# Changes in the exerted market power in the farming sector and the food industry in Poland, and the business cycle

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## 1. Introduction

Fluctuations in macroeconomic activity cause structural changes in the farming sector and the food industry, as well as influence the functioning of food chains, what effects food security [Da-Rocha & Restuccia 2002, Figiel & Kufel 2013, Hamulczuk 2015]. Therefore, in order to predict and prepare for future developments, the character of these relationships should be examined. The problem addressed in the paper is the interaction between formation of market structures in the Polish farming sector and the Polish farm industry, and development of the business cycle. Specifically, as an indicator of a degree of monopolization of market structures, a level of exerted market power measured by the markup of price over marginal cost, was utilized [Church 2000]. The related research question is how business cycle influences changes in the structure of the Polish food sector and the Polish farm industry, and whether these changes interact with each other.

## 2. Data and methods

As a business cycle indicator, real GDP in Poland was used, whereas for markups estimation the Rotemberg & Woodford [1999] method based on the labor input margin to measure marginal cost, was applied. In order to answer the research question, VAR analysis and impulse response functions were utilized. The data on business cycle came from the Polish Central Statistical Office (CSO), the data regarding food industry came from the financial statements delivered to the CSO, and the data on the farming sector came from the European Farm Accountancy Data Network (FADN). The dataset covers the period 2004-2013.

## 3. Results

It appeared from the analysis that the exerted market power in the Polish food industry behaves anticyclical, whereas the exerted market power in the Polish farming sector behaves procyclical. However, changes in market structures of the food industry positively affect changes in market structures of the farming sector. Thus, from the one hand fluctuations in economic activity change market structures along food chains, but from the other, market structures interact with each other as well. The reason may be that during recession firms restrain from lowering prices in a fear of rising market competition, as their competitors may do the same. In order to save profits they create cartels, which are closed during recovery because of increasing external competition and better perspectives for self-activity. While prices of final goods remain sticky during downturns, prices of raw materials decrease because of a shape of marginal cost curves in agriculture and mining, which deviate sharply upwards [Lopez & Assous 2010]. Consequently, during recessions, markups in the food sector increase and in the farming sector decrease. But this is no longer true in the longer period, as the increasing exerted market power in the food sector implies the increase in the exerted market power in the farming sector, as food industry oligopolists are more willing to contract deliveries with oligopolists in the farming sector, making smaller farmers to leave the market. Finally, related policy implications were pointed out.

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