THE GROWING DEMAND FOR FOOD QUALITY: IMPLICATIONS FOR AGRICULTURAL AND TRADE POLICY

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Implications for Agricultural and Trade Policy

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If competitive markets do not generate the necessary standard-assuring mechanisms, the nature of such a market failure needs to be understood. By setting out a simple of model contractual enforcement, it is possible to show that asymmetric information on food quality components is sufficient for the quality-enforcement mechanism not to work in the case of food safety. Given that public institutions will tend to set nationally divergent food quality standards, many will act as barriers to trade. Therefore, political coalitions between consumers and agricultural producers are likely to gain in importance which will add a new dimension to attempts at international agricultural and trade policy coordination.

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Introduction

Throughout history, the prime concern of mankind has been to assure the supply of a sufficient quantity of food. Quality considerations played only a secondary role. However, by the early 1980s the fear of persistent food scarcity had dissipated and was replaced by concerns over food surpluses in the developed world (von Witzke and Ruttan, 1989). This switch in the perception of food scarcity has been paralleled by a growing emphasis on food quality.

The growing demand for many food quality components is usually expressed in the form of a growing demand for food quality standards. Such standards represent public goods and thus involve a market failure. The general focus of this paper is on both the nature of this market failure and its central implications for agricultural and trade policy.

The paper is outlined as follows: in Section 1, a theoretical model of the market for food quality components is presented. In Section 2, the implications of this model for international trade and agricultural policy are discussed. The paper concludes in Section 3 with some thoughts on the methodology of trade and policy analysis in the presence of food quality standards.

1. Theoretical Background

There appears to be general consensus that many quality components can be left to market forces. A growing demand for quality will eventually be met through free contracting between private agents both domestically and internationally. However, there is also a consensus that certain quality components require regulation as a result of irreversible health consequences of consuming food with negative quality components and because of asymmetric information on those quality components (Kinsey, 1990; Kramer, 1990).

In examining the nature of market failure in the provision of food standards, it is useful to outline a model of contractual performance originally suggested by Klein and Leffler (1981). Consider a situation where, each period, consumers purchase a food product x which embodies a level of quality q. Prior to consumption, individuals are uncertain about the actual quality of the good but are able to ascertain, by pre-purchase inspection, that it meets a minimum standard, i.e. fruit is unblemished. Over the consumption period, as the good is experienced, consumers are able to costlessly communicate information to each other about the good's actual quality. If the quality is lower than claimed, the seller is punished by non-repeat purchase.

Assume many firms can supply the market with identical technology. Further, assume that the cost function is given as:

$$C - c(x,q) + F(q)$$

where c and F are variable and fixed costs respectively. Higher quality and quantity generate higher production costs. Marginal costs increase with quality.

Focussing on **Figure 1**, MC_{qmin} and AC_{qmin} refer to the costs for a good of minimum quality, whilst MC_{qh} and AC_{qh} refer to costs for a high-quality good, P_o and P_1 being the relevant competitive prices. Given that consumers can only observe that a good is of minimum quality pre-purchase, sellers will always have an incentive to cheat by selling x_3 of the low-quality good at the high-quality price, as the one-period quasi-rents from cheating outweigh the zero quasi-rents of being honest. Rational consumers will realize this, and because of the moral hazard, will only be willing to pay P_o. Therefore, only low-quality goods will be produced.

However, there may exist a price above the competitive price P_1 that will motivate firms to supply high-quality goods, i.e. P_2 which generates a price premium such that the perpetual quasi-rents from supplying high-quality outweigh the one-period rents from cheating[1]. In a competitive equilibrium, firms cannot earn positive profits, hence entry would force the market price below the quality assuring level. In order to generate an equilibrium, Klein and Leffler argue that firms will compete such profits away by investing in firm-specific assets that incur non-salvageable costs, e.g. brand names, logos and advertising. This shifts up the cost curve for high-quality goods to $AC_{qh}+s$. Firms will not cheat by selling low-quality at the high price P_2 as they will lose future sales and incur a capital loss. Also, investment in specific assets acts as a signalling device to consumers where they are uncertain about firms' cost structures[2].

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[1] See Klein and Leffler (1981) for the precise technical condition.

[2] Allen (1984) argues that the Klein and Leffler proposition does not hold if consumers can observe the price and output of firms and have information on costs.

Figure 1   Pricing and Quality Levels
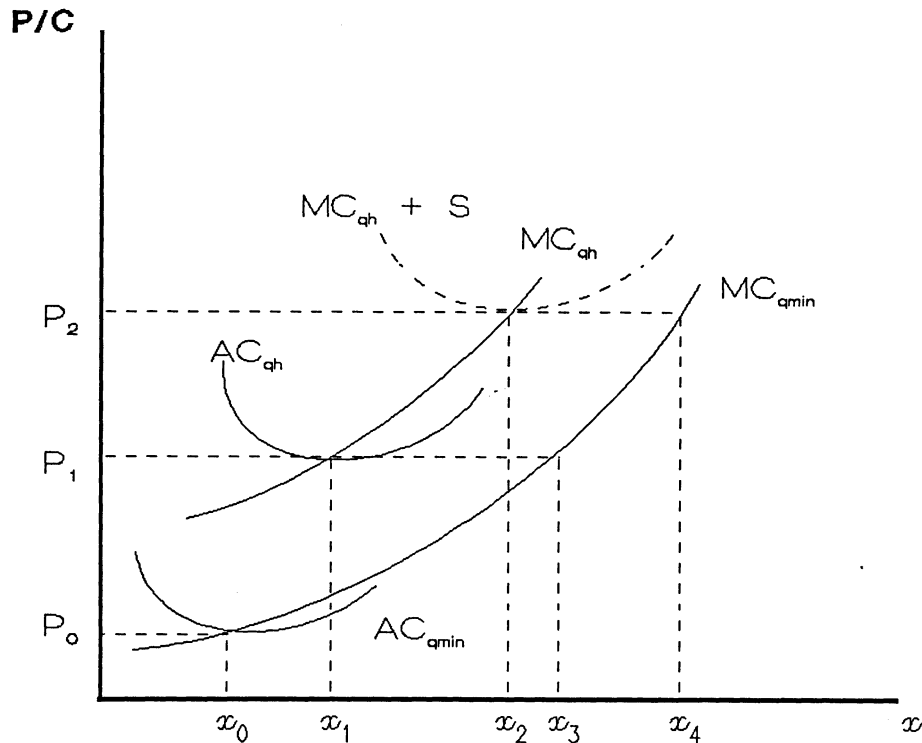
Given this analysis, how robust is it when the quality index for a product is a vector of characteristics? As Kinsey notes, food quality is a continuum of characteristics ranging from the very negative such as unsafe food to positive in terms of taste and convenience. The combination of the price premium and the repeat-purchase mechanism would likely generate a Pareto optimum for positive quality characteristics such as taste, and we certainly observe food processing firms investing in non-salvageable, firm-specific assets such as brand names.

However, it seems less likely that contractual assurance can be assured in the case of negative characteristics.   The repeat-purchase mechanism is based on the idea that consumers can evaluate quality immediately after consumption. When consumption of a

good bears a health risk, markets fail to achieve a Pareto optimum. Honest firms may invest in firm-specific assets concerning food safety, but because the repeat-purchase mechanism is undermined by consumer uncertainty, dishonest firms have an incentive to free-ride and cheat[3]. Hence the moral hazard problem remains in the case of negative quality characteristics, and a competitive market will not provide the necessary quality information. Of course, information itself has the characteristics of a public good (Stiglitz, 1985).

Even if the repeat-purchase mechanism works, it will tend to be sub-optimal in terms of known risks. For example, salmonella poisoning from eggs was not widely known to UK consumers until a government minister publicly claimed that all eggs sold in the UK were affected by salmonella, generating an almost immediate boycott by consumers, i.e. all eggs were assumed to be of low quality.

2. Implications for Trade and Policy

The demand for food quality, as well as for food safety and health standards, is a function of a number of variables. Both food quality and standards represent luxury goods (Falconi and Roe, 1990). Growing incomes, together with improved knowledge about health risks have led to a significant growth in demand for food quality in the last decade. Of course, the demand for food quality and food quality standards is also a function of other environmental hazards that consumers are exposed to and of (nationally divergent) preferences.

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[3] See Falconi and Roe (1990) for analysis of incentives to firms to distort safety information.

Moreover, the demand for food safety and health standards is driven by the growing opportunity cost of human time. Food components are frequently not easy to recognize. The cost of information on food quality components tends to rise with increasing opportunity costs of time. In addition, rising opportunity costs of time stimulate increased demand for food away from home (Senauer, 1979) and, thus, lead to a growing intake of food for which there is uncertainty about the quality components (Falconi and Roe, 1990).

As the variables determining the demand for food quality and food safety and health standards are different from one country to another, there will be differences in each country's optimum quality standards (in terms of positive as well as normative analysis) in the absence of international policy coordination. Such nationally divergent standards obviously represent barriers to trade. In terms of the previous analysis of contractual enforcement, this has a number of implications for policy and welfare evaluation.

Barriers to trade in the form of food quality standards could be removed through international harmonization of food quality standards. An international agricultural trading system which is free of barriers to trade represents an international public good. A single country cannot supply itself with such a good except in cooperation with other countries (Runge, von Witzke and Thompson, 1989). To the extent that a country can be made better-off by removing barriers to trade, there is an incentive for each country involved to pursue political strategies which could lead to harmonization of food quality standards among countries.

However, international harmonization of food quality standards may be very difficult to achieve for a variety of reasons. First, the general problems of public goods provisions have to be solved. As is well known, public goods are difficult to provide efficiently because of incentives for free-riding by the agents involved, and agreement has to be achieved over the distribution of contributions to the cost of providing the public good.

Second, the international distributive problems are aggravated in the case of food quality standards by the fact that the demand for both food quality and food quality standards is a positive function of income. However, incomes tend to be unequally distributed among countries making it more difficult to agree on uniform food quality standards.

Third, the growing importance of food quality standards will also re-define trade relations between the developed and the developing world. Food exporting countries are likely to face more barriers to trade, as developed countries introduce additional and tighten existing food safety and health standards. Less developed countries may have problems meeting standards set by wealthy countries because, in many cases, new production techniques are human capital intensive; human capital, however, is scarce in most low income countries. Moreover, production technologies that meet the standards developed in wealthy countries, may not be efficient under either the climatic conditions or relative factor prices in developing countries. A further dimension of this problem is that some developed food exporting nations may opt to constrain domestic sales of foods

to those that meet domestic standards but allow the production of below-standard foods for export to other countries with less restrictive regulation.

Fourth, the growing demand for food quality tends to favor political coalitions between farm interest groups and consumers. In developed countries, the influential minority of agricultural producers, seeking protection from foreign competition may find increasingly attractive coalition partners in consumers seeking protection from food and related health risks via food quality standards.

Finally, (nationally divergent) food quality standards may gain in importance as a substitute for more traditional tariff and non-tariff barriers to trade. Progress in international negotiations on a more liberal international agricultural trade, such as those in the GATT, may have been slow but they have contributed to significant policy adjustments both in the United States and the European Community (EC). In both countries, agricultural price supports have been reduced in real terms in recent years. Of course, if one instrument is taken away from an influential interest group, such as farmers in developed countries, its political power is usually not broken. If traditional forms of agricultural income support continue to lose their importance, agricultural interest groups will find substitutes. Again food quality standards and a coalition with consumers is likely to be an attractive option.

For the reasons outlined, it is expected that food quality standards will play an increasingly important role as non-tariff barriers to international trade (see also Runge, 1990). Recently, there has been a growing incidence of international disputes over food quality and food quality standards. There was disagreement between the EC and the

United States over the use of growth hormone in beef production and the Community threatened to ban the import of all beef from the United States for this reason. Also, the EC now requires that foreign meat processing plants meet EC standards. Recently, the EC significantly reduced the number of certified plants, causing the United States to threaten retaliation.

In reality then, there are apparently serious impediments to the harmonization of food quality standards which are likely to prove difficult to overcome. This can be demonstrated by the experience over time of both the United States and the EC. In the case of the United States, despite being a nation state for 200 years, there are still numerous interstate trade barriers. Many of them are based on differences in food quality and related standards.

In the case of the EC, one of the central objectives of the scheduled completion of the internal market by the end of 1992 is to remove all internal barriers to trade. It has now become apparent that the Community will fail to adopt a uniform set of standards before the 1992 deadline. It seems (Swinbank, 1990 and Gray, 1990) that the EC has in fact adopted the principle of "mutual recognition" in its approach to food standards harmonization. Products manufactured and sold within a particular EC country, and those imported from a non-EC country, are subject to that country's set of quality standards, whilst products imported from other member states only have to meet the standards set by their relevant governments. Therefore, the EC Commission appears to be following a policy of minimum standards.

In terms of the previous analysis of contractual enforcement, if the concept of "mutual recognition" were applied to trade between a wider set of countries than the EC, it would have a number of implications for welfare evaluation. First, if individual countries set differing food safety and health standards which translate into sunk costs for firms, there will be a range of qualities of goods that can be freely traded. This may be beneficial if there is a non-uniform distribution amongst consumers of the willingness to pay for quality. It also means that price differences for a particular food product will be observed for reasons other than transport costs. However, a range of differing product standards for the same type of product may interfere with the signalling mechanism of a particular country's set of standards and serve to increase consumer uncertainty.

Second, if the process of harmonization of international food quality standards focusses on a minimum set of standards, those firms from countries with higher standards may have an incentive to demand that domestic standards be lowered in order to allow them to compete with imports that embody a lower set of standards.

3. Summary and Conclusions

Using a simple model of contractual enforcement, it has been shown in this paper that asymmetric information on quality components is sufficient for a market determined, quality-enforcement mechanism not to work in the case of food safety, and hence safety standards may have to be set by public institutions . In this context, an attempt has been made to analyze the implications for international agricultural trade and policy of the

growing demand for food quality. This demand will result in a growing abundance of (nationally divergent) food quality standards. Many of them will act as barriers to trade. Political coalitions between consumers and agricultural producers demanding protection are likely to gain in importance, which will add a new dimension to attempts at international agricultural and trade policy coordination such as those in the GATT.

The growing demand for food safety and health standards also raises new methodological problems for which, as yet, there are no agreed answers. Specifically, the following issues are mentioned:

- If a Pareto optimum for each country requires them to set nationally divergent standards (public goods), free trade may have to be abandoned as the reference situation for trade and policy analysis, so what is it replaced by?

- If harmonization of standards is desirable for at least some countries, how should and how will countries cooperate in this regard?

-As the units of analysis are not individual economic agents, the political economic process needs to be understood both at the domestic and international level.

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