UDC 338.532.4.025.24

PRICE COLLUSION OF MANUFACTURERS AND SOCIAL WELFARE LOSSES IN BELARUS

I. V. IVANOUSKAYA
Belarusian-Russian University

M. P. DRAHUN
Sukhoi State Technical University of Gomel

Keywords: collusion, price collusion, social welfare, welfare loss, static efficiency, dynamic efficiency, woodworking industry.

Introduction

According to antimonopoly law provisions of CIS (Commonwealth of Independent States) countries, if price collusion/concerted actions of manufacturers in goods markets result in competition restriction (by fixing of monopolistically low prices which complicates market access for other business entities) or infringement of economic interests of other business entities or consumers (through fixing of a monopolistically high price) they are considered to be illegal [1]–[3]. In exceptional cases, agreements and concerted actions of that kind can be recognized to be admissible on condition that they result in process improvement, growth in sales of goods, stimulation of technological and economic progress or worldwide recovery of domestic goods competitiveness, i. e. when social welfare growth in the long term exceeds short-term losses to society [4]. Thereupon the assessment of short- and long-term social consequences of price collusion (concerted actions) of manufacturers in goods markets is an actual problem from the point of view of antitrust regulation. At the same time, our analysis of publications devoted to researches of inefficiency of price collusion has made it possible to establish absence of practical procedures which can give the complex objective quantitative assessment of consequences of the named actions. The present work aims to solution of this problem.

Objectives and Methodology

The objective of this research is to develop methodological approaches to the quantitative assessment of inefficiency of price collusion and concerted actions of manufacturers in oligopoly goods markets in short and long terms.

According to that objective, the following problems are raised and solved:

– analysis of known approaches to assessment of influence of price collusion and concerted actions of manufacturers on public welfare available in the literature;

– development of the method of assessment of social losses (inefficiency) caused by the presence of manufacturer's price collusion in goods markets;

– testing this method on the basis of the Belarusian plywood market for determination of necessity of antitrust regulation of this market.

The research method and initial data. To achieve the objective, we applied monographic and simulation methods of researches. Antimonopoly laws of the CIS countries and papers of foreign authors analyzing oligopoly market pricing and influence of industry market organization on social welfare were used as an informational background. Financial reporting of plywood manufacturers, data of National Statistical Committee of Belarus and data of Pricing Policy Committee of Belarus for 2006–2010 were used as initial data for a quantitative analysis.

Our researches of the market of plywood, particle boards and fiberboards of Belarus resulted in a conclusion about possible tacit price collusion of the industry manufacturers (see [5]).

Theoretical Background

Theoretical fundamentals of the assessment of industry structure efficiency

According to the literature, it is necessary to segregate three types of industrial cost efficiency, namely allocative, productive (technological), and dynamic ones [6]–[8]. Allocatively and productively inefficient industries can be dynamicly efficiency. That is because monopoly profit obtained by price collusion participants enables them to finance development of innovations and thereby to increase social welfare in the long term and to compensate short-term static efficiency losses. At the same time, dynamic inefficiency cannot be excluded since collusive oligopolists have smaller incentives to technology renewal (in this case, social losses are equivalent to those from X-inefficiency and product update [7], [9]. The reason is that they obtain smaller additional profit from the same innovation in comparison with Bertrand competition firms. Hence, to make objective decisions on suppression of price collusion of commodity manufacturers because of public welfare reduction, it is necessary, firstly, to estimate the probability that collusion's participants will have incentives for innovations because of their greater financial abilities to innovate; secondly, to compare social welfare losses stipulated by commodity market monopolization with growth of this welfare due to (possible) dynamic efficiency of the monopolized market in the long term.

Existing approaches to analysis and assessment of inefficiency of price collusion (concerted actions). We have established that the analysis of inefficiency of price collusion (obvious and nonobvious ones) assumes solving three main problems.

1. *The allocative efficiency loss assessment*. A basic criterion of allocative efficiency is the amount of social welfare loss which is determined in the literature through assessment of resource allocation efficiency [10]–[12]. Maximum allocative efficiency is achieved at the point where marginal costs equal consumer's willingness to pay (price of goods). The larger is the difference between the price and marginal costs, the larger are social welfare loss and the lower is allocative efficiency due to lack of resources directed at manufacturing of these goods.

Multiple researchers have studied the problem of quantitative assessment of welfare losses in the conditions of considerable deviation of the price of goods from marginal costs and tried to say whether these losses are large enough to be grounds for interference of antimonopoly authorities [10]–[16]. The priority in studying these problems belongs to Harberger who proposed to assess net social loss (W) as:

$$W = \frac{1}{2}(PQ)EM^2, \tag{1}$$

where P is the price established in the monopolized market; Q is the production volume (output) in this market; M is the relative deviation of the price from marginal costs (Lerner index); E is the price elasticity of demand. In the process of testing this model on the basis of the U.S. processing industry, the above author equated the elasticity of demand to unity that is why net losses were specified as sales volume multiplied by $\frac{1}{2}M^2$. The sum of these losses over all markets studied by Harberger on the assumption that all products were sold only in the consumer markets was about 0.1 % of GDP [10].

Stigler criticized Harberger's calculations on several points including the unit assessment of the price elasticity of demand that did not correspond to exclusive profit maximization [13]. The point is that the unit price elasticity of demand occurs when the marginal revenue $MR = 0$. But then MC of a monopolist who maximizes profits should also be equal to zero what is impossible. In case of $MR = MC > 0$, the elasticity exceeds unity, and

there by welfare losses exceed those specified by Harberger. Cowling and Mueller passed over the necessity for determination of a value of the price elasticity of demand [14]. They have shown that in case of Cournot competition the profit margin is inversely proportional to the elasticity of demand faced by a firm:

$$\frac{P - MC}{P} = M = \frac{H}{E}, \tag{2}$$

where H is the Lerner index.

Then, at high H (for the monopoly and also in the conditions of collusion or concerted actions H can be accepted to be unity), the following equality takes place:

$$W = \frac{1}{2}(PQ)EM^2 = \frac{1}{2}(PQ)M. \tag{3}$$

Thus, social losses form half of the profit of a monopolistic firm (cartel). Then Cowling and Mueller showed that damages caused by market power (noncompetitive pricing) were not only reduced to irretrievable losses [14]. They supplemented their model with expenses for reaching and preserving a monopolistic position, namely advertising expenses (A) and net profit of the monopoly (π' is an upper boundary of the monopoly's costs for creation of artificial barriers to entry the industry), and obtained:

$$W = \pi' + A + \frac{1}{2}(PQM + A). \tag{4}$$

This model has been criticized by a number of authors for a high degree of overstatement of welfare losses [15], [17]. Littlechild considered profit as a short-term phenomenon resulting from successful entrepreneurship and not from monopoly preservation. If the monopoly is a result of successful innovation, monopoly profit and consumer surplus at monopolistic production are social gain because both of them would be lost for society without innovations [17]. Cowling and Mueller concentrated their attention on successful firms and simply took into account temporary and subsequently vanishing advantages of more successful firms [14]. Criticism of this approach by Hay and Morris is connected with assessment of advertising effects which are negative for welfare as well as the use of monopoly profits in fighting for the monopoly position [18].

Hay and Morris suggested to use one of indices of market concentration as a substitute for direct measurement of welfare losses. For the oligopoly with homogeneous goods and firms with symmetric costs (and in the assumption of constant marginal costs), they showed that welfare losses are equivalent to:

$$\frac{\Delta P}{P} = \frac{H}{E} = \frac{\pi}{PQ};\ PQ = \frac{\pi E}{H};\ W = \frac{1}{2}\frac{\pi E}{H}\frac{H^2}{\varepsilon^2}E = \frac{1}{2}\pi H, \tag{5}$$

where π is the industry contribution margin (when an operating leverage factor <<1, this value can be accepted as gross profit) [18].

Then this model was supplemented with positive expected variations of price behavior of oligopolists β, which were interpreted as a degree of oligopolist's collusion, and took on form $W = \frac{1}{2}\pi H(1+\beta)$ thus complicating the use of H as welfare losses.

2. *Production* (*technological*) *efficiency loss assessment*. Influence of production efficiency on social welfare was studied by Comanor and Leibenstein, Parish and Ng, and

Dixit and Stern [19]–[21]. Here, the losses associated with production inefficiency are connected with direct waste of productive resources exhibited in the form of either expenditure of resources for acquisition or retention of the monopoly power (rent-seeking costs), or production with costs exceeding the lowest attainable ones at existing technologies.

The losses stipulated by excess of monopoly costs over the competitive ones include, firstly, losses in the form of resource over-expenditure (the same output volume could be produced with smaller expenditures) and, secondly, nonoptimal resource allocation losses.

3. *Dynamic efficiency loss assessment*. Unlike static inefficiency having positive criteria of assessment, dynamic efficiency losses caused by market monopolization are assessed indirectly by assumptions on the presence of stimuli of its participants to innovate. There are two opposite points of view about the market monopolization influence on dynamic efficiency in the literature.

The first one is that firms in monopolized markets have smaller stimuli to renewal of technologies and products due to several reasons [22]–[24].

The first reason is the absence of competition.

The second reason is smaller additional profits they obtain, for example, from application of the same technological innovation in comparison with the firms cooperating in competitive markets. Indeed, suppose that industry manufacturers compete in Cournot fashion and manufacture similar products. Industry demand is given by $P(Q) = a - bQ$ and a cost function of *i* th firm is given by $C_i = c_i(q_i)$. The technological innovation results in reduction of the innovator firm's marginal costs which become equal to $c_l = c_h(1-k)$, where *k* is the coefficient of marginal cost reduction due to the technological innovation. In this case, an absolute increase in profit of the innovating monopolist is:

$$\Delta\pi^{u/м} = \frac{1}{b}\left(\frac{a-c(1-k)}{2}\right)^2 - \frac{1}{b}\left(\frac{a-c}{2}\right)^2 = ck\left(\frac{a-c}{2b} + \frac{ck}{4b}\right) \approx \frac{ckq}{2}. \quad (6)$$

For the innovator firm operating in the competitive procedure conditions (i. e. with unequal access to technologies) and seizing the market due to the technological innovation, the profit increase is:

$$\Delta\pi^{u/ко} = pq - c(1-k)q - 0 = ckq. \quad (7)$$

Thus, according to the model that we have constructed, the monopolist has much less stimuli to invest in R&D, i. e. the compensation effect is observed.

The third reason relates to high probability of market penetration by potential competitors or collusion violation after innovation development [5].

The second point of view is that monopolized markets are dynamically effective [25]–[29]. In this case, the necessity of securing (preserving) the monopoly position acts as a stimulus for innovation. Etro F. showed that, to create or increase barriers to entry, monopolists would increase production volumes, reduce prices, and invest in R&D, thus disabling potential competitors to enter the market [26]. In case of high barriers to entry, cooperation of potential competitors for overcoming existing barriers and penetrating the monopolized market is probable. That means monopolists always have a stimulus to innovate irrespective of the height of barriers to entry.

Thus, our analysis makes it possible to conclude that quantitative integral indices of static and dynamic efficiencies of price collusion (concerted actions) of commodity manufacturers and index assessment methods as well as indices for assessing stimuli of participants of price collusion (concerted actions) to innovate are now undisclosed.

Method of Assessment of Industry Static and Dynamic Inefficiencies

Generalizing the above concerning allocative and technological efficiency, the industry equilibrium in the collusion conditions, for example, for six firms, i. e. for $i = 1, \ldots, 6$, can be illustrated by Fig. 1.

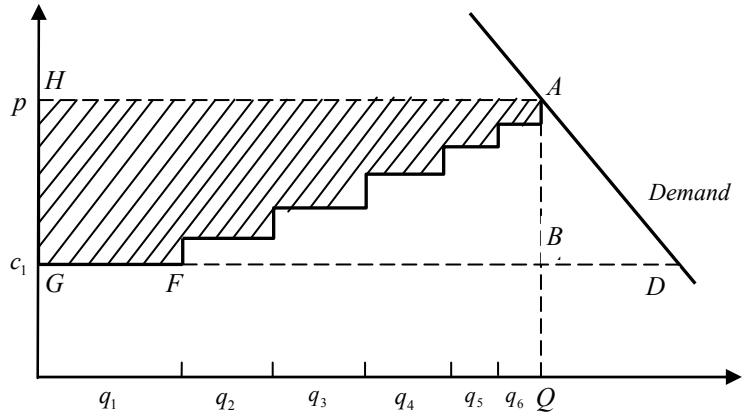

Fig. 1. Social welfare loss caused by static inefficiency in the conditions of collusion of commodity manufacturers. Source: [18]

Here, the contribution margin π is presented by a shaded area. A supply curve is described by a step function: firms with smaller costs have larger market shares (to improve collusion stability, firms redistribute market shares proportionally to technological efficiency [5]. Out-of-pocket unit costs of the largest firm c_1 reflect the best production technology in the industry. The rest of the firms are less effective, but they are viable in the given market as $p > c_2, ..., c_6$. Welfare losses (W) are the sum of areas of triangle ABD and irregular figure ABF representing a value of technological inefficiency of the industry, or the difference of areas of figures $AHGD$ and $AHGF$ which are losses of consumer surplus due to excess of the monopoly price over expenditures of the most effective firm and the contribution margin, respectively. If the supply curve is of the form of $Q(p) = ap^{-E}$ and $\frac{c_1}{p} = 1 - \frac{s_1}{E}$ (from the firm equilibrium condition), the area of figure $AHGD$ is equal to ([18], [21]):

$$AHGD = \int_{c_1}^{p} Q(p)dp = \frac{pQ}{1-E}\left[1 - \left(\frac{c_1}{p}\right)^{1-E}\right] = \frac{pQ}{1-E}\left[1 - \left(1 - \frac{s_1}{E}\right)^{1-E}\right]. \quad (8)$$

For sufficiently small s_1 / E, the following equality holds:

$$\left(1 - \frac{s_1}{E}\right)^{1-E} \approx 1 - \frac{1-E}{E} s_1. \quad (9)$$

Then losses of consumer surplus are:

$$AHGD \approx \frac{pQ}{E} s_1. \quad (10)$$

And social welfare losses are:

$$W = AHGD - AHGF \approx \frac{pQ}{E}(s_1 - H) \approx \pi\left(\frac{s_1}{H} - 1\right). \quad (11)$$

Thus, the total welfare losses due to allocative and technological inefficiency are directly proportional to a ratio of the share of the industry leading firm (with the lowest expenditures) to the Herfindahl-Hirschman index. The greater market share of the leading firm means the greater price ($p = \frac{c_1 E}{E - s_1}$), and, hence, greater consumer surplus losses. The greater Herfindahl-Hirschman index means the smaller output of less effective firms. Hence, a majority of consumer surplus turns into the manufacturer's profit and a minority is absorbed by high costs [18].

Results

Method of assessment of industry dynamic inefficiencies in the collusion conditions

We have established that dynamic efficiency of the industry in the collusion conditions (concerted actions) is reached, when the following inequality holds:

$$\sum_{t=t_I}^{n_I} \frac{1}{(1+r)^t} \geq \frac{1}{d_{WI}} \frac{1}{ROI}, \quad (12)$$

where n_I is the average payback period for investments in innovations (technological, product/offering, marketing, organizational, etc.) in the industry (years);

t_I is the average period of development of innovations in the industry, namely a time period between the beginning of investments in innovations and the emergence of monetary flows associated with their use (years);

r is the debt capital rate of interest for the industry firms;

d_{WI} is the fraction of funds obtained by collusion participants and invested in innovations;

ROI is the average industry profitability of investments in innovations (technological, product , marketing, organizational, etc.). It is determined by the formula:

$$ROI = \frac{\sum_{t=t_I}^{n_I} (Prod_t + Tech_t + Mar_t + Org_t)}{(n_I - t_I)(I_{prod} + I_{tech} + I_{mar} + I_{org})}, \quad (13)$$

where $Prod_t, Tech_t, Mar_t, Org_t$ are industry profits from product, technological, marketing, and organizational innovations, respectively, in t th year (Br m);

$I_{prod}, I_{tech}, I_{mar}, I_{org}$ are industry investments into product, technological, marketing, and organizational innovations, respectively (Br m).

Thus, dynamic efficiency of the industry in the conditions of collusion (concerted actions) is directly proportional to the average industry profitability of investments in innovations and the social welfare loss fraction invested from own funds of the industry firms in innovations. Besides, it is inversely proportional to the average payback period for investments in innovations, the average industry period of development of innovations, and the

debt capital rate. It should be noted that calculations by formula (13) can be performed separately for every type of innovations.

In case of insufficient input data for using formula (12), dynamic efficiency of the industry can be assessed with the aid of particular indices presented in Tabl. 1.

Table 1

Proposed system of particular indices of the industry dynamic efficiency

Index / Influence on dynamic efficiency	Calculation procedure
Industry average rate of growth of marginal costs in real terms T_{MCrt} / *Negative*	$T_{MCrt} = \frac{MC_t}{MC_{t-1}} \frac{Ip_{t-1}}{Ip_t}$, where $MC_{t,t-1}$ is industry average marginal costs of the firm within t and $t-1$ (Br m); $Ip_{t,t-1}$ is the price index within the same period
Fraction of funds obtained by collusion participants and invested in innovations d_{WI} / *Positive*	$d_{WI} = \frac{I_{own}}{W}$, where I_{own} is investments in innovations from own funds of the industry firms (Br m)
Industry average profitability of investments in innovations (ROI) / *Positive*	See formula (13)
Industry average payback period of firm's investments in innovations n_I (years) / *Negative*	–
Industry average period of development of innovations t_I (years) / *Negative*	–

Source: Independent research.

The quantitative assessment of innovation stimuli of participants of price collusion in oligopoly markets can be made with the aid of the following expression:

$$\sum_{t=t_I}^{n_I} \frac{1}{(1+r)^t} \geq \frac{1}{ROI}. \quad (14)$$

Thus, in case of the presence of price collusion in the industry, their participants obtain positive economic effects from innovations in the conditions of smaller capital investments and (or) at smaller efficiency of these investments than are required for ensuring dynamic efficiency of the industry. Conditions (12) and (14) make it possible to explain why price collusion of oligopolists are often statically as well as dynamically ineffective despite the presence of larger financial resources for investments than without collusion.

Assessment of efficiency of collusion in the market of plywood, particle boards and fiberboards of Belarus

Our researches of the market of plywood, particle boards and fiberboards of Belarus resulted in a conclusion about possible tacit price collusion of the industry manufacturers (see [5]). However, to make a decision about the necessity of antimonopoly regulating of the industry, assessment of the social welfare losses caused by this price collusion of the manufacturers is required. To solve this problem, we have used the above stated methodological approach to assessment of static and dynamic industry efficiency (Tabl. 2–4).

Table 2

Dynamics of indices of static and dynamic efficiency of the studied plywood market in 2006–2010. Source: Independent research

Index	Plywood market				
	2006	2007	2008	2009	2010
1. Static efficiency losses					
1. Static efficiency losses:	13.5	18.7	17.3	15.7	27.1
1.1 Static efficiency losses $\left(W_{\pi} = \pi\left(\frac{s_1}{H} - 1\right)\right)$ (Br *m*)	11.8	13.2	15.9	11.5	24.1
1.2 Static efficiency losses $\left(W_{FC} = FC\left(\frac{s_1}{H} - 1\right)\right)$ (Br *m*)	1.68	5.50	1.40	4.15	3.03
Net static efficiency losses W (Br *m*).	0.02	0.05	0.01	0.04	0.02
2. Particular indices of dynamic efficiency					
2.1 Industry average rate of growth of marginal costs in real terms T_{MCrt}	1.16	1.22	1.16	0.91	1.36
2.2 Fraction of funds obtained by collusion participants and invested in innovations d_{WI}	0.00	0.00	1.00	0.37	0.20

Table 3

Dynamics of indices of static and dynamic efficiency of the studied particle board market in 2006–2010. Source: Independent research

Index	Particle board market				
	2006	2007	2008	2009	2010
1. Static efficiency losses					
1. Static efficiency losses:	7.08	11.8	10.2	11.0	8.05
1.1 Static efficiency losses $\left(W_{\pi} = \pi\left(\frac{s_1}{H} - 1\right)\right)$ (Br *m*)	6.32	9.77	9.26	8.64	7.46
1.2 Static efficiency losses $\left(W_{FC} = FC\left(\frac{s_1}{H} - 1\right)\right)$ (Br *m*)	0.76	2.00	0.97	2.34	0.58
Net static efficiency losses W (Br *m*).	0.01	0.03	0.01	0.04	0.01
2. Particular indices of dynamic efficiency					
2.1 Industry average rate of growth of marginal costs in real terms T_{MCrt}	1.11	1.13	1.23	1.10	1.19
2.2 Fraction of funds obtained by collusion participants and invested in innovations d_{WI}	0.00	0.00	1.00	0.11	1.00

Table 4

Dynamics of indices of static and dynamic efficiency of the studied fiberboard market in 2006–2010. Source: Independent research

Index	Fiberboard market				
	2006	2007	2008	2009	2010
1. Static efficiency losses					
1. Static efficiency losses:	6.93	7.86	7.96	2.42	2.71
1.1 Static efficiency losses $\left(W_{\pi} = \pi\left(\frac{s_1}{H} - 1\right)\right)$ (Br *m*)	3.92	4.22	2.70	1.53	1.47

Table 4

Index	Fiberboard market				
	2006	2007	2008	2009	2010
1.2 Static efficiency losses $\left(W_{FC} = FC\left(\frac{s_1}{H} - 1\right)\right)$ (Br *m*)	3.01	3.63	5.26	0.90	1.24
Net static efficiency losses W (Br *m*)	0.06	0.06	0.08	0.02	0.02
2. Particular indices of dynamic efficiency					
2.1 Industry average rate of growth of marginal costs in real terms T_{MCrt}	1.13	1.12	1.18	0.76	1.43
2.2 Fraction of funds obtained by collusion participants and invested in innovations d_{WI}	0.00	0.00	0.03	0.23	0.24

Notes:

1. Index 1.2 is calculated for a hypothetical case of regulating of the industry as a monopoly with use of an average cost regulation approach.

2. Index 1.3 is the difference of indices 1.1 and 1.2.

The indices presented in Tabl. 2–4 make it possible to draw the following conclusions.

Studied markets are statically ineffective. During the period under consideration, net static efficiency losses varied within 1.4–5.5 and 0.58–2.3 Br billions or 1.1–4.7 % and 0.8–3.5 % of sale proceeds in the plywood market and the particle board market, respectively. The value of these losses forbids considering them to be an essential damage to social welfare because, firstly, the value is not substantial over the industry and, secondly, a part of funds obtained by enterprises has been invested in product and process innovations. That indicates a lack of necessity for antitrust regulation of the industry as it will result in 7–30 % reduction of social welfare losses but involve essential administrative expenses. During the same period, net static efficiency losses in the particle board market were 0.9–5.3 Br billions or 2.1–7.6 % of sale proceeds. They were not substantial for the industry, but their innovation invested portion was also unessential and antitrust regulation of this market will result in 37–66 % reduction of social welfare losses.

The absence of necessary data does not enable us to make definite assessment of industry dynamic efficiency. At the same time, particular indices presented in Tabl. 2 probably indicate dynamic inefficiency of the industry in the period under consideration as marginal costs of production of plywood, particle and fiber boards grew in real terms and a portion of funds obtained by manufacturers due to price collusion and invested in innovations was very low. That indicates that manufacturers have insufficient stimuli for investing in innovations, probably, due to their low efficiency in comparison with current interest rates on debt capital.

Conclusion and Recommendations

Our study makes it possible to draw the following conclusions:

1. To make economically feasible decisions in the field of antitrust regulation of obvious and nonobvious price collusion of manufacturers in the goods markets, quantitative assessment of short- and long-term consequences of these decisions for social welfare is required. In this connection, we have developed the method of assessment of social losses caused by price collusion in goods markets. This method consists in determination of static and dynamic efficiency losses caused by lowering competition in the market. The novelty of the method consists, firstly, in theoretical justification and formulation of the condition of industry dynamic efficiency as well as in determination of its factors such as the average industry profitability of investments into innovations, the fraction of social welfare losses

invested in innovations from own funds of the industry firms, the average payback period of investments in innovations, the average industry period of innovations, and the debt capital rate; secondly, in quantitative determination of the condition estimating stimuli of price collusion participants to innovate in oligopoly markets. Using this method, antimonopoly bodies can make well-grounded decisions on the need of suppression of obvious and nonobvious price collusion in goods markets on the basis of correlation of short- and long term social welfare losses and antitrust regulation expenditures.

2. It is also found that in the presence of explicit and tacit price collusion in the industry its participants obtain economic benefits from innovations under the condition of investment of smaller capital and(or) smaller efficiency of these investments than required for ensuring dynamic efficiency of the industry. In this connection, it is determined that from the point of view of improvement of social welfare, in the conditions of low capital intensity of innovative activity and (or) its low profitability in the industry, high actual interest rates, and large innovation and payback periods, suppression of obvious and nonobvious price collusion of manufacturers in goods markets is an optimum strategy of antitrust regulation (but with allowance for expenditures on administration of the oligopolists' activity).

References

1. Об утверждении Инструкции по выявлению и пресечению антиконкурентных соглашений (согласованных действий) о ценах : постановление М-ва предпринимательства и инвестиций Респ. Беларусь, 28 апр. 2000 г., № 9 / Нац. правовой интернет-портал Респ. Беларусь. – 2011. – Режим доступа: http://www.pravo.by/webnpa/text.asp?r=6&RN= W20003470. – Дата доступа: 22.08.2014.
2. Усенко, Е. В. Соотношение понятий «соглашение» и «согласованные действия» в российском антимонопольном законодательстве / Е. В. Усенко // Закон. – 2008. – № 2. – С. 37–40.
3. Юсупова, Г. Ф. Проблемы противодействия ограничивающим конкуренцию соглашениям в российской антимонопольной политике / Г. Ф. Юсупова // Современная конкуренция. – 2009. – № 2 (14). – С. 31–43.
4. Авдашева, С. Б. Незаконность молчаливого сговора в российском антимонопольном законодательстве: могут ли экономисты быть полезны при выработке юридических норм / С. Б. Авдашева // Вопр. экономики. – 2011. – № 5. – С. 87–102.
5. Ивановская, И. В. Факторы возникновения и устойчивости ценовых соглашений на рынке / И. В. Ивановская, Н. П. Драгун // Вестн. Гомел. гос. техн. ун-та им. П. О. Сухого. – 2011. – № 3. – С. 82–95.
6. Farrell, M. J. The measurement of productive efficiency / M. J. Farrell // Journal of the Royal Statistical Society. – 1957. – № 120. – P. 252–290.
7. Leibenstein, H. Allocative efficiency vs. «X-Efficiency» / H. Leibenstein // The American Economic Review. – 1966. – № 56. – P. 392–415.
8. Cabral, L. Introduction to industrial organization / L. Cabral. – Massachusetts: MIT Press, 2000. – 356 p.
9. Шерер, Ф. Структура отраслевых рынков ; пер. с англ. / Ф. Шерер, Д. Росс ; под ред. Н. М. Розановой. – М. : ИНФРА-М, 1997. – 698 с.
10. Harberger, A. Monopoly and Resource Allocation / A. Harberger // The American Economic Review. – 1954. – № 44. – P. 77–87.

11. Williamson, O. Economies as an Anti-trust Defense: Correction and Reply / O. Williamson // American Economic Review. – 1968. – № 58. – P. 1372–1376.
12. Ross, P. Economies as an Anti-trust Defense: Comment / P. Ross // American Economic Review. – 1968. – № 58. – P. 1371–1372.
13. Stigler, G. The Statistics of Monopoly and Merger / G. Stigler // Journal of Political Economy. – 1956. – № 64. – P. 33–40.
14. Cowling, K. The Social Costs of Monopoly Power / K. Cowling, D. Mueller // Economic Journal. – 1978. – № 88. – P. 727–748.
15. Gisser, M. Price Leadership and Welfare Loss in US Manufacturing / M. Gisser // American Economic Review. – 1986. – № 76. – P. 756–767.
16. Posner, R. The social costs of monopoly and regulation / R. Posner // Journal of Political Economy. – 1975. – № 83. – P. 807–828.
17. Littlechild, S. Misleading calculations of the social costs of monopoly power / S. Littlechild // Economic Journal. – 1981. – № 91. – P. 348–363.
18. Хэй, Д. Теория организации промышленности : в 2 т. ; пер. с англ. / Д. Хэй, Д. Моррис ; под ред. А. Г. Слуцкого. – Спб. : Экон. шк., 1999. – Т. 2. – 592 с.
19. Comanor, W. Allocative Efficiency, X-Efficiency and the Measurement of Welfare Losses / W. Comanor, H. Leibenstein // Economica. – 1969. – № 36. – P. 304–309.
20. Parish, R. Monopoly, X-Efficiency and Measurement of Welfare Loss / R. Parish, Y. Ng // Economica. – 1972. – № 39. – P. 301–308.
21. Dixit, A. Oligopoly and Welfare: A Unified Presentation with Applications to Trade and Development / A. Dixit, N. Stern // European Economic Review. – 1982. – № 19. – P. 123–143.
22. Arrow, K. Economic Welfare and the Allocation of Resources for Invention / K. Arrow // The Rate and Direction of Inventive Activity: Economic and Social Factors. – Princeton, NJ : Princeton University Press, 1962. – P. 609–625.
23. Aghion, P. (2002). Competition, Innovation and Growth in Transition: Exploring the Interactions between Policies / P. Aghion, W. Carlin and M. Schaffer. – William Davidson Working Paper, No. 151. – Режим доступа: http://www.cepr.org/meets/wkcn/7/753/papers/carlin.pdf.
24. Geroski, P. A. Innovation, Technological Opportunity and Market Structure / P. A. Geroski // Oxford Economic Papers, New Series. – 1990. – Vol. 42 (№ 3). – P. 586–602.
25. Blundell, R. Market Share, Market Value and Innovation in a Panel of British Manufacturing Firms / R. Blundell, R. Griffith, J. van Reenen // Review of Economic Studies. – 1999. – Vol. 6 (№ 3). – P. 529–554.
26. Etro, F. Innovation by Leaders / F. Etro // The Economic Journal. – 2004. – Vol. 114. – P. 281–303.
27. Hausman, J. A. Price Discrimination and Patent Policy / J. A. Hausman, J. K. MacKie-Mason // The RAND Journal of Economics. – 1988. – Vol. 19 (№ 2). – P. 253–265.
28. Parente, S. L. Monopoly Rights: A Barrier to Riches / S. L. Parente, E. C. Prescott // American Economic Review. – 1999. – Vol. 89 (5). – P. 1216–1233.
29. Geroski, P. A. Innovation and the Evolution of Market Structure / P. A. Geroski, R. Pomroy // Journal of Industrial Economics. – 1990. – Vol. 38 (№ 3). – P. 219–314.

Получено 22.11.2017 г.