



ISSN (Print): 2251-6735
ISSN (Online): 2423-7051

Vol. 9/ No. 36/ Winter 2019

Research Paper

Quantitative Analysis of Spatial Dimensions of Regional Economic Sectors Using New Mixed EFLQ-RAS Method

Ali Asghar banouei: Professor of Department of Development Economics and Planning, Allameh Tabataba'i, Faculty of Economics, Tehran, Iran

Zahra Ziaee: P.H.D Student of Theoretical Economics, Allameh Tabataba'i, Faculty of Economics, Tehran, Iran

Parisa Mohajeri¹: Assistant Professor of Department of Theoretical Economics, Allameh Tabataba'i, Faculty of Economics, Tehran, Iran

Received: 2018/8/1

pp: 45- 48

Accepted: 2019/6/10

Abstract

Application of any types of location coefficient leads to unwanted adjustment in official data of GDP and value added of economic sectors in regional accounts. This problem appears even in the extended FLQ (EFLQ) method which as compared to the former methods is more sensitive to the spatial dimensions of regional sectoral economy. To tackle this problem, in this paper, regional input-output tables for Gilan province is calculated with using a new mixed EFLQ-RAS method and three questions is analyzed: one- Can the application of new methods solves the problem of unwanted official data? Second- As compared to the FLQ and EFLQ methods, does the new method have less statistical errors? Third- Which one of the variables like specialization, concentration, intermediate imports and value-added coefficients have significant effects on δ_j ? Overall findings are as follows: The unwanted adjustment in GDP and sectoral value added in EFLQ is inevitable whereas the new mixed EFLQ-RAS method solves these problems. The new mixed EFLQ-RAS method outperforms the FLQ and EFLQ methods, and the specialization has a significant negative effect and intermediate import has a significant positive effect on δ_j .

Key Words: Input-Output Table, Location Quantity Methods, New Mixed EFLQ-RAS Method,

Extended Abstract

Introduction:

Regional input-output tables (RIOTs) were introduced by Walter Isard to address the issue of quantifying the spatial economy in the framework of Leontief input-output general equilibrium approach. So far, three general methods have been introduced in estimating RIOTs: survey based method, non-survey based method and hybrid method. Among these three methods, the non-survey based spatial location quotient method, which focuses on estimating regional input-output coefficients (RIOCs), is less costly and time consuming than the survey based method and requires less data than the non-survey based method and therefore it is more acceptable.

¹. Corresponding Author's: Email: Parisa_m2369@yahoo.com, Tel: +989059636467

Among the variety of location quotient methods, Flegg Location Quotient (FLQ) and its modified (AFLQ) versions are the most commonly used. Using these methods requires determining and identifying the appropriate δ value which depends on the relative size of the region. The major weakness of these methods is that the determination of the appropriate value of δ is the same for all sectors of the region regardless the size of sectors is large or small.

To overcome the above drawback, the regional analysts have modified the FLQ method which is known the extended FLQ method (EFLQ). One of the advantage of this method is that δ can be determined at sectoral level, on the basis of which RIOC matrix and the propensity to import from other regions can be estimated. The EFLQ method has at least two advantages over the FLQ method:

1. A more detailed adjustment of the national domestic coefficients matrix and the propensity to regional import
2. Linking δ_j to the problem of spatial dimensions such as centralization and specialization at the regional level using the econometrics approach;

It is expected that the EFLQ method will have less statistical error than the FLQ method.

The main concern of the present article is that using any kind of location quotient method to estimate RIOTs leads to an unwanted adjustment of official GDP figures and value-added vectors of provinces in regional accounts. This weakness appears even in the EFLQ method, which is more sensitive to the spatial dimensions of the region than other methods. In order to overcome this weakness, a new hybrid method EFLQ-RAS is introduced. This brings to mind three basic questions: Can a new method solve the problem of an unwanted adjustment of official statistics? Does using of the new method have less statistical errors than the FLQ and EFLQ methods? Three - Do variables such as centralization, specialization, intermediate imports and value added of the sectors have a statistically significant effect? The present study attempts to answer the above questions.

Methodology:

Applying any non-survey based location quotient method to estimate RIOT requires taking into account of two residuals: the vector of value added to balance the columns of table and the vector of exports to balance the rows of table. The former is far from reality due to the existence of official data in regional accounts, while the latter is inevitable due to the lack of required statistics at the regional level. Using the EFLQ-RAS hybrid approach can eliminate the first shortcoming. The following steps have to be taken for applying the above approach:

Step One - Calculate the domestic input-output coefficients of the region by EFLQ method

Step Two - Calculate the regional intersectoral transaction matrix by EFLQ method

Step Three - Calculate intermediate import coefficients vector and regional intermediate import vector from other regions

Step Four - Calculate the intermediate import vector of a region from abroad

Step Five - Subtract the region's intermediate import vector from other countries and the intermediate import vector of one region from the other region from the intermediate cost vector of sectors in the regional accounts that are sectoral or totally available. This computes the required row vector of the sum of domestic consumption by the RAS method.

Step 6 - Calculate the region's intermediate demand vector

Step 7 - Calculate the export vector as residual after calculating the components of final demand vector

Step Eight – prepare the matrix structure without the domestic regional intersectoral transaction matrix

Step 9 - Use the Initial regional intersectoral transaction matrix of the EFLQ method and then apply the RAS method to calculate the final regional intersectoral transaction matrix

In this paper, two types of data bases are used: 1- A symmetric RIOT with the assumption a fixed product sales structure industry by industry table for Iran and Gilan province in 2002. Two- Regional accounts of Gilan Province in 2002. The calculation of SLQ, FLQ, EFLQ and EFLQ-RAS methods are based on the above data. For the second question of the paper, the statistical errors of the estimated

tables from the above methods are compared to the province survey based RIOT using the minimum absolute value of relative error (MAPE).

Results and Discussion:

With respect to the first question, applying the EFLQ method to estimate RIOT and taking the sectoral value added as a residual for column balancing table, the results show that the deviation of the estimated GDP and the official GDP of 1.0739 percent. The deviations at sectoral level is pronounced and ranges between maximum of 54.850% in the manufacture of paper and paper products sector and a minimum of 0.0098% in the wholesale, retail, repair of vehicles and goods sectors. In this article, we show how the new EFLQ-RAS hybrid approach can theoretically and practically solve this shortcoming. Concerning the second question, the findings indicate that the mean statistical errors in the FLQ and EFLQ methods are 9.4150% and 4.6727%, respectively, while the corresponding figure in the new hybrid method is 1.7318% which is less than the EFLQ method error and far less than the FLQ method error. The econometrics method is used to measure the effect of spatial dimensions variables (such as sectoral centralization, specialization, intermediate imports and value-added of the province) as effective and explanatory factors on the sectoral δ_j . The overall findings show significance of the sectoral centralization and value-added effect is not statistically acceptable. The regional specialization index has a significant and negative impact and the intermediate import ratio has a positive and significant effect on Gilan province.

Conclusion:

The main concern of the present article is that using any kind of location quotient method to calculate regional input-output tables leads to unwanted adjustment of official GDP figures. In order to overcome this shortcoming, a new hybrid method EFLQ-RAS is proposed. This brings to mind three basic questions: Can a new method solve the problem of unwanted adjustment of official statistics? Does using of the new method have less statistical errors than the FLQ and EFLQ methods? Three - Do variables such as centralization, specialization, intermediate imports and value added of the sectors have a statistically significant effect?

In this article, we show how the new EFLQ-RAS hybrid approach can theoretically and practically solve this problem. The findings indicate that the mean statistical errors in the FLQ and EFLQ methods are more than the new EFLQ-RAS method. The econometrics method indicate that the regional specialization index has a significant and negative impact and the intermediate import ratio has a positive and significant effect on Gilan province, but the significance of the sectoral centralization and value-added effect is not statistically acceptable.

