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Evaluations of Driving Effects of the Automotive Industry in the Romanian Economy – a Quantitative Analysis

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Abstract

After a decade of transformations experienced by Romania on its way to the market economy, the sustained economic growth in the period 2000-2008 marked a positive change of path. Structural changes of the production system were expected under the impact of technological upgrading and of the integration to the European Union. The paper is focusing on the analysis of inter-industrial linkages, as well as on the evaluation of direct and indirect technological requirements, by using the Input-Output model. Since the automotive industry had a very good dynamic in the last years, its position in the system is of great interest. The research reveals its linkage intensities during the growth period and under the shock of the crisis. The results show that this export oriented industry has reduced its upstream linkages and increased its downstream linkages, while becoming more dependent on the international flows.

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Keywords: input-output model; technological structure; automotive industry; backward and forward linkages; linkage intensity

1. Introduction

The analysis of structural changes represents a useful procedure for observing the transformation of a national economy while production is adapting to the demand dynamics and to technological changes.

One of the best methods to estimate the interdependence between activities and the cumulated (direct and indirect)

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effect of final demand components on the productive system is to use the Input-Output (I-O) model proposed by W.W. Leontief. The most complete representation of I-O model results was achieved by Leontief (1951) in his research work “Studies in the structure of US Economy”, where he aimed at constructing the *Tableau économique* of the United States. That scheme became the prototype of the current I-O model. According to his own statement, Leontief (1966) tried to apply the neoclassical theory of general equilibrium presented by L. Walras at the realities of economic life. Currently, this method is spread and applied for analysis, planning and anticipation of trends at national and regional level.

In Romania there is constant concern for evaluating structural changes of the economy and for estimating the competitiveness of different sectors. Scutaru and Florescu (2005) analyzed the global competitiveness of branches in Romania when the intensity at export doubled in the period 1989-2002 and observed that, the more export shares increased, the branches contribution to resource formation decreased. Olteanu (2006) identified in Romania in 2003 a symmetrical distribution, on the technological scale, of linkage intensities in the upstream and downstream of manufacturing branches. This intensity was reduced in the area of low technologies, increased for the medium technologies, and decreased again in the case of high technologies. According to Zaman et al. (2010) the interdependencies level of the economy increased in 2006 compared to 2000, during the economic growth period, while more than a half of the branches have offered higher inputs to the other branches. Dobrescu et al. (2010) evaluated the impact of investments in economy during the crisis period by using the I-O model, noting that a decline by only 0.32% of gross fixed capital formation (GFKf) in 2010 was sufficient for any aggregated sectors to hinder the recovery and the process of economic growth.

The current paper aims at evaluating some aspects of structural changes in the Romanian economy in the period 2001-2010, by highlighting the driving effects produced by the industries of equipment, automotive and transport machines. The analysis refers especially to the automotive industry, which became an engine for economic recovery in the last years.

2.Methodology

For achieving the proposed objectives, we utilized the I-O model, by aggregating the branches of Romanian economy. The productive system has been reduced to ten main branches (R.1.-R.10.):

- R.1. Agriculture, forestry, hunting and fishing
- R.2. Mining and quarrying
- R.3. Electricity, gas and steam production, distribution and treatment/decontamination
- R.4. Food industry, alcohol and tobacco
- R.5. Textiles, leather industry, production of cellulose and paper, furniture industry
- R.6. Industries of equipment, automotive and transport machines, other metal products
- R.7. Other manufacturing industries
- R.8. Constructions
- R.9. Transportation, post and telecommunications
- R.10. Trade, commercial and public services.

In table 1 is given the simplified Input-Output model of production and distribution of goods and services of a national economy.

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