Mandatory Labeling

In addition to a potential role in bolstering voluntary labeling, the government may also decide that some information must be labeled. Most demands for mandatory labeling (including the "consumer's right to know" and calls for fair competition) arise in two general economic situations: when the market does not supply enough information to allow consumers to make consumption choices mirroring their individual preferences (asymmetric or missing information); and when individual consumption decisions affect social welfare differently than they affect the individual consumer's welfare (externality problems). In both of these situations, social costs and benefits may suggest a different labeling outcome than the one resulting from a private firm's labeling decision. Each situation is examined below.

Mandatory Labeling To Correct Asymmetric or Imperfect Information

Properly functioning markets provide a valuable service to society. In properly functioning markets, consumers are able to purchase the goods and services that best match their preferences. As a result, society's resources are used in ways that match consumers' preferences. However, sometimes the market supplies too little information to enable consumers to make consumption choices reflecting their preferences. One such situation occurs when there is asymmetric information, that is, the seller knows relevant information about a product that the buyer does not know (for example, someone selling a used car has information about the car that the buyer does not have). In cases of asymmetric information, resources are used less efficiently than with perfect, symmetric information.[2]

Asymmetric information may particularly be a problem in markets for foods with negative credence attributes or for markets in which information has a public good aspect. In these cases, firms may have no incentive to provide consumers with information. As a result, consumers may end up purchasing goods that do not match their preferences. In this case, the market does not work efficiently: goods that would be profitable with full disclosure may go unproduced while those of lesser value to consumers are produced instead.

In some cases of asymmetric information, the government may decide to intervene in the market to require producers to disclose critical information. Mandatory labels targeting asymmetric information are designed to provide consumers with greater access to information and to increase the efficiency of the market. The objective of government intervention in these types of cases is not so much to *alter* consumption behavior but to increase *informed* consumption (Magat and Viscusi, 1992, develop this point).[3]

Another type of information problem that may occur in food markets is that of imperfect information. Unlike the case of asymmetric information, where producers know relevant information about the product that consumers do not, in cases of imperfect or missing information, relevant market information does not exist or is contradictory. This situation could arise when the long-term health effects of a food or food attributes are unknown, or when scientific opinions differ about the health consequences of consumption. In these cases, the government might require full disclosure of even preliminary or contradictory information to provide consumers with the fullest information possible. Hadden (1986, p. 263) argues "It is a perversion of the intent of information provision to wait until full knowledge is available before labeling products." Indeed, if such information is valuable to consumers, it could improve market efficiency as in the case of asymmetric information.

Mandatory Labeling To Correct Externalities

Individual food consumption decisions can have a wide variety of social welfare consequences, including effects on the environment, health and productivity, labor conditions, and farm and industry structure. For example, consumers who choose diets high in saturated fat increase their risk of heart disease and cancer, creating costs not just for themselves, but also for employers and public health systems. Conversely, diets high in oat bran may lower the risk of heart disease, creating productivity gains and medical-care savings that benefit the whole society.

[2] One of the best-known studies of the effects of asymmetric information is Akerlof, 1970. For an overview of asymmetric information see Carlton and Perloff, 1994, or Varian, 1993.

[3] In some cases, government labeling requirements may force firms to generate new information or present information in a new format.

When the food consumption choices of consumers affect the welfare of others, and these welfare effects are not priced, then consumers may consume more or less than is socially optimal. If the price of the food were changed to fully reflect these welfare effects, then the market outcome would be socially optimal. For example, if the price of saturated fat were raised to reflect the costs of public health impacts, then less saturated fat would be consumed. Economists describe situations in which action of one economic agent affects the utility or production possibilities of another in a way that is not reflected in the marketplace as *externalities*.[4]

Where private consumption decisions result in externalities, social welfare may be maximized by a labeling choice that differs from the one generated by private firms. In the diet example, the potential social benefits of providing dietary information on labels include a healthier, more productive population and reductions in medical costs. These potential benefits may be larger than the increase in profits that compose a private firm's labeling benefits. As a result, the social benefits of labeling may outweigh the social costs even though the private benefits do not outweigh private costs. The opposite could also be true, with negative net social benefits and positive net private benefits. For example, the social costs of labeling red wine with the information that moderate consumption lowers the risk of heart disease may be greater than the social benefits. The potential social costs of such a label include increased rates of birth defects, car accidents, and alcohol-related health costs, while the potential social benefit is the reduction in heart disease. The private firm's costs of redesigning labels are potentially much lower than the benefits of increased sales.

In externality cases where private firms do not supply relevant information, the government may decide to intervene in labeling decisions to try to maximize net social benefits. Government-mandated labeling can be a useful tool for achieving social objectives because of the potential power of information to influence consumption decisions. In this role, labeling falls into that category of government policy dubbed by Magat and Viscusi (1992) as "information provision programs to alter people's economic behavior."

[4] A seminal analysis of externalities is Bator, 1958. See Just et al., 1982, for a thorough description of economic implications of externalities.

The primary difficulty in regulating to achieve a social objective comes in clearly identifying "the social objective." Although particular special or public interest groups may advocate labeling as a means of influencing consumption decisions to align them with a particular social objective, such objectives may not be widely valued. Society is composed of a diverse variety of individuals and interest groups. It is not a trivial task to design regulation that truly reflects widespread public interest. This is not to say that it is difficult to identify activities that affect social welfare. In fact, if social welfare is defined to include the "public purse," it may be difficult to find an activity that does not qualify (Shultz, 1980). What is difficult is determining if the benefits of a given social objective merit the costs of government intervention in the market.

Is Labeling an Effective Policy Tool?

Even if informational and social welfare considerations indicate that there may be a role for government intervention, labeling may not be an effective policy tool. Magat and Viscusi (1992) argue that information policy such as labeling generally is not very effective and there are some circumstances, such as when people do not read or do not care about the information on the label, in which it may not be effective at all.

Empirical studies have found labels to be both successful (Ippolito and Mathios, 1990b and 1995) and unsuccessful (Variyam, Blaylock, and Smallwood, 1995 and 1997; Moorman, 1996) in educating consumers and changing consumption behavior. These and other studies highlight the observation that consumers often make hasty food choices in grocery stores and usually do not scrutinize food labels (see Aldrich, 1999, for a summary of research on consumers' label usage). These studies also illustrate the fact that the format and context of the information are important elements in maximizing the possibility that labeled information will influence its audience.

Consumers are more likely to read and understand labels that are clear and concise (a point argued by Hadden, 1986; Viscusi and Magat, 1992; Noah, 1994). A large number of warnings or a large list of detailed product information may cause many consumers to disregard the label completely. Even if consumers do consider each piece of information on a label, they may find it difficult to order the information according to importance. For example, out of 10 warnings on a label, consumers may have difficulty picking out the

most important. As a result, consumers may underreact to important information or overreact to less important information (Noah, 1994).

While clear, concise labels could possibly be designed to address problems of asymmetric information, problems for which information exists, it is unlikely that labels would be successful in addressing problems of imperfect information. By definition, the information available in these situations is unclear. Not only is it difficult to convey such information on a label, it is difficult for consumers to decipher it. Consumers have a particularly difficult time making sense of small probabilities or of information about an issue that lacks scientific or political consensus (for analysis of how consumers react to risk information see Slovic, Fischhoff, and Lichtenstein, 1980; Viscusi and Magat, 1987; and Magat and Viscusi, 1992). As observed by Hadden (1986, p. 196), "It is unreasonable to expect individuals to process information that has confounded the experts." Providing information that leaves consumers confounded is unlikely to lead to improvements in market efficiency.

A more comprehensive and better targeted approach to inadequate information might include research and science education programs that stress the probabilistic nature of scientific knowledge. As noted by Slovic, Fischhoff, and Lichtenstein (1980, p. 178), "It is important to recognize that informing people, whether by labels, package inserts, or more extensive programs, is but part of the larger problem of helping people cope with the risks and uncertainties of modern life."

Labels may also be a poor means of addressing problems of externalities and advancing social objectives. Individuals tend to weigh their individual private costs and benefits, exclusive of externality costs, when making consumption decisions. Even if certain individuals alter their behavior to completely reflect externality costs, the fact that others do not means that the objective will probably not be met. For example, while some consumers may purchase only free-range chickens, the goal of more humane treatment of chickens will not be achieved so long as most consumers continue to purchase coop chickens. Differing preferences for the targeted consumption good may also lead to less than optimum results. For example, even if all agree that a slimmer, fitter population is a good social (and personal) objective, some consumers' preferences for fatty foods and inactivity may outweigh their valuation of the social objective.

Labels may also be unable to change behavior enough to meet a social objective if some consumers free-ride on others' socially responsible behavior. For example, although a consumer may feel that sea turtles should be protected and that strict laws protecting them should be enforced, he or she may decide that eating one small bowl of turtle soup will not really make a difference. The uneven distribution of collective benefits also mitigates against the achievement of social goals through labeling. Even if individuals have similar preferences over the social outcome, the fact that some benefit more than others probably means that not everyone will change their behavior to match the social optimum (Hadden 1986, p. 38).

Economic theory identifies a number of policy tools that may be more suited to redressing externalities than information remedies. Bans, quotas, production regulations or standards, and Pigouvian taxes[5] may all be more successful than mandatory labels in adjusting consumption and production to better match socially optimum levels.[6]

Regardless of the objective, effective labeling hinges on the existence of standards, testing, certification, and enforcement services. To establish credible, effective mandatory labeling, the government must ensure that every step along the labeling tree (fig. 1) exists. The government must ensure that the quality standards in question are clear and achievable; that testing services, if necessary, are available to measure the validity of labeling claims; that producers (and consumers) are able to certify or otherwise prove the validity of the quality claim; and that a mechanism for enforcing labeling rules exists, including a mechanism to punish producers who make fraudulent claims. The government must either perform these services (and find a way to finance them) or accredit third-party agents to perform them (as described by branch 4 of the labeling tree). Mandatory labeling laws that are not supported by standards, testing, certification, and enforcement services could result in confusion and actually increase transaction costs.

[5] A Pigouvian tax is a tax that imposes the externality cost of an activity, e.g., pollution, on the generator of that pollution.

[6] For an analysis of policies for obtaining social optimality in the presence of externalities see Just, Hueth, and Schmitz, 1982

Weighing the Costs and Benefits of Mandatory Labeling

Effective labeling may generate a variety of benefits. Effective or not, it generates a variety of costs. Policymakers must weigh the benefits and costs of labeling as well as the distribution of benefits and costs to determine whether labeling is an appropriate policy option.

Measuring the Benefits of Mandatory Labeling

In measuring the benefits of mandatory labeling, analysts must consider a wide set of effects, few of which are found on a balance sheet. The task of actually measuring benefits may involve difficult methodological and philosophical problems.

The primary benefits of a government labeling program are increases in informed consumption and socially desirable changes in consumption behavior. To measure these benefits, analysts need to answer a number of difficult questions. Has the label increased the number of informed consumers? What is the value of the increase in informed consumption? Has the label changed behavior as desired? What is the value of this changed behavior, that is, what is the value of this additional contribution to the social objective? Answering these questions requires gauging public preferences and measuring the value that consumers attach to different social outcomes. The fact that these outcomes usually involve goods without established market prices, such as health and environmental quality, makes it particularly difficult to assign dollar amounts to these outcomes for cost-benefit comparisons.[7] The fact that the stated objective often involves social goals over which different groups of consumers may have diametrically opposing opinions and valuations makes the task of measuring benefits even more challenging.

Another type of benefit arising from government intervention in labeling could be those stemming from product reformulation. Firms that are forced to disclose negative characteristics of their products may choose to reformulate to eliminate the negative characteristics rather than risk losing sales as a result of the disclosure label. In this way, labeling benefits all consumers who use the products, not just those who read the label (Salop, 1976; Beales, 1980; OECD, 1997). These benefits could actually be quite large. For example, Ippolito and Mathios (1990b) found that health claims on cereal boxes helped change consumer behavior and resulted in significant product innovation. Some analysts argue that more healthful foods resulting from reformulation may be the largest benefit of labeling (Beales, 1980).

Social benefits other than those targeted by the labeling policy may also arise from government-mandated labeling. Caswell and Padberg (1992) argue that cost-benefit analyses of labeling policies should include the value of such policies in (1) generating consumer confidence in product quality; (2) establishing the parameters for advertising; (3) signaling which of the product's quality attributes are important; and (4) reinforcing other forms of education at the consumer level.

Measuring the Costs of Mandatory Labeling

The costs of government labeling policy could be as far ranging and difficult to measure as the benefits. The least difficult costs to gauge are the actual costs to the government of program initiation, administration, and enforcement. Industry costs of relabeling are also relatively easy to assess and, in some cases, these costs may be absorbed in the normal label-change cycle if the compliance period is sufficiently long (French and Neighbors, 1991).

Some of the industry costs of labeling will most likely be passed on to consumers in higher prices (with the exact amount depending on the magnitude of industry costs and the elasticity of demand and supply). As a result, consumers who do not particularly value the information are forced to pay for it through higher prices. A redistribution of welfare occurs. Mazis (1980, p. 8) comments that because of this price change, labeling may produce a "reverse Robin Hood effect" in which the poor and less educated pay for information they cannot use and do not want. Hadden (1986, p. 224) continues this argument by pointing out that this price increase may force poorer individuals to consume larger amounts of lower priced, riskier products.

The costs of any reformulation resulting from labeling laws could also be quite large—and quite difficult to measure. For example, though the costs of reformulation after the NLEA were expected to be large, the difficulty in predicting and quantifying firms' reactions to the rule precluded including these costs in the official regulatory impact analysis for the NLEA (*Federal Register,* 1991).

Labeling programs may also result in changes to industry structure that could be viewed as costs. For example, mandatory labeling could result in higher additional

[7] Magat and Viscusi (1992) present a number of examples of cost-benefit studies grappling with these issues.

per-unit costs for small firms than for large firms. As a result, the market price may not compensate small firms for the additional costs of labeling, thus putting them at a competitive disadvantage. This could impose disproportionate costs on rural economies and communities.

Costs of additional labeling also include the extent to which it dilutes the effectiveness of the information already included on the product label. As mentioned before, too much information on a label reduces the chances that consumers will read it. If consumers do read it, too much information reduces the chance that they will be able to accurately evaluate the importance of each piece of information (Noah, 1994).

The distribution of the benefits and costs of labeling could play as important a role in influencing the government's decision to intervene in labeling as the overall level of net benefits. Any intervention will yield some distributional consequences. Changes in consumption choices or product reformulation resulting from labeling will lead to growth in some sectors of the economy and declines in others. Policy that imposes costs on certain critical groups, even if it confers benefits on a wide variety of other groups, may be undesirable from a political or equity standpoint.

Conclusion–When is Mandatory Labeling an Appropriate Policy Tool?

Even if mandatory labeling is effective and the net benefits and distributional consequences are positive, it may not be the best policy option. The government has a number of policy tools at its disposal to correct for asymmetric information and to control externalities. The government has used taxes, bans, education programs, and regulation of production and marketing practices to influence food consumption decisions or increase informed food choices. For example, Federal and State governments levy excise taxes on alcohol; FDA has banned the use of a variety of food colorings to eliminate health hazards associated with their consumption; the FDA established a maximum acceptable level of mercury content for all swordfish landed or imported into the United States to reduce the risk of mercury poisoning; the EPA regulates the use of pesticides in agriculture; to decrease the risk of birth defects, the FDA requires that enriched grain products contain folic acid; and to improve nutritional status, the Federal Government contributes to many diet and health educational programs, including the Five-A-Day For Better Health campaign.

In each of the examples listed above, the government could have opted for a labeling policy instead. Indeed, in many similar cases, policymakers chose labeling as the appropriate policy response. For example, Louisiana mandates warning labels on fresh shellfish; USDA requires safe handling labels on meat and poultry; the Bureau of Alcohol, Tobacco, and Firearms requires warnings on alcohol about the increased risk of birth defects and accidents due to alcohol consumption; and the FDA mandates standardized nutrition labels to educate consumers about the nutritional content of foods.

The question of when labeling is the most appropriate policy tool has been examined at many different levels of government and by numerous policymakers, economists, and commentators (primarily Morris, Mazis, and Barofsky, 1980; Hadden, 1986; Magat and Viscusi, 1992; Noah, 1994; OECD, 1997). A review and synthesis of this literature, most of which focuses on warning labels, reveal a few suggestions for when labeling may be an appropriate policy tool.

Consumer preferences differ. Labeling may be preferable to other policy tools if consumer preferences differ widely with respect to product characteristics (Magat and Viscusi, 1992). Information is often the best solution in cases where "one man's meat is another man's poison." Unlike a ban, information allows consumers to match their individual preferences with their individual purchases. A ban on high-sodium foods, for example, may be good public health policy for one group of consumers, but unnecessary for another group. For sodium-tolerant consumers, such a ban would reduce welfare. Saccharine labeling is an interesting example of labeling to accommodate differences in consumer preferences. In 1977, FDA determined that saccharine posed an unacceptable health risk because of its demonstrated association with increased bladder cancer in animal studies. FDA proposed banning saccharine as an ingredient in food products while allowing saccharine to be sold as a nonprescription drug product so long as such products were labeled with an appropriate cancer warning. In response to consumer outcry, Congress placed a moratorium on FDA's proposed action, mandating instead that a warning label appear on all food products containing saccharine.

Information is clear and concise. The information on the label must be clear, concise, and informa-

tive. Information that is unread or misunderstood will not lead to better informed consumption decisions nor to a better matching of preferences with purchases. Too much information diminishes the value of all the information on the label. Information should focus on concrete facts and explanations about how such facts should be interpreted. As stated by Slovic, Fischhoff, and Lichtenstein (1980, p. 179), scientifically complex labels "if not ignored, are likely to confuse people or raise anxiety levels without providing much information relevant to decision making."

Information on product use enhances safety. For some products, the manner in which consumers use or consume the product influences the quality attributes of the product. In these cases, information about how to enhance the positive characteristics of the product or reduce the negative ones could benefit consumers. Labeled warnings are particularly valuable to consumers if they include instruction on how to avoid or minimize the risk. An example of this type of labeling is the safe handling instructions label on meat and poultry. This label, mandated by USDA in 1994, not only alerts consumers to the health risks due to possible bacterial contamination of meat and poultry, it also describes how to avoid these risks. (Hadden, 1986, argues that the true purpose of labeling should primarily be instruction for safe use.)

Costs and benefits of consumption are borne by the consumer. If the consumption or production of a food creates externalities (that is, affects someone else's welfare in a way not reflected in the market), then information-based policies will usually be insufficient to align private consumption choices with socially optimal choices. For example, information about environmentally detrimental production practices on the label of a product would not succeed in eliminating these practices if most consumers continued to purchase the good. In these cases, bans, quotas, production regulations or standards, and Pigouvian taxes may all be more successful than mandatory labels.

Each of the steps along the labeling tree can be established. Mandatory labeling will result in confusion and actually increase transaction costs unless it is supported by clear, achievable quality standards, testing services to measure the validity of labeling claims, certification services substantiating the validity of the quality claim, and mechanisms for enforcing labeling rules, including mechanisms to punish producers who make fraudulent claims. The government must either perform these services or accredit third-party agents to perform them (as described by branch 4 of the labeling tree).

No political consensus on regulation exists. In many regulatory policy debates, there is little consensus on the appropriate regulatory response. Some groups may advocate complete product bans while others advocate no government intervention at all. These debates could be national or international and could lead to difficult problems in harmonizing standards for a wide range of goods (biotech labeling is a case in point). In these cases, labeling may represent not just the best compromise solution but also the path of least resistance, both domestically and internationally. In this capacity, the labeling option has a political appeal that is independent of its merits (a point made by Magat and Viscusi, 1992, with respect to hazard-warning programs). However, labeling to avoid political stalemate may provide consumers with no real information. This may particularly be the case when the inability to reach a political consensus arises from a lack of scientific consensus. As pointed out by Hadden (1986, p. 196), "Policymakers like labeling precisely because it leaves these difficult choices to the individuals who will benefit from or suffer the risk. Unfortunately, many labels do not describe the hazards at all, and, of the ones that do describe the hazard, most give limited information about severity and none about probability."

For situations characterized by these descriptions, labeling may be one of the best tools for increasing the match between preferences and purchases, and for changing consumption patterns to achieve a social objective. However, more than any hard and fast rules, the costs and benefits associated with specific circumstances determine the best use of labeling as a policy tool. The decision of when to label and when to use another form of regulation, or no regulation at all, depends on the interaction among a complicated set of political, legal, social, and scientific objectives and considerations. In some situations, mandatory labeling may be the least restrictive and most cost-effective policy tool, while in other very similar cases, alternative policies may be better.