

ISSN 1045-6333

HARVARD

JOHN M. OLIN CENTER FOR LAW, ECONOMICS, AND BUSINESS

LAW AND PREFERENCES

Oren Bar-Gill
Chaim Fershtman

Discussion Paper No. 457

02/2004

Harvard Law School
Cambridge, MA 02138

This paper can be downloaded without charge from:

The Harvard John M. Olin Discussion Paper Series:
http://www.law.harvard.edu/programs/olin_center/

The Social Science Research Network Electronic Paper Collection:
http://papers.ssrn.com/abstract_id=#####

Law and Preferences

Oren Bar-Gill* and Chaim Fershtman**

Forthcoming in the *Journal of Law, Economics & Organization*

Abstract

Legal rules do more than provide incentives; they change people. When preferences and norms are endogenously determined via a process of imitation and learning, legal rules, by affecting the market outcome, may affect the dynamics of preference formation. Analyzing the effect of different legal rules should, therefore, go beyond the analysis of the incentives they provide. It should also include an analysis of their effect on the distribution of preferences and norms of behavior. We illustrate this claim by considering a simple market game in which individuals may have preferences that include fairness concerns. We show that different legal rules change not only the pattern of trade in a market game, but also the individuals' fairness concern. That is, different rules may eventually make individuals care more (or less) about a fair outcome. Specifically, our model suggests that enhanced remedies for breach of contract may reduce equilibrium preferences for fairness.

Keywords: Endogenous preferences, norms, fairness concerns, contract law.

* Harvard University, The Society of Fellows, 78 Mt. Auburn St., Cambridge, MA 02138 ; And, Harvard Law School, The John M. Olin Center for Law, Economics and Business.

** The Eitan Berglas School of Economics, Tel Aviv University, Tel Aviv 69978, Israel.

This paper has greatly benefited from comments and suggestions by Yael Aridor Bar-Ilan, Eric Posner, Adriaan Lanni, three anonymous referees and conference participants at the 2003 annual meetings of the Canadian and Israeli Law & Economics Associations. We thank Benjamin Roin for excellent research assistance. We gratefully acknowledge the generous financial support provided by the John M. Olin Center for Law, Economics and Business at Harvard Law School and by the William F. Milton Fund of Harvard University.

Law and Preferences

Oren Bar-Gill* and Chaim Fershtman**

© 2004 Oren Bar-Gill and Chaim Fershtman. All rights reserved.

Introduction

The economic analysis of law adopts the view that legal rules are incentive mechanisms (see, e.g., Posner (2003), Cooter and Ulen (2003)). They influence individual behavior by shaping the payoff structure associated with alternative courses of action. In this paper we argue that the legal system does more than provide incentives; it also affects the preference profile in the population.¹ That is, different legal systems may affect not just the behavior of individuals but who they are. And, since who you are also affects how you choose to behave, a new indirect influence on behavior is introduced. Such an approach expands the boundaries of Law and Economics introducing the endogenous formation of preferences as part of the analysis.

Lawyers, philosophers and psychologists have long recognized the role of law in shaping norms and preferences. Speaking more generally on government, John Stuart

* Harvard University, The Society of Fellows, 78 Mt. Auburn St., Cambridge, MA 02138 ; And, Harvard Law School, The John M. Olin Center for Law, Economics and Business.

** The Eitan Berglas School of Economics, Tel Aviv University, Tel Aviv 69978, Israel.

This paper has greatly benefited from comments and suggestions by Yael Aridor Bar-Ilan, Eric Posner, Adriaan Lanni, three anonymous referees and conference participants at the 2003 annual meetings of the Canadian and Israeli Law & Economics Associations. We thank Benjamin Roin for excellent research assistance. We gratefully acknowledge the generous financial support provided by the John M. Olin Center for Law, Economics and Business at Harvard Law School and by the William F. Milton Fund of Harvard University.

¹ In its focus on incentive effects, taking preferences as given or exogenous, the economic analysis of law has followed a basic tenet of neo-classical economics. See, e.g., Becker (1976) (“... all human behavior can be viewed as involving participants who maximize their utility from a stable set of preferences...”) and Stigler and Becker (1977). While neo-classical economics traditionally assumes that preferences are exogenous, economists have long recognized the malleability of individual preferences. See, e.g., Schoeffler (1952), Harsanyi (1953-1954), Sen (1995) and Bowles (1998).

Mill argued that “government itself should be evaluated in large measure by its effects on the character of the citizenry.” (cited in Sunstein (1997), p. 27; see also Bar-Gill and Fershtman (2000)) Focusing on legal policy, traditionally criminal law has been understood as a means of shaping preferences and instilling morality. Jeremy Bentham noted that:

“A punishment may be said to be calculated to answer the purpose of a moral lesson, when, by reason of the ignominy it stamps upon the offence, it is calculated to inspire the public with sentiments of aversion towards those pernicious habits and dispositions with which the offense appears to be connected; and thereby to inculcate the opposite beneficial habits and dispositions.” (Bentham (1789), p. 339)

(See also Dau-Schmidt (1990), Rychlak (1990), Andenaes (1952, 1966, 1971), Hampton (1984), Hawkins (1969), Aronson and Carlsmith (1963) and Kahan (1996).)

The understanding that law influences norms and preference is not confined to the criminal justice arena. Summarizing the literature, Kaplow and Shavell (2002) observed: “The suggestion is often made that, if the law symbolically denounces some preferences or reinforces others by appearing to embody certain viewpoints, individuals will come to adopt different preferences and, in turn, to behave differently.” (See also Kornhauser (1989), pp. 42-49, Sunstein (1997)). More recently, the literature on law and social norms has stressed the influence of legal rules on norms and preferences (see, e.g., Cooter (1998, 2000), Sunstein (1996), Huang and Wu (1994)).

The broad writing on the influence of legal policy on norms and preferences has largely been founded on the symbolic or expressive impact of law. If the law says that X is “bad” (or illegal), then preferences will ultimately adjust to disvalue X; and conversely,

if the law says that X is “good”, then preferences will adjust to value X (see, e.g., Cooter (1998) and Kaplow and Shavell (2002)).

Building on recent developments in economic theory and evolutionary game theory (specifically on the indirect evolutionary approach initiated by Guth and Yaari (1992)), we introduce a different mechanism through which law influences the formation of preferences. Following traditional law and economics, we focus on the incentive effects, rather than on the expressive effects, of the law. The law defines the payoffs associated with various choices that people make. But, choices also depend on preferences. For any given payoff matrix, as established by the legal system, different people with different preferences will generally choose different courses of action. And, certain people, with certain preferences, will do better (in material terms, for instance) than other people with different preferences. Assuming that learning, imitation and other forms of cultural transmission shift the preference profile in a given society toward more successful preferences, the link between law and preferences is established.

We propose this payoff-based model of the interaction between law and preferences as an alternative to the expressive law model. Importantly, the two models are not mutually exclusive. In particular, there are contexts where the legal regime may affect norms and preferences both through an expressive channel and through a payoff-based evolutionary channel. For example, anti-discrimination laws likely work through both channels. On the other hand, there are contexts where the legal rule can affect norms and preferences, through the payoff-based evolutionary channel, without having any apparent expressive content. In the example studied below, the preference change

brought about by the legal rule, operating through the payoff-based evolutionary channel, cannot be explained on expressive grounds.

To illustrate the proposed approach, we consider a common scenario. A seller and a buyer negotiate the price of a product. After the contract is signed an “unforeseen” event may occur raising the seller’s cost of performance. Given such an event the seller may ask to renegotiate the contract. The threat point in such renegotiation is determined by the legal rule that specifies the legal remedy in case no agreement is reached in the renegotiation phase and the seller decides to breach the contract. The standard law and economics approach considers the incentive effects of different legal rules on the outcome of the renegotiation process and on the seller’s decision whether to perform, or rather breach the contract.

Into this framework we introduce preferences for fairness. We allow for the possibility that individuals wish to be treated fairly, and that they experience disutility whenever they are not so treated. These fairness concerns will affect the market outcome i.e., the original contract price, the seller’s ability to extract a modification in the renegotiation stage as well as the magnitude of the price modification if it is agreed upon.

In particular, fairness concerns reinforce a party’s bargaining position when negotiating the initial contract price, thus providing for a more favorable price. At the renegotiation stage, fairness concerns mostly affect the seller’s bargaining position. On the one hand, preferences for fairness may bolster the credibility of the seller’s threat to breach, thus enabling the seller to extract modifications that would otherwise be impossible to obtain. On the other hand, an excessive fairness concern might lead the seller to demand more than the buyer is willing to concede, leading to a breakdown in

renegotiations. Such a breakdown entails inefficient breach and consequently material loss to both parties.

While allowing for the possibility that individuals care about fairness, we do not impose such preferences, but rather derive them endogenously. We assume dynamic preferences formation guided by quasi-evolutionary forces. We demonstrate that preferences for fairness are selected in this evolutionary process. Moreover, we show that the intensity of the fairness concerns depends on the pertaining legal rules, and specifically on contract law doctrines that determine the remedies for breach of contract. Interestingly, we demonstrate that stronger remedies for breach lead to weaker fairness concerns, since with the enhanced remedies stronger fairness concerns would lead to costly breakdown in the renegotiation process.

The indirect evolutionary approach has been previously applied to study the interaction between legal policy and preferences. Huck (1998) analyzes the effects of the cost, effectiveness and outcome of a legal monitoring process on the evolution of remorse, and shows how legal institutions can be designed to encourage mutual trust. Similarly, Bohnet et al. (2001) show how a small probability of contract enforcement can “crowd-in” trustworthiness, or preferences for honesty, and thus lead to a higher probability of performance. We build on the insights developed in Huck (1998) and Bohnet et al. (2001), and apply them in the contract modification game. Rather than remorse or honesty, we focus on fairness concerns, and study the effects of the legal remedy for breach of contract on the evolution of fairness norms and preferences.

The remainder of the paper is organized as follows. Section 1 develops a general framework where legal rules influence the endogenous formation of preference. Section 2

presents our incomplete contracting (with renegotiation) model with fairness concerns. Section 3 demonstrates how the rules of contract law affect the equilibrium level of fairness concerns. Section 4 concludes.

1. Fairness Concerns and the Endogenous Determination of Preferences

1.1 Preferences with a fairness concern

One of the important conclusions of recent experimental studies is that people frequently choose actions that do not maximize their monetary payoffs. One of the most convincing examples is the ultimatum game experiment in which people consistently reject “unfair” offers even at the expense of reducing their own payoffs. The intuition explaining this result is that people would like to be treated fairly and that this fairness concern may affect their behavior. For example, Akerlof and Yellen (1990), focusing on the labor market, describe several examples and real life stories in which workers, when treated unfairly, respond by reducing the effort they invest. In a more general framework, Bolton (1991) incorporates fairness concerns into players’ utility functions and studies the effect of such preferences for fairness on the strategic interaction between the players.

Incorporating fairness concerns into individuals’ preferences requires the introduction of a concept of a “fair outcome”, a measure of unfairness and a utility function that takes into account fairness concerns.

A “fair outcome“ or a concept of “fairness” is not an objective term. The perception of “fairness” depends on the social environment (for example on “what other

people get”) or on the history of the interaction.² At this point we therefore refrain from defining a fair allocation and just assume that each player has a perception of what constitutes a “fair outcome”.

When incorporating fairness concerns into individuals’ preferences one can distinguish between two aspects. The first is a global concern for fair outcomes, which implies that players wish that all players, including their opponents, would receive a fair share. The second is a more individualistic concern that captures the fact that players wish to be treated fairly and suffer if they are not, without any concern about a fair treatment of other players. (See, e.g., Huck and Oechssler (1999), Bolton (1991), Frank (1988), Neale and Bazerman (1991), Ochs and Roth (1989), Roth (1991), Forsythe et al. (1994), Adams (1963, 1965), Loewenstein, Thompson and Bazerman (1989).) We will adopt in this work only the latter interpretation of fairness concerns.

Consider a strategic interaction between two players and assume that the market interaction is affected by the prevailing legal rule L . Let $\Theta(L)$ be the outcome of the interaction and let $M_i(\Theta(L))$ be player i ’s monetary payoff. Let $\Theta_i^F(L)$ be player i ’s perception of a fair outcome given the legal regime L and let $M_i(\Theta_i^F(L))$ be player i ’s monetary payoffs when the fair outcome is reached.³

In order to capture fairness concerns we introduce an “unfairness cost”. Player i incurs an unfairness cost whenever $M_i(\Theta) < M_i(\Theta_i^F)$. In general, the unfairness cost

² Moreover, players do not necessarily agree on the concept of fairness as it may depend on the role they play in the game.

³ Due to the subjective context-dependent nature of fairness, we allow $\Theta_i^F(L)$ to change from one period of the interaction to the next. We also allow the parties to hold different conceptions of fairness.

will be $Max\{0, \sigma(M_i(\Theta^F) - M_i(\Theta))\}$, where $\sigma \in [0, \sigma_{max}]$ represents the intensity of the player's fairness concerns.⁴ In this framework, player i 's utility is given by:

$$U = M_i(\Theta(L)) - Max\{0, \sigma(M_i(\Theta^F(L)) - M_i(\Theta(L)))\}.$$

1.2 Endogenous determination of preferences with a fairness concern

While our focus is on fairness concerns we will not impose such preferences exogenously but rather derive them endogenously. There are two leading approaches to modeling preference dynamics. The ‘‘cultural transmission’’ approach, initiated by the anthropologists Cavalli-Sforza and Feldman (1973, 1981) and Boyd and Richerson (1985), assumes that the next generation's preferences are determined partially by education and partially by imitation of a randomly chosen role model (see Bisin and Verdier (1998) for an economic discussion). The second approach adopts an evolutionary setup, where preferences that are more successful at period t will be represented in the population with greater frequency at period $t+1$. The meaning of ‘‘success’’ becomes the primitive of these models (i.e. the fitness function that controls the evolutionary dynamics). See, e.g., Bester and Guth (1998), Dekel and Scotchmer (1999), Fershtman and Weiss (1997,1998), Guth and Yaari (1992), Huck and Oechssler (1999), Kokesen et al. (2000) and Rogers (1994).

We follow the evolutionary approach, and adopt the conventional assumption that ‘‘success’’ means economic success. Therefore, the dynamics of preferences formation will be affected by the market outcome. Since the outcome of the market game depends

⁴ In many settings having such non *homo economicus* preferences with a fairness concern may be quite costly. These costs suggest the existence of an upper limit on a populations fairness concerns. Also, experimental data, as well as casual observation, suggest that people do not have limitless fairness concerns. Accordingly, we set σ_{max} as an upper-bound on the possible value of σ .

on the prevailing legal rule, the link between law and the evolution of preferences is established.

Specifically, we show how the legal rule influences the equilibrium level of fairness concerns in the population. In our model, the evolutionary dynamics associate each legal rule, L , with a specific level of fairness concerns, $\sigma(L)$, that is shared by all individuals in the population.⁵ We study the properties of the $\sigma(L)$ function, focusing on the relationship between the prevailing legal rule and the individuals' fairness concerns.

2. The Model

Consider a population with a large number of individuals. In each period a random matching divides this population into pairs, of one seller and one buyer. The market interaction lasts one period during which a trade between the players may take place. The process of random matching and trading repeats itself every period.

2.1 The Market Interaction

Consider a seller (he) and a buyer (she) contracting over the sale of one indivisible asset. At time 1 the two parties sign the “original contract” which specifies the delivery of the asset by the seller to the buyer in exchange for a payment, p . The value of the asset to the buyer is v while the seller's cost of creating the asset (or parting from it) is assumed to be $c(< v)$. At this initial contracting stage the players do not anticipate any possible change in the cost of providing the good or in the value of the good to the

⁵ We focus on homogeneous populations. We find the Evolutionary Stable Strategy (ESS), or the evolutionary stable level of fairness concerns. See section 3.2 below. For a discussion and a formal definition of the ESS solution concept - see Maynard Smith (1982) and Weibull (1995).

seller. Thus the “original contract” only specifies the price p that the parties have agreed upon.⁶

After time 1 there is a probability q that a random shock will increase the cost of providing the good to $C > c$. We assume that $v > C$ such that the transaction is still efficient, even after the increase in performance cost. We further assume that this high cost contingency is totally unforeseen by the players and thus cannot be part of the original contract.

If the unanticipated change of circumstances does not occur the players trade the good according to the original contract. If the unanticipated change does occur, the seller may perform the contract at the original price or he may demand a modification of the contract. In such a case the buyer must decide whether to succumb and renegotiate the original contract, or to reject this demand. If the buyer refuses to renegotiate, the seller then must decide whether to perform or breach the original contract. If the buyer agrees to renegotiate, then at time 2 renegotiation commences and the two parties negotiate a price increase, Δp . If they reach an agreement the modified contract is executed, otherwise the seller decides whether to perform or to breach the original contract.

Finally, at time 3, if the seller breached the contract, the buyer files suit for the recovery of damages, or for specific performance of the contract. The law determines the remedy for breach of contract. We represent this remedy by D , and we hereafter refer to D as the prevailing legal rule. The remedy D is measured in monetary terms and stated

⁶ This is clearly an incomplete contract. In particular, the contract is incomplete in the sense that it is not contingency specific, that is, it does not specify the optimal provisions for every possible contingency. *See, e.g.* Shavell (1984), Hart (1995), Hermalin and Katz (1993), and Ayers and Gertner (1989, 1992). The contractual incompleteness may be the product of imperfect verifiability, rather than imperfect foresight as we assume in the text. Our analysis is robust to variations in the source of the contractual incompleteness, as long as these variations do not affect the applicable concept of fairness. Moreover, even if the concept of fairness changes, preferences will still be subject to the dynamic forces studied in this paper, although the specific preference dynamics might be different.

gross of the original price, p . (Specific performance is represented by $D = \infty$.) Thus, litigation implies that the seller gets a monetary payoff of $p - D$ while the buyer gets $D - p$.

2.2 The Original Contract

We first discuss the original contract. We begin by describing the parties' preferences at time 1. We then derive the contract price, p .

2.2.1 Preferences

We assume that players (may) have fairness concerns, with unfairness costs as described in Section 1. Buyers and sellers are assumed to come from a single population, where a common fairness concern $\sigma \in [0, \sigma_{\max}]$ prevails.⁷ In the initial stage of the market interaction the buyer and the seller must agree on a sale price, p , which determines the division of surplus between the two parties. We define the “equal split of surplus” as the fair outcome for both the seller and the buyer. Numerous studies have demonstrated that the equal split is considered by many to be the fair outcome. See, e.g., Ochs and Roth (1989), Guth et al. (1982), Kahneman et al. (1986). Frank (1988) has proposed the following definition of a fair transaction: “A fair transaction is one in which the surplus is divided (approximately) equally. The transaction becomes increasingly unfair as the division increasingly deviates from equality” (p. 165). It has also been argued that the fifty-fifty split is the evolutionary stable convention in bargaining. See Young (1993). Given that the value of the good for the buyer is v while the cost of production for the seller is c an equal split of the surplus yields a fair price of $\frac{1}{2}(v + c)$.⁸

Thus, the seller's utility function, given a contract price of p , is given by

$$(1) \quad U_s(p, \sigma) \equiv y_s + (p - c) - \text{Max}\{0, \sigma \cdot [\frac{1}{2}(v + c) - p]\},$$

⁷ We assume that a player's type, i.e. her level of fairness concerns, is observable. While this assumption is redundant when all individuals share the same fairness concern, it becomes less innocuous in heterogeneous populations.

⁸ The equal split is not the only possible fairness anchor. In particular, there may be some exogenous factors that render one party more deserving than the other. For instance, it can be argued that a poorer party deserves a greater share than a richer party in order to promote distributive justice.

where y_s is the seller's income. Similarly, the buyer's utility, given a contract price of p , is given by

$$(2) U_B(p, \sigma) \equiv y_B + (v - p) - \text{Max}\{0, \sigma \cdot [p - \frac{1}{2}(v + c)]\},$$

where y_B is the buyer's income.

2.2.2 The Contract

The contract price is the product of bargaining between the two players. We do not model the bargaining game explicitly. Rather, we simply assume that the parties will agree on a contract price of $p = \frac{1}{2}(R_S + R_B)$, where R_S and R_B are the reservation prices of the seller and the buyer, respectively.⁹

The seller will sell the good at a price p as long as this trade provides him with utility greater than his alternative no-trade utility, $U_S = y_S$. Thus, the lowest price the seller will be willing to consider is:

$$(3) R_S(\sigma) = \frac{1}{1+\sigma} \cdot c + \frac{\sigma}{1+\sigma} \cdot [\frac{1}{2}(v+c)].^{10}$$

The buyer will purchase the good at a price p as long as this trade provides her with utility greater than her alternative no-trade utility, $U_B = y_B$. Thus, the highest price the buyer will be willing to consider is:

$$(4) R_B(\sigma) = \frac{1}{1+\sigma} \cdot v + \frac{\sigma}{1+\sigma} \cdot [\frac{1}{2}(v+c)].^{11}$$

Given the parties reservation prices the original contract price will set the "fair price":

⁹ This reduced form account of the bargaining game may represent an equal bargaining power assumption.

¹⁰ Note that a seller with no fairness concern, i.e. $\sigma = 0$, has a reservation price $R_S = c$. And, when $\sigma \rightarrow \infty$, a seller will not accept anything below the fair price, i.e. $R_S = (v+c)/2$.

¹¹ Note that a buyer with no fairness concern, i.e. $\sigma = 0$, cares only about the value of performance, i.e. $R_B = v$. And, a buyer with $\sigma \rightarrow \infty$, will not pay anything above the fair price.

$$(5) \quad p(\sigma) = \frac{1}{2}(R_S(\sigma) + R_B(\sigma)) = \frac{1}{2}(v + c).$$

2.3 The Renegotiation Stage

If an “unanticipated” change of circumstances increases the seller’s cost of performance to $C > c$, the seller may try to renegotiate the original contract and to obtain a higher price. However, the buyer will refuse to renegotiate the original contract unless the seller has a credible threat to breach. Let U_S^O and U_B^O denote the utility to the seller and the buyer, respectively, from performance of the original contract, and let $U_S^{Br}(D)$ and $U_B^{Br}(D)$ denote their respective utilities in case of breach. The seller will have a credible threat if and only if $U_S^{Br}(D) > U_S^O$. In such a case the seller prefers to breach the contract rather than to sell the item at the original price.

If the seller’s threat to breach is credible, the players negotiate a price increase of Δp . Let $U_S^M(\Delta p, \sigma)$ and $U_B^M(\Delta p, \sigma)$ denote the utility to the seller and the buyer, respectively, from performance of a modified contract that specifies a price increase of Δp . We follow the same negotiation procedure as in the first stage. Let $R_S^2(\sigma; D)$ denote the seller’s reservation price at this stage, such that $R_S^2(\sigma; D)$ is the minimum price increase that the seller would accept. The seller’s reservation price can be derived from equating the utility from breaching to the utility from performing the modified contract, i.e., $U_S^M(R_S^2(\sigma; D), \sigma) = U_S^{Br}(D)$. The buyer’s reservation price $R_B^2(\sigma; D)$ is defined similarly, such that $U_B^M(R_B^2(\sigma; D), \sigma) = U_B^{Br}(D)$. The buyer will prefer buying at the modified price rather breaching the contract as long as $\Delta p \leq R_B^2(\sigma; D)$.

When $R_B^2(\sigma; D) < R_S^2(\sigma; D)$, the minimum price increase demanded by the seller is greater than the maximum price increase that the buyer is willing to pay, and the two players will not be able to agree on a modification. However, when $R_B^2(\sigma; D) \geq R_S^2(\sigma; D)$, the players would agree on a modified price of:

$$(6) \quad \Delta p(\sigma; D) = \frac{1}{2} \cdot [R_S^2(\sigma; D) + R_B^2(\sigma; D)]$$

We continue to assume that players perceive an equal split of the actual surplus to be the fair outcome, so that if the cost of performance rises to C , the fair price becomes $\frac{1}{2}(v + C)$. Importantly, the concept of a fair outcome in the renegotiation stage is more controversial than in the initial negotiations stage, where the equal split was a natural candidate. In particular, rather than the allocative conception of fairness invoked by the equal split concept, a procedural concept of fairness, based on the sanctity of the promise embodied in the initial contract, would support the fulfillment of whatever has been agreed upon (see Fried (1980)). Since the unforeseen event affects the pie itself, there is a conflict between the procedural argument of “keeping our initial agreement” and an allocative argument that claims an equal division of the real pie. A third candidate for a ‘fair outcome’ is a price that would divide the burden of the unexpected price increase equally between the two parties (see Fried (1980)). For a general discussion of alternative concepts of a fair outcome in the contract modification context – see Bar-Gill and Ben-Shahar (2002b).¹²

¹² An additional question concerns the players’ conceptions of a fair outcome when renegotiation ends in disagreement leading to a breach of contract and litigation. For simplicity, we assume that neither player incurs a fairness cost when the contract is not performed. It is important to emphasize that while we adopt specific assumptions regarding the players’ conceptions of fairness, our main argument regarding the interdependence between preferences and the law does not hinge on these specific assumptions.

With this caveat in mind, we proceed with the equal split concept. The seller's utilities from performing the original contract, performing the modified contract and breaching the contract are given by

$$(7) U_S^O \equiv y_S + p - C - \text{Max}\{0, \sigma \cdot [\frac{1}{2}(v + C) - p]\},$$

$$(8) U_S^M(\Delta p, \sigma) \equiv y_S + p + \Delta p - C - \text{Max}\{0, \sigma[\frac{1}{2}(v + C) - (p + \Delta p)]\}, \text{ and}$$

$$(9) U_S^{Br}(D) \equiv y_S + p - D.$$

And, the buyer's utilities from performance of the original contract, performance of the modified contract and breach of the contract are given by

$$(10) U_B^O \equiv y_B + v - p - \text{Max}\{0, \sigma[p - \frac{1}{2}(v + C)]\},$$

$$(11) U_B^M(\Delta p, \sigma) \equiv y_B + v - p - \Delta p - \text{Max}\{0, \sigma[p + \Delta p - \frac{1}{2}(v + C)]\}, \text{ and}$$

$$(12) U_B^{Br}(D) \equiv y_B - p + D.$$

We focus on the more interesting range of scenarios where $D \in (v - \frac{1}{2}(C - c), v)$. If $D \leq v - \frac{1}{2}(C - c)$, then there is no fear of breakdown in the stage 2 renegotiations (namely, $R_S^2(\sigma; D) \leq R_B^2(\sigma; D)$); and if $D \geq v$, then there will be no renegotiation in stage 2 (since the buyer has nothing to gain from modification). Therefore, if $D \notin (v - \frac{1}{2}(C - c), v)$, there is no cost to an ever increasing fairness concern (to balance against the bargaining advantage of having a greater fairness concern), which means that the equilibrium fairness concern in the population would be σ_{\max} , and the legal rule, D , would have no effect on the level of fairness concerns in the population.

We can now state the following observation:

Observation 1: Assuming $D \in (v - \frac{1}{2}(C - c), v)$ -

(i) When $D > C + \sigma \cdot \frac{1}{2}(C - c)$, the seller does not have a credible threat, there will be no modification, and the original contract will be performed.

(ii) When $D \leq C + \sigma \cdot \frac{1}{2}(C - c)$, the seller has a credible threat, the seller's reservation price is:

$$R_S^2(\sigma; D) = \frac{1}{1 + \sigma} \cdot [-(D - C)] + \frac{\sigma}{1 + \sigma} \cdot \frac{1}{2}(C - c),$$

and the buyer's reservation price is:

$$R_B^2(\sigma; D) = v - D.$$

Therefore -

(a) When $R_S^2(\sigma; D) \leq R_B^2(\sigma; D)$ or $D \leq v - \frac{1}{2}(C - c) + (v - C)/\sigma$, a modification will be reached, and the original contract price will be increased by

$$\Delta p(\sigma; D) = \frac{1}{2} \cdot \left[\frac{1}{1 + \sigma} \cdot [-(D - C)] + \frac{\sigma}{1 + \sigma} \cdot \frac{1}{2}(C - c) + (v - D) \right].$$

(b) When $R_S^2(\sigma; D) > R_B^2(\sigma; D)$ or $D > v - \frac{1}{2}(C - c) + (v - C)/\sigma$, there will be no modification, and the seller will breach the contract.

Proof: See the Appendix.

Remarks:

(i) The seller has a credible threat to breach *if and only if* the fairness concern is sufficiently large, i.e. $\sigma \geq \frac{D - C}{\frac{1}{2}(C - c)}$ (which is equivalent to $D \leq C + \sigma \cdot \frac{1}{2}(C - c)$).

Without a credible threat, there will be no modification, and the seller will perform the original contract. Note that without fairness concerns the seller's threat to breach would

be credible *if and only if* $C > D$. Allowing for an “unfairness cost” bolsters the credibility of the seller’s threat, so that the seller may have a credible threat even when $C < D$. In such a case the seller is willing to breach the contract, even though he will suffer a monetary loss, simply because he prefers not to perform a contract which he feels is unfair.¹³

(ii) Even when the seller has a credible threat to breach the contract the buyer will not necessarily agree to pay more than what was stipulated in the original contract. Indeed, if the buyer could force the seller to perform the original contract by suing for specific performance, or if the buyer could obtain perfectly compensatory damages in case the seller breaches the original contract, then she would never agree to any price increase. However, often the effective legal remedy available to the buyer is significantly under-compensatory, namely $D < v$ (see, e.g., Schwartz (1979), Bar-Gill and Ben-Shahar (2002a), *Austin Instrument, Inc. v. Loral Corp.*, 272 N.E.2d 533, 535 (NY, 1971)). In such cases, the buyer may prefer to ensure performance by conceding to a price increase, rather than opting for the prolonged and imperfect litigation process. Generally, when the law provides the buyer with stronger remedies, it reduces the buyer’s loss from breach, and thus lowers the maximum price concession that the buyer will be willing to make at the renegotiation stage to ensure performance.

(iii) At the stage 1 negotiations, a stronger fairness concern could only improve a party’s position. At the stage 2 renegotiations, however, an excessive fairness concern might

¹³ See Bar-Gill and Ben-Shahar (2002b). See also Frank (1988), p. 167: “Suppose we assume that buyers care strongly about fairness as defined. In particular, suppose they have a strong aversion to receiving less than 50 percent of the surplus. (Many people, of course, will feel no difficulty about receiving *more* than half. But as we will see, a surprisingly large number choose a 50-50 split over one that gives them a larger share.) My simple definition of fairness, coupled with the assumed aversion to unfairness, yields a “fairness model” with the following specific prediction: *People will sometimes reject transactions in which the other party gets the lion’s share of the surplus, even though the price at which the product sells may compare favorably with their own reservation price.*”

generate material costs. On the one hand, preferences for fairness may bolster the credibility of the seller's threat to breach and increase his reservation price, leading to a larger price increase and to a higher material payoff. But, on the other hand, an excessive fairness concern might raise the seller's reservation price above $R_b^2(\sigma; D)$, leading to a breakdown in renegotiations. Such a breakdown entails inefficient breach and consequently material loss to both parties. The relative importance of these countervailing effects will be determined by the legal rule, D . Stronger legal remedies (i.e. a higher D) reduce $R_b^2(\sigma; D)$, thus lowering the critical level of fairness concerns, above which negotiations will break down, leading to an inefficient breach.

2.4 Payoffs

Using the above specifications, we can now derive the parties' *ex ante* payoffs. The seller's payoff is:

$$(13) \quad \Pi_s(\sigma; D) = p - (1 - q) \cdot c + q \cdot \begin{cases} -C & , R_s^2(\sigma; D) < 0 \\ \Delta p(\sigma; D) - C & , R_s^2(\sigma; D) \in [0, R_b^2(D)] \\ -D & , R_s^2(\sigma; D) > R_b^2(D) \end{cases}$$

The buyer's payoff is:

$$(14) \quad \Pi_b(\sigma; D) = -p + (1 - q) \cdot v + q \cdot \begin{cases} v & , R_s^2(\sigma; D) < 0 \\ v - \Delta p(\sigma; D) & , R_s^2(\sigma; D) \in [0, R_b^2(D)] \\ D & , R_s^2(\sigma; D) > R_b^2(D) \end{cases}$$

3. Fairness Concerns and the Legal Rule

We can now utilize the model developed in section 2 to study the implications of different legal rules (i.e. different levels of D) on the formation of fairness concerns.

First, it is important to emphasize that the standard incentive effects of the legal rule are

maintained in our model. These effects are briefly discussed in section 3.1, focusing on the interaction between these effects and the parties' fairness concerns. However, beyond the standard incentive effects, our endogenous preferences framework captures the effects of the law on individuals' fairness concerns. In section 3.2 we examine the effects of fairness concerns on an individual's fitness. In section 3.3 we focus on the role of the legal rule in shaping a population's preferences for fairness.

3.1 Incentive Effects and the Impact of Fairness

As recognized by the law and economics literature, the legal rule provides incentives that affect the parties' behavior. The legal rule, D , affects the credibility of the seller's threat to breach, as well as the minimum price increase that the seller will accept when he has such a credible threat. The legal rule also affects the maximum price concession that the buyer will consider. Consequently, the legal rule determines whether a modification will be reached. It also determines the new price, i.e. the terms of the modification, when the renegotiation is successful. The incentive effects of the legal remedy, D , in a model with fairness concerns are summarized in the following observation.

Observation 2: *Assuming $D \in (v - \frac{1}{2}(C - c), v)$, a higher D -*

- (i) *Reduces the seller's stage 2 reservation price; the magnitude of this effect is decreasing in the magnitude of the fairness concern;*
- (ii) *Reduces the buyer's stage 2 reservation price;*
- (iii) *Reduces the magnitude of the potential price increase in the contract modification stage; the magnitude of this effect is decreasing in the magnitude of the fairness concern.*

Proof: See the Appendix.

The intuition for these results is as follows. In the renegotiation stage, a higher D worsens the seller's bargaining position and improves the buyer's bargaining position. Therefore, a higher D makes it increasingly difficult for the seller to extract a price modification. Even when the seller has a credible threat, a higher D reduces the magnitude of the price increase that the seller can hope to attain. In addition, a higher D reduces the buyer's willingness to succumb to a modification (even when the seller has a credible threat).¹⁴

3.2 Fairness and Fitness

We assume an indirect evolutionary approach and let preferences be determined endogenously. We further assume that the fitness criterion in this evolutionary process is the players' monetary payoffs. That is, the percentage of each type in the population changes over time according to the economic success of this player type.

We focus on homogenous populations, where all individuals share the same preferences for fairness, $\hat{\sigma}$, as determined by prevalent norms in that population. Since buyers and sellers are taken from a single population (each player has a 50% chance of being a buyer and a 50% chance of being a seller), the fitness of an individual in this population is given by

$$(15) \quad f(\hat{\sigma}; D) = \frac{1}{2} \cdot [\Pi_B(\hat{\sigma}; D) + \Pi_S(\hat{\sigma}; D)].$$

Let $f(\sigma, \hat{\sigma}; D)$ be the expected fitness of a player with a fairness concern σ , when matched against a player with a fairness concern $\hat{\sigma}$.

$$(16) \quad f(\sigma, \hat{\sigma}; D) = \frac{1}{2} \cdot [\Pi_B(\hat{\sigma}, \sigma; D) + \Pi_S(\sigma, \hat{\sigma}; D)],$$

¹⁴ Moreover, since $|\partial R_B^2 / \partial D| > |\partial R_S^2 / \partial D| \quad \forall \sigma > 0$, higher damages decrease the range where a modification will be agreed.

where $\Pi_s(\sigma, \hat{\sigma}; D)$ is the payoff to a player with σ , when as a seller he meets a buyer with $\hat{\sigma}$, and $\Pi_b(\hat{\sigma}, \sigma; D)$ is the payoff to a player with σ , when as a buyer, he meets a seller with $\hat{\sigma}$. Specifically,

$$(17) \quad \Pi_s(\sigma, \hat{\sigma}; D) = p(\sigma, \hat{\sigma}) - (1-q) \cdot c + q \cdot \begin{cases} -C & , R_s^2(\sigma, \hat{\sigma}; D) < 0 \\ \Delta p(\sigma, \hat{\sigma}; D) - C & , R_s^2(\sigma, \hat{\sigma}; D) \in [0, R_b^2(D)] \\ -D & , R_s^2(\sigma, \hat{\sigma}; D) > R_b^2(D) \end{cases}$$

and

$$(18) \quad \Pi_b(\hat{\sigma}, \sigma; D) = -p(\hat{\sigma}, \sigma) + (1-q) \cdot v + q \cdot \begin{cases} v & , R_s^2(\hat{\sigma}, \sigma; D) < 0 \\ v - \Delta p(\hat{\sigma}, \sigma; D) & , R_s^2(\hat{\sigma}, \sigma; D) \in [0, R_b^2(D)] \\ D & , R_s^2(\hat{\sigma}, \sigma; D) > R_b^2(D) \end{cases}$$

where the definitions of the asymmetric price functions and reservation values functions in the case where the seller and the buyer do not share the same level of fairness concerns parallel the definitions of the symmetric price and reservation values function, as defined above for the case where the two parties share the same fairness concern, subject to the proper adjustments.

3.3 Law and Fairness

We now solve for the evolutionary stable fairness concern $\hat{\sigma}$, and study the effects of the legal environment, as captured by the parameter D , on the equilibrium fairness level. A population with a fairness concern, $\hat{\sigma}$, is said to be evolutionary stable *if and only if* for every σ , $\sigma \neq \hat{\sigma}$: $f(\sigma, \hat{\sigma}; D) \leq f(\hat{\sigma}, \hat{\sigma}; D)$ and if $f(\sigma, \hat{\sigma}; D) = f(\hat{\sigma}, \hat{\sigma}; D)$ then $f(\hat{\sigma}, \sigma; D) > f(\sigma, \sigma; D)$ (see, e.g., Mainard Smith (1982), Weibull (1995)).

We can now use the above analysis to find the evolutionary stable fairness concern.

Proposition 1: *Assuming $D \in (v - \frac{1}{2}(C - c), v)$ -*

(i) *A homogenous population with no fairness concern, i.e. with $\hat{\sigma} = 0$, is unstable.*

(ii) $\exists \hat{\sigma}_{\max}$ such that $\forall \sigma_{\max} < \hat{\sigma}_{\max} \exists \hat{D} \in (v - \frac{1}{2}(C - c), v)$ such that $\forall D > \hat{D}$ -

a) the unique evolutionary stable homogeneous population shares a fairness

$$\text{concern of } \hat{\sigma}(D) = \frac{v - C}{\frac{1}{2}(C - c) - (v - D)}; \text{ and}$$

b) a higher level of legal damages, D , reduces the common fairness concern in the population.

And, $\forall D \leq \hat{D}$ the unique evolutionary stable homogeneous population shares a fairness concern of σ_{\max} .

Proof: See the Appendix.

The intuition for these results is as follows:

(i) A population with no fairness concerns is unstable, since a player with a higher fairness concern will outperform the other members of the population. A greater fairness concern improves the stage 1 prices, without any effect on stage 2, since there will be no credible threat to breach and hence no renegotiation.¹⁵

(ii) The stable fairness concern $\hat{\sigma}(D) = \frac{v - C}{\frac{1}{2}(C - c) - (v - D)}$ is the maximal fairness

concern for which the stage 2 renegotiations do not break down (and is defined by

$R_S^2(\hat{\sigma}_2, \sigma = \hat{\sigma}_2, D) = R_B^2(D)$). A population sharing this fairness concern cannot be

invaded by a mutant with a weaker fairness concern. Such a mutant will be in a less favorable bargaining position in both the stage 1 negotiations and the stage 2

¹⁵ Assuming that $C < D$. If $C > D$, then a credible threat exists even without fairness concerns (or even with only very weak fairness concerns). In this case, a stronger fairness concern will further increase a player's payoff by improving her position in the stage 2 renegotiations.

renegotiations.¹⁶ The population is also immune against invasion by a mutant with a stronger fairness concern. The excessive fairness concern will induce breakdown in the renegotiation stage, leading to inefficient breach.¹⁷

The upper limit on the population's fairness concern is imposed by the threat of breakdown in the stage 2 renegotiation, and the resulting inefficient breach, that are a result of excessive fairness concerns. These inefficiencies will occur when the seller, empowered by a strong fairness concern, demands more than the buyer is willing to concede. A higher level of damages, D , reduces the buyer's loss from breach, and thus lowers the maximum price concession that the buyer will make at stage 2 to ensure performance. To avoid inefficient breaches, a weaker fairness concern will evolve.

Remarks:

(i) *No fairness concerns versus the equilibrium level of fairness concerns – a comparison.*

The results stated in proposition 1 imply that – (a) the fitness given

$\hat{\sigma}(D) = \frac{v - C}{\frac{1}{2}(C - c) - (v - D)}$ is identical to the fitness given $\hat{\sigma} = 0$, but (b) the outcome is

different: when $\hat{\sigma} = 0$, there is no modification (if $C < D$), whereas a modification is

agreed upon when $\hat{\sigma}(D) = \frac{v - C}{\frac{1}{2}(C - c) - (v - D)}$.

(ii) *The modified contract price – comparative statics.* When the equilibrium level of

fairness concerns is $\hat{\sigma}(D) = \frac{v - C}{\frac{1}{2}(C - c) - (v - D)}$, the modified contract price (see

Observation 1) is decreasing in the magnitude of the damage award, D .

¹⁶ If the mutant has a sufficiently weak fairness concern, then it might not have a credible threat to breach, thus precluding any stage 2 price increase.

¹⁷ This stage 2 inefficiency outweighs the stage 1 advantage provided by a greater fairness concern, at least as long as the mutant's fairness concern is not too high. See the proof of proposition 1 in the appendix.

4. Concluding Remarks

In the basic law and economics framework individuals' preferences are exogenously given. Consequently, the economic analysis of law has focused on the incentive effects of legal rules. But, preferences, social norms and other cultural attributes are in constant change, and these changes are not all exogenous. They may be the outcome of imitation, learning and other cultural transmission mechanisms. This paper has argued that legal rules do more than provide incentives. They affect the dynamic formation of preferences and norms. They change people. This understanding extends the traditional setting or boundaries of law and economics. Some focus on the educational aspect of changing preferences. Others perceive endogenous preferences as a tool in overcoming market failures. Without entering this and other important debates, this paper demonstrates that while preference formation will likely remain a controversial subject, one cannot ignore the interdependence between the prevailing legal rules and the preferences that emerge.

Appendix

Proof of Observation 1:

(i) Comparing (7) and (9), we find that the seller does not have a credible threat to breach when $D > C + \sigma \cdot \frac{1}{2}(C - c)$. Absent a credible threat to breach, there will be no modification, and the seller will perform the original contract.

(ii) Comparing (7) and (9), we find that the seller has a credible threat to breach when $D \leq C + \sigma \cdot \frac{1}{2}(C - c)$. When a credible threat exists, the seller's reservation price, $R_S^2(\sigma; D)$, can be found by comparing $U_S^M(\Delta p, \sigma)$ (eq. (8)) and $U_S^{Br}(D)$ (eq. (9)). That is, the seller would prefer performance of the modified contract *if and only if* $U_S^M(\Delta p, \sigma) > U_S^{Br}(D)$, i.e., *iff*

$$y_S + p + \Delta p - C - \text{Max}\{0, \sigma \cdot [\frac{1}{2}(C - c) - \Delta p]\} > y_S + p - D,$$

or after simplifying *iff*

$$\Delta p - C - \text{Max}\{0, \sigma \cdot [\frac{1}{2}(C - c) - \Delta p]\} > -D.$$

Since $D > v - \frac{1}{2}(C - c)$ implies $D > C - \frac{1}{2}(C - c)$ (or $\frac{1}{2}(C - c) + (D - C) > 0$), we know that given a price increase $\Delta p \geq \frac{1}{2}(C - c)$, the seller would prefer performance to breach.

In this case, the seller's reservation price at the renegotiation stage is:

$$R_S^2(\sigma; D) = \frac{1}{1 + \sigma} \cdot [-(D - C)] + \frac{\sigma}{1 + \sigma} \cdot \frac{1}{2}(C - c) \quad (< \frac{1}{2}(C - c)).^{18}$$

Comparing (11) and (12), we find that when $D > v - \frac{1}{2}(C - c)$ the buyer's reservation price is:

$$R_B^2(\sigma; D) = v - D \quad (< \frac{1}{2}(C - c)).^{19}$$

If $R_S^2(\sigma; D) \leq R_B^2(\sigma; D)$, the parties will agree on a price increase of:

¹⁸ Note that $R_S^2(\sigma; D) \geq 0$ whenever the seller has a credible threat, i.e. whenever $D \leq C + \sigma \cdot \frac{1}{2}(C - c)$.

¹⁹ When $D \leq v - \frac{1}{2}(C - c)$, the buyer's reservation price is:

$$R_B^2(\sigma; D) = \frac{1}{1 + \sigma} \cdot (v - D) + \frac{\sigma}{1 + \sigma} \cdot \frac{1}{2}(C - c) \quad (> \frac{1}{2}(C - c)).$$

Since $R_S^2(\sigma; D) < \frac{1}{2}(C - c)$, $R_S^2(\sigma; D) \leq R_B^2(\sigma; D)$ and modification is always feasible.

$$\Delta p(\sigma; D) = \frac{1}{2} \cdot [R_S^2(\sigma; D) + R_B^2(\sigma; D)] = \frac{1}{2} \cdot \left[\frac{1}{1+\sigma} \cdot [-(D-C)] + \frac{\sigma}{1+\sigma} \cdot \frac{1}{2}(C-c) + (v-D) \right].$$

If $R_S^2(\sigma; D) > R_B^2(\sigma; D)$, the parties will not agree on a price increase, and the seller will breach the contract.

QED

Proof of Observation 2:

Using the expressions for $R_S^2(\sigma; D)$, $R_B^2(\sigma; D)$ and $\Delta p(\sigma; D)$, as derived in observation

1, we obtain: (i) $\frac{\partial R_S^2}{\partial D} = -\frac{1}{1+\sigma} < 0$; (ii) $\frac{\partial R_B^2}{\partial D} = -1 < 0$; (iii) $\frac{\partial(\Delta p)}{\partial D} = -\frac{1}{2} \cdot \frac{2+\sigma}{1+\sigma} < 0$. QED

Proof of Proposition 1:

(i) and (ii): The fitness function of an individual with a fairness concern, σ , in a homogeneous population that shares a fairness concern, $\hat{\sigma}$, is:

$$(16a) \quad f(\sigma; \hat{\sigma}, D) = \frac{1}{2} \cdot \left[(p(\sigma, \hat{\sigma}) - p(\hat{\sigma}, \sigma)) + (1-q) \cdot (v-c) + \right. \\ \left. + q \cdot \begin{cases} v & , R_S^2(\hat{\sigma}, \sigma, D) < 0 \\ v - \Delta p(\hat{\sigma}, \sigma, D) & , R_S^2(\hat{\sigma}, \sigma, D) \in [0, R_B^2(D)] \\ D & , R_S^2(\hat{\sigma}, \sigma, D) > R_B^2(D) \end{cases} \right. \\ \left. q \cdot \begin{cases} -C & , R_S^2(\sigma, \hat{\sigma}, D) < 0 \\ -C + \Delta p(\sigma, \hat{\sigma}, D) & , R_S^2(\sigma, \hat{\sigma}, D) \in [0, R_B^2(D)] \\ -D & , R_S^2(\sigma, \hat{\sigma}, D) > R_B^2(D) \end{cases} \right]$$

In an evolutionary stable homogeneous population the common fairness concern $\hat{\sigma}$ must satisfy: $\hat{\sigma} \in \arg \max_{\sigma} f(\sigma; \hat{\sigma}, D)$. We thus focus on $f(\sigma = \hat{\sigma}; \hat{\sigma}, D)$, and check for which

values of $\hat{\sigma}$, $\sigma = \hat{\sigma}$ maximizes the fitness function. As a first step, we derive the two threshold values of $\hat{\sigma}$ that are implied by (16a). The first threshold value is defined by

$R_S^2(\hat{\sigma}_1, \hat{\sigma}_1, D) = 0$. Using the expression for $R_S^2(\sigma; D)$, as derived in observation 1, we

obtain: $\hat{\sigma}_1 = \frac{D-C}{\frac{1}{2}(C-c)}$. The second threshold value is defined by $R_S^2(\hat{\sigma}_2, \hat{\sigma}_2, D) = R_B^2(D)$.

Using the expressions for $R_S^2(\sigma; D)$ and $R_B^2(\sigma; D)$, as derived in observation 1, we

obtain: $\hat{\sigma}_2 = \frac{v-c}{\frac{1}{2}(C-c)-(v-D)}$. Clearly, $\hat{\sigma}_1 < \hat{\sigma}_2$.²⁰ The two threshold values determine

three ranges of $\hat{\sigma}$ that need to be examined:

1) $\hat{\sigma} < \hat{\sigma}_1$:²¹ Any homogenous population with a fairness concern in this range is necessarily unstable. A mutant with a greater fairness concern will outperform other members of the population. Such a mutant will attain more favorable stage 1 prices (e.g. when a seller with $\sigma > \hat{\sigma}$ meets a buyer with $\hat{\sigma}$, the price, p , is higher than in the case

where both players have $\hat{\sigma}$: $p(\sigma, \hat{\sigma}) - p(\hat{\sigma}, \hat{\sigma}) = \frac{(v-c) \cdot (\sigma - \hat{\sigma})}{4 \cdot (1+\sigma) \cdot (1+\hat{\sigma})}$), without any adverse

consequences in the renegotiation stage.

2) $\hat{\sigma} > \hat{\sigma}_2$: Any homogenous population with a fairness concern in this range is necessarily unstable, since it can always be invaded by a mutant with a greater fairness concern, $\sigma > \hat{\sigma}$. Members of the population never reach an agreement at the stage 2 renegotiations, leading to inefficient breach. A mutant with a greater fairness concern will likewise fail to reach agreement at the stage 2 renegotiations, but this mutant will attain more favorable stage 1 prices.

3) $\hat{\sigma} \in [\hat{\sigma}_1, \hat{\sigma}_2)$: Any homogenous population with a fairness concern below $\hat{\sigma}_2$ is necessarily unstable. To see this, take the derivative of the fitness function, $f(\sigma = \hat{\sigma}; \hat{\sigma}, D)$, with respect to σ at any $\hat{\sigma} \in [\hat{\sigma}_1, \hat{\sigma}_2)$:

$$\begin{aligned} \frac{\partial f(\sigma = \hat{\sigma}; \hat{\sigma}, D)}{\partial \sigma} &= \frac{1}{2} \left[\frac{\partial [p(\sigma = \hat{\sigma}, \hat{\sigma}) - p(\hat{\sigma}, \sigma = \hat{\sigma})]}{\partial \sigma} + q \frac{\partial (\Delta p(\sigma = \hat{\sigma}, \hat{\sigma}, D) - \Delta p(\hat{\sigma}, \sigma = \hat{\sigma}, D))}{\partial \sigma} \right] = \\ &= \frac{1}{4 \cdot (1+\hat{\sigma})^2} \left[\left(1 - \frac{q}{2} \frac{\hat{\sigma}}{1+\hat{\sigma}} \right) (v-c) + q \left(\frac{1}{2}(C-c) - (C-D) \right) \right] > 0 \end{aligned}$$

The positive derivative means that any homogeneous population with a fairness concern $\hat{\sigma} \in [\hat{\sigma}_1, \hat{\sigma}_2)$ can be successfully invaded by a mutant with a slightly greater fairness concern.

We have thus far shown that any fairness concern other than $\hat{\sigma}_2$ is unstable. To prove that a population with $\hat{\sigma}_2$ is stable, we verify that no mutant can outperform this

²⁰ By assumption, $D > v - \frac{1}{2}(C-c)$. Hence, $\hat{\sigma}_2 > 0$.

²¹ This range disappears if $D \leq C$ such that $\hat{\sigma}_2 \leq 0$.

population. The analysis of ranges 1 and 3 implies that no mutant with $\sigma < \hat{\sigma}_2$ can invade the $\hat{\sigma}_2$ population. It remains to prove that no mutant with $\sigma > \hat{\sigma}_2$ can invade the $\hat{\sigma}_2$ population. Mutants with $\sigma > \hat{\sigma}_2$ lose from inefficient breaches, and thus face a significant disadvantage compared to the $\hat{\sigma}_2$ population. These mutants, however, enjoy more favorable stage 1 prices. The fitness of a player with $\hat{\sigma}_2$ is:

$$f(\hat{\sigma}_2, \hat{\sigma}_2, D) = \frac{1}{2} \cdot [(1-q) \cdot (v-c) + q \cdot (v-C)].$$

The fitness of a mutant with $\sigma > \hat{\sigma}_2$ is:

$$f(\sigma > \hat{\sigma}_2, \hat{\sigma}_2, D) = \frac{1}{2} \cdot \left[\frac{1}{2} \cdot (v-c) \cdot \left(\frac{1}{1+\hat{\sigma}_2} - \frac{1}{1+\sigma} \right) + (1-q) \cdot (v-c) + q \cdot (v-C) - q \cdot (D-C + \Delta p(\sigma > \hat{\sigma}_2, \hat{\sigma}_2, D)) \right]$$

Thus, a mutant with a sufficiently large fairness concern will do better than the population, especially when q is small. In particular, $\exists \bar{\sigma}(D) > \hat{\sigma}_2$ such that mutants with $\sigma > \bar{\sigma}$ can invade the $\hat{\sigma}_2$ population. Let $\bar{\sigma}_{\min} \equiv \min_D \bar{\sigma}(D)$. If $\sigma_{\max} \leq \bar{\sigma}_{\min}$, then $\forall D$ $\bar{\sigma}(D) \geq \sigma_{\max}$. Define \hat{D} by $\hat{\sigma}_2(\hat{D}) = \sigma_{\max}$. Since $d\hat{\sigma}_2(D)/dD < 0$, $\forall D > \hat{D}$ $\hat{\sigma}_2(D) < \sigma_{\max} \leq \bar{\sigma}(D)$ and the unique evolutionary stable homogeneous population shares a fairness concern of $\hat{\sigma}_2(D)$. And, $\forall D \leq \hat{D}$ $\sigma_{\max} \leq \hat{\sigma}_2(D) < \bar{\sigma}(D)$ and the unique evolutionary stable homogeneous population shares a fairness concern of σ_{\max} .

(iii) The common fairness concern at the unique evolutionary stable population is

$$\hat{\sigma}(D) = \frac{v-C}{\frac{1}{2}(C-c) - (v-D)} \text{ (see part (ii) of the proposition). And, } \frac{\partial \hat{\sigma}(D)}{\partial D} < 0.$$

QED

References

- Aaron, H. J. (1994), "Public Policy, Values, and Consciousness", *Journal of Economic Perspectives*, 8, 3-21
- Adams, J. S. (1963), "Toward an Understanding of Unequity," *Journal of Abnormal and Social Psychology*, 67, 422-436.
- Adams, J. S. (1965), "Inequity in Social Exchange", in Berkowitz, L. (Ed.), *Advances in Experimental Social Psychology*, 2, 422-436.
- Andenaes, J. (1952), "General Prevention – Illusion or Reality?," *Journal of Criminal Law, Criminology and Police Science*, 43, 176-198.

- Andenaes, J. (1966), "The General Preventive Effects of Punishment," *University of Pennsylvania Law Review*, 114, 949-983.
- Andenaes, J. (1971), "The Moral or Educative Influence of Criminal Law," *Journal of Social Issues*, 27(2), 17-31.
- Aronson, E. and Carlsmith, J. M. (1963), "Effect of Severity of Threat on the Devaluation of Forbidden Behavior," *Journal of Abnormal & Social Psychology*, 66, 584-588.
- Ayers, I. And Gertner, R. (1989), "Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules," *Yale Law Journal*, 99, 87-130.
- Ayers, I. And Gertner, R. (1992), "Strategic Contractual Inefficiency and the Optimal Choice of Legal Rules," *Yale Law Journal*, 101, 729-773.
- Balkin, J. M. (1998), *Cultural Software: A Theory of Ideology* (Yale University Press, New Haven, CT).
- Bar-Gill, O. and Fershtman, C. (2000), "The Limit of Public Policy: Endogenous Preferences," Discussion Paper #2000-71, CentER, Tilburg University.
- Bar-Gill, O. and Ben-Shahar, O. (2002a), "The Credibility of Threats to Breach," Discussion Paper #02-017, Olin Center for Law & Economics, University of Michigan Law School.
- Bar-Gill, O. and Ben-Shahar, O. (2002b), "Threatening an Irrational Breach of Contract," Discussion Paper #02-016, Olin Center for Law & Economics, University of Michigan Law School.
- Becker, G. (1976), "Altruism, Egoism and Genetic Fitness: Economics and Sociobiology", *Journal of Economic Literature*, 14, 817-826.
- Bentham, J. (1789), *An Introduction to the Principles of Morals and Legislation*, reprinted in *The Utilitarians* (Doubleday, 1961), vol. 7.
- Bester, H. and Güth, W. (1998), "Is Altruism Evolutionary Stable?", *Journal of Economic Behavior and Organization*, 34, 193-209.
- Bisin, A. and Verdier, T. (1998), "On the Cultural Transmission of Preferences for Social Status", *Journal of Public Economics*, 70, 75-97.
- Bohnet, I., Frey, B. S. and Huck, S. (2001), "More Order With Less Law: On Contract Enforcement, Trust and Crowding," *American Political Science Review*, 95, 131-144.
- Bolton, G. E. (1991), "A Comparative Model of Bargaining: Theory and Evidence," *American Economic Review*, 81, 1096-1136.
- Bowles, S. (1998), "Endogenous Preferences: The Cultural Consequences of Markets and Other Economic Institutions", *Journal of Economic Literature*, 36, 75-111.
- Boyd, R. and Richerson, P. (1985), *Culture and Evolutionary Process* (Chicago University Press, Chicago, IL).
- Cavalli-Sforza, L. L. and Feldman, M. W. (1973), "Cultural versus Biological Inheritance: Pheno-type Transmission from Parent to Children," *American Journal of Human Genetics*, 25, 618-37.
- Cavalli-Sforza, L. L. and Feldman, M. W. (1981), *Cultural Transmission and Evolution: A Quantitative Approach* (Princeton University Press, Princeton, NJ).
- Cooter, R. (1995), "Law and Unified Social Theory: Thickening the 'Self' in 'Self-Interest'," in Galligan, D. J. (ed.), *Socio-Legal Studies in Context: The Oxford Center Past and Future* (Blackwell, Oxford, UK).

- Cooter, R. (1998), "Expressive Law and Economics," *Journal of Legal Studies*, 27, 585-608.
- Cooter, R. (2000), "Do Good Laws Make Good Citizens? An Economic Analysis of Internalized Norms," *Virginia Law Review*, 86, 1577-1601.
- Cooter, R. and Ulen, T. (2003), *Law and Economics* (4th ed., Addison-Wesley, Boston, MA).
- Dau-Schmidt, K. G. (1990), "An Economic Analysis of the Criminal Law as Preference-Shaping Policy," *Duke Law Journal*, 1990, 1-38.
- Dekel, E. and Scotchmer, S. (1999), "On the Evolution of Attitudes towards Risk in Winner-Take-All Games," *Journal of Economic Theory*, 87, 125-143.
- Fershtman, C. and Weiss, Y. (1997), "Why Do We Care about What Others Think about Us?," in: Ben-Ner, A. and Putterman, L. (Eds.), *Economics, Values and Organization* (Cambridge University Press, Cambridge, UK).
- Fershtman, C. and Weiss, Y. (1998), "Social Rewards, Externalities and Stable Preferences," *Journal of Public Economics*, 70, 53-74.
- Forsythe, R., Horowitz, J., Savin, N. E. and Sefton, M. (1994), "Fairness in Simple Bargaining Experiments," *Games and Economic Behavior*, 6, 347-369.
- Frank, R. (1988), *Passions within Reason: The Strategic Role of the Emotions* (W. W. Norton & Company, New York, NY).
- Fried, C. (1980), *Contract As Promise* (Harvard University Press, Cambridge, MA).
- Guth, W., Schmittberger, R. and Schwartz, B. (1982), "An Experimental Analysis of Ultimatum Bargaining," *Journal of Economic Behavior & Organization*, 3, 367-388.
- Guth, W., and M. Yaari (1992), "Explaining Reciprocal Behavior in Simple Strategic Games: An Evolutionary Approach," in Witt, U. (ed.) *Explaining Forces and Changes: Approaches to Evolutionary Economics* (University of Michigan Press, Ann Arbor, MI).
- Hampton, J. (1984), "The Moral Education Theory of Punishment," *Philosophy and Public Affairs*, 13, 208-238.
- Harsanyi, J. C. (1953-54), "Welfare Economics of Variable Tastes," *Review of Economic Studies*, 21, 204-213.
- Hart, O. (1995), *Firms, Contracts, and Financial Structure* (Oxford University Press, New York, NY).
- Hawkins, G. J. (1969), "Punishment and Deterrence: The Educative, Moralizing, and Habitulative Effects," *Wisconsin Law Review*, 1969, 550-565.
- Hermalin, B. and Katz, M. (1993), "Judicial Modification of Contracts Between Sophisticated Parties: A More Complete View of Incomplete Contracts and Their Breach," *Journal of Law, Economics & Organization*, 9, 230-255.
- Huang, P. H. and Ho-Mou, W. (1994), "More Order Without More Law: A Theory of Social Norms and Organizational Culture," *Journal of Law, Economics and Organization*, 10, 390-406.
- Huck, S. (1998), "Trust, Treason, and Trials: An Example of How the Evolution of Preferences Can Be Driven by Legal Institutions," *Journal of Law, Economics and Organization*, 14, 44-60.
- Huck, S. and Oechssler, J. (1999), "The Indirect Evolutionary Approach to Explaining Fair Allocations," *Games and Economic Behavior*, 28, 13-24.

- Kahan, D. M. (1996), "What Do Alternative Sanctions Mean?," *University of Chicago Law Review*, 591-653.
- Kahneman, D., Knetsch, J. L. and Thaler, R. H. (1986), "Fairness and the Assumptions of Economics," *Journal of Business*, 59(4), S285-300.
- Kaplow, L. and Shavell, S. (2002), *Fairness versus Welfare* (Harvard University Press, Cambridge, MA).
- Koçkesen, L., Ok, E. A. and Sethi, R. (2000), "Evolution of Interdependent Preferences in Aggregative Games", *Games and Economic Behavior*, 31, 303-310.
- Kornhauser, L. A. (1989), "The New Economic Analysis of Law: Legal Rules as Incentives," in Mercuro, N. (ed.), *Law and Economics*, Vol. 27.
- Loewenstein, G., Thompson, L. and Bazerman, M. H. (1989), "Social Utility and Decision Making in Interpersonal Contexts," *Journal of Personality and Social Psychology*, 57, 426-441.
- Marschak, T. A. (1978), "On the Study of Taste Changing Policies," *American Economic Review*, 68(2), 386-391.
- Maynard Smith, J. (1982), *Evolution and the Theory of Games* (Cambridge University Press, Cambridge, UK).
- Neale, M. A. and Bazerman, M. H. (1991), *Cognition and Rationality in Negotiation* (The Free Press, New York, NY).
- Ochs, J. and Roth, A. E. (1989), "An Experimental Study of Sequential Bargaining", *American Economic Review*, 79, 335-385.
- Posner, R. A. (2003), *Economic Analysis of Law* (6th ed., Aspen, New York, NY).
- Rogers, A. R. (1994), "Evolution of Time Preferences by Natural Selection", *American Economic Review*, 84, 460-481.
- Roth, A. E. (1991), "An Economic Approach to the Study of Bargaining," in Bazerman, M. H., Lewicki, R. J. and Shepard, B. H. (eds.), *Handbook of Negotiation: Research on Negotiation in Organizations*, Vol. 3 (JAI Press, Greenwich, CT).
- Rychlak, R. J. (1990), "Society's Moral Right to Punish: A Further Exploration of the Denunciation Theory of Punishment," *Tulane Law Review*, 65, 299-338.
- Sandel, M. J. (1991), "Liberalism and Liberal Justice," in Bellah, R. N. (ed.), *The Good Society* (Knopf, New York, NY).
- Schoeffler, Sidney (1952), "Note on Modern Welfare Economics," *American Economic Review*, 42, 880-887.
- Schwartz, A. (1979), "The Case for Specific Performance," *Yale Law Journal*, 89, 271-306.
- Sen, A. K. (1995), "Rationality and Social Choice", *American Economic Review*, 85, 1-24.
- Shavell, S. (1984), "The Design of Contracts and Remedies for Breach," *Quarterly Journal of Economics*, 99, 121-148.
- Stigler, G. J. and Becker, G. S. (1977), "De Gustibus Non Est Disputandum," *American Economic Review*, 67, 76-90.
- Sunstein, C. R. (1993), "Endogenous Preferences, Environmental Law," *Journal of Legal Studies*, 22, 217-254.
- Sunstein, C. R. (1996), "Social Norms and Social Roles," *Columbia Law Review*, 96, 903-968.

- Sunstein, C. R. (1997), *Free Markets and Social Justice* (Oxford University Press, New York, NY).
- Sunstein, C. R. (1999), "Behavioral Law and Economics: A Progress Report," *American Law and Economics Review*, 1, 115-157.
- Weibull, J. W. (1995), *Evolutionary Game Theory* (MIT Press, Cambridge, MA).
- Young, H. P. (1993), "An Evolutionary Model of Bargaining," *Journal of Economic Theory*, 59, 145-168.