

**CONSUMER LAW & ECONOMICS:
PUNITIVE DAMAGE SETTLEMENTS IN ARGENTINA**

MATÍAS IRIGOYEN-TESTA*

ABSTRACT: Argentina is the only country with a pure Continental civil-law system that admits punitive damages awards. Specifically, since 2008, the Consumer Protection Law has allowed the applicability of punitive damages to protect consumer rights.

The Argentine doctrine and jurisprudence developed a modern exegesis about the function, admission, and monetary calculation of this legal remedy. Following this exegesis, the monetary punitive damage award should not be less than or exceed the amount necessary to address its function of deterrence. Assuming that the Argentine courts properly calculate the socially desirable amount of punitive damage, according to its main function (deterrence), wrongdoers would still be able to avoid such full payment if there is no legal restriction to reach an agreement for a lower amount.

This article studies the incentives that a legal system creates when there are no limits for determining settlements about punitive damages, such as the Argentine one. We analyze this problem with Game Theory and Behavioral Law and Economics. We conclude that due to asymmetric information problems, asymmetric opportunity cost of money, and limited rationality (e.g., inequity aversion) in the Argentine consumer market, some legal restrictions to reach an agreement are socially desirable. In general, as a rule, secret settlements and settlements for amounts that would not fulfill the main function of punitive damages (deterrence) must not be allowed. In particular, among other restrictions necessary, under finite horizon negotiation games, the injured consumer (the plaintiff) must be the only party legally allowed to make the last counteroffer.

KEYWORDS: Consumer Law; Game Theory; Behavioral Law and Economics; Punitive Damages; Settlements.

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* Full-professor of civil law in Argentina. He teaches undergraduate and graduate courses at the Universidad Nacional del Sur (Bahía Blanca) and Universidad Torcuato Di Tella (Buenos Aires); and graduate courses at Universidad de Buenos Aires (Buenos Aires). Director of the Master of Laws (LL.M.) and of the Research Group on "Law, Economics and Institutions: Consumer Protection", Universidad Nacional del Sur (Bahía Blanca). Obtained his Ph. D. (Universidad Complutense de Madrid) and two masters degrees (Instituto Universitario Ortega y Gasset de Madrid and Universidad Carlos III de Madrid) in the field of law and economics. Former visiting scholar at Harvard University and scholarship holder of the Fundación Rafael del Pino, Spain, and Real Colegio Complutense at Harvard University, U.S.A. The author thanks Elizabeth Kline for proof-reading the manuscript. University phone number: +54 (0291) 4595084. Corresponding email: mirigoyentesta@post.harvard.edu.

I. INTRODUCTION

“P[unitive]’ or ‘exemplary’ damages are money damages awarded to a plaintiff in a private civil action, in addition to and apart from compensatory damages, assessed against a defendant guilty of flagrantly violating the plaintiff ‘s rights” (footnote omitted).² Argentina is the only country with a pure Civil Law system (in opposition to a mix or pure Common Law system)³ that admits in its legal system awards for punitive damages. Specifically, since 2008 the Argentine Consumer Protection Law (Law 24.240) has allowed the applicability of punitive damages to protect consumer rights.⁴ The amount for punitive damages is given, in total, to the victim (consumer) in Argentina.⁵ The

² David G. Owen, *A Punitive Damages Overview: Functions, Problems and Reform*, 39 VILL. L. REV. 363, 364 (1994).

³ Argentina is the only country in the world with a *pure* continental-civil law system that successfully overcame prejudice and distrust against punitive damages. For example, other countries that also admit punitive damages in their legal systems, have a pure Common Law system or a *mixed* legal system (they are derived partly from the common law tradition and partly from the civil law tradition). William Tetley explains that a *legal system* “is an operating set of legal institutions, procedures, and rules”; a *mixed legal system* “is one in which the law in force is derived from more than one legal tradition or legal family”; and a *legal tradition or family* “is a set of deeply rooted, historically conditioned attitudes about the nature of law, about the role of law in the society and the polity, about the proper organization and operation of a legal system, and about the way law is or should be made, applied, studied, perfected, and taught”. William Tetley, *Mixed jurisdictions: common law v. civil law (codified and uncoded)*, 60 LA. L. REV. 677, 681-84. See Matías Irigoyen-Testa, *Punitive Damages in Developing Countries: The Argentine case*, 1 THE LATIN AM. & IBERIAN J.L. & ECON., Aug. 31 (Issue 1), 79, 79-80 (2015), available at <http://alacdeorg.com/journal/item/738-punitive-damages-in-developing-countries-the-argentine-case>

⁴ Law 26.361, Article 25, approved in March, 2008 (Adla, LXVIII-B, 1295), incorporated Article 52 bis in Law 24240, *Ley de Defensa del Consumidor* (Argentine Consumer Protection Law, 1993, Adla, LIII-D, 4125).

⁵ An Amendment bill to Argentine Law 24240 (2008), *Ley de Defensa del Consumidor* (Argentine Consumer Protection Law 1993), was approved and incorporated in Article 52 bis, which provides: “Punitive Damages. If a supplier does not meet his legal or contractual obligations to a consumer, at the request of an injured party, the judge may impose on the supplier a civil fine in favor of the consumer, which is graduated according to the gravity of the offense and other circumstances, beyond compensatory damages. When more than one supplier is responsible for the failure, they are jointly and severally liable to the consumer, without prejudice to any contribution action in their favor. The civil fine that is imposed may not exceed the maximum monetary punishment of the fine provided in Article 47, inc. b of this law.” (The translation is ours.) Article 47, inc. b, Argentine Law 24240, establishes a maximum of 5 million Argentine pesos. In Spanish: “Artículo 52 bis: Daño Punitivo. Al proveedor que no cumpla sus obligaciones legales o contractuales con el consumidor, a instancia del damnificado, el juez podrá aplicar una multa civil a favor del consumidor, la que se graduará en función de la gravedad del hecho y demás circunstancias del caso, independientemente de otras indemnizaciones que correspondan. Cuando más de un proveedor sea responsable del incumplimiento responderán todos solidariamente ante el consumidor, sin perjuicio de las acciones de regreso que les correspondan. La multa civil que se imponga no podrá superar el máximo de la sanción de multa prevista en el artículo 47, inciso b) de esta ley.” See Article 52 bis, Argentine Law 24240, <http://servicios.infoleg.gob.ar/infolegInternet/anexos/0-4999/638/texact.htm>

Argentine experience is quite effective in applying punitive damages to deter wrongdoers (supplier of goods or services) that speculate with low probabilities of being detected and condemned for compensatory damages.⁶ Normally, because the expected compensatory damages are insufficient to deter wrongdoers, according to the social desirable level of precaution, punitive damages are needed to dissuade, in an extra way, those injurers in the Argentine consumer market.

Nevertheless, assuming that Argentine courts know how to properly calculate the socially desirable amount of punitive damages,⁷ wrongdoers would still be able to escape for that desirable amount, and, as a consequence, would not be deterred from repeating the same illegal behavior in the future, if there is no restriction to reach a settlement in those type of cases. Furthermore, the importance of this issue is evident when we analyze the impact of punitive damages in driving settlements, in countries in which punitive damages awards have been allowed for centuries. For instance, in the U.S. some empirical research papers suggest that, under certain conditions in antitrust cases, "treble damages lead to a decrease in the proportion of cases resolved by trial and an increase in the number of settlements".⁸ In addition, as another example, Thomas Koenig argues that his "thesis is that even though the empirical research

⁶ Matías Irigoyen-Testa, *¿Cuándo el juez puede y cuándo debe condenar por daños punitivos?* [When can and when should the judge award punitive damages?], 10 REVISTA DE RESPONSABILIDAD CIVIL Y SEGUROS, LA LEY 16, 23-24 (2009); Matías Irigoyen-Testa, *The Legal Cap of Punitive Damage in Argentina*, 6 CIVILISTICA.COM, Dec. 31 (Issue 2), 7-8 (2017); Matías Irigoyen-Testa, *Prohibition against punitive damages insurance: the Argentine case*, in 4 POLISH LAW & ECONOMICS YEARBOOK 95-97 (Jarosław Beldowski et al. eds., C. H. Beck & Polish Association of Law & Economics, 2013); Matías Irigoyen-Testa, *Non-Insurability of Punitive Damages in Argentina: An Economic Analysis of Law Explanation*, 3 INDRET 1, 4-5 (2011), available at <http://www.indret.com/code/getPdf.php?id=1593&pdf=919.en.pdf>

⁷ Matías Irigoyen-Testa, *Cuantificación de los daños punitivos: una propuesta aplicada al caso argentino* [The quantification of punitive damages: a proposal applied to the Argentine case], in RELACIONES CONTEMPORÁNEAS ENTRE DERECHO Y ECONOMÍA [CONTEMPORARY RELATIONSHIPS BETWEEN LAW AND ECONOMICS] 27-61 (Fernando Castillo Cadena & Juan S Reyes Buitrago eds., Grupo Editorial Ibañez & Universidad Pontificia Universidad Javeriana, 2012).

⁸ Robert D. Cooter & Daniel L. Rubinfeld, *Economic Analysis of Legal Disputes and Their Resolution*, 27 J ECON LITERATURE 1067, 1081 (1989). Also see: Jeffrey M. Perloff & Daniel L. Rubinfeld, *Settlements in Private Antitrust Litigation*, in PRIVATE ANTITRUST LITIGATION 149-84 (Steven Salop & Lawrence White eds., MIT Press, 1987); A. Mitchell Polinsky, *Are Punitive Damages Really Insignificant, Predictable, and Rational? A Comment on Eisenberg et al.*, 26 J. LEGAL STUD. 663, 671 (1997).

consistently shows that punitive damages are rare and well-controlled by the judiciary, this remedy plays a significant role in driving settlements.”⁹

For those reasons, this article studies the incentives that a legal system creates when there is no restriction for driving settlements about punitive damages, such as, the Argentine system. We analyze this problem with game theory. First, we explain the theory with an ultimatum game. Second, we analyze the issue with settlements throughout offers and counteroffers: we study scenarios in which players have the same discount factor and when they have a different one. Third, according to behavioral law and economics theory, we include in our analysis, the players’ social preferences. Fourth, we study punitive damages settlements and their impact on the social interest to fulfill the main punitive damages’ goal: deterrence of harms according to the social desirable level of precaution. Finally, we provide some conclusions.

II. ULTIMATUM GAME

In this paper, we always assume (only for coherence in the exposition) for each game applied to the Argentine consumer legal context, on the one hand, that the player number 1 (*player 1*) is an alleged injurer (the defendant), who is a supplier of goods or services. On the other hand, the player number 2 (*player 2*) is always the injured party (the plaintiff), who is a consumer. (Of course, this is an arbitrary decision and we could choose an opposite one, without changing our conclusions.)

For didactic reasons, we start this explanation with a very simple game: an ultimatum game of settlements throughout a successive game, which is a zero-sum game, by two players. Consequently, player 1 (a supplier that was alleged injurer) will make an offer and player 2 (the injured consumer) would accept it or would reject it (without having the possibility of making a counteroffer). As we all know, in legal practice there is no restriction to make counteroffers. Nevertheless, we start with the explanation of an ultimatum game, which has this restriction, in order better to clarify the basic theory, and, after that, gradually explain more complex games.

⁹ See Thomas Koenig, *The Shadow Effect of Punitive Damages on Settlements*, 1998 Wis. L. REV. 170, 172 (1998).

Imagine that the supplier who was the alleged injurer has perfect information ($i_1 = 100\%$) and the expected punitive damages award that he will pay is ($p_d D$) is of \$100,000 ($i_1 p_d D = 1 \times \$100,000$). On the other hand, the injured consumer—with imperfect information—underestimates by 20% the expected punitive damages award that he will collect ($i_2 = 80\%$, consequently, $i_2 p_d D = 0.80 \times \$100,000 = \$80,000$).¹⁰ Besides this asymmetric information problem, assume that players have perfect information about the remaining aspects of the decision, and they are rational and risk-neutral. Consequently, because $i_1 p_d D > i_2 p_d D$, the negotiation margin is \$20,000 ($M = i_1 p_d D - i_2 p_d D = \$100,000 - \$80,000 = \$20,000$). To the contrary, whenever $i_2 p_d D > i_1 p_d D$ the disputants will not reach an agreement (because there is no negotiation margin: $M < 0$).

In addition, when disputants do not drive a bargain, the alleged injurer's expected punitive damages award is a negative consequence for him ($- i_1 p_d D$) because he has to pay it, and that of the injured consumer is positive ($+ i_2 p_d D$), because he will collect this award. Take into account that this is a zero-sum game, i.e. if one legal party gains an expected advantage from a court legal ruling or a settlement, the other party involved must suffer an equivalent expected disadvantage. Only when both players have perfect information ($i_1 = i_2 = 1$), their expected gains are $p_d D$, but with the opposite mathematical sign (negative for the wrongdoer [$- p_d D$] and positive for the victim [$+ p_d D$]).

Furthermore, when players reach a settlement (S), [1] occurs and the expected payments are $- S$ (negative) for the alleged injurer and $+ S$ (positive) for the injured consumer. [1]

$$i_2 p_d D \leq S \leq i_1 p_d D$$

According to [1], the amount of the settlement (S) will be between $i_2 p_d D$ and $i_1 p_d D$. On the one hand, the best agreement for the supplier is when that amount (S) equals the consumer's "expected" punitive damages award: $i_2 p_d D$ (according to the

¹⁰ Take into account that said percentage (i) will be equal to or greater than zero and it has no maximum limit (e.g., in case of a punitive damages award overestimation, $i > 1$ occurs).

consumer's imperfect information); that is to say, $S = i_2 p_d D = \$ 80,000$. On the other hand, the consumer's maximum expected payment is when that amount (S) equals the supplier's expected punitive damages award ($i_1 p_d D$); formally, $S = i_1 p_d D = \$ 100,000$.

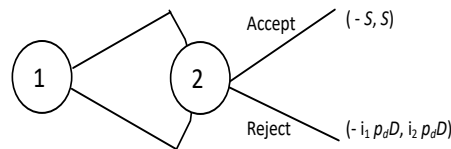


Figure 1

On the one hand, the strategy of player 1 is to offer an amount to drive a settlement (S) between $i_2 p_d D$ and $i_1 p_d D$ (respectively, between \$ 80,000 and \$ 100,000). On the other hand, the strategy of player 2 is a function of the offer of player 1. Player 2 must accept or reject the offer, and any threat of rejecting an offer should be credible by player 1.

Imagine that player 2 claims that he would reject the offer if $S < i_1 p_d D$ and, consequently, he would accept one if $S = i_1 p_d D$. Notice that this statement is a non-credible threat, because it would not be in the best interest of player 2 to do so. Under this simple ultimatum game, whenever S is higher than $i_2 p_d D$, he would maximize his expected payment accepting the offer (without taking into account whether $S < i_1 p_d D$). As a result, claiming that he would reject the offers in those cases would be a non-credible threat.

On the contrary, only accepting $S \geq i_2 p_d D$ is a credible threat giving by player 2 (and rejecting in any other case). With backward induction, player 1 foresees this credible threat and tries to maximize his expected payments, offering only $S = i_2 p_d D$. Because none of the players have another more beneficial strategy there is a subgame perfect Nash equilibrium (or for simplicity, a subgame perfect equilibrium), in which the expected payments are the followings: - $i_2 p_d D$, $i_2 p_d D$ (respectively, for player 1 and player 2).

Nevertheless, assuming that there is a minimum unit of money (such as, a cent), we would detect a second subgame perfect equilibrium. With his new assumption, player 2

accepts offers only if $S > i_2 p_d D$ (and he does not in any other case). As a result, player 2 adverts —with backward induction— that it is a credible threat, and, as a result, he offers $i_2 p_d D + \$0.01$. Thus, the payments for this new subgame perfect equilibrium are: $- i_2 p_d D - \$0.01$, $i_2 p_d D + \$0.01$. Notwithstanding, to simplify the exposition in this paper, we continue this analysis without assuming that there is a minimum money unit, assuming that it tends to zero; so, we accept as the only valid subgame perfect equilibrium the following: $- i_2 p_d D$, $i_2 p_d D$.

III. SETTLEMENT THROUGHOUT OFFERS AND COUNTEROFFERS

In this section, we analyze a more realistic case, according to legal practice. After player 1 makes an *offer*, player 2 will *accept* or will make a *counteroffer*. In the latter situation, player 1 will *accept* or will make a *counteroffer*, and so on. Notwithstanding, as a rule, this is a finite horizon negotiation game, in which there is a deadline to drive a settlement because, for instance, a final legal ruling or the prescription of legal action is going to take place sooner or later.

Assuming irrelevant the period of time in which the agreement is reached (we ignore inter-temporal discounting), the subgame perfect equilibria are the same than those in the case of an ultimatum game. The player who will make the *counteroffer* in the last period of the game will have all the bargaining power. Consequently, the expected payments will be $- i_2 p_d D$, $i_2 p_d D$ or $- i_1 p_d D$, $i_1 p_d D$, whether player 1 or player 2 will have, respectively, the opportunity to make the counteroffer in the last period.

A. Inter-temporal Discounting

According to financial theory ¹¹ and legal practice, it is unrealistic to assume that there is no opportunity cost of money, and, that receiving a monetary unit today is equal than receiving it in the future. Consequently, we should not ignore inter-temporal discounting in settlements.

¹¹ See RICHARD A. BREALEY ET AL., PRINCIPLES OF CORPORATE FINANCE 49-54 (The McGraw-Hill Companies, Inc., 2014).

The opportunity cost of money can be measured, in general, by a discount factor (f). To simplify, the value in today's monetary units of a monetary unit obtained by a player within t periods will be [2] (although in practice other factors may influence it). Variable r represents the difference between the market interest rate of the players (r_p) and the legal interest rate r_l ($r = r_p - r_l$). Only in the case where both are equal ($r_p = r_l$), r is zero ($r = 0$) and we can assume (without taking into consideration other potential influential factors) that the period to drive a settlement is irrelevant. Note that the discount factor may not be the same for each player (f_1, f_2) since in many cases, the interest rate (r_{p1}, r_{p2}) that each one faces would be different.

$$f = \frac{1}{(1+r)^t} \quad [2]$$

1. Players with the same discount factor

Assume that both players have the same discount factor (f) for each period. For instance, while the legal interest rate for each period is 2% ($r_l = .02$), the market interest rate is 7% ($r_p = .07$). Because interest rate r is the result of the latter one (r_p) minus the former one (r_l), the discount factor, according to [2] is 95% ($f = 1 / (1 + .05) = .95$).

Imagine a two-period settlement game ($t=0, t=1$). See Figure 2 where player 2 will make a counteroffer in the last period ($t=1$), having all the bargaining power—capturing the money of the negotiation margin “ M ” ($-i_1 p_d D, i_1 p_d D$)—. With backward induction, player 1 will foresee the following credible threat: in period $t=0$, player 2 will take into account the discount factor and will not accept offers that are not equal or better than that that will take place in period $t=1$ ($T \geq f i_1 p_d D$). Thus, in period $t=0$, player 1 maximizes his expected payments offering $T = f i_1 p_d D$. As a result, the payments for this subgame perfect equilibrium are $-f i_1 p_d D, f i_1 p_d D$.

In numbers, applying the same way of reasoning for a three-period settlement game ($t=0, t=1, t=2$), imagine that $p_d D = \$100,000$ in $t=2$, $i_1 = 100\%$, $i_2 = 80\%$, and $f = 95\%$ (see Figure 3).

Note that, in period $t = 2$, player 1 will have all the bargaining power. He will make a counteroffer of $T = i_2 p_d D = \$ 80,000$, so, the payments are - \$ 80,000, \$ 80,000. Consequently, in the period $t = 1$, player 2 will make a counteroffer of $T = f i_2 p_d D = 0.95 \times \$ 80,000 = 76,000$, since player 1 in that period credibly threatens to reject a settlement when $T > f i_2 p_d D$ (and accept in any other case); so, the payments will be - \$ 76,000, \$ 76,000. Finally, in the period $t = 0$, player 1 will offer $T = f_2 i_2 p_d D = 0.95^2 \times \$ 80,000 = \$ 72,200$, because in this period, player 2 will only accept offers that equal or improve his payment at $t = 1$ (f \$ 76,000). The payments for this subgame perfect equilibrium are - \$ 72,200, \$ 72,200.

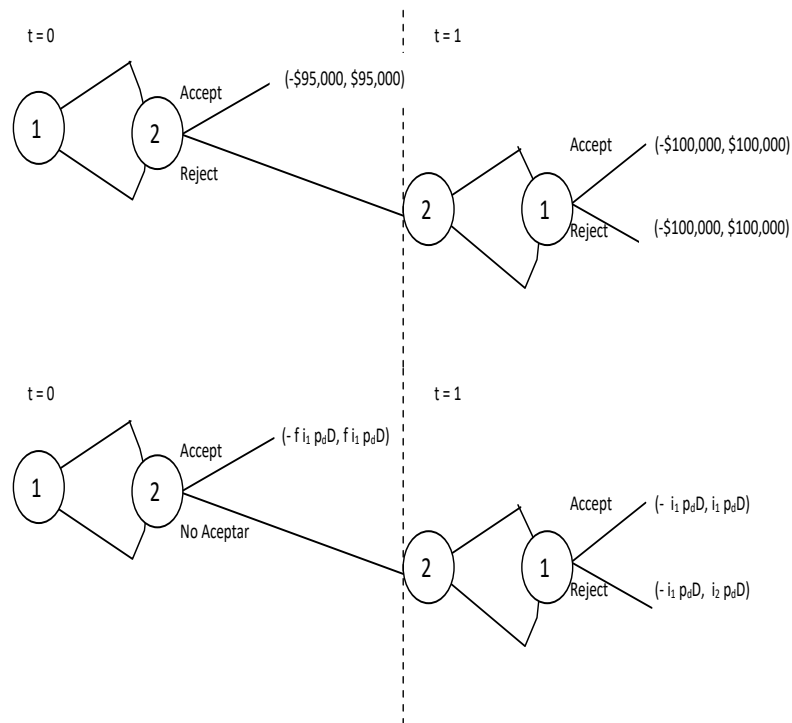


Figure 2

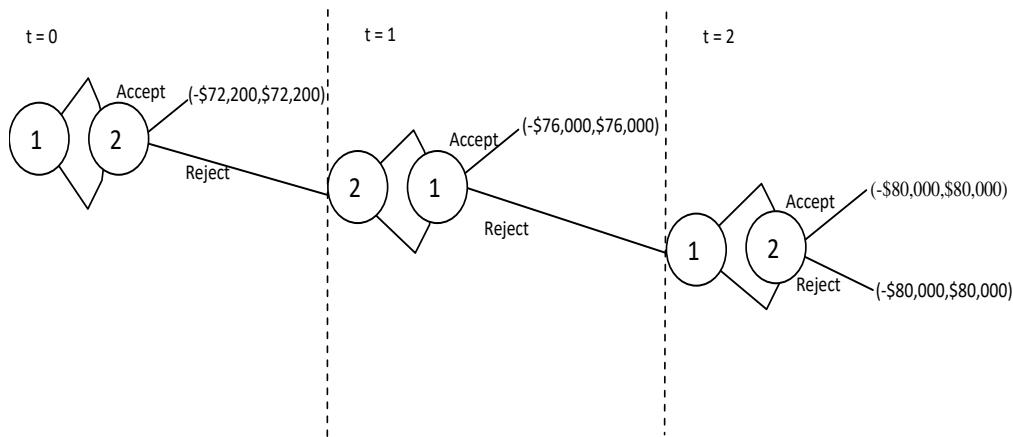


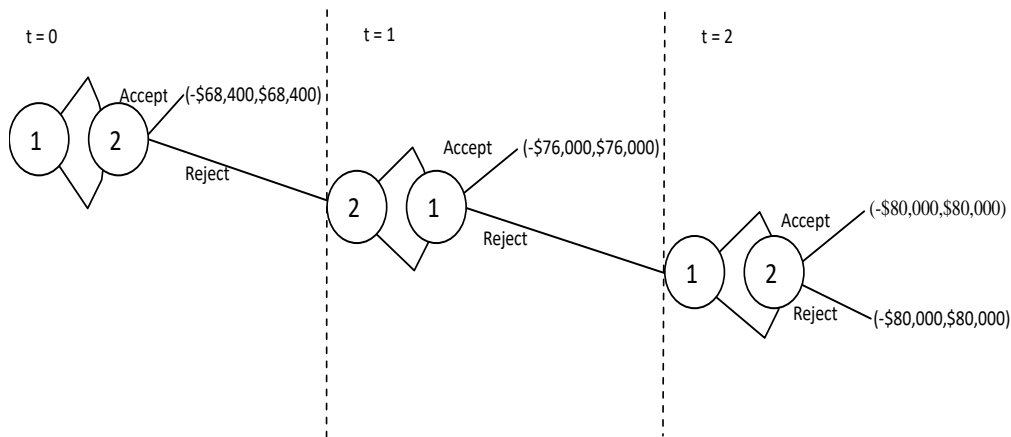
Figure 3

From the above, it can be stated that when a finite horizon with an odd number of periods (T) is presented, the payment of player 1 will be $(-f_T i_2 p_d D)$ and that of player 2 will be $(f_T i_2 p_d D)$. If instead, when the number of periods is even, the gains will be $(-f_T i_1 p_d D)$ and $(f_T i_1 p_d D)$ for player 1 and 2, respectively.

2. Players with different discount factors

Suppose now that players have different money opportunity costs. The legal rate is 2% ($r_l = 0.02$). For instance, while player 1 (the supplier of goods or services that was alleged injurer) is a solvent company (a legal person) with a borrowing capacity of 7% per period ($f_1 = 1 / (1 + 0.05) = 0.95$), the victim is a natural person (a living human being) who resorts to the financial market as a consumer, 13% per period ($f_2 = 1 / (1 + 0.11) = 0.90$).¹²

¹² For greater clarity, we work with very high rates. Also, keep in mind that periods can represent any time interval.



Suppose that we are dealing with a settlement game with three periods. Player 1, in period $t=2$, will make a counteroffer $T = i_2 p_d D = \$80,000$, with payments - \$80,000, \$80,000. Player 2, in the period $t=1$, will make a counteroffer $T = f_1 i_2 p_d D = 0.95 \times \$80,000 = \$76,000$ (note that player 1 will not accept if $T > f_1 i_2 p_d D$), with payments - \$76,000, \$76,000. In the period $t=0$, player 1 will offer $T = f_2 f_1 i_2 p_d D = 0.90 \times 0.95 \times \$80,000 = \$68,400$, because player 2 in this period will only accept offers that equal or improve his gain of $t=1$ ($f_2 \$76,000$). Thus, the following subgame perfect equilibrium payments are obtained (- \$68,400, \$68,400).

Note that when both had the same discount factor (f), the subgame perfect equilibrium payments were different - \$72,200, \$72,200. As can be seen, in this section player 1 is benefited, while player 2 is worse off. The higher the discount factor of player 1 is, *ceteris paribus*, the higher the likelihood of an agreement he will have, and the higher his expected gains will be.

IV. BEHAVIORAL LAW AND ECONOMICS: THE SOCIAL PREFERENCES

Up to the present, we have assumed according to the traditional economic literature that the players are selfish. They respond as a *homo economicus*; so, they intend to maximize their payments in each strategy, without taking into account the gains of others.

In this section, we will consider the existing transactions when the players respond to a different pattern. According to Behavioral Law and Economics theory,¹³ players are not moved exclusively by the maximization of their profits, but also, among others, by certain social preferences of justice and reciprocity.

The existence of those social preferences is well-known in the Behavioral Law and Economics literature¹⁴ and supported by results of experimental research projects.¹⁵ For example, following Gonzalo Olcina and Vicente Calabuig,¹⁶ the most common of those social preferences are the following three: reciprocity, aversion to inequality, and pure altruism.

First, *reciprocity* is defined as the prize for generosity or cooperation and the punishment for opportunism or non-cooperation. For instance, the reciprocity means a cost for the player who behaves with non-cooperation or opportunism.

Second, *aversion to inequality* is possessed by the so-called *homo equalis*. According to the named authors, the *homo equalis* is willing to resign part of his payment to reduce an inequality, which can be: [1] against him (and this is a strong preference); or [2] in his favor (a weak preference). Such behavior is similar to that carried out by those who have a preference for reciprocity, since both are based on the notion of a fair payment or behavior.

Third, *altruism* is an unconditional preference. It is not the response to another behavior, and therefore it is different from the previous two explained (in which, for instance, a punishment is a reaction of an unfair action or a cooperation is a consequence of other player's cooperation).

¹³ See: YORAM AMIEL & FRANK COWELL, THINKING ABOUT INEQUALITY. PERSONAL JUDGMENT AND INCOME DISTRIBUTIONS (Cambridge University Press, 1999); Matthew Rabin, *Psychology and Economics*, 36 J.ECON. LITERATURE, Mar. 1998 (issue 1), 11 (1998); Daniel Kahneman et al., *Fairness as a Constraint on Profits: Entitlements in the Market*, 76 AM. ECON. REV., Sep., 1986 (issue 4), 728 (1986).

¹⁴ See: Ernst Fehr & Klaus M. Schmidt, *A Theory of Fairness, Competition, and Cooperation*, 119 Q. J.ECON., 817 (1999); Matthew Rabin, *Incorporating Fairness into Game Theory and Economics*, 83 AM. ECON. REV. 1281 (1993).

¹⁵ See: Gary Charness & Matthew Rabin, *Understanding Social Preferences with Simple Tests*, 117 Q. J. ECON. 817 (2002); JOHN H. KAGEL & ALVIN E. ROTH (EDS.), THE HANDBOOK OF EXPERIMENTAL ECONOMICS (Princeton University Press, 1995).

¹⁶ GONZALO OLCINA & VICENTE CALABUIG, CONDUCTA ESTRATÉGICA Y ECONOMÍA: UNA INTRODUCCIÓN A LA TEORÍA DE JUEGOS [STRATEGIC CONDUCT AND ECONOMICS: AN INTRODUCTION TO GAME THEORY], 253 (Tirant Lo Blanch, 2002).

On the one hand, it is important to note that a selfish player can also cooperate, but as a way to maximize his payments; for example, in repeated games under situations of reciprocity. On the other hand, when a person has preferences for reciprocity and aversion to inequality, he collaborates in order to reach that correspondence and parity (even if the game is not going to be played again in the future). Finally, an altruistic player helps another player, regardless of the lack of reciprocity or a future game.

In addition, different sub-game perfect equilibria are going to take place because the individuals' preferences are heterogeneous. Consequently, following Olcina and Calabuig, we first study the settlement by an ultimatum game between players with social preferences (The following example is equally applicable to the different cases of settlements previously developed.)

We assume that this is a game with complete information about the profit and legal monetary award expected by the other player, but imperfect on the amount of that award estimated by each one, for instance, where $i_1 p_d D = \$100,000 > i_2 p_d D = \$80,000$.

To simplify the analysis in this section, we calculate the player's payments with their negotiation margin ($M = i_1 p_d D - i_2 p_d D = \$100,000 - \$80,000 = \$20,000$). Under the conditions [3], [4], and [5], we assume that if players drive a settlement, their aggregate winnings will be \$20,000 ($M = \$20,000$), where M_1 is the payment of player 1 and M_2 is the payment of player 2 (both belong to the interval $[i_1 p_d D, i_2 p_d D]$).

$$M = M_1 + M_2 \quad [3]$$

$$0 \leq M_1 \leq M \quad [4]$$

$$0 \leq M_2 \leq M \quad [5]$$

By way of illustration, if players drive a settlement for the amount of \$90,000, their payments will be \$10,000, \$10,000. While the injurer experiences a saving of \$10,000 ($m_1 = \$10,000$) over what he expected to pay ($\$100,000 - \$10,000 = \$90,000$), the victim receives an additional payment of \$10,000 ($M_2 = \$10,000$), over what he expected

to receive ($\$ 80,000 + \$ 10,000 = \$ 90,000$). See that when $M_1 = M_2 = \frac{1}{2} M$, then the players share the negotiation margin equally.

Also, the best settlement for the injurer (player 1) is $\$ 80,000$ ($T = i_2 p_d D$) and, consequently, the players' payments are $\$ 20,000$, $\$ 0$. On the contrary, the victim (player 2) will maximize his earnings when $T = i_1 p_d D = \$ 100,000$ ($\$ 0$, $\$ 20,000$). Finally, if there is no agreement, the game will finish and the payments will be $0,0$ (the players do not improve or worsen their pre-existing situation).

On the one hand, assuming that player 1 is selfish, his utility function is [6], where M_1 represents his gain.

[6]

$$U_1(M_1, M_2) = M_1$$

On the other hand, assuming that player 2 is averse to inequality, so, his utility function is [7]. M_2 represents his payment. The second and third terms, respectively, measure the decrease in their utility due to disadvantageous and advantageous inequality. Where $\alpha_2 \geq \beta_2$, since, in general, individuals suffer more when the inequality is of the first one (disadvantageous inequality). The condition of these parameters is that $\alpha_2 \geq 0$ y, $1 > \beta_2 \geq 0$. When $\alpha_2 = 0$, there is no aversion to the disadvantageous inequality and when the parameter $\beta_2 = 0$ the same thing happens, with respect to advantageous inequality. It is not logical to assume $\beta_2 = 1$ (or greater) since it would mean that the individual is willing to destroy a monetary unit of his payment to diminish his relative advantage (this restriction does not happen in α_2). It can be noticed that with a constant M_2 , the player maximizes his utility when $M_1 = M_2$. [7]

$$U_2(M_1, M_2) = M_2 - \alpha_2 \max\{M_1 - M_2, 0\} - \beta_2 \max\{M_2 - M_1, 0\}$$

Remember that in the ultimatum game in which both players are selfish (see utility function [6] or [7] with $\alpha_2 = \beta_2 = 0$) the subgame perfect equilibrium payments are $\$20,000$, $\$0$, where $T = i_2 p_d D = \$ 80,000$, $M_1 = \$ 20,000$, and $M_2 = \$ 0$.

In contrast, in this case studied, for example, only player 1 (the wrongdoer, who is a vendor of goods or services) is selfish (utility function [6]), while player 2 is adverse to inequality (see the utility function [7], with $\alpha_2 = 2.5$ and $\beta_2 = 0.50$). Consequently, the subgame perfect equilibrium changes.

Given player 1 has more bargaining power (ultimatum game), so, $M_1 > M_2$. There will only be a disadvantageous inequality for player 2, so his utility function is [8].

[8]

$$U_2(M_1, M_2) = M_2 - \alpha_2 \max\{M_1 - M_2, 0\} = M_2(1 + \alpha_2) - \alpha_2 M_1$$

If we differentiate the function [8] we obtain [9]. Thus, we can calculate what will be the reduction in the payment of player 1 (M_1), while maintaining constant the utility of player 2 (U_2), reduces the monetary gain (M_2) of player 2, in one unit [10].

$$d U_2 = (1 + \alpha_2) d M_2 - \alpha_2 d M_1 \quad [9]$$

$$\left. \frac{d M_1}{d M_2} \right|_{U_2} = \frac{(1 + \alpha_2)}{\alpha_2} \quad [10]$$

In other words, player 2 is indifferent between losing a monetary unit of his payment and reducing the other player's payment by 1 and 2/5 monetary units $[(1 + \alpha_2) / \alpha_2 = (1 + 2.5) / 2.5 = 1.40]$.

Because the players' negotiation margin (M) is \$ 20,000 and player 1 will make an offer for M_2 , we can replace said data in the utility function [8], obtaining [11].

[11]

$$U_2(\$20.000 - M_2, M_2) = M_2 - \alpha_2 ((\$20.000 - M_2) - M_2) = M_2 - \alpha_2 (\$20.000 - 2 M_2)$$

Thus, player 2 is indifferent between accepting or rejecting the settlement (T), when it is for the amount \$88,333.33, given that when his payment is $M_2 = \$ 8,333.33$, his utility of function [11] is equal to zero. Player 1 foresees that situation and will offer that amount, being the following perfect subgame equilibrium payments: \$11,666.67,

\$8,333.33. Note that if we replace these gains in functions [6] and [11], we obtain the same utility and gain for player 1 who is selfish (\$ 11,666.7), and a utility equals to zero (\$ 0) for player 2 (who is averse to inequality).

V. SOCIAL INTEREST AND PUNITIVE DAMAGES SETTLEMENT

As a rule, punitive damages are admitted against a wrongdoer when he behaves, for instance, under a serious disregard of the subjective rights of another person (the victim); thus, in these cases, once the illicit action was made, a punitive damages award transcends the private relationship between wrongdoer and victim.

For instance, in Argentina, Matilde Zavala de González said that the goals of a punitive damages award go further than a matter of pure individual interests and contains a social ingredient. According to this Argentine author, punitive damages should: erase the consequences of an unlawful act; dissuade the speculation of getting a benefit by harming others; and achieve prevention of similar harms that may affect other victims.¹⁷ In other words, Augusto R. Sobrino pointed out in the same country that "punitive damages exceed the victim's own individuality, and punitive damages' basic purpose is the protection of society in general, trying to prevent new damages from occurring."¹⁸

Therefore, at least in the Argentine consumer law context, the functional importance of punitive damages cannot be ignored. The general deterrence named above can be hampered by private agreements without further publicity. Furthermore, if $T \geq p_d D$ is not met, punitive damages will not carry out their function of optimal (or socially desirable) deterrent and, therefore, they will lose their reason to exist.

¹⁷ MATILDE ZAVALA DE GONZÁLEZ, RESARCIMIENTO DE DAÑOS [COMPENSATION FOR DAMAGES], DAÑOS A LAS PERSONAS [INTEGRIDAD ESPIRITUAL Y SOCIAL] [DAMAGE TO PEOPLE [SPIRITUAL AND SOCIAL INTEGRITY]] 453 (Hammurabi, 1999).

¹⁸ The translation is ours. Sobrino explains in his own Spanish words, the following: "(...) *los daños punitivos exceden la propia individualidad de la víctima, y tienen por finalidad básica la protección de la sociedad en general, para tratar de prevenir y evitar que nuevos daños puedan llegar a producirse.*" See SOBRINO, Augusto R., *Los Daños Punitivos: Una Necesidad de la Postmodernidad* [Punitive Damage: A Need for Postmodernity], 1996- III EL DERECHO, 979.

As we explained in previous works, punitive damages must be faced by the one who, with a serious violation of the law, speculated with the low probability (less than one hundred percent) of being condemned for the total real value of the caused/expected harm.¹⁹ Socially desirable incentives are restored when punitive damages are admitted and quantified correctly; for example, by the appropriate mathematical formulas available to legal operators,²⁰ which are applied in Argentina.²¹ In other words, the optimal incentives are reestablished when compensatory damages are awarded plus the necessary amount for punitive damages to dissuade similar illicit acts. Accordingly, in the “Third Euro-American Congress for the Legal Protection of Consumers” (2010) unanimously approved the following conclusion: “the civil fine [punitive damages] must not be less nor higher than the amount necessary to fulfill its dissuasive function.”²² However, if a settlement for punitive damages is reached for an amount lower than that that is necessary to reestablish those optimal incentives ($T < p_d D$), punitive damages' deterrence goal cannot be reached and more than the tolerated socially harms will occur.

¹⁹ See: Matías Irigoyen-Testa, *Daños Punitivos: Análisis Económico del Derecho y Teoría de Juegos* [*Punitive Damage: Economic Analysis of Law and Game Theory*], JURISPRUDENCIA ARGENTINA 2006-II-1024. On this subject, see the traditional theory of Economic Analysis of Law: ROBERT D. COOTER & THOMAS ULEN, *LAW AND ECONOMICS* 314 (Addison-Wesley Educational Publishers Inc., 1997); ROBERT D. COOTER, *Punitive Damages for Deterrence: When and How Much?*, 40 *Ala. L. Rev.* 1143 (1988-1989); ROBERT D. COOTER, *Economic Analysis of Punitive Damages*, 56 *S. CAL. L. REV.*, 79 (1982); A. Mitchell Polinsky & Steven Shavell, *Punitive Damages*, THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW, DISCUSSION PAPER (JOHN M. OLIN CENTER FOR LAW, ECONOMICS, AND BUSINESS) (Harvard Law School, 1997); RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* (Little, Brown and Company, 1992).

²⁰ On the traditional mathematical formula of Economic Analysis of Law, see: Cooter & Ulen, *supra* note 19; Cooter, 1988-1989, *supra* note 19; Cooter, 1982, *supra* note 19; Polinsky & Shavell, *supra* note 19; Posner, *supra* note 19. On mathematical formulas that seek to improve the traditional one, consult: Matías Irigoyen-Testa, *Fórmulas para cuantificar los Daños Punitivos* [*Math formulas to calculate Punitive Damages*], 13 JURISPRUDENCIA ARGENTINA, L. & ECON. SPECIAL ISSUE 83-96 (2011).

²¹ Matías Irigoyen-Testa, *Aplicación jurisprudencial de una fórmula para daños punitivos* [*Jurisprudential application of a math formula for punitive damages*], JURISPRUDENCIA ARGENTINA, L. & ECON. SPECIAL ISSUE, 137-46 (2014).

²² The translation is ours. In Spanish: “*la multa civil [daños punitivos] no debe ser inferior ni exceder el monto necesario para cumplir con su función de disuasión.*” See “Conclusiones de las III Congreso Euroamericano de Protección Jurídica de los Consumidores. En homenaje al profesor doctor Roberto M. López Cabana. Celebrado en Buenos Aires, Argentina, entre el 23 y el 25 de Setiembre de 2010 en la Facultad de Derecho de la UBA” [“Conclusions of the Third Euro-American Congress for the Legal Protection of Consumers. In honor of Professor Dr. Roberto M. López Cabana. Held in Buenos Aires, Argentina, between September 23 and 25, 2010 at the Law School, Buenos Aires University”], organized jointly by Cantabria University, Spain, and Buenos Aires University, *elDial.com* - CC2244, available at http://www.eldial.com.ar/nuevo/lite-tcc-detalle.asp?id=8807&id_publicar=11376&fecha_publicar=01/10/2010&camara=Documento&base=99

Under the theory developed in this paper, the settlement (T) belongs to the interval $[i_2 p_d D, i_1 p_d D]$ and there is an inefficient settlement when $T < p_d D$. Unfortunately, we can reasonably predict that only in exceptional cases, $T \geq p_d D$ occurs; this would happen exclusively when the following conditions happen simultaneously:

a.-) The wrongdoer (player 1) must have perfect information, or imperfect information overestimating the expected punitive damages award ($i_1 \geq 100\%$).

b.-) The victim, in principle, must have perfect information about the punitive damages award that the wrongdoer expects, according to the wrongdoer's point of view ($i_1 p_d D \geq p_d D$) and, consequently, the victim should never assume that $i_1 p_d D < p_d D$ occurs.

c.-) The victim must have all the bargaining power, being the person who is legally allowed to make the last counteroffer (being null any previous agreement or negotiation in order to restring this right).

d.-) Both players must be selfish and have no social preferences.

e.-) The victim must have a discount factor (δ) greater than or equal to that corresponding to the wrongdoer.

As we can observe, these requirements will never or almost never be given simultaneously; so the wrongdoer will generally achieve $T < p_d D$. Otherwise, he will not reach an agreement.

Unfortunately, there is, in principle, an asymmetric problem of information in this game against the victim and, consequently, an inefficient (or no socially desirable) settlement, as a rule, will occur. The wrongdoer is the one that, in principle, is better informed about the possible admission or not of punitive damages. He committed or not committed the illicit act and therefore, he knows perfectly what is true or is not true in a lawsuit against him. Furthermore, the victim has to prove the wrongdoer's malice or recklessness (or at least, gross negligence) to collect punitive damages. This is why the victim often faces a complicated burden of proof. In addition, in general, the defendant will have more data about whether this evidence exists (evidence about an unlawful act that he performed or not performed), whether he can hid it and, consequently, about how likely that evidence against him can be brought to the judicial process (a

circumstance that, in general, may be overvalued or undervalued by a victim). Therefore, the wrongdoer will have more information about the expected monetary punitive damage award. He may also, in general, have statistical data about the probability of being condemned by punitive damages in similar cases and he would know whether is possible to hide elements of evidence against him, if it would be necessary. Consequently, under the assumption of rational players, if the victim estimates that according to the wrongdoer's point of view $i_1 p_d D < p_d D$ and he wants to reach an agreement, in any case, he will never offer a settlement in which $T \geq p_d D$ (so, parties will drive an inefficient [or no socially desirable] punitive damages settlement).

On the other hand, players can be risk-averse, risk-neutral or risk-loving. It is likely that a company (provider of goods and services) is risk-neutral while a private individual (a consumer) making a claim for a harm suffered is risk-averse. This can be inferred because a person's marginal utility of his wealth is a decreasing function of his wealth. *Ceteris paribus*, the greater a person's assets (physical or legal person), the lower his or her risk aversion. Thus, assuming that a legal person has, in general, a greater asset than a physical person, the latter is more risk-averse than the former one. However, this situation of imbalance between the players can be neutralized if we consider that a punitive damages award will set a judicial precedent against the wrongdoer, will increase the risk of future punitive damages awards, and thus, will increase the wrongdoer's particular aversion to the risk of future punitive damages awards. In this regard, on the other hand, remember when parties drive a secret settlement will set no judicial precedent, no legal ruling will be made public, and the main goal of punitive damages will be ever more difficult to be met: deterring other potential wrongdoers.

Likewise, there is ample empirical evidence that indicates that many individuals have social preferences (e.g., aversion to inequality) and, therefore, are not selfish.²³ Suppose that $i_1 p_d D = p_d D > i_2 p_d D$, this heterogeneity of the players prevents the achievement of $T = p_d D$ since it will tend to be $T = (i_1 p_d D + i_2 p_d D)/2 < p_d D$.

Finally, according to the discount factor studied (f), in general, when the wrongdoer is an entrepreneur he will be more solvent than a private individual (victim). As a rule,

²³ See Olcina & Calabuig *supra* note 16, at. 256.

the entrepreneur will be exposed to less financial costs than a consumer and his conversion factor will be higher than that of a consumer (victim). Consequently, the entrepreneur (wrongdoer) will have a more favorable financial situation that will help him to obtain an agreement in which $T < p_d D$.

6. CONCLUSION

For all the above reasons, we conclude that being aware that, as a rule, wrongdoers and victims could have imperfect information about an expected punitive damages award, it is socially desirable to partially restrict the admission of a punitive damages settlement, accepting its judicial approval in a restrictive manner.

In order for the victim to have all the bargaining power for punitive damages settlements—and in this way, it would be more feasible that the main function of punitive damages (optimal deterrence of harms) be fulfilled—, the law must prescribe that only the victim is legally allowed to make the last counteroffer, during the negotiation in order to obtain a valid settlement. Furthermore, any agreement between wrongdoer and victim to restrict this victim's right is null.

In any case, the judicial homologation of a punitive damages settlement cannot be carried out when it undercuts the main function of punitive damages (optimal deterrence) that gives them their reason to exist (i.e., when $T < p_d D$).