

# Access to Justice and Litigation Trade-off: A Theoretical Analysis

Preliminary Draft (September 2008)

Margherita Saraceno\*

## Abstract

This paper presents a simple model of disputes resolution both from a macro-perspective (social planner's problem) and from a micro-perspective (parties' choice). Furthermore, it analyzes the effects of a number of policies on: a) victim's access to justice, b) parties' choice between settlement and litigation, c) social costs of disputes resolution. Our research extends the existing literature by showing that reducing litigation rate is not always socially efficient. Rather, in many cases, a social trade-off exists between curbing litigation and enhancing access to justice. Using this framework, we derive policy implications for access to justice and judicial economy.

*Keywords:* access to justice, litigation, legal aid, uncertainty.

*JEL classification:* K41.

---

\*University of Milano-Bicocca and Paolo Baffi Centre on Central Banking and Financial Regulation. E-mail: margherita.saraceno@unimib.it. I wish to thank Paolo Colla, Lisa Crosato, Lucia Dalla Pellegrina, Giuseppe Dari-Mattiacci, Giorgio Rampa, and Neil Rickman for useful suggestions. The usual disclaimer applies. Comments are appreciated.

# 1 Introduction

Disputes naturally occur in every complex society. Disputes emerge among citizens, between criminals and their victims, or the State, between firms and workers, producers and consumers, and citizens and institutions<sup>1</sup>. Parties of a dispute are directly affected by the events which determine it and they are interested in the dispute resolution. Particularly, who suffers a damage usually wants to receive a relief and satisfy his own sense of justice<sup>2</sup>. However, disputes and their resolutions are not only a private problem, but also a social one. Disputes produce negative externalities for the whole society. In fact, unsolved disputes can lead to a sense of impunity and misconducts are left undeterred<sup>3</sup>. In extreme situations, when a legal system of disputes resolution<sup>4</sup> is missing or inaccessible, disputes can lead to disorders and violence. When access to justice is guaranteed<sup>5</sup>, disputes can be resolved by legal “private” systems as settlement, or by public systems as litigation.

According to the United Nation Development Program (UNDP, 2004), access to justice denial for people who need legal remedies is a crucial problem of development and social efficiency<sup>6</sup>. However, policy makers underline further problems due to judicial diseconomies and inefficiencies linked to the excessive amount of litigation and consequent courts’ workloads<sup>7</sup>. Law and economics literature focuses on costly litigation *versus* settlement and other alternative disputes resolution means<sup>8</sup>. However,

---

<sup>1</sup>UNDP (2004) and (2002). On conflict theory see Hirshleifer (2001), pp. 7-21 and 131-163.

<sup>2</sup>See Cappelletti (1979), particularly, Cappelletti and Garth (1979).

<sup>3</sup>See UNDP (2004). On negative externalities due to disputes, see also Posner (1973), Shavell (1999a), (1997), and (1982b), and Cooter and Rubinfeld (1989).

<sup>4</sup>According to UNDP (2002), justice institutions are established by law, either formal or customary.

<sup>5</sup>According to the UNDP (2002), an environment of corruption, lack of respect for the rule of law, impunity and lack of accountability illegitimizes the legal framework and enhances violence and conflicts.

<sup>6</sup>Access to justice is scarcely analyzed in law and economics literature. Mainly, theoretical literature concerns access to justice problem in specific contexts as “small claims”. See, for instance, Shaffer and Nordstrom (2007). However, access to justice problem is deeply analyzed by UNDP (2002) and (2004) and World Bank (2006a) and (2006b) from a development perspective. On access to justice movement and related problems, see also Shavell (1999a), Sinnar (2002), Sommerland (2004), Mattei (2006), Stratto 2007, and Varano and De Luca (2007). New contributions on access to justice from an applied law and economics perspective are in Barendrecht, Mulder and Giesen (2006).

<sup>7</sup>See CEPEJ (2006) on Europe. See also Silver (2002) and Djankov, La Porta, Lopez-de-Silans and Shleifer (2003). For statistics on the United States, see Cohen and Smith (2004).

<sup>8</sup>See Landes (1971), Gould (1973), Posner (1973), Shavell (1982a), (1995) and

the literature usually analyzes these two problems separately, despite their evident interconnections<sup>9</sup>. Particularly, a trade-off between increasing access to justice and reducing litigation seems often to emerge<sup>10</sup>. The problem is relevant from the policy perspective. On the one hand, policy makers study amendments and reforms of procedural rules in order to reduce courts' workloads and linked social costs<sup>11</sup>. On the other hand, they debate on the suitability of procedural rules to enhance access to justice for victims who are usually excluded from the legal system<sup>12</sup>. For example, policy makers can discourage turning to the courts by designing procedures and rules which make litigation more expensive for parties. However, this kind of policies can negatively affect access to justice for victims. Furthermore, policy makers might enhance access to justice by reducing victim's litigation costs, while increasing litigation. This means that policies on both litigation rate and access to justice often determine a trade-off. Thus, the problem is to understand how policies simultaneously affect access to justice and litigation. Finally, it is important to verify the total effect of policies on social costs of disputes resolution.

The paper presents a simple model of the disputes resolution problem from a macro-perspective (social planner's problem) and from a micro-perspective (parties' choice). Furthermore, the paper analyzes policies as litigation tax, legal aid, punitive damages, policies on legal merit and uncertainty of law, and costs shifting, and their effects on social costs of disputes resolution. For the sake of simplicity, this paper considers only monetary civil cases<sup>13</sup>, however many implications derived from it have a certain generality.

Let us explain our approach. When a dispute arises, it could be resolved privately. We include among "private" systems of disputes res-

---

(1999b), P'ng (1983), Reinganum and Wilde (1986), Mnookin (1993), Hay and Spier (1998), Lederman (1999), Spier (2003), and Dari-Mattiacci (2007b). On the relationship among courts, justice and efficiency, from a multidisciplinary perspective see Fix-Fierro (2004).

<sup>9</sup>On a related perspective, see Silver (2002). The Author analyzes the problem of excessive expensiveness of litigation in the United States. He confirms that the system is very expensive. However, probably it does not cost too much: "(...Scholars) may realize that a country's legal system supports its economic system and that the two must be considered together. Any society could reduce litigation costs dramatically by eliminating its courts, but the need to resolve disagreements would remain and the burden on economic development could be substantial".

<sup>10</sup>See Posner (1973), and Shavell (1997).

<sup>11</sup>See Silver (2002), Taruffo (2005), and CEPEJ (2006).

<sup>12</sup>See Posner (1973), Shavell (1997), UNDP (2002) and (2004), WB (2006a) and (2006b).

<sup>13</sup>In such a context rationality and risk neutrality, that are common in the law and economics literature, can be accepted. See Shavell (2003).

olution (ADR) any legal mechanism of disputes resolution alternative to a public one (PDR). For instance, we consider settlement, arbitration, mediation and conciliation as ADR. ADR work without any cost (or with very low costs) for third parties and for society. Parties agree on a negotiated remedy (settlement, conciliation, mediation) or on a method to solve the dispute and accept consequent outcomes (arbitration). Efficient ADR can allow victims to obtain relief and justice and can determine positive externalities by deterring misbehavior. However a point has to be underlined. A legal private system of disputes resolution can exist only as a complement of a public one. A bargaining mechanism between parties can effectively clear a dispute only if the resulting contractual solution is enforceable. Thus, a private disputes resolution system needs a public one to work<sup>14</sup>.

Litigation can be considered as the main public disputes resolution system (PDR). By applying laws and procedural rules, judges and courts constitute the PDR of modern countries. Litigation do not need a parties' agreement to work. In fact, by litigation, a party can reach an enforceable solution against the other party. An effective public system allows victims to obtain redress and justice. PDR can also produce positive externalities by deterring misbehavior as well as a private system does. PDR is costly for society. It can also produce additional positive externalities which a private system does not<sup>15</sup>. Particularly, judges' decisions set precedents and allow principles and rights to be affirmed. Finally, public disputes resolutions enhance a legal environment of rights protection. In addition, PDR might be more effective than private solutions in deterring misconducts through reputational mechanisms and others. However, for the sake of simplicity, the paper focuses on the fact that society bears social costs due to PDR, while ADR is socially free cost.

If a legal system is missing<sup>16</sup> or inaccessible<sup>17</sup>, access to justice is denied to victims and disputes remain unsolved, or are violently solved.

---

<sup>14</sup>In the literature ADR and PDR are mainly considered as substitutes. See Shavell (1995). However, our statement about complementarity is strengthened in Subsection 2.2., where the model shows that people must be able to proceed before the court also when settlement is preferable.

<sup>15</sup>See Posner (1973), Shavell (1997) and (1999b), and Dari-Mattiacci (2007b).

<sup>16</sup>According to UNDP (2004), supply of remedies includes capacities enabling adjudication of decisions, enforcement of remedies and accountability of the process through civil society and parliamentary oversight.

<sup>17</sup>Justice remedies (PDR or ADR) are not always available, yet even when they are available, people may not always make use of them. Demand for remedies relates to the key skills people need to seek remedies through PDR and ADR, including legal awareness, legal aid, and other legal empowerment capacities. See, UNDP(2002), and (2004).

Violent disputes resolution (VDR) is costly for society, because of the consequent costs of underdeterrence and violence.

From an aggregate perspective, the social planner has to simultaneously minimize social costs of VDR (this case includes also unsolved claims) and social costs of PDR. However, the social planner cannot directly determine how disputes are solved. In fact, the choice of dispute resolution system depends on how parties of a dispute decide to solve it.

Thus, in order to analyze the social planner's problem, we have to understand the problem below: how the parties in conflict choose their preferable dispute resolution system<sup>18</sup>. Let us introduce an example. The social planner sets up PDR. A victim suffers a damage by an injurer and wants a remedy. Parties choose to litigate before the court, or to settle out of court, or to violently solve their dispute. The parties' choice depends on effective availability of PDR for the victim.

The main results of the paper are as follows:

*Access to justice.* Victims choose whether to access justice on the basis of their expected trial outcome and budget constraint. Wealth, confidence in success of trial, and high damage redress enhance access to justice. High victims' litigation costs can prevent access to justice and consequently, every type of legal solution of disputes.

*Litigation vs settlement.* Parties choose between settlement and litigation only if victims can access justice. Differently with respect to the existing literature, the model shows that victims' litigation costs and amount at stake have ambiguous effects on settlement<sup>19</sup>. High victims' litigation costs and low damage redress make litigation more expensive for victims and enhance settlement. However, if victims' litigation costs are sufficiently high, or damage redress sufficiently low, settlement decreases because victims cannot access justice. As usual, the probability of settlement negatively depends on the divergence between the victim's and injurer's beliefs on the litigation's outcome while litigation positively does. Furthermore, as common in the literature, litigation depends negatively on parties' litigation costs and positively on the amount at stake.

*Social costs of disputes resolution and policies analysis.* The paper provides a theoretical framework to analyze several policies and their

---

<sup>18</sup>A broad literature concerns the determinants of the rate of litigation and settlement. See Gould (1973), P'ng (1983), Mnookin (1993), Hay and Spier (1998), Lederman (1999), and Spier (2003). However this literature usually do not consider whether legal remedies, private or public, are effectively accessible. Authors analyze when parties litigate and settle, given that victims can legally proceed.

<sup>19</sup>Usually the literature on litigation and settlement (see note 143, and in Section 2, note 32), describes a positive effect of increased litigation costs and reduced amount at stake on settlement rate. However the literature usually does not consider any kind of access to justice constraint.

effects on social costs of disputes resolution. Actually, from a social perspective, often a trade-off exists between improving access to justice and reducing litigation. For a given amount of access to justice, reductions in the probability of litigation benefit society by reducing expected social costs of disputes resolution. However, discouraging litigation by policies which also reduce access to justice can be socially detrimental. Thus, some policies on access to justice or litigation have ambiguous effects on expected social costs of disputes resolution. This is the case of litigation tax paid by victims and punitive damages in favour of victims. However, other policies can unambiguously reduce expected social costs. Litigation tax charged to injurer, punitive damages in favour of the State, and fines benefit society of reductions in the probability of litigation while not affecting access to justice. Also legal aid reduces expected social cost of disputes resolution. Furthermore, the paper analyzes the influence of legal merit, uncertainty of law and rules of costs shifting.

The paper is organized as follows: Section 2 presents our simple model. In Section 3, the effects of a number of policies on a) victim's access to justice, b) parties' choice of litigating before the court, c) expected social costs due to disputes resolution, are analyzed. Particularly we consider policies as litigation tax, punitive damages, legal aid, policies affecting legal merits and uncertainty of law, and costs shifting. Section 4 describes the main policy implications of the model and concludes.

## 2 The Model

### 2.1 The social planner's problem

From a macro-perspective, the social planner's problem can be defined as follows. Disputes which emerge in society should be resolved<sup>20</sup>. Disputes can be legally solved by PDR such as litigation in court, or by ADR as settlement. Otherwise disputes are solved by VDR.

- PDR is costly for society<sup>21</sup>. Every dispute solved by PDR has a constant social cost  $K_{PDR}$  financed by the taxpayers.
- Alternatively, disputes can be solved by ADR. This system of disputes resolution is assumed not to be costly for society. We can also

---

<sup>20</sup>In the model disputes are assumed as exogenously determined. Endogenous disputes would complicate our analysis without being crucial to our research.

<sup>21</sup>For instance, according to the statistics of CEPEJ (2006), the annual budget allocated to all courts without prosecution and legal aid per inhabitant (year 2004) was 28.7 euros in Denmark, 36.6 in France, 47 in Italy, 52 in Spain, 8.1 in the United Kingdom, 46.6 in the Netherlands. According to the United States Council of Economic Advisers annual direct costs of the US tort system is around 1.8 percent of GDP (year 2002).

assume that ADR is simply less costly than PDR and normalize the ADR social cost to zero.

- If disputes are solved by VDR (this case includes unsolved claims), society bears the social cost of this solution. Social cost of VDR includes social costs of violence, underdeterrence, and others negative externalities. Every dispute solved by VDR has a constant social cost  $K_{VDR} \geq K_{PDR}$ <sup>22</sup>.

Let us normalize the total number of disputes to 1. The social planner's problem can be summarized as in Figure 1.

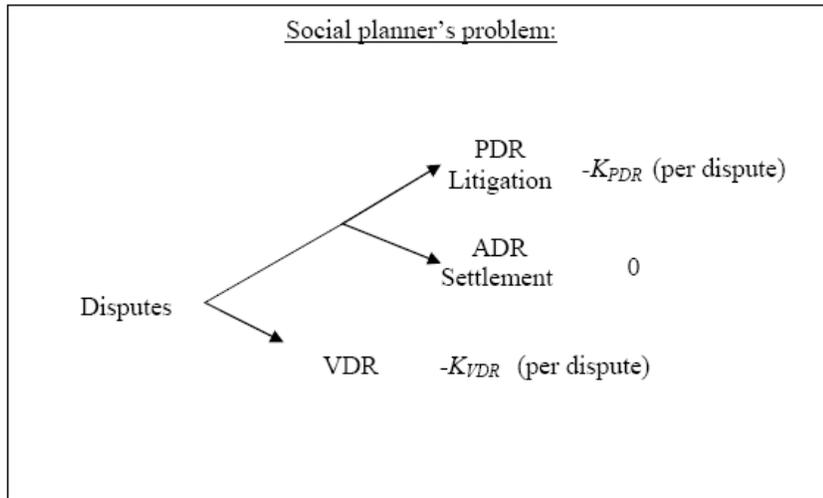


Figure 1

Thus, the social planner should minimize the total expected social cost of dispute resolution that is defined as:

$$\Sigma = \Pr(VDR)K_{VDR} + \Pr(PDR)K_{PDR} \quad (1)$$

where  $\Pr(VDR)$  is the probability that a dispute is solved by a violent disputes resolution system and  $\Pr(PDR)$  is the probability that a dispute is solved by litigation.

It is evident that the first best solution for the social planner who wants to minimize the expected social cost of disputes resolution, would

<sup>22</sup>We aggregate unsolved and violently solved disputes. As explained in Section 1, unsolved or, worse, violently solved disputes are a cost for the society. By assuming  $K_{VDR} \geq K_{PDR}$  we are simply recognizing the high negative impact of impunity, violence and underdeterrence on society, as well described in WB and UNDP reports on access to justice. The assumptions of constant social costs could be relaxed in further extensions.

be that all the disputes were solved by ADR, with null social costs. However, as explained above, an ADR system needs a credible and working PDR system to work itself. So that, the social planner must always guarantee PDR. Furthermore, being  $K_{VDR} \geq K_{PDR}$ , by assumption, the second best solution for the social planner would be no disputes solved by VDR.

However, the social planner cannot directly determine  $\Pr(VDR)$  and  $\Pr(PDR)$ . In fact, these probabilities depend on how parties of a dispute decide to solve it. The social planner can only affect these probabilities by some policies which influence parties' choices. Thus, in order to study the social planner's problem, we have to analyze how the parties of a dispute choose the dispute resolution system.

## 2.2 The parties' problem

From a micro-perspective, in order to analyze how the victim  $V$  and the injurer  $I$  behave in case of monetary dispute, define:

- $q_V \in (0, 1)$  as the victim's subjective probability of prevailing in litigation (victim's belief).
- $q_I \in (0, 1)$  as the injurer's subjective probability of victim's success in litigation (injurer's belief).

Parties, who are rational and risk neutral, have subjective beliefs on the litigation outcome because of the uncertainty of the case<sup>23</sup>. Beliefs of parties are assumed to become common knowledge once dispute has arisen<sup>24</sup>.

- $D > 0$  as the damage compensation awarded by the court in a judgement in favour of the victim. This amount at stake is common knowledge because we assume no court's error over the damage magnitude<sup>25</sup>.

---

<sup>23</sup>On uncertainty, information asymmetries, and parties' beliefs in litigation, see Shavell (1982), Bebchuk (1984), Cooter and Rubinfeld (1989), and Dari-Mattiacci (2007b).

<sup>24</sup>Also when subjective probabilities become common knowledge they can diverge. In the law and economics literature, divergences between parties beliefs are usually considered the main explanation of failures in settlement. Authors often rely on "relative optimism" and omit to consider how this divergence between parties arises (see Bebchuk, 1984 and Shavell, 2005). According to a recent literature, divergent beliefs and common knowledge are not in contradiction with rationality when the initial beliefs of the parties differ (see Gilboa, 1992) or people have differing priors (see Van de Steen, 2005).

<sup>25</sup>Thus, in the model, the uncertainty of litigation outcome depends only on the uncertainty of causation (the injurer's liability), and not on the damage magnitude.

- $C_V$  and  $C_I$  as positive litigation costs borne by the victim and injurer respectively, to litigate before the court. Litigation costs are assumed allocated according to the “American rule”: every party bears his/her own litigation cost. Litigation costs include lawyers fees, taxes and court’s fees, and every other costs linked to litigation borne by parties<sup>26</sup>.
- Parties can avoid the trial by settling the case and thereby saving on litigation costs. As commonly assumed in the literature<sup>27</sup>, settlement costs are smaller than litigation costs. We normalize settlement costs to zero.
- For the sake of simplicity, if the dispute is resolved by VDR, it simply remains unresolved and the victim does not obtain any kind of relief. Thus, the payoff of VDR is zero for both parties.

### 2.2.1 Without budget constraint

When an accident occurs and a dispute arises, the victim has to choose whether to access justice and then solve the dispute by PDR or ADR. If victim does not access justice, the dispute remains unsolved (VDR). What does access to justice means?

Let us begin by assuming that there are no budget constraints for parties in disputes. A victim has to evaluate litigation (PDR) as preferable to VDR in order to decide to access justice and sue her injurer. This condition is necessary also when settlement (ADR) is preferable to litigation. Otherwise victim’s threat to sue is not credible for the injurer and no legal action follows at all<sup>28</sup>. Recalling that, in case of VDR, parties’ payoff is zero, the victim accesses justice if and only if her expected litigation outcome ( $q_V D - C_V$ ) is nonnegative, thus if:

$$q_V \geq \frac{C_V}{D} \tag{2}$$

This condition determines when the victim accesses justice. Only when the access to justice constraint (2) holds, the victim can evaluate litigation *versus* settlement. She prefers settlement only when she can bargain a settlement amount ( $S$ ) greater than her expected litigation outcome, thus when:

---

<sup>26</sup>Also costs due to delays and inefficiencies in trial which affects parties can be included.

<sup>27</sup>See, for instance, Hay and Spier (1998) and Daughety and Reinganum (2005).

<sup>28</sup>This point well explains the complementarity of ADR to PDR. ADR cannot substitute ADR. ADR can be only an alternative solution to PDR when PDR is feasible.

$$q_V D - C_V < S \quad (3)$$

Obviously, the injurer accepts the settlement agreement only if  $S$  is smaller than his expected litigation outcome ( $q_I D + C_I$ ), thus when:

$$q_I D + C_I > S \quad (4)$$

Rearranging (2), (3) and (4), settlement occurs when two conditions are simultaneously satisfied:

$$q_V \geq \frac{C_V}{D}; \text{ and } (q_V - q_I) < \frac{C_V + C_I}{D} \quad (5)$$

Obviously litigation occurs when  $q_V \geq \frac{C_V}{D}$  and  $(q_V - q_I) \geq \frac{C_V + C_I}{D}$ . These two conditions can be written also as:  $q_V \geq \frac{C_V}{D}$  and  $q_V \geq \frac{C_V + C_I}{D} + q_I$ , where, as we know,  $q_I \in (0, 1)$ . Obviously when the second holds, the first is always satisfied and results redundant. Thus parties litigate simply when:

$$(q_V - q_I) \geq \frac{C_V + C_I}{D} \quad (6)$$

Figure 2 summarizes the problem explained above.

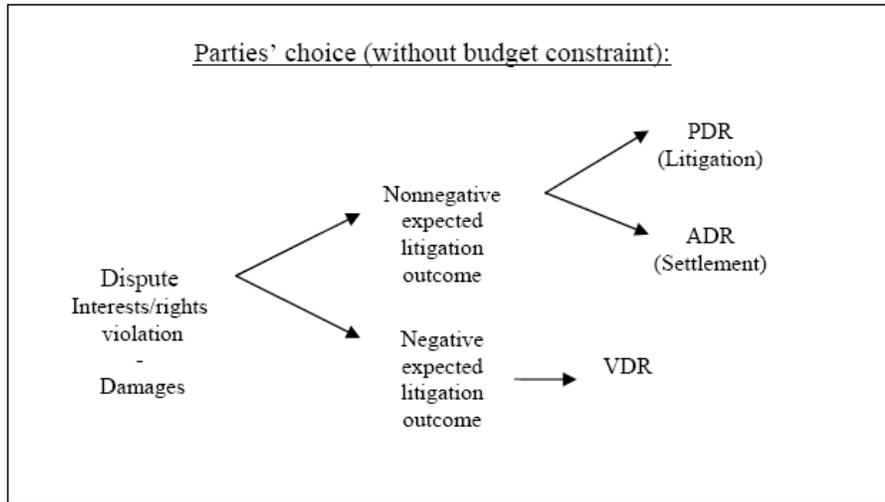


Figure 2

### 2.2.2 When victims choose under budget constraint (poor victims)

Let us introduce a budget constraint, only for victims. One of the main barriers for victims' access to justice is their inability to pay for litigation

costs<sup>29</sup>. On the contrary, injurers are assumed to be always solvent<sup>30</sup>. In such a case, the necessary condition of a nonnegative expected litigation outcome (2) is not enough. An additional condition must hold why access to justice is guaranteed: victim’s wealth must be sufficient to cover litigation cost ( $w > C_V$ ). See Figure 3.

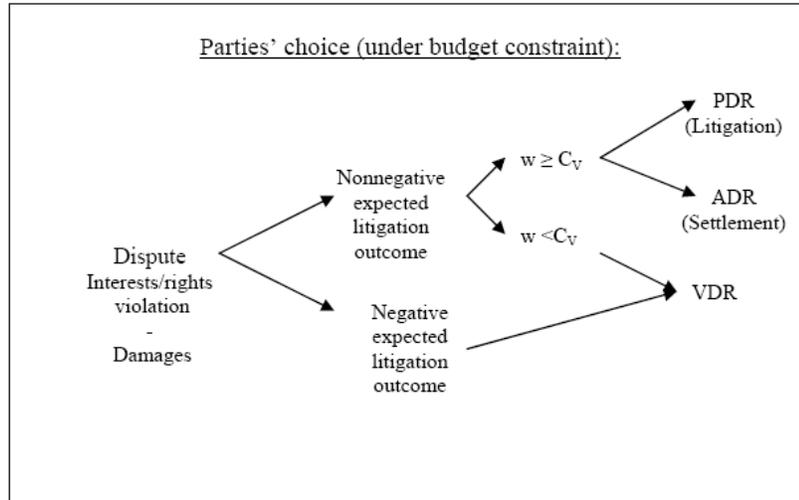


Figure 3

### 2.2.3 Victim’s access to justice

As seen in Section 1, access to justice is a relevant issue for policy makers who are interested in protecting rights and deterring misbehavior. Generally speaking, if (2) holds, and  $w > C_V$ , the victim accesses justice and legally proceeds against the injurer. Otherwise, she can choose only VDR<sup>31</sup>. This means that the victim’s access to justice depends on her own subjective probability of success in trial, on her own litigation cost, on her budget constraint, and on the damage redress. Access to justice does not depend on the injurer’s belief and litigation cost.

**Proposition 1** *Access to justice positively depends on the victim’s subjective probability of prevailing in litigation (optimism) and damage compensation. Access to justice negatively depends on the victim’s litigation*

<sup>29</sup>Understanding of the content and attributes of rights (awareness of rights) is also necessary to access justice. Lack of awareness of rights is a further strong barrier to access to justice. However, this paper omits to consider this question. See WB (2006a), UNDP (2004) and (2002), Sinnar (2002).

<sup>30</sup>This paper focuses on problems in accessing justice, and not on “judgment proof” problems. A judgment proof problem occurs when the injurer does not pay the appropriate damage award, for instance because she goes to bankrupt. See Shavell (1986), and Summer (1983). We can now assume a large and professional injurer or an injurer who is covered by an insurance.

<sup>31</sup>Note that, when  $C_V \geq D$ , action never occurs.

cost. Finally victim's access to justice negatively depends on how much his/her budget constraint is binding.

From (2) and victim's budget constraint, Proposition 1 is self-evident. Policy makers cannot directly determine access to justice. They can influence access to justice by designing procedures and rules able to affect victims' litigation costs, beliefs and budget constraint, or by influencing damage compensations.

### 2.2.4 Settlement *versus* litigation

As seen in Section 1, from a policy perspective, another relevant issue concerns how parties choose between settlement and litigation. In recent years, policy makers have encouraged resolutions of disputes out of court in order to reduce courts' workloads, inefficiencies, and linked social costs.

By defining  $(q_V - q_I) = \Delta$ , and reminding (5) and (6), the model shows that, when the victim's budget constraint is satisfied:

- If  $q_V \geq \frac{C_V}{D}$  and  $\Delta < \frac{C_V + C_I}{D}$  parties settle out of court;
- If  $\Delta \geq \frac{C_V + C_I}{D}$ , parties litigate.

**Proposition 2** *Settlement negatively depends on the spread between the victim's and injurer's beliefs. Litigation costs and amount at stake have an ambiguous effect on settlement. On the one hand, when access to justice is guaranteed, high litigation costs and low damage redress enhance settlement. On the other hand, high litigation costs for victims and low damage redress can reduce settlement by reducing access to justice.*

**Proposition 3** *Litigation positively depends on the spread between the victim's and injurer's beliefs and on the amount at stake (damage redress). Instead, litigation negatively depends on the parties' litigation costs.*

About Proposition 2, let us underline that this result is not standard in the literature. Usually the literature studies when disputes are litigated or settled<sup>32</sup> and omits to consider the access to justice constraint.

---

<sup>32</sup>This topic is widely discussed in the law and economics literature on legal procedures. For a review on this issue, see Hay and Spier (1998) and Daughety and Reinganum (2005). See also Shavell (1982a), P'ng (1983), Mnookin (1993), and Spier (2003). On settlement under asymmetric information, see Bebchuk (1984). On arbitration, settlement, and litigation see Dari-Mattiacci (2007b). On litigation *versus* settlement when parties seek non-monetary judgments, see Shavell (1993). An empirical approach is in Lederman (1999).

By including the access to justice constraint, we find that when the victim's litigation cost is sufficiently large (damage redress is sufficiently small), the victim cannot access justice (condition  $q_V \geq \frac{C_V}{D}$  is less easily satisfied). In such a case dispute is solved neither by litigation, nor by settlement. However, when costs increase (damage redress decreases), but access to justice is guaranteed, settlement augments ( $q_V \geq \frac{C_V}{D}$  holds and  $\Delta < \frac{C_V+C_I}{D}$  is more easily satisfied).

About proposition 3, note that litigation arises only if the victim's subjective probability of success  $q_V$  is sufficiently greater than the injurer's subjective probability of failure  $q_I$  ( $\Delta \geq \frac{C_V+C_I}{D}$ ). This condition is usually interpreted as a condition of mutual optimism: litigation occurs when parties are both optimistic enough over the litigation outcome. As seen above, divergences in subjective probabilities are due to the uncertainty of law. Less uncertainty in law means that  $q_V$  and  $q_I$  trend to converge. So that, settlement condition is easily satisfied. This outcome is standard in the law and economics literature (see Hay and Spier, 1998; Daughety and Reinganum, 1999; Dari-Mattiacci, 2007a and 2007b; and Daughety and Reinganum, 2005).

Policy makers interested in reducing courts' workloads can indirectly influence parties' choice between litigation and settlement. They can implement policies aimed at reducing the spread in parties' beliefs (by reducing the uncertainty of law, for instance). In addition, policy makers can reduce litigation by designing procedures and rules which make litigation more expensive for parties. However, this kind of policies can negatively affect access to justice for victims. This means that policies on litigation costs determine a trade-off between enhancing access to justice and reducing litigation. This point will be discussed in detail in the next Section.

### 2.3 Social costs

Let us move back to the social planner problem of costs minimization. As seen above, the parties in disputes choose how to resolve their disputes. Finally, the probability of VDR and the probability of PDR depend on the parties' litigation costs and beliefs, on the amount at stake, and finally on the victim's wealth. Define:

- $\frac{C_V}{D} = v$  as the victim's litigation cost to the damage redress ratio for a representative dispute<sup>33</sup>;
- $\frac{C_V+C_I}{D} = r$  as the litigation costs to the damage redress ratio for a representative dispute.

---

<sup>33</sup>We ground this assumption and the next one on the fact that at this stage we are working on an aggregate level.

- The social planner cannot know the beliefs of every couple of litigants. The social planner can assume that the idiosyncratic parties' beliefs  $q_V$  and  $q_I$  are modelled as probability of victim's success  $q \in (0, 1)$ . They are assumed to be independent<sup>34</sup>, identically distributed random variables with probability density function  $f$  positive, continuous, and differentiable over the interval  $(0, 1)$  and zero elsewhere, and cumulative distribution  $F$ . The distribution is unimodal, with mean  $\mu$  and variance  $\sigma^2$ . Changes in variance occur according to the single crossing property<sup>35</sup>.
- The victims' wealth  $w \in [0, \infty]$  is a random variable. It is distributed according to the density function  $h$ , with cumulative function  $H$ . Parties' beliefs and wealth are assumed to be independent random variables<sup>36</sup>.

According to the analysis on parties' behavior, parties avoid VDR and consequent null payoff every time they can access justice. Furthermore, a dispute is solved by litigation only if victims can access justice and settlement is less suitable. Thus, the social planner minimizes expected social costs of disputes resolution ( $\Sigma$ ) that can be rewritten as:

$$\Sigma = (1 - \Pr(AJ))K_{VDR} + \Pr(PDR | AJ)K_{PDR} \quad (7)$$

where  $\Pr(AJ)$  is the probability that victims access justice and  $\Pr(PDR | AJ)$  is the probability that a dispute is resolved by PDR (litigation). Obviously this probability is calculated given that victims access justice.

### 2.3.1 Without budget constraint

By knowing that a victim of a representative dispute behaves as described in Subsections 2.2.1, according to the access to justice constraint

---

<sup>34</sup>Although it could be reasonable to assume some degree of correlation between the parties' subjective probabilities, each party has a own idiosyncratic "type". Roughly speaking, each party is less or more optimistic on the trial outcome, independently of the other party's type.

<sup>35</sup>These assumptions on parties' beliefs follow Dari-Mattiacci (2007a). Variance of beliefs distribution and single crossing property are useful in Subsection 3.4. Variance can be interpreted as a measure of uncertainty of law. Single crossing property refers to individuals' preferences. Individuals with different attitude toward risk have beliefs' distributions with different variance. Indifference curves of low risk individuals are less steep than ones of high risk individuals. This property implies some desirable features of variance. Particularly, for  $\sigma_2^2 > \sigma_1^2$  there exists a  $\bar{q}$  such that  $F(q, \mu, \sigma_2^2) - F(q, \mu, \sigma_1^2) \leq 0$  for  $q \geq \bar{q}$ .

<sup>36</sup>Despite of the thought that richer people could be more optimistic and poorer people could be more pessimistic, Hirshleifer (2001) shows that this assumption is reasonable.

(2) we can calculate the probability of access to justice without any budget constraint as:

$$\Pr(q_V \geq v) = 1 - F(v) \quad (8)$$

Obviously the probability that a dispute will be solved by VDR is  $\Pr(q_V < v) = F(v)$ .

According to (6), the probability that a dispute will be resolved by *PDR* (litigation) can be calculated as the probability that  $\Delta \geq r$ . Thus, by defining  $g$  as the density function, and  $G$  as the cumulative function of the new random variable  $\Delta \in (-1, 1)$ ,  $\Pr(PDR | AJ)$  can be calculated as:

$$\Pr(\Delta \geq r) = (1 - G(r)) \quad (9)$$

Note that this probability implies victims' access to justice, by the fact that condition (6) is sufficient to guarantee access to justice. The probability of ADR (settlement) is slightly more complicated, because, according to (5), it is calculated as  $\Pr(\Delta < r | q_V \geq v)$ . However it can be found as:  $\Pr(AJ) - \Pr(PDR | AJ) = (1 - F(v)) - (1 - G(r))$ . Thus, the probability of ADR is  $\Pr(ADR | AJ) = G(r) - F(v)$ .

Note that  $\Delta$  is a transformed random variable of  $q$ . Obviously the density of probability  $g$  and the cumulative function  $G$  are transformed functions of  $f$ . By applying the convolution rule<sup>37</sup>, we can rewrite equation (9) as:

$$\Pr(ADR | AJ) = \int_r^1 F(q - r)f(q)dq \quad (10)$$

Thus, when victims are not subject to any budget constraint, the expected social cost of disputes resolution (7) that the social planner minimizes can be rewritten as:

$$\Sigma_{no\ b.c.} = K_{VDR}F(v) + K_{PDR} \int_r^1 F(q - r)f(q)dq \quad (11)$$

---

<sup>37</sup>According to the convolution rule, distribution of a sum (or a difference) of two independent random variables can be easily calculated. For instance:  $\Pr[Z = X + Y \leq z] = \int_{-\infty}^{\infty} F_Y(z - x)f_x dx$ . Roughly speaking, variable  $Z = X + Y$  is distributed according to a function which includes distribution functions of  $X$  and  $Y$ . Distribution function of  $Z$  moves following "comovements" of  $X$  and  $Y$  distributions.

### 2.3.2 Under budget constraint

By knowing that a victim under budget constraint behaves as described in Subsections 2.2.2, we can recalculate also the probability of access to justice and the probability of litigation under the victims' budget constraint. Owing to the independence of wealth and parties' beliefs, the probability of access to justice is  $\Pr(q_V \geq v) \Pr(w > C_V)$  and can be written as:

$$\Pr(AJ) = (1 - F(v)) (1 - H(C_V)) \quad (12)$$

The probability that a representative dispute is solved by VDR is equal to  $\Pr(q_V < v) + \Pr(q_V \geq v) \Pr(w \leq C_V)$  and can be written as:

$$\Pr(VDR) = F(v) + (1 - F(v)) H(C_V) \quad (13)$$

thus, victims do not access justice when are too poor or when are rich enough to legally proceed but their claims are negative in expected value.

The probability that a representative dispute is solved by PDR (litigation) becomes  $(1 - H(C_V)) (1 - G(r))$ , equal to:

$$\Pr(PDR | AJ) = (1 - H(C_V)) \int_r^1 F(q - r) f(q) dq \quad (14)$$

The probability of ADR is  $(1 - H(C_V)) [G(r) - F(v)]$ <sup>38</sup>. Once again, people decide to litigate or to settle if and only if they are rich enough to legally proceed and their claims are nonnegative in expected value.

With broad generality, by including the victims' budget constraint, the social planner has to minimize expected social costs of disputes resolution equal to:

$$\begin{aligned} \Sigma = & K_{VDR} [F(v) + (1 - F(v)) H(C_V)] + \\ & + K_{PDR} (1 - H(C_V)) \int_r^1 F(q - r) f(q) dq \end{aligned} \quad (15)$$

### 2.3.3 The social trade-off

From a social perspective, often a trade-off exists between improving access to justice and reducing litigation. Particularly, by analyzing equation (7), we find that:

**Proposition 4** *For a given probability of access to justice, reductions in the probability of litigation reduce expected social costs of disputes resolution.*

---

<sup>38</sup>  $\Pr(ADR) = (1 - H(C_V)) (1 - F(v)) - (1 - H(C_V)) \int_r^1 F(q - r) f(q) dq.$

**Proposition 5** *An augmented probability of access to justice can improve or reduce expected social costs of disputes resolution. When the improvement in the probability of access to justice corresponds to an equivalent or a smaller improvement in the probability of litigation, expected social costs decrease. When an improvement in the probability of access to justice corresponds to a greater improvement in the probability of litigation, expected social costs can decrease or increase.*

Proposition 4 is self-evident. As seen above, parties choose between settlement and litigation only when victims can access justice. A reduction in the probability of litigation (which is conditioned on a certain probability of access to justice) obviously reduces the weight of the expected social costs of litigation while not affecting the unconditioned probability of access to justice.

Conversely, as explained in Proposition 5, an augmented probability of access to justice ambiguously affects expected social costs of disputes resolution. On the one hand, augmented access to justice reduces expected social costs by reducing the weight of VDR costs. On the other hand, augmented access to justice can increase, or reduce (or do not change) the probability of litigation and linked social costs. Given  $K_{VDR} \geq K_{PDR}$ , as long as the augmented probability of access to justice results in an equivalent enlargement of probability of litigation, expected social costs of disputes resolution surely decrease.

This means that the problem of the social planner slightly changes. If a policy aimed at reducing litigation, do not affect the probability of access to justice, it is a good policy from a social perspective. If a policy in favour of access to justice does not improve litigation, it is always a good social policy. A policy aimed at reducing litigation which negatively affects the probability of access to justice could be a bad policy from a social perspective.

Obviously the social planner can reduce expected social costs of disputes resolution also by reducing per capita social cost of litigation  $K_{PDR}$ . For instance, policy maker might reduce social (and private) costs of litigation by reducing delays and inefficiencies in courts' system. However, the paper does not focus on this goal<sup>39</sup>.

Equations in Subsection 2.3.1. and 2.3.2. allow us to develop the broad policy analysis that is purposed in the next Section.

---

<sup>39</sup>Social planner could also try to reduce  $K_{VDR}$ . However it is evident that, while social costs of courts and judges might be better controlled by social planner, cost of violence, underdeterrence and impunity are less controllable.

### 3 Policy analysis

To understand the influences of a policy on the expected social cost of disputes resolution, effects on both the probability of access to justice and the probability of litigation have to be simultaneously considered. In this Section we analyze a number of policies that can influence the probability of access to justice and/or the probability of litigation. Particularly we study litigation taxes, legal aid, punitive damages, policies on the legal merit and the uncertainty of law, and finally costs shifting. The analysis is developed according to our main research questions: how do these policies affect a) the probability of access to justice, b) the probability that parties choose to litigate in court, c) total expected social costs due to disputes resolution.

#### 3.1 Policies on parties' litigation costs: litigation tax

Let us begin by analyzing policies aimed at reducing litigation. Policy makers interested in discouraging litigation could introduce extra costs borne by parties who want to solve their dispute by litigation. We can imagine a sort of extra fee or additional tax<sup>40</sup> paid to sue in front of the judge. The parties' litigation costs become greater than in the benchmark case (Subsection 2.2).

**Proposition 6** *Litigation tax charged to victims ambiguously affects expected social cost of disputes resolution. On the contrary, litigation tax charged to injurers unambiguously reduces expected social cost of disputes resolution. When tax is charged to both parties, the total effect is ambiguous.*

*Access to justice:* The probability of access to justice negatively depends on the victims' litigation costs  $\left(\frac{\partial}{\partial C_V} \Pr(AJ) < 0\right)$ , and does not depend on the injurers' litigation costs  $\left(\frac{\partial}{\partial C_I} \Pr(AJ) = 0\right)$ . Details about this Subsection are in the Appendix A.1. Thus, a policy which enlarges litigation costs as a litigation tax, discourages access to justice only when affects victims' litigation costs.

*Litigation:* As expected by policy makers, increased litigation cost of both the victims and injurers reduces the probability of litigation  $\left(\frac{\partial}{\partial C_i} \Pr(PDR | AJ) < 0; \text{where } i = V, I\right)$ .

---

<sup>40</sup>This extra-fee does not change social costs of litigation. It simply determines a redistribution of social costs due to litigation from a widespread cost (charged on all citizens) to a specific one (charged on parties). On litigation tax see also Shavell (1999), Abramowicz (2001), Dari-Mattiacci (2007a).

*Social costs:* Increased victims' litigation costs ambiguously affect expected social costs of disputes resolution  $\left(\frac{\partial \Sigma}{\partial C_V} \leq 0\right)$ . In fact, on the one hand, increased victims' litigation costs reduce access to justice. On the other hand increased victims' litigation costs reduce litigation. The combined effect might be an increase, rather than a reduction, in expected social costs of disputes resolution. Increased injurers' litigation costs unambiguously reduce expected social costs of disputes resolution, by reducing the probability of litigation while not affecting access to justice  $\left(\frac{\partial \Sigma}{\partial C_I} < 0\right)$ . So that, given an amount of cases legally solved, litigation decreases.

### 3.2 Policy on victims' wealth: legal aid

Legal aid is one of the main issues related to the problem of access to justice<sup>41</sup>. Usually legal aid is limited to criminal cases, in order to guarantee a fair trial for plaintiffs<sup>42</sup>. However we generically consider a transfer from the State, or from a social security system to a poor person who wants to protect his rights in court. As seen in Proposition 1, if victim's budget constraint is too binding ( $C_V > w$ ), victim does not access justice, also when it is suitable (litigation expected outcome is nonnegative). Thus, legal aid may be interpreted as an insurance guaranteed by the State or by a social security system aimed at allowing a poor victim to legally resolve a dispute. We omit to consider potential abuses or moral hazard. Thus, assume that legal aid does not determine any enrichment for recipients. So that, in case of victim's success in trial, the amount of legal aid will be returned back. Being a transfer, victims however evaluate whether proceeding in court is suitable. Thus, poor victims proceed if and only if their claims are nonnegative in value. Legal aid simply allows all victims with nonnegative claims to proceed,

---

<sup>41</sup>According to UNDP (2002), "inability to pay for litigation costs, or to proceed effectively, or the risk of bad consequences are all critical concerns when navigating the legal process. Legal aid relates to all necessary capacities in litigation, including not only legal counsel, but also various forms of psycho-social support". On this topic, see Buchko, Rekosh, and Terzieva (2002). See also UNDP (2004), Garoupa and Stephen (2004), WB (2006), and De Luca and Varano (2007). Some interesting statistics on legal aid in European countries are in CEPEJ (2006).

<sup>42</sup>Resources scarcity usually requires applying some restrictions for access to legal aid. However, the State should be responsible for providing legal aid to those who need it. Under international law, free legal counsel is required only for criminal cases. The reality for poor however, is that to access justice, they require legal counsel to be expanded to other areas as well, from civil and commercial matters to administrative and labour relations. Many countries have expanded the scope of free legal counsel by constitutional law. Legal aid should provide not only financial support but also other forms of support to navigate the legal process (UNDP, 2002).

also in case of insufficient wealth.

**Proposition 7** *Legal aid unambiguously reduces expected social costs of disputes resolution. Although it enlarges expected social costs due to litigation, its curbing effect on expected social costs due to VDR prevails.*

*Access to justice:* By comparing (8) with (12), the model shows that legal aid effectively augments access to justice probability. Legal aid enlarges the probability of access to justice by an amount equal to  $H(C_V)(1 - F(v))$ . So that, access to justice increases exactly by the probability which a dispute is nonnegative in expected value (for victims) given a budget constraint too binding. We can also imagine a mechanism to filter unmeritorious suits. In such a case, only a share of disputes would be funded, however our qualitative outcome does not change.

*Litigation:* By comparing (10) with (14) it is clear that legal aid enlarges the probability of litigation by allowing poor victims to proceed. The probability of litigation increases by  $H(C_V) \int_r^1 F(q-r)f(q)dq$ , thus, it increases by the probability which a dispute is suitably litigated in court given the probability that the budget constraint is too binding to proceed.

*Social costs:* By comparing expected social costs under legal aid equal to  $\Sigma_{no\ b.c.}$  in equation (11) with expected social cost under budget constraint  $\Sigma$  (15), the model shows that legal aid unambiguously reduces expected social costs of disputes resolution. Although the augmented access to justice due to legal aid determines an enlargement in litigation, the positive effect of reduced VDR dominates. Note that the difference in expected social costs with and without legal aid is always negative. In fact it is exactly the difference existing in expected social costs due to litigation and expected social costs due to VDR without any budget constraint:  $K_{PDR} \int_r^1 F(q-r)f(q)dq - K_{VDR}(1 - F(v)) < 0$ , because  $\int_r^1 F(q-r) \leq (1 - F(v))$ .

Obviously, our assumption on  $K_{PDR} < K_{VDR}$  becomes crucial. If this assumption is relaxed, once again the model might show a trade-off between enhancing access to justice and curbing litigation.

### 3.3 Policy on the amount at stakes: punitive damages

In this Subsection we analyze the effects of punitive damages<sup>43</sup> on access to justice, litigation, and finally, expected social costs of disputes resolu-

---

<sup>43</sup>Punitive damages are deeply analyzed in the law and economics literature. See Stoll (1983), Polinsky and Shavell (1997) and (1998), Eisenberg et al. (1997), Spier (2003) and Sebok (2007). Punitive damages are typically used in US legal system. In

tion. Punitive damages are damages not awarded in order to compensate the victim, but in order to deter the injurer from pursuing a course of action such as that which damaged the victim. We have to distinguish two cases: 1) punitive damages are paid by losing injurers to winning victims; 2) punitive damages are paid by losing injurers to the State as a fine.

### 3.3.1 Punitive damages in favour of victims

Let us begin from case 1). Punitive damages in favour of victims simply imply a greater amount at stake ( $D$ ) in favour of the winning victim paid by the losing injurer.

**Proposition 8 (1)** *Punitive damages in favour of victims have ambiguous effects on expected social costs of disputes resolution. On the one hand expected social costs due to VDR decrease (the probability of access to justice increases) in the amount at stake. On the other hand the probability of litigation increases in the amount at stake.*

To prove statement (1) of Proposition 8 it is sufficient to analyze first derivatives of the probability of access to justice, of litigation, and of expected social costs of disputes resolution with respect to  $D$ .

*Access to justice:* The probability of access to justice (12) increases in the amount at stake ( $\frac{\partial}{\partial D} \Pr(AJ) > 0$ ). Details about this Subsection are in the Appendix A.2.

*Litigation:* By analyzing the first derivative of the probability of litigation (14) with respect to the amount at stake, it is easy to see that the probability of litigation positively depends on damage redress ( $\frac{\partial}{\partial D} \Pr(PDR | AJ) > 0$ ).

*Social costs:* Increased amount at stake ambiguously affects expected social costs ( $\frac{\partial \Sigma}{\partial D} \leq 0$ ). In fact, on the one hand increased damage redress enlarges access to justice. On the other hand increased amount at stake enlarges the probability of litigation.

### 3.3.2 Punitive damages in favour of the State or fines

To study case 2), let us define  $d$  as the punitive damages (or fine) paid by losing injurers to the State. Obviously condition of victims' access to justice given by (2) and ( $w > C_V$ ) does not change. However, the injurer's expected value of litigation outcome changes with respect to the benchmark case described in Subsection 2.2. and becomes equal to:  $q_I (D + d) + C_I$ .

---

many countries, particularly in Europe, punitive damages are completely forbidden. However, main results of this Subsection are useful to understand the effects of every policy which influences the amount at stake in a dispute.

**Proposition 8 (2)** *Punitive damages in favor of the State (fines) unambiguously reduce expected social costs of disputes resolution, by reducing litigation.*

*Access to justice:* In case of punitive damages in favour of the State the probability of access to justice does not change.

*Litigation:* However, by changing the injurer’s expected value of litigation outcome, the probability of litigation changes too. Litigation occurs when  $q_V - q_I \left(\frac{D+d}{D}\right) > \frac{C_V+C_I}{D}$ . Note that this new condition why parties litigate in court is more hardly satisfied than in the benchmark case (6). Define  $\hat{q} = q_I \left(\frac{D+d}{D}\right) \in \left(0, \frac{D+d}{D}\right)$  as a new random variable calculated from a linear transformation of  $q_I$ , distributed with a density function  $\hat{f}(\hat{q}) = \frac{D}{D+d}f(q)$ . By defining  $\hat{\Delta} = q_V - \hat{q}$ , we can recalculate the probability of litigation in case of punitive damages in favour of the State as  $\Pr(\widehat{PDR} | AJ) \equiv \Pr(\hat{\Delta} \geq r)$ . By applying the convolution rule, we obtain  $\Pr(\widehat{PDR} | AJ) = \frac{D}{D+d} \int_r^1 F(q-r)f(q)dq$ . Being  $\frac{D}{D+d} < 1$ , it easy to understand that the probability of litigation in case of punitive damages in favour of the State is smaller than in the benchmark case (10).

*Social costs:* The effect of punitive damages in favour of the State on expected social costs of disputes resolution is a reduction. This is an obvious consequence of reduced probability of litigation.

### 3.4 Policies on parties’ beliefs: legal merit and uncertainty of law

According to the literature, uncertainty enhances litigation<sup>44</sup>. As seen above, the uncertainty of litigation outcome determines parties’ subjective beliefs. Furthermore, when victims can access justice, for litigation to arise the spread between parties’ beliefs must be large enough, otherwise parties settle<sup>45</sup>. Policy makers can reduce the uncertainty of law by enacting clearer laws, by setting a strong role of precedents, by forcing judges to decide consistently with previous equivalent cases, and by defining regulatory standards. We verify whether policy makers can effectively discourage litigation by reducing the uncertainty of law. Furthermore, we analyze the effects of a reduced uncertainty of law on access to justice and expected social costs of disputes resolution.

<sup>44</sup>As well described in Dari-Mattiacci (2007b) a sort of circularity exists in the relationship between rate of litigation and uncertainty. By litigation which sets precedents and interpretive standards, uncertainty of law decreases. Further, reduced uncertainty implies a reduced rate of litigation. A reduced rate of litigation increases uncertainty of law, and so on. However this paper focuses on that less uncertainty determines a reduced divergence in parties’ beliefs.

<sup>45</sup>See notes 23 and 24.

We also consider the influence of legal merit of the cases. Merit of cases is another sensitive issue from a policy perspective. Unmeritorious lawsuits (with low or null legal merit) are considered a sort of unsuitable abuse of the legal system and usually discouraged by judges<sup>46</sup>.

**Proposition 9** *By reducing the uncertainty of law, policy makers can reduce the probability of litigation. However the effects of reduced uncertainty on expected social costs of disputes resolution are not verifiable. Without additional information on the distribution of parties' beliefs, the uncertainty effects on the probability of access to justice remain unknown.*

*Merit of the cases enhances the probability of access to justice, and does not affect the probability of litigation. Expected social costs of disputes resolution are decreasing in the legal merit.*

Let us follow Dari-Mattiacci (2007a), according to whom the mean  $\mu$  of beliefs' distribution represents the legal merit of cases (beliefs are correct and unbiased on average), and variance  $\sigma^2$  measures the uncertainty of law.

*Access to justice:* Without additional assumptions on parties' beliefs distribution, it is impossible to evaluate whether the probability of access to justice is increasing or decreasing in variance. In further research it would be suitable make some simulations in order to understand how uncertainty of law affects the probability of access to justice according to different beliefs' distributions.

By analyzing the relationship between parties' beliefs and the probability of access to justice, it results that in cases with high merit, the probability that agents access justice is greater than in cases with low merit. Imagine two arbitrary distributions: beliefs of agents with very meritorious cases (low contentious population) are distributed with a density function skewed to the left. On the contrary, beliefs of agents with low merit cases (strongly contentious population) are distributed with a density function skewed to the right. Obviously, the probability of access to justice, according to the first distribution is greater than the second one.

*Litigation:* We can easily prove that the probability of litigation is increasing in variance of beliefs and is not affected by the mean of beliefs. From the mean and the variance of beliefs,  $E(\Delta) = 0$  and  $Var(\Delta) = 2\sigma^2$  are calculated. Note that, for an arbitrary distribution

---

<sup>46</sup>For instance, in the United States, Rule 11 - Federal Rules of Civil Procedure - sanctions frivolous or improper litigations. In Civil law countries there is the concept of *Litis temeraria*. Also according to this principle, parties who sue a claim without any legal merits before the court are usually sanctioned.

$f, g(\Delta)$  defined for all  $\Delta \in (-1, 1)$  is symmetrically centered on zero and does not depend on  $\mu$ . From the single crossing property we know that  $\frac{\partial}{\partial \sigma^2} (1 - G(\Delta)) > 0$ , for all  $\Delta > 0$ <sup>47</sup>. Being the probability of litigation calculated as  $\Pr(\Delta \geq r) = (1 - G(r))$ , we find  $\frac{\partial}{\partial \sigma^2} (\Pr(\Delta \geq r)) > 0$ .

*Social costs:* As in the case of the probability of access to justice, without additional restrictive assumptions on parties' beliefs distribution, the uncertainty's effects on expected social costs of disputes resolution remain unknown. In further research, simulations would be useful to analyze effects of the uncertainty of law on expected social costs of disputes resolution.

However, legal merit positively affects the probability of access to justice and does not affect the probability of litigation. Thus, we can conclude that, by curbing litigiousness of population and increasing the level of merit of the disputes, expected social costs of disputes resolution decrease.

### 3.5 Policies of costs shifting: the British rule

Law and economics deeply study costs shifting effects on litigation. Particularly, effects on deterrence, and settlement equilibrium have been analyzed<sup>48</sup>. In this Subsection, the case of "British rule" is presented: the party loosing in trial bears both his and winning party's litigation costs. To analyze this policy, a simple extension of the benchmark case of Subsection 2.2 is developed. We distinguish two cases: 1) without any budget constraint, 2) under victims' budget constraint.

#### 3.5.1 Without budget constraint

As usual, the victim decides to sue her injurer if and only if her expected litigation outcome is nonnegative, thus if  $q_V D - (1 - q_V) (C_I + C_V) \geq 0$ .

By defining  $\tilde{r} = \frac{C_V + C_I}{D + C_V + C_I} \in (0, 1)$ , under British Rule the victim's access to justice constraint can be written as:

$$q_V \geq \tilde{r} \tag{16}$$

If the access to justice constraint holds, victim evaluates litigation *versus* settlement. The victim prefers settlement when can bargaining a settlement amount ( $\widehat{S}$ ) greater that her expected litigation outcome. Thus, when:  $q_V (D + C_I + C_V) - (C_I + C_V) < \widehat{S}$ . The injurer settles when the settlement amount is smaller than his expected litigation outcome, thus when:  $q_I (D + C_V + C_I) > \widehat{S}$ . Settlement occurs when two conditions are simultaneously satisfied:

<sup>47</sup>See note 35.

<sup>48</sup>The literature on this argument is broad. See for instance Shavell (1882b), Reinganum and Wilde (1986), Spier (2003), Hersh and Viscusi (2007).

$$q_V \geq \tilde{r}; \text{ and } (q_V - q_I) < \tilde{r} \quad (17)$$

Obviously litigation occurs when  $q_V \geq \tilde{r}$  and  $(q_V - q_I) \geq \tilde{r}$ . These two conditions can be written also as:  $q_V \geq \tilde{r}$  and  $q_V \geq \tilde{r} + q_I$ , where, as we know,  $q_I \in (0, 1)$ . Obviously when the second holds, the first is always satisfied and results redundant. Thus parties litigate simply when:

$$\Delta \geq \tilde{r} \quad (18)$$

**Proposition 10 (1)** *When no budget constraint exists, British rule increases the probability of litigation and ambiguously affects the probability of access to justice. The effects on expected social costs of disputes resolution are uncertain.*

*Access to justice:* Under the British rule, the probability of access to justice becomes:  $\Pr(\widetilde{AJ}) = \Pr(q_V \geq \tilde{r}) = 1 - F(\tilde{r})$

In such a case, not necessarily shifting costs increases access to justice. The probability of access to justice under British rule is greater than in the benchmark case (8) only when  $\tilde{r} < v$ . Thus, British rule enhances the probability of access to justice when the victim's litigation costs to the amount at stake ratio is greater than the weight of injurer's litigation costs to total ones ( $\frac{C_I}{(C_V+C_I)} < \frac{C_V}{D}$ ). In the case of small claims (small  $D$ ) and/ or disproportion in litigation costs in favour of the injurers, British rule can enhance access to justice. Perhaps, British rule can enhance access to justice when "small" victims pay costly lawyers for proceeding against "professional" litigants supported by insider corporate lawyers (with low fees) . However, in general, effects of British rule on access to justice are ambiguous.

*Litigation:* From condition (18) we can calculate the probability of litigation without budget constraint, under the British rule:  $\Pr(\widetilde{PDR} | \widetilde{AJ}) = \Pr(\Delta \geq \tilde{r}) = 1 - G(\tilde{r})$ . It easy to see that the probability of litigation always augments. In fact the probability of litigation under British rule is always greater than (9), being  $\tilde{r} = \frac{C_V+C_I}{D+C_V+C_I} < \frac{C_V+C_I}{D} = r$ .

*Social costs:* British rule ambiguously affects expected social costs of disputes resolution. In fact, British rule surely enlarges the probability of litigation. However British rule ambiguously affects access to justice probability. The total effect depends on parameters of costs litigation and amount at stake. Details about this subsection are in the Appendix A.3. Obviously if British rule reduces the probability of access to justice, it always enlarges expected social costs of disputes resolution. However, British rule can reduce expected social costs of disputes resolution by

augmenting the probability of access to justice less than the augmented probability of litigation. In fact British rule can reduce expected social costs when:  $F(v) - F(\tilde{r}) > \frac{K_{PDR}}{K_{VDR}} [G(r) - G(\tilde{r})]$ , where  $\frac{K_{PDR}}{K_{VDR}}$  is less than 1.

### 3.5.2 Under budget constraint

Under budget constraint, victims can sue nonnegative value claims only if their wealth is greater than expected costs linked to the proceedings, thus when  $w > (1 - q_V)(C_I + C_V)$ . This constraint can be written as:  $w + q_V(C_I + C_V) > (C_I + C_V)$ . Let us define  $C = (C_I + C_V)$  and  $\bar{q} = q_V C, \in (0, C)$  as a new random variable calculated from a linear transformation of  $q_V$ , distributed with a density function  $\bar{f}(\bar{q}) = \frac{1}{C} f(q)$ . The budget constraint under British rule can be written as:  $w + \bar{q} > C$ . According to the convolution rule, being  $w$  and  $\bar{q}$  independent, the probability that victims are rich enough to legally proceed is:

$$\Pr(w + \bar{q} > C) = 1 - \frac{1}{C} \int_0^1 H(C(1 - q)) f(q) dq.$$

**Proposition 10 (2)** *Under victims' budget constraint, the British rule ambiguously affects both the probability of access to justice and the probability of litigation. Thus, effects on expected social costs of disputes resolution are uncertain.*

*Access to justice:* Under the British rule and budget constraint the probability of access to justice becomes:

$$\Pr(\overline{AJ}) = (1 - F(\tilde{r})) \left( 1 - \frac{1}{C} \int_0^1 H(C(1 - q)) f(q) dq \right) \text{ which can be}$$

greater or smaller than in the benchmark case (12)<sup>49</sup>.

*Litigation:* The probability of litigation becomes:

$$\Pr(\overline{PDR} | \overline{AJ}) = \left( 1 - \frac{1}{C} \int_0^1 H(C(1 - q)) f(q) dq \right) (1 - G(\tilde{r})). \text{ Dif-}$$

ferently then in the case without budget constraint, British rule not necessarily improves the probability of litigation. In order to understand the effects of British rule with budget constraint, additional assumptions on wealth's and beliefs' distributions should be made .

*Social costs:* Obviously also the effect of British rule with budget constraint on expected social costs of disputes resolution is ambiguous and should be analyzed by making more assumptions.

<sup>49</sup>See the Appendix, A.3.

## 4 Conclusions

Disputes and their resolution are a crucial issue, both for social fairness and economic development. Scholars and policy makers focus on two interconnected questions: curbing social costs due to tribunals and trials, and guaranteeing access to justice for all people who need legal remedies. Augmenting access to justice, however a “fair” goal, results in enlarged social costs by increasing litigation. This outcome could be always true, if we omit to consider that unresolved or violently-solved disputes charge high social costs to society. This model studies the problem of disputes resolution by including also these social costs. By analyzing both access to justice requirements and the choice between settlement and litigation (Propositions 1-3), the paper contributes to the existing literature by providing some not trivial outcomes.

First, litigation costs and amount at stake have ambiguous effects on parties’ choice to settle. When access to justice is guaranteed, we find, as common in the literature, that high litigation costs and low damage redress enhance settlement. Otherwise, high victims’ litigation costs and low amount at stake can reduce settlement by reducing access to justice (Proposition 2).

Second, this paper provides a theoretical framework to analyze several policies and their effects on the probability of access to justice, the probability of litigation, and finally, on consequent social costs of disputes resolution.

Actually, from a social perspective, often a trade-off exists between improving access to justice and reducing litigation. Given a probability of access to justice, reductions in the probability of litigation benefit society by reducing expected social costs of disputes resolution. This means that policies that shift the choice of people from litigation to settlement while not affecting access to justice allow savings in social costs (Propositions 4). However, discouraging litigation while simultaneously reducing access to justice can be socially detrimental. Enlargements in the probability of access to justice may benefit society when consequent enlargement in the probability of litigation is not excessive (Proposition 5).

Let us summarize the main paper’s results on policies analysis. Two types of policies can be identified. The first type includes policies which ambiguously influence expected social costs of disputes resolution. Precisely in such a type of policies, the trade-off between access to justice and litigation emerges. Social gains due to improvements in access to justice are in some measure counterbalanced by enlargements in litigation and linked social costs. These policies could be effective in reducing expected social cost only if suitably gauged. According to our analysis,

litigation tax paid by victims<sup>50</sup> or by both parties, and punitive damages in favour of victims<sup>51</sup>, have ambiguous effects on expected social costs, although by opposed mechanisms (Propositions 6 and 8.1).

The second type includes policies which can unambiguously reduce expected social costs of disputes resolution. Litigation tax charged to injurer and punitive damages in favour of the State and fines can benefit society of reductions in the probability of litigation while not affecting access to justice. These policies effectively discourage parties to litigate before the court and do not produce any effect on access to justice (Propositions 6 and 8.2). Probably, the main obstacle to implementing a tax unilaterally charged to the defendant is that it could be perceived as “unfair”. However punitive damages in favour of the State might be suitably applied, at least in specific areas of law<sup>52</sup>. Also legal aid determines unambiguous effects. It enlarges the probability of litigation. However, it also reduces expected social cost of disputes resolution. Actually, legal aid shifts a certain amount of cases from VDR to litigation. However, all additional litigations are removed from the amount of cases solved by VDR with a gain for society (Proposition 7). Finally, expected social costs of disputes resolution negatively depend on legal merit (Proposition 9). Thus, a low contentious society can avoid high costs of the disputes resolution system. This outcome also underlines the significance of rules aimed at discouraging people to sue frivolous cases.

The paper also analyzes the influence of the uncertainty of law and the effects of British rule. A strong role of precedent and other policies which reduce the uncertainty of law could be useful for controlling social costs of disputes resolution. In fact, by reducing the uncertainty of law, policy makers can reduce the litigation rate. However effects of the uncertainty on access to justice are unclear and should be further explored (Proposition 9). On the contrary, British rule does not seem an effective policy aimed at reducing expected social costs of disputes resolution. However, also in this case, further research is necessary (Proposition 10).

The results of this research provide a framework to evaluate policies aimed at curbing litigation and ones implemented to improve access to justice. Obviously, policy makers should evaluate also mix of policies to reduce expected social costs of disputes resolution by guaranteeing access to justice for all, and favouring ADR instead of litigation.

---

<sup>50</sup>This outcome holds also for other policies resulting in increased victims’ litigation cost.

<sup>51</sup>This outcome holds also for other policies resulting in increased amount at stake for victims.

<sup>52</sup>For instance, punitive damages could be applied in environmental or in consumer cases where super-individual or diffusive right and individual ones are together infringed upon .

Finally, this paper could be extended by simulations. By introducing explicit functions of parties' beliefs<sup>53</sup> and wealth<sup>54</sup> distributions, our analysis could be enriched. As seen above, several policies determine ambiguous effects from a social perspective. Simulations might extend our results and clarify which effects prevail when trade-off between access to justice and litigation exists.

---

<sup>53</sup>See Dari-Mattiacci (2007a) who models parties' beliefs according to beta distributions.

<sup>54</sup>For instance, wealth could be modelled according to a Pareto distribution.

## References

- [1] Abramowicz, M. 2001. A Compromise Approach to Compromise Verdicts. 89 *California Law Review* 231-314.
- [2] Barendrecht, M., Mulder, J., Giesen, I. 2006. How to Measure the Price and Quality of Access to Justice? The Study Group Access to Justice, *Tilburg University Working Paper*. Tilburg University.
- [3] Bar-Gill, O. 2006. The Evolution and Persistence of Optimism in Litigation. 22 *Journal of Law, Economics, and Organization* 490-507.
- [4] Bebchuk, L.A. 1986. A New Theory Concerning the Credibility and Success of Threats to Sue. 25 *Journal of Legal Studies* 1-25.
- [5] Bebchuk, L.A. 1984. Litigation and Settlement under Imperfect Information. 15 *RAND Journal of Economics* 404-415.
- [6] Buchko, K.A., Rekosh, E., Terzieva V. 2002. Access to Justice: Legal Aid for the Underrepresented, in Buchko, K.A., Rekosh, E., Terzieva, V., eds., *Pursuing the Public Interest: A Handbook for Legal Professionals and Activists*. New York: Columbia Law School.
- [7] Cappelletti, M., ed. 1979. *Access to Justice and the Welfare State*. Milano: Giuffrè Editore.
- [8] European Commission for the Efficiency of Justice. 2006. *Report on the European Judicial system*. Belgium: Council of Europe.
- [9] Cohen, T.H., Smith, S.K. 2004. Civil Trial Cases and Verdicts in Large Counties. *Bureau of Justice Statistics Bulletin*. U.S. Department of Justice - Office of Justice Programs.
- [10] Cooter, R.D., Rubinfeld, D.L. 1989. Economic Analysis of Legal Disputes and Their Resolution. 27 *Journal of Economic Literature* 1067-1097.
- [11] Dari-Mattiacci, G. 2007. Arbitration *versus* Settlement. 58 *Revue Économique* 1291-1308.
- [12] Dari-Mattiacci, G., Deffains, B. 2007. Uncertainty of Law and the Legal Process. 163 *Journal of Institutional and Theoretical Economics* 627-656.
- [13] Daughety, A.F., Reinganum J.F. 2005. Economic Theories of Settlement Bargaining. 1 *Annual Review of Law and Social Science* 35-59.
- [14] Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A. 2003. Courts. 118 *Quarterly Journal of Economics* 453-517.
- [15] Eisenberg, T., Goerd, J., Ostrom, B., Rottman, D., Wells, M.T. 1997. The Predictability of Punitive Damages. 26 *Journal of Legal Studies* 623-661.
- [16] Fix-Fierro, H. 2004. *Courts, Justice and Efficiency: A Socio-Legal Study of Economic Rationality in Adjudication*. Oxford and Port-

- land: Hart Publishing Ltd.
- [17] Garoupa, N., Stephen, F.H. 2004. Optimal Law Enforcement with Legal Aid. 71 *Economica* 493–500.
  - [18] Garth, B. 1978. Access to Justice and the Welfare State: An Introduction, in Cappelletti, M., ed., *Access to Justice and the Welfare State*. Milano: Giuffrè Editore.
  - [19] Gould, J.P. 1973. The Economics of Conflicts. 2 *Journal of Legal Studies* 393-406.
  - [20] Hay, B.L., Spier, K.E. 1998. Settlement of Litigation, in Newman P., ed., *The New Palgrave Dictionary of Economics and Law*. New York: Palgrave MacMillan.
  - [21] Hersh, J.H., Viscusi, W.K. 2007. Tort Liability Litigation Costs. *Law and Economics Working Paper* No. 07-16. Vanderbilt University Law School.
  - [22] Hirshleifer, J. 2001. *The Dark Side of the Force - Economic Foundations of Conflict Theory*. Cambridge: Cambridge University Press.
  - [23] Landes, W.M. 1971. An Economic Analysis of the Court. 14 *Journal of Law and Economics* 61-107.
  - [24] Landes, W.M., Posner, R.A. 1976. Legal Precedent: A Theoretical and Empirical Analysis. 19 *Journal of Law and Economics* 249-307.
  - [25] Lederman, L. 1999. Which Cases Go to Trial: An Empirical Study of Predictors of Failure to Settle. 49 *Case Western Law Review* 315-358.
  - [26] Mattei, U. 2006. Access to Justice, Costs, and Legal Aid. *General Report for the XVIIth Congress of the International Academy Of Comparative Law*. Utrecht, The Netherlands, 16th – 22nd July 2006.
  - [27] Mnookin, R. 1993. Why Negotiations Fail: An Exploration of Barriers to the Resolution of Conflict. 8 *Ohio State Journal on Dispute Resolution* 235-249.
  - [28] P'ng, I. 1983. Strategic Behavior in Suit, Settlement and Trial. 1 *Bell Journal of Legal Studies* 305-347.
  - [29] Posner, R.A. 1973. An Economic Approach to Legal Procedure and Judicial Administration. 2 *Journal of Legal Studies* 399-458.
  - [30] Polinsky, A.M., Shavell S. 1998. Punitive Damages: An Economic Analysis. 111 *Harvard Law Review* 869-962.
  - [31] Polinsky, A.M., Shavell S. 1997. Punitive Damages, in Blume L.E., Durlauf S.N., eds., *The New Palgrave Dictionary of Economics and the Law*. New York: Palgrave MacMillan (1st edition).
  - [32] Reinganum, J., Wilde, L. 1986. Settlement, Litigation, and the Allocation of Litigation Costs. 17 *RAND Journal of Economics* 557-566.
  - [33] Sebok, A.J. 2007. Punitive Damages: From Myth to Theory. 92 *Iowa Law Review* 25-47.

- [34] Shaffer, G., Nordstrom, H. 2007. Access to Justice in the World Trade Organization: The Case for a Small Claims Procedure. *SSRN Working Paper*. Loyola University of Chicago and Swedish Board of Trade. Available at <http://ssrn.com/abstract=983586>.
- [35] Shavell, S. 2003. Economic Analysis of Litigation and the Legal Process. *Harvard Law and Economics Discussion Paper* No. 404. Harvard Law School.
- [36] Shavell, S. 1999a. The Law and Economics of Judicial Systems. *PREMNote* No. 26. World Bank.
- [37] Shavell, S. 1999b. The Level of Litigation: Private *versus* Social Optimality of Suit and of Settlement. 19 *International Review of Law and Economics* 99-115.
- [38] Shavell, S. 1997. The Fundamental Divergence between the Private and the Social Motive to Use the Legal System. 26 *Journal of Legal Studies* 575-616.
- [39] Shavell, S. 1995. Alternative Disputes Resolution: An Economic Analysis. 24 *Journal of Legal Studies* 1-28.
- [40] Shavell, S. 1993. Suit *versus* Settlement When Parties Seek Non-monetary Judgments. 22 *Journal of Legal Studies* 1-13.
- [41] Shavell, S. 1986. The Judgment Proof Problem. 6 *International Review of Law and Economics* 45-58.
- [42] Shavell, S. 1982a. Suit, Settlement and Trial: A Theoretical Analysis under Alternative Methods for the Allocation of Legal Costs. 11 *Journal of Legal Studies* 55-81.
- [43] Shavell, S. 1982b. The Social *versus* Private Incentive to Bring a Suit in Costly Legal System. 11 *Journal of Legal Studies* 333-340.
- [44] Silver, C.M. 2002. Does Civil Justice Cost Too Much? *Public Law Research Paper*, No. 37. University of Texas Law.
- [45] Sinnar, S. 2002. The Access to Justice Movement. *Topic brief-Legal Institutions Thematic Group*. World Bank. Available at <http://go.worldbank.org/ZELBVA60W0>.
- [46] Sommerlad, H. 2004. Some Reflections on the Relationship between Citizenship, Access to Justice, and the Reform of Legal Aid. 31 *Journal of Law and Society* 345-368.
- [47] Spier, K.E. 2003. Economics of Litigation, in (2006), Blume L.E., Durlauf S.N., eds., *The New Palgrave Dictionary of Economics*. New York: Palgrave MacMillan (2nd edition).
- [48] Stoll, H. 1983. Consequences of Liability: Remedies, in Tunc, A., ed., *International Encyclopedia of Comparative Law* Vol. 11. Tübingen.
- [49] Stratto, M. 2007. *Research in Action: Understanding Civil Justice in the Everyday World Research Priorities and Potentials*. Canan-

- dian Forum on Access to Justice. University of Alberta.
- [50] Summers, J. 1983. The Case of the Disappearing Defendant: An Economic Analysis. 132 *University of Pennsylvania Law Review* 145-185.
  - [51] Taruffo, M. 2005. Procedural Reform in Italy, in Trocker, N., Varano, V., eds., *The Reforms of Civil Procedure in Comparative Perspective*. Torino: Giappichelli.
  - [52] Varano, V., De Luca, A. 2007. Access to Justice in Italy. 7 *Global Jurist* (Advances, art. 6).
  - [53] United Nation Development Program. 2004. Access to Justice – Practice Note. Executive Summary. *UNDP Publication*.
  - [54] United Nation Development Program. 2002. Programming for Justice: Access for All - A Practitioner’s Guide to a Human Rights-Based Approach to Access to Justice. *UNDP Publication*.
  - [55] U.S. Council of Economic Advisers. 2002. Who Pays for Tort Liability Claims? An Economic Analysis of the U.S. Tort Liability System. *Council of Economic Advisers*, White House of USA.
  - [56] World Bank. 2006. Justice for Poor Program. *WB Report*. Available at [www.justiceforthe poor.org](http://www.justiceforthe poor.org).
  - [57] World Bank. 2006. *World Development Report 2006: Equity and Development*. New York: Oxford University Press.

## Appendix

### A.1

Recalling that  $v = \frac{C_V}{D}$ , the probability of access to justice under the budget constraint is:  $\Pr(AJ) = (1 - F(\frac{C_V}{D})) (1 - H(C_V))$ .

We calculate the first derivatives with respect to litigation costs:

$$\frac{\partial}{\partial C_V} \Pr(AJ) = -\frac{1}{D} f(\frac{C_V}{D}) (1 - H(C_V)) - h(C_V) (1 - F(\frac{C_V}{D})) < 0$$

$$\frac{\partial}{\partial C_I} \Pr(AJ) = 0.$$

Recalling that  $r = \frac{C_V + C_I}{D}$ , the probability of litigation under the budget constraint is:  $\Pr(PDR | AJ) = (1 - H(C_V)) \int_r^1 F(q - r) f(q) dq$ .

We calculate the first derivatives with respect to litigation costs:

$$\begin{aligned} \frac{\partial}{\partial C_i} \Pr(PDR | AJ) &= -h(C_i) \int_r^1 F(q - r) f(q) dq + \\ &- \frac{1}{D} (1 - H(C_i)) \int_r^1 f(q - r) f(q) dq < 0; \text{ where } i = V, I. \end{aligned}$$

Under the budget constraint, the expected social costs of disputes resolution  $\Sigma$  are :

$$K_{VDR} [F(\frac{C_V}{D}) + (1 - F(\frac{C_V}{D})) H(C_V)] + K_{PDR} (1 - H(C_V)) \int_r^1 F(q - r) f(q) dq.$$

We calculate the first derivatives with respect to litigation costs:

$$\begin{aligned} \frac{\partial \Sigma}{\partial C_V} &= K_{VDR} [f(\frac{C_V}{D}) \frac{1}{D} - f(\frac{C_V}{D}) \frac{1}{D} H(C_V) + (1 - F(\frac{C_V}{D})) h(C_V)] + \\ &+ K_{PDR} [-h(C_V) \int_r^1 F(q - r) f(q) dq - \frac{1}{D} (1 - H(C_V)) \int_r^1 f(q - r) f(q) dq] = \end{aligned}$$

$$\begin{aligned} &= \frac{1}{D} [1 - H(C_V)] \left( K_{VDR} f(\frac{C_V}{D}) - K_{PDR} \int_r^1 f(q - r) f(q) dq \right) + \\ &+ h(C_V) \left( K_{VDR} (1 - F(\frac{C_V}{D})) - K_{PDR} \int_r^1 F(q - r) f(q) dq \right) \leq 0 \end{aligned}$$

$$\begin{aligned} \frac{\partial \Sigma}{\partial C_I} &= K_{PDR} (1 - H(C_V)) \left[ -\frac{\partial r}{\partial C_I} \int_r^1 f(q - r) f(q) dq \right] + \\ &- \frac{1}{D} K_{PDR} (1 - H(C_V)) \int_r^1 f(q - r) f(q) dq < 0. \end{aligned}$$

## A.2

The first derivative of the probability of access to justice (under the budget constraint) with respect to the amount at stake is:  $\frac{\partial}{\partial D} \Pr(AJ) = +\frac{C_V}{D^2} f\left(\frac{C_V}{D}\right) (1 - H(C_V)) > 0$

The first derivative of the probability of litigation (under the budget constraint) with respect to the amount at stake is:  $\frac{\partial}{\partial D} \Pr(PDR | AJ) = - (1 - H(C_V)) \left(-\frac{C_V+C_I}{D^2}\right) \int_r^1 f(q-r)f(q)dq > 0$

The first derivative of the expected social costs of disputes resolution (under the budget constraint) with respect to the amount at stake is:

$$\begin{aligned} \frac{\partial \Sigma}{\partial D} &= -K_{VDR} f\left(\frac{C_V}{D}\right) \frac{C_V}{D^2} (1 - H(C_V)) + \\ &+ \frac{C_V+C_I}{D^2} K_{PDR} (1 - H(C_V)) \int_r^1 f(q-r)f(q)dq = (1 - H(C_V)) * \\ &* \left[ \frac{C_V+C_I}{D^2} K_{PDR} \int_r^1 f(q-r)f(q)dq - \frac{C_V}{D^2} K_{VDR} f\left(\frac{C_V}{D}\right) \right] \leq 0 \end{aligned}$$

## A.3

Without budget constraint, social costs of disputes resolution are:  $\Sigma_{no\ b.c.} = K_{VDR}F(v) + K_{PDR}(1 - G(r))$ . They are greater or smaller ( $\leq$ ) than social costs of disputes resolution, under the British rule, without budget constraint  $\tilde{\Sigma}_{no\ b.c.} = K_{VDR}F(\tilde{r}) + K_{PDR}(1 - G(\tilde{r}))$ , where  $\tilde{r} = \frac{C_V+C_I}{D+C_V+C_I} < r$ .

$$\begin{aligned} \text{However, } \Sigma_{no\ b.c.} &> \tilde{\Sigma}_{no\ b.c.} \text{ if} \\ K_{VDR} [F(v) - F(\tilde{r})] &> K_{PDR} [G(r) - G(\tilde{r})] \\ F(v) - F(\tilde{r}) &> \frac{K_{PDR}}{K_{VDR}} [G(r) - G(\tilde{r})] \end{aligned}$$

Right term is always positive. When British rule reduces the probability of access to justice ( $v < \tilde{r}$ ), left term is negative and the condition above never holds. Instead when British rule enlarges the probability of access to justice ( $v > \tilde{r}$ ), the condition above holds for enlargement smaller than  $G(r) - G(\tilde{r})$ , because  $\frac{K_{PDR}}{K_{VDR}} < 1$ .

The probability of access to justice under British rule and the budget constraint  $\Pr(\overline{AJ})$  is greater or smaller than the probability of access to justice in the benchmark case  $\Pr(AJ)$ :

$$\Pr(\overline{AJ}) = (1 - F(\tilde{r})) \left( 1 - \frac{1}{C} \int_0^1 H(C(1-q)) f(q) dq \right) \leq \Pr(AJ);$$

British rule, under the budget constraint, enlarges the probability of access to justice when:

$$\frac{(1-F(\tilde{r}))}{(1-F(v))} > \frac{(1-H(C_V))}{\left( 1 - \frac{1}{C} \int_0^1 H(C(1-q)) f(q) dq \right)}.$$