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Agricultural Supply Management and Antitrust in the United States System of Agribusiness

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Abstract

During the last decade organizations of agricultural producers in the U.S. used a supply management practice, which included some form of production restrictions. The purpose of using it is to control the level of supply in order to ensure a fair level of returns to agricultural producers. A practice of using production restrictions has recently raised a lot of concerns among industry participants, lawyers and antitrust law enforcers in the U.S. The plaintiffs in a number of recent and on-going private antitrust lawsuits allege that agricultural production restrictions violate the Sherman Antitrust Act (1890). The article identifies and analyzes key legal and economic issues relevant to the nature and performance of agricultural supply management programs in the United States.

Keywords: agricultural production restrictions, antitrust, cartels, dairy industry, market power, potato industry, supply management.

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Introduction

The organizations of agricultural producers in the United States (i.e. agricultural cooperatives, associations, federations, etc.) have used a variety of supply management strategies/programs affecting production and marketing of agricultural products. These strategies vary from affecting the quantity of agricultural commodities produced to managing marketed product shipment patterns. The joint (collective) activities of individual agricultural producers implemented through their organizations are possible due to the Capper-Volstead Act (1922). This Act provides a *limited* antitrust exemption from the Sherman Antitrust Act (1890), which in general prohibits the joint activities of competitors aiming to restrict the amount of output and/or to increase/fix the level of output price.

During the last decade organizations of agricultural producers in a number of industries in the United States (dairy, potatoes, eggs, mushrooms) used a supply management practice, which included some form of production restrictions (limitations). The purpose of using it is to control the level of supply with the purpose of obtaining a fair level of returns to agricultural producers. In the modern agribusiness environment, this practice allows agricultural producers to mitigate the adverse effects of a number of market forces affecting their profitability, such as over-supply of agricultural commodities, increasing agricultural input and output price volatility, and increasing exposure to the volatility of international agricultural commodity markets and to increased competition from these markets. The "supply management programs" typically include a number of programs, some of them affect production and some of them affect agricultural product marketing.

For example, the U.S. dairy industry developed and implemented a herd retirement program used to remove the entire milking herds of selected dairy farmers from the production. The export assistance program was used to divert cheese and butter to export markets. The U.S. potato industry developed and implemented a potato acreage management program used to control the number of fresh potato acres planted. In addition, the potato industry implemented the potato flow control program affected the fresh potato product shipment throughout the marketing year. Both the dairy and potato industry supply management programs were funded through the assessments from participating producers.

The organizations of agricultural producers (cooperatives) played the key role in developing and implementing the supply management programs in dairy and potato industries. They designed the programs and developed the detailed guidelines on their implementation. From the perspective of agricultural producers and their organizations, the desirable economic effects of this type of programs are higher and less volatile prices received by agricultural producers. The economic effects of these supply management programs were noticed on the national level (USDA Rural Development Rural Cooperatives: March/April 2005).

A practice of using production restrictions as an element of agricultural supply management by the organizations of agricultural producers has recently raised a lot of concerns among industry participants, lawyers and antitrust law enforcers in the United States (Varney 2010, Frackman and O'Rourke 2011, Hibner 2011, Manning and Welle 2012). The plaintiffs (direct and indirect

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buyers) in a number of recent and on-going private antitrust lawsuits allege that agricultural production restrictions violate the Sherman Antitrust Act (1890)[1].

The issue to be decided during these legal proceedings is whether production restrictions are protected by the Capper-Volstead Act. The outcomes of these litigations will have important implications for the design of supply management practices as well as related production, marketing and pricing strategies of the organizations of agricultural producers and individual agricultural producers in all agricultural commodity markets. Furthermore, the antitrust enforcement agencies, U.S. Department of Justice and U.S. Federal Trade Commission, rely on the case law in their antitrust enforcement efforts.

The objective of this research is to identify and analyze the key legal and economic issues relevant to the nature and performance of agricultural supply management programs, with a particular focus on agricultural production restrictions (limitations). The analyzed agricultural supply management programs are private industry-funded and administered programs, which involve no government participation. Very little research can be found which analyses the current nature, design, performance and market effects of supply management programs in agricultural markets or examines relevant competition and antitrust law issues. This analysis aims to provide useful information for agricultural and agribusiness decision-makers, policy-makers, agricultural and antitrust law practitioners and research scholars working in this area.

The article is organized as follows. First, an overview of the economics of joint conduct of agricultural producers through their organizations and its legal foundation, the Capper-Volstead Act (1922), is presented. Second, the most recent experience of implementing supply management programs by the organizations of agricultural producers in the U.S. dairy and potato industries is described. The economic forces leading to the idea of supply management in these industries, the design of the supply management programs and the available empirical evidence on their market effects are discussed. The dairy and potato industries are selected for the analysis because information on their supply management programs is available from public sources. Third, the current debate on the legal status of agricultural supply management practices and production restrictions is presented. The article concludes with a discussion of business and policy implications of the uncertainty currently surrounding the legal status of agricultural supply management practices (production restrictions).

The Economics of Agricultural Supply Management and its Legal Foundation

Legal Foundation for the Joint Conduct of Agricultural Producers

The joint activities of agricultural producers implemented through their organizations can be characterized as cartel agreements. A cartel is a group of firms, otherwise competitors, who join together for the purpose of controlling the amount of output supplied to the market and/or market price[2]. The joint activities of competitors aiming to restrict output and/or to control market price

[1] A number of the most recent antitrust lawsuits is listed in References section of the manuscript.

[2] Cartels can be either private or public. In the latter case, a government participates in organizing and monitoring cartel activities or the government can be a part of the cartel agreement. Cartels can be either legal or illegal

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are illegal *per se* under the U.S. antitrust law. Section 1 of the Sherman Antitrust Act (1890) prohibits contracts, combinations and conspiracies in restraint of trade. Price-fixing and output control agreements are considered to be the most damaging to market practices, because their typical market effects are a decrease in output quantity supplied to the market, an increase in price paid by consumers and a deadweight loss.

Many joint activities of agricultural producers, which might affect output prices and quantities, would potentially be subject to Section 1 of the Sherman Act, because agricultural producers are competitors. The Capper-Volstead Act (1922) provides a *limited* antitrust immunity to the joint activities of agricultural producers implemented through their organizations[3]. Section 1 defines in general terms the scope of activities protected by the Act[4]. In particular, "*persons engaged in the production of agricultural products…may act together in associations… in collectively processing, preparing for market, handling and marketing …such products*". These associations are allowed to form marketing agencies in common and to make necessary contracts and agreements to achieve their objectives.

Section 2 of the Capper-Volstead Act is concerned with potential market power that may result from activities allowed by Section 1. The concerned conduct is monopolization and restraint of trade that lead to unduly enhanced prices. Section 2 authorizes the Secretary of Agriculture to issue a cease and desist order, if he has a reason to believe that an organization of agricultural producers monopolizes and restraints trade to such extent that the price of agricultural commodity is unduly enhanced. Section 2 has virtually never been enforced.

The case law performs the major role in interpreting the Capper-Volstead Act. While the existing case law in general provides a well-developed guidance on how to interpret the purpose and scope of the Act, there is some uncertainty relating to the scope of conduct (activities) immune. Given that a potential range of activities of the organizations of agricultural producers that may be protected by the Capper-Volstead Act is very broad, the alleged practices (conduct) are subject to interpretation by courts on a case-by-case basis.

Price-fixing practices of the organizations of agricultural producers, a type of activities considered to be illegal *per se* in other industries, fall within the Capper-Volstead Act protection. Some of the actions on withholding already produced volume of agricultural commodities from the market might be immune. Acquiring large market shares by growth in membership and forming associations of cooperatives are legal. However, gaining market power by using

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depending on the antitrust law regime in a particular country. For a comprehensive survey of cartels operating in different periods of history, the nature of their practices and the market effects of these practices, see Connor (2007) and Bolotova et al. (2007).

[3] The Congressional intent in passing the Capper-Volstead Act was to equalize the market position of agricultural producers with the market position of the middlemen. In particular, the objective was to give agricultural producers additional market power so they could compete effectively in the market place and could earn additional income by capturing the middlemen returns. Some of the desired market effects of the Capper-Volstead Act were higher prices received by agricultural producers and lower food prices paid by final consumers. For a comprehensive discussion of the Capper-Volstead Act see Jesse et al. (1982) and USDA Rural Business Cooperative Service (2002).

[4] Section 1 also sets criterions that have to be met for the organizations of agricultural producers to be protected by the Act.

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predatory means, exclusionary practices, boycotts and similar conduct are not exempt by the Capper-Volstead Act[5].

The legal status of various supply management practices, including production restrictions (production limitations or production control), is currently the most controversial issue on the proper interpretation of the scope of activities protected by the Capper-Volstead Act. First, Section 1 does not explicitly mention "supply management" and/or "production restrictions". Second, there is no well-developed case law interpreting the legal status of various supply management practices. Plaintiffs (direct and indirect buyers) in a number of recent and on-going private antitrust lawsuits challenge the legal status of agricultural supply management practices, and in particular, the legal status of production restrictions, which will be discussed later in the article in greater details.

The Economics of Joint Conduct of Agricultural Producers:
Agricultural Output Control Practices: Supply Management and Production Restrictions

Agricultural markets are traditionally characterized as markets with perfectly competitive structures. There are many agricultural producers, and each of them produces the amount of output which is small relative to the total industry output. Agricultural producers are price-takers, who individually do not have any control over the market price. However, in light of the entire industry, the total amount of agricultural output supplied to the market each year/season is pre-determined, and market price is a function of the output quantity. In other words, agricultural producers representing the entire industry face inverse demand. Given this nature of demand, agricultural producers representing a single industry, as a group, could attempt to control the output quantity produced and supplied to the market each year, and consequently they can affect to some extent the level of output price that they receive.

The joint production and marketing decisions, corresponding conduct of agricultural producers, and market effects of this conduct could be analyzed using the profit-maximization models of firms with the seller market power (oligopoly and monopoly)[6]. The most traditional economic model used in applied antitrust analysis is the one based on the assumptions of a linear inverse demand and a constant marginal cost. Figure 1 depicts the profit-maximizing price-quantity combinations corresponding to a perfectly competitive and a monopolistic scenarios, two extremes within which the seller market power is analyzed[7].

The Lerner Index of market power (L) measures the degree of the seller market power, which reflects the firms' (industry) ability to increase output price relative to marginal cost. L = (P-

[5] See USDA Rural Business Cooperative Service (2002) for a comprehensive analysis of the activities protected by the Capper-Volstead Act and related case law.

[6] There is a variety of these models, which differ in terms of complexity and key assumptions (linear or non-linear demand, assumptions on the marginal cost curve, static or dynamic, etc.). Standard microeconomics and industrial organization text-books discuss these models and related economics concepts; for example, see Besanko and Braeutigam (2002) and Carlton and Perloff (2004). A discussion of selected economic models and concepts for the purpose of antitrust analysis is presented in Carlton and Perloff (2004) and Hovenkamp (1994).

[7] Under monopoly, marginal revenue (MR) curve is twice as steep as inverse demand curve (D). The monopoly profit is maximized at MR=MC.

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MC)/P, where P is output price and MC is marginal cost. The Lerner Index of market power is equal to 0 under perfect competition, and it is equal to 37.7% under monopoly (in the market scenarios depicted in Figure 1). The oligopoly Lerner Index would be greater than 0 but smaller than 37.7%.

The organizations of agricultural producers implementing supply management practices, in particular, production restrictions, act as cartels or oligopolies, who have market power over the output price. The supply management (production restrictions), if effectively implemented, can help increase the output price level relative to marginal cost. As a result, the seller market power (i.e. the Lerner Index or mark-up) increases in comparison with the market scenario without the supply management (production restrictions). The antitrust law enforces are concerned with the effects that the output control practices have on the level of market price. An output reduction leads to two adverse market effects: an increase in the market price imposed on consumers (buyers) and a dead-weight loss (Figure 1).

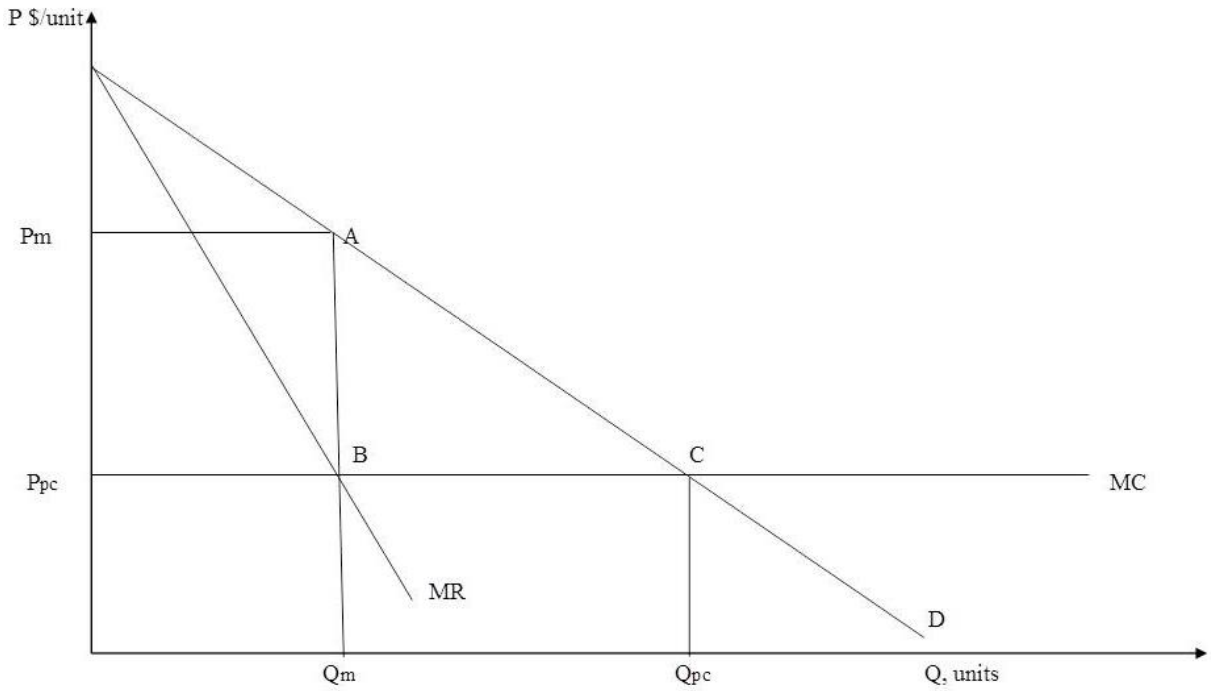

Figure 1. Perfectly Competitive (Qpc; Ppc) and Monopoly (Qm; Pm) Equilibriums.
Note. Triangle ABC is a deadweight loss due to monopoly market power. Rectangle PpcPmAB is a monopoly overcharge. Trapezoid PpcPmAC is a reduction in the consumer surplus due to monopoly power.

The market price increase due to the exercise of market power (in this article, due to the joint conduct of competitors) is also referred to as overcharge or damage. The actual imposed price increase is affected by a number of factors that can be identified using the Lerner Index formulas from more comprehensive models explaining the profit-maximizing behavior of firms with the seller market power. Table 1 presents formulas for Lerner Index corresponding to a perfectly competitive market and markets with the seller market power: oligopoly, monopoly or cartel with a competitive fringe, and monopoly.

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Table 1. Lerner Index in market structures with the seller market power.

Market Structure	Profit-Maximizing First Order Condition MR=MC	Lerner Index: $L = \frac{P - MC}{P}$
Perfect competition (*N*=many)	P = MC	$L = 0$
Oligopoly (*N*=few)	$P \times (1 + \frac{\theta_i}{\varepsilon_{Q,P}}) = MC_i$	*For a single firm* $L_i = \frac{P - MC_i}{P} = -\frac{\theta_i}{\varepsilon_{Q,P}}$ *For the industry* $L = \sum_{i=1}^{N} s_i \times \frac{s_i}{\varepsilon_{Q,P}} = \frac{1}{\varepsilon_{Q,P}} \times \sum_{i=1}^{N} s_i^2 = \frac{HHI}{\varepsilon_{Q,P}}$
Monopoly/Cartel with competitive fringe (*N*=1+fringe)		$L = -\frac{1}{\frac{Q}{Q_{cartel}} \times \varepsilon_{Q,P} + \frac{Q_{fringe}}{Q_{cartel}} \times \varepsilon_f}$
Monopoly (*N*=1)	$P \times (1 + \frac{1}{\varepsilon_{Q,P}}) = MC$	$L = \frac{P - MC}{P} = -\frac{1}{\varepsilon_{Q,P}}$

HHI is Herfindahl–Hirschman Index: $HHI = \sum_{i=1}^{N} s_i^2$. *N* is the number of firms in the industry. $\varepsilon_{Q,P}$ is the industry demand elasticity: $\varepsilon_{Q,P} = \frac{dQ}{dP} \times \frac{Q}{P}$. ε_f is the elasticity of competitive fringe supply: $\varepsilon_f = \frac{dQ_f}{dP} \times \frac{P}{Q_f}$.

An analysis of these formulas indicates that the Lerner Index (output price increase) can be generally related to: (1) the number of market (cartel) participants (-), (2) the market share of a group of firms with market power (cartel) (+), (3) the size inequality among market (cartel) participants (-), (4) the industry demand elasticity (-), and (5) the industry competitive fringe[8] supply elasticity (-), if the competitive fringe firms are present in the industry. The plus and minus signs in the parentheses indicate either a positive or negative relationship of the factor to the Lerner Index magnitude[9].

[8] In the case of agricultural cooperatives and in the context of this article, non-members represent competitive fringe. Some of them may choose to comply with the programs of the cooperatives (without being formal members), and some of them may undermine the effectiveness of the programs by either producing more or selling at a lower price.
[9] For a more detailed discussion of factors influencing the magnitude of cartel overcharges see Bolotova (2006) and Bolotova (2009).

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The results of this analysis are in line with hypotheses (predictions) of the theory of oligopoly (Stigler 1964), which has traditionally been used to analyze cartels, their conduct and market effects of this conduct. According to this theory, factors contributing to cartel success (i.e. ability to impose a price increase) can be classified in two groups. The first group includes market structural characteristics that facilitate effective collusion: the homogeneity of product and purchasing commitments, a high level of market concentration, a small number of sellers, inelastic demand and high barriers to entry.

Based on the theory predictions, classic cartels are typically formed in oligopolistic markets with a relatively small number of firms. Theoretically, oligopolists joining cartel can manage to act as a single monopolist to achieve a monopolistic price level. However, the mere presence of market structural characteristics is not sufficient for cartel success. The costs of organizing and enforcing cartel agreements represent the major obstacle in achieving the monopoly price level.

Consequently, the second group of factors contributing to cartel success includes factors relating to developing an effective cartel agreement and its enforcement mechanism (policy). This represents a real challenge for cartel participants and involves substantial costs. Each cartel member seeks to maximize his own profit and always has incentives to deviate from the agreement (it is often referred to as an opportunistic behavior or a cheating problem). Furthermore, cartels have to deal with non-members, who create a free-riding problem and can destroy the cartel efforts.

The main differences between the organizations of agricultural producers implementing supply management (production control) and classic cartels are the type of market structure, including the number of participants and barriers to entry, and legal status. As compared to classic cartels, which are organized in industries with oligopolistic market structures, where there is a relatively small number of firms and high barriers to entry, the organizations of agricultural producers are organized in industries with perfectly competitive structures, where there are many firms (agricultural producers) and relatively low barriers to entry.

The type of market structure is a major determinant affecting the success of the implementation of output control strategy and the ability to increase market price. As the number of cartel participants increases, the degree of their seller market power (i.e. price increase) decreases. Furthermore, a large number of agricultural producers makes it more difficult to develop and especially to effectively enforce the output control strategy. Despite the fact that some agricultural cooperatives have large market shares, which theoretically contributes to cartel success, a large membership represents a real challenge in developing and enforcing their agreements (programs).

In agricultural industries, large market shares of the organizations of agricultural producers are not likely to be reflected in a significant degree of market power, as compared to other industries. Assuming that agricultural producers can legally implement some form of agricultural supply (output) control, they are much less likely to be effective in imposing a sustainable price increase, in terms of both the magnitude and duration. A large number of agricultural producers, low barriers to entry, a presence of producers-non-members, and the size inequality among agricultural producers would make achieving a sustainable price increase more difficult. This

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may suggest that the size of damage (overcharge) from agricultural supply control is likely to be lower than the damage imposed by classic cartels using a similar output control strategy, though acting illegally.

Supply Management in the United States Dairy and Potato Industries

This section discusses supply management programs implemented in the U.S. dairy and potato industries in the 2000s. The focus of this discussion is on economic forces leading to the decision of agricultural producers to implement supply management programs, the design of supply management programs and their enforcement procedures. Available empirical evidence on the market (price) effects of these programs is also discussed.

U.S. Dairy Industry and Cooperatives Working Together (CWT) Supply Management Program

The U.S. dairy industry implemented two government-sponsored voluntary supply management programs in the 1980s to address the over-supply problem and increasing volatility of milk prices: Milk Diversion Program (1984) and Dairy Termination Program (1986 and 1987). The U.S. Congress authorized these programs, and they were funded partially through the dairy producer assessments and partially through the government funds[10].

The supply management program developed and implemented during the period of 2003-2010 was the first *private*, industry-funded and administered program. There was no government participation involved, and the participation of dairy producers was voluntarily. The program was initiated by the National Milk Producers Federation (NMPF), a trade association of dairy cooperatives. It was implemented through the Cooperatives Working Together (CWT), which encompassed dairy producers and their cooperatives throughout the country. Participating dairy producers marketed on average 70% of the national milk supply.

The objective of the CWT supply management program was to balance milk supply with milk demand and to stabilize the level of prices received by dairy farmers in order to obtain a satisfactory level of farm-level milk price[11]. The CWT supply management program was developed in response to a number of economic forces adversely affecting the dairy farm profitability: over-supply of raw milk; increasing over time volatility of milk prices received by dairy farmers; an increasing level and volatility of agricultural input prices, in particular, feed prices; a substantial decrease in the government milk price support; and increasing exposure of domestic dairy industry to fluctuations taking place in international dairy markets.

The CWT supply management included a herd retirement program, a dairy export assistance program and a milk production reduction incentives program. The herd retirement program was the major of these three programs. The purpose of this program was to remove from production

[10] Gale (1990), Dixon et al. (1991) and Brown et al. (2010) discuss the nature of these programs and their economic effects. A general conclusion is that these programs were more likely to have some short-term positive effects and no long-term effects.

[11] The nature and design of the CWT supply management program are discussed in Parkinson (2008), Siebert and Lyford (2009), Brown et al. (2010) and McCay (2011).

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the entire milking herds of selected dairy farmers. The dairy export assistance program allocated subsidies to participating dairy cooperatives on exports of butter and cheese. The milk production reduction program was implemented once at the very beginning; there was a lack of support from dairy producers for this program.

During the period of 2003-2009, CWT held 9 herd retirement rounds, during which entire herds of selected number of dairy farms were removed from the production. To make a decision on whether to conduct a herd retirement round and the scale of the round, the CWT used the guidelines that included a number of economic indicators characterizing the industry conditions, such as the all-milk price[12], milk production cost, milk-feed price ratio, and cow numbers, among others.

During each heard retirement round, participating dairy producers had to submit their bids on how much money they were willing to accept in order to slaughter their entire milking herds. The CWT selected the bids that they were willing to accept. The producers of accepted bids were required to slaughter their entire herds during 15 days after the audit process of their production was completed. The CWT supply management program was funded through the assessments of participating dairy producers. Approximately 90% of the funds was allocated to the herd retirement program. The originally introduced in July 2003 assessment was $0.05/cwt[13]; it increased to $0.10/cwt in July 2006.

The available empirical evidence on the market (price) effects of the CWT supply management program includes estimated milk price increases. According to Brown (2009), the estimated all-milk price increase due to CWT program ranges from $0.22/cwt in 2004 to $1.54/cwt in 2009, with the average of $0.67/cwt increase (2004-2008). The largest share of the magnitude of these price increases are due to the herd retirement program. For example, while in 2008 CWT increased all-milk price by $0.87/cwt, the herd retirement program contributed $0.78/cwt, and the export assistance program added $0.09/cwt to the reported price increase.

The estimated all-milk price increases due to the herd retirement program reported by McCay (2011: Table 9) depend on the assumption on the elasticity of milk demand. Under the assumption of the demand elasticity equal to -0.1, the estimated short-run returns are in the range of $0.21/cwt (2009, 4th quarter) to $0.62/cwt (2009, 2nd quarter). If the demand elasticity is assumed to be -0.8, the estimated short-run returns are in the range of $0.03/cwt (2003, 4th quarter; 2008, 3rd quarter; 2009, 4th quarter) to $0.08/cwt (2009, 2nd quarter). As milk demand becomes less elastic, the price increase effect becomes stronger.

[12] In the United States, the Federal and State Milk Marketing Orders set the minimum prices that the first-level handlers (milk processors) have to pay to dairy farmers for raw milk (regulated pricing). This system uses classified milk pricing and pooling principles. Raw milk is priced according to its use defined by four milk classes (FMMOs). Class I milk is milk used in manufacturing of fluid (beverage) milk products (whole milk, reduced-fat milk, etc.). Class II, III and IV milk is used in manufactured dairy products (ice-cream, cheese, butter, etc.); this milk is often referred to as manufacturing milk. The receipts from milk processors are pooled within the orders and distributed among farmers based on the milk utilization rate in each milk class. Dairy farmers within the same Order receive the same *"all-milk" price*. The overview of FMMOs milk pricing is presented in Manchester (1983), Manchester and Blayney (1997, 2001 and 2004) and Brown et al. (2010).

[13] "Cwt" is one hundredweight (100 pounds).

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The milk price increases due to the herd retirement program reported in Parkinson (2008: Table 4) depend on the assumptions on the demand elasticities for manufacturing milk and fluid milk and the ratio of these two uses of milk. Assuming the average demand elasticities for manufacturing milk and fluid milk are -0.29 and -0.14 respectively, and the ratio of milk going in these two uses is 2:1 (consequently, the weighted average elasticity is -0.24), the estimated average nation-wide milk price increase is $0.36/cwt (a 2.63% price increase). If the weighted average demand elasticity for milk ranges from -0.17 to -0.31, the estimated milk price increase ranges from $0.51/cwt (a 3.71% price increase) to $0.28/cwt (a 2.03% price increase).

The reviewed studies emphasized that the CWT herd retirement program was likely to have a stronger short-run positive effect than a long-run effect. Some of the problems in effective implementation of the program include the following. First, the nature of animal reproduction process and improvements in genetics mitigate the effective impact of the supply reduction on market price. Second, a "free-riding" problem represents a great challenge and is difficult to address. There are dairy producers who benefit from higher milk prices without participating in the program by paying assessments. Furthermore, these producers have incentives to expand their herds in response to favorable (increasing) milk prices.

U.S. Potato Industry and United Potato Growers of America (UPGA) Potato Supply Management

The U.S. potato industry followed the dairy industry experience. A potato supply management program was developed and implemented in order to mitigate a similar to the dairy industry economic conditions adversely affecting the profitability of potato growers . This program was a private, industry-funded and administered program and involved no government participation. The idea of potato supply management originated in Idaho, the leading potato producing state in the country. The United Fresh Potato Growers of Idaho (UFPGI), a marketing cooperative of fresh potato growers, was organized in the fall of 2004, and the first potato supply management program was implemented in the spring of 2005.

Originally the UFPGI represented 85% of fresh potato growers in Idaho. Shortly, processing and seed potato growers joined the cooperative. A national level cooperative, the United Potato Growers of America (UPGA), was organized in March 2005. UPGA originally represented 70% of fresh Russet potato growers in the country. The UPGA became a coordinating mechanism for a newly created system of regional cooperatives of potato growers with similar objectives, which were joined by Canadian potato growers.

The objective of the potato supply management program was to stabilize the potato supply in order to provide a fair level of returns to potato growers. The program was expected to help mitigate the adverse effects of the over-supply of fresh potatoes, a low level and high volatility of fresh potato prices received by potato growers, increasing level and volatility of potato production costs, and increasing competition from Canadian potatoes. The combination of these economic forces adversely affected the profitability of potato producers and caused frequent financial situations when the returns received by potato growers did not cover their potato production costs.

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The potato supply management program was originally developed to control fresh potato supply (production and marketing). The potato acreage management program was used to control the number of fresh potato acres planted. The potato flow control program and exchange of marketing information were used to effectively manage the shipments of fresh potatoes throughout the marketing year. The potato supply management program was funded through the assessments of participating growers.

To implement the potato acreage management program, a system of base acres was introduced. The base acres for each grower were those acres where potatoes were planted during the period of 2003-2004. Each base acre was originally assessed at $50. During the first year of the program implementation, the cooperative members were required to decrease the planted area by 15% relative to the base year (i.e. 2004). If a grower chose not to reduce the planted area or to reduce it by less than 15%, he was assessed a pro-rated percentage of $50. The assessment fund was used to buy acres elsewhere in Idaho. If a grower decided to expand relative to the base year, he was assessed $100 per acre. Field audit was conducted to monitor a proper implementation of the acreage management program.

The potato flow control program and exchange of marketing information were used to coordinate quantity of potatoes supplied to the market throughout the year. A variety of marketing information (capacity, stocks, prices, demand and supply trends, etc.) was discussed during conference calls that took place once a week at the national level. The results of the discussion were summarized in a price advisory used as a recommended pricing strategy for the coming week. Other marketing activities included the removal of excess potatoes from the market by diverting them to charities, food banks and humanitarian services.

The empirical evidence available for the first few years of the potato supply management program implementation may suggest that the program was effective. Bolotova (2009), using data for all Idaho potatoes (fresh, processing, seed), reported an increase in the Lerner Index of market power from 0.4% in 2004 to 11.3% in 2005 (the first year of the program implementation). A successful implementation of the potato supply management may have contributed to the observed increase in the Idaho potato industry Lerner Index. It should be noted that the major focus of the supply management program was originally on fresh potato market. Taking into account the evidence of the over-supply of fresh potatoes and the fact that fresh potato prices were below the potato production cost in 2004 and a few preceding years, the Lerner Index of Idaho fresh potato market alone was likely to be much lower than the presented number for the entire industry (fresh, processing and seed potatoes).

Bolotova et al. (2008) reports fresh potato price changes (increases) between a period without the supply management (the pre-coop period) and a period encompassing the first few years of the program implementation (the coop period). An empirical analysis based on monthly fresh potato prices received by potato growers for all potato varieties indicates that the Idaho fresh potato prices increased from $3.89/cwt in the pre-coop period to $6.63/cwt in the coop period. While this reflects a 70% increase in Idaho fresh potato price, potato production costs' increase was in the range of 10% to16%. The U.S. fresh potato prices increased from $7.78/cwt to $10.19/cwt or by 31%.

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These price increases should be interpreted by evaluating the level of potato price relative to the potato production cost and relative to the U.S. average potato price during the pre-coop and coop periods reported in Bolotova et al. (2008: Table 5). First, the average Idaho potato price was $3.89/cwt during the pre-coop period, and it was below the minimum level of potato production costs, which ranged from $4.63/cwt to $5.23/cwt during the same period. During the coop period, the average Idaho potato price was $6.63/cwt, which was above the maximum level of potato production costs, which ranged from $5.17/cwt to $5.96/cwt during the same period. In addition, the average Idaho potato price during the coop period, $6.63/cwt, was far below the average U.S. potato price during the coop period, $10.19/cwt, and was also lower than the U.S. average potato price during the pre-coop period, $7.78/cwt.

An empirical analysis utilizing a more disaggregated data, Idaho weekly shipping point prices for Russet Burbank between the pre-coop and coop periods, suggests that fresh potato price increases were in the range of 47%-71% for US No1 non-size A potatoes, 14%-52% for US No 1 size A potatoes and 34%-72% for US No 2 potatoes (Bolotova et al. 2010: Table 3) . The Russet Burbank potato production and packing costs increased by 16%-20% (Bolotova et al. 2010: Table 2). Finally, Bolotova et al (2008 and 2010) report empirical evidence reflecting a reduced fresh potato price volatility during the first years of the program implementation.

Current Debate on the Legal Status of Agricultural Supply Management Practices and Production Restrictions

Currently the legal status of agricultural supply management practices of the organizations of agricultural producers, in particular, the legal status of various forms of production restrictions, represents a very controversial issue. Possible consequences of this legal uncertainty for agricultural producers and their organizations are substantial civil penalties under federal and state antitrust laws. Under federal antitrust law, direct buyers are entitled to recover treble damages (i.e. three times the overcharge). Under the state antitrust and similar statutes, indirect buyers are entitled to recover from a single to three times the overcharge, depending on a particular state jurisdiction.

Until very recently, the existing case law was not clear on whether and which exactly supply management and production control practices were protected by the Capper-Volstead Act. A general perception of the industry participants was that this type of activities was immune. In terms of economics, the market effects of supply (production) control are similar to the market effects of price-fixing. There is a well-developed case law establishing that the organizations of agricultural producers can fix output prices, as this is an element of marketing activities that Section 1 of the Capper-Volstead Act aims to protect.

A number of recent publications of government officials from the U.S. Department of Justice Antitrust Division and a number of on-going federal and state private antitrust litigations indicate that the uncertainty surrounding the legal status of agricultural supply management practices remains. This situation represents a great challenge for agricultural community because it affects production, marketing and pricing decisions and strategies of individual agricultural producers and of their organizations.

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A set of arguments for holding production (supply) restrictions both outside and within the Capper-Volstead Act immunity are discussed by Christine Varney, a former Assistant Attorney General of the U.S. Department of Justice Antitrust Division (2010). This issue is evaluated by analyzing the language of Section 1 of the Capper-Volstead Act, existing decisions/recommendations of the government agencies (Federal Trade Commission, Department of Justice and Department of Agriculture) and the relevant case law. The summary of the analysis is presented below[14].

A number of reasons favoring the point of view that agricultural production restrictions are not immune by the Capper-Volstead Act are the following. First, the explicit list of activities included in Section 1 does not include words "production" or "supply". This list encompasses a range of marketing (post-production) activities. It reads that agricultural producers "may act together in collective processing, preparing for market, handling and marketing". One might argue that all these activities are post-production type, and therefore they do not include joint production activities.

Second, any antitrust exemption is to be interpreted very narrowly, as guided by the U.S. Supreme Court. Third, a similar to the Capper-Volstead Act statute, the Fisherman's Collective Marketing Act (FCMA), which regulates fishermen activities, defines the scope of protected activities by explicitly including words "catching" and "production". The Capper-Volstead Act does not include similar words. Finally, the legislative history of the Capper-Volstead Act may suggest that Congress did not intend to include production (supply) restrictions in the scope of protected activities. An approach that both antitrust enforcement agencies, Federal Trade Commission and Department of Justice, have taken is that the Capper-Volstead Act does not protect production restrictions.

A number of reasons favoring the point of view that agricultural production (supply) restrictions are within the scope of the Capper-Volstead Act are the following. First, it can be argued that the scope of activities listed in the Act does encompass the whole range of activities from pre-planting through harvest, processing to sales. One might argue that effective marketing (i.e. preparing for market and marketing) includes the decision on how much to produce in the first place. Second, withholding already available agricultural output from the market might be considered as part of marketing. This may include donating this part of output to charities and/or destroying it. Actually, allowing withholding already available output, but not allowing production restrictions, may be more wasteful and inefficient from the societal perspective.

Third, the Act's legislative history may be used to argue that production restrictions were immune. In particular, Congress indented to treat the organizations of agricultural producers as single corporations. This implies that an organization of agricultural producers, as a single corporation, can decide on how much to produce. Fourth, some limited case law may be used to argue that supply (production) restrictions are protected by the Act. For example, in *Alexander vs. National Farmers Organizations* (1982), the court held that the cooperative could withhold the members' output in order to obtain a higher price. One may further interpret this legal

[14] Also see Ondeck and Clair (2009), Frackman and O'Rourke (2011), Hibner (2011) and Manning and Welle (2012).

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opinion as the one suggesting that agricultural cooperatives can limit their production. Finally, there are opinions indicating that, if the Fisherman Collective Marketing Act allows controlling production, the Capper-Volstead Act should protect this activity as well, although the language of the latter is somewhat different, as mentioned earlier.

The case law influences the antitrust enforcement efforts of antitrust enforcement agencies. In particular, as indicated by Varney (2010), the outcomes of current litigations were important for the enforcement efforts of the Department of Justice. In December 2011, a U.S. district court for the first time in history addressed the issue of planting restrictions in a lawsuit against a group of cooperatives of potato growers, including the United Potato Growers of Idaho and United Potato Growers of America (*In Re: Fresh and Process Potatoes Antitrust Litigation*).

After conducting a very comprehensive analysis, the court concludes that production restrictions (acreage limitations) are not protected by the Capper-Volstead Act. First, by having analyzed the existing case law, the court indicates that there are no legal opinions that explicitly approve a pre-production output limitation as opposed to a post-production marketing decision. Furthermore, there are no legal opinions suggesting that the Capper-Volstead Act immunizes cooperatives who decide to collectively reduce production in order to increase market prices. Second, by analyzing the plain language of the Capper-Volstead Act, the court concludes that it does not include reducing acreage for planting.

Third, the opinion reiterates that the government agencies responsible for antitrust law enforcement in their own opinions have not approved production restrictions. Fourth, in response to the defendants' (i.e. the cooperatives) argument that production restrictions are similar to price-fixing, and it is well-established that the latter is immune by the Capper-Volstead Act, the Judge concludes that these are not the same. This is because an individual freedom to produce more during the periods of higher prices acts as a safe-guard against the Capper-Volstead Act abuse. Finally, the Act's legislative history is used to conclude that Congress did not indicate a strong intent to give farmers opportunity to limit their production. The Judge clarifies that agricultural supply control is possible under Agricultural Marketing Agreement Act (1937).

Discussion and Implications of the Analysis Results

Agricultural producers and their organizations involved in developing and implementation of the private industry-funded and administered supply management programs in the U.S. had a legitimate objective: to address the over-supply problem and increasing output price volatility in order to achieve a fair level of returns. Due to the nature of agricultural production, the over-supply of agricultural commodities has been a common problem in agricultural markets. It becomes a more challenging problem to deal with in the modern agribusiness environment.

First, during recent decades, the level of various forms of domestic government support of agricultural producers has been decreasing, mostly due to international trade liberalization and WTO rules imposing the limits on the amount of domestic support. There is a considerably higher degree of exposure of domestic agricultural commodity markets to conditions of international commodity markets and to increased competition from these markets. This situation contributes to increasing volatility of agricultural input and output prices.

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Second, agricultural producers are affected by increasing concentration and consolidation that have been taking place in agricultural input markets as well as in food processing, distribution and retailing. An increase in market power observed in these segments of the food supply chain leads to higher agricultural input prices (due to the seller market power of agricultural input suppliers) paid by agricultural producers and to lower agricultural commodity prices (due to the buyer market power of buyers of agricultural commodities) received by agricultural producers.

Third, some of the economic effects of the over-supply of agricultural commodities have a direct adverse effect on the profitability of agricultural producers and also involve losses for the society. The over-supply of agricultural commodities causes a wasteful use of resources used in agricultural production. From the agricultural producers' perspective, this increases their agricultural production costs. At the same time, the excessive volume of agricultural commodities in the market place causes prices received by agricultural producers to decline further. An increase in agricultural production costs and a decrease in revenue decreases the farm profitability.

The reviewed empirical evidence on the economic (price) effects of the private industry-administered and funded supply management programs in the U.S. dairy and potato industries implemented during the 2000s suggests that these programs may be a workable mechanism to be used to address the over-supply problem and may provide some noticeable returns to agricultural producers in terms of a higher level of prices and a lower price volatility (i.e. reduced price risk).

However, direct and indirect buyers of agricultural commodities (and food products manufactured from these commodities) affected by the supply management programs have challenged the legal status of the supply management practices and in particular of agricultural production restrictions in a number of recent and on-going antitrust litigations. The current uncertainty surrounding the legal status of various agricultural supply management practices implemented by the organizations of agricultural producers in the U.S have significant implications for production, marketing and pricing decisions of individual agricultural producers and their organizations.

This situation poses a number of legal, economic and business issues that deserve further analysis and discussions among industry participants, policy-makers, lawyers and researchers. Some of the issues to be evaluated in the future are discussed below.

Implications for Industry Decision-Makers and Law Practitioners

1. *It is important to distinguish between supply management practices implemented at the pre-production, production and post-production stages.*

Various supply management practices at the post-production stage are more likely to be protected by the Capper-Volstead Act, because they are likely to be characterized as "marketing" activities described in Section 1. It is "safer" to use only those agricultural supply management practices that are known to be immune.

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One of the challenges is that there is a very limited case law interpreting supply management practices, which creates uncertainty on how a particular practice will be interpreted in the future, should a legal dispute arise. An analysis presented in *Alexander vs. National Farmers Organizations (1982)*[15] may suggest that the organizations of agricultural producers may withhold already produced agricultural output of their members in order to obtain a higher price for this output. This type of "post-production" supply management is more likely to be interpreted as "preparing for market and marketing" in light of Section 1 of Capper-Volstead Act.

2. *Evaluating and developing alternative to agricultural supply management (including production restrictions) practices deserve consideration.*

here is a well-developed case law establishing that price-fixing (price-setting) activities of the organizations of agricultural producers are protected by the Capper-Volstead Act, because they are elements of marketing.

For example, in *Treasure Valley (1974)* the joint bargaining activities of two cooperatives of potato growers with two potato processors involving negotiations of both price and non-price terms in potato processing contracts were found to be within the scope of the Capper-Volstead Act. Furthermore, *Northern California Supermarkets (1976)* clarifies that an organization of agricultural producers can fix prices without being directly involved in the process of marketing, sales or other activities mentioned in Section 1. This legal opinion confirms that price-fixing by the organizations of agricultural producers is a legitimate Capper-Volstead Act activity.

The issue for some of the organizations of agricultural producers to evaluate is whether some form of price-fixing may be a viable alternative to agricultural supply management and in particular to production restrictions at the pre-production and production stages.

3. *It is important to re-evaluate the role and functions that the organizations of agricultural producers may perform for the joint benefits of their members in the modern agribusiness environment.*

Some of these organizations may be purely bargaining organizations, which would represent agricultural producers in the contract negotiation processes with buyers of agricultural commodities (processors, distributors and retailers) (cases analyzed in *Treasure Valley (1974)* and *Northern California Supermarkets (1976)*).

Additionally, some of the organizations of agricultural producers may be actually involved in various marketing activities, including some form of supply management and exchange of marketing information (the U.S. dairy and potato industry experience discussed in the article). The specific market structural characteristics and the nature of contractual relations (selling/buying practices) between agricultural producers and buyers of agricultural commodities

[15] USDA Rural Business-Cooperative Service (2002) presents a comprehensive analysis of the case law discussed in this section.

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(processors, distributors and retailers) would define the role and functions that the organizations of agricultural producers should perform.

4. *In order to be legally involved in the activities protected by the Capper-Volstead Act, it is imperative for the organizations of agricultural producers (cooperatives, associations, federations, agencies, etc.) to comply with the requirements to the organizational structure specified in Section 1 of the Capper-Volstead Act, and all agreements and contracts of these organizations with other entities must comply within the requirements of this section*[16].

First, all members of the organization have to be agricultural producers and have to be *actually* involved in agricultural production. A presence of one member, who is not involved in agricultural production, removes the Capper-Volstead Act protection for the whole organization and its activities.

For example, in *Case-Swayne (1967)*, U.S. Supreme Court interprets "a person engaged in agricultural production" (Section 1 of the Capper-Volstead Act) very narrowly. This caused Sunkist, an organization of citrus fruit producers, to fall outside the Capper-Volstead Act protection. Approximately 15% of Sunkist's members handling approximately 13% of its volume were packing houses, who operated for profit and did not grow citrus fruits. Their relationships with growers were through marketing contracts and not through membership agreements.

In *National Broiler (1978)*, U.S. Supreme Court revisits the definition of agricultural producers (i.e. farmers) in the case of a large vertically integrated cooperative of entities involved in broiler production. This legal opinion reiterated a very narrow definition of agricultural producers for the purpose of Section 1 of the Capper-Volstead Act, by restricting it to persons who were *actually* involved in growing broilers. The Court declined to extend this definition to the members of cooperative who were involved in other but growing activities (i.e. processing, feed supply) and rejected the idea that these entities participated in actual production through risk involvement.

The most recent legal opinion addressing the definition of agricultural producer in light of the Capper-Volstead Act, *Re: Mushroom (2008)*, reiterates that this definition is to cover only producers directly engaged in agricultural production. The presence of one member who was a non-producer, but who participated in the decision-making process of a mushroom cooperative, removed the antitrust immunity from this organization.

Second, being involved in combinations and contracts with non-exempt entities removes the antitrust protection, and these agreements are potentially subject to Section 1 of the Sherman Act. According to *Borden (1939)*, the organizations of agricultural producers are subject to

[16] Associations of agricultural producers have to operate for the mutual benefits of their members and have to conform to one of the following: (a) no member is allowed more than one vote or (b) the association does not pay dividends in excess of 8 per cent per annum. In addition, the volume of products from non-members handled through the association cannot exceed the volume of products from its members.

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Sherman Act, if they enter into combinations with non-exempt entities with the purpose of restraining trade and monopolization.

5. *Government-sponsored (public) supply management programs are alternatives to private industry-funded and administered programs.*

These public programs are possible under Agricultural Marketing Agreement Act (1937). However, this alternative is not likely to be feasible for a number of reasons. First, this would be considered to be a measure of domestic agricultural support under the WTO rules. Second, the U.S. dairy industry experience with Milk Diversion Program (1984) and Dairy Termination Program (1986 and 1987) may suggest that this type of programs is likely to provide only some short-term positive effects.

Implications for Researchers and Policy Decision-Makers

6. *There is a need for a comparative analysis of the actual market (price) effects of the output control and price-fixing practices of the organizations of agricultural producers*.

It may be hypothesized that the market (price) effects of price-fixing, which is protected by the Capper-Volstead Act, may be stronger (more harmful to the market) than the market (price) effects of agricultural supply management at the pre-production and production stages. In other words, from antitrust law perspective, the former is more damaging to the market than the latter.

In the case of production restrictions, there is a great deal of production and price uncertainty that would affect (and likely to reduce) the effective impact of output reduction on the market price. First, there is a certain time lag between the moment when the supply control (production restrictions) is implemented and the moment when the market price adjustment takes place. Second, there is uncertainty pertaining to agricultural production process. In particular, increasing over time crop yield and livestock productivity (due to the improvement in genetics and agricultural management practices) would mitigate the effect of the supply reduction on the output price over a longer time horizon. Third, given that there are many agricultural producers in the industry, there will be always non-members, which are likely to expand their production at the expense of participating members, which would drive the market price down.

On the other hand, a pure price fixing at the farm-gate, which is an element of marketing activities typically protected by the Capper-Volstead Act, has an immediate effect on market price. One may hypothesize whether a practice which market effects may be more damaging is permitted, and a practice which market effects may be (hypothetically) less damaging is prohibited. A rigorous empirical analysis of the market effects of various supply management and price-fixing practices in different agricultural markets is required to test this hypothesis.

7. *A related policy question is whether agricultural supply management practices, and in particular production restrictions, are viable means to deal with the over-supply problem and help balance supply with demand.*

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The results of a comprehensive analysis of the economic effects of the private supply management programs (and of their key elements) implemented in the U.S. during the period of 2002-2009 would help answer this question.

8. *Under the presumption that the private industry supply management, including production control, is not protected by the Capper-Volstead Act, could a legitimate price-fixing practice help effectively deal with the over-supply problem?*

A comparative analysis of the economic effects of price-fixing and supply management in a particular industry setting should be conducted to answer this question.

Conclusion

During recent years the nature of competition process in agricultural and food industries in the United States attracted increased attention of policy decision-makers, industry participants and antitrust law practitioners (U.S. Department of Justice Antitrust Division and U.S. Department of Agriculture Initiative 2009-2010, Ondeck and Clair 2009). A considerable number of questions have been raised about the Capper-Volstead Act in general and its role in the modern agribusiness environment. The increased attention to various practices used by the organizations of agricultural producers, including agricultural supply management, tends to stem from the fact that many agricultural cooperatives today have large market shares. It is often presumed that large market shares are reflected in market power and higher prices paid by buyers and final consumers.

The analysis presented in this article, by comparing agricultural cooperatives with classic cartels (typically organized in markets with oligopolistic market structures where there are "few" firms), indicates that the price effects of production restrictions used by agricultural cooperatives are likely to be much weaker than the price effects of output control strategies implemented by classic cartels. Furthermore, a large membership of agricultural cooperatives and presence of non-members would always present challenges in effective enforcement of various supply management practices and their actual effects on market prices.

Finally, the issue of the legal status and market effects of the joint activities of agricultural producers is relevant for the overall international community. Many countries have similar to the Capper-Volstead Act laws. These laws typically provide a very limited antitrust immunity. During the recent decade many countries have strengthened their antitrust laws, and consequently the systems of penalties for antitrust violations. The effective joint efforts of domestic antitrust authorities have been also observed at the international level (International Competition Network).

In the past, agricultural producers in many countries benefited from a variety of income and price support government-administered programs as well as from substantial international trade barriers protecting their domestic markets. In a modern global market environment, with a constantly decreasing degree of domestic government support and trade barriers, many agricultural producers are more frequently and severely affected by agricultural over-supply. Individual agricultural producers and, more importantly, their organizations in the near future

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will have to consider new supply management and pricing practices, which can help them remain profitable and preserve viable agricultural production.

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