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CYCLICALITY OF MARKUPS IN THE EU FOOD INDUSTRY AND THE MICHAŁ KALECKI THEORY

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Abstract. The problem of markups cyclicality is nowadays one of the most urgent one, as the assumption of countercyclical markups is a key one in a number of neokeynesian macroeconomic models. The aim of the paper was to use the Kalecki theory to explain the mechanism behind the countercyclical markups in the EU and Polish food sectors taking advantage of literature review and logical reasoning. Moreover, as an answer for the newest studies indicating procyclical markups in the EU and the USA, it was checked, utilizing panel regressions, if the EU food sector markups cyclicality is different from that of other EU manufacturing industries. It was concluded, that although the Kalecki explanation of countercyclical markups is still in force regarding the EU countries food sector, it is no longer adequate in regards to the EU manufacturing sector.

Key words: price-cost margins, business cycles, Kalecki approach

INTRODUCTION

The monopolistic markup of price over marginal cost is inversely proportional to the price elasticity of demand and indicates the level of exerted market power [Pindyck and Rubinfeld 2013]. As pointed Nekarda and Ramey [2013], research on markups cyclicality is currently one of the more challenging measurement issues in macroeconomics. This is mostly because the assumption of countercyclical[1] markups, referring to the changes in the level of market competition, is one of the main in a number of neokeynesian macro--economic models, e.g. Smets and Wouters [2003] and Christiano et al. [2005]. Because

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[1] Markups are referred as procyclical, when its correlation with the business cycle is positive, and countercyclical – when it's negative, where both correlation and regression analysis are used to determine the cyclicality (see Rotemberg and Woodford [1999]).

these models are nowadays most frequently used by central banks, including the Polish Central Bank, estimates of markups cyclicality influence the monetary policy[2]. Moreover, the topic is important in the context of predicting business cycles [Figiel i Kufel 2015].

The first economist, who presented a market-clearing model, in which the elasticity of goods demand behaves procyclically, giving the theoretical justification for countercyclical markups, was the Polish economies Michał Kalecki [Bils 1987, Martins and Scarpetta 1999]. Klein [1951] admitted that the model created by Kalecki presented in 1933 in *The trial of business cycle theory* includes all important elements from the *Theory of employment, interest rate and money* written by Keynes and published in 1935, what makes Kalecki the parallel creator of the so-called Keynesian revolution. According to Perlman and Mc Cann [1998] his theory of effective demand predated the theory as stated by Keynes.

As proved in the previous studies, markups in the Polish food industry [Kufel 2015a], as well as in the EU food industry [Kufel 2014] behave countercyclical. Also markups in the whole Polish manufacturing behave countercyclical [Gradzewicz and Hagemejer 2007, Hagemajer and Popowski 2012, Gradzewicz et al. 2012]. This however stays in contradiction with the latest results obtained for the EU [Gali et al. 2007], as well as for the USA [Nekarda and Ramey 2013], what may undermine the assumptions behind the neokeynesian models and created the urgent need for an explanation for these inconsistent results.

In such a framework, the aim of this paper is to describe the mechanism behind the countercyclical behaviour of the EU and Polish food industry using theories created by Michał Kalecki, as well as to check if the EU food industry cyclicality is different from the cyclicality of other branches of the EU manufacturing industry. Therefore, the two following questions are tried to be answered:

- How the Kalecki theory explains the cyclicality of markups in the food industry?
- Is the markups cyclicality in the food industry different from that of other EU industries?

The author hope is that the answer to these questions will contribute to the ongoing discussion on how and why markups change, especially considering their cyclicality.

MATERIAL AND METHODS

In order to answer the first question, presented in the introduction chapter, the literature review and logical reasoning are utilized. The problem of markups cyclicality is tacked in the framework of three main theories created by Michał Kalecki, that is the theory of effective demand, the theory of prices and the distribution of national income and the business cycle theory [Lopez and Assous 2012]. Although the problem of countercyclical markups was discussed mostly within the second one, it concerns the first and the third one, as the Kalecki macroeconomic model is underlid by the assumption of imperfect competition.

[2] More broadly on the concept of markup, its significance and estimation methods (see Kufel [2015b]).

In order to reveal the character of the relationship between markups and business cycle in different industries the 14 regression models separately for each of 14 manufacturing industries in 27 EU countries (without Croatia) are solved. Industries being analyzed are as follows: (1) Production of food, non-alcoholic beverages and tobacco; (2) Production of textiles and textile products; (3) Production of leather and leather products; (4) Production of wood and wood products; (5) Production of pulp, paper and paper products, publishing and printing; (6) Production of coke, refined petroleum products and nuclear fuel; (7) Production of chemicals, chemical products and man-made fibres; (8) Manufacture of rubber and plastic products; (9) Manufacture of other non-metallic mineral resources; (10) Manufacture of basic metals and fabricated metal products; (11) Manufacture of machinery and other equipment; (12) Production of electrical and optical equipment; (13) Manufacture of transport equipment; (14) Other manufacturing industries.

Because of the data availability, for markups measurement price-cost margin (*PCM*) is applied. In the *k* industry of *i* country it can be expressed as follows [Cheung and Fujii 2005]:

$$PCM_{i.t}^{k} = \frac{V_{i.t}^{k} - M_{i.t}^{k} - W_{i.t}^{k}}{V_{i.t}^{k}} = \frac{VA_{i.t}^{k} - W_{i.t}^{k}}{V_{i.t}^{k}}$$

where: $V_{i.t}^{k}$ – output value;
$M_{i.t}^{k}$ – cost of materials;
$W_{i.t}^{k}$ – compensation of labour;
$VA_{i.t}^{k}$ – value added.

The high *PCM* value is an evidence of higher increase of a price above costs and therefore a bigger market power [Kufel 2014]. A business cycle, after Gradzewicz and Hagemejer [2007], is considered on both sectorial and macroeconomic levels. Consequently, as an indicator of the macroeconomic business cycle the most common indicator [Drozdowicz-Bieć 2012], that is real GDP is utilized, whereas value added testifies for changes in the activity on the sectorial level. Both measures, because of being non-stationary, are detrended using first differences of logarithms[3].

Due to the limited number of explanatory variables, the panel regression is chosen. It is estimated with the generalized least squares method. Group effects is tested with the F-test, the Breusch-Pagan test is used to check if group effects extraction is justified, and the type of effects is chosen with the Hausmann test. Both, the time and the country effects are taken into consideration. Consequently, the analyzed equation is as follows:

$$\mu_{it} = \alpha_i + \alpha_t + \beta Y_{it} + \varepsilon_{it}$$

where: μ_{it} – logarithm of *PCM*;
α_i – country effect;

[3] Markups are not detrended because in their essence they cannot grow indefinitely.

α_t – time effect[4];
Y_{it} – logarithm of a business cycle indicator.

The data are on a yearly basis and come from the Eurostat database covering the period 1995–2010. Because of the missing data, the number of observations, the number of countries analyzed, the length of the time series differs across industries. The panel wasn't balanced.

THE DEGREE OF MONOPOLY AND THE BUSINESS CYCLE ACCORDING TO MICHAŁ KALECKI

Michał Kalecki (1899–1970) was an autodidact in economics. Because of the material situation he stopped his polytechnic studies, became a publicist and an economic analyst. *The trial of business cycle theory* was published while he worked in the Institute for Business Cycles and Prices Research in Warsaw. Although in 1970 his candidacy was considered by the Nobel Prize Committee, only after the 2007 crises his theory was brought back by the most influential economists in the USA, the UK and Germany, who regarded his solutions as more appropriate than those created by Keynes [Woś 2014]. The possible reason may be that Michał Kalecki was always aware of a need for combining rationality with socio-political consequences, e.g. by studying the convertibility of a loss in consumption for the later benefits [Brus 1999].

Both economists share the following: a principle of effective demand, investments as a variable guiding the economic system, and an allowance of persistent involuntary unemployment [Assis Libanio 2002]. Nevertheless, according to Klein [1951] as well as Landreth and Colender [1998] the Kalecki model may be regarded as even superior to Keynes because of including: dynamic setting, national income division, both investment decisions and their realisation, as well as elements of monopoly instead of perfect competition. Assis Libanio [2002] wrote Kalecki wasn't discovered because of the Polish language of publication and a lack of Keynes ability to attract attention. Moreover, his works were quite laconic and difficult to understand, and he made few references to works of other authors. But the main reason why Kalecki hasn't been popular is the dominance of neoclassical economic theory in teaching economics and excluding other options from consideration [Sawyer 1985]. While Kalecki placed himself in the classical or the Ricardian-Marxian approach, Keynes contributed to the neoclassical, particularly the Marshallian one, so he could be more accepted by the mainstream [Assis Libanio 2002]. Although Kalecki used mathematical modelling and econome-trics in empirical studies, his works were in contrast with neoclassical orthodoxy because of an assumption that a capitalist economy may be better described by monopolistic competition, taking advantage of social classes, as well as an absence of: equilibrium analysis, utility function and production function.

[4] This study is a continuation of the analysis of the behavior of the EU food sector markups in the business cycle [Kufel 2014], which was concentrated solely on this industry and 8 different specifications were analyzed taking into consideration different variables indicating the business cycle. For a more detailed characteristic of the panel regression methodology and data see Kufel [2014].

The Kalecki principle of effective demand states the aggregate expenditure determines the aggregate supply. In other words, expenditures in relation to what was spent on consumption and investment, determine profits and wages [Assis Libanio 2002]. Kalecki distinguished two classes – workers who earn wages (W) and spent them (C_w) immediately without savings, and capitalists who earn profit (P) and spend it on consumption (C_c) and investment (I). Considering identity between national income ($P + W$) and aggregate expenditure ($C_w + C_c + I$), it turns out that profits equals investments plus capitalists consumption. Because according to the principle of effective demand causality runs from expenses to income, capitalists are the one who by their spending decisions determine profit, and having the national income distribution between profits and wages given, also the national income and product. In other words workers spend what they earn and capitalists earn what they spend. Because consumption is quite stable, investments become the most important for the business cycle dynamics. Summarising, it can be stated, that production and employment depend on the capitalists investment expenses and on the national income distribution (e), which is calculated as the share of profits in the national income [Lopez and Assous 2012].

The Kalecki theory of national income distribution is based on three assumptions. Firstly, short-term marginal cost of majority of companies isn't considerably different from the average cost including workers wages and cost of materials until the point of practical production capacity[5]. He pointed, that in the imperfect competition firms revenues are limited by the demand, and its changes cause quantity and prices adjustments, opposite to the perfect competition, where costs and prices limit revenues. Secondly, a firms production is usually under this point, as excess capacity is a normal consequence of imperfect competition, in which firms operate most of the time. Thirdly, companies make markup (μ) over their marginal costs (MC), where markup is called a degree of monopoly and it's an inverse of the elasticity of demand. The degree of monopoly is expressed as a ratio of firms outputs (profits plus costs) to costs, but it can be also (see PCM) measured by the markup over price (k') calculated as the ratio of output value minus costs to the value of output[6]. When an industry is vertically integrated, so costs are made of wages only, we get:

$$k' = \frac{P + W - W}{P + W} = \frac{P}{P + W} = e$$

Summarising, if the marginal costs curves are horizontal (1) until the point of practical production capacity (2), the degree of monopoly (3) describes the relation of profits to the national income, and consequently also the relative shares of wages and profits in the national income[7].

[5] The Kalecki assumption, that when the production capacity is underutilized, firms can act on the horizontal part of their marginal cost curve (constant returns to scale) was however broadly criticized [Scitovsky 1964].

[6] It is widely utilized transformation, as $\frac{P - MC}{P} = 1 - \frac{MC}{P} = 1 - \frac{1}{\mu}$.

[7] The same is true, when industry isn't vertically integrated, so a firm buys part of materials from other firms, and costs are made of both wages and materials [Lopez and Assous 2012].

The theory of income distribution shows that the degree of monopoly is the most important factor influencing the profits share in the national income, and stability of distributive shares depends on the stability of markups. Moreover, because according to the theory of effective demand changes in distribution of the national income between profits and wages affect the national income, the degree of monopoly is also the most important factor influencing the national income itself. The theory of income distribution says, that a change in aggregate expenditure doesn't have to cause a change in the share of profit in the national income as long as the degree of monopoly stays unchanged. The degree of monopoly is determined by: a structure of an industry, an intensity of price competition, a product differentiation and a power of labour unions [Lopez and Assous 2012]. Moreover, it should be noticed, that the Kalecki theory of effective demand is related to the entrepreneurs pricing policy, and that it is in fact a short-term theory dealing with daily firms decisions [Scitovsky 1964].

Kalecki proposed an endogenous explanation for the business cycle [Assis Libanio 2002]. Two basic engines are: a positive influence of the national income on investments and a negative of capital stocks on decisions to invest. The increase of investments orders in the prosperity phase leads to the increase of production of investment goods, and then to the increase of capital stocks, which finally exceeds replacement requirements, what decreases gross profitability and investment demand. Afterwards, investment orders start to decrease and downturn begins. Therefore, cycles are caused by investments acting in two roles – they increase aggregate expenditure and create production capacity. The investment paradox is that they stimulate the economy only when they are built, created (as expenditures). After that, they compete with the equipment of an older generation, make the employees unemployed and start producing goods and services which lack increasing demand, what ends the prosperity. Consequently, any investment is better than none[8].

Regarding markups cyclicality (the cyclicality of a degree of monopoly), Kalecki [1938] supported the Joan Robinson opinion [1933], according to which the degree of monopoly depends on the number of companies, which is changing in the cycle. He pointed out the countercyclical behaviour and explained it by the fact that during downturns firms restrain from decreasing prices in a fear of increasing competition[9]. Kalecki argued that during downturns, in order to save profits firms combine in cartels, which

[8] In the later stages of development of the business cycle theory, Kalecki stated the economy dynamics of capitalism cannot be taken as something given and obvious, resulting from the nature of capitalists. In his opinion business cycle fluctuations around the quasi-static state are caused by exogenous factors in the form of incentives for innovation, e.g. great technological innovations or new exogenous markets. Without them the stagnation comes [Kowalik 2015].

[9] Lopez and Assous [2010] noticed that this reasoning was in accordance with the Sweezy [1939] theory of a kinked demand curve in an oligopoly. If a producer increases a price, he notices a loss, as his rivals don't reciprocate in order to take his clients, whereas decreasing his price he can't expect expanding his business at the expanse of his market rivals, as they reciprocate in order not to lose their clients. The increase of demand with increasing prices results in the demand curve losing its elasticity, whereas the decrease of demand with decreasing prices results in the higher elasticity, as rivals are eager to reciprocate, so a producer is determined to keep the price unchanged. Consequently, during booms prices increase easily, whereas during downturns they resist pressure to decrease.

are closed during recovery because of an external competition (new entrants) and better perspectives for self-activity. Consequently, despite the decrease of prices of materials and wages during downturns, prices of final goods remain sticky. Entrepreneurs don't decrease prices as their competitors may do the same. Creating cartels they are not afraid of the external competition. Consequently, markups increase. In his opinion this argument was more important than the one saying that the higher income during the prosperity phase implies the lower expected value of looking for better options among closer substitutes, what would cause decrease of elasticity of demand and therefore increase of markups making them procyclical [Lopez and Assous 2010].

Moreover, when an industry isn't vertically integrated, so a firm buys part of materials from other firms, and costs are made of both wages and materials, the relative share of wages in the value added (w) being a sum of profits and wages, is described by both a degree of monopoly (k) calculated as a ratio of firms outputs ($P + W + M$) to costs ($W + M$) and a relation between variable costs of materials and wages (j) [Lopez and Assous 2010]:

$$W = \frac{1}{1+(k-1)\cdot(j+1)}$$

Consequently, Kalecki [1938] argued, that the observed stability in the relative share of wages (w) during the business cycle is an outcome of opposite changes of the degree of monopoly (k) and the ratio of materials cost to wages (j) in the cycle. While countercyclical changes in markups are caused by different sources of price stickiness at the product market and by cooperative firms activities, which aim is to save their profits by strengthening their market power during crises, the ratio of materials cost to wages change procyclically because of a shape of marginal cost curves in agriculture and mining, which deviate sharply upwards, so costs of materials from agriculture and mining fluctuate stronger during business cycle then wages in manufacturing industries[10]. Interestingly, Kalecki [1954] didn't want to explain more precisely why the degree of monopoly and the ratio of materials cost to wages change so accurately, that the labour share remains constant. In his opinion the knowledge with regard to transformations in manufacturing industry is needed and this is a task for an economic historian.

PCM CYCLICALITY IN 14 MANUFACTURING INDUSTRIES

Table 1 presents the results of panel regressions executed for 14 manufacturing industries across 27 EU countries.[11] The constant seemed to be significant in all specifications. The Hausmann test indicated fixed or random effects, and the Breusch-Pagan as well as

[10] Kalecki spoke about the class war, what eventually determines income distribution. Assuming an increase of costs of materials and stable wages, entrepreneurs would like to keep their profits by increasing prices by the same amount, so the degree of monopoly remains constant. As a result, the share of wages in value added decreases. But workers can defend their share, e.g. by creating labour unions, which increase their bargaining power. Additionally, he pointed, that the share of wages increases, when industries with share of wages above average become relatively more important in creating national income, so also the market structure matters [Lopez and Assous 2010].

[11] A more detailed presentation of data on business cycles may be found in Kufel [2014].

F-tests showed that group effects were significant in RE and FE models, respectively. The only exception was the result of regression for Production of wood and wood products (4), where the constant appeared to be insignificant, as well as group effects. In models with significant variables for both sectorial and macroeconomic business cycle, these variables explained more than 65% of the *PCM* variability. Interestingly, an industry the most vulnerable for changes in the business cycle was Production of food, beverages and tobacco (1). The explanatory variables explained 84% of an overall variation of this variable.

Table 1. Results of panel regressions with fixed (F) or random (R) effects separately for 14 EU manufacturing industries (parameter estimation; standard error; *p*)

Specification	1F	2R	3R	4F	5R	6R	7R	8R	9R	10R	11R	12R	13F	14R
Sectorial cycle (value added)	0.45 0.09 ***	1.11 0.19 ***	0.94 0.19 ***	1.03 0.34 ***	0.54 0.14 ***	–0.17 0.11 0.13	0.53 0.12 ***	0.93 0.21 ***	0.11 0.13 0.42	0.44 0.17 ***	1.05 0.17 ***	0.73 0.20 ***	0.67 0.17 ***	0.46 0.11 ***
Macrocycle (GDP)	–0.40 0.24 *	0.20 0.53 0.71	–0.31 0.85 0.72	–1.26 0.34 ***	1.31 0.33 ***	1.61 1.73 0.35	–0.14 0.36 0.69	0.81 0.64 0.21	1.96 0.45 ***	1.64 0.55 ***	–0.91 0.58 0.11	0.31 0.80 0.69	0.63 0.82 0.44	–0.13 0.39 0.74
Constant	–2.15 0.01 ***	–2.30 0.08 ***	–2.48 0.13 ***	0.00 0.01 0.76	–2.02 0.06 ***	–2.82 0.19 ***	–1.92 0.06 ***	–2.15 0.05 ***	–1.94 0.03 ***	–2.33 0.05 ***	–2.34 0.04 ***	–2.35 0.10 ***	–2.62 0.03 ***	–2.31 0.21 ***
Number of observations	280	280	258	280	280	233	280	277	280	279	280	271	278	269
Number of countries	22	22	21	22	22	20	22	22	22	22	22	22	22	22
Length of time series	8–14	8–14	8–14	8–14	8–14	3–14	8–14	8–14	8–14	8–14	8–14	7–14	8–14	3–13
'Within' and 'Between' variance	–	0.06 0.14	0.18 0.31	–	0.02 0.07	0.54 0.68	0.03 0.07	0.07 0.05	0.02 0.02	0.04 0.06	0.05 0.03	0.13 0.23	–	0.04 0.93
R^2 (when FE)	0.84	0.71	0.65	0.34	0.78	0.52	0.71	0.47	0.58	0.65	0.47	0.61	0.62	0.89
Breusch-Pagan test	1027 <0.01	710 <0.01	536 <0.01	0.05 0.82	874 <0.01	200 <0.01	679 <0.01	186 <0.01	342 <0.01	601 <0.01	153 <0.01	391 <0.01	408 <0.01	133 <0.01
Hausman test	6.80 0.03	1.43 0.49	2.09 0.35	6.74 0.03	1.37 0.50	1.15 0.56	1.34 0.51	1.86 0.40	3.17 0.20	2.91 0.23	4.01 0.13	1.16 0.56	18.62 <0.01	1.73 0.42
F-test	57.55 <0.01	25.89 <0.01	21.11 <0.01	1.18 0.27	37.63 <0.01	11.5 <0.01	27.55 <0.01	8.60 <0.01	12.97 <0.01	19.81 <0.01	7.96 <0.01	18.09 <0.01	15.25 <0.01	92.08 <0.01

* indicates significance at 10-percent level
*** indicates significance at 1-percent level

Source: Own elaboration based on Eurostat data.

In all industries analyzed markups approximated by *PCM* appeared to be procyclical regarding sectorial cycle indicated by the value added. The only exception was Production of coke, refined petroleum products and nuclear fuel (6), where the sectorial cycle influence was negative, but insignificant. Also in Manufacture of basic metals and fabricated metal products (9) the influence of sectorial cycle appeared to be insignificant. The strength of the influence of sectorial cycle was diverse. It was minimal in Manufacture of basic metals and fabricated metal products (10), where a 1-percent increase of sectorial value added was accompanied by 0.44-percent increase of markups, and maximal in Production of textiles and textile products (2), where a 1-percent increase of sectorial value added was accompanied by a 1.11-percent increase of markups. Regarding Production of food, non-alcoholic beverages and tobacco (1), a 1-percent increase of sectorial value

added was accompanied by a 0.45-percent increase of markups, what means the strength of relation above average, which amounted to 0.74.

Regarding the macroeconomic cycle, the results seemed to be much more varied. First of all, only in 4 out of 14 industries this relation was statistically significant. Out of these, it was negative in one industry and positive in three ones[12]. The positive relation was in Manufacture of machinery and other equipment (9), where a 1-percent increase of GDP was accompanied by a 1.96-percent increase of markups, as well as in Manufacture of basic metals and fabricated metal products (10) with a 1.64-percent increase of markups, and in Production of pulp, paper and paper products, publishing and printing (5) with a 1.31-percent increase of markups. Because in the regression regarding markups in Production of wood and wood products (4) the constant was insignificant, the only industry with countercyclical markups appeared to be Production of food, non-alcoholic beverages and tobacco (1), where 1-percent increase in GDP was accompanied by a 0.4-percent decrease in markups.

Summarising, the markups in the EU food industry, similar to the other manufacturing industries, were procyclical regarding industrial cycle, but countercyclical regarding the macroeconomic cycle, what makes it different from other EU manufacturing industries. Because of the insignificance of part of the results, additionally two panel regressions were conducted using our database, but with all industries combined (Table 2). Markups in the EU manufacturing industry in the period analyzed seemed to behave procyclical regarding the industrial business cycle and also procyclical regarding the macroeconomic business cycle, what is in accordance with results received by Gali et al. [2007]. Specifically, GDP (1F) was replaced by the national value added (2F), so the results for sectorial cycle may become significant. Finally, the second research question may be answered – markups cyclicality in the food industry in the period analyzed was indeed different from that of other industries.

Table 2. Results of panel regressions with fixed (F) effects for 14 EU manufacturing industries (parameter estimation; standard error; *p*)

Specification	1F	2F
Sectorial cycle (value added)	0.02; 0.06; 0.70	0.12; 0.06; **
Macrocycle (GDP)	1.92; 0.39; ***	
Macrocycle (value added)		1.05; 0.32; ***
Constant	–2.21; 0.01; ***	–2.19; 0.01; ***
Number of observations	196	196
Number of countries	14	14
Length of time series	14	14
R^2 (when FE)	0.87	0.86
Breusch-Pagan test	916.90; 2.08e-201	898.96; 1.66e-197
Hausman test	10.09; 0.01	9.92; 0.01
F-test	88.66; 6.09e-071	82.27; 1.88e-068

** indicates significance at 5-percent level; *** at 1-percent level

Source: Own elaboration based on Eurostat data.

[12] When not excluding the insignificant cases, markups were countercyclical in 6 industries and procyclical in 8 ones.

DISCUSSION

The Michał Kalecki theory of prices and income division brings an explanation of the countercyclical behaviour of markups in the EU food sector, so of the counteryclical changes in the exerted market power in the EU food sector. The same is true with the countercyclical markups in Poland [see Gradzewicz and Hagemajer 2007, Hagemajer and Popowski 2012, Gradzewicz et al. 2012] and all countries analyzed in other studies of markups cyclicality, e.g. by Bils [1987], Rotemberg and Woodford [1999], Martins et al. [1999], Bils and Kahn [2000], Gali et al. [2007], Jaimovich and Floetotto [2008], Edmond and Veldkamp [2009].

The Kalecki theory seemed however as not the proper one to explain the procyclicality of markups in reference to the business cycle in the part of the EU manufacturing industries in the period 1995–2010. The obtained results regarding the macro cyclicality of manufacturing industry confirm these received by Nekarda and Ramey [2013] for the USA and by Gali et al. [2007] for the EU. Consequently, the Kalecki explanation isn't good for them too. Also the procyclical behaviour of markups regarding the sectorial business cycle cannot be explained by the Kalecki theory. It should be added however, that the theory wasn't created to be applied to the sectorial business cycles. Gradzewicz and Hagemajer [2007] admitted, that the character of cyclicality regarding sectorial business cycle may be opposite because of different kind of adjustments to external shocks on the levels of economy and sectors, as well as different kinds of shocks encountered at both levels.

Moreover, looking at the type of industries, it can be observed, that markups are countercyclical in regard to industries of necessity goods (like food) and procyclical in regard to industries like machinery and other equipment, basic metals and fabricated metal products, pulp, paper and paper products, publishing and printing, which can be described as investment goods, superior goods or maybe goods where innovations nowadays appear more frequently. This may also explain countercyclical markups in Poland, as the Polish economy is the developing one and converging to the more innovative economies, which are primary based on production of superior goods. In other words, taking into account that manufacturing markups are procyclical in the EU and countercyclical in Poland, the result obtained may show that from the macroeconomic point of view the food industry is playing more important role in Poland than in the EU. Therefore, it can be stated, that although the Kalecki theory explains the behaviour of markups in the food sector, it might be not robust to changes in the structure and way of functioning of the developed countries manufacturing sector and theirs stages of development.

CONCLUSIONS

The aim of this study was to explain the mechanism behind the countercyclical behaviour of the Polish food industry markups using the theory of Michał Kalecki, and to check if the food industry cyclicality is different from the cyclicality of other EU manufacturing industries, taking advantage of the panel regression. The scope of the analysis equalled approximately 1–2 business cycles, what enables studying variability of markups in the cycle, though drawing general, long-term conclusions was rather limited. Business cycle

was approximated by the value added on the sectorial and GDP on the macroeconomic level, whereas markups – by the *PCM*. In order to remove the trend from the data first difference of logarithms were calculated.

The Polish economist Kalecki developed a theory of imperfect competition, in which firms set the price of a product adding a markup over average variable costs, what has become a standard assumption in many macroeconomic models. On the other hand, the Kalecki explanation of countercyclical markups was original and fruitful contribution to the field. Taking into account his theory of income division, the reason for countercyclical behaviour of markups in the food industry in reference to the macroeconomic cycle may be that firms restrain from decreasing prices during downturn in a fear of increasing market competition, as their competitors may do the same. Consequently, in order to save profits during downturns firms 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, because of a shape of marginal cost curves in agriculture and mining, which deviate sharply upwards, prices of raw materials decrease, so markups may increase, becoming countercyclical.

The examination of the impact of both kinds of cycles on markups revealed however, that although other manufacturing industries behaved similar to the food industry regarding sectorial cycle, their direction of cyclicality on the macrolevel, taking into account the statistically significant results, is opposite to that of the food industry. Also considering the insignificant results, markups in majority of industries seemed to behave procyclical. This stays in contradiction with the Kalecki theory of prices and income division. As a conclusion it was stated that, although the Kalecki theory explains the behaviour of food industry in reference to the macroeconomic business cycle, it seemed to be not suitable to explain the procyclical character of markups in the majority of EU manufacturing industries, both the sectorial and macroeconomic ones. As possible reasons, changes in the structure and way of functioning of the developed countries manufacturing sector and theirs stages of development were indicated.

Based on the research conducted, an analysis of markups may provide an interesting insight, not only in markups cyclicality and therefore in changes of the level of departure from perfect competition during business cycles, but also in the formation of business cycles. Further research should be conducted in order to check if this result is robust to different ways of business cycle approximation (e.g. unemployment rate) and markups estimation (e.g. Roeger method), as well as different ways of removing trends out of time series analyzed (e.g. the Hodrick-Prescott filter) and calculating the relationship between them (e.g. VAR analysis). Also the analysis taking advantage of longer time series would be very welcome. But the most important research direction seems to be the theoretical explanation of a change in the character of markups cyclicality from countercyclical to procyclical. So far convincing theories about markups are lacking and as Blanchard [2008] said in response to what and why markups move stays an area where research is still urgently needed. Nevertheless, it shouldn't be forgotten, that the Polish economist Michał Kalecki invented the theory of prices and income division, in which the countercyclicality of markups was explained, and that the EU food industry still behaves according to his explanation.

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CYKLICZNOŚĆ MARŻ W PRZEMYŚLE SPOŻYWCZYM A TEORIE MICHAŁA KALECKIEGO

Streszczenie. Problem cykliczności marż zaliczany jest obecnie do jednego z głównych problemów makroekonomii, ponieważ założenie o antycykliczności marż jest kluczowe w wielu modelach neokeynesowskich. Celem artykułu było wykorzystanie teorii Kaleckiego w celu wyjaśnienia mechanizmu prowadzącego do antycyklicznego zachowania się marż w przemyśle spożywczym UE oraz Polski, do czego posłużył przegląd literatury i logiczne wnioskowanie. Ponadto, w odpowiedzi na najnowsze badania wskazujące na procykliczne marże w UE i USA, korzystając z metody regresji panelowej, sprawdzono, czy charakter cykliczności marż jest różny w przemyśle spożywczym w porównaniu do innych gałęzi przetwórstwa przemysłowego krajów Wspólnoty. Pokazano, że pomimo iż wytłumaczenie antycykliczności marż autorstwa Kaleckiego może być adekwatne dla przemysłu spożywczego krajów UE, nie jest ono już aktualne w odniesieniu do przemysłu przetwórczego tych krajów.

Słowa kluczowe: marże cenowo-kosztowe, cykle koniunkturalne, podejście Kaleckiego

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