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Consumer Protection in Latin American Countries: an economic analysis of implied warranties

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Abstract: A set of institutions to protect consumer´s rights take a central role to reduce transaction costs contributing to economic efficiency and social equity. Unfortunately, consumer protection is still poor and weak in most developing countries. In this paper we focus on a particular institution of Consumer Law, *implied warranties*, current in most Latin American legal system. We develop a model to assess the economic consequences of introducing mandatory and uniformly implied warranties and their effects concerning to the moral hazard problem. Two main aspects will be crucial in order to design implied warranties efficiently: first, to determine the operative conditions to trigger warranties; second, to identify the empirical context in which implied warranties should applied. Then, certain topics related to institutional design and empirical constraints that may arise, especially in Latin American, are discussed.

Keywords: implied warranties, moral hazard, consumer protection, developing countries, Law & Economics.

I.INTRODUCTION

Institutions, as define the incentive structure of a society, are fundamental determinants of countries economic performance (North, 1990). Acemoglu & Robinson (2012) exposed that the quality of institutions is what explains the huge gap between the most and least developed countries. In this sense, a set of institutions to protect consumer´s rights takes a central role in markets to define incentive structure of suppliers and consumers and to promote more efficient consumer transactions.

Consumer protection constitutes an important device to reduce transaction costs contributing to economic efficiency and social equity. This requires both an adequate design of Consumer Law institutions and an effective enforcement of it (North, 1990). Consequently, it is a relevant factor of countries economic development.

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Unfortunately, in developing countries consumer protection is still poor[1]. Particularly, in most Latin American countries regulatory frameworks for consumer protection are still in place from previous decades. However, the design usually is unsatisfactory and the enforcement of Consumer Law is actually weak. The causes of that are related with several factors: corruption, lack of effective consumer education, informal barriers blocking entry in markets, among others. This context is favorable to generate suppliers' incentives to cheat, taking advantages of asymmetric information. In addition, this contributes to generating incentives to firms to enter in the market with a short term objective of maximizing profits, without taking into consideration long term effects of that behavior (Gomez, 2006). Then, in these countries, the design of an adequate set of institutions to avoid opportunistic behavior of firms becomes particularly relevant if the goal is to promote economic development and minimize social costs. In order to accurately design such institutions, it is necessary to analyze their functions and economic effects carefully.

In this paper, we will focus on a particular institution current in most Latin American countries: *implied warranties*[2]. At this point, certain terminological questions require explanation. First, "*implied warranties*" can refer to different ideas. On one hand, it means not expressly included in a contract, but expressly contemplate in the regulatory framework, e.g. the Magnuson-Moss Warranties Act (in advance, M-MWA) and the Uniform Commercial Code (in advance, UCC) of the United States of America uses "implied warranties" in this sense. On the other hand, "*implied*" can mean not expressly included in the regulatory framework but arising from judicial interpretation or law principles[3]. Second,

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[1]The United Nations Guidelines for Consumer Protection from 1985, with their amendment of 1999, emphasize the necessity of developing consumer protection law in developing countries.

[2]In Argentina, the Ley de DefensadelConsumidor24.240 in 22/09/1993 included implied warranties, but was vetoed in part by the President in the same year; after that they were incorporated by Ley24.999 in 30/07/1998, and expanded by Ley26.361 in 2008. In Chile, Ley sobre Derechos de los Consumidores 19.496, in 07/03/1997 and modified in 2004 and 2011. In Brazil, in Act 8.078, Dispõe sobre a proteção do consumidor e dá outras providências, in 11/09/1990. In Ecuador, Act 2000-21 in4/07/2000. In México, Ley Federal de Protección del Consumidor in 22/12/1992. In Costa Rica, Ley 7.472 in 20/12/1994 and the regulation 25234-MEIC. In Panamá, Ley 45 del 7/11/2007. In Guatemala, in11/03/2003, in the Ley de Protección de los Consumidores y Usuarios 006-2003 and in the Reglamento de la Ley de Protección del Consumidor of28/11/2003. In El Salvador, in Decreto 776 de la Asamblea Legislativa, 31/08/2005. In Perú, el 14/08/2010, in Ley 29.571. In Venezuela, Ley 37.930 in2004. In Colombia, Ley 1480 in 12/12/2011. In Honduras, in 30/04/2008, Decreto 24-2008 del Congreso Nacional. In Nicaragua, in 1994, Ley 182, and Decreto 2187 of 1999. In Dominican Republic in 26/07/2005, Ley 358-05.

[3]Furthermore, in certain legal systems it is usual to distinguish between "guarantee" (implied) and "warranty"(express), e.g. in the United Kingdom, whereas others only use the term "guarantee", e.g. Australia and New Zealand.

"*implied warranties*" usually can adopt two types: a) *by default*, in other words, if supplier does not disclaim it by contract they are required to; or b) *mandatory*, when it is not possible to exclude it by disclaimer[4]. Third, "*implied warranties*" can assume different meanings accordingly to their legal extent and content[5].

Here, we will use "*implied warranties*" to refer to warranties expressly included in the regulatory framework - in the sense of the M-MWA and the UCC-of the mandatory type. Furthermore, we will focus on *warranty ofmerchantability*– a product is "merchantable" if it does what is supposed to do-and*warranty of fitness for a particular purpose*– when the supplier promise to consumer that a product can be used for some particular purpose, it will be fit for that purpose[6]- for durable goods. It implies that in the event of product failure or it does not do what is supposed to do within a certain period of time, consumer will be able to claim the replacement, the repair or the monetary refund of the item.

There is considerable economic literature on warranties that may be divided into two branches. The first focuses on asymmetric information problems presented in the exchange between firms and consumers. Inside this branch it is possible to distinguish different approaches. One of them describes warranties as insurance policies. The main idea behind this concept is that consumers are more risk averse than sellers and consequently prefer choosing products with warranties, whereas sellers have incentives to offer them (Heal, 1977). Others approaches focus on the signaling effect: they explain that warranties work as a signal of product quality to consumers (Lutz, 1989; Spence, 1977; Grossman, 1981)[7]. Another perspective to explain warranties, closely related to the signaling motive, is the incentive mechanism. Under this approach, warranties work as a mechanism to provide an incentive for manufacturers to reveal product quality to consumers, improve it, or at least not cheat it. In fact, offering a long warranty would result in larger warranty costs if the product's true quality were lower than the warranted level (Cooper & Ross, 1985, 1988; Lutz, 1989; Priest, 1981)[8]. The

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[4]The M-MA the USA prohibits suppliers disclaiming implied warranties on any consumer product if they offer a written warranty for that product; but most states allow the disclaimer of implied warranties if suppliers do not offer a written warranty.

[5]For instance, *warranty of merchantability*, *warranty of fitness for a particular purpose*, *satisfaction guarantee*, *warranty of title*, *spare parts and repairs guarantee*, among others.

[6] In the Latin American countries where consumer law regulate implied warranties, usually it does not distinguish expressly between *warranty of merchantability* and *warranty of fitness for a particular purpose*, but generally both are included.

[7] The literature on signals suggests that warranty and quality are positively related, but some empirical evidence seems inconsistent with the use of warranty as a signaling device. Coricelli & Luini explain that evidence shows most warranties offer partial coverage, and high-quality products are not always sold with warranties higher than those offered on low quality goods (Coricelli & Luini, 2003).

[8] The signaling theories assumed exogenous quality products, while theories focus on incentives mechanisms assumed endogenous quality products.

second branch sees warranties as a marketing device to extract consumer surplus and explain warranties incorporated into the theories of monopolistic price discrimination and price dispersion (Emmons, 1989).

All these approaches make different assumptions about firm and consumer behavior and have different predictions on the economic roles of warranties. However, all of them focus on warranty contracts where suppliers decide voluntarily to offer it. In contrast, the analysis of mandatory implied warranties, imposed by law uniformly, constitutes the core of this paper.

We assume that asymmetric information is a proper characteristic of consumers and firms' transactions and introducing implied warranties could worsen it by raising a double moral hazard effect. Our point is that there is a set of strategies and legal remedies tending to deal with that effect. This paper is organized in five sections. After this introduction, in section II, the role of implied warranties to deal with the asymmetric information problem and its effects on consumer transactions are briefly presented. In section III, a model that allows exploring theoretical relevant relations to an optimal implied warranty design is developed. In section IV, some topics related with institutional design and empirical constraints that may arise, especially in Latin American, are discussed. Also, strategies and legal remedies tending to deal with the double moral hazard problem are analyzed and some final remarks are presented.

II. ASYMMETRIC INFORMATION, INCENTIVES AND IMPLIED WARRANTIES

The effects of the asymmetric information problem existing in consumer transactions are usually worse in developing countries because of the reasons described above. Thus, *adverse selection*[9] and *moral hazard* seriously affect market efficiency.

Warranties usually are seen as a tool to give certain information about product quality and consequently to reduce those problems. Thus, offering a warranty contract is generally seen as a signal about quality (Priest, 1981): at least a good performance of product during the coverage is expected and it allows overcoming adverse selection problem.

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[9] George Akerlof (1970) explained adverse selection by using the example of the market for second hand cars. When adverse selection is presented; market equilibria have special characteristics and depend crucially on the particular context under analysis. Spence (1973) studies the transmission of signals in the labor market, and states that there may be two types of equilibria: separating equilibria, in which the qualities are separated and there is a price for each segment, or pooling equilibria, when all the goods are grouped into a single market with a single price. Meanwhile, Rothschild & Stiglitz (1976) analyze the insurance market and conclude that it is impossible to find an equilibria pooling, and that the only possibility is separating equilibria.

Implied warranties are imposed by law uniformly so that the signaling effect does not arise. However, they contribute to guarantee a minimum quality threshold. Thus, they relieve consumers of the unobservable quality problem at the time of consumer's choice. Although a consumer has neither experience with nor knowledge of a product, he may trust that it is reliable on a minimum of quality: that it will do what it is supposed to do and that there is nothing significantly wrong with it (Lutz, 1989; Grossman, 1981). Then, consumers can stop worrying with respect toa certain level of unobservable quality; henceimplied warranties contribute to reduce information consumer costs tending to efficiency. In this sense, contribute to overcome adverse selection and moral hazard -from manufacturer´s side- problems.

Nevertheless, when warranties are introduced, moral hazard from consumer side can arise. Priest (1981) and Cooper & Ross (1985, 1988) have recognized the importance of the double moral hazard effect in shaping warranties contracts. This problem can be supposed worse in the case of implied warranties imposed uniformly and mandatory by consumer law.

At this point, it is relevant to observe that approaches based on moral hazard must face some subtlety. The term moral hazard originates in insurance literature; in the insurance market, moral hazard effect usually involves two main components. First, a change in the level of care of one party(the insured) due to the expectation that the other (let us say, the second party, the insurer) will afford every loss or at least a portion of the additional loss related to his less caring behavior. On the other hand, there is the impossibility of the second party (the insurer) to observe the behavior of the first one and consequently the magnitude of the decrease in the care of that one.

In this stylized version, moral hazard only shows one-direction effect since it is assumed that no effect of this kind can run from the second party (insurer) against the first (insured). In insurance markets, the duty of the insured appears as (more or less) instantaneous while his behavior will develop in time. Additionally, the content of the insurer´s duty is deemed plain and clear, whereas the particulars of the insured´s behavior are assumed to be extremely complex. Risks related to the contract only depend on the insured's behavior, whereas the insurer's behavior does not have influence on risks. Hence, at the time of every party´s choice, information is seen as asymmetric in that definite sense[10].

Nevertheless, the above explanation does not hold to describe general relations among consumers and suppliers. Focusing on hypothetical durable goods, it is clear that, at the time of the consumer´s choice, information about future performance is at least imperfect. Choices, in turn, assume a certain level of

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[10] Usually, the literature describes adverse selection as a problem at the time of contracting and moral hazard as a subsequent problem to the signing of contract. However, both concepts are connected in some sense and many situations contain elements of both types of problems.

quality, duration and safety[11]. Nonetheless, these features are going to show only in the future after the product is used and do not only depend on their manufacturing properties, but also on the usage the consumer will make of the item. At this point, it is clear that when introducing warranties, a double-moral hazard effect may arise. On the one hand, if suppliers are free from any duty of coverage or replacement after the purchase is done, they will be in the zone of moral hazard producers; on the other hand, if consumers are granted full coverage for every malfunction or loss derived from the product, suppliers will enter in the moral hazard victim zone.

Thus, the moral hazard problem plays a central role in the exchange between suppliers and consumers when warranties are introduced. In the next section, we will explore a model of implied warranties in which the double moral hazard effect is the core point.

III. THE MODEL

To assess the economic consequences of the incorporation of implied warranties on consumer transactions and analyze their effects in relation to the problem of moral hazard, a formal model is presented based on Cooper & Ross (1985)[12].

The existence of two types of agents is assumed: the buyer and seller, and both are supposed to be risk neutral. The product, sold in the market at price p, after transaction can work with probability π or can breakdown with probability $(1 - \pi)$. Occurrence of any of these scenarios depends on both the firm and consumer behavior. The control variable of the firm, which we call q, represents the actions that should perform quality associated with producing the product; e.g., the number of quality checks carried out during the production process, the quality of the raw materials used, and so on[13]. The control variable of the consumer will be called e, and in principle can be associated with the consumer´s level of care in the use of the product. However, both q and e require a narrower interpretation because our model intends to capture some crucial features of Consumer Law and reality in the area of implied warranties.

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[11] The "hidden actions" – that affects to consumer- would be related to the manufacturer's behavior and decisions about quality investment; and even if the consumer would be able to observe that behavior, there will be "hidden information" because consumers are supposed to be incapable of understanding the implications therein.

[12] Cooper & Ross (1985) analyzed the incorporation of voluntary warranties contracts by suppliers. In a later paper, Cooper & Ross (1988) developed a similar analysis but in the context of an intertemporal model on warranties.

[13] We assumed here that the supplier is the manufacturer. If the supplier is only the seller of the item he could simply hide information about the quality of the product, but could not make decisions about its quality.

In order to start with this task, the role of supplier's precaution deserves some attention. In most real systems the only factor which triggers the warranty is not exactly a substandard precaution taken by the supplier, but a mere product malfunction. It is indeed obvious that the proper working of a product is a function of the diligence the supplier puts into production although that diligence is not the only determinant of that outcome. In usual legal thinking some production choices are deemed straightforwardly outside the field of negligence in spite of being a palpable source of product breakdown. For instance, given a certain state of technology, the choice for producing a type of device *A* might be associated with a failure rate of 2% in certain time and space conditions even when the most diligent procedures are applied, while producing a device of type *B* can be linked, ceteris paribus, to a 1% of breakdown rate.

On the consumer side, there are also certain ambiguous variables. Focusing on how consumer behavior can affect the product failure likelihood, it is possible to observe two different forms: a) the consumer's selection of a product suitable for his expected needs, and b) the consumer's decision about the extent to which he will use the product (Priest 1981), e.g. a consumer who operates an appliance infrequently probably will have longer life product durability. These are not only related to "diligence", but also with "level of activity" -frequency or intensity of use-. The level of consumer care generally is related to the instructions, explanations and warnings for using the product correctly given by the supplier - which can be related to frequency or intensity of use or not. If the consumer uses the product following such instructions and recommended precautions, she will be "diligent" in most real systems. However, e.g. if consumer chose a small washing machine to use all day in a laundry room, in spite of being diligent using it,the "level of activity" can affect the performance.

In both cases, level of care is a determinant factor, but not the core point taking directly into account by the legal system. A little sophistication in theoretical framework can be intended to overcome these issues. Let us then employ the category of "causal inputs" in order to substitute level of care. This notion was introduced by Singh (2002), and was employed by one of the authors of this paper in a previous work (Acciarri *et al.*, 2007).

This shortcut is intended to contribute to formally shape the following ideas. We assume that suppliers know the best way to produce at the minimum quality required by law. Accordingly, they will be able to involve in the process the optimum *causal inputs:* production choices, diligence and every determinant of product quality. We assume also that the minimum legal quality is put by the legal system in such a level that being the product optimally used by a consumer, it will not present any kind of malfunction in a given set of space and time conditions.

At this point, the most apparent constraint in order to deal with the case unveils the key feature of optimal design. In the real world, suppliers cannot monitor consumers´ behavior in advance, nor are consumers able to check suppliers' investment in quality. However, ex post the breakdown takes place, there is a binary option: the failure can trigger the warranty; that is, the duty of replacement, or not. Hence, the conditions of suppliers´ legal obligation to replace the failed unit will clearly rule the outcome. If controversy on the requirements of the replacement arises between supplier and consumer, at this point, both supplier and consumer behavior will be past events and leaving their traces on the body of evidence. Then, as it is usual in Law & Economics approach, we will see the result of a potential lawsuit as a backward source of incentives. In other words, parties are deemed conscious of the future judgment of their present conduct at the time of choosing a level of precaution.

With these clarifications, the model assumes that choosing q and e , the firm and the consumer can influence the likelihood of product failure. Thus defined $\pi(q, e)$, with $\pi_e > 0, \pi_q > 0$ $and \pi_{ee} \leq 0, \pi_{qq} \leq 0$. The firm´s objective function is,

$$U(e, q, p, s) = y - p + \pi z + (1 - \pi)s - g(e)$$

in which U represents consumer´s utility, y income, z the monetary value obtained in case the product works, and s the protection offered by the warranty. For simplicity, we assume an implied warranty with the possibility of replacement if product fails[14]. Finally g represents disutility of adopting level e and meaning in our scheme hereinafter consumer causal inputs, with $g'(.) \geq 0, g'(0) = 0$, $g''(.) > 0$.

Correlatively, we define the producer benefit function

$$V(e, q, p, s) = p - C(q) - (1 - \pi)s$$

where $C(q)$ is the production cost function that depends on some level of the firm's causal inputs, with $C'(.) \geq 0, C'(0) = 0, C''(.) > 0$. The firm´s total cost is the sum of production cost plus the expected warranty payoff. Choosing e and q , directly affects both agents by the functions $g(e)$ y $C(q)$ and indirectly through $\pi(q, e)$, highlighting the interdependence between the agent´s behavior.

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[14] The same theoretical framework could include alternatively money-back warranties. With slight modifications the model could be adapted to cover the case of product repair without any charge. This would require modifying the firm´s cost function. To simplify the analysis we will restrict the analysis to replacement warranty.

Being both agents the only parties implied in our framework, maximization of $U+V$ is obviously the preferable outcome in terms of social cost. This cooperative solution defines the optimum value of (e^*, q^*) and must meet the following first order conditions:

$$\pi_e(e,q)s = g'(e)$$
$$\pi_q(e,q)s = C'(q)$$

For q given, the solution is $e^*(q)$, whereas for e given, the solution is $q^*(e)$, and the simultaneous equilibrium is (e^*, q^*)[15]. This solution shows that agents equal joint marginal cost - in our framework the social marginal cost - with their private marginal cost when they make their choices about causal inputs. It should be noted here that to reach the cooperative outcome, it is necessary to introduce an external mechanism to ensure this type of agent´s behavior. With this objective, we will analyze how the implied warranty should be designed.

Next, a non-cooperative setting in which the variables controlled by each agent are not observable to the other is considered. The non-observability of e and q introduces a problem in agents' incentive structure: this is the situation of the double moral hazard above mentioned[16].

In this non cooperative game, the legislator should set the appropriate conditions for how the implied warranty operates. When this setting is correctly made, rational producers and consumers will choose their optimal levels of causal inputs and then $U+V$ will be maximized.

At this point, it is worth remembering that the only kind of warranty considered in our model is one that implies only the possibility of replacement. For simplicity's sake, we will regard the replacement as giving the consumer the same utility as a working unit and representing for the producer its production cost. Then, variable s has only a binary dominium: its value can be $s = z$ or $s = 0$ depending on whether a certain level of q is met or not, respectively; and always, of course, depending on the fact that the breakdown takes place.

Getting back to the legislator, as it holds in every mechanism of this sort, any calculation is only rough, virtual and works as a kind of benchmark. It simply explains that if the quality $q<q^*$ is taken into account by law as the determinant to trigger the duty of replacement, the social cost will be minimized -saying nothing about factual conditions necessary to materialize this statement. This level of quality q^* correlates, on the side of producer, with production cost $C(q^*)$ and

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[15]This equilibrium is optimal in the sense of Pareto.

[16]When buyers consume the product, they can take actions not observable to the seller that affect its performance; on the other side, as the buyer cannot observe the actual quality of the product before purchase, the firm has no incentive to produce higher quality.

works as the needle of the scale in order to make the parties choose their causal inputs appropriately.

In addition, another usual feature of actual legal systems consists of denying granting any claims of replacement filed by negligent consumers; i.e., consumers who put socially substandard causal inputs in using the product, according to our framework. To illustrate this case, let us think of a consumer using substandard cheaper fuel in their car, having, at the same time, the car engine a structural failure which would result in a collapse of the machine even if regular fuel had been used. In the real world, probably evidence issues cast shadow on the rule governing this kind of cases and on its social outcomes. On the contrary, in formal terms, a rule requiring optimum consumer´s behavior together with substandard quality in order to grant a claim of replacement seems quite different to a rule that only focused on substandard quality. In our example, leaving evidence issues aside, a rule of the second type would have clearly granted a claim of replacement while a scheme of the first type would not have. This being true, in formal legal terms, incentives yielded by each of them are significantly close.

The ensuing matrix shows parties´ payoffs correlated to different values of causal inputs under a rule of the first type. According to this, a consumer claim of replacement is granted only if substandard quality and "diligent" consumer behavior are jointly present.

Producer causal inputs

		$q < q^*$	q^*
Consumer causal inputs	$e < e^*$	$U < U^*, V > V^*$	$U < U^*, V^*$
	e^*	$U^*, V < V^*$	U^*, V^*

The payoff matrix with this design shows that the consumer has a dominant strategy in e^*. Also, an optimum level of causal inputs will secure the producer an optimum benefit V^*- whatever the consumer behavior might be. There is only a chance of getting a higher benefit –if consumer plays substandard ($e < e^*$) and producer causal inputs are suboptimal. However, this case implies an irrational behavior on the consumer side, who obtains only a suboptimal utility. Thus, combination e^*, q^* is the only Nash equilibrium.

Let us now review the social effects of a rule focusing only on the substandard quality -whatever the consumer behavior - to grant a consumer´s claim of replacement. Buyers seek to maximize U and the resulting first-order condition is:

$$g'(e) = 0$$

As the marginal benefit of effort is zero in this case, the purchaser will have no incentive regarding the use of the product and the level of causal inputs will be $e < e^*$, precisely $e = 0$. Meanwhile, the firm chooses q to satisfy the first order condition $\pi_q(e, q)s = C'(q)$, which is identical to the cooperative case, so that the firm´s level of causal inputs matches the optimum $q = q^*$. The parties´ payoffs correlated to different values of causal inputs in this case are shown in the matrix,

Producer causal inputs

		$q < q^*$	q^*
Consumer causal inputs	$e < e^*$	$U > U^*, V < V^*$	$U > U^*, V^*$
	e^*	$U^*, V < V^*$	U^*, V^*

Under this scheme a negligent consumer will obtain a utility higher than the optimum if he invests in causal inputs zero or less than the optimum - in less technical terms, "acts negligently"- and the producer behaves sub-optimally. Yet, under this rule the producer has a dominant strategy in q^* and so is able to secure an optimal benefit on his own, whatever the consumer behavior. Given the firm´s dominant strategy the consumer will choose $e < e^*$ and the only Nash equilibrium will be $(q^*, e < e^*)$. This design generates optimal behavior by the firm but not by the buyer.

This model shows that a possibility to design an optimum rule to deal with the double moral hazard problem in consumer transactions exists. Theoretically, the design of a rule demanding substandard quality and "diligent" consumer behavior jointly present to trigger the legal obligation of replacement will be the efficient solution.

IV. INSTITUTIONAL DESIGN AND EMPIRICAL CONSTRAINTS IN DEVELOPING COUNTRIES

At this point, two main aspects will be crucial in order to design implied warranties efficiently: first, to determine the operative conditions to trigger warranties; second, to identify the empirical context in which implied warranty will be applied. Drawing up an institutional design in abstract, without taking into consideration the specific empirical conditions, could lead to a serious mistake

(Acciarri, 2009, 2012; Buscaglia, 2012). In the following paragraphs, we will refer to the most relevant empirical aspects.

a) Legal quality standard and consumer behavior's standard

Following the conclusions of the previous section, a rule demanding both substandard quality and "diligent" consumer behavior to trigger the legal obligation of replacement will be the efficient solution to overcome the double moral hazard effect. In the context of the real world, the problem will be known on the optimum level of causal inputs of producers and consumers: a large volume of information with respect to each product is necessary, such information is known by involved parties, but they will not have incentives to disclose it. The cost to get this information is no doubt too high and clearly imposes an empirical restriction. This concerns not only the legislator who makes the rule, but also judges and public agencies.

However, it is even possible to try to make an effort of overcoming it since the alternative of doing nothing seems to be worse. With respect to producer's causal inputs, an alternative could be to shape a reasonable "legal quality standard". In this way, the test of *reasonable consumer expectations of average quality and suitability for the ordinary purposes for which such goods are used* seems to be an a priori unbiased criterion that meets this idea. Certain legal systems expressly included it in this way[17]. For instance, if the supplier offer the consumer an oven, that oven must do what ovens are supposed to do - bake food at controlled temperatures selected by the buyer. In addition, it must be in working condition after its first use - it is not supposed to be used once and stop working. If the oven does not heat, or if it heats without proper temperature control, or stops working after the first use, it is not meeting the quality standard to satisfy the consumer expectations. Normally, an oven is purchased to bake food at controlled temperatures selected by the buyer and it is supposed to be "durable". Such are the consumer expectations related to an oven[18].

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[17] The M-MA in the USA contemplates two kind of implies warranties related to this idea: a) the implied warranty of merchantability, that it is a merchant's basic promise that the goods sold will do what they are supposed to do and that there is nothing significantly wrong with them; b) the implied warranty of fitness for a particular purpose is a promise that the law says a seller makes when a customer relies on advice that a product can be used for some specific purpose. In Latin American, the Código de Protección del Consumidor de Perú introduces three kinds of warranties: legal warranty, express warranty, and implied warranty, and this last is expressly connected with this idea. Also, this standard is closer to the idea of "consumers' legitimate rights and expectations" included in the Directiva de la Unión Europea, 1985 (art. 6).

[18] It would theoretically be possible to consider diverse legal categories to distinguish between products according to their main quality features. In the real world, however, making legal categories and trying to put each fact in a category is a costly task. It requires too much

Concerning the product durability and consumer expectations, it is important to note here that usually implied warranties coverage is limited to a short term. The short term coverage can be seen as another strategy to deal with the moral hazard of consumer (Priest, 1981). Limited coverage implies to share risks between consumer and supplier: after the term of coverage the consumer has to bear the costs of product breakdown, except in cases of personal injuries where products liability arises. Consequently, consumer expectations about durability could be different from the term of warranty coverage - it could be for a longer period of time. In any case, implied warranties guarantee the durability of the goods for a certain term, at least sufficient to allow the consumer to discover latent defects[19].

With respect to consumer casual inputs, the possibility to identify different types of consumers related to the level of diligence, the frequency or the intensity uses of each product and to create legal categories accordingly to that would be very costly and maybe not useful[20]. Nonetheless, legislators can do some segregation easily. For example, it is reasonable to suppose that onewho buys an oven to use at home, uses it less frequently than one who buys it to bake cakes and pies in a bakery. Actually, most Consumer Law defines the concept of consumer excluding clearly commercial and industrial uses.

Beyond that, to determine a legal standard of "due diligence" is another alternative. A simple possibility is to shape a rule requiring suppliers to disclose relevant information about instructions, conditions and warnings of use; then, shaping a "diligence" standard requiring consumers to follow them[21]. When a

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information, and it can generate errors at the moment of making a law and enforcing it. Even though it could be possible to take some product features into account, such as "second hand" and "first hand" products, in order to make some gross kind of product quality classification. For instance it is reasonable to expect a better performance for "first hand" than for a "second hand" product. In fact, this can be useful to evaluate *reasonable consumer expectations of average quality* at the moment of applying the rule.

[19] Priest (1981) explains that Yoram Barzel (1982) suggests that the duration of warranty coverage will be that period sufficient to allow the consumer to discover latent defects where inspection is cheaper for the consumer than for the manufacturer. But he adds that because "*there are no readily available means of measuring consumer's inspection costs, this theory cannot account – except by definition- for differences in warranty duration*".

[20]The same occurs when the possibility to establish different extent of coverage term of mandatory warranties is analyzed. On the contrary, theory that focus on insurance effect of voluntary warranties contracts, suggests that under certain conditions suppliers could segregate consumers and offer different warranties terms. That will be possible when the supplier can identify prior to sale those consumers, product uses, or intensity of use, or certain differences in risks across the set of potential consumers. In this point, sometimes suppliers seem to be in a better position than legislator to obtain the relevant information to segregate consumers. However, the success of this alternative is expected to be successful only in some specific cases (Priest, 1981).

[21]The legal "duty of information" implies explaining product features, warning about risks and instructions for using it among other important aspects. Usually, consumer law demands the

consumer uses the goods without taking said instructions, conditions, and warnings into consideration, she will not be covered by implied warranty. Thus, warranties would be connecting with another important Consumer Law institution, the legal "duty of information", current in most Latin American countries.

At this point, it is worth remarking the relevance of the design of the legal "duty of information". The legislator can impose suppliers to perform this under certain conditions, such as style, contents, explanations, and so on, so that it contributes to promote a high level of consumer´s diligence. The way to present the information, explain the current uses, instructions and recommendations, and the possibility of exploring technological alternatives for disclosure information will be relevant[22]. There is a vast literature on Behavioral Law & Economics providing important insights to attempt to stimulate "diligent" consumer behavior (Thaler&Sunstein, 2008)[23]. To achieve that will reduce the probability of disputes between consumers and suppliers, consequently reducing social costs.

b) Enforcement and procedural aspects

Beyond the terms of the rule, how to enforce it and how judges deal with disputes between consumers and suppliers is extremely important. The effect of an implied warranty as we discussed, requires verifying two standards - quality level of product and "diligence" of consumer. This involves delegating to public agencies the judgment of what the "reasonable consumer expectations of average quality", the "ordinary purposes", and the "diligent" level of consumer behavior are.

The last is particularly relevant in most developing countries, where the enforcement of Consumer Law is actually weak. Then, a large number of disputes between consumers and suppliers are expected and the role of public agencies perhaps will be slight. In the context of institutional weakness proper of developing countries, the public agencies usually are more vulnerable to bribe

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following conditions to accomplish the duty of information: to use the official tongue of the country, to explain features of product truthfully, clearly, among others. For instance, in Latin American: art. 6 Lei 8078, Dispõe sobre a proteção do consumidor e dá outras providências, in Brazil; art. 4 Ley 24.240 in Argentina; Código de Protección y Defensa del Consumidor of Perú, art. 8; art. 9 of Decreto 24-2008 of Guatemala; art.12 Ley 182 of Nicaragua; art. 3 Ley 1480 of Colombia.

[22]A good example of that is legislation about tobacco existing in a large number of countries. They usually require supplier disclosure information with graphics, pictures and specific warning messages.

[23]With regard to the idea of exploring technological alternatives to disclose information, Thaler & Sunstein (2008) e.g., proposes the "red light" idea for air conditioner: because many air conditioners need their filters changed regularly, they suggest putting a red light in a relevant and conspicuous place to inform people when filter needs to be changed.

than courts. In spite of corruption being a general problem in these countries, in Consumer Law cases, it could be more difficult to bribe courts than public agencies[24]. In this scenario, the role of judges appears more significant. However, the possibility that a consumer makes a claim will be restricted by a set of obstacles. On one hand, the consumer will only have incentives to claim when the costs of making it are lower than the expected benefits (Acciarri 2009, 2012; Mery, 2012); e.g., frequently, the amount involved when a household appliance breaks down is not important enough to make a claim. On the other hand, in developing countries it is common to find a high level of uncertainty concerning judicial decisions, trial span, and effective results; and that is another obstacle affecting consumer incentives to claim (Mery 2012; Buscaglia 2012; Buscaglia & Dakolias 2012; Buscaglia & Ulen 1997)[25]. Consequently, it will be necessary to shape rules for guarantying the access to justice.

A good strategy to encourage consumers´ claims could be include a rule shaping punitive damages in favor of the consumer (Irigoyen Testa, 2006, 2009, 2013) so as to increase expected benefits of making a claim, whereas increasing the expected costs for suppliers[26].

In addition, it would be necessary to design particular procedure rules to deal with consumer claims and explore alternative methods to solve disputes to guarantee access to justice. For instance, "free justice" for consumers, the possibility that consumer associations represent the interests of all consumers in class actions, and special rules of evidence, e.g., requiring suppliers instead of consumers provide evidence about product quality[27].

c) Other important considerations

Finally, two issues need to be clarified. On one hand, certain authors have focused on firm reputation to overcome the supplier´s moral hazard. This approach centers

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[24]Usually, in Latin American countries, for instance, there are more judges with competence to solve consumer law cases than public agents and generally it could be more difficult to know who will decide a dispute before it occurs in courts rather than in a public agency. In addition, a public agency depends directly on the government, whereas judges are expected to be more independent.

[25]Buscaglia & Dakolias (1999) have showed empirically that in Latin American countries judiciary is weakened and prepared to promote the economic developing of the private sector.

[26]In Argentina, the last modification to the Ley de Defensa del Consumidor, occurred in 2008, have included the possibility of consumers to claim punitive damages when the supplier behavior implied a breach the contract.

[27] A rule demanding consumers to provide all evidence in a trial in order to prove product quality, clearly will promote moral hazard on the supplier side. The supplier is the one who assesses the relevant information related to causal inputs which is unobservable for the consumer. Then it is necessary to generate incentives for supplier's disclosure of that information. Consequently, an efficient criterion requires suppliers instead of consumers provide evidence about product quality.

on firms having strong incentives to acquire reputation to gain market share and preserve it afterwards in order to increase its benefits; consequently they have incentives to invest voluntarily in high quality products (Shapiro, 1983; Allen, 1984; Bebchuk & Posner, 2005). Then, the market mechanism could solve the moral hazard problem and an unwary reader could think that introducing implied warranties is irrelevant. However, in a context of institutional weakness it is not expected that firm reputation attain a prevailing role to deal with supplier's moral hazard. Only in some particular segments of certain markets, could it be expected that firms offer higher quality products - above the threshold quality required by mandatory warranties - because of reputation effect, i.e. suppliers that remain in the market for a long term selling durable goods.

On the other hand, getting back to implied warranties effects, it has been affirmed that imposing them - as well as other market interventions based on Consumer Law-generates a price increase in products and is detrimental to all consumers (Beales *et. al*, 1981; Schwartz 1979; Bullard, 1996). Actually, the price increase after introducing implied warranties can be seen as the result of comparing a *full price*[28] with a *fictitious* lower price. The latter includes a hidden cost related to certain risk not taken into account by the consumer at the time of purchase even though they must equally pay for it. For instance, if a consumer buys an oven and it does not reach a proper temperature to bake food, the price paid for it perhaps was low but fictitious: it did not include the cost of not have the proper temperature to cook. In consequence, an inefficient quantity of product is exchanged as well as a distortion with respect to safer or higher quality substitutes. If that hidden cost becomes explicit at the time of consumer´s choice,then the price will be the *full price*.

Thus, implied warranties increase the minimum level of product´s quality exchanged and so contribute to exclude low quality product from the market. If it is not possible to distinguish between unit "goods" and "bads" of each product, a threshold of quality as implied warranties introduce tend to the efficiency as well as the cost to impose it - to exclude from the market consumers willing to pay less and to obtain less quality- used to be lower than their benefits - to satisfy the expectations of most consumers.

V. FINAL REMARKS

The previous analysis allows concluding that a clear, simple and understandable rule imposing implied warranty in defined terms contributes to solving the

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[28] Shavell (1987) uses "full price" to explain the price which includes all risks that the consumer has to assume.

problem of double moral hazard. It should be emphasized that the legislator must be very careful with the determination of the warranty trigger operational conditions and should specially consider the empirical context in which it will be applied. Beyond the terms of the rule, how agencies enforce it and how judges deal with disputes between consumers and suppliers is extremely important.

The evaluation of implied warranties effects requires also a comparison with other consumer law institutions. As we explained in previous works, different remedies and actions present also different properties of efficiency. Thus, implied warranties correctly designed guarantee a minimum level of product´s quality exchanged; above this minimum threshold, reputation and competition will become central to generate supplier incentives to invest in quality, whereas under this boundary, warranties, liability, and punitive damages, will play their role.

The issues previously described are particularly relevant in developing countries where many of these problems cannot find a solution in the market and the enforcement of Consumer Law is usually weak. Latin American countries are a good example of that. In most of these countries, additionally, the design of consumer protection is often inadequate or insufficient- not only implied warranties, but also other institutions- to generate the correct incentives to suppliers and consumers. Thus, in certain cases, to improve the rules of Consumer Law would be imperative as well as to develop a set of strategies – such as consumer education, particular procedural rules, free access to justice, encourage consumer associations, training judges, among others- tending to enforce it, if the goal is to reduce social costs and to tend to the efficient.

CONFLICTS OF INTEREST

The authors affirm that this article content has no conflicts of interest.

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