

Research of Economic Theory of Liability on Food Industry

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Abstract

The core operation of a company is maximum their profit, accordingly the behavior of a company is making profit as much as he can, which will may harm the natural people and damage the social product and welfare. Especially for the food industry, a human traditional and important social economic activity, the balance of social optimum between firms and consumers is a relative complete and different issue to the court and government. Consequently, this article main introduced the liability allocation between injurer and victim under the consideration of social optimum in the food industry.

Keywords

Liability, Economic Theory, Food Industry Safety

JEL Codes: K13, K42

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1. Introduction

As we know is that the core objective of a company is maximum profit, hence it is investable that the company will harm the social optimum of his consumers and decrease their social welfare, especially in a food industry company, the cost of product safety control is a relative huge expenditure, if there is no regulation, firm will reduce the cost of quantity control to increase his income. A relative loose rule may increase the profit on the side of company, but it will increase the amount of social-safety accident, which means the decrease of social welfare from victim side and much social loss on medical system. Relatively a too strict rule can also reduce the motivation of company, that is balance is important, which rule conform best to which situation, and what change should be done in food industry, these questions are what I will show in article.

2. Literature review

The illness form based on food safety accident include two sector acute heath disease from short term vision, chronic disease from long term vision, how achieve the social optimum and at same time assign the liability fairly is what I want to discuss. Although victim should control the purchase behavior to avoid accident and lot of media blame those chronic disease like obesity and type 2 diabetes into people's genic, as a food firm is can't excuse from this problem (Tempels *et al.*, 2020). Compared with companies, consumers are Vulnerable Groups, the precaution that a firm pay out will be considered as benefit they earn from those precaution. (Jean & Paul, 1999) These two articles present a view of legal and liability on food industry, to show the characteristic of food industry. According the analysis of Coase, the application tends of strict liability rule and negligence is depending on the economic performance from injurer and victim. Under strict liability proposition it may be desirable for analysis of acute illness like food poisoning, where the injurer should pay more present to avoid accident (Shavell, 1980).

When we focus on the chronic disease, contributory rule can solve this question better, may food firm give particular information and also do a right guidance. But customer ignore it consequently victim liable. (Brown, 1973) Judicial error is actually a social cost which can reduce the economic efficiency, if we do not choose right rule to analysis different case, we may destroy both site of injurer and victim and harm the economic development. (Posner 1973) Government in this case is as a court to do a damage rule to the company, according (Polinsky & Shavell, 1998) when the damage to the firm less than its harm the company will want to more benefit even much more than the harm. Which means that from social and individual sector, the legal rules concern is to make both socially good not for just damage. (Shavell, 2009) Therefore, I will also consider the expect utility of care level from both sides according the expected utility analysis from Mondello (2020). From these papers it can let us have objectively view of liability application on food safe control.

I will first present the different accident form which concentrate on food industry and then try to analysis the situation in order to find out a suitable model that can be used to analysis it. Then according the model that applied in different situation I will analysis what the model brought to us, and try to find a suitable rule for the liability allocation. Finally, is the result with example and conclusions.

3. Model and analysis of research

Coase 1960's analysis told us that the core operation of law and judgement in a tort accident is to achieve social optimum or an economic efficient. Based on compensation rule, the core goal of judge and the development of regulation for food industry is to balance the cost and benefit from both side of injurer and victim (Mondello, 2020). Accordingly, at the first I will introduce the social product optimum and the private product optimum when the firm make a safety system for their product.

We assume that the company performs quantity testing on each product, buy the equipment for each product. Every product detection expenditure is equal. Then the marginal cost curve intersected with the social marginal product curve at $q(s)$ denote the social optimum quantity that company should buy, which be showed in figure 1. This point only theoretically existed, which means the firm buy for each product equipment to avoid the accident. Practically, first from the expenditure side of company it is will cost too much, and finally will also improve the price on the market. Second on the hand of produce process, it is impossible that every product is broken, therefore the efficient equipment is less than the company bought, consequently we can get private product curve intersect with marginal cost curve at $q(p)$, which means the equipment that company really need to buy. And the shed area denoted social loss which means the rest of equipment is inefficient and will decrease the economic efficiency. The main operation of judgement and regulation in food industry is actually reduce social loss of enterprises while protecting consumers.

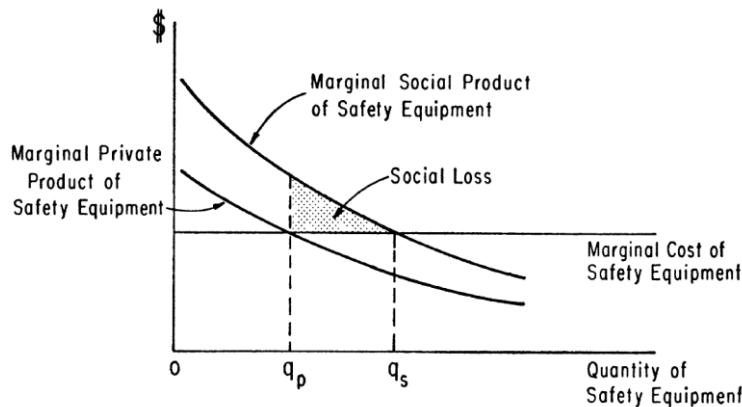


Figure 1. Social optimum quantity

Source: Posner (1973)

Accordingly, I can present the situation of acute illness caused by injurer like food poisoning, and discuss which rules better to apply. If we let Y denote the input that from injurer X from victim, according contributory negligence the accident occurs probability is $P(X, Y)$. In order to avoid accident, injurer spends W_y for every product. If every safety equipment is efficient then the optimum private cost is equal to optimum social cost which showed in figure 1. But there is not possible that every product will go wrong. When the probability of accident for every product is 1, that is for every product will have safety control equipment. Then from side of strict liability the cost is

$$C_y(X, Y) = YW_y \tag{1}$$

In this situation the input of victim X is the price of product she bought that is fixed. The yield probability of each product is much higher than the failure rate, therefore it is irrational to require the company responsible for every product which means a relative higher social loss from company side, and consequently companies frequently use some random sampling to assess whether their products comply with government legal requirements that balance the social cost from tow side. Y_r denote the samples that equipment control. r means the product that injurer real take care of. The amount that must be paid by injurer the company is $AL_y(X, Y)$. A is the gravity of the accident. And we assume that injurer is liable. $L_y(X, Y)$ is the liability of injurer, $L_x(X, Y)$ denote liability of victim, $L_y(X, Y) + L_x(X, Y) = 1$. In this model except the cost of product, the cost of accident should be considered, when it occurs.

$$C_{Yr}(X, Y) = W_y Y_r + AL_y(X, Y)P(X, Y) \tag{2}$$

if $0 < L_y(X, Y) < 1$, Injurer cost is showed in formula (2) is under side of negligence liability rule, for this acute illness situation I thought strict liability is better which means $L_y(X, Y) = 1$ for every X, Y . Then I will analysis from two sides to analysis why I think the strict liability is superior.

From company expenditure side there must be have $C_{yr} < C_y$, which means firms can't take due care of every product. C_y is under the condition that the injurer asses every product and there will have no probability that accident occurs, therefore we can see that $C_{yr} = C_y$ and firms is no liable, victim will also get no harm. But as we discussed it can't be that every product is broken equipment of every product will increase the social loss and the price of food, on the other hand if we assume that $C_{yr} \geq C_y$, profit maximum and cost minimum is the main goal of a company, by this assumption company will not produce one broken product, therefore most company will choose complete care level, but we know, nowadays all food company use the sampling research on the food quality control even they need to pay the bill if there have food poisoning accident. In addition, core objectives of government legislation on food safety is protect the life safety of citizen at same time do not affect the development of food industry, which means keep a relative social optimum to both sides, therefore under the view of firms and government there must have $C_{yr} < C_y$, hence formal (1) only theoretically exist, firms can't control the quality of all the products, then I will discuss why I think company is liable for acute illness case from benefit side.

The situation when victim as customer and injurer as seller we must consider whether the information is transparent enough that is the knowledge of customer to the product (Shavell, 1980). In fact, fast all food firms show the information on their products, which be required by government to give a transparent information for the customer. Accordingly the second side I will discuss is about the precaution cost, taking food safety precaution on the one hand is follow the law from government on the other important hand firms can take benefit from this measure, not only the benefit of accident avoidance but also it can receive good firm reputation to achieve a relative competition advantage and even benefit from higher price (Shavell, 1980). Precaution cost for a food firm is considered as the as another form of benefit, therefore I thought strict liability is superior than negligence which means in this situation $L_y(X, Y) = 1$ in formula (2). Therefore, for acute illness like food poisoning caused by product of injurer, the injurer not only to take precaution cost but also pay the bill that caused by accident below the strict liability rule.

The situation that I want to introduce in second part is about the liability allocation, when we consider about chronic diseases caused by food like obesity and type 2 diabetes. We assume that to follow the law and regulation, injurer must make the information about their product as transparent as they can, and the safety cost for every product is follow the law. And another thing is that when victim pay for the product it means she agree the contract with injurer, she not only buy the product but also buy the brand and the care from injurer, hence in this situation we mainly care the avoidance from injurer. The due care of injurer meets the entire requirement from government. Let Y^* donate the due care that injurer should satisfy. X^* donate the expenditure of product by victim. Then we have formula (3).

$$C_y(X^*, Y) = \begin{cases} W_y Y + AP(X^*, Y) & Y < Y^* \\ W_y Y & Y \geq Y^* \end{cases} \tag{3}$$

Accordingly, if injurer not give due care, he is liable, unless victim not give enough due care. In here I want introduce a perspective which stand on the side of expected analysis. Formula (3) can use in this situation but not preciseness enough. Before accident occurs, injurer and victim will give a precaution, that means the input of X and Y will be expenditure before accident occurs. Let t denote the time period $t = (0, 1)$, $t=0$ means injurer and victim give the precaution, then at period $t=1$ denote accident occur or not. d denote the repair from court. L_i is the expected damage of injurer; L_v is the expected damage of victim. u , and v denote the wealth for injurer and victim. Y^* is the legal standard of care of injurer. Then we have expected social welfare (Mondello, 2020):

$$ESW_{t=0} = \begin{cases} v + u - y - p(y)(L_{it=0} + (L_{vt=0} - d)) & Y < Y^* \\ v + u - y - p(y)L_{vt=0} & Y \geq Y^* \end{cases} \tag{4}$$

In the food industry, customer always expect that the quality of products she bought is under strict control of company, that is the victim always hope that court repair their loss (Shavell, 2009). But, for a company, the utility function can be wrote as $C_y(X^*, Y) U(C_y) = \sqrt{Y}$, which means for a company they will have less motivation to invest safety when the expenditure per unit can't bring correspond reward, therefore, a company can never do the best-level care if their product under the theory of social optimum. If the court repair the victim's damage that she expected at time period $t = 0$ then according

formula (4) $L_{vt} = 0 = d$, the cost is $y + p(y) L$ for both side, which is actually as same as formula (3). But for a food firms as I showed in acute illness situation, especially to a food firms, expenditure of food safety guaranty is a measure to attractive customers, that is the expenditure of due care can bring benefit in a firm. And another thing we should consider is about the advertisement induce to the customer that is main concentrate on how delicious is the food, although they have given all the resource on the package which can have relative too much fat or carbohydrate, customer will still purchase lots of them and get latent risk of e.g. diabetes, hence advertisement and reputation of firms is actually increase the expectation of victim which means the increase of $L_{vt} = 0$. And the cost of care is not just expenditure on regulation level to achieve Y^* but also bring much benefit and exist as a competition measure on business level, then we have $L_{vt} = 0 > d$. The care level Y^* on injurer side may is enough to avoid the accident, but in this situation $L_{vt} = 0 > d$ which means the care level that victim demand is higher than Y^* .

Therefore, negligence rule with contributory negligence can be use on this situation, but under rigorously consideration of social optimum should that be balanced with the benefit from care expenditure of the company, hence a higher compensate that conform to victim's expectation should be concern. Consequently, as a food firm it is responsible to prevent and mitigate the food-related social health issue, to fix the social loss of customer.

5. Results

As the example Coase give us, a cattle raiser will buy a fencing to avoid the accident and damage from his herds, if the damage per increased herd is higher than fencing cost (Coase, 1960). A company focus only on the profit, if the cost bring no benefit, theoretically the company would not chose the expenditure that will pay back nothing, even for a food firm. Food industry as the important economic behavior which is closely with the work and life of people, it is necessary set a reasonably regulation to control the food firm's behavior, because the law and regulation include the liability rules of the government is lead the food firms to assign their resource reasonably and reduce the social loss of victim to achieve the Pareto Optimality as much as possible to make the economic system more efficient. Follow this perspective, I use the liability rule model under the view of social optimum theory to discuss the social optimum achievement in food safety side.

Food industry especially focuses on food safety side, a characteristic condition must be considered is that the expenditure of food firms is his competition advantage and the cost is benefitable, the cost of care mostly will higher than the regulation from government. Under this condition the negligence rules and model also need to reconsider, when victim buy the product from a food firm, she is not only pay for the product, but also pay for the trust and expectation of brand, hence it is important to set the benefit of care cost from injuries in our consideration, when we discuss the question about the compensation of victim and social optimum under situation of food safety.

In USA, state courts recognize three main 'causes of action' where plaintiffs (e.g. ill consumers or their families) in a product liability lawsuit can receive compensation: strict product liability, negligence and breach of implied and express warranty. Strict liability is unsuccessful because firm can't ensure that every product is safe. Negligence control the due care of company when it producing or selling. Breach of warranty is claimed by most food liability cases. According our research we know that, strict liability apply on produce can achieve the social optimum of customers, but which based on the huge social loss on company, negligence rule can't consider about the benefit that from care cost. Breach of warranty is mainly discuss the obligation of injurer from implied warranty and express warranty, implied warranty include two sector, the product is produce and for general purpose of it, the seller know the demand of customer and the customer will trust the seller, from express, the seller must sell the factor that he describe, the victim can recover damage if injurer breach one of them (Buzby & Frenzen, 1999). As the discuss in the analysis sector, the expectation damage of victim is not only the cost of product itself, but also the expenditure of brand trust and product guarantee from inside and the outside describe of product from injurer, that is when customer buy a box of bacterium-free egg from a famous food firms rather than the other cheaper one to make a lightly poached egg, she cost for the eggs itself and she also cost for his trust of the firm that the egg will not have *Salmonella* to let her ill. Food firms is responsible for acute food-caused illness and should also responsible for chronic diseases, which means food firms is a apart in the social-healthy system.

6. Conclusions

According the analysis of liability rule application on food industry under different situation, the expectation expenditure of victim must be considered when we use the social optimum and liability rule theory to discuss this question. And may the analysis have limitation that only focus on injurer analysis, but in my opinion, when victim chose the products she is ambiguous, that is when victim buy the bacterium-free eggs she is not sure it have *Salmonella* as the announcement as the firm said or not, it's controlled by the injurer, hence victim will not sure the expected of compensate of victim, therefore the expected care level is higher than the traditional liability model. Accordingly, in this article I main focus on the injurer's liable or not and the expected damage of victim.

The law that I showed in result which USA use but the function is fall flat, although theoretically it limited the benefit from care cost of injurer side and decrease the expectation of victim to a product and accordingly to achieve a relative social optimum. The author of the article which I cited argued that there have a much higher lawyer fee and always cost more than the compensate that victim actually get, and the injurer will face 15 times more than japan 20 times more than Europe Product liability insurance injurer the company also face much frivolous lawsuits, excessive claims, or fraudulent consumer claims. That is why a logical liability system make lower efficient than UK, where add “due diligence” and “loser pays” rules, which as Posner argued that economics has penetrated the law more in the United States than in England. Application of social optimum theory and negligence rules is faced lot of challenge and various, the further research will based on those traditional theory and try to find a right way to discuss the theory application under different situation.

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