The political economy of geographical indications

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Abstract:

Despite a burgeoning literature on the economics of Geographical Indications (GIs), few analyses have explored the question of the optimal size of GIs and the role of lobbying in setting the boundaries of a GI. By contrast, historical evidence demonstrates that the emergence and expansion of GI areas has been accompanied by intense lobbying efforts. In this paper, we develop a political economy model to explore the size of GIs. Our model builds on four key aspects of a GI expansion: first, a larger GI area would increase production, thereby depressing prices. Second, a larger GI area potentially leads to a lower average (perceived) quality, which reduces consumer utility and prices. Third, a larger GI area allows producers to engage in better sharing of fixed costs such as marketing expenses. And fourth, the introduction or expansion of a GI area is a political decision, potentially influenced by lobbying. We show that a clear ranking exists of potential outcomes depending on whether governments maximize the welfare of all producers, "insiders" only, or "outsiders" only. However, the relationship between the political equilibrium and the social optimum is ambiguous, as it depends on how consumers' utility is affected by a change in quality.

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The Political Economy of Geographical Indications

1. Introduction

A geographical indication (GI) is a collective label, backed by government regulation, to certify the geographical origins of a product. Although GIs for wine (such as the French "appellation contrôlée" system) are most famous, GIs for a wide variety of products are widespread both inside and outside of the EU and the number of GIs has been growing steadily. In parallel with the growing importance of GIs, several articles have explored the economics of GIs, with some positing welfare gains due to the resolution of asymmetric information problems (e.g. Moschini et al., 2008) while other authors claim that GIs can be used as tools for extracting rents from consumers, e.g. by systematically oversupplying quality (Mérel and Sexton, 2012).

Geographical indications are in the midst of at least three distinct debates. A first debate concerns the actual link between the quality of a product and the location or "terroir" where it is produced. The debate about terroir is important given the strong emphasis in the existing GI regulations on the importance of the link between the geographical area and the product for which a GI is requested. For instance, the World Trade Organization's definition of a GI (as part of the TRIPS agreement on intellectual property) requires that the product possess a "given quality, reputation, or other characteristic" that is "essentially attributable to its geographical origin" (WTO, 1994; Marette et al., 2008). However, existing empirical evidence on the link between "terroir" and quality is mixed. Gergaud and Ginsburgh (2008) found that price and quality measures of Bordeaux wines are influenced by technological choices more than by the "terroir" of the vineyard. By contrast, Ashenfelter and Storchmann (2010) found that physical site attributes as well as solar radiation are important determinants of vineyard quality in the Mosel Valley. In a study of vineyard sales prices in the Willamette Valley in Oregon, Cross et al. (2011) find that physical site attributes (such as slope, elevation, or soil quality) do not explain observed sales prices. On the other hand, they find that prices of vineyards are strongly influenced by whether they are located in a GI. Since vineyard sales prices are influenced by expected revenues, these results suggest that expected revenues depend more on the collective label of the GI than on the actual intrinsic qualities of the wine as determined by "terroir". As Cross et al. (2011) note, their results suggest that "terroir matters economically – as a concept, though not as a fundamental reality".

A second debate concerns the status of geographical indications in international trade. While some countries consider GIs to be a way to solve information problems, other countries interpret GIs as an unnecessary protection of producers from an established region against new entrants from a different region. These differences of opinion have led to what Josling (2006) described as a "war on terroir" in the context of WTO negotiations.

A third debate which so far has not received much academic attention concerns the question of how large the optimal area of a GI should be. The delimitation of GI areas occurs through government regulation.[1] Like other policy decisions, the choice of the GI area can have both welfare and distributional consequences, which will tend to influence decision making. A dramatic example of this is given by the history of the Champagne region. In the early 20th century, when the Champagne region was officially delimited for the first time, there were major disputes over the precise definition of the area. The original proposal included only villages in the Marne department, while producers in the neighboring Aube department claimed that they should also be included. The disagreement led to bitter conflicts, eventually erupting into violence in 1911 (Simpson, 2011). In recent years, the expansion of the Champagne area is again

[1] In France, for instance, a request to create or change a GI area needs to be submitted at the *Institut National d'Appellations d'Origine* (INAO), which appoints a committee to study the request. The committee eventually proposes a delimitation of the GI area, which is then subject to a "national opposition procedure" whereby any interested party can voice complaints regarding the proposed GI area. In the end, INAO decides on the delimitation of the GI area which is then sent to the Ministry of Agriculture for approval. Since 2008, the European Commission ultimately approves or disapproves the proposed GI area after consulting the EU Member States.

on the agenda. Given that vineyards in Champagne can fetch prices of €1 million per hectare or more compared to prices of around €4000 per hectare outside the region, there is clearly a lot at stake for those producers eligible to be included in an expanded Champagne region; moreover, an open question is how the expansion will affect the reputation of Champagne among consumers (Stevenson, 2008).

Despite its importance, few papers have studied the question of how the size of a GI is determined. Landi and Stefani (2015) provide historical evidence on the proposed expansion of two GI regions in Tuscany (Italy) and use these cases as motivation for their theoretical model to explain the resistance of existing producers to proposed expansions. They do not take into account possible "cost sharing" effects of a GI region, where certain fixed costs for marketing or certification are shared by producers. Moreover, the only effect of an expansion of the GI area in their model is to increase production, keeping quality constant. While expansion thus has obvious negative effects on the existing producers, who will resist such a move, an expansion is always welfare-enhancing in their setup. Yet, in reality, an expansion is often criticized on the grounds that it would adversely affect quality. If this quality argument is correct, an expansion of the GI area might be a bad idea from the point of view of social welfare and not merely from the point of view of the existing producers.

Langinier and Babcock (2008) do take into account the 'cost sharing' effect of an expansion of the GI area, which they model as a club which enables its members to distinguish themselves from low quality producers. Quality is exogenously given, and club membership is a way for members to credibly signal their quality. However, this setup does not lend itself well to analyzing an actual expansion of a GI area, which might enable producers of lower quality levels to join the club. Once a GI area is defined, entry is free in the sense that any producer inside the region who meets the criteria can obtain GI status (Moschini et al., 2008). Moreover, Langinier and Babcock (2008) do not take a political economy perspective. In reality, the size of GI areas is determined by government agencies, not by producers. To understand the determination of GI areas, then, it is necessary to take into account the political process underlying the decision.

Recent work by Meloni and Swinnen (2017) studies the historical emergence and evolution of GIs for the major European wine regions of Porto, Chianti, Burgundy, and Champagne. Their analysis shows the important role played by trade in inducing the formation of the original GIs in these regions. In addition, these historical examples shed light on the political economy of expansions of GI areas. The popularity of both Porto and Chianti in Britain following the British-French war of 1688 (and subsequent British tariffs on French wine) led to an expansion of production beyond the original wine-growing areas. The original producers in both cases argued for regulations to exclude these new producers, leading to delimitations of GI areas in Chianti in 1716 and in Porto in 1756. Importantly, it appears that in both cases the rulers introducing the GI regulation themselves owned vineyards in the delimited areas. Once the areas were established, it took a remarkably long time before the original GI boundaries were expanded (more than 200 years in Chianti). In the case of Burgundy, when producers from the Cote d'Or region started selling their higher-quality wines in Paris in the fourteenth century, these wines were often confused with the lower-quality wines from the Auxerre region which until then had been known as "Burgundy" wines. This created conflict among the producers. Ultimately, the French king decided in 1415 that both regions qualified as Burgundy wines.

In this paper we develop a political economy model which incorporates four salient facts about GIs. First, an expansion of the GI area logically leads to an expansion of total production which will depress the price of the GI product. Second, an expansion of the GI area means that certain fixed costs incurred by the GI area (such as costs for marketing) can be spread over a larger number of producers, thus reducing the cost for existing producers. Third, the expansion of the GI area may have a negative effect on (actual or perceived) quality, whether because of an actual decline in the intrinsic quality of the product ("terroir") or because a larger area almost by definition is less "typical" of a given geographical area. Fourth, as the historical examples cited by Meloni and Swinnen (2017) show, the decision over the size of the GI area is taken by government bodies which may be influenced by producer organizations, and a political economy perspective is thus necessary to study the outcome.

Following Grossman and Helpman (1994) and Swinnen and Vandemoortele (2008, 2009, 2011), we model the political decision over the GI area as the maximization of a weighted objective function by the government, with different weights representing different degrees of political influence. We show under which conditions the political equilibrium would be closer or further away from the social optimum, and draw some conclusions regarding the likely welfare impact of existing GI regions. Our analysis shows that the optimal size of a GI region, from a social welfare perspective, will depend on the relative size of the negative "quality" effect and the positive "output" effect an expansion has on consumer welfare, as well as on the magnitude of variable costs related to managing the GI area. By contrast, the politically determined GI region may be too large or too small from a social welfare perspective.

The remainder of the paper is organized as follows. In the next section we explain the setup of our model. The third section derives and discusses the socially optimal area. The fourth section turns to the political equilibrium. We first analyze three special cases corresponding to a government maximizing aggregate producer welfare, insider producer welfare, or outsider producer welfare (corresponding to an 'open access' scenario). We then present the general case and compare the political equilibrium to the social optimum. A fifth section concludes.

2. The Model

2.1. Setup

We consider a region with a typical product which it aims to protect with a geographical indication. We assume that without geographical indication, consumers are unable to distinguish products from different producers and/or from different regions. A GI, by contrast, allows consumers to distinguish between products from the GI region and those from outside, but they are still unable to discriminate between different producers *inside* the GI.

We assume consumers value quality as in a standard vertical differentiation framework, but since they cannot distinguish producers within a region, their perceived quality is based on the average quality of producers in a region. For our present purposes, we assume that the quality of a producer is given exogenously and depends only on the location of the producer – i.e. whether the producer is located close to the center of the region or rather on the periphery. We thus abstract from the possibility that producers themselves can make a choice over the level of quality to be attained, or that the governing body of the geographical indication sets quality standards (as in Mérel and Sexton, 2012). This simplification can be defended on two grounds. First, there could be objective aspects of the region, such as the soil, the micro-climate, local traditions or other factors which strongly influence the actual quality of the product. It is precisely this emphasis on the importance of "terroir" which underlies the official regulations regarding GIs. Second, even if there was no real link between "terroir" and the objectively verifiable qualities of a product, consumers might value buying a product which is "typical" of a region. In this case, the geographical indication would serve as a guarantee that the product is indeed typical of the region.

We additionally assume that quality decreases as we move away from the center of the GI region. There are several justifications possible for this assumption. First, if a GI region can be expanded without any loss of quality, it is clear that social welfare can always be improved by increasing the size of the region. It is precisely the potential trade-off with quality which makes the size of the GI region an interesting policy question. To the extent that the intrinsic quality of the product is determined by “terroir”, increasing a GI region must mean that at some point the soil, climate, local traditions or other factors which constitute “terroir” become less suitable to create a qualitative product. Likewise, if consumers attach importance to the degree to which a product is typical of a certain region, expanding the region makes the GI label less meaningful for consumers. If the Champagne region were defined so broadly as to cover the whole of France, the geographical indication “Champagne” would lose much of its appeal (as well as the corresponding price premium), even if the intrinsic quality of sparkling wine remained the same. Other mechanisms might have a similar effect: the increased availability of a product could undermine the “luxury” status of a product, turning it into a commodity; or where producers can influence the quality of the product, a greater number of producers can create free-riding problems which reduce the quality of the product.

To incorporate this effect, we use the following setup. Imagine a continuum of producers indexed by i, which denotes their “distance” from the center of the GI region. For simplicity, we assume each producer has an identical productivity of one unit, but producers differ in the quality of their product. A continuous quality function $s(i) > 0$ gives the quality level of producer i and this function is decreasing as we “move away from the center”, i.e. $s_i < 0$.[2] If we denote by q the marginal producer (i.e. the producer “on the border” of the GI region), then q can be interpreted as the size of the GI region, as well as its total production.

As we assume consumers are unable to distinguish individual producers inside the geographical indication, the perceived quality of the product to consumers equals the average

[2] Throughout, subscripts denote partial derivatives.

quality produced inside the GI region, which we denote by $\bar{s}(q)$ for a given area q. Average quality equals

$$\bar{s}(q) = \frac{1}{q}\int_0^q s(i)di \tag{1}$$

2.2. Consumers

Following Vandemoortele and Deconinck (2014), we assume that consumer utility of a representative consumer is given by a utility function $u(q,\bar{s})$ where utility is concave in both quantity q and quality $\bar{s}$ ($u_q > 0, u_{qq} < 0, u_{\bar{s}} > 0, u_{\bar{s}\bar{s}} < 0$).[3] Moreover, we assume that a higher quality level increases the marginal utility of consumption ($u_{q\bar{s}} > 0$). Given these assumptions, the consumer maximizes consumer surplus:

$$u(q,\bar{s}) - pq \tag{2}$$

Demand for the product is given by an inverse demand function of the form

$$p(q,\bar{s}) = u_q(q,\bar{s}) \tag{3}$$

As a result of our assumptions on the utility function, the demand curve is downward sloping ($p_q < 0$) and shifts upward if quality increases ($p_{\bar{s}} > 0$). Since consumer surplus equals $\Pi^C = u(q,\bar{s}) - pq$, the effect of an increase in the GI area on consumer surplus is given by

$$\frac{\partial \Pi^C}{\partial q} = u_s\bar{s}_q - q\left(p_q + p_s\bar{s}_q\right) \tag{4}$$

The first term, $u_s\bar{s}_q$, represents the direct utility impact of the change in average quality as a result of the increase in area. The second term, $-q\left(p_q + p_s\bar{s}_q\right)$, is the marginal change in consumer expenditures and depends in turn on two effects: an increase in the area leads to a higher quantity, which induces a lower price (p_q); in addition, the increase in the area leads to a lower quality which is also associated with a lower price ($p_s\bar{s}_q$). Graphically, the first effect is

[3] Alternatively, we could work directly with an inverse demand curve as in Spence (1975). Working with the utility function makes the notation easier, however.

the result of a downward movement along the demand curve while the second effect is the result of the downward shift of the demand curve.

Figure 1 illustrates the effects on consumer surplus. In panel (a), with a parallel shift in demand, $u_s \bar{s}_q$ and $-qp_s \bar{s}_q$ cancel out. The only effect on consumer surplus comes from the change in quantity; the net effect is $-qp_q$ which is positive (since $p_q < 0$). However, if we assume that changes in quality also affect the slope of the demand curve, the situation is as depicted in panel (b) or panel (c). If $p_{q\bar{s}} > 0$, a decrease in quality leads to a counterclockwise decrease in demand. Intuitively, this case corresponds to a situation where a quality decrease has a larger impact on consumers with a higher willingness-to-pay. In this case, shown in panel (b), the negative direct utility impact $u_s \bar{s}_q$ will be larger, and the decrease in expenditures $-qp_s \bar{s}_q$ may no longer compensate for the lower utility. The resulting effect on consumer surplus will be smaller or negative. The opposite conclusion holds for the case depicted in panel (c), where $p_{q\bar{s}} < 0$ such that the decrease in quality leads to a clockwise decrease in demand. This scenario corresponds to a case where lower quality does not affect consumers with a high willingness to pay as much as it affects those with a lower willingness to pay. In that scenario, the direct utility impact would be smaller and would be dominated by the effect of lower expenditures.

The importance of rotations of the demand curve for the analysis of quality issues was first emphasized by Spence (1975), who showed that monopolists could either over- or undersupply quality depending on the rotation of demand. In the present setting, such rotations can be given an intuitive interpretation. Imagine all consumers have the same quality perception $\bar{s}$ but consumers are heterogeneous in their valuation of this quality level. For instance, consumers may have individual utility $U_j = \theta_j \bar{s}$, with θ_j varying in the population, similar to a standard Mussa-Rosen framework (Mussa and Rosen, 1978). If quality is reduced, the negative utility impact will then be greater for consumers who have a greater "taste" θ_j for quality and hence a higher willingness-to-pay. By contrast, imagine consumers consist of a core of loyal "connoisseurs" with high willingness-to-pay and a group of "prestige seekers" with a lower willingness-to-pay. An expansion of the GI area may only have a minor effect on the connoisseurs, but it may make the product less prestigious to consumers with lower willingness-to-pay. This would be equivalent to a clockwise rotation of demand. Both of these scenarios are possible depending on the circumstances, but they will generally have quite different welfare implications.

2.3. Producers

For simplicity, we assume that production itself is costless. However, following Moschini et al. (2008) and Langinier and Babcock (2008), we assume that managing the GI region leads to some costs which are borne by the producers. In particular, governing a GI region implies both fixed costs (e.g. marketing expenses) and variable costs (e.g. certification costs). Simplifying, the total cost of the GI region can thus be written as $F + cq$ where q is aggregate production. Following Moschini et al. (2008), we assume that these costs are borne by the producers in proportion to their output; that is, the GI region requires producers to pay a per-unit charge of $\gamma = \frac{F}{q} + c$. We normalize the profits of producers outside the GI region to zero.

Producer surplus is then given by $\Pi^I(i) = p - \gamma$ for "insider" i inside the GI region, and zero for an "outsider". The aggregate surplus of insiders is given by $\Pi^I = \int_0^q \Pi^I(i)di$. The effect of an increase in the area on total insider surplus is

$$\frac{\partial \Pi^I}{\partial q} = q\left(p_q + p_s \bar{s}_q\right) - \gamma_q q \qquad (5)$$

where $\gamma_q = -\frac{F}{q^2}$. An increase in the GI area depresses insiders' revenues (first term) while it also leads to better cost sharing (second term).

An expansion of the GI area implies that some former "outsiders" can now sell their product under the GI label but have to pay the per-unit charge γ. Given an infinitesimal increase in the area, the change in surplus for the marginal outsider who enters the GI region is given by $p - \gamma$. By contrast, the surplus for all other outsiders remains zero. The effect of an increase in q on the aggregate surplus of outsiders is thus given by

$$\frac{\partial \Pi^O}{\partial q} = p - \gamma \tag{6}$$

Combining both insiders and outsiders, aggregate producer surplus is given by $\Pi^P = pq - F - cq$. The effect of a change in the GI area on aggregate producer surplus is thus given by

$$\frac{\partial \Pi^P}{\partial q} = p - c + q\left(p_q + p_s \bar{s}_q\right) \tag{7}$$

3. The Socially Optimal Area

As a benchmark to compare the political equilibrium to, we first derive the socially optimal area. Social welfare is given by the sum of consumer surplus and aggregate producer surplus:

$$W = u(q, \bar{s}) - F - cq \tag{8}$$

Maximizing with respect to q, the first order condition is

$$\frac{\partial W}{\partial q} = u_q + u_s \bar{s}_q - c = 0 \tag{9}$$

Comparing the relevant expressions for consumer surplus (equation (4)) and aggregate producer surplus (equation (7)) with equation (9), we see that the term $q\left(p_q + p_s \bar{s}_q\right)$ cancels out, as this term represents a transfer from consumers to producers. Equation (9) defines the optimal area

q_{SO} of the GI region, assuming that the resulting social welfare is positive, i.e. $u(q_{SO}, \bar{s}) - cq_{SO} \geq F$, and assuming the second-order condition is satisfied.[4]

An increase in the area affects social welfare in three ways. First, it increases aggregate production which has a positive (but diminishing) effect on utility. Second, the increase in area reduces the average quality ($\bar{s}_q < 0$) which has a negative effect on utility. Third, the expansion of production means that extra variable costs will be incurred. The optimal area of the GI balances these three effects.

Using the fact that $u_q = p$, equation (9) defines an interesting relationship between price and marginal cost:

$$p - c = -u_s \bar{s}_q \tag{10}$$

Figure 2 shows this relationship, denoting the social optimum by q_{SO}. Equation (10) can be rewritten as:

$$\frac{p-c}{p} = -\frac{u_s \bar{s}_q}{u_q} \tag{11}$$

That is, in the social welfare optimum, the markup of price over marginal cost should equal the relative effect on consumer utility of the change in quality ($u_s \bar{s}_q$) and the change in quantity (u_q). Since $\bar{s}_q < 0$ while all other terms are positive, the markup in the optimum will be positive too, as shown in Figure 2. By contrast, if there is no quality effect ($\bar{s}_q = 0$), the optimal markup is zero. In that case, the welfare optimum is to expand the GI region until price equals marginal cost.

Importantly, the markup does not arise because of the need to offer incentives to producers, as both quality and quantity are exogenously given. Rather, because quality effects of

[4] Equation (9) identifies a quality-quantity trade-off, and requires the social planner to strike the optimal balance. As quality is decreasing in q, the possibility of multiple equilibria exists. In what follows, we abstract from this possibility.

a further expansion would negatively affect consumer surplus, the optimal area will be smaller than what would be necessary to drive prices down to the marginal cost of operating the GI region. In short, if quality exogenously depends on the area of the GI region, the socially optimal GI region implies rents for producers in the GI region.

However, this statement needs to be qualified in two ways. First, if producers are forced to bear the fixed costs themselves, they will only benefit if the rents exceed the fixed cost ($pq_{SO} - cq_{SO} \geq F$). However, from a social welfare perspective, the GI region is beneficial as soon as the sum of consumer surplus and producer rents exceeds the fixed cost (i.e. $u(q_{SO}, \bar{s}) - cq_{SO} \geq F$). The social planner might thus be willing to introduce GI regions where producer rents are smaller than the fixed cost, as long as the difference is made up by consumer surplus. But in those cases, producers would not be willing to implement the GI region. The practical implementation of the GI region would then necessitate government intervention, e.g. by subsidizing the fixed costs of operating the region.[5]

A second qualification is that our result of rents accruing to the producers depends on our assumption of exogenously given quantities. A typical assumption in the literature is that producers are perfectly competitive inside the GI region (e.g. Mérel and Sexton, 2012; Moschini et al., 2008), which implies that rents will be competed away. On the other hand, since land is the scarce factor of supply, there would still be some rents captured by the landowners (Moschini et al., 2008). As we see here, this result may be consistent with social welfare maximization.

4. The Political Equilibrium

Given the conflicting interests of consumers, "insider" producers, and "outsider" producers, the question is how the actual size of a GI region will be determined by the government. We study

[5] Similar results can be found regarding optimal product variety in the presence of fixed costs; see Spence (1976).

this question using the political economy approach of Grossman and Helpman (1994), first applied to quality and standards by Swinnen and Vandemoortele (2008, 2009a, 2009b). We follow this approach in assuming that the government maximizes its own objective function, which consists of a weighted sum of social welfare and contributions from interest groups. The government can only use one instrument (the total area of the GI region). We assume that producers inside an existing GI region are politically organized, as are the "outsiders", but consumers are not organized.[6]

Models following Grossman and Helpman (1994) typically assume fixed and exogenously given lobbying groups. By contrast, in our setting the lobbying groups change as the GI area expands. For our definition of the lobbying group of the insiders we will assume that expansion of the GI area proceeds step-by-step. New producers are added to the GI area in piecemeal fashion and the corresponding group of insiders increases gradually in the process. One justification for this assumption is that in reality the insiders may be represented by a producer organization managing the GI region, in which case adding producers to the region indeed changes the lobbying group. Following Grossman and Helpman (1994), the "insider" interest group uses a truthful contribution schedule of the form $C^I(q) = max\{0, \Pi^I(q) - b^I\}$ defined over the different possible values a of the area of the GI region. In this formulation, b^I is a constant, representing a minimum level of profits the interest group does not wish to spend on lobbying.

Likewise, our definition of the lobbying group of the outsiders needs some care. Increasing the size of the GI region from q_0 to q_1 only affects producers located in this interval and has no effect on outsiders located beyond q_1. As a result producers beyond q_1 have no

[6] This does not affect our results: as the government maximizes a weighted sum, what matters are the relative weights (see the appendix to Vandemoortele and Deconinck, 2014).

reason to lobby for an increase in the area to q_1. Taking this argument to its logical conclusion, we assume every outsider is willing to make a personal contribution only to have the GI area expanded to include just himself. Given that joining the GI region leads to a profit increase of $(p-\gamma)$ for an outsider, this will be the maximum an outsider is willing to pay. The marginal contribution of outsiders just outside area q thus equals $(p-\gamma)$. The lobby group of the outsiders can then be thought of as a continuum of producers, each willing to pay $(p-\gamma)$ if the area is expanded to include himself. We therefore write the total contribution of the outsiders as $C^O(a)=\int_{q_0}^{q}(p-\gamma)di$ starting from an arbitrary initial area q_0.

The government's objective function $\Pi^G(q)$ is a weighted sum of the interest group contributions weighted by their relative lobbying strength (assumed exogenously given), and social welfare:[7]

$$\Pi^{\mathrm{G}}(q)=\alpha^I C^I(q)+\alpha^O C^O(q)+\alpha^W W(q) \tag{12}$$

The government chooses the size of the GI region to maximize its objective function (12). Each possible size of the GI region corresponds to a certain level of profits for insiders and outsiders, and hence also to a certain level of contributions. The government receives higher contributions from an interest group if the proposed size of the GI region creates higher profits for that group. Therefore maximizing the contributions from one interest group is equivalent to maximizing their profits. The government's optimal GI region is defined by the following first order condition:

$$\frac{\partial\Pi^{\mathrm{G}}(q)}{\partial q}=\alpha^I\frac{\partial\Pi^{\mathrm{I}}(q)}{\partial q}+\alpha^O(p-\gamma)+\alpha^W\frac{\partial W(q)}{\partial q}=0 \tag{13}$$

[7] In the traditional formulation, $\alpha^W=1$. However, it aids our exposition if we explicitly attach a weight to social welfare. Since what matters are the *relative* weights, this does not influence the results.

If the lobbying strength of insiders and outsiders is zero ($\alpha^I = \alpha^O = 0$), this reduces to $\frac{\partial W(q)}{\partial q} = 0$ and the political equilibrium coincides with the social optimum. In general, both insiders and outsiders may have some lobbying power, but not necessarily to the same degree.

Before we study the political equilibrium for this general case, it is instructive to first compare three special cases. The first case is where the government aims to maximize aggregate producer welfare, corresponding to a situation where $\alpha^I = \alpha^O > 0$ and $\alpha^W = 0$ in equation (13). The second case is where the government focuses only on maximizing insider producer welfare, which would be the case if $\alpha^I > 0$ while $\alpha^O = \alpha^W = 0$. Conversely, the third case is where the government only maximizes the welfare of outsider producers, corresponding to $\alpha^I = \alpha^W = 0$ and $\alpha^O > 0$. We discuss these three cases in turn, and then present the political equilibrium in the more general case.

4.1. Maximizing Aggregate Producer Welfare

If insiders and outsiders have equal lobbying weight, while the government is not concerned at all with social welfare, maximizing the government's objective function is equivalent to maximizing aggregate producer welfare. The first order condition is

$$\frac{\partial \Pi^P}{\partial q} = p + q\left(p_q + p_s \bar{s}_q\right) - c = 0 \tag{14}$$

The first term gives the positive impact on aggregate producer revenues of the extra production made possible by expanding the GI zone. The second term denotes the negative impact on aggregate producer revenues caused by the increased supply on the one hand, and the decrease in average quality on the other. The third term denotes the increase in variable costs due to an increased area. The optimal area from the point of view of aggregate producer welfare thus balances these effects. This situation is depicted in Figure 3, denoting the resulting area by q_P.

As shown, compared to the social optimum, two effects play a role, which we can label "rent-seeking through quality" and "rent-seeking through quantity".

The first effect arises because producers do not take into account the effect of lower quality on consumer utility ($-u_s\bar{s}_q$), but only its effect on price through consumers' marginal willingness to pay ($-ap_s\bar{s}_q$). Depending on how a change in quality affects demand, the impact on price may be larger or smaller than the impact on consumer utility. If the negative price effect is larger than the negative utility effect, producers will prefer a smaller region than what is socially optimal. If the negative price effect is smaller than the negative utility effect, the "rent-seeking through quality" effect implies that a deterioration in quality is less harmful to producer revenues than it is to consumer utility, and the optimal area will be larger than what is socially optimal. Thus, the "rent-seeking through quality" effect can go in the direction of increasing or decreasing the area, depending on how changes in quality affect utility and prices.

By contrast, the "rent-seeking through quantity" effect will always tend to decrease the area, as a smaller area implies a restriction of production and thus a higher producer price, ceteris paribus. To see both effects algebraically, we can rearrange the first order condition to give

$$p - c = -q\left(p_q + p_s\bar{s}_q\right) \quad (15)$$

Rewriting using $p = u_q$, we obtain:

$$\frac{p-c}{p} = -\frac{1}{\eta^D} - \frac{qp_s\bar{s}_q}{u_q} \quad (16)$$

By adding and subtracting $-\frac{u_s\bar{s}_q}{u_q}$, we get

$$\frac{p-c}{p} = -\frac{1}{\eta^D} - \left(\frac{qp_s\bar{s}_q}{u_q} - \frac{u_s\bar{s}_q}{u_q}\right) - \frac{u_s\bar{s}_q}{u_q} \quad (17)$$

The last term reflects the markup which would hold in the social optimum (see equation (11)). The first and second term reflect how this markup is affected by aggregate producer welfare maximization. The first term is the traditional “inverse elasticity” rule, reflecting “rent-seeking through quantity”. This term will always tend to increase the markup relative to the social optimum. The second term captures the quality effect and could be positive or negative, depending on whether the price effect dominates the direct utility effect or not. Importantly, we see that if there was no quality effect ($\bar{s}_q = 0$), the GI region would still be set so as to lead to a markup of $-\frac{1}{\eta^D}$ and hence rents for producers.

4.2. Maximizing Insider Welfare

If insiders have positive lobbying weight ($\alpha^I > 0$) while outsiders have zero lobbying weight and the government is not concerned with social welfare ($\alpha^O = \alpha^W = 0$), the government would set the GI region to maximize insider welfare. The corresponding first order condition is

$$\frac{\partial \Pi^I}{\partial a} = q\left(p_q + p_s \bar{s}_q\right) - \gamma_q q = 0 \tag{18}$$

The first term is the marginal effect on insider revenues of expanding the GI region. Since expansion leads to lower prices, while the output of insiders remains constant, this effect is always negative. The second term is the cost sharing effect.

If the cost sharing effect was absent, the effect of an expansion on insider surplus would always be negative. Insiders would have an incentive to try to get rid of the producers at the periphery, as this would at the same time raise average quality and restrict quantity and thus increase the price for the remaining producers. Equation (18) would in that case imply a continuously shrinking GI area. In reality, the benefits of achieving some external economies of scale through cost sharing would prevent this.

Using $\gamma_q = -\frac{F}{q^2}$, equation (18) implies

$$-q\left(p_q + p_s \bar{s}_q\right) = \frac{F}{q} \tag{19}$$

Comparing equation (15) (maximizing aggregate producer welfare) with equation (19) (maximizing insider welfare), we see that producers now equate $-q(p_q + p_s \bar{s}_q)$ with $\frac{F}{q}$ instead of with $p - c$. The situation is depicted in Figure 4, where we have drawn the area q_I defined by equation (19) as lying to the left of q_P. In theory, it is possible that q_I lies to the right of q_P. However, in that case, the curve $\frac{F}{q}$ would lie above $p - c$, which implies that $F > (p - c)q$ for both q_P and q_I. Since producers would not be able to cover their fixed costs, they would not implement the GI area. Hence, if the GI area is implemented at all, it must be the case that the group of insider producers prefers a smaller GI area than that which would maximize aggregate producer surplus.

4.3. Maximizing Outsider Welfare

The third special case of equation (13) considered here is the situation where the government is only concerned about outsiders. Maximizing the government's objective function then leads to

$$p - \gamma = 0 \qquad (20)$$

Since $\gamma = c + \frac{F}{q}$ this implies $p - c = \frac{F}{q}$. That is, if the government maximizes outsider welfare, the result is an equilibrium where the rents $p - c$ are just sufficient to cover fixed costs. In Figure 4, the resulting equilibrium (denoted by q_O) corresponds to the right-most intersection of $p - c$ and $\frac{F}{q}$. Interestingly, if there is no quality effect ($\bar{s}_q = 0$), the social optimum would be $p - c = 0$ and q_O would be too small from a social welfare perspective.[8] If there is a quality effect, q_O can either be too large or too small depending on whether $-u_s \bar{s}_q$ intersects $p - c$ to

[8] This result follows from our assumption that the fixed cost F is financed using a per-unit charge γ, effectively transforming a fixed cost into a marginal cost, and thus restricting production. A similar result can be found in Moschini et al. (2008).

the left or to the right of q_O. However, if the social optimum is greater than q_O, producers could not recover fixed costs in the social optimum.

Given that outsiders are a heterogeneous group and hence probably less organized than the insiders, it may seem unrealistic to assume that the government would give consideration only to outsiders. However, this case is in fact equivalent to a situation where the government lets anyone join the GI region who wishes to do so (and who is willing to pay the per-unit charge γ). The expansion would continue until at the margin, joining the GI region does not bring extra profits for producers. The case where outsider welfare is maximized can thus be interpreted as an “open access” equilibrium.

To summarize, the three special cases lead to a clear ranking: we find that $q_I < q_P < q_O$. However, with respect to the social welfare optimum q_{SO} the conclusions are less clear-cut. Since $-u_s \bar{s}_q$ and $p - c$ may intersect anywhere, the social welfare optimum could be smaller than q_I, larger than q_O, or anywhere in between.

4.4. The Political Equilibrium

Having studied the three special cases, we now turn to the political equilibrium in general, i.e. for arbitrary values of the lobbying weights α^I and α^O and the weight attached to social welfare α^W. Substituting the appropriate expressions in equation (13), maximization of the government’s objective function implies

$$\frac{\partial \Pi^G(q)}{\partial q} = \alpha^I \left(q \left(p_q + p_s \bar{s}_q \right) + \frac{F}{q} \right) + \alpha^O \left(p - c - \frac{F}{q} \right) + \alpha^W \left(p - c + u_s \bar{s}_q \right) = 0 \qquad (21)$$

We first normalize the weight $\alpha^W = 1$, and then rewrite:

$$\alpha^I q \left(p_q + p_s \bar{s}_q \right) + (\alpha^I - \alpha^O) \frac{F}{q} + (1 + \alpha^O)(p - c) + u_s \bar{s}_q = 0 \qquad (22)$$

Dividing through by $(1+\alpha^I)$ and rearranging,

$$\left(\frac{\alpha^I-\alpha^O}{1+\alpha^I}\right)\left(\frac{F}{q}\right)+\left(\frac{1+\alpha^O}{1+\alpha^I}\right)(p-c)=\left(\frac{\alpha^I}{1+\alpha^I}\right)\left(-q\left(p_q+p_s\bar{s}_q\right)\right)+\left(\frac{1}{1+\alpha^I}\right)\left(-u_s\bar{s}_q\right) \quad (23)$$

To interpret this expression, note that the left-hand side is a weighted sum of $\frac{F}{q}$ and $p-c$. Likewise, the right-hand side is a weighted sum of $-q\left(p_q+p_s\bar{s}_q\right)$ and $-u_s\bar{s}_q$. These components all have a clear graphical interpretation, as discussed in earlier sections. If we assume that the lobbying strength of outsiders is smaller than that of insiders ($\alpha^I>\alpha^O$), the weights on both sides of the equation are between zero and one, and sum up to one. We can then interpret the political equilibrium q_G as the intersection of two curves, both of which are a "weighted average" of curves already encountered previously. Figure 5 shows this graphically.

The first panel of Figure 5 shows the right-hand side of equation (23) as a weighted average of $-q\left(p_q+p_s\bar{s}_q\right)$ and $-u_s\bar{s}_q$. If the lobbying power of insiders is zero ($\alpha^I=0$), this curve coincides with $-u_s\bar{s}_q$, the direct utility impact of a decrease in quality. By contrast, as the lobbying power of insiders grows, the curve moves closer to $-q\left(p_q+p_s\bar{s}_q\right)$, the negative price impact of an increased GI region through expanded quantity and lower quality.

The second panel of Figure 5 shows how the left-hand side of equation (23) can be seen as a weighted combination of $\frac{F}{q}$ and $p-c$. If outsiders and insiders have equal lobbying weights ($\alpha^I=\alpha^O$), the left-hand side coincides with $p-c$. If insiders have greater lobbying weight ($\alpha^I>\alpha^O$), the left-hand side would converge on $\frac{F}{q}$ as α^I grows larger.

When outsiders have greater lobbying power and α^O grows larger, the left-hand side of equation (23) would no longer lie in-between $\frac{F}{q}$ and $p-c$. To see what happens if α^O grows large, it is useful to multiply both sides by $\frac{1+\alpha^I}{1+\alpha^O}$. The right-hand side then converges to zero while the left-hand side converges on $\left(p-c-\frac{F}{q}\right)$. Hence, this scenario results in the condition $p-c=\frac{F}{q}$, which is the definition of the "open access" equilibrium q_o.

The third panel of Figure 5 shows how the combination of the two curves determines the political equilibrium.

Although the exact optimum depends on the specifics of the lobbying weights, it is clear that the special cases we considered earlier, as well as the social welfare optimum, are boundary solutions. Our political economy approach thus defines the political equilibrium q_G as lying somewhere in between four extreme cases, corresponding to the social welfare optimum q_{SO}, the optimum for aggregate producer surplus q_P, the optimum for the insiders q_I and the "open access" outcome q_O.

4.5. Comparison of the Social Optimum and the Political Equilibrium

To see when the political equilibrium would be below or above the social optimum, we can evaluate the derivative of the government's objective function at the social optimum q_{SO}:

$$\left.\frac{\partial \Pi^G(q)}{\partial q}\right|_{q_{SO}} = \alpha^I \left.\frac{\partial \Pi^I(q)}{\partial q}\right|_{q_{SO}} + \alpha^O (p-\gamma)|_{q_{SO}} \tag{24}$$

If this expression is zero, then the political equilibrium would coincide with the social optimum; if positive, the political equilibrium would set a GI area greater than the social optimum, and if negative, the political equilibrium will be smaller than the social optimum. Clearly, the expression will be zero if $\alpha^I = \alpha^O = 0$ (i.e. the government is not influenced by lobbying). To get more insight, we study the case where the government assigns equal weight to insiders and outsiders ($\alpha^I = \alpha^O > 0$). The expression then becomes $\frac{\partial \Pi^P(q)}{\partial q}\Big|_{q_{SO}} = p + q\left(p_q + p_s \bar{s}_q\right) - c$. By definition, at the social optimum q_{S0} we have $p - c = -u_s \bar{s}_q$, and equation (24) can be rewritten as

$$\frac{\partial \Pi^G(q)}{\partial q}\Big|_{q_{SO}} = -u_s \bar{s}_q + q\left(p_q + p_s \bar{s}_q\right) \qquad (25)$$

If insiders and outsiders have equal lobbying weight, the derivative of the government's objective function is thus equal to minus the derivative of consumer surplus, $-\frac{\partial \Pi^C(q)}{\partial q}\Big|_{a_{SO}}$. The political equilibrium coincides with the social optimum only if it also coincides with the consumer's optimum. This is by no means true in general, and the political equilibrium may end up being greater or smaller than the social optimum. A different way of seeing this is by analyzing the case with $\alpha^I = \alpha^O$ in terms of the "rent-seeking through quality" and "rent-seeking through quantity" effects introduced earlier. While the rent-seeking through quantity effect will always tend to restrict the GI area, the rent-seeking through quality effect might go both ways, depending on whether the direct utility impact of a change in quality ($u_s \bar{s}_q$) is greater or smaller than the price effect ($q p_s \bar{s}_q$). This depends on the specifics of consumer demand, and again no general statements are possible. If we take an "neutral" approach and assume that changes in quality lead to parallel shifts in demand, so that $q p_s \bar{s}_q$ and $u_s \bar{s}_q$ cancel out, the "rent-seeking through quality" effect would be zero. In this scenario, the "rent-seeking through quantity" effect implies that if $\alpha^I = \alpha^O > 0$, the political optimum will lead to a GI region which is inefficiently small, and the gap will increase to the extent that producers have greater lobbying power.

Compared to the neutral case, we see that if demand decreases clockwise with decreases in quality, the political equilibrium with $\alpha^I = \alpha^O > 0$ will definitely generate a GI region that is inefficiently small. On the other hand, if demand decreases counterclockwise, the "rent-seeking through quantity" effect is counteracted by the "rent-seeking through quality" effect. If the quality effect proves strong enough, the political equilibrium may lead to an inefficiently large GI region. This will be the case if a decrease in quality has only a small effect on price (keeping quantity constant) but a large effect on consumer utility. Since aggregate producer welfare only takes the price effect into account, the optimal area for aggregate producer welfare is larger than the social optimum. The political equilibrium will thus set the region larger than the social optimum, and the difference will be greater to the extent that the lobbying strength of the producers is larger. However, this effect only holds if the "rent-seeking through quality" effect more than offsets the "rent-seeking through quantity" effect.

5. Conclusion

In this paper, we developed a theoretical model to study both the socially optimal size of a GI area and the likely outcome if the area is decided by a government which is possibly susceptible to lobbying. Taking into account that an expansion of the GI area will increase production, potentially decreases the average quality or reputation of the GI area, and allows better cost-sharing of fixed costs of managing a GI area (e.g. marketing), we show that the political equilibrium may be either too large or too small from a social welfare perspective, depending on how a decrease in quality affects consumer utility versus prices. In addition to the tension between the interests of consumers and those of producers, we emphasize the existence of two interest groups among producers – insiders and outsiders. Compared with the GI area that maximizes total producer surplus, the GI area will be smaller if the government aims to maximize insider welfare, while it will be larger if the government maximizes outsider welfare.

As we have shown, maximizing outsider welfare is equivalent to an “open access” equilibrium where rents are driven down to the point at which they just cover fixed costs.

The theoretical model developed in this paper leads to a number of policy implications. First, the size of GI areas is an important policy decision and deserves more attention, especially as the optimal size is not merely a technical question. In recent years, European countries have modernized the process for applying for GI status by requiring that teams of experts study the requests, for instance by carefully studying whether the geology is suitable for certain wines. Our analysis shows that even if such a procedure is done without interference by interest groups, the technical outcome may be inefficient from a social point of view if consumer preferences are not taken into account. Furthermore, proposals by producer groups regarding the size of GI areas should be evaluated critically to study the extent to which the proposed area deviates from the social optimum because of rent-seeking through quantity and/or rent-seeking through quality.

Importantly, the theoretical framework developed here points to the need to understand how changes in (actual or perceived) quality affect consumer utility compared to the effect of quality on prices. Without an understanding of the impact of quality changes on consumer utility, it is in general not possible to correctly evaluate existing GI areas or proposals for new GI areas. It may be possible, however, to use experimental or survey methods to estimate consumers’ willingness to pay for different quality levels associated with the GI region. Such studies could be included in the technical analysis of proposals for the introduction or expansion of GIs.

Finally, the present model does not yet explicitly incorporate international trade. Adding trade to the model would lead to several interesting implications. Assuming the GI region has market power in world markets would create the possibility of extracting “rents” from foreign consumers, and the question of setting the GI region would then have some similarities to the question of setting an optimal tariff in the large-country scenario. This may be an interesting avenue for future research.

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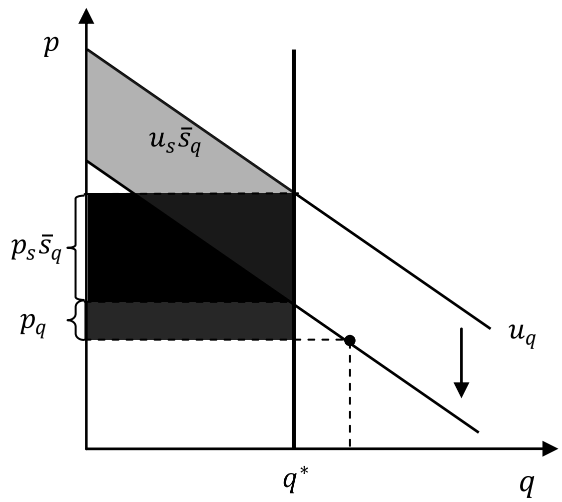
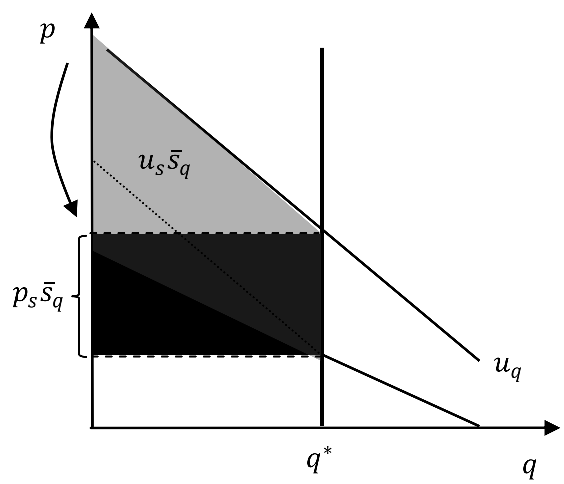
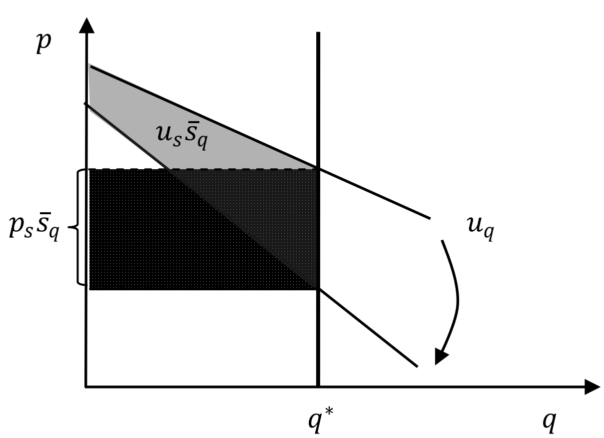


(a) A parallel decrease in demand



(b) A counterclockwise decrease in demand



(c) A clockwise decrease in demand

Figure 1. Effects of an increase in GI area on consumer surplus

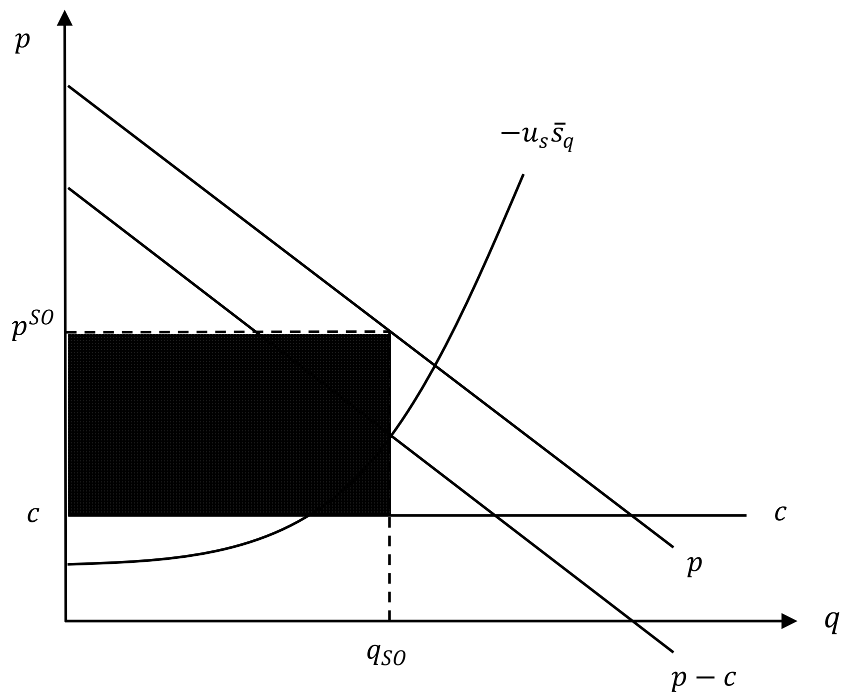


Figure 2. Socially optimal size of the GI region

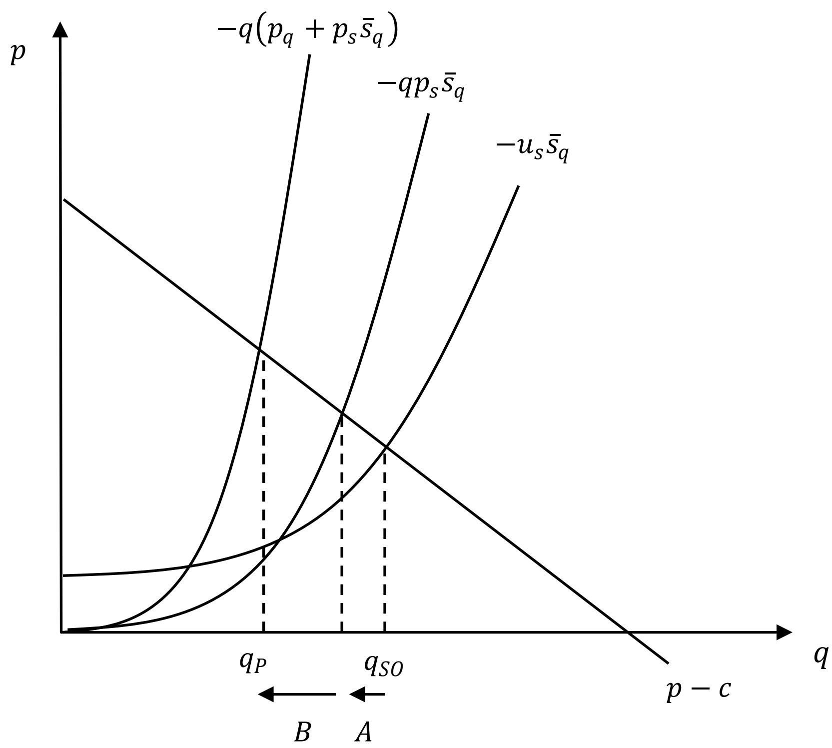


Figure 3. Optimal size of the GI region for aggregate producer surplus

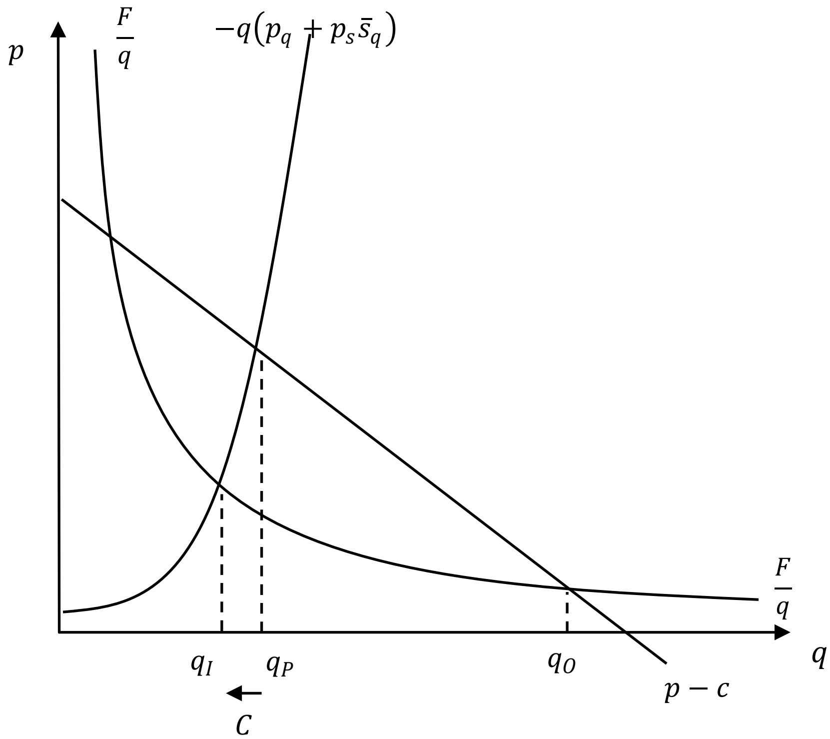
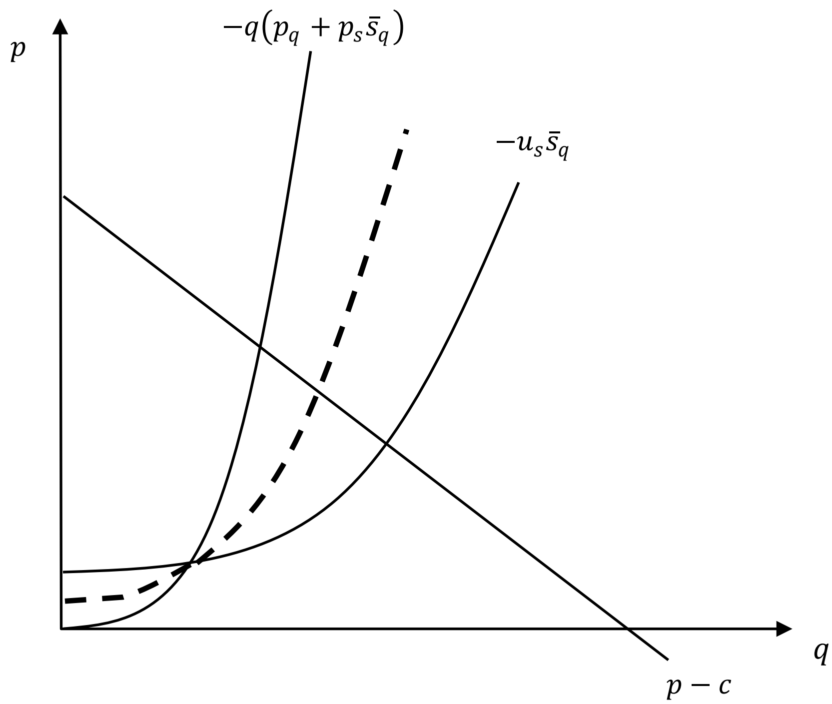
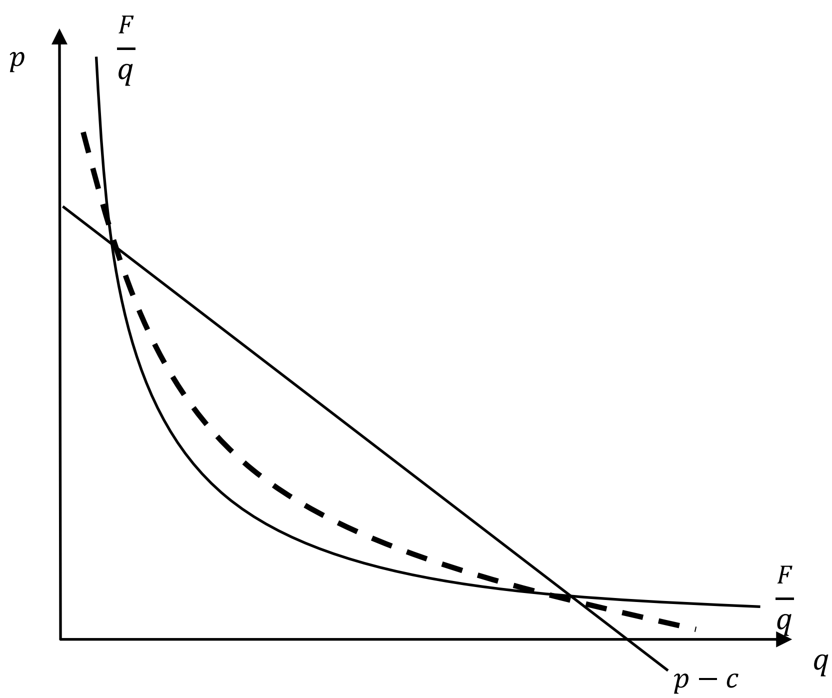


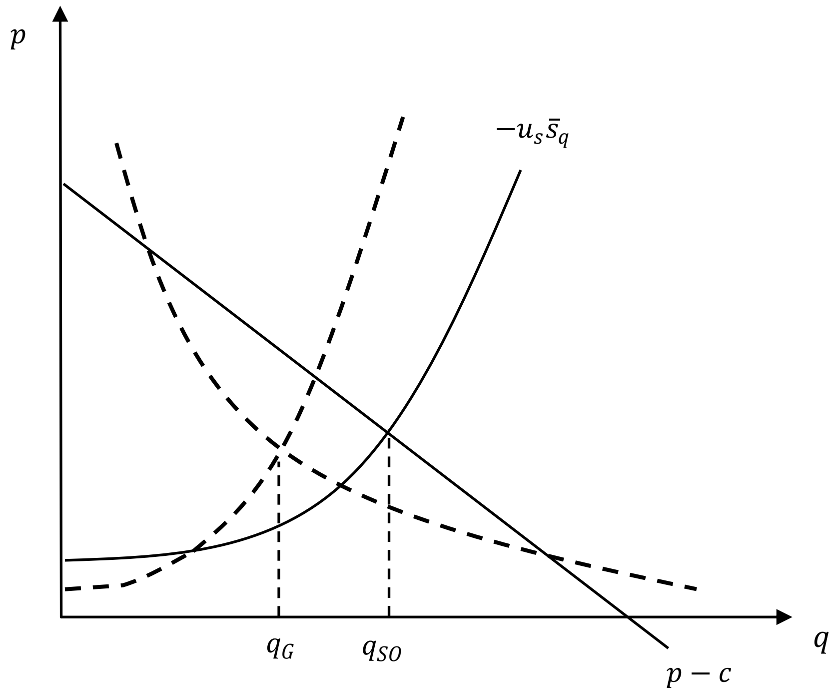
Figure 4. Optimal size of the GI region for insiders and for outsiders



(a) The right-hand side as weighted average



(b) The left-hand side as weighted average



(c) The political equilibrium

Figure 5. Determination of the Political Equilibrium