Geographical Indicators and Quality

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Short Course - Lecture 5
Catholic University of Milan
Cremona, Italy
June 11-22, 2012

Motivation

- **Food and agricultural products subject to market failure identified by Akerlof (1970) – *asymmetric information* and *moral hazard***

- **Market-based solution to problem possible when product attributes are not observable prior to purchase, but are determined at consumption**

- **Relies on key idea of firm's *reputation* – specifically, buyers' beliefs about quality**

- **As shown in seminal work of Klein and Leffler (1981), and Shapiro (1983), a key instrument for supporting firms' reputations are *trademarks***

- **By identifying themselves with trademarks, firms can build reputation for quality over time**

Geographical Indications

- **Functions of trademarks well-understood, and supported by legal statutes in most developed countries**

- **In food and agricultural sector, related concept is that of geographical indications (GIs) – form of branding focusing on use of names associated with geographic origin of a product**

- **Use of GIs has long history in EU, and they are growing in popularity in emerging and developing economies (EU, 2008) – also figured prominently in 1994 TRIPS Agreement of WTO**

- **Unlike trademarks, GIs are common labels, typically accessible to many firms producing similar products**

Geographical Indications

■ **Often observe concurrent use of GIs and trademarks for specific food products, e.g. European wines may be labeled with a specific GI, e.g., Champagne, and supplied by many firms, each with a distinctive trademark, e.g.,** *Veuve Clicquot*

■ **An interesting question then, is if private trademarks can sustain reputation as suggested by Shapiro (1983), what is point of GIs?**

■ **While several articles have been published on GIs, including, Zago and Pick (2004), and Moschini, Menapace and Pick (2008), Moschini and Menapace (2012) first to analyze concurrent use of private trademarks and GIs**

Basic Results

- **Moschini and Menapace (2012) extend Shapiro (1983) to reflect both collective (GIs) and firm-specific (trademarks) reputations in a competitive market**

- **GIs and trademarks turn out to be complementary means of signaling quality**

- **Specifically GIs reveal information regarding origin (indirectly quality) of product, and by constraining moral hazard behavior, reduce costs of building reputation, lowering prices and raising welfare**

- **Approach also shows type of GI scheme used might matter – European-style *sui generis* scheme vs. US-style scheme based on certification marks**

Institutional Framework

- **GIs are places/regions used to brand goods – most commonly wines (Burgundy) and foods (Parmigiano-Reggiano)**

- **Distinctive feature of GIs is that quality is linked to geographic location where production occurs, e.g., climate, soil, local knowledge – i.e., *terroir***

- **Considered one of earliest instruments to counteract asymmetric information problem – date back to 15th Century in Europe, but are now key part of its approach to quality assurance (EU, 2003)**

- **Countries such as China, India, South Korea and Colombia are also introducing/expanding GI laws**

Institutional Framework

■ **Ability of GIs to alleviate market failure rests on their credibility, necessitating intellectual (IP) protection**

■ **While TRIPS agreement requires countries to provide legal means for protecting GIs against unfair competition, no specification on means of protection**

■ **Two key legal notions used to protect GIs:**

(i) *Sui generis* originally developed under Roman law, and adopted in EU, as well as some Asian and Latin American countries, e.g., China, Thailand, Colombia and Venezuela

Examples include: protected designations of origin (PDOs) e.g., Chianti, and protected geographical indications (PGIs) e.g., Tuscany olive oil

Institutional Framework

Distinction between PDOs and PGIs based on quality-geography nexus – former requiring stronger link between natural production environment and quality

Key to *sui generis* schemes – evidence required that quality is due to natural and human factors of region, along with code of rules (specification) for each GI product, e,g., production process, geographic area

Schemes not exclusionary, i.e., GI granted to all producers in region who meet specification

(ii) Common law schemes, including US, where GIs protected by trademark system, registered as certification marks, origin of good being key attribute that is certified – also non-exclusionary

Model

- **Supply-side:**

  Experience good that can be produced in continuum of qualities $q \in [q_0, \infty)$, where q_0 is minimum quality standard (MQS), enforced by government

  Two production areas, GI/other, with different qualities – unit costs of production being $c^G(q)$ and $c(q)$

  GI technology only available in GI region, and assumed $c_q(q) > 0$, $c_{qq}(q) > 0$, and $c^G_q(q) > 0$, $c^G_{qq}(q) > 0$

  GI technology has advantage producing high-quality, conventional technology has advantage producing low quality, i.e., threshold such that:

  (1) $c^G(q) > c(q)$ for all $q < \tilde{q}$

  $c^G(q) < c(q)$ for all $q > \tilde{q}$

Model

(1) can be supported by actual examples – Val di Non apples have PDO status in EU, produced in mountain region, making mechanization infeasible, and growing conditions costly to replicate

Firms are price takers, and industry has free entry, consistent with non-exclusionary nature of GIs; and each firm produces fixed output/period, normalized to unity, and also chooses quality level

- **Demand-side:**

Continuum of consumers with different tastes for quality, indexed by $\theta \in [0, \infty)$ with distribution F(θ), each buying one unit with surplus:

(2) $U(q, \theta) - p, U_q > 0, \text{ and } U_\theta > 0$

Model

- **Reputation and information:**

  Based on Klein and Leffler (1981) and Shapiro (1983), assume consumers' beliefs about quality based on producer's past quality choices, observed *ex post*

  Assume reputation R of firm k at t given by $R_t^k = q_{t-1}^k$

  Any firm delivering lower quality than expected punished by consumer boycott in perpetuity (Allen, 1984) – requires firms be clearly identified

- **Firms use brands, where brand is trademark and or GI, where trademark requires firm to establish firm-specific reputation, while GI requires certification to provide collective reputation**

Model

Sui generis GI system requires detailed specification of production process and product attributes – i.e., GI-specific MQS, q_0^G, where $q_0^G \geq q_0$

Assume no specific costs over and above production costs $c(q)$ and $c^G(q)$, associated with use of trademarks or GI certification, trademark system and GI certification schemes being fully credible

■ Equilibrium

Steady-state configuration with price function $p(q)$ and distribution of firms $n(q)$, where (i) each consumer knows $p(q)$, chooses quality/does not consume, (ii) markets clear at all quality levels, (iii) firm with reputation R, produces quality $q=R$, (iv) no entry/exit

Model

Focus on cost-of-quality structure by assuming all factors of production are perfectly elastic in supply – allows equilibrium price-quality schedules to be derived, based on general demand conditions:

(i) consumers indifferent between products of equal quality, (ii) utility increasing in quality and decreasing in price paid for quality, (iii) consumers have heterogeneous preferences over quality

Consider three IP scenarios and derive equilibrium price-quality schedules

> **- trademarks only (benchmark case)**

> **-** *sui generis* **GI scheme**

> **- certification mark GI scheme**

Benchmark Case

■   With trademarks only, consumers cannot detect technology used in production

In equilibrium, given quality produced with lowest production costs based on threshold level of quality $\tilde{q}$

(i) <u>Standard technology</u> $(q \leq \tilde{q})$:

Firm can be honest producing q, earning discounted profits $[(1+r)/r][p(q) - c(q)]$ where r > 0 is per-period interest rate; firm can cheat by cutting quality to MQS, earning one-period profits $p(q) - c(q_0)$

Range of prices where firms do not cheat is *credibility constraint*:

(3) $p(q) \geq c(q) + r[c(q) - c(q_0)]$

Benchmark Case

New entrant can only charge $p_e = c(q_0)$, incurring a sure loss of $c(q_0)-c(q)$ in entry period, after which they earn $p(q)-c(q)$

Free entry requires discounted profits of new brands to be non-positive, i.e., $c(q_0)-c(q)+1/r[p(q)-c(q)] \leq 0$

Price-quality schedule satisfies *free-entry condition*:

(4) $p(q) \leq c(q) + r[c(q) - c(q_0)]$

(3) and (4) imply an equilibrium price-quality schedule for firms using standard technology:

(5) $A(q) \equiv c(q) + r[c(q) - c(q_0)]$ for $q_0 \leq q \leq \tilde{q}$

Benchmark Case

(ii) GI Technology ($q \geq \tilde{q}$):

Similar conditions can be derived for firm using GI technology, only difference being cheating results in outsourcing production at cost q_0

For firms using GI technology, *credibility constraint* and *free entry* condition imply equilibrium price-quality schedule:
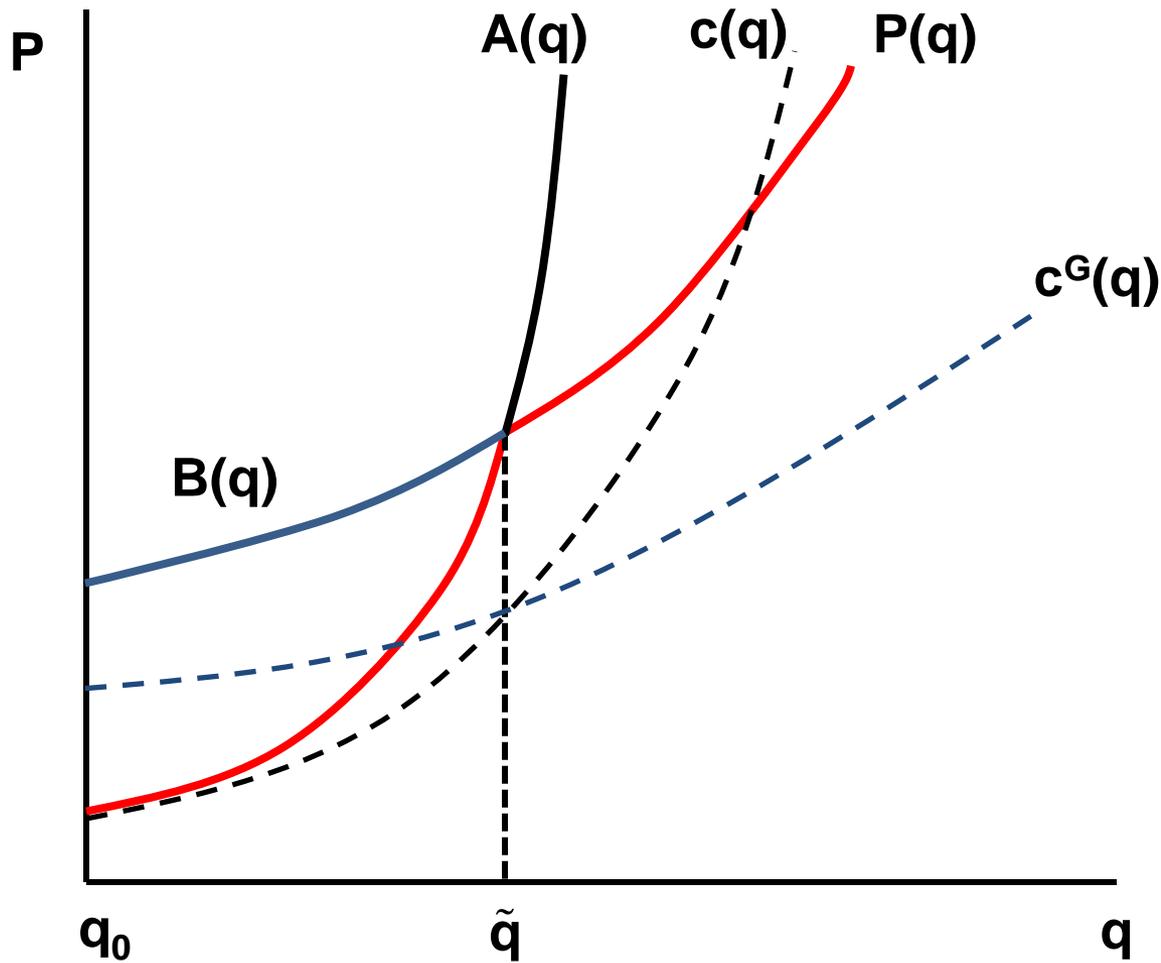
(6) $B(q) \equiv c^G(q) + r[c^G(q) - c(q_0)]$ for $q \geq \tilde{q}$

Result 1:

(7) $P(q) \equiv \begin{cases} A(q) \text{ for } q \in [q_0, \tilde{q}] \\ B(q) \text{ for } \quad q \geq \tilde{q} \end{cases}$

Each $q \geq q_0$ produced using lowest cost technology

Figure 1: Equilibrium Price-Quality Schedule – Trademarks Only

Sui Generis Case

- **Assume any GI-certified product has quality greater than the GI-specific MQS, $q \geq q_0^G$, firm will still require a private trademark to protect from opportunistic entrants who will sell lower and cheaper to produce q_0^G**

  In order to enter with a branded GI-certified product, firm must build reputation, such that loss is incurred in entry period, and profits thereafter, the *free-entry condition* being:

  (8) $p(q) \leq c^G(q) + r[c^G(q) - c^G(q_0^G)]$

  Once a product is trademarked product has a reputation, and is GI-certified, firm must continue certifying, otherwise consumers will believe it is cutting quality, resulting *credibility constraint* being:

Sui Generis Case

(9) $\qquad p(q) \geq c^G(q) + r[c^G(q) - c^G(q_0^G)]$

(8) and (9) imply the price-quality schedule for certifying producers is:

(10) $\qquad G(q) \equiv c^G(q) + r[c^G(q) - c^G(q_0^G)]$ for $q \geq q_0^G$

Suppose a firm has built reputation R= $q > q_0^G$, if it no longer certified under GI system, credibility constraint becomes:

(11) $\qquad p(q) \geq c^G(q) + r[c^G(q) - c(q_0)]$

i.e., without GI certification, no price exists that satisfies credibility constraint and free entry condition, as long as $q > q_0^G$

Sui Generis Case

- **Equilibrium price-quality schedule under *sui generis* scheme, is made up of (5), (6), and (10), although schedule takes different forms depending on size of q_0^G**
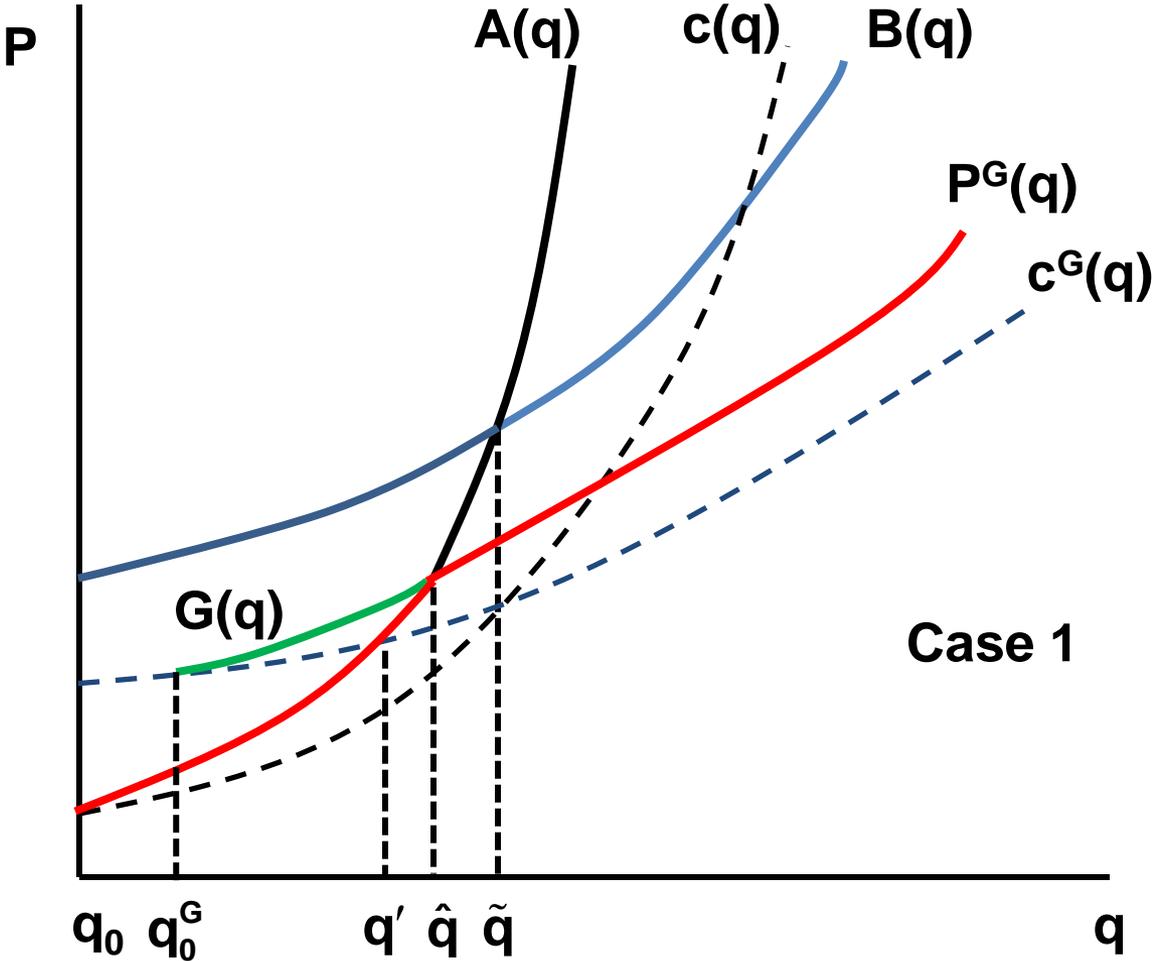
Case 1: $q_0^G \in [q_0, q']$, **schedule is:**

$$(12) \qquad P^G(q) \equiv \begin{cases} A(q) \text{ for } q \in [q_0, \hat{q}] \\ G(q) \text{ for } \qquad q \geq \hat{q} \end{cases}$$

where $\hat{q}$ and q' satisfy $G(\hat{q}) = A(\hat{q})$ and $A(q') = c^G(q')$

When MQS is suitably low, price-quality schedule is continuous (Figure 2) – key is if G(q) is above A(q), there is range of qualities that can be supplied more cheaply with standard technology

Figure 2: Equilibrium Price-Quality Schedule – *Sui Generis*

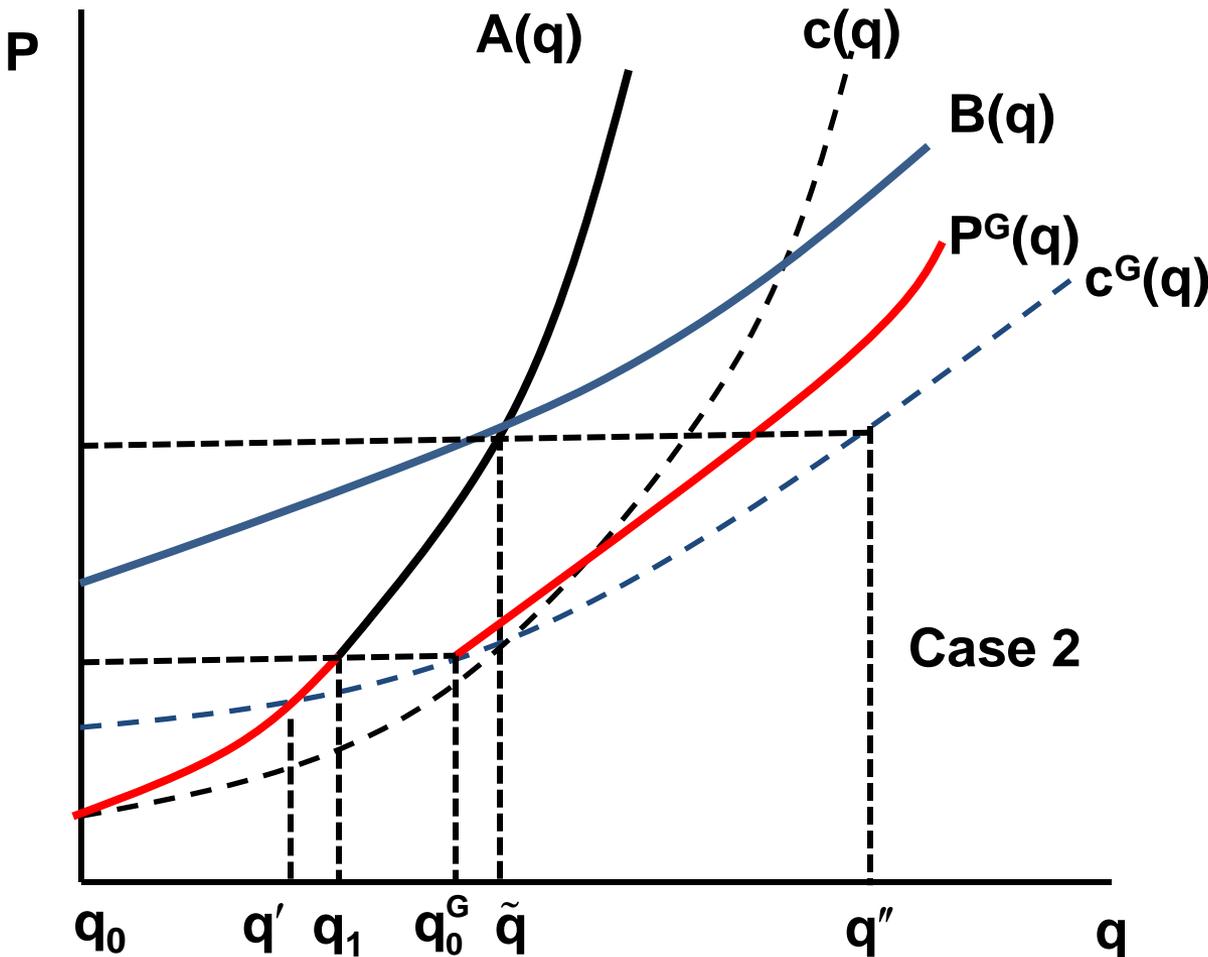# *Sui Generis* Case

- **Case 2: $q_0^G \in [q', q'']$, schedule is:**

$$(13) \qquad P^G(q) \equiv \begin{cases} A(q) \, \text{for} \, q \in [q_0, q_1] \\ G(q) \, \text{for} \qquad q \geq q_0^G \end{cases}$$

where q' and q'' satisfy $A(q_1) = c^q(q_0^G)$ and $A(\tilde{q}) = c^G(q'')$

When MQS is in intermediate range, price-quality schedule has discontinuity (Figure 3), and range of qualities $q_0^G \leq q \leq \tilde{q}$ produced with costly GI technology

Importantly, no quality can be produced using GI technology without being certified, and that can also be competitive on market

Figure 3: Equilibrium Price-Quality Schedule – *Sui Generis*

Sui Generis Case

- **Case 3:** $q_0^G \geq q''$, schedule is:

$$(14) \quad P^G(q) \equiv \begin{cases} A(q) & \text{for} & q \in [q_0, \tilde{q}] \\ B(q) & \text{for} & q \in [\tilde{q}, q_2] \\ G(q) & \text{for} & q \geq q_0^G \end{cases}$$

where q_2 satisfies $B(q_2) = c^G(q_0^G)$

Quality gap over range $q \in [q_2, q_0^G]$, but now supplied qualities are produced with lower cost technology (Figure 4)

Also a set of firms that use GI technology, but do not certify, just using own trademark, supplying in quality range $\tilde{q}, q_2$

Figure 4: Equilibrium Price-Quality Schedule – *Sui Generis*
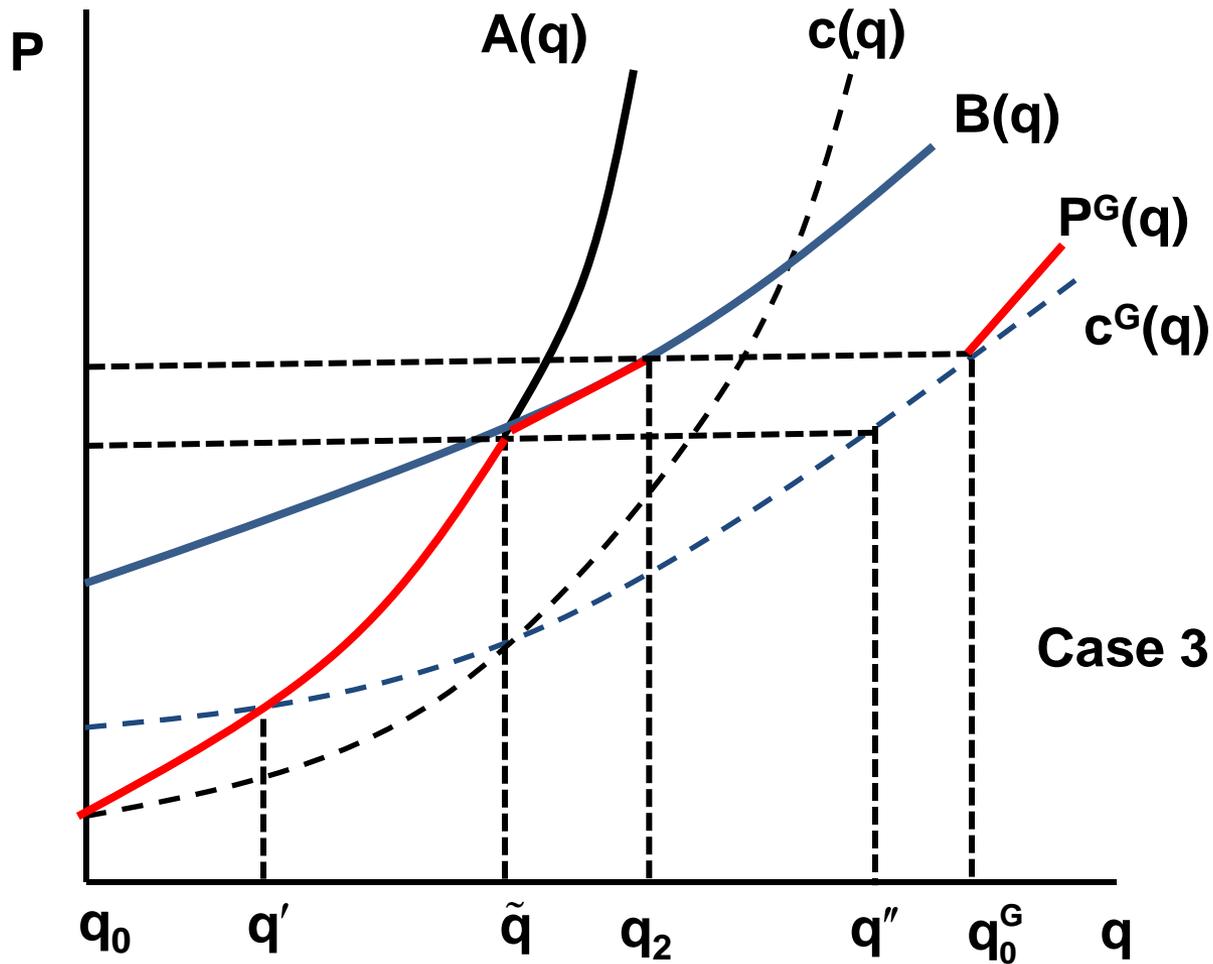
Certification Marks Case

- **This case is equivalent to *sui generis* case with lowest minimum quality, $q_0^G = q_0$, as no quality specification is covered in this system**

  However, presence of certification mark curtails moral hazard behavior of firms by limiting their ability to cut costs were they to depart from equilibrium

  Price-quality equilibrium similar to Case 1, with range of qualities $q' \leq q \leq \tilde{q}$ produced with GI technology, even though cost of producing them with standard technology is lower (see Figure 2)

Welfare

- **GI certification reduces reputation premium needed to support higher level qualities – *sui generis* system reveals technology in production, and that it is at least of qualityq_0^G**

- **Consumers may be better off as equilibrium prices lower for some qualities, but firms are generally worse off if premium they can charge is lower after their reputation has been established**

- **Consumers with relatively high values of θ are also better off with a *sui generis* GI scheme rather than certification marks**