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# Law and Economics and Tort Litigation Institutions: Theory and Experiments\*

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## Abstract

In tort litigation, delayed settlement or impasse imposes high costs on the parties and society. Litigation institutions might influence social welfare by affecting the likelihood of out-of-court settlement and the potential injurers' investment in product safety. An appropriate design of litigation institutions and tort reform requires good knowledge of the factors that affect litigants' behavior. The combination of theoretical and experimental law and economics, which represents the cornerstone of the application of the scientific method, might enhance our understanding of the effects of litigation institutions and tort reform on settlement and deterrence.

We evaluate the interaction between theoretical and experimental law and economics in the study of tort litigation institutions. Special attention is devoted to liability, litigation and tort reform institutions, and behavioral factors that might affect impasse. Our analysis suggests a productive interaction between theoretical and experimental law and economics. In particular, findings from experimental economics work on litigation institutions indicate the presence and robustness of cognitive biases, and provide evidence of the effects of litigants' biased beliefs on the likelihood of impasse. These findings

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have motivated the construction of new economic models of litigation involving more empirically-relevant assumptions about litigants' beliefs. As a result of the application of the scientific method, the contributions of law and economics to the design of legal institutions might be strengthened.

KEYWORDS: Law and Economics; Experimental Law and Economics; Scientific Method; Civil Litigation; Institutional Design; Settlement; Litigation; Asymmetric Information; Self-Serving Bias; Pretrial Bargaining; Incentives for Care; Experiments; Caps on Non-Economic Damages; Motivated Reasoning; Divergent Beliefs; Motivated Anchoring; Non-Cooperative Games; Disputes

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# 1 INTRODUCTION

In tort litigation, delayed settlement or impasse imposes high costs on the parties and society.<sup>2</sup> Litigation institutions might influence social welfare by affecting the likelihood of out-of-court settlement and the potential injurers' investment in product safety. An appropriate design of litigation institutions and tort reform requires good knowledge of the factors that affect litigants' behavior. The combination of theoretical and experimental law and economics, which represents the cornerstone of the application of the scientific method, might enhance our understanding of the effects of litigation institutions and tort reform on settlement and deterrence.

This chapter assesses the interaction between theoretical and experimental law and economics in the study of tort litigation institutions. Special attention is devoted to liability, litigation and tort reform institutions, and to behavioral factors that might affect impasse.

We start our analysis by identifying the methodological aspects of seminal law and economics work on litigation institutions. Law and economics scholars have studied the properties of tort litigation institutions by constructing economic models. The theoretical literature on settlement and litigation has identified two important sources of impasse. First, impasse is attributed to the presence of litigants' divergent beliefs about the trial outcome (Landes 1971; Gould 1973; Posner 1977; Shavell 1982; Priest and Klein 1984). The high degree of uncertainty that characterizes

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<sup>2</sup> The direct costs of tort litigation in the U.S. reached \$247 billion in 2006 (Towers Perrin Tillinghast 2007). Tort costs in the U.S. (as a percentage of the gross domestic product) were double the cost in Germany and more than three times the cost in France or the United Kingdom in 2004 (Towers Perrin Tillinghast 2005).

judicial adjudication might originate this divergence. The possibility of systematic egocentric biases in the litigants' beliefs is not considered in these frameworks.<sup>3</sup> A second source of impasse is related to asymmetries of information between the litigants about the strength of the plaintiff's case. Using game-theoretic tools, scholars have demonstrated that asymmetric information might generate impasse even in the absence of divergent beliefs (Cooter, Marks, and Mnookin 1982; Png 1983; Bebchuck 1984; Reinganum and Wilde 1986; Schweizer 1989; Spier 1992, 1994; Hylton 1993).<sup>4</sup> Whether litigants exhibit divergent beliefs and the nature of this divergence are ultimately empirical questions. Motivated by these empirical concerns, law and economics scholars have applied experimental economics methods in the study of litigation institutions.<sup>5</sup>

We extend our analysis by assessing the components of the experimental environments used in more recent law and economics work of litigation and identifying the main findings of these studies. Experimental economics work has investigated the behavioral factors that might generate litigants' divergent beliefs in litigation environments. Babcock et al. (1995a, 1995b, 1997a, 1997b) and Loewenstein et al. (1993) identify an important source of divergence that rests on a judgment error called self-serving bias. In legal contexts, self-serving bias refers to the litigant's biased belief that the court decision will favor his case. This bias is posited to originate from the egocentric interpretation of facts associated with the legal dispute. As a result of the litigants' self-serving beliefs, a higher likelihood of impasse might be observed. Babcock and

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<sup>3</sup> Hence, the cognitive processes that originate these divergent beliefs are not studied in these models.

<sup>4</sup> See Png (1987), Hylton (2002), Landeo and Nikitin (2006), and Landeo et al. (2007b) for models of liability and litigation.

<sup>5</sup> Empirical studies of legal institutions can be broadly classified as follows: (1) econometric analysis of naturally generated data, (2) experimental law and economics studies (lab and field experiments), and (3) experimental social psychology studies. This chapter focuses on the interaction between experimental law and economics (lab experiments) and theoretical law and economics in the analysis of tort litigation institutions.

Pogarsky (1999), Pogarsky and Babcock (2002) and Landeo (2009) provide experimental evidence of the effects of tort reform in the presence of self-serving bias.<sup>6</sup> Importantly, empirical work by Babcock et al. (1996, 1997a, 1997b) and Eisenberg (1994) suggest that self-serving bias is generally robust to debiasing interventions and litigants' experience. In response to the experimental evidence regarding litigants' self-serving beliefs, new theoretical models of liability and litigation have been developed.

Finally, we evaluate the main elements of recent theoretical studies on litigation and the contributions of this work. Building upon Bebchuk's (1984) framework, Farmer and Pecorino (2002) study settlement and litigation under self-serving bias and asymmetric information. They find that self-serving bias operates as a commitment device for the recipient of a settlement offer. As a result, the likelihood of impasse increases.<sup>7</sup> Landeo, Nikitin and Izmalkov (2013) extend Reinganum and Wilde's (1966) signaling model to investigate the effects of self-serving bias on the potential injurer's incentives for care, litigation outcomes, and social welfare. Their findings suggest that self-serving bias negatively affects the defendant's expenditures on accident prevention, and hence, increases the likelihood of an accident. Their results also indicate that self-serving bias increases the likelihood of impasse and might be welfare-reducing. Next, Landeo, Nikitin and Izmalkov (2013) use their framework to assess the effects of damage caps. Their model predicts that caps might reduce the incentives for care and increase the likelihood of an accident. Importantly, their results suggest that self-serving bias might reverse the positive

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<sup>6</sup> See Glöckner and Engel (2013) for experimental evidence of cognitive limitations in interactions between defense attorneys and prosecutors; and, Eigen and Listokin (2012) for evidence of cognitive limitations of legal advocates in moot court competitions.

<sup>7</sup> Deffains and Langlais (2009) provide a different extension of Bebchuk's (1984) framework that allows for self-serving bias and risk aversion.

effect of damage caps on impasse observed in theoretical environments that do not allow for litigants' egocentric biases.<sup>8</sup>

Our analysis suggests a productive interaction between theoretical and experimental law and economics in the study of litigation institutions. Specifically, seminal theoretical law and economics work on litigation institutions has indeed guided empirical research. The new experimental economics studies have provided empirical evidence of decision-making processes and behavioral factors that might affect litigants' beliefs and litigation outcomes. This recent knowledge on litigants' cognitive biases has motivated the construction of economic models of litigation involving more empirically relevant assumptions regarding litigants' beliefs.

Regarding the contributions of empirical legal studies to law and economics, Professor Cooter (2011, pp. 1475 and 1483; emphasis added) states that

Empirical Legal Studies [...] is the maturation of law and economics [...] into normal science [...] Together they constitute the long-awaited science of law.<sup>9</sup> The peripheral influence of [law and economics] on law's content is sobering. To make [empirical legal studies and law and economics] central to law's content, scholars must show that correct legal reasoning often requires *scientific prediction* of law's effects.

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<sup>8</sup> See Watanabe (2010) for a recent model of filing and litigation under divergent beliefs and complete information; and Bar-Gill (2007) for a theoretical analysis of the persistence of optimistic beliefs under an evolutionary game-theoretic approach. See Yildiz (2003) for a more general bargaining model with divergent beliefs.

<sup>9</sup> In contrast to revolutionary science, normal science evolves by incremental improvements of theories, motivated by empirical tests of hypotheses (Kuhn 1996). See Cooter (2011) for an extensive discussion of the scientific method applied to the study of law.

The analysis presented in this chapter indicates that, by complementing theoretical analysis with experimental economics and more traditional empirical methods, law and economics scholars are contributing to the construction of the science of law. Importantly, as a result of the application of the scientific method, the contributions of law and economics to law's content and to the design of legal institutions might be strengthened.

Although this chapter is motivated by tort litigation institutions, we believe that the insights presented here apply to other contexts as well. Bargaining and impasse are prevalent in environments such as labor contract negotiations (Farber 1978; Kennan and Wilson 1989, 1992; Babcock and Olson 1992; Babcock, Wang and Loewenstein 1996) and partnership dissolution procedures (Landeo and Spier 2014a, 2014b, 2013; Brooks, Landeo and Spier 2010). Given that individuals run firms and human agents negotiate contracts, it is reasonable to expect that cognitive biases might be also present in these settings.<sup>10</sup> Hence, experimental work on the behavioral factors that affect impasse in these environments might contribute to the construction of more empirically relevant theories.

The chapter is organized as follows. Section 2 outlines seminal theoretical work on litigation. Section 3 evaluates experimental economics work on tort litigation institutions and cognitive biases. Section 4 discusses new theoretical frameworks motivated by this experimental work. Section 5 presents concluding remarks.

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<sup>10</sup> Marital dissolution environments (Wilkinson-Ryan and Small 2008) represent an additional interesting application.

## 2 SEMINAL THEORETICAL WORK ON LITIGATION

Seminal law and economics work has used economic models to study the properties of tort litigation institutions. The theoretical literature on settlement and litigation has identified two important sources of impasse: divergence beliefs and asymmetric information.

First, impasse is attributed to the presence of litigants' divergent beliefs about the trial outcome. For instance, Shavell (1982) studies settlement and litigation using a theoretical framework that allows for divergent beliefs about the outcome at trial and risk-aversion.<sup>11</sup> In this setting, litigants' estimates of their chances of prevailing at trial, their estimated judgment amounts, the legal costs, and their attitudes toward risk influence the likelihood of an out-of-court settlement. His model predicts that trial occurs if the plaintiff's estimate of the expected award at trial exceeds the defendant's estimate by at least the sum of their legal costs.<sup>12</sup> Priest and Klein (1984) investigate the selection of cases that proceed to trial by using a framework that allows for errors in the litigants' estimates of the trial outcome.<sup>13</sup> The errors are assumed to be independent, random variables with zero expectation and identical standard errors. In other words, the authors assume that the litigants form independent, unbiased estimates of the true value of the dispute. Trial occurs when the plaintiff's estimate of the award at trial exceeds the defendant's estimate by

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<sup>11</sup> Specifically, this framework allows for divergent beliefs about the likelihood of prevailing at trial and the amount of the judgment in the event the plaintiff succeeds at trial.

<sup>12</sup> In other words, trial occurs if the plaintiff's estimate of his expected award at trial net of litigation costs exceeds the defendant's estimate of his expected total loss at trial including litigation costs. The model also predicts that risk aversion increases the likelihood of out-of-court settlement. Settlement allows the parties to avoid the risk associated to going to trial.

<sup>13</sup> See also Landes (1971), Gould (1973), Posner (1977).



enough to offset the incentive for settlement generated by trial costs.<sup>14</sup> Their findings also suggest that the cases that go to trial are characterized by a 50 percent chance of plaintiff's success at trial regardless of the applied substantive standard of law (negligence or strict liability).<sup>15</sup> More generally, these theoretical frameworks (1) allow for uncertainty but do not allow for asymmetric information; (2) allow for divergent litigants' assessments of the expected trial outcome but do not allow for biased beliefs (i.e., do not consider role-specific biases) and do not explicitly model the possible sources of divergence, and (3) do not explicitly model the bargaining process.

Second, impasse is attributed to information asymmetries. Using game-theoretic environments that explicitly model the bargaining process and common beliefs (also known as common priors), law and economics scholars study how the likelihood of impasse might be affected by asymmetric information between the litigants about the trial outcome. For instance, Bebchuk (1984) constructs a model of settlement and litigation in which the defendant has private information about the probability of the plaintiff's prevailing at trial (i.e., known as the defendant's type).<sup>16</sup> The sequence of moves is as follows. First, the uninformed plaintiff makes a settlement offer. After observing the offer, the informed defendant decides whether to accept or

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<sup>14</sup> More general bargaining models (Crawford 1981, p. 208) predict that, in the presence of uncertainty and divergent beliefs, "[T]he existence of the contract zone [i.e., the set of mutually beneficial outcomes] is guaranteed unless the beliefs are relatively too 'optimistic.'" See Coursey and Stanley (1988) and Babcock and Landeo (2004) for experimental evidence on the effects of the size of the contract zone on the likelihood of impasse in litigation environments.

<sup>15</sup> This result holds when the amount the loser pays is equal to the amount the winner gains (i.e., when the stakes are symmetric). Asymmetric stakes might occur in situations in which the resolution of the dispute affects the defendant beyond the payment at trial. Consider, for instance, the reputational costs for the defendant (firm) in case of a verdict in favor of the plaintiff (consumer) in a products liability case. See Priest and Klein (1984) for details.

<sup>16</sup> The defendant's type indicates the strength of the plaintiff's case: defendants who are low types face plaintiffs with a relatively low probability of prevailing at trial.

reject it. Rejection induces a costly trial. In this framework, impasse occurs in equilibrium.<sup>17</sup> Bebachuk's (1984) findings also suggest that an increase in the size of the potential award at trial, a reduction in litigation costs, or an expansion of uncertainty (i.e., an expansion in the range of defendant's types) increases the likelihood of trial. Reinganum and Wilde (1986) study a litigation game between an informed plaintiff and an uninformed defendant, in which the informed plaintiff makes the out-of-court settlement proposal. After observing the proposal, the uninformed defendant decides whether to accept or reject the offer. As in Bebachuk (1984), rejection results in a costly trial. In this setting, the plaintiff's settlement demand can serve as a signaling device because the cost of disputes is lower for a more severely damaged plaintiff, who can expect to get a higher award at trial. Their findings suggest that, even in cases in which both parties share common beliefs about the likelihood of a judgment in favor of the plaintiff, asymmetric information about the damages suffered by the plaintiff suffices to generate impasse.<sup>18</sup>

The next two sections discuss experimental work and new theoretical developments motivated by these experimental findings. We evaluate the interaction between theoretical and experimental economics by focusing on litigation institutions and cognitive biases.

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<sup>17</sup> The presence of information asymmetries explains this result. Specifically, if the plaintiff knew the probability of prevailing at trial, then the plaintiff would make a settlement demand that the defendant would be willing to accept. The optimal settlement demand for the uninformed plaintiff, however, will be an amount that a low-type defendant (the defendant for which the case is associated with a low probability of the plaintiff's prevailing at trial) will reject.

<sup>18</sup> Perfect Bayesian equilibrium is the equilibrium concept applied in these settings. See also Cooter, Marks and Mnookin (1982), Png (1983), Schweizer (1989), Spier (1992, 1994), and Hylton (1993) for seminal work on pretrial bargaining. Png (1987), Hylton (2002), Landeo and Nikitin (2006), and Landeo et al. (2007b) extend these models by analyzing the potential injurer's investment in product safety. See Waldfogel (1998) for an empirical test of models of divergent (but unbiased) beliefs and asymmetric information.

### **3 EXPERIMENTAL LAW AND ECONOMICS WORK ON LITIGATION**

This section first outlines the main components of the method used in experimental law and economics. It then discusses experimental work on litigation institutions and cognitive biases. Finally, it presents empirical evidence on the robustness of self-serving bias.

#### **3.1 Methodological Aspects**

Experimental law and economics refers to the application of experimental economics methods to the study of legal institutions and business practices relevant to the design of legal institutions.<sup>19</sup>

Controlled laboratory experiments represent an optimal methodology for causality assessment (Falk and Heckman 2009) in litigation environments. In settings outside the laboratory, although researchers might be able to observe the final outcomes of pretrial bargaining and the impact of tort reform, the processes associated with pretrial bargaining negotiations and the factors that affect those processes are generally private information. In fact, data that would permit researchers to perfectly isolate the causal connection between impasse and various behavioral factors (such as cognitive limitations) and institutional interventions (such as tort reform) are

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<sup>19</sup> See Smith (1976), Plott (1982), Roth (1986, 1995), and Davis and Holt (1993) for seminal discussions about experimental economics methods. See Croson (2005) and Croson and Gächter (2010) for more recent excellent discussions of experimental economics methods. See Roth (2008) for a discussion of the contributions of experimental economics methods to market design. See Hoffman and Spitzer (1985), McAdams (2000), Croson (2002, 2009), Talley and Camerer (2007), and Arlen and Talley (2008) for surveys regarding the application of experimental economics methods to law and economics. See Landeo (2015) for a discussion of experimental economics methods applied to the study of antitrust institutions, and an analysis of the contributions of experimental law and economics to the study of vertical restraints and antitrust.

scarce or inexistent. Conducting experiments to assess the predictions from theoretical models is, therefore, a valuable complement to more traditional empirical analysis.

## *Types of Studies*

Experimental law and economics work on litigation institutions includes (1) experiments that study behavioral factors such as cognitive limitations that might affect litigation outcomes and the effectiveness of tort reform;<sup>20</sup> and (2) studies that test the predictions from economic models of liability and litigation.<sup>21</sup> Both types of studies involve experimental environments aligned with the theoretical frameworks, and pay-for-performance schemes that replicate the incentives the theory.<sup>22</sup> These studies do not involve deception.<sup>23</sup>

While these two types of studies are similar in many ways, they differ fundamentally along two dimensions: context and the population from which subjects are drawn. Economic theories consist of abstract representations applicable to different situations and individuals. Experiments

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<sup>20</sup> See Thaler (1987) for a discussion of behavioral anomalies. This chapter focuses on this type of study.

<sup>21</sup> For instance, Croson and Johnson (2000) experimentally study the power of institutional rules on pretrial bargaining in environments in which inappropriate taking might occur. Babcock and Landeo (2004) experimentally study the effects of asymmetric information and a settlement escrows institution on settlement and litigation. Landeo et al. (2007a) experimentally assess the effects of tort reform on liability and litigation in the presence of asymmetric information. Although the findings from these studies support the predictions of the standard theories under investigation, they also suggest the presence of behavioral factors such as fairness considerations and cognitive limitations.

<sup>22</sup> See Smith (1976). Experimental economics methods are generally criticized because of the size of subjects' payments, and the degree of alignment of these incentives with the economic consequences of choices in settings outside the laboratory. Evidence regarding the effects of the size of payoffs is inconclusive and seems to depend on the experimental environment (Faulk and Heckman 2009; Camerer and Hogarth 1999).

<sup>23</sup> The fields of economic and psychology fundamentally differ on the use of deception. Economics forbids deception while psychology sometimes employs it.

that test economic models generally involve minimal context<sup>24</sup> and the use of university students as subjects.<sup>25</sup> As mentioned by Croson (2002), although both types of studies must have a high degree of internal validity (i.e., their experimental environments should be aligned with the theoretical frameworks), the experimental environments used in studies devoted to investigate behavioral anomalies should also allow for the elicitation of these anomalies. The degree of context deemed acceptable is related to this point. In particular, studies devoted to assess cognitive biases should encompass a degree of context necessary to trigger these anomalies (if they exist).<sup>26</sup> In addition, if the anomalies are expected to occur in specific groups of individuals, these groups should be used as subjects. Finally, studies that evaluate cognitive biases generally include post-experimental questionnaires to explore the sources of the anomalies.<sup>27</sup>

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<sup>24</sup> The lab implementation of a theoretical setting generally involves the use of a simple context, i.e., a simple environment where the theory applies. For instance, the experimental environment associated with a pretrial bargaining model might resemble a simple bilateral bargaining setting. Labels such as player A (representing the plaintiff) and player B (representing the defendant) might be used to describe the roles played by the subjects. The use of minimal contextual features ensures control over subjects' subjective interpretations of labels. Control facilitates replicability, i.e., the replication of the study by other researchers with the purpose of assessing the robustness of findings.

<sup>25</sup> Experimental studies devoted to studying the effects of subject pools in context-free experiments do not suggest significant differences in the behavior of undergraduate students and other populations (Fréchette forthcoming).

<sup>26</sup> Croson (2002) argues that “the conditions in the experiment should be such that the traditional theory can make a behavioral prediction. However, the experiment should be designed to create the anomaly as well” (p. 932). In particular, if the experiment is motivated by the results observed in a previous experimental economics lab study, then the experimental environment (including the use of context) used in the previous experiment should be replicated. If, on the other hand, the experiment is motivated by regularities observed in naturally-occurring settings that challenge a theoretical framework (i.e., non-random behavioral deviations), the features of the theory should be implemented in the lab *and* the experimental environment should allow for the elicitation of the anomalies. A simple example might illustrate this point. Suppose that the anomaly refers to divergent and biased beliefs of the parties involved in bargaining negotiations. Suppose also that these cognitive limitations are role-specific biases and are elicited in environments characterized by rich context and ambiguity. Finally, suppose that these cognitive limitations challenge previous bargaining theories that assume divergent but unbiased beliefs. The experimental environment used to assess these anomalies should implement the components of the bargaining theory. In addition, the experimental environment should include rich context and ambiguity. The lab implementation might then result in an environment where the theory applies and where the anomaly might be elicited.

<sup>27</sup> A third type of experimental studies is devoted to assess the effectiveness of specific policies before these policies are implemented (testbed policy experiments). Hong and Plott (1982) present seminal work

## ***Contributions***

Important contributions are derived from the application of experimental economics methods to the study of litigation institutions. Experimental law and economics work can help advance the knowledge of the factors that affect litigation processes and outcomes. Specifically, studies devoted to investigate cognitive biases in litigation environments might provide evidence of the importance of these previously non-modeled behavioral factors and hence, contribute to the construction of more empirically relevant models of litigation. Experimental studies conducted to test the theoretical predictions of economic models of liability and litigation might provide evidence of the robustness of the theories. These studies might also reveal the presence of previously non-modeled factors that influence the impact of tort litigation institutions, and hence, might provide useful feedback to theorists. Finally, experimental studies involve the laboratory implementation of simplified versions of complex theories. These simple environments might facilitate policy-makers' understanding of the theories, and hence, might strengthen the contributions of law and economic theories to the design of litigation institutions and tort reform.

### **3.2 Experimental Evidence on Pretrial Bargaining and Cognitive Biases**

As previously mentioned, seminal models of settlement and litigation (Shavell 1982; Priest and

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on the effects of a policy change proposed by the Interstate Commerce Commission. (See Plott 1994, for a general discussion of testbed experiments.) Although this type of experimental study has not been used in liability and litigation settings yet, the information provided by these experiments might also provide good feedback to theorists and contribute to the improvement of litigation institution design. The previous classification follows Roth (1986) and Croson (2002). Roth (1986) presents a general classification of experimental economics studies. Croson (2002) applies Roth's (1986) classification to experimental law and economics studies.

Klein 1984) predict that, in the presence of uncertain but symmetric information, litigants' divergent (but unbiased) beliefs regarding the expected outcomes at trial might preclude settlement.<sup>28</sup> More recently, game-theoretic models with common beliefs (Bebchuck 1984; Reinganum and Wilde 1986) find that asymmetric information between the litigants about the outcome at trial might generate impasse even in the absence of divergent beliefs. The importance of litigants' divergent beliefs on impasse and the nature of this divergence are empirical questions.

Babcock et al. (1995a, 1995b), Loewenstein et al. (1993), Babcock et al. (1997a, 1997b) experimentally investigate the behavioral factors that might generate litigants' divergent beliefs, and hence, might influence the likelihood of out-of-court settlement agreements.<sup>29</sup> They propose an explanation for impasse that rests on a judgment error called self-serving bias. Self-serving bias, as applied in this context, refers to the litigant's biased beliefs that the court decision will favor his case due to the interpretation of the facts of the dispute in an egocentric manner. This work builds on seminal research in social psychology regarding cognitive biases (Messick and Santis 1979; Ross and Sicoly 1982; Kunda 1990, 1987; Danitioso et al. 1990; Thompson and Loewenstein 1992). In this literature, self-serving bias is attributed to motivated reasoning, which can be understood as individuals' propensity to reason in a way that supports their subjectively favored propositions by attending only to some of the available information. In particular, Kunda's (1990) experimental work suggests that "[p]eople rely on cognitive processes and representations to arrive at their desired conclusions, but motivation plays a role in determining which of these will be used on a given occasion" (p. 481). "[S]elf-serving biases are

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<sup>28</sup> Settlement will occur if there is a non-empty contract zone (a set of mutually beneficial agreements).

<sup>29</sup> See also Babcock et al. (1997a) for a survey of their work on self-serving bias.

best explained as resulting from cognitive processes guided by motivation because they do not occur in the absence of motivational pressures” (Kunda 1987, p. 636).

Babcock and colleagues hypothesize that, in complex environments characterized by ambiguity, even when the parties are exposed to the exact same information, they might arrive at expectations of an adjudicated settlement that are biased in a self-serving manner. As a result, the likelihood of impasse might be negatively affected by the magnitude of self-serving bias. Importantly, given that litigation outcomes might influence the decisions of potential injurers regarding their expenditures on accident prevention (Png 1987; Hylton 2002; Landeo et al. 2006, 2007a, 2007b), self-serving bias might also negatively affect social welfare and the effectiveness of tort reform.<sup>30</sup>

For instance, Babcock et al. (1995a) provides a test of the existence of the self-serving bias in litigation environments, and the causal relation between the self-serving bias and impasse. The authors manipulate the magnitude of the self-serving bias by informing subjects of their roles at different points of the experimental session, and then analyze the effects of this manipulation on the likelihood of out-of-court settlement. Their experimental environment replicates a pretrial bargaining game between a plaintiff and a defendant. Structured bargaining with face-to-face

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<sup>30</sup> The core features of the experimental environments Babcock and colleagues used are as follows: (1) an informational structure aligned with seminal theoretical models of litigation, i.e., uncertain but symmetric information; (2) a structured bargaining process (a sequence of negotiation rounds with predetermined length and unstructured face-to-face communication); (3) contextual features motivated by a simplified versions of an actual legal case; (4) elicitation of judgments and choices; (5) pay-for-performance incentive schemes; and, (6) university students used as subjects. Multiple experiments are conducted using the same basic experimental design. This feature of Babcock and colleagues’ work allows them to test the robustness of their initial findings across subject pools, and to explore additional factors that might originate these initial findings. See Babcock and Loewenstein (1997a) for a discussion of the features of these experimental studies.



communication, rich but symmetric information (i.e., the same complex information about a legal case is provided to both subjects), and human subjects paid according to their performance are used in this experiment. An experimental currency, the experiment dollar, is adopted. The conversion rate of experiment dollars/U.S. dollars is 10,000 experimental dollars to 1 U.S. dollar. The subject pool consists of public policy and law students.

The authors' full-context experimental environment is motivated by an actual legal case in Texas. It refers to a claim for damages resulting from an accident in which a motorcyclist and an automobile driver are involved. In this legal case, the plaintiff (the motorcyclist) is suing the defendant (the car driver) for \$100,000. The material provided to the subjects includes witnesses' testimony, police reports, maps, and litigants' testimony. Subjects playing the roles of plaintiff and defendant are given the same exact information and are informed that their partners will receive the same information.<sup>31</sup> They are also informed that the same material was provided to an actual judge in Texas, who decided the amount of the award that the subject-plaintiff would receive at trial (a number between \$0 and \$100,000) in case of impasse.<sup>32</sup> To preserve ambiguity, the judge's exact award is not disclosed to the subjects until the end of the session. The judge's predetermined award (\$30,560) is applied across all sessions and conditions.

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<sup>31</sup> Lab studies devoted to study role-specific biases involve the use of complex context characterized by ambiguity. Labels such as plaintiff and defendant characterize the assigned roles. As mentioned before, the use of minimal context and simple labels ensures control over subjective interpretations of labels. In this study, the use of labels to characterize the roles is aligned with the requirement of implementing a complex context.

<sup>32</sup> The researchers could provide information about the actual judgment. Instead, they used the award provided by another judge. This procedure was adopted and described to the subjects to preclude subjects from believing that the case was chosen because the judgment award fell within a desired range (for instance, because the amount at trial was relatively high or was relatively low). Using these sorts of techniques, the design controls for factors that might affect the subjects' formation of beliefs, and hence, their pretrial bargaining decisions. See Babcock et al. (1995a).

Three experimental tasks are included in this study. Subjects are asked to state their judgments about various aspects of the legal case, to participate in pretrial bargaining negotiations, and to answer a questionnaire. The first experimental task is implemented after subjects read the case material, but before they negotiate. Each subject is required to make two judgments: (1) a settlement amount the subject would consider to be fair, and (2) a best guess regarding the amount of the award that the judge chose. Before completing this experimental task, subjects are informed that their responses will be not disclosed to the other party.<sup>33</sup> Subjects receive monetary incentives aligned with the precision of their judgment – a bonus of \$1 at the end of the session if their prediction of the judge's award is within \$5,000 (plus or minus) of the judge's actual award. The session proceeds with the next experimental task, the participation in pretrial bargaining negotiations. The subjects have 30 minutes to negotiate an agreement. The 30-minute period is divided into six 5-minute rounds. Face-to-face communication is allowed. At the end of each round, both parties simultaneously submit settlement proposals. If the defendant's offer is greater than the plaintiff's request (i.e., a non-empty contract zone exists), an agreement is reached. The transfer is set at the midpoint. In case of disagreement, \$5,000 in litigation costs is imposed, and subjects move to the next round. In case of negotiation failure in the sixth 5-minute round, the judge's decision is imposed.

Finally, a questionnaire is administered. Subjects are asked to state their perceptions of how a judge would rate the importance of 16 predetermined arguments (8 favoring the plaintiff, and 8 favoring the defendant) in determining the award. The purpose of this instrument is to assess

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<sup>33</sup> This feature of the experimental design allows the researchers to control for strategic factors that might affect litigants' judgments. For instance, when the plaintiff's judgment about a fair settlement amount is disclosed to the defendant, the plaintiff might behave strategically and inflate the amount to induce the defendant to propose a higher out-of-court settlement offer. In the absence of disclosure, the plaintiff's judgment is not affected by strategic considerations.

whether the subjects' roles affect their perceptions of the specific facts of the case. At the end of the session, subjects are paid for their participation in the study. The components of the subjects' payment are as follows. In addition to the potential bonus related to the judgment task, the payment involves a fixed participation fee and game earnings. The game earnings represent the pay-for-performance component of the pretrial bargaining negotiations task. Game earnings are aligned with the negotiation outcomes.

Two experimental conditions are implemented. In the first condition, subjects are informed about their randomly-assigned role before reading the case material. In the second condition, subjects first read the case material and state their judgments about a fair settlement and about the judge's award, and then are informed about their roles. These two conditions create variation in the magnitude of the self-serving bias. Following the findings from social psychology, the authors hypothesize that self-serving interpretations of fairness would be stronger in the condition in which the roles are assigned before the subjects read the case material and assess fairness. As a result, they expect a lower likelihood of out-of-court settlement under that condition.

Their findings indicate that role assignment elicited self-serving bias. Three within-condition measures of self-serving bias are constructed. The first two indicators measure the difference between the plaintiff's and defendant's assessment of a fair settlement amount, and the plaintiff's and defendant's assessment of the judge's award. Both indicators were significantly different from zero in the condition in which roles were assigned before the case was read, suggesting the presence of self-serving bias. The last indicator measures the difference between the plaintiff's and defendant's assessments of the importance of arguments favoring each litigant. Comparisons

of these measures across conditions indicate that the magnitude of self-serving bias was higher in the condition in which roles were assigned before the case was read. Importantly, their results suggest that the likelihood of impasse and the time needed to achieve an out-of-court settlement were higher when the role was assigned before the subjects read the case material. Hence, the findings support the claim that out-of-court settlement might be negatively affected by the self-serving biases of the litigants.

### **3.3 Experimental Evidence on Tort Reform and Cognitive Biases**

Tort reform has been motivated by the common perception that excessive damage awards promote unnecessary and costly litigation (Danzon 1986) and the escalation of liability insurance premiums (Sloane 1993). Some reforms take the form of caps or limits on damage awards (Avraham and Bustos 2011), while others mandate that a portion of the award be allocated to the plaintiff with the remainder going to the state (Landeo and Nikitin 2006; Landeo et al. 2007a).<sup>34</sup> Seminal theoretical work on litigation environments that assume unbiased litigants' beliefs suggests that a reduction in the expected award at trial (a cap) increases the likelihood of out-of-court settlement.<sup>35</sup>

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<sup>34</sup> See Arlen (2000) for a survey of tort reform institutions.

<sup>35</sup> Under caps, the plaintiff's expected award at trial is lower, and hence, plaintiffs are willing to accept lower settlement offers. This theoretical result holds in litigation environments characterized by common and unbiased litigants' beliefs (Bebchuck 1984), and in environments with divergent but unbiased litigants' beliefs (Priest and Klein 1984). However, in a model of liability and litigation with common and unbiased beliefs, Png (1987) finds that the effects of a reduction in the award at trial on the (unconditional) likelihood of impasse is generally ambiguous due to the effects of this tort reform on the incentives for care (and hence, on the likelihood of an accident).

More recently, as previously described, experimental work on cognitive biases in litigation environments (Babcock et al. 1995a; Loewenstein et al. 1993) provides evidence of the presence of role-induced biases. In addition, findings from social psychology in ambiguity environments suggest that the formation of beliefs can reflect anchoring mechanisms or adjustments towards a reference point, and that these adjustments can be affected by self-serving bias. In litigation environments, anchoring mechanisms might characterize the influence of a damage cap on litigants' beliefs. Babcock and Pogarsky (1999) and Pogarsky and Babcock (2001) hypothesize that motivated anchoring or the self-serving adjustment of the litigants' beliefs towards the cap will occur when the value of the actual claim is below the damage cap amount.<sup>36</sup> When the actual claim value is above the cap, on the other hand, the cap will truncate litigants' beliefs. Hence, in environments characterized by ambiguity, damage caps might affect litigation outcomes and litigants' beliefs.<sup>37</sup>

Babcock and Pogarsky (1999) experimentally study the effects of damage caps on the likelihood of out-of-court settlement and litigants' beliefs in a litigation environment characterized by ambiguity and a cap set below the actual claim value.<sup>38</sup> Their experimental environment replicates a pretrial bargaining game between a plaintiff and a defendant (roles randomly assigned), and provides rich but symmetric information about a legal case. Subjects, MBA and public policy students attending negotiation courses, are rewarded according to performance. The pay-for-performance scheme is set in terms of grades. Better negotiation outcomes earned

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<sup>36</sup> Pogarsky and Babcock (2001) refer to this situation as a “non-binding cap.”

<sup>37</sup> Following the theoretical literature on settlement and litigation, Babcock and Pogarsky (1999) and Pogarsky and Babcock (2001) abstract from the effects of the jury on the plaintiff's award at trial. Theoretical and experimental work on the effects of self-serving bias and tort reform in environments that allow for group decision-making represents an interesting extension.

<sup>38</sup> See Landeo (2009) for an experimental study on coherence-based reasoning (bi-directionality between choices and beliefs) in litigation environments.

students better grades.<sup>39</sup> Two experimental conditions are implemented, cap and non-cap conditions. The only difference between these two conditions is the limit on the award at trial under the cap condition.

Their experimental environment is motivated by a legal case involving a personal injury lawsuit filed by a pedestrian who fell through a street vent (the plaintiff) against the manufacturer of the vent (the defendant). In this legal case, the plaintiff seeks \$1,000,000 in damages for pain and suffering. Subjects playing the roles of plaintiff and defendant are given the same case information and know that their partners will receive the same information. The material provided to the subjects includes witnesses' testimony, police reports, maps, and litigants' testimony. Subjects are also informed that the same material was provided to an actual judge, who decided the plaintiff-subject award in the event of settlement impasse.<sup>40</sup> In the cap condition, subjects are informed that the amount of damages a judge could award to the plaintiff for pain and suffering was limited by law to \$250,000. Note that the cap amount is lower than the value of the amount sought by the plaintiff. The main experimental tasks used in Babcock et al. (1995a) are also implemented in this study.<sup>41</sup>

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<sup>39</sup> Although this study implemented a pay-for-performance scheme, unnecessary noise related to the subjects' subjective valuation of grades could have been avoided if dollars had been used instead.

<sup>40</sup> The exact amount decided by the judge is not told to the subjects to preserve ambiguity. The judge's predetermined award, equal to \$770,000, is announced at the end of the session, across all sessions in the non-cap condition. In the cap condition, the judge's award is truncated to \$250,000.

<sup>41</sup> Specifically, judgments and pretrial bargaining are elicited. Before negotiation starts, subjects are required to make three judgments. First, subjects are requested to state their judgment about a fair settlement amount. Second, subjects are asked to state their judgment about the judge's award. Before completing this task, subjects are informed that their chosen judgments will not be disclosed to the other party. Third, subjects' reservation values are elicited. Specifically, plaintiffs are asked their minimum acceptable offer, and defendants are asked their maximum acceptable offer. Subjects receive monetary incentives aligned with the precision of their prediction of the judge's award. A bonus consisting of three lottery tickets is provided at the end of the session if the prediction of the judge's award is within \$25,000 (plus or minus) of the judge's actual award. Then, the pretrial bargaining negotiation begins. The subjects have 20 minutes to negotiate an agreement. The 20-minute period is divided into four 5-minute rounds. At

Their findings suggest that the litigants' assessment of fairness and their predicted trial outcomes determine their pretrial bargaining choices (i.e., the litigants' beliefs influence their choices). Their results also indicate the presence of self-serving bias, and that damage caps reduce the magnitude of the bias.<sup>42</sup> Finally, a higher likelihood of out-of-court settlement is observed under the cap condition. This last result might be explained by the lower uncertainty and lower self-serving bias in the cap condition.

Pogarsky and Babcock (2001) extend this work by analyzing how a damage cap that is higher than the actual claim affects litigation outcomes and litigants' beliefs. This study follows the protocol applied in Babcock and Pogarsky (1999) with a few changes. In the current experiment, the severity of the plaintiff's injuries is reduced, and the cap is set to \$1,000,000. Pay-for-performance is set in monetary terms.<sup>43</sup> Game earnings are aligned with the negotiation outcomes. The experimental currency is the experimental dollar (50,000 experimental dollars equal 1 U.S. dollar). As in the previous study, two tasks are included in this experiment. Subjects are asked to state their judgments about the judge's award at trial, and are asked to participate in a pretrial bargaining negotiation. The two conditions studied are cap and non-cap.<sup>44</sup>

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the end of each round, both parties simultaneously and privately submit offers. If the defendant's offer is greater than the plaintiff's request, an out-of-court settlement agreement is reached. The transfer is set at the midpoint. In case of disagreement, \$10,000 in litigation costs is imposed, and subjects move to the next round. In case of negotiation failure in the fourth 5-minute round, the judge's decision is imposed. The exact amount decided by the judge is not told to the subjects to preserve ambiguity. The judge's predetermined award, equal to \$325,000, is applied at the end of the session, across sessions and conditions.

<sup>42</sup> The magnitude of the self-serving bias is represented by the disparity in litigants' predicted trial award. The cap significantly reduces this disparity.

<sup>43</sup> In Babcock and Pogarsky's (1999) study, pay-for-performance is set in terms of grades.

<sup>44</sup> The judge's award is equal to \$325,000.

Their results indicate that litigants' beliefs about the size of the award are affected by the cap due to a motivated anchoring mechanism. The magnitude of the self-serving biases is significantly higher under the cap condition.<sup>45</sup> As a result, a higher likelihood of impasse and a higher settlement amount are observed in the cap condition. Remember that the results from Babcock and Pogarsky's (1999) study on binding caps indicate that a relatively low cap reduces the magnitude of the self-serving bias. Hence, the findings from these two studies suggest that the effects of damage caps on litigants' beliefs and litigation outcomes depend on the relationship between the size of the cap relative to the underlying claim value.

### **3.4 Empirical Evidence on the Robustness of Self-Serving Bias**

Debiasing interventions in pretrial bargaining environments refer to techniques intended to reduce the magnitude of self-serving bias as a way to promote out-of-court settlement. Previous literature indicates that self-serving bias is generally robust to debiasing interventions and to experience.

Babcock and Loewenstein (1997a) report the findings of two debiasing interventions. The first intervention, implemented in Babcock et al.'s (1995a) experimental paradigm is as follows. After the roles are assigned and subjects read the case material but before they state their judgments about fairness and predictions of the judge's award, subjects receive information (a paragraph) describing self-serving bias and its consequences. A short test is then administered to check the subjects' understanding of the paragraph describing the bias. They find that informing the

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<sup>45</sup> The magnitude of the self-serving bias is represented by the disparity in the litigants' predicted trial award. This disparity significantly increases with the cap.



subjects about the bias did not affect the differences in litigants' expectations or the likelihood of out-of-court settlement. The second intervention, also implemented in Babcock et al.'s (1995a) paradigm, involves the following features. Before negotiations take place, subjects are asked to write an essay stating arguments in favor of their opponent's case. This procedure had a marginal effect on the litigants' expectations but in a direction opposite to the expected one. The settlement rate was not affected. Babcock et al. (1997b) explore a third debiasing procedure. After the role is assigned and subjects read the case material, they receive information about self-serving bias and its consequences (similar to the first intervention discussed above). They are also told that self-serving bias could arise from the failure to think about the weaknesses of their own case, and are asked to list the weaknesses of their own case. The findings indicate that this intervention was effective at reducing the differences in the litigants' expectations about the judge's award. The settlement rate also increased.

Field data also suggest that self-serving bias is robust to experience. In fact, seasoned labor negotiators, lawyers, and judges exhibit self-serving bias and other cognitive errors. Babcock et al. (1996) study Pennsylvania school teachers' salary negotiations. In this type of negotiation, the school district and the union representatives commonly use agreements from comparable communities as a reference. Their findings indicate that both parties choose their comparable school districts in a self-serving manner.<sup>46</sup> Eisenberg (1994) analyzes data from a survey eliciting experienced bankruptcy lawyers' and bankruptcy judges' perceptions of the bankruptcy system

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<sup>46</sup> This study combines the use of survey data with field data on public school teacher contract negotiation in Pennsylvania. The survey involves data on union and school board negotiators from all school districts in Pennsylvania regarding the list of districts considered as comparable to their own district for the purpose of salary negotiations. Survey participants were assured that their responses would remain confidential. This feature allows the experimenters to control for the effects of strategic factors on the participants' perceptions.

and lawyers' reports of their performance in bankruptcy cases. Comparisons of judges' and lawyers' responses also suggest the presence of self-serving bias.<sup>47</sup>

## **4 NEW THEORETICAL WORK ON LITIGATION**

Findings from experimental economics work on litigation institutions suggest the presence of self-serving bias and provide evidence of its negative effects on the likelihood of impasse. Experimental evidence on debiasing mechanisms and field data on experienced negotiators support claims of the robustness of self-serving bias. This empirical evidence has motivated the development of new theories of litigation. The new frameworks combine the two previously proposed sources of impasse: asymmetric information and divergent beliefs. Importantly, these new models allow for role-induced biases in litigants' beliefs.

### **4.1 Pretrial Bargaining under Self-Serving Bias**

Farmer and Pecorino (2002) theoretically investigate the effects of self-serving bias on litigation outcomes. Their framework extends Bebchuk's (1984) work by allowing for asymmetric information and self-serving bias. In their model, two Bayesian risk-neutral players, an informed

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<sup>47</sup> In this study, experienced lawyers and judges involved in bankruptcy cases were asked questions regarding bankruptcy fees such as how long it takes judges to rule on fee applications and the compliance of lawyers with fee regulations. Comparisons of the responses of judges and lawyers suggest the presence of self-serving bias. For instance, seventy-eight percent of judges indicated that they rule on interim fee applications at the fee hearing stage (i.e., at an early stage of the bankruptcy process) while only forty-six percent of lawyers stated that judges rule at this stage. Similarly, sixty percent of lawyers indicated that they always comply with fee regulations but only eighteen percent of judges stated that attorneys always comply with these regulations.

defendant and an uninformed plaintiff negotiate an out-of-court settlement. The source of information asymmetry is the plaintiff's probability of succeeding at trial. In addition, both litigants exhibit self-serving bias in their interpretation of the facts of the case.<sup>48</sup>

The biases are modeled using multiplicative and additive approaches. In the multiplicative approach, the biased probability that the plaintiff succeeds at trial is represented by the actual probability that the plaintiff succeeds at trial times the bias term. The plaintiff's bias term is assumed to be strictly greater than 1, and the defendant's is assumed to be strictly lower than 1. In the additive approach, the biased probability that the plaintiff succeeds at trial is represented by the actual probability that the plaintiff succeeds at trial plus the bias term (for the plaintiff) or minus the bias term (for the defendant). Both litigants' bias terms are assumed to be strictly positive. In both the multiplicative and additive settings, the sequence of events in the litigation game is as follows. The plaintiff (uninformed party) makes a take-it-or-leave-it settlement offer to the defendant (the informed party); after observing the offer, the defendant decides whether to accept or reject the offer. In case of rejection, the case is resolved at a costly trial.

Their model predicts that impasse occurs in equilibrium.<sup>49</sup> In addition, their findings suggest that the plaintiff's bias increases the likelihood of impasse. The effect of the defendant's bias on the likelihood of impasse depends on the modeling choice for the bias. In the multiplicative setting, they find conditions under which an increase in the defendant's bias decreases the likelihood of

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<sup>48</sup> See Deffains and Langlais (2009) for a different extension of Bebchuk's (1984) framework that allows for self-serving bias and risk aversion.

<sup>49</sup> The equilibrium concept used is perfect Bayesian equilibrium.

trial. In contrast, when the bias is additive, an increase in the bias of the defendant increases the likelihood of trial.<sup>50</sup>

## **4.2 Pretrial Bargaining, Incentives for Care and Tort Reform under Self-Serving Bias**

Landeo et al. (2013) theoretically study the effects of self-serving bias on litigation outcomes and the potential defendant's level of care. Their model builds on Reinganum and Wilde's (1986) theoretical framework on settlement and litigation and extends this framework in several ways. First, their setting encompasses two sources of disputes: asymmetric information about the plaintiff's economic losses and role-induced biases in litigants' beliefs (divergent and biased beliefs) about the size of the non-economic award at trial.<sup>51</sup> Second, their framework incorporates a stage prior to the litigation game. In this stage, the potential injurer chooses his level of care (i.e., expenditures on accident prevention). Hence, this environment is suitable for studying the effects of self-serving bias on litigation outcomes, incentives for care, and social welfare.

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<sup>50</sup> An increase in the plaintiff's bias decreases her payoff because due to the increase in the likelihood of costly impasse. The effect of a change in the defendant's bias on his payoff is generally ambiguous. Specifically, when the bias is multiplicative, if the total litigation costs are greater than the expected award at trial (from the biased plaintiff's point of view), an increase in the defendant's bias decreases the likelihood of trial and the settlement demand. As a result, the defendant's payoff increases. When the bias is additive, an increase in the defendant's bias increases the likelihood of trial. The defendant's bias might increase or reduce the settlement demand. As a result, the defendant's payoff might increase or decrease. (Conditions for an unambiguous effect of the defendant's bias on his payoff are not derived.)

<sup>51</sup> Compensatory damages include both economic and non-economic damages. Non-economic damages are primarily intended to compensate plaintiffs for injuries and losses that are not easily quantified by a dollar amount (e.g., pain and suffering). These awards have been widely criticized for being unpredictable.

Their benchmark model involves two Bayesian risk-neutral parties, a potential plaintiff and a potential defendant. They assume that the plaintiff has private information about the amount of her economic losses. Given the uncertainty and unpredictability regarding the determination of non-economic damages, and following empirical regularities regarding the elicitation of cognitive biases (Babcock et al. 1995a),<sup>52</sup> they also assume that the players exhibit self-serving beliefs about the size of the non-monetary award at trial.<sup>53</sup> Two stages are considered. In the first stage, the potential injurer decides his level of care, which determines the probability of an accident. This decision depends on the cost of preventing accidents and on the expected litigation loss in case of an accident. They assume that every injured potential plaintiff has an economic incentive to file a lawsuit. Then, if an accident occurs, the second stage, called the litigation stage, starts. The litigation stage consists of a take-it-or-leave-it bargaining game, where a plaintiff and a defendant negotiate prior to a costly trial. The informed plaintiff makes a settlement offer; after observing the offer, the uninformed defendant decides whether to accept the proposal. Rejection from the defendant leads to trial. Using the court to resolve the dispute is costly, and may be subject to error.

The findings from their benchmark model are as follows.<sup>54</sup> First, accidents and disputes do occur

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<sup>52</sup> Babcock et al. (1995a) argue that environments characterized by ambiguous information might elicit self-serving bias on litigants' beliefs.

<sup>53</sup> Self-serving bias is modeled using an additive approach. Intuitively, the plaintiff's self-serving bias implies that he believes that the non-economic award at trial is higher than it actually is. The defendant's self-serving bias, on the other hand, implies that she believes that the non-economic award at trial is lower than it actually is. Following reported empirical regularities (Ross and Sicoly 1982; Loewenstein et al. 1993), they also assume that the litigants are unaware of their own bias and the bias of their opponent (i.e., the biased litigant believes that her opponent shares her beliefs).

<sup>54</sup> They apply a generalization of the perfect Bayesian equilibrium concept to this environment, and focus their analysis on the universally-divine, fully-separating perfect Bayesian equilibrium. See Banks and Sobel (1987) for details of the universally-divine refinement.

in equilibrium.<sup>55</sup> Second, the defendant's bias negatively affects his expenditures on accident prevention, and hence, increases the likelihood of an accident. Third, litigants' self-serving biases exacerbate the likelihood of impasse generated by asymmetric information. Fourth, although self-serving bias serves litigants to commit to tough negotiation positions, it is economically self-serving only for the defendant. Fifth, litigants' self-serving biases might be welfare-reducing.<sup>56</sup>

Next, Landeo, Nikitin and Izmalkov (2013) extend their benchmark framework to study the effects of caps on non-economic damages on litigation outcomes and potential injurer's incentives for care. Following experimental findings (Pogarsky and Babcock 2001; Babcock and Pogarsky 1999), they model the bias related to litigants' beliefs about the size of the award at trial as a function of the cap.<sup>57</sup> Their model predicts that caps decrease the likelihood of impasse only if the litigants do not exhibit self-serving bias. In fact, the presence of self-serving bias might reverse the positive effect of caps on impasse. In addition, their results indicate that caps

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<sup>55</sup> In equilibrium, the potential injurer spends resources on accident prevention but the likelihood of an accident remains greater than zero, each plaintiff type (differentiated by the amount of economic losses) makes a different settlement offer, and the defendant randomizes between accepting and rejecting the offer. In particular, the settlement demand made by the plaintiff is equal to the defendant's expected loss at trial (from the point of view of the biased defendant). The defendant is then indifferent between accepting and rejecting the plaintiff's demand. As a result, the defendant randomizes between accepting and rejecting the settlement proposal.

<sup>56</sup> Specifically, the plaintiff's bias is always welfare reducing. This result might be explained by the higher likelihood of trial when the plaintiff's bias increases. The defendant's bias is welfare reducing only in cases of under-deterrence (i.e., when the defendant's level of care is lower than the socially optimal level).

<sup>57</sup> Remember that Babcock and Pogarsky's (1999) and Pogarsky and Babcock's (2001) findings suggest that caps might influence litigation outcomes not only by directly reducing the expected award at trial but also by indirectly affecting litigants' beliefs about the award at trial. These findings also indicate that the effects of caps on litigants' beliefs depend on the relationship between the size of the cap and the value of the underlying claim. Landeo's (2009) experimental work on split-awards also suggests that this tort reform might affect litigants' beliefs.

might reduce the defendant's level of care and increase the likelihood of an accident.<sup>58</sup> Landeo et al.'s (2013) findings suggest that this policy intervention should be used with caution.

These studies demonstrate that theoretical frameworks involving asymmetric information and self-serving bias are useful tools for assessing the effects of litigation institutions. This work underscores the importance of combining theoretical and experimental economics methods in the study of litigation institutions.

## **5 DISCUSSION AND CONCLUSIONS**

An optimal design of civil litigation institutions and tort reform requires adequate knowledge of the factors that affect litigation outcomes and deterrence. The combination of theoretical analysis and empirical investigation represents the application of the scientific method. Economic models, as Professor Shavell (1982, p. 56) states “provide a generally useful tool for thought,” and hence, contribute to the understanding of litigation institutions. Experimental economics contributes to the scientific process of constructing empirically relevant theories of litigation by assessing the robustness of the theoretical predictions and identifying relevant behavioral factors not previously modeled.

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<sup>58</sup> Consider the effects of a damage cap on the defendant's level of care. The cap will increase the defendant's bias if he perceives the cap as relatively low (with respect to his biased estimation of the non-economic award at trial). The defendant's increased bias will reduce his expected litigation loss, and hence, the level of care. Analyze now the effects of a cap on the probability of trial. The cap will increase the bias of the plaintiff if he perceives the cap as relative high (with respect to his biased estimation of the non-economic award at trial). The plaintiff's increased bias will increase his settlement demand. Caps will also increase the bias of the defendant if he perceives the cap as relatively low (with respect to his biased estimation of the non-economic award at trial). These two factors, which simultaneously occur when the economic damages are relatively low, will induce a higher probability of trial.

This chapter evaluates the interaction between theoretical and experimental law and economics in the study of tort litigation institutions. Special attention is devoted to liability, litigation, and tort reform institutions, and to behavioral factors that might affect impasse.

Seminal theoretical work on settlement and litigation (Shavell 1982; Priest and Klein 1984; (Bebchuck 1984; Reinganum and Wilde 1986) identifies two main sources of impasse, litigants' divergent beliefs and asymmetric information between the litigants about the outcome at trial. The importance of litigants' divergent beliefs on impasse and the nature of this divergence are empirical questions. Inspired by these empirical concerns, Babcock et al.'s (1995a) and Loewenstein et al.'s (1993) experimentally study pretrial bargaining and self-serving bias. Their findings suggest the presence of self-serving bias in pretrial bargaining environments, and a causal relation between self-serving bias and impasse. Babcock and Pogarsky (1999) and Pogarsky and Babcock (2001) provide additional evidence of the presence of self-serving bias in litigation environments that allow for damage caps. Their findings also suggest that the effects of damage caps on impasse depend on the size of the cap relative to the underlying claim. In particular, high damage caps (relative to the size of the claim) might increase the likelihood of impasse while low damage caps might decrease the likelihood of impasse. Importantly, Babcock and Loewenstein (1997a) and Babcock et al. (1997b) suggest that self-serving bias is generally robust to debiasing interventions.

The findings from experimental work on litigation institutions have motivated the construction of new theoretical frameworks. Farmer and Pecorino (2002) study settlement and litigation using a framework that allows for asymmetric information about the plaintiff's likelihood of succeeding



at trial and litigants' egocentrically-biased beliefs. Their results suggest that impasse occurs in equilibrium, and that self-serving bias might exacerbate the likelihood of impasse. Landeo et al. (2013) extend this work by studying incentives for care and litigation using a framework that allows for asymmetric information about the plaintiff's economic losses and self-serving beliefs about the size of the non-economic award at trial. They find that self-serving bias negatively affects the likelihood of impasse. Then, they use their framework to assess the effects of damage caps. Their results suggest that self-serving bias might reverse the positive effect of damage caps on impasse observed in environments that do not allow for litigants' egocentric biases. In fact, in the presence of self-serving bias, caps might increase the likelihood of impasse. Their findings also indicate that caps might decrease the incentives on care and increase the likelihood of an accident. This literature underscores the importance of studying the effects of public policy in environments that include empirically relevant assumptions about litigants' beliefs.

Our analysis of theoretical and experimental work on litigation and cognitive bias suggests a productive interaction between both methods of research. As a result of the application of scientific methods, the contributions of law and economics to the design of litigation institutions and tort reform might be strengthened.

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