1.597	1.649	1.498	2.148	1.737	1.486	1.405	1.545	1.534	1.545

Appendix 2. Regional contributions to output multiplier in inter-regional I-O model (%)

	Crops	Other agricultural activities	Mining	Food processing	Light manufactures	Heavy manufactures	Machinery	Utility	Construction	Services
Type I										
Reg 1	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
Reg 1	94.999	93.582	96.927	91.152	88.579	95.593	95.513	96.231	92.621	95.650
Reg 2	0.711	0.925	0.485	1.663	1.061	0.482	0.391	0.456	0.762	0.532
Reg 3	0.367	0.527	0.187	0.522	0.549	0.318	0.242	0.206	0.385	0.268
Reg 4	0.217	0.300	0.139	0.452	0.443	0.138	0.180	0.201	0.244	0.228
Reg 5	0.135	0.198	0.105	0.426	0.160	0.151	0.116	0.095	0.145	0.144
Reg 6	2.631	3.191	1.970	3.862	8.286	3.141	3.326	2.573	5.521	2.729
Reg 7	0.939	1.277	0.186	1.923	0.922	0.177	0.232	0.237	0.323	0.449
Reg 2	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
Reg 1	3.096	3.796	5.010	3.534	9.471	5.157	5.384	4.427	7.061	4.260
Reg 2	89.931	86.936	82.558	87.531	70.307	81.356	80.423	85.085	76.420	84.595
Reg 3	0.705	0.803	1.201	1.464	1.628	0.597	0.939	0.942	1.091	0.912
Reg 4	0.759	0.921	1.521	0.981	2.119	0.778	1.232	1.150	1.437	1.203
Reg 5	0.473	0.434	0.179	0.386	1.351	0.252	0.470	0.413	0.748	0.294
Reg 6	4.488	6.208	8.572	5.292	13.457	10.076	10.351	7.134	11.644	7.654
Reg 7	0.548	0.902	0.960	0.811	1.667	1.783	1.203	0.850	1.599	1.081
Reg 3	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000
Reg 1	4.107	5.304	3.486	7.072	10.254	4.634	6.237	4.961	7.982	5.015
Reg 2	0.233	0.412	0.388	0.858	0.762	0.861	2.254	0.456	1.229	0.503
Reg 3	91.438	87.535	90.108	87.036	74.728	83.103	78.210	88.047	77.056	87.487
Reg 4	0.507	0.650	0.670	1.161	1.179	0.477	0.690	0.690	0.882	0.744
Reg 5	0.023	0.032	0.011	0.045	0.040	0.018	0.045	0.018	0.035	0.020
Reg 6	3.163	5.468	5.052	3.264	11.680	10.232	9.051	5.032	10.951	5.640
Reg 7	0.529	0.599	0.285	0.564	1.357	0.675	3.514	0.796	1.866	0.590

Appendix 2. Regional contributions to output multiplier in inter-regional I-O model (%) (cont.)

Reg 4	100	100	100	100	100	100	100	100	100	100
Reg 1	4.123	3.998	1.719	3.293	10.616	3.366	4.157	3.851	6.59	2.977
Reg 2	0.16	0.186	0.451	0.341	0.516	0.389	0.174	0.734	0.616	0.272
Reg 3	1.109	0.875	0.163	3.679	1.527	0.263	0.47	0.454	0.779	0.397
Reg 4	91.944	90.697	93.415	87.358	80.965	87.137	89.588	91.113	84.21	91.471
Reg 5	0.014	0.023	0.011	0.075	0.039	0.013	0.015	0.022	0.023	0.038
Reg 6	2.33	3.962	4.177	3.89	6.026	8.731	5.482	3.715	7.605	4.718
Reg 7	0.319	0.26	0.065	1.365	0.311	0.101	0.114	0.111	0.177	0.128
Reg 5	100	100	100	100	100	100	100	100	100	100
Reg 1	6.27	6.316	2.968	6.726	12.811	1.301	4.464	3.599	7.34	4.331
Reg 2	0.177	0.284	1.582	0.655	1.094	0.5	0.252	0.149	1.002	0.531
Reg 3	0.839	0.757	0.22	0.563	1.65	0.143	0.501	0.657	0.91	0.38
Reg 4	2.86	3.859	1.779	4.093	4.41	1.591	4.236	1.755	4.141	2.59
Reg 5	82.691	77.423	85.517	79.258	67.551	88.194	81.074	88.227	72.053	83.487

Reg 6	5.965	10.263	7.626	7.71	10.22	8.054	8.779	4.9	13.291	8.152
Reg 7	1.199	1.099	0.307	0.996	2.264	0.218	0.694	0.712	1.263	0.529
Reg 6	100	100	100	100	100	100	100	100	100	100
Reg 1	0.862	0.944	0.911	2.132	1.41	0.838	1.259	1.377	1.255	1.131
Reg 2	0.629	0.559	0.475	2.22	0.653	0.584	0.318	0.482	0.898	0.348
Reg 3	0.66	0.557	0.142	2.195	0.347	0.126	0.136	0.417	0.173	0.234
Reg 4	0.405	0.482	0.382	0.606	0.618	0.349	0.387	0.402	0.489	0.439
Reg 5	0.569	0.425	0.028	2.227	0.202	0.031	0.028	0.069	0.057	0.098
Reg 6	90.057	90.56	97.437	75.096	93.276	97.479	97.172	96.441	96.123	96.236
Reg 7	6.818	6.472	0.626	15.524	3.493	0.592	0.701	0.813	1.006	1.513
Reg 7	100	100	100	100	100	100	100	100	100	100
Reg 1	1.098	1.208	0.732	1.481	2.753	0.884	2.371	1.878	2.027	1.183
Reg 2	0.416	0.392	0.11	0.307	1.063	0.219	0.359	0.299	0.596	0.217
Reg 3	0.306	0.388	0.04	0.4	0.24	0.076	0.432	0.085	0.196	0.111
Reg 4	0.41	0.462	0.223	0.391	0.817	0.225	0.363	0.33	0.487	0.298
Reg 5	0.121	0.149	0.044	0.246	0.113	0.079	0.507	0.104	0.196	0.089

Reg 6	2.808	3.116	2.345	3.65	7.439	3.28	4.309	2.748	5.848	2.622
Reg 7	94.841	94.286	96.507	93.524	87.574	95.236	91.66	94.556	90.65	95.479

	Crops	Other agricultural activities	Mining	Food processing	Light manufactures	Heavy manufactures	Machinery	Utility	Construction	Services
Type II										
Reg 1	100	100	100	100	100	100	100	100	100	100
Reg 1	52.875	57.658	56.155	63.349	66.263	66.755	71.499	56.545	68.172	59.49
Reg 2	4.591	4.191	4.266	3.981	3.198	3.207	2.692	4.187	3.072	3.921
Reg 3	4.478	4.022	4.162	3.325	2.877	3.129	2.61	4.101	2.846	3.815
Reg 4	4.524	4.005	4.243	3.359	2.871	3.094	2.631	4.2	2.819	3.887
Reg 5	1.481	1.337	1.391	1.246	0.934	1.059	0.884	1.364	0.949	1.285
Reg 6	20.102	18.104	18.804	15.541	16.53	14.803	12.987	18.789	14.997	17.544
Reg 7	11.949	10.683	10.979	9.199	7.328	7.954	6.697	10.814	7.145	10.058
Reg 2	100	100	100	100	100	100	100	100	100	100
Reg 1	14.522	13.966	13.065	11.65	14.034	12.533	10.64	13.971	12.716	13.387
Reg 2	41.489	43.831	48.065	53.354	48.382	50.018	58.08	44.203	51.243	46.102
Reg 3	4.655	4.397	4.062	4.011	3.651	3.494	2.926	4.359	3.405	4.165
Reg 4	4.787	4.553	4.321	3.813	4.037	3.678	3.187	4.556	3.693	4.404
Reg 5	1.633	1.526	1.221	1.266	1.734	1.183	1.076	1.485	1.369	1.369
Reg 6	21.027	20.547	19.629	16.967	20.152	19.648	17.179	20.571	19.312	20.126
Reg 7	11.886	11.179	9.636	8.938	8.009	9.445	6.913	10.857	8.262	10.448
Reg 3	100	100	100	100	100	100	100	100	100	100
Reg 1	14.993	14.41	13.889	13.654	15.059	12.852	12.515	14.528	13.617	13.996
Reg 2	4.449	4.089	4.201	3.629	3.346	3.849	4.225	4.219	3.606	4.023

Reg 3	41.902	45.285	45.037	53.223	48.467	48.429	51	44.246	50.156	46.528
Reg 4	4.704	4.328	4.461	3.906	3.694	3.752	3.356	4.458	3.487	4.264
Reg 5	1.454	1.307	1.341	1.067	0.98	1.132	0.969	1.339	0.968	1.263
Reg 6	20.564	19.818	20.11	15.756	19.872	20.515	18.132	20.05	19.344	19.471
Reg 7	11.934	10.764	10.962	8.765	8.582	9.471	9.802	11.16	8.822	10.455

	Crops	Other agricultural activities	Mining	Food processing	Light manufactures	Heavy manufactures	Machinery	Utility	Construction	Services
Reg 4	100	100	100	100	100	100	100	100	100	100
Reg 1	14.72	13.912	12.916	11.401	14.901	12.118	10.737	13.722	12.526	12.742
Reg 2	4.309	4.028	4.173	3.303	2.978	3.576	2.75	4.24	3.13	3.816
Reg 3	4.744	4.378	4.069	5.259	3.646	3.532	2.959	4.136	3.253	3.906
Reg 4	43.5	46.343	47.336	53.815	54.669	50.895	60.295	47.079	55.755	49.674
Reg 5	1.414	1.319	1.321	1.074	0.904	1.124	0.885	1.302	0.925	1.24
Reg 6	19.762	19.291	19.482	15.998	15.579	19.643	15.199	18.988	16.918	18.653
Reg 7	11.551	10.73	10.702	9.15	7.323	9.112	7.174	10.532	7.493	9.969
Reg 5	100	100	100	100	100	100	100	100	100	100
Reg 1	14.942	13.654	12.722	12.991	16.296	13.44	11.193	14.352	12.779	13.265
Reg 2	4.011	3.489	4.468	3.315	3.34	4.428	2.902	4.249	3.281	3.888
Reg 3	4.349	3.773	3.811	3.281	3.717	4.306	3.079	4.5	3.241	3.837
Reg 4	5.395	5.559	4.688	5.489	5.558	5.034	5.495	5.082	5.385	5.056
Reg 5	39.991	43.569	44.177	48.882	44.294	39.249	51.85	39.599	47.194	43.784
Reg 6	20.177	20.382	20.091	17.582	18.241	22.106	17.66	20.644	20.213	20.165
Reg 7	11.134	9.575	10.043	8.46	8.553	11.436	7.821	11.573	7.908	10.005
Reg 6	100	100	100	100	100	100	100	100	100	100
Reg 1	12.858	11.928	13.156	10.215	8.559	9.509	8.6	12.57	9.07	12.025
Reg 2	4.361	4.024	4.38	4.262	2.927	3.297	2.752	4.127	3.275	3.923
Reg 3	4.405	4.051	4.266	4.268	2.742	3.043	2.651	4.124	2.836	3.894
Reg 4	4.395	4.11	4.477	3.382	2.985	3.252	2.88	4.217	3.105	4.09
Reg 5	1.609	1.454	1.397	2.315	0.962	0.997	0.862	1.327	0.934	1.293
Reg 6	58.342	61.156	60.818	58.315	72.798	71.618	74.95	62.756	72.856	63.934
Reg 7	14.031	13.278	11.507	17.243	9.027	8.285	7.305	10.879	7.923	10.842
Reg 7	100	100	100	100	100	100	100	100	100	100
Reg 1	13.157	11.823	12.451	9.816	9.318	9.642	8.447	12.811	8.99	11.676
Reg 2	4.329	3.866	4.013	3.104	3.157	3.112	2.472	4.042	2.896	3.733

Reg 3	4.311	3.891	4.009	3.181	2.624	3.049	2.54	3.969	2.651	3.705
Reg 4	4.462	4.021	4.195	3.25	3.072	3.214	2.547	4.184	2.906	3.893
Reg 5	1.429	1.293	1.335	1.117	0.888	1.037	1.091	1.344	0.96	1.247
Reg 6	19.582	17.805	18.621	15.122	15.799	15.152	12.842	18.561	14.942	17.367
Reg 7	52.73	57.302	55.376	64.409	65.143	64.794	70.06	55.089	66.654	58.379

Appendix 3. Regions' percentage contributions to output multipliers induced by final demand in inter-regional I-O model

	PCE	%	GCE	%	GFCF	%	CI	%	FXP	%
Type I										
Reg 1	1.276	100.00%	1.206	100.00%	1.432	100.00%	0.919	100.00%	1.567	100.00%
Reg 1	1.003	78.64%	1.108	91.84%	1.324	92.46%	0.734	79.86%	1.451	92.60%
Reg 2	0.036	2.86%	0.032	2.67%	0.011	0.79%	0.023	2.52%	0.015	0.95%
Reg 3	0.014	1.13%	0.007	0.58%	0.006	0.41%	0.009	0.93%	0.006	0.41%
Reg 4	0.018	1.40%	0.010	0.86%	0.004	0.26%	0.010	1.04%	0.005	0.33%
Reg 5	0.008	0.62%	0.002	0.16%	0.002	0.17%	0.006	0.62%	0.003	0.22%
Reg 6	0.146	11.46%	0.043	3.52%	0.080	5.56%	0.112	12.14%	0.071	4.54%
Reg 7	0.050	3.90%	0.004	0.36%	0.005	0.35%	0.027	2.90%	0.015	0.95%
Reg 2	1.385	100.00%	1.323	100.00%	1.482	100.00%	1.031	100.00%	1.658	100.00%
Reg 1	0.161	11.62%	0.130	9.83%	0.109	7.38%	0.127	12.36%	0.093	5.63%
Reg 2	0.792	57.17%	0.999	75.50%	1.110	74.90%	0.547	53.06%	1.345	81.09%
Reg 3	0.011	0.77%	0.420	31.74%	0.008	0.57%	0.165	16.05%	0.001	0.09%
Reg 4	0.009	0.63%	0.551	41.65%	0.006	0.39%	0.217	21.03%	0.002	0.13%
Reg 5	0.006	0.40%	0.191	14.45%	0.001	0.08%	0.100	9.73%	0.001	0.06%
Reg 6	0.118	8.50%	3.023	228.45%	0.031	2.12%	1.761	170.78%	0.015	0.92%
Reg 7	0.025	1.78%	0.628	47.49%	0.003	0.19%	0.237	22.94%	0.004	0.22%
Reg 3	1.372	100.00%	1.301	100.00%	1.552	100.00%	0.969	100.00%	1.445	100.00%
Reg 1	0.241	17.55%	0.102	7.82%	0.130	8.38%	0.156	16.09%	0.081	5.57%

Reg 2	0.017	1.21%	0.006	0.46%	0.038	2.44%	0.050	5.18%	0.008	0.52%
Reg 3	<i>0.944</i>	68.79%	<i>1.063</i>	81.69%	<i>1.146</i>	73.84%	<i>0.484</i>	49.98%	<i>1.252</i>	86.69%
Reg 4	0.031	2.26%	0.014	1.11%	0.015	0.96%	0.019	1.93%	0.011	0.74%
Reg 5	0.001	0.11%	0.000	0.02%	0.001	0.05%	0.001	0.12%	0.000	0.03%
Reg 6	0.120	8.73%	0.106	8.13%	0.185	11.93%	0.191	19.68%	0.082	5.69%
Reg 7	0.019	1.35%	0.010	0.76%	0.037	2.41%	0.068	7.02%	0.011	0.75%
Reg 4	1.429	100.00%	1.193	100.00%	1.530	100.00%	1.013	100.00%	1.618	100.00%
Reg 1	0.132	9.27%	0.099	8.33%	0.100	6.54%	0.093	9.20%	0.064	3.98%
Reg 2	0.026	1.83%	0.147	12.33%	0.026	1.70%	0.012	1.18%	0.005	0.30%
Reg 3	0.040	2.79%	0.006	0.50%	0.012	0.76%	0.042	4.17%	0.026	1.62%
Reg 4	<i>1.107</i>	77.48%	<i>0.881</i>	73.84%	<i>1.261</i>	82.40%	<i>0.703</i>	69.45%	<i>1.442</i>	89.12%
Reg 5	0.005	0.38%	0.001	0.08%	0.001	0.03%	0.004	0.44%	0.001	0.04%
Reg 6	0.103	7.23%	0.056	4.68%	0.128	8.37%	0.142	13.98%	0.071	4.40%
Reg 7	0.014	1.01%	0.003	0.23%	0.003	0.20%	0.016	1.60%	0.009	0.55%
Reg 5	1.356	100.00%	1.147	100.00%	1.444	100.00%	0.966	100.00%	1.533	100.00%
Reg 1	0.271	20.00%	0.053	4.63%	0.102	7.06%	0.182	18.81%	0.103	6.75%
Reg 2	0.009	0.67%	0.003	0.25%	0.014	0.97%	0.030	3.08%	0.006	0.40%
Reg 3	0.029	2.13%	0.084	7.35%	0.012	0.85%	0.012	1.23%	0.013	0.83%
Reg 4	0.155	11.41%	0.050	4.33%	0.065	4.50%	0.136	14.06%	0.049	3.20%
Reg 5	<i>0.690</i>	50.88%	<i>0.834</i>	72.64%	<i>0.977</i>	67.66%	<i>0.342</i>	35.43%	<i>1.230</i>	80.29%
Reg 6	0.169	12.43%	0.066	5.73%	0.256	17.75%	0.246	25.48%	0.113	7.34%
Reg 7	0.034	2.48%	0.058	5.08%	0.018	1.21%	0.019	1.92%	0.018	1.19%
Reg 6	1.251	100.00%	1.155	100.00%	1.264	100.00%	0.928	100.00%	1.476	100.00%
Reg 1	0.053	4.24%	0.100	8.64%	0.247	19.58%	0.026	2.76%	0.020	1.32%
Reg 2	0.031	2.48%	0.076	6.54%	0.011	0.88%	0.026	2.85%	0.012	0.80%

Reg 3	0.030	2.43%	0.063	5.41%	0.013	1.02%	0.017	1.88%	0.008	0.57%
Reg 4	0.018	1.42%	0.014	1.20%	0.013	1.05%	0.008	0.84%	0.007	0.50%
Reg 5	0.019	1.56%	0.007	0.64%	0.001	0.08%	0.017	1.85%	0.007	0.47%
Reg 6	<i>0.896</i>	71.59%	<i>0.877</i>	75.90%	<i>0.964</i>	76.31%	<i>0.715</i>	77.07%	<i>1.360</i>	92.11%
Reg 7	0.204	16.29%	0.019	1.67%	0.014	1.10%	0.118	12.75%	0.062	4.22%
Reg 7	1.244	100.00%	1.013	100.00%	1.284	100.00%	0.902	100.00%	1.478	100.00%
Reg 1	0.079	6.36%	0.173	17.07%	0.034	2.65%	0.050	5.53%	0.023	1.53%
Reg 2	0.010	0.77%	0.003	0.33%	0.008	0.61%	0.007	0.77%	0.006	0.44%
Reg 3	0.010	0.84%	0.001	0.13%	0.046	3.56%	0.008	0.86%	0.004	0.24%
Reg 4	0.013	1.03%	0.010	0.96%	0.007	0.54%	0.006	0.67%	0.006	0.43%
Reg 5	0.006	0.48%	0.006	0.56%	0.004	0.32%	0.007	0.81%	0.002	0.14%
Reg 6	0.114	9.20%	0.085	8.39%	0.117	9.11%	0.112	12.39%	0.055	3.74%
Reg 7	<i>1.012</i>	81.34%	<i>0.735</i>	72.55%	<i>1.068</i>	83.22%	<i>0.712</i>	78.97%	<i>1.382</i>	93.47%
Type II										
Reg 1	1.950	100.00%	2.187	100.00%	2.199	100.00%	1.400	100.00%	2.438	100.00%
Reg 1	<i>1.392</i>	71.39%	<i>1.756</i>	80.30%	<i>1.821</i>	82.82%	<i>1.002</i>	71.60%	<i>2.034</i>	83.43%
Reg 2	0.073	3.77%	0.085	3.88%	0.050	2.28%	0.050	3.57%	0.054	2.20%
Reg 3	0.036	1.86%	0.032	1.44%	0.026	1.17%	0.024	1.69%	0.027	1.12%
Reg 4	0.045	2.30%	0.042	1.93%	0.025	1.16%	0.027	1.92%	0.029	1.17%
Reg 5	0.014	0.72%	0.011	0.49%	0.011	0.50%	0.011	0.78%	0.011	0.46%
Reg 6	0.289	14.80%	0.200	9.13%	0.201	9.15%	0.221	15.81%	0.213	8.75%
Reg 7	0.101	5.16%	0.062	2.83%	0.064	2.93%	0.065	4.63%	0.070	2.86%
Reg 2	2.484	100.00%	2.759	100.00%	2.687	100.00%	1.758	100.00%	2.988	100.00%

Reg 1	0.369	14.87%	0.389	14.10%	0.295	10.97%	0.271	15.43%	0.316	10.58%
Reg 2	<i>1.138</i>	45.81%	<i>1.554</i>	56.34%	<i>1.642</i>	61.10%	<i>0.756</i>	42.98%	<i>1.868</i>	62.51%
Reg 3	0.099	3.98%	0.108	3.92%	0.077	2.88%	0.061	3.45%	0.083	2.79%
Reg 4	0.130	5.24%	0.108	3.90%	0.093	3.45%	0.082	4.66%	0.102	3.40%
Reg 5	0.034	1.35%	0.024	0.87%	0.028	1.04%	0.026	1.47%	0.031	1.02%
Reg 6	0.572	23.01%	0.466	16.89%	0.441	16.40%	0.444	25.27%	0.470	15.72%
Reg 7	0.143	5.74%	0.110	3.99%	0.112	4.16%	0.118	6.74%	0.119	3.98%
Reg 3	2.537	100.00%	2.737	100.00%	2.749	100.00%	1.841	100.00%	2.986	100.00%
Reg 1	0.525	20.70%	0.419	15.33%	0.385	14.02%	0.350	18.99%	0.412	13.81%
Reg 2	0.052	2.07%	0.042	1.52%	0.080	2.89%	0.099	5.36%	0.046	1.55%
Reg 3	<i>1.459</i>	57.49%	<i>1.796</i>	65.63%	<i>1.752</i>	63.74%	<i>0.796</i>	43.21%	<i>2.071</i>	69.35%
Reg 4	0.089	3.51%	0.074	2.70%	0.066	2.40%	0.059	3.22%	0.070	2.35%
Reg 5	0.008	0.31%	0.007	0.24%	0.008	0.29%	0.008	0.46%	0.007	0.23%
Reg 6	0.315	12.44%	0.320	11.71%	0.347	12.62%	0.361	19.63%	0.296	9.92%
Reg 7	0.088	3.48%	0.079	2.88%	0.111	4.04%	0.168	9.13%	0.084	2.80%
Reg 4	2.665	100.00%	2.545	100.00%	2.873	100.00%	1.842	100.00%	3.157	100.00%
Reg 1	0.335	12.58%	0.304	11.93%	0.279	9.70%	0.234	12.68%	0.290	9.19%
Reg 2	0.078	2.91%	0.258	10.14%	0.072	2.49%	0.043	2.33%	0.054	1.73%
Reg 3	0.101	3.78%	0.060	2.35%	0.099	3.46%	0.096	5.20%	0.094	2.99%
Reg 4	<i>1.798</i>	67.47%	<i>1.618</i>	63.59%	<i>2.083</i>	72.49%	<i>1.117</i>	60.62%	<i>2.386</i>	75.58%
Reg 5	0.013	0.50%	0.010	0.41%	0.009	0.31%	0.011	0.58%	0.010	0.31%
Reg 6	0.273	10.23%	0.240	9.43%	0.265	9.23%	0.275	14.91%	0.259	8.20%
Reg 7	0.067	2.53%	0.055	2.16%	0.067	2.32%	0.068	3.68%	0.063	2.01%
Reg 5	2.225	100.00%	2.336	100.00%	2.453	100.00%	1.566	100.00%	2.778	100.00%
Reg 1	0.493	22.14%	0.305	13.06%	0.323	13.18%	0.315	20.09%	0.383	13.79%

Reg 2	0.032	1.46%	0.027	1.17%	0.038	1.56%	0.059	3.74%	0.030	1.09%
Reg 3	0.074	3.32%	0.174	7.45%	0.052	2.13%	0.041	2.60%	0.060	2.16%
Reg 4	0.312	14.03%	0.221	9.48%	0.202	8.22%	0.251	16.00%	0.234	8.41%
Reg 5	<i>0.873</i>	39.22%	<i>1.188</i>	50.88%	<i>1.326</i>	54.08%	<i>0.419</i>	26.77%	<i>1.646</i>	59.26%
Reg 6	0.337	15.16%	0.271	11.59%	0.410	16.72%	0.397	25.32%	0.329	11.83%
Reg 7	0.104	4.68%	0.149	6.37%	0.101	4.11%	0.086	5.48%	0.096	3.46%
Reg 6	1.907	100.00%	2.099	100.00%	2.102	100.00%	1.419	100.00%	2.440	100.00%
Reg 1	0.136	7.12%	0.234	11.16%	0.397	18.88%	0.083	5.85%	0.103	4.21%
Reg 2	0.061	3.18%	0.142	6.78%	0.046	2.21%	0.052	3.68%	0.051	2.09%
Reg 3	0.063	3.31%	0.132	6.31%	0.055	2.61%	0.043	3.02%	0.049	2.02%
Reg 4	0.051	2.66%	0.053	2.54%	0.044	2.11%	0.029	2.07%	0.039	1.58%
Reg 5	0.026	1.37%	0.023	1.08%	0.021	0.99%	0.027	1.88%	0.026	1.07%
Reg 6	1.228	64.40%	1.343	63.97%	1.329	63.23%	0.950	66.93%	1.897	77.77%
Reg 7	0.342	17.95%	0.171	8.17%	0.210	9.98%	0.235	16.57%	0.275	11.25%
Reg 7	1.847	100.00%	1.758	100.00%	2.091	100.00%	1.346	100.00%	2.378	100.00%
Reg 1	0.165	8.93%	0.320	18.20%	0.111	5.30%	0.108	8.02%	0.110	4.63%
Reg 2	0.024	1.32%	0.019	1.05%	0.023	1.09%	0.019	1.40%	0.021	0.89%
Reg 3	0.028	1.49%	0.016	0.88%	0.084	4.02%	0.021	1.56%	0.021	0.86%
Reg 4	0.035	1.90%	0.033	1.86%	0.027	1.29%	0.021	1.53%	0.028	1.16%
Reg 5	0.012	0.64%	0.013	0.77%	0.011	0.55%	0.013	0.99%	0.009	0.39%
Reg 6	0.225	12.19%	0.207	11.79%	0.226	10.80%	0.206	15.30%	0.176	7.40%
Reg 7	<i>1.358</i>	73.52%	<i>1.151</i>	65.45%	<i>1.609</i>	76.95%	<i>0.959</i>	71.22%	<i>2.013</i>	84.68%

Box 1. Vietnam's Trade Openness

Vietnam's economy stands out for its openness, as measured by the ratio of total trade (imports plus exports) to GDP. As shown in the table below, comparing with other countries in the table, Vietnam's level of openness is behind only that of Malaysia.

Trade Openness (% of GDP)						
	<u>Exports</u>		<u>Imports</u>		<u>Total trade</u>	
	1990	2004	1990	2004	1990	2004
U.S.	9.2	9.8	10.6	15.1	19.8	24.9
Euro Zone	27.1	36.5	27.6	34.5	54.7	71.0
Japan	10.6	13.6	9.8	11.6	20.4	25.2
Emerging South America ¹	24.9	30.0	18.7	25.7	43.7	55.8
China	14.8	39.7	12.0	36.7	26.8	76.3
India	7.2	17.9	9.4	20.7	16.6	38.6
Indonesia	23.9	34.1	24.5	30.1	48.4	64.3
Korea	29.0	43.6	30.2	39.3	59.2	83.0
Malaysia	74.6	121.2	72.6	99.9	147.2	221.1
Philippines	25.9	51.4	31.6	60.6	57.5	112.0
Thailand	36.6	69.9	45.2	65.5	81.8	135.4
Vietnam	32.6	67.3	30.9	74.6	63.6	141.9

¹ Argentina, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, and Venezuela. Simple average.

Source: IMF, *Asia – Pacific Regional Outlook – September 2005*

