Coarse Grades

2 June 2009. Rick Harbaugh and Eric Rasmusen[1]

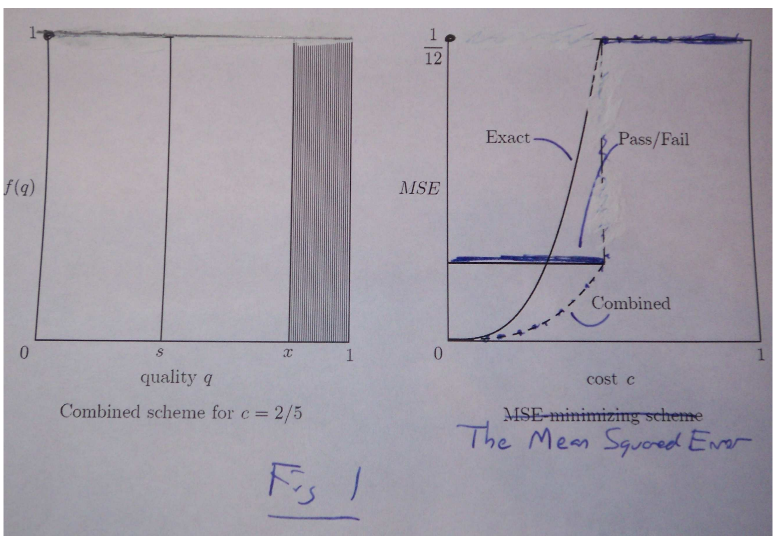
The Point: If certification is voluntary, then a coarse scheme that fails to report all information to the public will elicit more participation and be more efficient even if fine grading would be as cheap as coarse grading.

The Model: Firms are atomistic and have product quality q distributed according to $F(q)$ with support $[0,1]$ and density $f(q) > 0$. Each firm knows its own quality and has zero marginal cost of production. Firms maximize profits by choice of price p and whether or not to become certified.

Consumers are willing to pay a price up to their estimate $\hat{q}$ of quality, where that estimate is conditioned on any information available to them.

The single certifier will not certify any product unless the firm selling that product pays it the exogenous amount c. If it does certify a product, it measures the firm's quality perfectly, though it might not report that exact measure publicly. The certifier's objective is to minimize the squared error of consumer quality estimates. The certifier's choice variable is the grading scheme, $\overline{q}(q)$, a mapping of measured quality q to certified quality $\overline{q}$.

In an *exact scheme* of grading, the certifier reports every quality exactly. In a *coarse scheme he does not.* One type of coarse scheme is a *combined scheme,* in which the certifier (a) reports all types above some cutoff x exactly, (b) reports that types in the range $[s, x)$ are certified but without giving their exact quality, and (c) reports that types below s are uncertified. The figure illustrates a combined scheme.



Proposition 1: For any quality distribution $F(q)$, the best grading scheme is coarse. It fails to report all measured information to consumers.

Proposition 2: For sufficiently high certification costs c, the best pass/fail scheme is better than exact grading for any distribution $F(q)$. It is the best possible scheme if F is strictly concave (i.e., f is strictly decreasing).

Proposition 3: Pass/fail grading is feasible for a strictly larger range of certification costs than exact grading is if $E[q] > 1/2$ or $f(1) > 1$.

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