

Comparing Gross Multiplier Coefficients with Net Multiplier Coefficients in terms of Regional Economy (Case study: Markazi Province)

Ali Azadinejad¹

Corresponding Author, Assistant Professor of Economics, Meybod University, Meybod, Iran

Sayed Yahya Abtahi²

Assistant Professor of Economics, Islamic Azad University of Yazd, Yazd, Iran

Received: 04\12/2016

Accept:23/11/2017

Extended Abstract

Input-outputtable is a suitable way to identify the key sectors of regional economy. Multiplier coefficients of demand and supply extracted from input-output table may be used to calculate the innovating sectors of demand and supply and consequentially their key sectors. Multiplier coefficients are classified as gross and net (innovated by Oosterhaven&Stelder, 2002).. This study attempts to calculate the gross and net multiplier coefficients for the province of Markazi. The results show that for regional studies the gross multiplier coefficients work better than the net multiplier coefficients. The net multiplier coefficients divide economic activities in two groups of supply or demand; therefore, they cannot be used to create regional key sectors in Iran. However, the gross multiplier coefficients divide the regional economic activities into four groups and can be used to identify the key sectors in Iran.

Methodology

Regional analysis is, in fact, an important branch of economics. One of the most common methods for studying regional economics is the use of regional input-output tables. To identify key sectors, the multiplier coefficients of supply and demand are used. The multiplier coefficients derived from the output-output table are called grossmultiplier coefficients. In this sense, Oosterhaven and Stelder(2002) haverecently introduced a new version called net multiplier coefficients.

In a n-section economy, the relation between sections is expressed in the

1- email:azadinejad@meybod.ac.ir

2- abtahi@iauyazd.ac.ir

formula $x = Ax + f$ when x is the level of production, A is the technical coefficients Matrix, and f is the final demand. When the equation is solved, the Leontief formula ($x = (I - A)^{-1}f = Lf$) would be obtained. The gross multiplier coefficient is computed from the sum of the Leontief matrix column. This equation is $m_d^g = iL = i(I - A)^{-1}$. where m_d^g is the gross multiplier coefficient of demand and i is a row vector of one. Oosterhaven and Stelder believe that the application of these coefficients in determining the economic importance of a sector leads to an overestimation of the importance of that part. Oosterhaven and Stelder (2002) introduce the net multiplier coefficient with $m_d^n = i(I - A)^{-1} \langle f \rangle$ where $i(I - A)^{-1}$ is the gross multiplier coefficient of demand, while $\langle f \rangle$ is a diagonal matrix where its main diameter is filled by the ratio of final demand to output $\langle f \rangle = \frac{f_i}{x}$. Dietzenbacher and Miller (2009) have proved that if net multiplier coefficient of a sector is greater than one, means that this sector very dependent to other sectors.. It is safe to say that the net multiplier has the ability to interpret interdependence among the sections.

Results

After calculating the net and gross multiplier coefficients for Markazi Province, interesting results were obtained from net multiplier coefficients and gross multiplier coefficients. Gross multiplier coefficients classified the sectors into four groups where the first cell reports the key sectors. Key sectors in gross multiplier are:

“Manufacture of paper and paper products”; “Manufacture of chemicals and chemical products”; “Manufacture of basic metals”; “Manufacture of fabricated metal products, except machinery and equipment”; “Manufacture of machinery and equipment” and “Electricity”

There is no key section in net multiplier coefficients. The net multiplier coefficients divide economic activities in two groups of supply or demand and as result cannot be used to create regional key sectors in Iran.

Keywords: Input-output table; Regional economy; Gross multiplier coefficients; Net multiplier coefficients

JELclassification: R12 , R15

References (in Persian)

Azadinejad A., Assari A., & Jahangard E. (2013). Identifying key sectors in Khorasan Razavi Province with a new intersection method and comparing it with AFLQ method [moarefi va karbord teknik jadid mflq bejay aflq baray tadvin jadval dade setande mantaghaei motalea moredi ostan khorasan razavi]. Economics and Regional Development, ۲(5), 168-188

Banouei, A. A., Bazzazan, F., & Karami, M. (2006). A quantitative study on the relationship between space economy and input-output coefficients in 28 provinces of the country [barasi kami rabeta bayne abade eghtesad faza va zarayebe dade setande

- 28 ostane keshvar]. Iranian Journal of Economic Research, 29(1), 143-170.
- Banouei, A. A., JelodariMamaghani, M., &Mohagheghi,M.(2007).the identification of key sectors based on the traditional and modern approaches of demand and supply side economies[shenasaei bakhshhaye kelidi bar mabnay rooykardhaye sonati va novin tarfhay taghaza va arza eghtesad]. Economic Research(Growth and Sustainable Development), 1(1), 1-26.
- Ghelbash, M.(2010).Comparing net multiplier coefficients with gross multiplier coefficients in determining the key sectors in Iran: An input-output approach[moghayesa tatbighi zarayeb fazayande khales va zarayeb fazayande nakhales dar taain bakhshhaye kelidi eghtesad iran: rooykarde dade setande]. (Unpublished master's thesis). AllamehTabatabaeeUniversity, Tehran.
- Jahangard, E.(1998). Identifying the key sectors in the economy of Iran in a program of economic development[shenasaei faaliathaye kelidi eghtesad iran dar yek barname tosea eghtesadi].Program and Budget Journal, 31(32), 99-123.
- Jahangard, E.(2002).Identify the key sectors in the industrial of Iran[shenasaei faaliathaye kelidi sanati iran]. Economic Research and Policy, 21(1), 45-70.
- Pirmoradian,M.(2008). Measuring the importance of size of Iranian economy sectors based on hypothetical elimination methods[sanjesh ahamiat andaza nesbi bakhshhay eghtesad iran bar mabnay ravesh hazfe farzi] (Unpublished master's thesis), AllamehTabatabaeeUniversity, Tehran.
- SabaghKermani, M. (2001). Regional economics (theory and models)[eghtesad mantaghaei:teori va modelha]. Tehran, Iran: SAMT Publications.
- Tofigh, P.(1992). Analysis of input-output in Iran and its applications in predicting and planning.[tahlil dade setande dar iran va karbordhay an dar sanjesh, pishbini va barnamahrizi] Tehran, Iran: pirooz.
- Vaisi, E. (2007).Measuring spatial linkage (internal and external) in the regional development of Kermanshah province[sanjesh payvandhay fazaei(dakheli va khareji) dar tosea mantaghaei ostan kermanshah](Unpublished master'sthesis).AllamehTabatabaeeUniversity, Tehran.

References (in English):

- Dietzenbacher, E., & Miller, R.E. (2009). RAS-ing the transactions or the coefficients: It makes no difference. Journal of Regional Science, 49(3), 555-566.
- Flegg, A. T.,&Webber, C. D. (1997). On the appropriate use of location quotients in generating regional input-output tables: Reply. Regional Studies, 31(8), 795-805.
- Flegg, A. T., &Webber, C. D. (2000). Regional size, regional specialization and the FLQ formula. Regional Studies, 34(6), 563-569.
- Ghosh, A.(1958).Input-output approach in an allocation system. Economical, 25(97), 58-64.
- Hirschman, A.O. (1958). The strategy of economic development. New Haven, USA: Yale University Press.
- McCann, P.,&Dewhurst, J. H. L. (1998). Regional size, industrial location and input-output expenditure coefficients. Regional Studies, 32(5), 435-444.
- Mesnard, L. (2007). Reply to Oosterhaven's: The netmultiplier is a new key sector indicator. Annals of Regional Science,41(2), 249-271.
- Miller, R. E.,& Blair, P. D. (2009). Input-output analysis: Foundations and extensions (2nd Ed.). Cambridge: Cambridge University Press.
- Oosterhaven J., &Hoen, A.R. (1998). Preferences, technology, trade and real income

changes in the European Union: An intercountry decomposition analysis for 1975–1985. *Annals of Regional Science*, 32(4), 505-524.

Oosterhaven, J. (2006, November). A new approach to the selection of key sectors: China, South Korea, the Netherlands, the United States. Paper presented at the 53rd North American Meetings of the Regional Science Association International, Toronto, Canada.

Oosterhaven, J., & Stelder, D. (2002). Net multipliers avoid exaggerating impacts: With a bi-regional illustration for the Dutch transportation sector. *Journal of Regional Science*, 42(3), 533-543.

Rasmussen, P.N. (1956). *Studies in intersectional relations*. North-Holland, Amsterdam: Poul Nørregaard.

Round, J. I. (1978). An interregional input-output approach to the evaluation of non-survey methods. *Journal of Regional Science*, 18(2), 179-194.

Stevens, B.H., Treyz, G.I., & Lahr, M.L. (1989). On the comparative accuracy of rpc estimating techniques. In R. E. Miller, K. R. Polenske & A. Z. Rose (Eds.), *Frontiers of input-output analysis* (pp. 245-257). Oxford: Oxford University Press.

Tohmo, T. (2007). *Regional economic structures in Finland: Analyses of location and regional economic impact* (Unpublished doctoral dissertation). University of Jyväskylä, Jyväskylä, Finland.