

Agricultural Policy and Imperfect Competition: Why the CAP reform needs a competition policy.

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Abstract:

The objective of this paper is to show that the reform of the EU Common Agricultural Policy (CAP) should be accompanied by policy measures aimed to reduce market power in the European food system. I provide an example of the potential interaction between market power and agricultural policy describing the effects of removing a price floor policy in an imperfectly competitive market. The model shows that the oligopsony power in the food system may reduce the benefit from decoupling. If the price floor is optimally chosen, decoupling may reduce the social welfare. Thus, in presence of oligopsony the price floor policy may be socially efficient. However the policy is at most a “second best”, because the social welfare under the policy regime is equal or lower than under the perfect competition regime. Thus, keeping the price floors is less efficient than decoupling and, at the same time, increasing the level of competition in the market. From this point of view, pro-competition policies are a complement of the CAP reform.

Introduction

The objective of this paper is to show that the reform of the EU Common Agricultural Policy (CAP) should be accompanied by policy measures aimed to reduce the potential oligopsony power in the European food system. The main conclusion of the analysis is that oligopsony power may reduce the increase in social welfare due to the total decoupling of the EU agricultural policy. Thus, the nature of the competition in the food market is a fundamental issue in the design of the new CAP.

Since 1992, the CAP underwent a slow but steady process of reform. One of the cornerstones of this process is the decoupling of the government intervention in agriculture. The price support measures have been progressively attenuated and the farmers have been compensated with direct payment based on historical production. The EU Commission has indicated a term for the completion of the transition. In 2013 the last coupled measures (for example, the dairy quotas) will be dismantled. Moreover, the agenda for the scheduled 2013 reform is already based on the insight that it will be difficult to provide a political justification for historical payments in the long run. In this political scenario, the after-2013 CAP is expected to be a market-oriented policy and the government intervention will focus on “green-box” measures, such as environmental or rural development payments in order to preserve the European rural way of life and landscape. Dismantling the coupled intervention and historical-based payments is expected to achieve two main objectives: to increase the efficiency of the agricultural markets (by exposing farmers to competition) and to make available financial resources to funding the environmental and rural development measures, without increasing the total expenditures for the agricultural policies.

The goal of this paper is to show that the EU Commission’s strategy is based on the critical assumption that agricultural markets are perfectly competitive. Our model shows that if markets are imperfectly competitive, the reduction of the government intervention does not necessarily increase the social welfare. Thus, the resource shifting from market measures to rural development measures might not achieve the Commission’s objectives in terms of efficiency of agricultural markets. As a consequence the design of the 2013 CAP reform should include measures aimed to increase the level of competition in the EU food system. The current *health check* of the CAP can be an important opportunity to bring the competition issue into the debate about the reform of the EU agricultural policy.

Market Power in the E.U. Food System.

The impact of imperfect competition on policy design is a relevant topic, given the concerns about the increasing concentration in the EU food-retailing sector. In 1999 a report by Dobson Consulting stressed the impact of buyer power on the food system (Dobson, Waterson and Davies 2003, Dobson-Consulting 1999). In 2000, the DG Competition of the EU Commission found that supermarkets exerted market power to the detriment of suppliers (Cooper 2003). In 2005 the European Economic and Social Committee voiced the concern for the negative effects of supermarket concentration (Opinion NAT/ 262/2005). More recently, the EU Parliament voted a written declaration calling upon DG Competition to investigate the impacts of EU supermarket concentration on small businesses, suppliers, workers and consumers and requesting the Commission to propose appropriate measures including regulation (Declaration 0088/2007). Empirical studies have found evidence of market power in EU member states’ food system (Dobson, Waterson and Davies 2003).

Despite the increasing importance of market power in the food industry, the majority of

the policy analysis is based on perfect competition models (Rude and Meilke 2004). The implicit assumption is that perfect competition can be a good approximation to describe the behavior of industries holding a relatively small amount of market power. The main point of the analysis is that the interaction between market power and policy measures can affect substantially the outcome of government intervention. As a consequence, market power should be carefully considered in policy analysis (Bucirossi, Marette and Schiavina 2002, McCorrison 2002, Sexton 2000).

In this paper I provide an example of the potential bias in policy analysis that may result from ignoring market power by illustrating a theoretical model describing the effects of removing a price floor policy in an imperfectly competitive market.

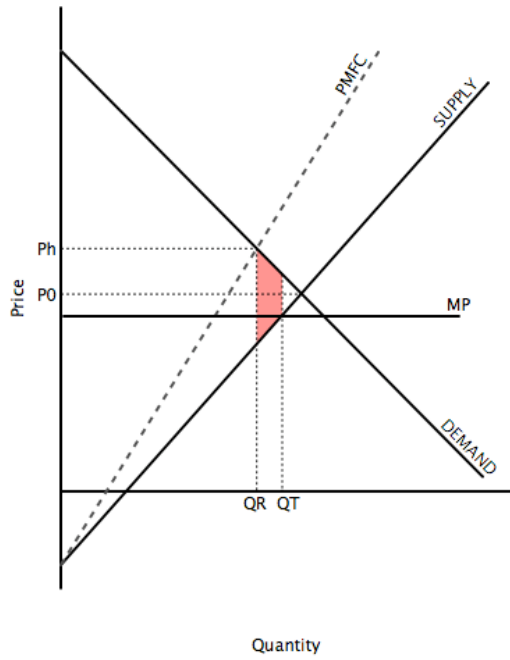
The Theoretical Model: Price Floors in Imperfectly Competitive Markets

I model a simplified price floor policy in which support prices are paid directly to farmers and there are no other constraints to the policy (such as maximum budget or closed-stock months, etc.). I assume that if the price floor policy is in place, a government agency is willing to buy the entire excess production at the floor price. I assume that the government stocks have no value (i.e., the goods are destroyed). At the expenses of more complicated algebra, the model can be generalized to allow for a positive social value of the stock. In order to focus the discussion on the issues of interest, I assume that there is no uncertainty in the market and no international trade.

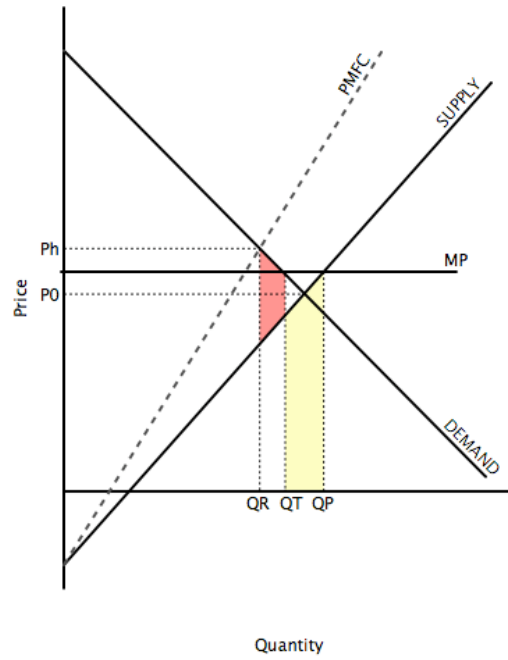
The model represents the interactions among three groups of agents: consumers, farmers and processors. Consumers and farmers are passive players, whose price-taker behavior is summarized by linear demand and supply functions. Processors are profit maximizers and may act strategically, using their oligopoly and oligopsony power. Processors' strategic behavior can be described using a conjectural variation approach, and it is summarized in the parameters θ and ξ describing oligopsony and oligopoly power, respectively. Both parameters vary between zero (perfect competition) and one (monopoly and monopsony, respectively). I assume that processors use a fixed proportion technology with constant returns to scale. This assumption states that i) the production technology adopted by the processors converts the farm commodity into the finished product according to a fixed proportion and ii) we have constant returns to scale in processing. As a consequence, the processors' cost function can be expressed as $C(Q) = (P_f + mc)Q$, where Q is the quantity of the finished product, P_f is the cost paid by the processors to buy the amount of the farm commodity necessary to produce a unit of the finished product and $mc \cdot Q$ are the processors' other production costs. Given such assumptions, in the next sections I model the welfare consequences of removing a price floor when the processing industry has market power. The key finding of the model is that a binding price floor may prevent processors from using oligopsony power but strengthens the effects of their oligopoly power. As a consequence, the net effect on social welfare of decoupling will depend on the relative size of the social benefit from removing the policy distortion and reducing the welfare effects of middlemen's oligopoly and the social cost of increasing the social loss from the middlemen's oligopsony power.

To illustrate the welfare effect of market power under a price floor regime, I begin by describing oligopoly and oligopsony separately, in order to identify the specific impacts. Later on, I integrated the two cases in a general model.

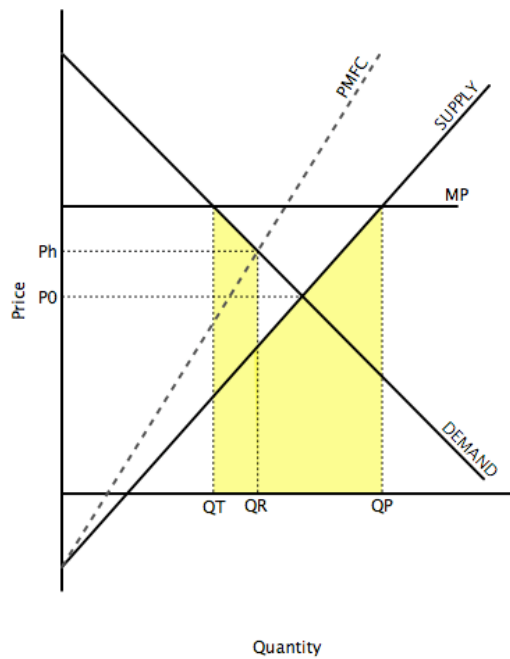
Figure 1: Welfare Effects of Liberalization in an Oligopsony



(A) Price floor lower than the perfectly competitive price (the red area is the loss from liberalization)

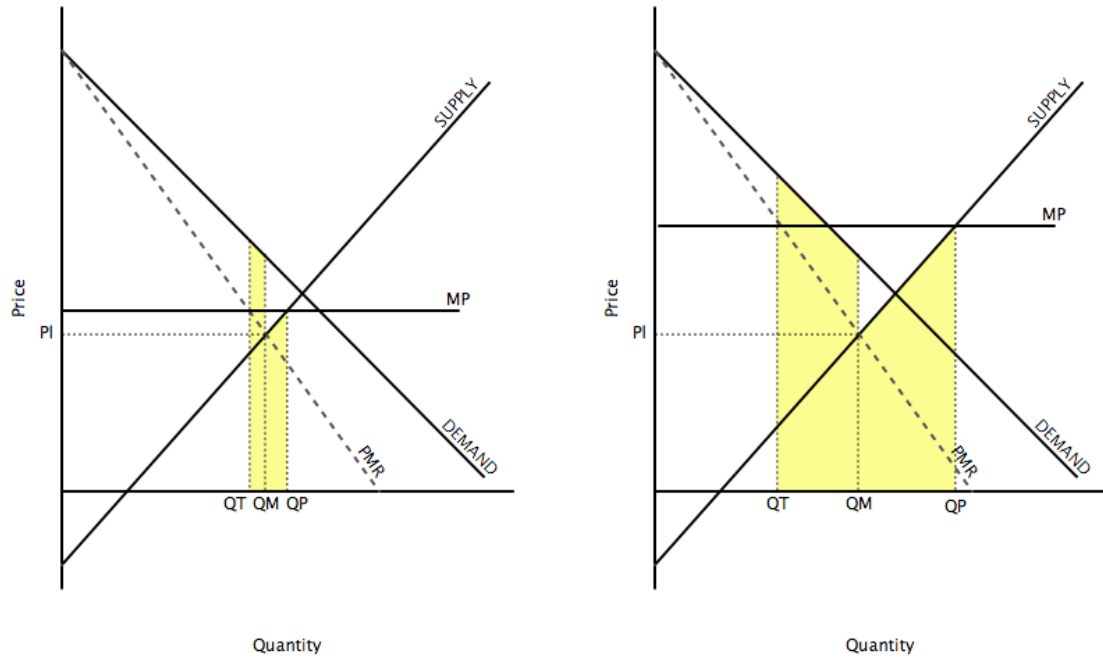


(B) Price floor higher than the perfectly competitive price but lower than the unregulated retail price P_h . (The gain from liberalization is the red area minus the yellow area)



(C) Price floor higher than the unregulated retail price P_h . (The yellow area is the gain from liberalization)

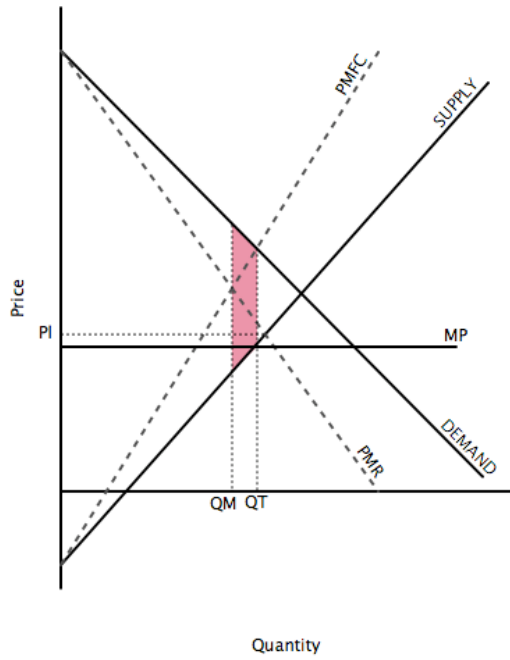
Figure 2: Welfare Effects of Liberalization in an Oligopoly



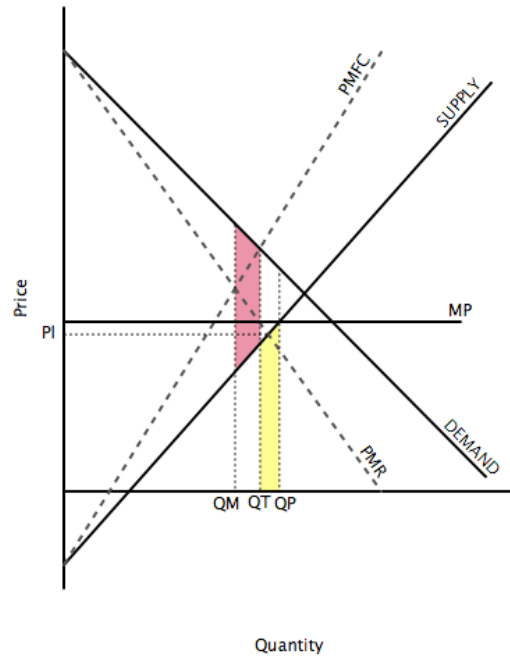
(A) Price floor lower than the perfectly competitive price (the shaded area is the gain from liberalization)

(C) Price floor higher than the perfectly competitive price (The shaded area is the gain from liberalization)

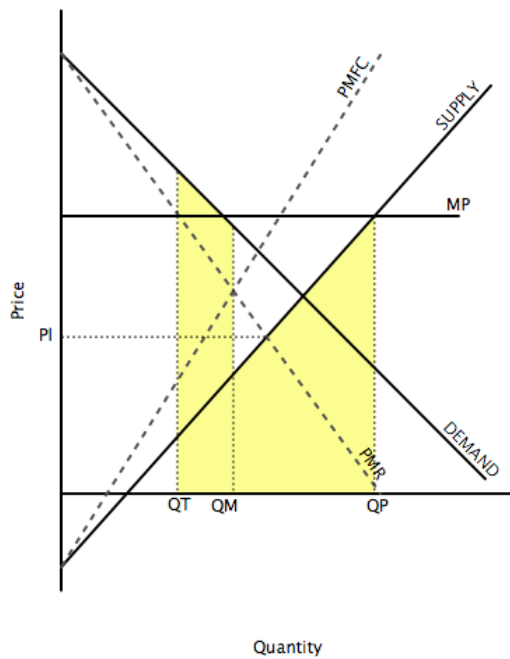
Figure 3: Welfare Effect of Liberalization in a Mixed Oligopoly-Oligopsony Model



(A) Price floor lower than the intersection between PMR and Supply (the shaded area is the loss from liberalization)



(B) Price floor higher than the intersection between PMR and supply but lower than the intersection between PMR and PMCF. (The gain from liberalization is the red area minus yellow area)



(C) Price floor higher than the than the intersection between PMR and PMCF. (The shaded area is the gain from liberalization)

Oligopsony

Figure 1 illustrates the pure oligopsony case. If the price floor is binding, the processing industry faces a perfectly elastic supply and, consequently, processors have no opportunity to exploit the oligopsony power. Figure 1 identifies three possible cases, depending on the position of the price floor (MP) level with respect to the perfectly competitive equilibrium price (P_0) and the unregulated retail price (P_h). In Panel A, MP lies below P_0 . Since the industry has no oligopoly power, the equilibrium under the policy regime is at the intersection of the supply curve with the price floor. At the equilibrium point (Q_T) there is a discontinuity in the perceived marginal factor cost ($PMFC$), because for higher quantities the constraint is not binding and processors recognize that an increase in the traded quantity would trigger an increase in prices.

Since we have that the consumer price is higher than the PMFC for any quantity lower than Q_T and lower than PMFC for any quantity higher than Q_T , the equilibrium is exactly at the discontinuity point. In this case, the policy increases social welfare: compared to the unregulated market, the price floor results in a higher consumed quantity, higher farmer prices and lower consumer prices. Note that this result is achieved without inducing excess supply. The shaded area in Panel A represents the social loss for the society if the regulator removes the price floor.

In case B, the price floor is higher than the perfect competition equilibrium price and lower than the unregulated consumer price ($P_0 \leq MP \leq P_h$). The equilibrium prices and quantities are determined by the intersection of the price floor line with the demand and supply curves. The policy increases consumption and reduces consumer price but it induces excess supply that must be bought by the government. The graph shows that the welfare consequences of liberalization depend on the relative magnitude of the saving in government expenditure relative to the social losses from the decrease in the traded quantity. In pane B the net effects of the two components are represented by the red area and the yellow area, respectively. The relative magnitude of the effects depends on the demand and supply elasticity and on extent of market power. Note that a price floor higher than P_0 may still increase the social welfare.

If the price floor is higher than the unregulated retail price (case C), the equilibrium is still determined by the intersection of the price floor with demand and supply, but the policy is always socially inefficient. The traded quantity under the policy regime (Q_T) is lower than the traded quantity in the unregulated market (Q_R). The shaded area represents the social gain from liberalization.

Oligopoly

In the case of pure oligopoly, price floors are always inefficient compared to the unregulated market equilibrium. The intuition behind this result is that price floors cannot prevent processors from using their oligopoly power, so that the deadweight losses from the policy and from market power are cumulative rather than offsetting. Figure 2 illustrates the effects of liberalization in an oligopoly given a binding price floor that is either lower than the perfectly competitive price (panel A) or higher (panel B). In both cases the equilibrium is found at the intersection of the perceived marginal revenue curve (PMR) and the price floor. Unless either demand or supply are perfectly inelastic, the policy regime results in lower consumed quantities and in excess supply compared to the unregulated market and the policy is welfare-reducing. The shaded areas represents the gains from removing the price floor. Note that in an oligopoly there is excess supply even if the price floor is below P_0 .

The Mixed Model

If the processing industry has both oligopoly and oligopsony power, the welfare effect of liberalization depends on the extents of the two kinds of market power, the value of the price floor and the elasticity of consumer demand and farmer supply. Figure 3 illustrates the model. There are three possible cases, depending on the relative value of the price floor with respect to P_l (the price corresponding to the intersection of the perceived marginal revenue (PMR) curve with the supply curve).

If the price floor is binding but below P_l , the equilibrium quantity Q_T is determined by the intersection of the price floor line with the supply curve (Figure 3, Panel A). At this point, in fact, there is a discontinuity in the marginal factor cost curve defined by the following limits:

$$\lim_{Q \rightarrow Q_T^-} PMFC = MP \qquad \lim_{Q \rightarrow Q_T^+} PMFC = P_f + \theta \frac{\partial P_f}{\partial Q} Q = PMFC^+$$

Since by construction $Q_T \geq Q_M$ and $MP \leq P_l$ we have the following inequalities at the discontinuity point:

$$MP \leq MR \leq PMFC^+$$

Because the PMR and the PMFC curves are monotonic, for any quantity Q lower than Q_T the processors have an incentive to increase production. For any quantity Q higher than Q_T , processors have an incentive to reduce the quantity because the marginal factor cost is higher than the marginal revenue. The equilibrium satisfies the policy constraints and it is feasible because the farmers are willing to provide the quantity Q_T .

The consumer price can be found from the consumers' inverse demand function. Since Q_T is at a discontinuity of the perceived marginal factor cost, economic theory does not offer any formal analytical tool to find the equilibrium price in the procurement market. However, it is possible to argue that the equilibrium farmgate price is the price floor MP . Since farmers behave competitively, if the price was higher than MP they would react by increasing quantity produced to $Q^* > Q_T$. Processors would be unwilling to buy $Q^* > Q_T$ because the perceived marginal factor cost is higher than the marginal revenue. Since the market price is above the price floor, the government would not intervene to buy excess production. In order to clear the market, price would be driven down until the price floor is hit and farmers produce exactly Q_T . Note also that there is no incentive to deviate from this equilibrium. Farmers and consumers satisfy the requirement imposed by their supply and demand functions and processors, the active players, are maximizing their profit.

Given this equilibrium, Figure 3, Panel A, shows that, when the price floor is binding but below P_l , removing the price floor would result in a reduction in the traded quantity and higher consumer prices, because without the policy in place the processors may exert a greater degree of oligopsony power. In this case, liberalization would reduce social welfare.

If the price floor lies between P_l and the intersection of the PMR with the PMFC curve (Panel B), the sign of the welfare change depends on the model parameters. The equilibrium quantities for production and consumption are determined by the intersection of the price floor with the supply and PMR curve, respectively. This condition implies the existence of excess supply, unless demand or supply is perfectly rigid. Under the price floor regime the traded quantity (Q_T) is higher than in a unregulated market (Q_M), but the consequent social benefit may be offset by the government expenditure due to excess supply. The net welfare effect from the liberalization is determined by the relative

magnitude of the two components. The shaded areas in Panel B show the two components graphically.

If the price floor is higher than the intersection of PMFC and PMR curves (panel C), removing the policy is expected to increase social welfare. Under the regulated regime, in fact, the traded quantity is lower than in the unregulated market, and there is excess supply. The shaded area shows the social gain from liberalization.

The main point from the graphical analysis is that the welfare gain from liberalization may be reduced by the presence of oligopsony power in the industry. In fact, under specific conditions (i.e., high oligopsony power, low oligopoly power and a price floor that is not “too much” higher than the perfect competition price) liberalization may reduce social welfare. The next sections offer a formal discussion of this point and its implications.

Optimal Price Floor.

The conclusions from the graphical analysis can be used to determine the optimal price floor under the assumption that the objective of the policy maker is the maximization of social welfare. Using the mixed oligopoly-oligopsony model we can conclude that the social optimum is achieved when the price floor is placed at price level P_l (i.e., the farm-level price as if the processing industry had oligopoly power only). This conclusion can be shown observing that any other policy reduces the social welfare.

If the price floor is set above the unregulated procurement market price and below P_l , raising the minimum price MP can increase the social gain from the policy (Figure 3, Panel A). In fact, by raising MP, we obtain an increase in the traded quantity (which is still lower than in the perfectly competitive equilibrium), reducing the deadweight loss. Consumers pay lower prices for the goods, farmers obtain higher prices and there is no excess supply. These benefits overcome the loss of profits in the processing industry.

If the price floor is set above P_l , lowering MP increases the social welfare. As shown in Figure 3 panels B and C, a lower price floor reduces the excess supply and increases the traded quantity (which is still lower than in the perfectly competitive equilibrium), reducing the deadweight loss. Consumers pay lower prices for the goods and taxpayers save on the policy expenditure. These benefits overcome the reduction of the producers' surplus and the processors' profits.

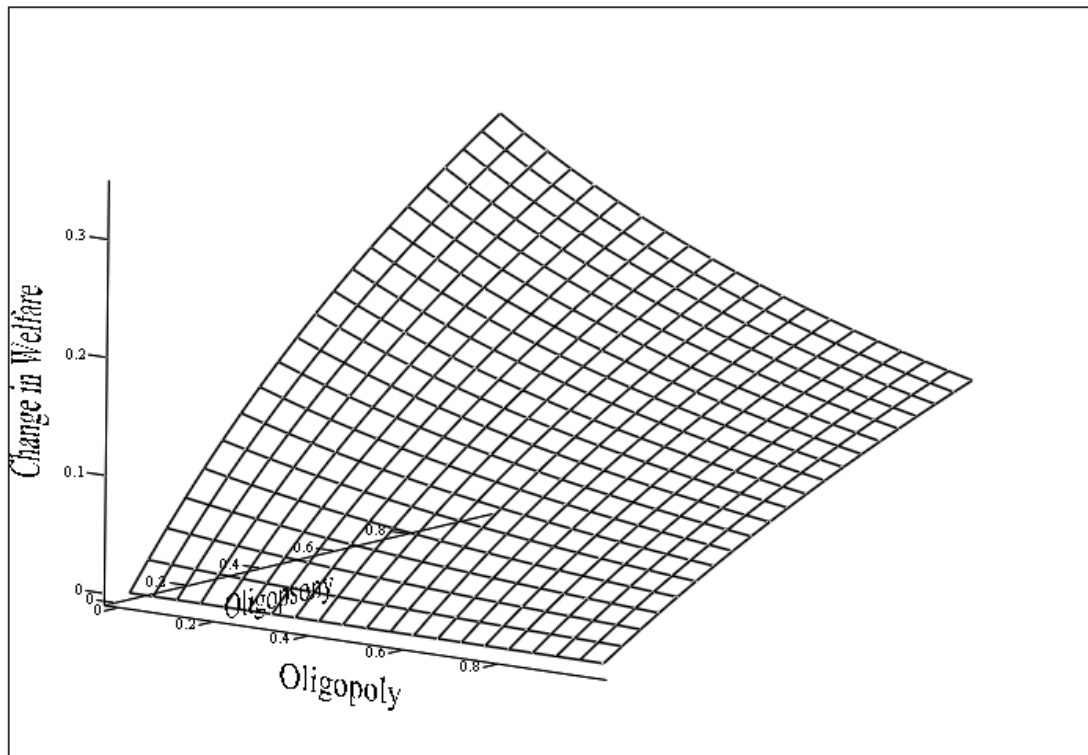
A price floor placed at the price level P_l prevents the processing industry from exerting its oligopsony power but cannot affect the deadweight loss from oligopoly. By setting a price floor, the regulator introduces an additional agent in the procurement market, the government agency, which is willing to buy an unlimited amount of the product for a given price. The agency behaves as a competitive buyer of the product, exiting the market as soon the market price is higher than the floor. Thus, the optimal price floor eliminates the oligopsony power of the processing industry. The agency acts in on the procurement market only and does not participate in the final market. As a consequence, the price floor policy cannot mitigate the social consequence of oligopoly.

Under a perfect competition regime, the social planner maximizes the social welfare by liberalizing the market. In my model this strategy is represented by the adoption of a price floor that does not affect the unregulated equilibrium (i.e., equal or lower the equilibrium price in the procurement market). The analysis shows that, if the processing industry holds market power, it exists a binding price floor – higher than the unregulated price – that makes the policy socially desirable.

Numerical Analysis.

The welfare effect of the adoption of the optimal price floor (MP^*) can be illustrated via numerical analysis. Figure 4 reports the percent welfare gain as a function of the processing industry market power. Note that, since the level of MP^* varies with the elasticity values and on the degree of oligopoly power, the price floor is not held constant. The graph assumes linear and unit-elastic demand and supply. Simulations show that the welfare gain decreases when demand and/or supply elasticity increases.

Figure 4: Welfare Gain from the Adoption of an Optimal Price Floor



The gain from the policy increases with the degree of oligopsony power. If the processing industry does not hold oligopsony power, the price floor coincides with the unregulated price in the procurement market and the policy does not affect the social welfare.

The oligopoly power of the processing industry, *ceteris paribus*, reduces the gain from the policy. In absence of oligopoly power, the optimal price floor is set at the perfect competition price and the social welfare from the policy is equal to a perfectly competitive market. As the oligopoly power increases, the value of the optimal price floor decreases, the traded quantity and the social welfare decrease.

The numerical analysis confirms that a price floor policy is effective against the processing industry oligopsony power, but cannot alleviate the social consequences of the oligopoly power.

Policy Implications.

The model described in the previous sections has strong implications in the current E.U. policy scenario. The theoretical justification of the decoupling of the CAP is based on the conventional wisdom that deregulated markets are eff

icient. The theoretical model shows that, under specific conditions (the presence of processors' oligopsony power), removing a coupled policy measure (the price floor) may reduce the social welfare. This conclusion suggests that the social consequences of decoupling should be carefully considered before implementing the reform, because the sign of net welfare effect of liberalization may be an empirical question. The welfare effect of removing the price floor system depends on the degree of processors' market power.

However, it must be noted that, in the theoretical model the policy is at most a "second best", because the social welfare under the policy regime is equal or lower than under the perfect competition regime. Thus, keeping the price floors is less efficient than decoupling and, at the same time, increasing the level of competition in the market.

A competition policy is the necessary complement of the decoupling strategy. Policy and market power are two major distortions in the agricultural markets. The theoretical model suggests that the former may partially offset the latter. Thus, by removing the policy distortion, the regulator may increase the negative effects of market power.

The results of the theoretical model suggests that the full decoupling of the CAP will deploy its full benefit only if the food markets are perfectly competitive. As a consequence, a pro-competition policy should prepare the 2013 reform. The design of the competition policy cannot be addressed naively. The supermarket concentration has brought a considerable increase in the efficiency of the retail sector and it is conceivable that lower prices have occurred where the cost-savings from the improved efficiency have been passed on to consumers. As a consequence, the competition policy should focus on supply concentration, vertical relationships and contract regulations rather than countering the concentration in the retail industry.

Summary and Conclusions.

The full decoupling of the Common Agricultural Policy is one of the main E.U. objectives. In the Commission's vision, the liberalization of the agricultural markets will improve efficiency and will remove the distortions affecting production decisions and trade.

Decoupling may fail to achieve these goals if the agricultural markets are not perfectly competitive. Liberalization may give agents new opportunities to exert market power, increasing the deadweight loss from imperfect competition. In this case, the net effect of the policy reform is the algebraic sum of the benefits from decoupling and the loss from market power.

In the case of a price floor policy, I show that the benefit from liberalization may be offset by the oligopsony power of middlemen. An optimally chosen price floor can be more efficient than an unregulated market, because it eliminates the oligopsony distortion. The model also shows that, even in the case of imperfect competition, the police regime is a second best. A perfect competition equilibrium is socially preferable to the equilibrium under the policy regime. Thus, the joint implementation of decoupling and pro-competition policies is socially optimal.

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