



Certification and minimum quality standards when some consumers are uninformed



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ABSTRACT

We compare certification to a minimum quality standard (MQS) policy in a duopolistic industry where firms incur quality-dependent fixed costs and only a fraction of consumers observe the quality of the offered goods. Compared to the unregulated outcome, both profits and social welfare would increase if firms could commit to producing a higher quality. An MQS restricts the firms' quality choice and leads to less differentiated goods. This fuels competition and may therefore deter entry. A certification policy, which awards firms with a certificate if the quality of their products exceeds some threshold, does not restrict the firms' quality choice. In contrast to an MQS, certification may lead to more differentiated goods and higher profits. We find that firms are willing to comply with an ambitious certification standard if the share of informed consumers is small. In that case, certification is more effective from a welfare perspective than a minimum quality standard because it is less detrimental to entry.

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1. Introduction

When consumers are ill-informed about the quality of a product, firms may provide less than the socially optimal level of quality.¹ Policy makers have resorted to a variety of instruments to address this problem. Two important such instruments are minimum quality standards and certification. Minimum quality standards (MQS) prevent firms from selling goods whose quality is below a predefined standard. Examples include safety standards as well as occupational licensing for professional services. Certification is a process whereby the government or an independent third party verifies if a product fulfills certain criteria. Products that satisfy these criteria obtain a certificate that is visible to consumers. Certification is used to document, among other things, the security of cars (crash tests, rollover ratings), the origin of food and wood (organic food certificates, FSC label for timber from sustainable forestry), and the environmental impact of products (e.g., the EU Ecolabel).²

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¹ Firms respond to this problem in various ways, such as by promising warranties, signaling quality through prices, or developing a reputation for high quality. Research on these market instruments has shown, however, that they may alleviate the problem but rarely eliminate it. See, e.g., Gal-Or (1989) for warranties and Daughety and Reinganum (2008a,b) for price signaling.

² A third instrument that is important in practice is mandatory disclosure, whereby firms are obliged to publish standardized and comparable information about their products. The distinction between mandatory disclosure and certification is not always clear-cut. There are two main features that

It is natural to ask which of these instruments is likely to be most effective in a given context. To investigate this question, we introduce uninformed consumers into the well-known model of [Ronnen \(1991\)](#). We show that certification can outperform minimum quality standards, in the sense that it induces firms to produce qualities that are closer to the socially optimal levels and thus leads to greater welfare. The superior performance of certification arises precisely when the underlying problem these instruments are intended to solve is most severe, namely when the share of uninformed consumers is large. By contrast, when the share of uninformed consumers is small, the rationale for certification disappears. Minimum quality standards, however, may continue to play a useful role, as [Ronnen \(1991\)](#) established for the limiting case in which all consumers are informed.

[Ronnen \(1991\)](#) studies a duopoly model in which firms play a two-stage game. In stage one, firms decide whether to enter the market and invest in the quality of their product. In stage two, they observe each other's entry and quality choices, and then compete in prices. All consumers observe quality; they have unit demand and differ in their taste for quality. The equilibrium is one of the vertical differentiation, with one firm selling high quality at a high price and the other firm selling low quality at a low price.

We depart from Ronnen's setup by introducing a subset of consumers who do not observe quality. In this setup, in the absence of government intervention, firms' revenues from uninformed consumers do not directly depend on quality: by assumption, uninformed consumers cannot react to changes in quality. When deciding on their investment in quality, firms thus only take into account the revenues from informed consumers. Nevertheless, the uninformed consumers correctly anticipate the firms' quality choices, so that in equilibrium the firms' quality investments determine their revenue from *both* types of consumers. The firms would like to commit to producing higher quality, but have no credible way of doing so. It follows that quality levels are below those that would be optimal for the firms. While the equilibrium continues to feature a vertical-differentiation outcome, both firms' qualities are lower than under full information. We then study the effect of the two policy instruments considered above. Our use of the Ronnen framework, in which an MQS is known to raise welfare when all consumers are informed, gives an MQS its best shot.³

Certification offers firms the possibility to commit to a higher level of quality. When the certification threshold is set above the highest quality level that would be offered in an unregulated market, it may induce both firms to raise their quality. With the certificate, a firm can demonstrate that the quality of its product meets at least the certification standard. Therefore, if the standard is not too demanding, one firm will match this level. The other firm differentiates its product by offering low quality, but compared to the unregulated equilibrium, it can raise its quality without compromising the degree of differentiation between the goods (and thus without intensifying price competition). As we show, there exists a certification standard that increases both consumer surplus and industry profit.

When setting the certification standard, the government has to ensure that obtaining the certificate is attractive for producers. The certification threshold has to be set such that the required investment in quality is not too high compared to the expected revenues. The decision to certify a product crucially depends on the profit that a firm expects to earn from selling its product without the certificate. As argued above, the quality level the firms can credibly produce without the certificate (and the resulting profit they can secure) is low when the fraction of informed consumers is small. This leads to the surprising result that if quality is more difficult to discern, a firm is more reliant on certification and tends to comply with a higher certification standard.

The government can exploit this informational problem. Through the strategic use of certification, it can achieve a higher maximum quality than in case the quality is perfectly observable.⁴ In our framework, this is welfare-enhancing because even full-information qualities are lower than the socially optimal ones. The source of this underprovision of quality is twofold. It stems both from the fact that the marginal consumer has a lower taste for quality than the average consumer (see also [Spence, 1975](#)), and from the firms' desire to offer differentiated products so as to alleviate price competition.⁵

It is important to point out that our result that certification can raise the high-quality firm's investment above the full-information level relies on the coarseness of the certification process: the government certifies that quality exceeds a

(footnote continued)

distinguish the two: first, disclosure usually concerns technical information which consumers may not always be able to understand and translate into an assessment of quality, whereas certification usually involves a grading system that is easy to grasp; second, disclosure can in principle give consumers an idea of a product's precise position on the quality scale, whereas certification is coarse (in the sense of dividing the scale into discrete steps) and thus merely allows consumers to identify the interval to which a product belongs. The coarseness of certification is important for the results in this paper.

³ A priori, the welfare effect of an MQS is ambiguous, see [Leland \(1979\)](#) and [Shapiro \(1983\)](#).

⁴ Indeed, concerning the FSC certificate mentioned above, the timber industry's attempts to install another certification system with a relatively soft standard provide evidence that some firms would prefer less restrictive certification. For a detailed report, see http://www.fern.org/sites/fern.org/files/media/documents/document_1890_1900.pdf. The observation that these attempts have been ineffective so far exemplifies that firms often lack the power to install certification in which consumers have confidence. This in turn allows the government – or institutions which may credibly enforce certification – to step in and manipulate the qualities in the market by setting suitable certification standards. This may also explain why simple threshold schemes are so popular.

Our analysis is based on the assumption that policy interventions are adopted so as to maximize social welfare. Although we speak of governmental interventions for concreteness, our results also apply to non-governmental institutions whose objective is to maximize social welfare. For example, the FSC is a non-governmental, not-for-profit organization that promotes "environmentally appropriate, socially beneficial, and economically viable management of the world's forests" (see http://www.fsc.org/vision_mission.html). This objective could be interpreted as maximizing social welfare.

⁵ Our results also apply to other sources of quality underprovision. For example, if underprovision occurs because of positive externalities (e.g., car safety), the government could similarly raise the quality level by resorting to certification if consumers are not fully informed.

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