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Mandatory Food Recalls

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Mandatory Food Recalls

Sensible regulatory oversight of food recalls is of obvious importance. Human exposure to health hazards can be reduced if recalls remove suspect foods from commerce. Moreover, recalls make consumers aware that adverse health outcomes might be associated with certain products and thereby enable them to seek appropriate medical interventions that lessen the magnitude of harm. Finally, it has been noted that regulation of the recall process can strengthen the incentives of companies to invest in food safety measures (Roberts 2004b).

In the United States, food recalls are supervised by federal regulatory bodies. The United States Department of Agriculture (USDA) provides oversight for recalls of meat and poultry products, and the Food and Drug Administration (FDA) supervises recalls of most other foods. In practice, a recall is initiated when (1) the firm recognizes a problem, takes steps to recover its products, and notifies the appropriate regulatory bodies or (2) when the FDA or USDA issues a request that the firm initiate a recall. It is not uncommon for recalls to result from such requests. Data presented by Teratanavat and Hooker indicate that from 1998 through 2002, 62 percent of all meat and poultry recalls were the result of USDA requests.¹ Regardless of whether the recall is initiated upon the firm's own volition or upon the request of a regulatory agency, regulators provide an oversight role in the recall process. Typically they assess whether the scope and size of the recall being pursued is appropriate, verify that the firm is being diligent in its efforts

¹ Authors' calculation based on Table 4 of Teratanavat and Hooker.

to recover products, and maintain records on outcomes of the recall. The interested reader is directed to Roberts (2004a) and Burrows for concise overviews of the authority and role of regulatory agencies in food recalls as well as to the agency recall policy documents themselves (USDA 2004, FDA 2002).

Strictly speaking, food recalls are voluntary actions taken by firms, and despite their oversight role, FDA and USDA do not have authority to mandate recalls.² The inability of government to formally mandate food recalls is frequently the subject of criticism and some have argued that this lack of authority constitutes an important shortcoming of the current the regulatory framework (Government Accountability Office (GAO) 2004; Roberts 2004b). Others have noted that regulatory agencies have powers that are tantamount to mandatory recall authority (Packman). Although regulators lack statutory authority to mandate recalls, they do have other enforcement tools at their disposal. The implicit threat of more drastic enforcement actions is usually sufficient to motivate firms to voluntarily comply with requests for recalls (Roberts 2004a).

From time to time, changes have been proposed that would authorize mandatory recalls and that would otherwise attempt to strengthen the role of regulators in the recall process. At present, there are several legislative proposals before the 110th congress that address recall authority (Burrows; Becker). Roberts (2004b) summarizes the arguments in favor of statutory authority to mandate recalls. Roberts contends that such authority would expedite the removal of unsafe foods, especially when a recalcitrant firm was involved, and would otherwise improve a recall system that works fairly well but has

² Infant formula is one exception (See 21CFR107).

suffered several significant breakdowns. He suggests that mandatory recall authority could be accompanied by safeguards to protect against regulatory abuse. One such safeguard would be the extension of due process to food companies so that they would be entitled to an informal hearing in the event of a disagreement with a mandatory recall order.

The purpose of this article is to present an economic model to clarify the role of recalls in the overall food safety system and thereby shed light on the merits of legislative proposals relating to food recall policy. Specifically, the model reflects two roles for recalls. The first is to mitigate harm when product failures occur. The second is to strengthen incentives for product safety measures. This second role is important when:

- a) Recalls facilitate the assignment of liability and/or increase the probability that consumers will seek damages.
- b) Recalls raise the costs of product failures to firms net of the liability exposure they mitigate.

The modeling exercise shows that if recalls are important in strengthening incentives for safety, there will be cases where recalls are justified for their incentive effect even when the value of the harm they mitigate is so small as to be less than the cost of conducting the recalls. It is argued that in these cases, there is less need for direct regulation of the recall process because mitigation is of limited potential. Instead, regulatory activities should emphasize the incentive enhancement effect through detection of product failures and use of recalls to assign blame. Such appears to be a major focus of the existing food product recall system.

Previous Studies

Economic models of product recalls have been presented by Marino and by Welling. Both of these are within the context of durable goods. Marino incorporates mandatory recalls into a model of product safety regulation and shows that product recalls can supplement incentives for safety. In Marino's model, recall costs supplement imperfect liability and thereby facilitate an alignment of social and private incentives. Recalls play a similar role in the model presented here. Welling examines recalls (strictly voluntary) within the context of a signal and contrasts a reputation for recalling products with other signals found in the economics literature. The types of problems that Welling considers are best characterized as quality failures as opposed to safety failures. As such, Welling's model is more applicable to what are typically termed market withdrawals or stock recovery actions in the food industry. These actions do not require regulatory oversight and so are not considered within the model presented below.

While there are few theoretical models of product recalls *per se*, there are a number of studies that measure the impact of recalls on implicated firms. The findings of these studies tend to support to Marino's conclusion that the recall mechanism can be an important tool that helps to align incentives for safety in addition to mitigating failures when they occur.

One group of studies has tested the significance and magnitude of stock price responses when companies are implicated in a recall. Examples include automobile and drug recalls (Jarrell and Peltzman; Pruitt, Reilly and Hoffer; Dranove and Olsen), and

recalls of consumer products (Pruitt and Peterson; Davidson and Worrell). At least two studies have examined food company stock prices (Salin and Hooker; Thomsen and McKenzie). Salin and Hooker examined several high profile recall cases in the late 1990's and report mixed evidence as to the significance of stock price movements on a case-by-case basis. Thomsen and McKenzie find significant and negative stock price reactions to meat and poultry recalls involving serious health hazards.

There is also evidence that recalls impact product prices and product demands, especially where a specific product line or brand is implicated. Lusk and Schroeder and McKenzie and Thomsen examined the response of livestock futures prices to recalls and found very little evidence of price responses. However, McKenzie and Thomsen did find significant and negative responses in cash prices for lean beef trimmings in response to recalls for *E. coli* O157:H7. Marsh, Schroeder, and Mintert found that recalls caused small but statistically significant responses in the demand for aggregate beef, pork, and poultry products. Thomsen, Shiptsova, and Hamm examined branded frankfurters and recalls for *Listeria monocytogenes*. Their results show large and statistically significant drops in the sales of the implicated brands. Also, sales did not approach pre-recall levels for several months after the recall occurred.

The Model

The model is a straightforward extension of earlier unilateral accident models that have been developed under the assumptions of strict liability (Shavell; Schmitz). In these models, the firm reduces the likelihood of accidents by engaging in safety measures.

Safety measures, however, are costly and so the problem is one of balancing the expected reduction in post-failure accident costs with the increase in pre-failure safety costs. The model presented here differs primarily in that when accidents occur, there is the opportunity to issue a recall and thereby mitigate, to some degree, the cost of the accident.

The assumptions about product safety and its attendant costs follow those of Schmitz. The level of safety is represented by s , where $0 \leq s \leq 1$. The cost of safety is assumed to be a continuous and differentiable function $c[s]$, which is increasing in s , strictly convex, and approaches infinity as s approaches 1. Defining s over the unit interval is appealing since s can be interpreted as a safety percentage with a value of $s = 1$ corresponding to 100 percent safety. Moreover, the probability that a product failure occurs can be expressed as $p = (1 - s)$. These assumptions about $c[s]$ are consistent with diminishing returns to safety efforts and reflect situations where achieving 100 percent safety is not economically feasible so that there is always some chance $(1 - s) > 0$ of a product failure at an optimal level of safety. Finally, as a simplification to rule out corner solutions, it is assumed, as in Schmitz, that $c[s]$ has the property $c[0] = c'[0] = 0$.

Socially Optimal Decisions Regarding Recalls and Pre-failure Safety

Consider the question of whether a recall should or should not occur in the event of a product failure. This is a binary (yes/no) type of decision. It is convenient to characterize this decision in terms of recall benefits (B). Let us define a rule $\delta[B]$ such that $\delta[B] = 1$ (or yes) if $B \geq 0$ and $\delta[B] = 0$ (or no) if $B < 0$. According to this rule, recalls

occur only when their benefits are non-negative. When a product failure occurs, let the monetary value of harm be given by $h > 0$. Suppose that by conducting a recall, some fraction k ($0 \leq k < 1$) of the product is recovered, and harm costs are reduced accordingly from h to $(1 - k)h$. However, by initiating a recall, the firm incurs a cost, the magnitude of which is represented by $R \geq 0$. With this in mind, total post-failure costs are contingent on the decision to recall and can be expressed as $A^0 = h$ in cases where there is no recall or as $A^1 = h - hk + R$ in cases where there is. Subtracting A^1 from A^0 provides the net social benefits of conducting recalls as.

$$(1) \quad B^S = hk - R.$$

If recall decisions are based on equation 1, then the decision rule $\delta[B^S]$ will result in recalls being initiated when their social costs warrant. In other words, recalls are initiated according to the social benefits rule.

The pre-failure problem is one of finding an optimal level of product safety. Our interest at this point is in a social optimum, and this requires that firms internalize the harm their products cause. Accordingly, assumptions are made that (1) the firm is strictly liable for harm and (2) that liability is assigned perfectly. Since the probability of product failure is given by $(1 - s)$, the economic problem when recalls do not occur is to choose the level of s that minimizes

$$(2a) \quad Z[A^0, s] = (1 - s) A^0 + c[s].$$

In cases where recalls do occur the problem is to choose s in order to minimize

$$(2b) \quad Z[A^1, s] = (1 - s) A^1 + c[s].$$

The value of s that minimizes equation 2a or 2b will equate the marginal cost of safety, $c'[s]$, with post failure costs A^0 or A^1 , respectively, and will be of the form $s = s[A]$. Let $s^0 = s[A^0]$ and $s^1 = s[A^1]$ refer to the optimal safety levels in the absence and presence of recalls, respectively, and note that $Z[s^0, A^0]$ and $Z[s^1, A^1]$ are the corresponding minimal values of equations 2a and 2b. It is straightforward to show that $s[A]$ is increasing in A and so the optimal safety level will generally be contingent on the recall decision.³ This is because A^1 and A^0 will generally differ in magnitude. Also, since $s[A]$ is increasing in A , s^1 is decreasing in k . In other words, assuming that recalls occur; the optimal level of safety will reflect the role that recalls play in reducing harm costs. The greater the effectiveness of recalls at mitigation, the less there is a need to prevent harm in the first place. In this respect, recalls are a substitute for safety.

The minimum social cost can be characterized in terms of the above notation as

$$(3a) \quad Z^* = \text{Min}\{Z[s^0, A^0], Z[s^1, A^1]\}.$$

³ To see this, note that at an optimum $c'[s[A]] - A \equiv 0$. Differentiating this with respect to A and solving for $s'[A]$ provides $s'[A] = \frac{1}{c''[s]}$, which is positive by the assumption that $c[s]$ is strictly convex.

Implicit in equation 3a is a decision rule that initiates recalls only when $Z[s^1, A^1] \leq Z[s^0, A^0]$. It turns out that the social benefits rule, $\delta[B^S]$, is such a decision rule. An alternative and equivalent expression for the minimal social cost can be expressed in terms of the social benefits rule as:

$$(3b) \quad Z^* = Z[s^{\delta[B^S]}, A^{\delta[B^S]}].$$

To see why, consider figure 1. In the top panel, the area to the left of h^R represents situations where the post-failure benefits of a recall are negative, and the region to the right represents situations where the post-failure benefits of a recall are positive. The middle and lower panels show safety levels and social costs under the assumption that recalls always occur (solid line) and under the assumption that recalls never occur (dashed line). The main thing to note from the lower panels is that if the benefits rule is violated -- that is to say, if recalls occur when benefits are negative or if recalls do not occur when benefits are positive -- then the safety level supplied will exceed the optimal safety level, and social costs will increase accordingly. In regions of the graph where $B^S < 0$, the solid curves are above the dashed curves and reflect the increases in pre-failure safety needed to offset higher post-failure costs that result from unnecessary recalls. Similarly, when $B^S > 0$, the dashed curves exceed the solid curves and reflect increases in pre-failure safety to compensate for inadequate post-failure mitigation.

Private Decisions Regarding Recalls and Pre-failure Safety

Let us now relax the assumption that liability is assigned perfectly. Instead suppose that there is some probability (strictly less than 1) that the firm will be held liable for harm in the event of a product safety failure. From the standpoint of economic efficiency, the important thing is that now the firm internalizes only a portion of the resulting harm. Consequently, private decisions with respect to prevention and mitigation activities will generally depart from those that are optimal from the standpoint of society as a whole.

Before turning specifically to the divergence between private and social optima, it is important to note that recalls have the potential to either increase or decrease liability costs. On one hand, recalls mitigate harm. Since liability costs would be directly related to harm caused, it is certainly conceivable that there are many situations in which recalls will lower liability costs. However, a recall is also likely to facilitate the assignment of liability. Recalls increase general awareness that a product failure has occurred, enhance the ability to attribute harm suffered to a specific firm, and often involve an admission by the firm that its products posed undue risks; all of which tend to increase the probability that consumers will successfully seek damages. For this reason, it is not unreasonable to define liability probabilities as $\mathbf{q} = \langle q^0, q^1 \rangle$ where q^0 and q^1 are the probabilities of being held liable in the absence and presence of recalls, respectively, and to assume that $0 \leq q^0 \leq q^1 < 1$. If a firm initiates a product recall, its expected liability costs are given by

$q^1 h(1 - k)$. If it does not, then its expected costs are $q^0 h$. Whether the former is smaller than the latter is ambiguous.⁴

Let us now turn to the private benefit of conducting recalls and consider how it differs from the social benefit. Post-failure costs that are internalized by firms are given by $A_q^1 = (q^1 h - q^1 h k + R)$ and $A_q^0 = q^0 h$ in the presence and absence of recalls, respectively. Subtracting A_q^0 from A_q^1 provides the private benefit as:

$$(4) \quad B^P = q^1 h k - (q^1 - q^0) h - R.$$

A comparison of equation 4 with equation 1 shows that recalls are less likely to occur if decisions are based on the private benefit rule. There are two reasons for this. First, the private value of mitigation will be smaller than the social value ($q^1 h k < h k$). Second, the private costs of recalls will generally be higher because they include an augmentation to liability costs of $(q^1 - q^0) h \geq 0$.

Imperfect liability has implications for the level of pre-failure safety as well. The safety levels under a private optimum are of the same form as those under a social optimum and can be expressed as $s_q^0 = s[A_q^0]$ and $s_q^1 = s[A_q^1]$ in the absence and presence of recalls, respectively.⁵ Because $s[A]$ is increasing in A , and because $A_q^0 < A^0$ and $A_q^1 <$

⁴ Note that this model does not reflect a role for punitive damages when firms fail to conduct recalls that are socially warranted.

⁵ The subscript **q** is being used to note that post-failure costs and consequent safety levels reflect imperfect liability.

A^1 , the level of safety under a private optimum will be unambiguously smaller than that under a social optimum.

In an unregulated market, recalls will be initiated according to the private benefits rule ($\delta[B^P] = 1$ only when $B^P \geq 0$), and the level of safety at the private optimum can be expressed in terms of this rule as $s_q^{\delta[B^P]} = s[A^{\delta[B^P]}]$. That the private benefits rule brings about a private optimum follows from the same logic used to explain that the social benefits rule brings about a social optimum. Total social costs at the privately optimal level of safety can be defined as:

$$(5) \quad Z[s_q^{\delta[B^P]}, A^{\delta[B^P]}] > Z^*.$$

It is important to emphasize that equation 5 represents post-failure social costs (not private costs), albeit in terms of the private decision rule and at the privately optimal level of safety.

Mandatory Recalls

Consider the case where the decision to initiate recalls is made by a regulator, and, for the sake of argument, assume that the regulator initiates recalls according to the social benefits rule. In this case, firms would be compelled to recall products whenever post-failure social costs warrant but would still respond to the strength of liability in making decisions about pre-failure safety. In terms of the notation above, recalls would occur when $\delta[B^S] = 1$ but corresponding safety levels would be $s_q^{\delta[B^S]}$.

Are there situations in which mandatory recalls would reduce social cost from the level shown in equation 5? To answer this question, consider the special case where the private benefit rule is just satisfied so that $\delta[B^S] = 1$ but $B^S = 0$. If $B^S = 0$, then equation 4 assures that $B^P < 0$ and it is possible to rank social and private post-failure costs conditional on recalls as $A^1 = A^0 > A_q^1 > A_q^0$. The result of the mandatory recall is that the firm no longer chooses safety based on the lowest private cost of A_q^0 . Instead, it bases its decisions on the higher private cost of A_q^1 . Since optimal safety levels are increasing in A , the privately supplied level of safety increases from s_q^0 to s_q^1 .

This increase in safety caused by the recall will unequivocally lower the social cost when $B^S = 0$. To see why, note that $Z[s, A^1]$ (equation 2b) is strictly convex in s and that by definition s^1 minimizes total social costs when $B^S = 0$ (equation 3b). It follows that $Z[s^1, A^1] < Z[s', A^1] < Z[s'', A^1]$ for $s'' < s' < s^1$. In short, the recall lowers costs by increasing the amount of privately supplied safety to an amount that is closer to a social optimum. This is illustrated in figure 2.

Let us now consider two other scenarios. The first and easiest to address relates to more general cases of when the social and private benefits rules diverge so that $B^S \geq 0$ but $B^P < 0$. As in the special case of $B^S = 0$, the curvature assumptions for $Z[s, A]$ and the relative magnitudes of s^1 , s_q^1 , and s_q^0 can be used to show that $Z[s_q^1, A^1] < Z[s_q^0, A^0]$ provided that $B^S \geq 0$ and $B^P < 0$. The second, and more interesting, scenario is when B^S is strictly negative meaning that the cost of a recall exceeds the value of the harm it

mitigates. Is it possible that mandatory recalls could bring about improvements in total social costs even when mandating such recalls would violate the social benefits rule?

In answering this question, it is useful to define the benefits of mandating a recall as:

$$(6) \quad B^M = Z[s_q^0, A^0] - Z[s_q^1, A^1] = (s_q^1 - s_q^0)h - (c[s_q^1] - c[s_q^0]) + (1 - s_q^1)B^S$$

As explained above, B^M will be strictly positive when $B^S = 0$. The first term in equation 6, $(s_q^1 - s_q^0)h > 0$, values the harm that is prevented when recalls are mandated. The second term, $(c[s_q^1] - c[s_q^0]) > 0$, represents the costs of this additional safety. Finally, the third term is the social benefit of conducting the recall multiplied by the probability of failure. If $B^S < 0$, this term will be negative and will represent the expected social costs of conducting superfluous recalls. So in answer to the question, there can be situations in which the benefits of mandating recalls is positive ($B^M > 0$) even though the recall itself has a negative net mitigation value ($B^S < 0$). All that is required is that the prevention value of improvements in safety exceeds the sum of the costs of providing that additional safety and of conducting the recalls.

Figure 3 illustrates the benefits of mandating recalls.⁶ Note that the B^M curve in the top panel intersects the horizontal axis where the total social cost in the presence of recalls equals the total social cost in their absence (shown in the bottom panel). For situations between h^R and h^M , society is better off if recalls occur, even though cost of

⁶ In figures 1 and 3, harm is represented on the horizontal axis. The goal here is to depict a variety of different situations in a visually appealing manner. It is not necessarily to show a relationship between recall benefits and harm. Certainly there are other variables that impact the benefits of conducting recalls and some of these variables will be dependent on harm. Liability probabilities q^1 and q^0 are obvious examples.

conducting recalls exceeds the harm they mitigate. For situations to the left of h^M , mandating recalls would only increase social costs in excess of the private unregulated optimum. Note that even to the left of h^M , there are cases where privately provided safety levels would be more closely aligned with the socially optimal levels if recalls were to be mandated. However, in these cases, the cost of recalling products exceeds the value of the increase in safety and the unregulated solution is socially superior to the regulated solution.

Implications for Federal Policy Concerning Meat and Poultry Recalls

As noted earlier, current policy towards food recalls has resulted in a situation wherein FDA and USDA can generally compel “voluntary” recalls through an implicit threat of more drastic actions. Although these agencies lack statutory authority to mandate recalls, there are very few cases where firms have denied recall requests. In fact, a GAO (2000) investigation found that firms delayed initiating recalls in only nine of several thousand recall cases. For these reasons, the *status quo* might best be described as a *de facto* mandatory recall regime. In this respect, proposed legislation that would authorize governmentally mandated recall orders, would simply be formalizing the *status quo* (Roberts 2004b). Other enhancements to governmental recall powers such as the ability to impose monetary penalties or criminal sanctions for non-compliance with recall orders would generally strengthen regulatory oversight of the recall process. On the other hand, such formalization will likely include some safeguards to limit the real or perceived potential for regulatory abuse. One such safeguard is a review process

involving an independent judge or a designee within the agency. Such review has typically been part of earlier legislative proposals (see USDA 1997), and is included in the most of the legislative proposals that are now before the 110th congress (Burrows).

If situations being regulated are predominantly those in which the post-failure benefits of recalls are positive to society, formalizing the *de facto* mandatory regime in this manner appears to have few if any drawbacks and likely has some advantages. These situations fall to the right of h^R in figure 3. In the event a firm did challenge a mandatory recall order, a fair-minded court or other designee would generally be expected side with the regulator. After all, $B^S > 0$, and the value to society of going forward with the recall is greater than the cost incurred by firm. Furthermore, in these situations, recalls would generally be effective means of mitigating harm. The ability to impose fines or other sanctions if firms fail to conduct effective recalls would provide additional options for the regulator to use in encouraging firms to take actions that increase the effectiveness of recalls.

If, on the other hand, post-failure social benefits of conducting recalls are negative, the modeling exercise shows that there are still situations where social costs can be reduced by mandatory recalls. In figure 3, these cases fall between h^M and h^R and depict scenarios in which recalls are justified only by their incentive alignment role. Here the advantages of a change in the status of the mandatory recall regime from “*de facto*” to “formal” are less clear. Because the post-failure benefits of recalls are negative, one could argue that there is a greater likelihood that firms will successfully challenge mandatory recall orders or will mount successful defenses against fines or criminal

sanctions in the courts. Accordingly, a change in the recall regime could have the unintended consequence of preventing recalls from occurring that would otherwise be useful in aligning social and private incentives for safety. Of course, this outcome could be avoided if courts (or other designees) were to base decisions to affirm or deny recall orders on B^M as opposed to B^S . A comparison of equation 6 with equation 1 indicates that estimating the magnitude of B^M would generally be harder and would require more information than would estimating the magnitude of B^S ; however that does not preclude the possibility that simple heuristics may exist that result in decisions consistent with a $B^M \geq 0$ recall threshold.

Even so, the mitigatory value of recalls is of secondary importance. In these cases, the main value of recalls is to increase the private provision of safety by better assigning liability and/or by imposing additional costs in the event of product failures. There will be less of a need for direct regulation and oversight of the recall process and more need for emphasis on the identification of failures and their assignment to firms. To the extent that mandatory recall legislation diverts regulatory resources to providing better justification for recall requests or to monitoring compliance with recall orders, the ability of recalls to align incentives could be diminished.

Finally, what if many of the recalls under the current *de facto* mandatory regime are to the left of h^M ? In this case, formalizing the regime and better defining due process mechanisms by which firms are able to contest recall orders would tend to prevent recalls that truly are superfluous and would thereby lower total social costs. This, however, is

hardly the justification being given by those who have called for mandatory recall legislation (see GAO 2004; Roberts 2004b).

The implications up to this point can be summarized with reference to the top panel of figure 3. If most recall situations in the food industry fall predominantly within regions I or III, mandatory recall legislation has some clear advantages. If, on the other hand, recall situations fall largely within region II, mandatory recall legislation may worsen rather than strengthen the role of recalls in the food industry. The argument here is not that mandatory recall legislation will be unambiguously bad in Region II types of cases. Rather, such legislation needs to avoid unintentionally limiting the potential for recalls to continue to be used primarily as incentive alignment devices.

Where do the food industry recall cases actually fall within this continuum? It is hard to answer this question definitively, but an argument can be made that Region II type cases are relatively frequent. In Region II, recalls are justified only for their incentive alignment role. The post-failure mitigation value is of secondary importance. As emphasized above, $B^S < 0$ in Region II and so the cost of conducting recalls exceeds the harm they mitigate. In order for recalls to have incentive value, they must increase the cost that firms face in the event of product failures.

As noted earlier, one way recalls increase costs is by facilitating the assignment of liability. Identifying the source of a foodborne illness is difficult. Time elapses between consumption and onset of symptoms, pathogens can be associated with multiple foods, maladies are written off as something other than foodborne illnesses, and there is often a lack of physical evidence linking an illness to a specific food product (Busby, Frenzen,

and Rasco). If nothing else, recalls help to assign blame. Anecdotal evidence of this is provided by a recent recall of peanut butter for *Salmonella* contamination. The recall was announced in an FDA press release on February 14, 2007 (FDA 2007). Just days later, on February 21, the *Seattle Post-Intelligencer* reported on the filing of a class-action lawsuit to represent people who became sick from the peanut butter. The report indicated that the law firm Marler Clark, had been contacted by about 2,500 people nationwide. It seems unlikely that the timing of the suit, following so shortly after the recall, was a mere coincidence. Also, a voluntary recall is an admission that products were in violation of regulatory standards (Packman). Such violations are deemed to be negligence *per se* in the courts (Busby, Frenzen, and Rasco) and will arguably strengthen the position of plaintiffs in reaching favorable settlements or judgments.

In addition to liability costs, food recalls impose costs on firms in a variety of other ways. There are expenses related to recovering, destroying, and replacing products from the marketplace, and the negative publicity generated as a result of being implicated in a recall situation can erode prior investments in reputation and brand capital (Packman). Studies showing significant and negative stock price movements (Thomsen and McKenzie; Pruitt and Peterson; Salin and Hooker) and precipitous drops in the sales of branded products (Thomsen, Shiptsova, and Hamm) following recalls are suggestive that these types of costs are important to food industry firms.

While it is fairly easy to make the case that recalls in the food industry do strengthen incentives for safety, it is harder to assess their role in mitigating harm. Teratanavat and Hooker; and Hooker, Teratanavat, and Salin present statistics on recent

meat and poultry recalls. Venugopal et al. and Wong et al. provide statistics on the characteristics of FDA recalls. It is clear from these studies that most food recalls are aimed at serious health risks. It is less clear that recalls are an effective way to mitigate these risks when they enter the food supply. Hooker, Teratanavat, and Salin, in particular, analyzed recovery rates for meat and poultry recalls. Their data show that recovery rates vary widely. The reported mean and standard deviation in their sample was 49 percent 50 percent, respectively. The 49 percent mean recovery rate is fairly impressive except that their data imply that good products are being returned with the bad. Recovery rates ranged from 0 to 651 percent!⁷

An ideal regulatory strategy in Region II situations is to use the threat of recall to encourage pre-failure safety. Evidence from actual food recalls is generally consistent with this. Many food recalls are the result of product surveillance and not the result of outbreaks or sporadic infections. Data compiled by the GAO (2000) suggest that a very small fraction of recalls are association with outbreaks of foodborne illness. Others provide higher estimates, but it seems clear that a considerable majority of recall cases are not associated with illness or injury. Wong et al. report that among FDA recalls of foods and cosmetics for microbial contamination, 19 percent were associated with one or more cases of illness. Results provided by Teratanavat and Hooker suggest that, at most,

⁷ In other respects, recovery rates may actually understate the mitigation value of a product recalls. When consumers learn of a recall, they may be more likely to discard an unconsumed food product than to return it to the place of purchase. Also, as noted earlier, recalls may still have mitigatory value even when they do not result in any product recovery. The announcement itself increases awareness that potential health problems are associated with the recalled product and better enables consumers to seek medical interventions if symptoms develop.

11 percent of meat and poultry recalls were initiated as a result of foodborne illness from 1998 through 2002.⁸

Conclusion

This article presented a modeling exercise that accentuated the role of recalls in mitigating harm when product safety failures occur and in bringing social and private incentives into better alignment. The exercise demonstrated that under imperfect liability, there will be situations in which private firms will not voluntarily recall products even though recalls are socially justified. In these situations, an unregulated market will result in higher social costs because:

- (a) Mitigation that should take place does not and so social post-failure harm costs are higher.
- (b) The incongruence between the social and private recall decision exacerbates the misalignment of socially and privately supplied levels of safety.

For these reasons, the model shows a clear and important role for regulator initiated recalls. By ensuring that recalls occur when their post-failure social benefits warrant, harm is better mitigated and the privately supplied level of safety improves.

Importantly, the model also suggested the existence of situations in which recalls are beneficial even if the post-failure benefits of such recalls are negative. In these situations, recalls are relatively ineffective at mitigating harm and society actually spends more conducting recalls than is saved by the corresponding reduction in exposure to

⁸ Author's calculation based on Table 4 of Teratanavat and Hooker.

contaminated products. However, by requiring firms to recall products, regulators increase the costs of product failures and this causes firms to invest more in safety efforts. Such recalls are justified whenever the value of harm reduced through improved safety efforts offsets the higher post-failure costs that result from the recalls.

The main argument of the article is that regulation should reflect the ability of recalls to mitigate harm as well as their ability to augment incentives for safety. When recalls are justified for their mitigation value alone, it makes sense that regulatory bodies be granted more control of the recall process in order to improve the manner in which recalls are conducted. Such appears to be the stated goal of most proposals for changing the food recall system. An important point of this article, however, is that recalls can be of social value even when they are of little or no use in mitigating harm. In these cases regulatory overhauls aimed at enhancing the effectiveness of recalls will likely do little to reduce the overall burden of foodborne illnesses and injury and may actually limit the ability of product recalls to enhance food safety. That is not to say that if recalls were to become more effective then society would somehow be worse off. Rather, the concern is that proposals that force more emphasis on the recall process may have unintended side effects. If recalls have limited potential as mitigatory devices, redirecting regulatory resources towards recall oversight will mean that less emphasis is placed on other food safety priorities. Also, with more direct control over the recall process, regulators could face the need to more rigorously justify their requests for voluntary recalls or their orders for mandatory recalls. This may inadvertently prevent the initiation of recalls that would otherwise play a positive role in aligning incentives for safety.

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Figure 1. Safety and cost levels depend on the recall decision.

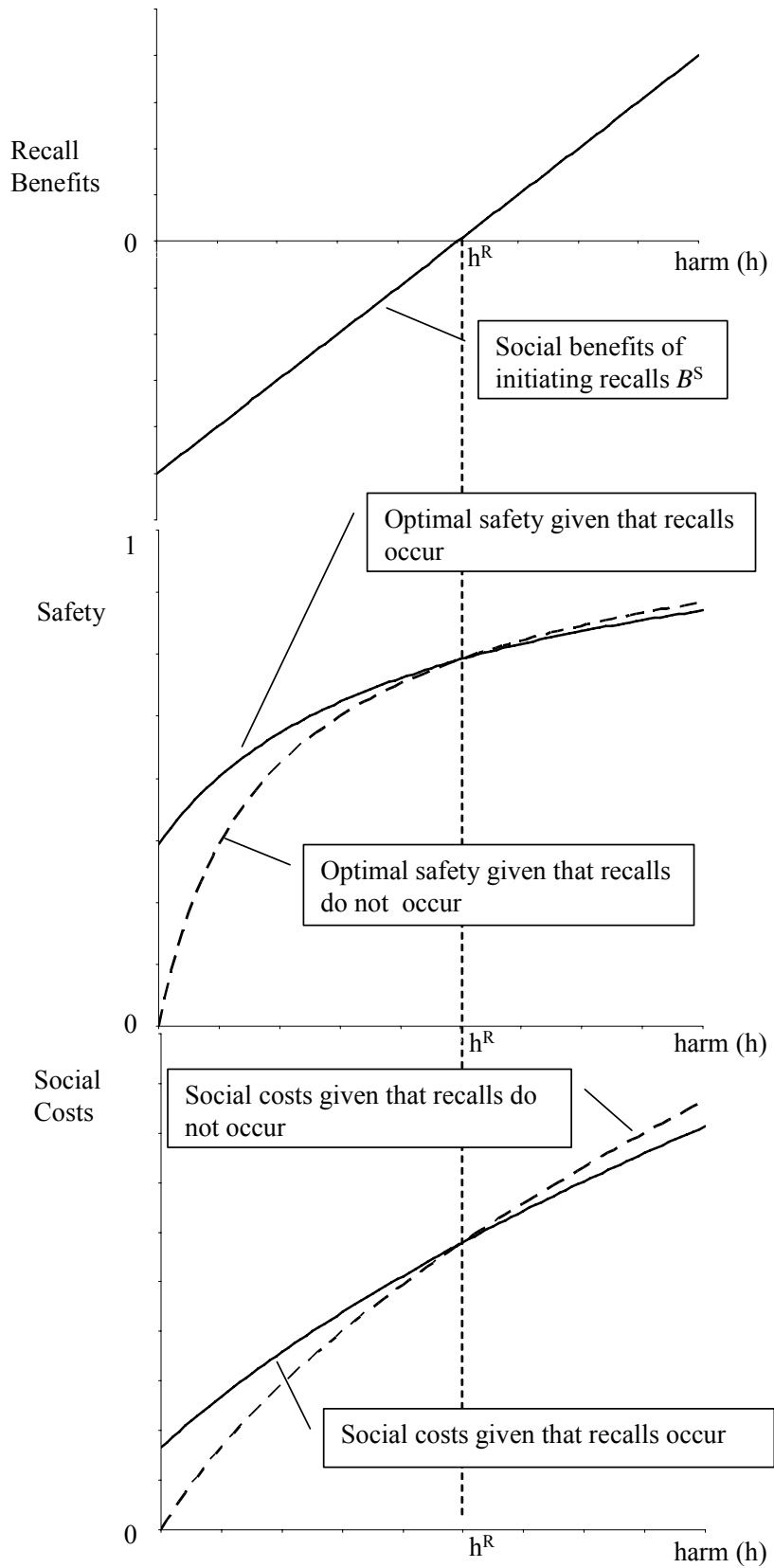


Figure 2. Mandating recalls can lower social costs.

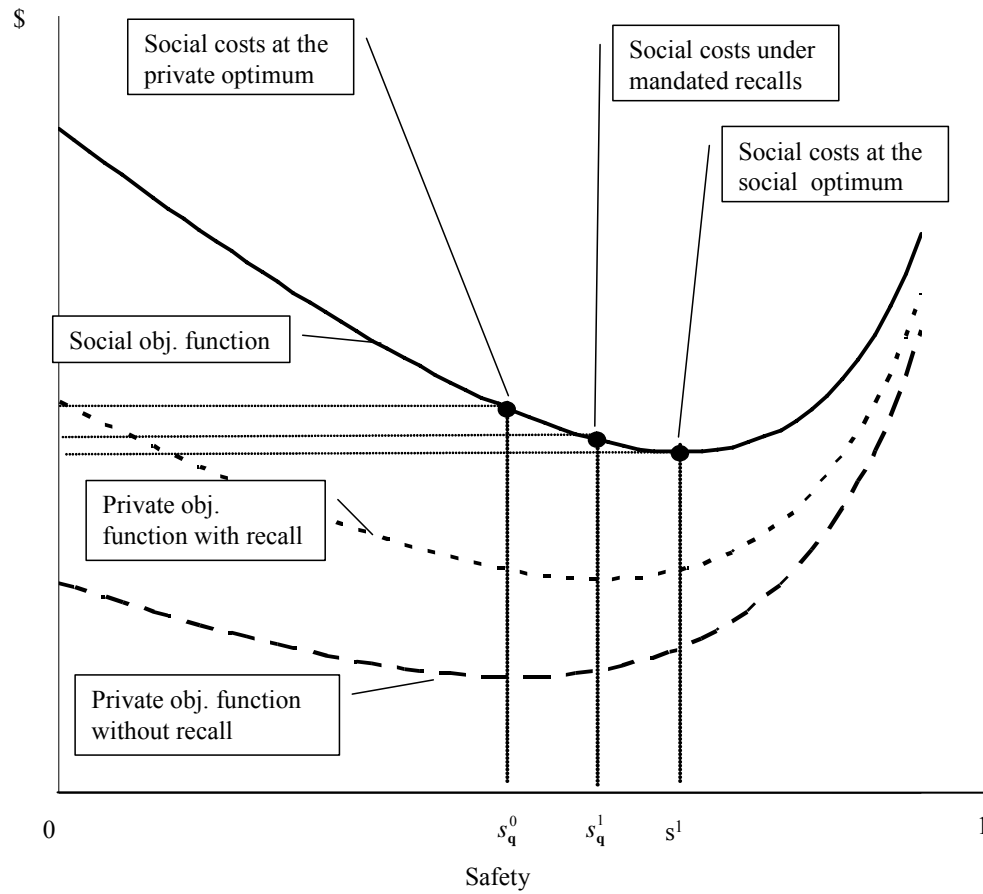


Figure 3. Private safety levels and resulting social costs depend on whether recalls are mandated.

