MORAL SENTIMENTS: CULTURE, RENT SEEKING, AND PROPERTY RIGHTS

By

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ABSTRACT: We explore society's cultural moral code as a possible explanation for the prevalence of the rule of law. At a general equilibrium level, we show that a greater cultural emphasis on guilt may increase aggregate rent seeking, inhibit the establishment of strong property rights institutions, discourage the adoption of human capital and reduce overall social welfare. The impact of a greater cultural emphasis on pride is in the opposite direction.

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"… the root of what is amiss in life is tendencies in the human heart. This is a brutally honest assessment."

<div align="right">Genesis 3.8-20</div>

1. INTRODUCTION

Some social scientists point out that the extent of aggregate rent seeking and the associated quality of property rights institutions may largely stem from society's culture (Weber [1930], Banfield [1958], Putnam [1993], Guiso, Sapienza and Zingales [2006]). Recent empirical research provides some evidence that society's cultural moral code may indeed have significant effects on the strength of the rule of law (Treisman [2000], Guiso, Sapienza and Zingales [2003, 2006, 2013], Stulz and Williamson [2003]). Still, despite the hypothesized importance of culture and the supporting evidence, the potential mechanisms by which culture may affect rent seeking and property rights institutions are still not well-understood in formal economic theory.

Our objective is to provide a model of one such mechanism where the cultural moral code is central. In the spirit of the Chicago School (e.g., Becker and Murphy [1988, 2001], Becker and Mulligan [1997]), our analysis allows for rational agents that have the opportunity to choose whether to become moral and develop a conscience, ― subsequently experiencing intrinsic motivation, ― or to become amoral and refrain from the inculcation of a conscience.[1] Furthermore, in our analysis there may be substantial cross-cultural variation in the negative and positive components of intrinsic motivation, ― i.e., in guilt and pride, ― as recent findings in cultural psychology suggest (Murphy [1974], Eid and Diener [2001], Tracy, Robins and Tangney [2007]).

In our model, we consider society's cultural moral code to be an exogenous and persistent parameter; for example, culture may be the outcome of a historical accident (Weber [1930], Putnam [1993], Tabellini [2008a], Guiso, Sapienza and Zingales

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[1] Becker and Murphy [1988] and Becker and Mulligan [1997] show that agents may endogenously shape the form of their utility functions. Akerlof and Kranton [2000, 2005] also point out that agents often have the ability to choose endogenously their identity. Furthermore, in Tabellini [2008b], an agent's ethical type is determined by conscious (albeit imperfect) choices. However, as we will see, our results would carry through even if the development of a conscience was shaped by biology, rather than by conscious choice.

[2013]).[2] However, although agents inherit their culture, they need not necessarily adopt it; agents choose whether to accept society's cultural moral code, and become moral, or to reject it, thereby becoming amoral.[3] Moral agents develop a conscience that allows them to experience feelings of guilt when they engage in unethical behavior and feelings of pride when they refrain from it. Amoral agents, on the other hand, experience neither positive nor negative feelings from their actions. Our analysis shows that a smaller emphasis on guilt in society's cultural moral code may lead to reduced rent seeking, stronger property rights institutions, enhanced human capital and greater social welfare.

For simplicity, in the general equilibrium framework, the only factor of production is labor. Agents sell their productive labor to firms in exchange for a wage, but may also engage in rent seeking activity. We model such rent seeking as being unethical and involving the extraction of value from firms; agents lobby for an extractive tax on firms with the proceeds being redistributed to the agents (Acemoglu [2008]).[4] Meanwhile, to protect themselves from such extractive taxation, firms engage in their own lobbying and private safeguarding activities. The effectiveness of such firms' defensive efforts depends on society's property rights institutions (North [1981]); stronger property rights enhance the effectiveness of safeguarding.[5] If agents are moral, rent seeking may also be constrained by the sentiments of pride or guilt.

There may be two subgame-perfect equilibria with trembling-hand-perfect ethical choices. In a moral equilibrium, the proportion of moral agents in the population is large, allowing moral agents to prevail politically and to ensure the establishment of strong property rights. A moral agent has an incentive to support strong property rights because his resulting wage gains — as firms pass on to agents the gains from stronger property rights — outweigh his individual rent seeking losses (from firms' more effective

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[2] For example, as Guiso, Sapienza and Zingales [2006], p. 23, note, culture is "those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation."

[3] The ability of agents to choose endogenously (albeit not necessarily perfectly) a particular identity from an exogenously (or culturally) predefined set of possible identities is a standard assumption in the literature (e.g., Akerlof and Kranton [2000, 2005], Bisin and Verdier [2000, 2001], Tabellini [2008b]).

[4] Acemoglu [2008] points out that this is a common form of rent seeking in democracies. However, our results would carry through to several other forms of rent seeking.

[5] As North [1981] notes, we can distinguish between two types of institutions. There are "property rights institutions" which provide checks against expropriation by other social groups or by the government and "market supporting institutions" which reduce transaction costs in contracting. We focus on property rights institutions although our results would also carry through to several forms of market supporting institutions.

safeguarding) since moral agents engage in relatively little rent seeking. In an amoral equilibrium, on the other hand, amoral agents prevail, ensuring the choice of weak institutions. The moral equilibrium is Pareto superior because less output is dissipated in rent seeking and in countermeasures, and also greater sentimental payoffs are attained.

Society's cultural emphasis on guilt may shape the amount of aggregate rent seeking in a given (moral or amoral) interior equilibrium. Within a given institutional framework (strong or weak), a greater cultural emphasis on guilt generates opposing effects on rent seeking. The possible disutility from stronger feelings of guilt in the future discourages agents from deciding to become moral *ceteris paribus*. However, after an agent chooses to become moral, he is constrained in his rent seeking activity by stronger guilt *ceteris paribus*. We show that the former effect is always dominant. Specifically, a greater emphasis on guilt makes moral agents (who experience guilt) worse off *ceteris paribus*. Since the equilibrium payoffs of moral and amoral agents must be equal (to prevent deviation), a more guilt-based culture is associated with greater aggregate rent seeking and thus greater countermeasures by firms. Such increased countermeasures equalize the payoff of the two ethical types by reducing the non-wage payoff — i.e., the sum of rent seeking and sentimental payoffs — of amoral agents by more than that of moral ones; the non-wage payoff of moral agents contains sentiments that are insensitive to firms' safeguards, which cushions the negative impact of more safeguarding

In addition to shaping rent seeking activity within a given institutional framework, the cultural emphasis on guilt may also determine the type of society's equilibrium, moral or amoral, and thus the strength of property rights institutions, strong or weak. Only a moral equilibrium (with strong institutions) exists when the cultural emphasis on guilt is sufficiently weak, and only an amoral equilibrium (with weak institutions) exists when the emphasis on guilt is sufficiently strong; both equilibria may exist for intermediate levels of guilt. In particular, in a given equilibrium, the increase in aggregate rent seeking that stems from a more guilt-based culture can occur only with a sufficient increase in the proportion of amoral agents in the population, so that the reduction in rent seeking by individual moral and amoral agents — which follows from the greater equilibrium safeguarding by firms, as well as the greater sentimental or guilt penalty for

rent seeking (for moral agents) — is outweighed. An emphasis on guilt thus reduces the numerical size and the political power of the group of moral agents.

We also show that a greater cultural emphasis on guilt, as well as the prevalence of an amoral equilibrium, discourages agents from acquiring human capital or know-how from the available worldwide stock since the payoff (pecuniary plus non-pecuniary) per unit of human capital is lower. However, the cultural emphasis on guilt does not affect domestic human capital generation since it impacts symmetrically both the benefits and the costs of such generation. Finally, we also examine the sentiment of pride and show that the effects of a stronger cultural emphasis on pride are largely opposite to those of a stronger emphasis on guilt.

Cultural psychology suggests that the emphasis on the sentiment of guilt may be substantially different across cultures (Tracy, Robins and Tangney [2007]); such differences among a few specific countries have been documented.[6] Our analysis is consistent with the observation that countries with a strong cultural emphasis on guilt, such as China and Taiwan, tend to exhibit a weaker rule of law and a smaller amount of human capital per capita than countries with a weak emphasis on guilt, such as Australia and the U.S (World Bank [2006, 2013]). See, for example, table 1. Furthermore, research in cultural psychology suggests that Protestantism may be associated with a relatively weak emphasis on guilt (Albertsen, O'Connor and Berry [2006], Sheldon [2006]).[7] Our analysis is thus consistent with the observation that Protestant countries often exhibit an especially strong rule of law and especially high levels of human capital per capita (World Bank [2006, 2013]). Of course, more formal empirical research is required to better study those correlations.

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[6] The Chinese and Taiwanese societies, for example, may culturally emphasize guilt more than the U.S. and Australian ones (Eid and Diener [2001]). Furthermore, French Canadians may place a stronger cultural emphasis on guilt than British Canadians (Murphy [1974]). As far as we know, there are no other major studies that compare the emphasis on guilt in specific countries. We are grateful to Richard Robins and Jessica Tracy for giving us with information on related research in cultural psychology.

[7] The Protestant principles of *sola gratia* ("by grace alone") and *sola fide* ("by faith alone") imply that salvation comes by God's grace alone. Thus Protestants may view their behavior as a sign of God's gift to them, emphasizing positive feelings of pride from good behavior, rather than negative feelings of guilt from bad behavior (McGiffert [1911]). For example, McGiffert [1911], p. 39-40, describes a Protestant's motivation to behave morally and points out that "… and out of his gratitude to God … he cannot do otherwise than give himself in glad surrender to God's work. …. Confidence instead of fear." In addition, Judaism is believed to de-emphasize guilt (London, Schulman and Black [1964]).

In the theoretical literature, Frank [1987] and Guiso, Sapienza and Zingales [2008] abstract from intrinsic motives and show how morality may enhance pecuniary payoffs ― for example, by facilitating cooperation. Our analysis, on the other hand, highlights intrinsic motivation. Tabellini [2008b] shows how two different cultural moral codes, namely limited morality (i.e., good behavior only toward one's family and extended family) and generalized morality (i.e., good behavior toward the entire society) may shape the strength of the rule of law in a country. We supplement this research by focusing on a different aspect of culture, the moral sentiments of guilt and pride.[8] Benabou and Tirole [2006] examine how the design of optimal pecuniary government subsidies or penalties to promote specific deeds may be affected by the presence of intrinsic motivation. We focus on different issues, namely the comparison of cultural moral codes entailing different types of intrinsic motivation and the link between culture and the rule of law.

In a different vein, Akerlof and Kranton [2000, 2010] introduce the concept of social identity. In our model an agent's social identity is defined by his choice to be moral or amoral. Bisin and Verdier [2000, 2001] examine the intergenerational transmission of culture when parents have "imperfect empathy," i.e., when parents perceive their children's happiness in terms of their own preferences. Greif [1994] studies the differences between individualistic and collectivist cultures while Kaplow and Shavell [2007] derive optimal ethical rules for various types of behavior.

The political economy literature identifies several possible causes of rent seeking and institutional quality. For example, the strength of the rule of law may be impacted by historical accidents and persistence (Acemoglu and Robinson [2008]), factor endowments (Dal Bo and Dal Bo [2011]), income inequality (Acemoglu, Johnson and Robinson [2005], Do and Levchenko [2009]) and openness to international trade (Levchenko [2007], Do and Levchenko [2009]).[9] Our analysis supplements this line of research by bringing out society's culture as an important cause of the strength of the rule of law.

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[8] Kanatas and Stefanadis [forth] examine how the sentiments of guilt and pride may affect financial transactions, i.e., contract breach, asset pricing and the size of firms. As Zingales [1995], among others, points out, firm stakeholders may have conflicting incentives. In this paper, on the other hand, we study a link between moral sentiments and property rights institutions or the rule of law. We also explore the effects of moral sentiments on human capital.

[9] Acemoglu, Johnson and Robinson [2005], among others, provide an extensive survey of the literature.

2. THE MODEL

The economy is populated by a large number n of agents. Each of a large number of firms manufactures a homogeneous product. For simplicity, we assume that the only factor of production is labor; each firm has a constant returns to scale production function L, where L is the amount of labor that is used.[10] An agent is endowed by nature with one unit of labor and sells his labor to a firm in exchange for a wage. As in the standard framework of perfect competition, agents' ownership shares in firms are historically given; since product and labor markets are perfectly competitive, such ownership shares are immaterial for agent payoffs.

In the spirit of public choice theory, society is vulnerable to the rent seeking activities of agents. We focus on a common form of rent seeking, namely on the expropriation and redistribution of firm output through extractive taxation (Acemoglu [2008]); our findings, however, would be similar for several other forms of rent seeking. Thus in our model, in addition to his regular productive activities (i.e., selling his labor to firms), an agent also has the opportunity to engage in lobbying, requesting a subsidy from society. For simplicity, it is assumed that all n agents have equal opportunities in rent seeking; each agent has the opportunity to prey on a fraction $1/n$ of society's total output, i.e., on a fraction $1/n$ of each firm's gross output before wages to labor are paid. The level z ($z \in [0,1]$) of rent seeking is a choice variable for an agent. Thus an agent may request a subsidy that entails the confiscation and redistribution (to the agent) of a fraction z/n of society's total output.[11] Lobbying is costly; a level z of rent seeking corresponds to a cost $c(z)$ for an agent, i.e., to a cost that is equal to a proportion $c(z)/n$ of society's total output. We make the standard assumption that such a cost is a strictly increasing and convex function of z, i.e., $\partial c(z)/\partial z > 0$ and $\partial^2 c(z)/\partial z^2 > 0$.

Firms have the opportunity to engage in various safeguarding activities, including lobbying of their own or hiding of their output, to protect themselves from extractive taxation. A firm can choose how intensively to engage in such defensive activities; this is

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[10] The specific form of the constant returns to scale production function is immaterial for our results.

[11] For example, an agent's rent seeking request may entail the imposition of a value (*ad valorem*) tax or of tollbooth regulation (license fees, operating fees, fines, etc) on each firm.

captured in our model by the choice of a safeguarding expenditure m ($m \in [0,1]$). The protection of firm output is imperfect and costly. By incurring a safeguarding cost that is a fraction m of its gross output, a firm successfully neutralizes a proportion $d\pi(m)$ of any rent seeking campaign against it, where $d > 0$ and $d\pi(m) \in (0,1)$, $\forall m \in [0,1]$. It follows that if an agent aims at the expropriation of a fraction z/n of the firm's gross output, he actually succeeds in obtaining (as part of his redistributive subsidy) only a fraction $[1 - d\pi(m)]z/n$ of the firm's gross output. We make the standard assumption that $\pi(m)$ (which is effectively a safeguarding production function) is strictly increasing and concave in m, i.e., $\partial\pi(m)/\partial m > 0$ and $\partial\pi^2(m)/\partial m^2 < 0$.

As in North [1981], society has property rights institutions that facilitate private defensive efforts against expropriation and extractive taxation (see note 5). Parameter d corresponds to the strength of such property rights. In particular, stronger institutional enforcement d allows firms to attain greater effectiveness in their private safeguarding activities in that any individual choice m generates greater private protection $d\pi(m)$.[12] We shall take society's enforcement of property rights enforcement as either strong or weak, $d \in \{\underline{d}, \overline{d}\}$, where $\overline{d} > \underline{d} > 0$. For example, $\overline{d}$ and $\underline{d}$ may be determined by technological constraints in output protection and expropriation.

Agents engage in a political battle to establish the strength d of property rights. In this political contest strength lies in numbers. Each agent votes for a level of property rights $d \in \{\underline{d}, \overline{d}\}$, and society adopts the one with the most votes. This method of determining property rights is in the overall spirit of the social conflict literature (North [1981], Acemoglu, Johnson and Robinson [2005]), which stresses that institutions are shaped by the prevalent social group. As we will see in section 6.2, our results are similar when the strength of property rights is determined by a violent struggle (or by a lobbying contest), rather than by voting in a democratic election.

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[12] Society's property rights institutions may also entail an operating cost; a proportion of a firm's private safeguarding expenditure may be expended on the maintenance of the institutions that the firm utilizes. Whether such institutional costs are present is not important for our results. Our findings carry through as long as stronger institutions allow firms' private safeguarding expenditures (regardless of how they are allocated between private protection per se and institutional maintenance) to be more efficient, i.e., as long as they lead to a stronger protection of firms for the same level of private safeguarding expenditures m.

Agents are also differentiated on the basis of their ethical type; agents choose to become either moral, or amoral. In the spirit of Kanatas and Stefanadis [forth], a moral agent cultivates a conscience that gives rise to negative feelings of guilt when the agent engages in rent seeking and to positive feelings of pride when the agent abstains. In contrast, amoral agents have no conscience, experiencing no feelings of guilt or pride; their overall payoff is solely pecuniary.[13] When a moral agent chooses a level z of rent seeking, — i.e., when he attempts to obtain a subsidy that is a fraction z/n of the total gross output V of all firms, — he experiences feelings of guilt that reduce his payoff by gzV/n, where $g > 0$. Likewise, for not attempting the fraction $(1-z)$ of his rent seeking opportunities, a moral agent experiences feelings of pride that increase his payoff by $p(1-z)V/n$, where $p > 0$.[14]

Each agent rationally chooses his ethical type, moral or amoral, aiming to maximize his individual payoff. However, as section 6.1 will explain, our results would be similar if the ethical types of agents were determined by genetics, rather than by conscious rational choices. The determination of ethical types occurs at the beginning of the game as, for example, in Frank [1987]. An agent's choice of ethical type is taken to be irreversible and serves to characterize him for the remainder of his life. This is consistent with the well-known observation in psychology, especially in the psychoanalytic school of thought, that a person's character is largely formed in the early years of their life (e.g., Erikson [1985]).[15] The proportions of moral and amoral agents in the population are θ^M and $1 - \theta^M$ respectively, where θ^M will be determined in equilibrium. Because of the very long-term nature of ethical choices, decisions about rent seeking, safeguarding and property rights are made in the game after agents have chosen their ethical types.

We have a three-stage game:

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[13] Our results would be similar if amoral agents also had a conscience as long as their conscience was weaker (i.e., *ceteris paribus*, it gave rise to weaker feelings of guilt and pride) than the one of moral agents.
[14] It is straightforward to see that our conclusions would carry through if the negative sentimental payoff from guilt were a convex function of z and the positive sentimental payoff from pride were a concave function of z. In our model the feelings of guilt and pride are assumed to be linear for simplicity.
[15] In practice, parents may also influence the ethical types of their children. Then, our approach is equivalent to assuming that agents' ethical types, moral or amoral, are chosen by parents who are perfectly altruistic toward their children, i.e., by parents whose objective is to maximize their children's payoff (although, of course, agents have no parents in our model).

Stage 1: Each agent chooses his ethical type, either moral or amoral.

Stage 2: Each agent chooses his level $z \in [0,1]$ of rent seeking and his vote $d \in \{\underline{d}, \overline{d}\}$ for the strength of property rights enforcement. Each firm chooses its level of private safeguarding expenditure, $m \in [0,1]$. Society adopts the strength of property rights enforcement with the most votes.

Stage 3: Manufacturing takes place; agents sell their labor to firms.

An agent chooses his strategy in each stage of the game with rational expectations about the simultaneous decisions of other agents and the future effects of these decisions on his payoff, i.e., we focus on subgame-perfect equilibria. We also adopt the standard refinement of trembling hand perfection in the stage 1 ethical choices of agents (Selten [1975]). In particular, if the stage 1 subgame is perturbed through the introduction of a small positive probability of each agent having "trembling hands," — i.e., of becoming an ethical type different from the one he actually chose, — the perturbed game must converge to the basic pure strategy game when the tremble probability approaches zero. In our model such a refinement has empirical relevance because as psychologists note, character development is an especially complicated and unpredictable mental process (Erikson [1985]) that may entail considerable "trembling hand" departures in practice. For simplicity, we assume that in the case of a tie in stage 2 voting, the weakest property rights are chosen. We also adopt the tie-breaking convention that if an agent is non-pivotal, — i.e., unable to affect the voting outcome, — he votes for strong property rights if he is moral and for weak property rights if he is amoral.[16]

3. EQUILIBRIUM

To solve for the equilibrium, we proceed by backward induction. In stage 3, the wage rate w is equal to the marginal product of labor whose possession a firm is able to retain. If each firm chose a level m of private safeguarding expenditures in stage 2, the wage rate is $1 - [1 - d\pi(m)] \sum_{i=1}^{i=n} (z_i / n) - m$ in stage 3, i.e., equal to the laborer's marginal

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[16] Such a simple tie-breaking convention ensures that the indifference of agents does not lead to "perverse" voting outcomes in which the institutions preferred by the majority of the population fail to be elected because agents in the majority consider their votes to be unimportant. This tie-breaker would be unnecessary if we allowed for some degree of coordination among agents.

product that is not expropriated through taxation nor expended on safeguarding. Since each firm's production function L exhibits constant returns to scale, the size and number of firms is immaterial for the wage rate. Furthermore, given that the profit of a perfectly competitive firm is zero, an agent's payoff is independent of his ownership shares.

An agent j obtains a rent seeking subsidy that is a fraction $[1-d\pi(m)]z_j/n$ of the economy's total output n. It follows that the payoff of an amoral agent j — the output that he obtains through his wage and his rent seeking activities — is

$$1-[1-d\pi(m)]\sum_{i=1}^{i=n}(z_i/n)-m+[1-d\pi(m)]z_j-c(z_j).$$ The payoff of a moral agent j, which for him also includes the non-pecuniary sentiments of guilt and pride, is

$$1-[1-d\pi(m)]\sum_{i=1}^{i=n}(z_i/n)-m+[1-d\pi(m)]z_j-c(z_j)-gz_j+p(1-z_j).$$

Since there are a large number n of agents in society, an individual agent's choice of rent seeking in stage 2 has a negligible effect on the economy's subsequent level of wages in stage 3. Thus in stage 2, the optimal level of rent seeking of an amoral agent, $\tilde{z}_j^A$, and of a moral agent, $\tilde{z}_j^M$, are[17]

$$\tilde{z}_j^A = \arg\max_{z_j\in[0,1]}\{[1-d\pi(m)]z_j-c(z_j)\}, \tag{1a}$$

$$\tilde{z}_j^M = \arg\max_{z_j\in[0,1]}\{[1-d\pi(m)]z_j-c(z_j)-gz_j+p(1-z_j)\}. \tag{1b}$$

The first-order conditions are

$$[1-d\pi(m)]-\frac{\partial c(z_j)}{\partial z_j}=0, \tag{2a}$$

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[17] Since (1a) and (1b) are continuous and strictly concave on the closed interval $z_j\in[0,1]$, they each have a unique argument of the maximum on $z_j\in[0,1]$. To focus on interior solutions, we assume that first-order conditions (2a) and (2b) lead to interior solutions ($z_j\in(0,1)$) for both the upper bound $\overline{d\pi}(1)$ and lower bound $\underline{d\pi}(0)$ of $d\pi(m)$.

$$[1 - d\pi(m)] - \frac{\partial c(z_j)}{\partial z_j} - (g + p) = 0. \tag{2b}$$

Conditions (2a) and (2b) imply that $\tilde{z}_j^A > \tilde{z}_j^M$ since a moral agent also faces sentimental penalties (greater guilt and less pride) for rent seeking behavior.[18]

    In stage 2, suppose that the level of rent seeking by each amoral and moral agent is z_j^A and z_j^M, respectively. Then, a firm has an expected profit per hired laborer that is $1 - [1 - d\pi(m)][\theta^M z_j^M + (1 - \theta^M) z_j^A] - m - w^\varepsilon$, where w^ε is the expected wage. Thus a firm's optimal choice of safeguarding expenditures is[19]

$$\widetilde{m} = \underset{m \in [0,1]}{\arg\max}\{1 - [1 - d\pi(m)][\theta^M z_j^M + (1 - \theta^M) z_j^A] - m\}. \tag{3}$$

The first-order condition is

$$\frac{\partial \pi(m)}{\partial m} d[\theta^M z_j^M + (1 - \theta^M) z_j^A] - 1 = 0. \tag{4}$$

Conditions (2a), (2b) and (4) imply that for given levels of d and θ^M, parameters $\tilde{z}_j^A$ and $\tilde{z}_j^M$ are functions of $\widetilde{m}$, while parameter $\widetilde{m}$ is a function of $\tilde{z}_j^A$ and $\tilde{z}_j^M$. Thus the unique equilibrium choice $\hat{m}(d, \theta^M)$ of safeguarding by a firm is implicitly defined by[20]

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[18] Condition (2b) implies that guilt and foregone pride are perfect substitutes in the stage 2 subgame. This stems from the linearity of the sentiments of pride and guilt. As note 14 points out, the assumption of linearity is made for simplicity; our results would carry through to more general functional forms.

[19] Since (3) is continuous and strictly concave on the closed interval $m \in [0,1]$, it has a unique argument of the maximum on $m \in [0,1]$. To focus on interior solutions, we assume that condition (3) leads to an interior solution ($m \in (0,1)$) for all $z_j^A \in (0,1)$ and $z_j^M \in (0,1)$.

[20] In (3), we have an interior solution $m \in (0,1)$) for all $z_j^A \in (0,1)$ and $z_j^M \in (0,1)$ (note 19); thus condition (4) is strictly positive when m is zero and strictly negative when m is one. It directly follows that condition (5) is also strictly positive when m is zero and strictly negative when m is one. Then, since (5) is a continuous and strictly decreasing function of m, there exists a unique $m \in (0,1)$ for which (5) holds.

$$\frac{\partial \pi(m)}{\partial m} d[\theta^M \tilde{z}_j^M + (1-\theta^M)\tilde{z}_j^A] - 1 = 0. \qquad (5)$$

When moral agents are the majority in the population ($\theta^M > 0.5$), they are the politically prevalent group, and it can be readily seen that the strength d of property rights is then set equal to the high level $\bar{d}$. Given the choices $\tilde{m}$ of a safeguarding expenditure by firms and the choices $\tilde{z}_j^A$ or $\tilde{z}_j^M$ of rent seeking by amoral or moral agents, a moral agent's payoff is strictly increasing in d, i.e., $\pi(m)(\tilde{z}_j^A - \tilde{z}_j^M)(1-\theta^M) > 0$ (since, as conditions (2a) and (2b) imply, $\tilde{z}_j^A > \tilde{z}_j^M$). As a result, voting always leads to $d = \bar{d}$.[21] Similarly, the payoff of an amoral agent is strictly decreasing in d, i.e., $\pi(m)(\tilde{z}_j^M - \tilde{z}_j^A)\theta^M < 0$, and thus when $\theta^M \le 0.5$, voting always leads to $d = \underline{d}$.[22] Intuitively, stronger property rights enforcement has two opposing effects on agents. First, firms' gains from the resulting reduction in extractive taxation are passed on to agents in the form of a higher wage. Second, stronger property rights decrease the extractive subsidies of agents. Moral agents engage in less rent seeking than amoral agents; thus the first effect outweighs the second for moral agents, while the second effect outweighs the first for amoral agents.

In stage 1, if the strength of property rights is expected to be d ($d \in \{\underline{d}, \bar{d}\}$), the expected payoff u^A of an amoral agent is the sum of his wage payoff $1 - [1 - d\pi(\hat{m}(d, \theta^M))][\theta^M \tilde{z}_j^M + (1-\theta^M)\tilde{z}_j^A] - \hat{m}(d, \theta^M)$ and his non-wage payoff u_N^A that consists of his rent seeking proceeds $[1 - d\pi(\hat{m}(d, \theta^M))]\tilde{z}_j^A - c(\tilde{z}_j^A)$. The expected payoff of a moral agent is the sum of his wage and his non-wage payoff u_N^M; the latter consists of his rent seeking proceeds $[1 - d\pi(\hat{m}(d, \theta^M))]\tilde{z}_j^M - c(\tilde{z}_j^M)$ and his non-pecuniary

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[21] Furthermore, in the corner solution where all agents in the population are moral ($\theta^M = 1$), a moral agent is indifferent between different levels of property rights, i.e., $\pi(m)(\tilde{z}_j^A - \tilde{z}_j^M)(1-\theta^M) = 0$. Then, according to the tie-breaking convention, he chooses to supports the strongest property rights enforcement $\bar{d}$.

[22] Similarly to note 21, in the corner solution where all agents in the population are amoral ($\theta^M = 0$), each amoral agent chooses to support the weakest property rights $\underline{d}$.

proceeds (feelings of guilt and pride) $-g\tilde{z}_j^M + p(1-\tilde{z}_j^M)$. Since $d \in \{\underline{d},\overline{d}\}$, we can have two possible subgame-perfect equilibria, with the strength d of property rights enforcement being $\overline{d}$ in a moral and $\underline{d}$ in an amoral equilibrium. Then, the proportion of moral agents in the population is $\theta^M *$ in a moral and $\theta^M **$ in an amoral equilibrium.[23]

All agents obtain the same wage regardless of their ethical type. Then, in any interior equilibrium, moral or amoral, in which there is a strictly positive proportion of both ethical types in the population, the expected non-wage payoffs are equal across ethical types ($u_N^A = u_N^M$), so that no agent has an incentive to deviate. In particular, condition (3) implies that in a given institutional regime $d \in \{\underline{d},\overline{d}\}$, the safeguarding expenditure m by firms is decreasing in the proportion θ^M of moral agents in the population since moral agents engage in less rent seeking. In addition, by applying the envelope theorem to conditions (1a) and (1b) we can see that u_N^A is more sensitive than u_N^M to the level of firm safeguarding $d\pi(\hat{m}(d,\theta^M))$; since a moral agent's non-wage payoff entails insensitive non-pecuniary elements (sentiments of pride and guilt), it is less decreasing in firm safeguarding than an amoral agent's non-wage payoff. Thus, as figure 1 shows, within a given institutional regime $d = \overline{d}$, the non-wage payoff u_N^A of an amoral agent is more increasing in θ^M than the non-wage payoff u_N^M of a moral agent. It follows that when $u_N^A = u_N^M$, no agent has an incentive to deviate from his ethical type.[24] The same reasoning applies within a given institutional regime $d = \underline{d}$.

<< INSERT FIGURE 1 HERE >>

A moral equilibrium exists when we have $\theta^M * > 0.5$ so that moral agents are indeed a numerical majority which is politically capable of setting $d = \overline{d}$ in stage 2 (fulfilling stage 1 agents' expectations). Similarly, an amoral equilibrium exists when

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[23] Conditions (2a), (2b), (4) and (5) imply that $\theta^M * > \theta^M **$.

[24] If an amoral agent deviated and became moral (leading to a larger θ^M), amoral agents would earn a strictly larger payoff than moral agents (see figure 2). Thus the deviating amoral agent would have an incentive to return to being moral. Similarly, a moral agent has no incentive to deviate and become amoral.

$\theta^M ** \leq 0.5$ so that amoral agents indeed set $d = \underline{d}$ in stage 2.[25]   At least one of those

two equilibria (and possibly both) exists (and possibly both exist). Furthermore, a moral

or an amoral equilibrium may sometimes take the form of a corner solution. Specifically,

if $u_N^A \leq u_N^M$ when $\theta^M * = 1$, we have a corner moral equilibrium where all agents in the

population are moral. Similarly, if $u_N^A \geq u_N^M$ when $\theta^M ** = 0$, we have a corner amoral

equilibrium where all agents in the population are amoral. We can also see that a moral

and an amoral equilibrium (when they exist) entail trembling hand perfection in the stage

1 ethical choices of agents. This means that if there is a sufficiently small probability

$\varepsilon > 0$ of each agent making a mistake, i.e., of becoming moral (amoral) when he chooses

to be amoral (moral), then an agent's stage 1 decision to become moral or amoral

converges to the decision he would make in the absence of a tremble.[26]   Lemma 1

follows.

Lemma 1: There exists at least one subgame-perfect equilibrium that entails trembling

hand perfection in the ethical choices of agents:

(a) If $u_N^A \geq u_N^M$ when $d = \underline{d}$ and $\theta^M = 0.5$, there exists an amoral equilibrium. Such an

equilibrium is interior ($\theta^M ** \in (0, 0.5]$) if $u_N^A < u_N^M$ when $d = \underline{d}$ and $\theta^M = 0$ while it is

corner ($\theta^M ** = 0$) otherwise.

(b) If $u_N^A < u_N^M$ when $d = \overline{d}$ and $\theta^M = 0.5$, there exists a moral equilibrium. Such an

equilibrium is interior ($\theta^M * \in (0.5, 1)$) if $u_N^A > u_N^M$ when $d = \overline{d}$ and $\theta^M = 1$ while it is

corner ($\theta^M * = 1$) otherwise.

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[25] In the extreme case where $\theta^M ** = 0.5$, each amoral agent is pivotal; if he switches to being moral, political power switches from amoral to moral agents and property rights switch from $\underline{d}$ to $\overline{d}$. In this case, an additional condition for $\theta^M ** = 0.5$ to be a subgame-perfect equilibrium is that the payoff $u^M(0.5, \overline{d})$ of a moral agent when $\theta^M = 0.5$ and $d = \overline{d}$ is smaller than the payoff $u^A(0.5, \underline{d})$ of an amoral agent. Furthermore, it is possible that an amoral (moral) subgame-perfect equilibrium may sometimes exist even if the conditions of lemma 1a (lemma 1b) are not met. However, then such equilibria would not entail trembling hand perfection.

[26] Suppose that a proportion $\theta^M {}'$ of agents choose to be moral. The binomial distribution implies that the probability of $\theta^M {}'$ being θ^M tends to one as ε approaches zero. Thus an agent's stage 1 decision to become moral or amoral converges to the decision he would make in the absence of a tremble.

Proof: The proof is in the appendix.

The payoff of a moral agent is u^M* in a moral equilibrium and u^M** in an amoral equilibrium. The payoff of an amoral agent is u^A* in a moral equilibrium and u^A** in an amoral equilibrium. As we have showed, in an interior equilibrium, in which there is a strictly positive proportion of both ethical types in the population, the payoffs of moral and amoral agents are equal. Thus in an interior moral equilibrium we have $u^M*=u^A*=u*$ while in an interior amoral equilibrium $u^M**=u^A**=u**$. We can see that an interior moral equilibrium strictly Pareto dominates an interior amoral equilibrium (when both interior equilibria exist). Proposition 1 follows.

Proposition 1: An interior moral equilibrium strictly Pareto dominates an interior amoral equilibrium, i.e., $u*-u**>0$.

Proof: The proof is in the appendix.

In particular, compared with an interior amoral equilibrium, an interior moral equilibrium entails a smaller aggregate safeguarding cost for firms, as well as a smaller aggregate lobbying cost for agents, which translates into pecuniary gains for society. Furthermore, aggregate non-pecuniary or sentimental payoffs are greater in an interior moral equilibrium because the proportion of moral agents (who actually earn non-pecuniary payoffs) in the population is larger.

4. CULTURE AND RENT SEEKING

Society's cultural emphasis g and p on the moral sentiments of guilt and pride, respectively, affects the rational decisions of agents to become moral or amoral, as well as subsequent rent seeking and property rights choices. In our model, the cultural moral code $\{g, p\}$ is an exogenous and persistent element of society, which is in harmony with the notion that culture may be the outcome of a historical accident and may evolve only very slowly over the generations (Weber [1930], Putnam [1993], Guiso, Sapienza and

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Zingales [2006, 2013], Tabellini [2008a]).[27] In this section, we will first examine how society's cultural emphasis on guilt impacts rent seeking and social welfare within a given institutional framework. We will then explore how the emphasis on guilt may shape the strength of property rights institutions. An analysis for pride also follows.

In most of the section we will focus mostly on interior equilibria in which there is a strictly positive proportion of both ethical types, moral and amoral, in the population. The empirical relevance of such interior equilibria is confirmed by surveys that point to the diverse moral disposition of agents within any given country (World Values Survey [2005]).   The presence of ethical heterogeneity within societies is well-known in psychology (Erikson [1985]) and social economics (Benabou and Tirole [2006]).[28] We will also discuss briefly corner equilibria in which a society is completely homogeneous ethically, with all agents being moral or amoral.

Within a given institutional framework, $\underline{d}$ or $\overline{d}$, — i.e., in a given equilibrium, amoral or moral, — a stronger cultural emphasis g of guilt has two opposing effects on the extent of rent seeking in the economy. *Ceteris paribus*, a greater g encourages agents to become amoral (to avoid experiencing guilt), which increases aggregate rent seeking since an amoral agent engages in more lobbying than a moral agent. However, by increasing the sentimental penalty for unethical lobbying, a larger g also reduces the level of rent seeking by each individual moral agent *ceteris paribus*, which reduces aggregate rent seeking. We can see that the first effect always outweighs the second; in a given equilibrium the extent of aggregate rent seeking against firms, as well as the level of safeguarding expenditures by firms, is increasing in g. A larger g also causes a strong Pareto deterioration in the economy. Proposition 2 follows.

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[27] In addition, in practice, an agent may encounter substantial costs if he switches to a different culture since various cultures are often separated by substantial "ethnic distances" (Caselli and Coleman [2013]). As a result, agents are largely locked into the culture in which they are born.

[28] For example, in Benabou and Tirole [2006], disposition to altruistic behavior (which is determined by nature) may vary across individuals.

Proposition 2: In an interior equilibrium, moral or amoral, a greater emphasis g on guilt in society's cultural moral code leads to:

(i) Increased aggregate rent seeking against firms, i.e., $\partial[\theta^M * \tilde{z}_j^M + (1 - \theta^M *)\tilde{z}_j^A] / \partial g > 0$ and $\partial[\theta^M * * \tilde{z}_j^M + (1 - \theta^M * *)\tilde{z}_j^A] / \partial g > 0$.

(ii) A strong Pareto deterioration, i.e., $\partial u * / \partial g < 0$ and $\partial u * * / \partial g < 0$.

Proof: The proof is in the appendix.

Intuitively, a stronger emphasis g on the negative sentiment of guilt reduces the non-wage payoff of a moral agent *ceteris paribus*, i.e., for a given level $d\pi(m)$ of firm safeguarding (condition (1b)). Furthermore, in an interior equilibrium, the non-wage payoffs of moral and amoral agents need to be equal for agents not to have an incentive to deviate from their ethical type (given that wages are always equal across ethical types). Then, as figure 2 shows, an increase in g leads to greater equilibrium aggregate rent seeking in the economy and thus greater equilibrium safeguarding expenditures by firms. Greater safeguarding by firms equalizes the non-wage payoffs of the two ethical types by reducing the non-wage payoff of moral agents (which also entails insensitive non-pecuniary elements) by less than the non-wage payoff of amoral agents. In addition, the greater aggregate rent seeking against firms, as well as the resulting larger safeguarding cost, is passed on to agents in the form of a lower equilibrium wage. More firm safeguarding (as well as the emphasized negative sentiment of guilt for moral agents) also implies that the equilibrium non-wage payoff of agents is lower (conditions (1a), (1b)). As a result, a stronger sentiment g of guilt leads to a strong Pareto deterioration.

<< INSERT FIGURE 2 HERE >>

Proposition 2 focuses on interior equilibria, in which there is a strictly positive proportion of both ethical types, moral and amoral, in the population. On the other hand, in a corner equilibrium where all agents are amoral, any changes in the cultural emphasis g on guilt are immaterial for rent seeking or for social welfare since no agents actually experience guilt. In a corner equilibrium where all agents are moral, an increase in g reduces aggregate rent seeking in the economy; a larger g discourages moral agents from

engaging in lobbying (to avoid experiencing the stronger sentiment of guilt) while it does not impact the proportion of moral agents (since all agents are moral). The effects of social welfare are ambiguous since a larger g implies a more pronounced negative sentiment of guilt, but also reduces lobbying and safeguarding costs.

4.1. Property Rights

In addition to impacting the level of rent seeking and social welfare within a given institutional framework, society's cultural emphasis g on guilt may shape property rights institutions. We can see that a greater emphasis g on guilt leads to a smaller proportion of moral agents in the population in a given interior equilibrium, moral or amoral. In particular, a more pronounced sentiment g of guilt leads to an increase in the equilibrium level of aggregate rent seeking (proposition 2(i)). Such an increase can only occur when the equilibrium proportion of amoral agents in the population rises sufficiently to outweigh the decreased equilibrium rent seeking $\tilde{z}_j^A$ and $\tilde{z}_j^M$ by each individual amoral and moral agent (because of the greater equilibrium safeguarding by firms and the stricter guilt penalty for rent seeking).[29] Lemma 2 follows.

Lemma 2: In a given interior equilibrium, moral or amoral, a greater emphasis g on guilt in society's cultural moral code leads to a smaller proportion of moral agents in the population, i.e., $\partial \theta^M * / \partial g < 0$ and $\partial \theta^M ** / \partial g < 0$.

Proof: The proof is in the appendix.

Since society's cultural emphasis g on guilt affects the proportion of moral and amoral agents in the population, it may also impact the voting outcome on the strength

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[29] Furthermore, in a corner equilibrium in which all agents are moral, a further decrease in the cultural emphasis g on guilt reinforces the incentive of agents to be moral. In such a corner moral equilibrium, a decrease in g increases the level of safeguarding by firms (since agents are more eager to lobby *ceteris paribus*), reinforcing the (positive) difference between the payoffs of moral and amoral agents. As we explained in section 3, the non-wage payoff of moral agents is less sensitive to increased firm safeguarding than the non-wage payoff of amoral agents. Similarly, in a corner equilibrium in which all agents are amoral, a further increase in g reinforces the incentive of agents to be amoral.

d of property rights enforcement in stage 2. Thus in addition to shaping appropriation and social welfare in a given equilibrium, the emphasis g on guilt may also determine the type of the equilibrium — moral or amoral — and thus the strength of property rights enforcement — strong $\bar{d}$ or weak $\underline{d}$ — at which society arrives. For simplicity, to bring out the effects of guilt in a straightforward manner, we assume that the cultural emphasis p on pride is not excessively strong, i.e., p is not sufficiently large to make total refraining from lobbying (and thus total refraining from guilt) an optimal strategy in an interior equilibrium. Specifically, even if firms apply the maximum level $\bar{d}\pi(1)$ of safeguarding, we assume that $\sup\limits_{z_j \in [0,1]} \{[1 - \bar{d}\pi(1)]z_j - c(z_j)\} > p$.[30]

<< INSERT FIGURE 3 HERE >>

Keeping the strength p of pride constant, there exist two unique thresholds $\underline{g}$ and $\bar{g}$ of guilt, where $\underline{g} < \bar{g}$ (since $\theta^M * > \theta^M **$ as footnote 23 points out). A moral equibrium exists when $g < \bar{g}$ while an amoral equilibrium exists when $g \geq \underline{g}$. Thus, as figure 3 shows, only a moral equilibrium (interior or corner) exists when the cultural moral code deemphasizes guilt ($g < \underline{g}$), while only an amoral equilibrium (interior or corner) exists when the emphasis is on guilt ($g \geq \bar{g}$). Both equilibria exist for intermediate levels ($\underline{g} \leq g < \bar{g}$). Overall, society's cultural emphasis g on guilt completely determines the quality d of property rights institutions when $g \geq \bar{g}$ or $g < \underline{g}$. Proposition 3 follows.

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[30] Proposition 3 would hold even without the assumption that $\sup\limits_{z_j \in [0,1]} \{[1 - \bar{d}\pi(1)]z_j - c(z_j)\} > p$. However, it would then be possible (although not necessary) to have $\underline{g} \to \infty$ or $\bar{g} \to \infty$.

Proposition 3: There exist two unique thresholds $\underline{g}$ and $\overline{g}$ of guilt ($\underline{g} < \overline{g}$), so that

(i) Only a moral equilibrium (with strong property rights $\overline{d}$) exists when $g < \underline{g}$.

(ii) Only an amoral equilibrium (with weak property rights $\underline{d}$) exists when $g \geq \overline{g}$.

(iii) Both equilibria exist when $\underline{g} \leq g < \overline{g}$.

Proof: The proof is in the appendix.

Intuitively, the proportion $\theta^M *$ or $\theta^M **$ of moral agents in any interior equilibrium is decreasing in the cultural emphasis g on guilt (lemma 2). Thus when g is sufficiently high ($g \geq \overline{g}$), we have $\theta^M * \leq 0.5$, and a moral equilibrium does not exist. Even if strong property rights enforcement $\overline{d}$ is expected, moral agents are unable to attain the numerical size that will allow them to prevail politically. Similarly, when g is sufficiently low ($g < \underline{g}$), we have $\theta^M ** > 0.5$, and an amoral equilibrium does not exist; amoral agents are never able to prevail politically and impose weak property rights $\underline{d}$. Finally, when $\underline{g} \leq g < \overline{g}$, both equilibria exist.

4.2. The Sentiment of Pride

By following the same procedure, we can examine how changes in the cultural emphasis p on pride may affect economic outcomes. It is straightforward to see that in a given interior equilibrium, amoral or moral, — i.e., within a given institutional framework, $\underline{d}$ or $\overline{d}$, — the impact of a stronger emphasis p on pride on aggregate rent seeking and social welfare is in the same direction as the impact of a weaker emphasis on guilt, i.e., $\partial[\theta^M ** \tilde{z}_j^M + (1 - \theta^M **)\tilde{z}_j^A]/\partial p < 0$, $\partial[\theta^M * \tilde{z}_j^M + (1 - \theta^M *)\tilde{z}_j^A]/\partial p < 0$, $\partial u **/\partial p > 0$ and $\partial u */\partial p > 0$; a stronger sentiment of pride strictly reduces aggregate rent seeking and leads to a strong Pareto improvement.

Unlike changes in the cultural emphasis g on guilt (lemma 2), changes in the emphasis p on pride have no clear implications for the proportion of moral agents in an

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interior equilibrium. Although a more pronounced sentiment p of pride leads to a decrease in the equilibrium level of aggregate rent seeking, such a decrease can occur either through a possible decrease in rent seeking by each individual moral agent (because of the greater pride reward for refraining from lobbying), or from a possible change in the proportion of moral agents in the population. However, we can still see that there exist two thresholds $\underline{p}$ and $\overline{p}$ of pride ($\underline{p} < \overline{p}$), so that only a moral equilibrium exists when the emphasis on pride is strong ($p > \overline{p}$) and only an amoral equilibrium exists when the emphasis on pride is weak ($p \leq \underline{p}$). Since pride has no clear implications for the proportion of moral agents, there are no general implications for the proportion of moral agents at intermediate levels of pride $\underline{p} < p \leq \overline{p}$; either one or both equilibria may exist in this range. We summarize in proposition 4.

Proposition 4: (i) In an interior equilibrium, moral or amoral, the effects of a greater cultural emphasis p on pride on aggregate rent seeking and social welfare are in the opposite direction to those of a greater emphasis g on guilt in proposition 2.

(ii) There exist two thresholds $\underline{p}$ and $\overline{p}$ of pride ($\underline{p} < \overline{p}$), so that only a only a moral equilibrium exists when $p > \overline{p}$ and only an amoral equilibrium exists when $p \leq \underline{p}$.

Proof: The proof is in the appendix.

5. HUMAN CAPITAL

So far we have showed that the cultural emphasis on moral sentiments — on guilt or on pride — may affect the amount of rent seeking and the strength of property rights institutions in society. We will now extend the model to examine how such moral sentiments may impact the economy's level of human capital, namely the adoption of human capital from either domestic or international sources. The exploration of possible links between culture and human capital constitutes an important question in the literature (e.g., Akerlof and Kranton [2002], Becker and Woessmann [2009]).

Similarly to Lucas [1988], we assume that an agent's effective labor — i.e., his skill-weighted labor — is equal to the product of his raw labor times a function of his human capital. We first focus on human capital that is generated domestically within an economy. A simple way to model the generation of domestic human capital is to follow the approach of Lucas [1988]; an agent may allocate his one unit of raw labor (with which he is endowed by nature as in our base model) between being a self-educator and being a laborer. As a self-educator, an agent generates human capital — i.e., skills or know-how — for himself, improving his own skills.[31] As a laborer, he engages in manufacturing and rent seeking activities.[32] For simplicity, we assume that an amount e ($e \in [0,1]$) of raw labor that is spent on education generates linearly an amount e human capital. Such an agent has an amount of effective labor that is equal to $(1-e)f(e)$ (i.e., equal to the product of his raw labor $1-e$ that is not spent on education times a function $f(e)$ of his human capital). We make the standard assumption that $\partial f(e)/\partial e > 0$ and $\partial^2 f(e)/\partial e^2 < 0$. For simplicity, we also assume that the Inada conditions hold, i.e., $\lim_{e \to 0} \partial f(e)/\partial e = \infty$ and $\lim_{e \to \infty} \partial f(e)/\partial e = 0$; this ensures the existence of interior solutions in which agents spend a strictly positive amount of raw labor on education.

In stage 3 an agent sells his effective labor $(1-e)f(e)$ to a firm in exchange for a wage. Furthermore, in the spirit of Tullock [1980], in stage 2 an agent's opportunity to engage in rent seeking is equal to the ratio of his effective labor to the overall amount of effective labor in the economy.[33] Thus an agent who has spent an amount e of raw labor on education may lobby for a subsidy that entails a fraction $[(1-e)f(e)/\sum_{j=1}^{n}(1-e_j)f(e_j)]z$ ($z \in [0,1]$) of society's total output, where z is a choice parameter as in the base model. Agents generate human capital before rent seeking and manufacturing activities, which utilize human capital, take place. We thus assume that

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[31] Our results carry through to other forms of domestic human capital generation. For example, our results would be similar if a welfare-maximizing central planner allocated the population between two professions, educators and laborers, with educators providing laborers with human capital (instead of having self-educators providing themselves with human capital).

[32] As, for example, Dal Bo and Dal Bo [2011] point out, rent seeking is a labor-intensive activity.

[33] As is standard in the theory of conflict, in Tullock contest success functions each agent's success is a function of the ratios of the respective inputs (Tullock [1980]). In our base model all agents had the same amount of human capital and thus such a ratio was equal to $1/n$.

human capital is generated in stage 1. Furthermore, although in this section we focus on human capital, our conclusions would carry through to other forms of infrastructure that enhanced both the manufacturing and rent seeking capabilities of agents.

By solving the model, we can easily see that each agent maximizes his effective labor in stage 1. The optimal level of raw labor that each agent spends on human capital generation is[34]

$$\hat{e} = \arg\max_{e \in [0,1]} \{(1-e)f(e)\}. \tag{6}$$

The equilibrium of the remaining game — i.e., equilibrium rent seeking, safeguarding and ethical type decisions — is identical to the base model. An agent, moral or amoral, earns a payoff $(1-\hat{e})f(\hat{e})u*$ in a moral and a payoff $(1-\hat{e})f(\hat{e})u**$ in an amoral equilibrium. Propositions 1 through 4 carry through. Thus since an agent always aims to maximize his effective labor so as to maximize his subsequent payoff (regardless of the specific level of such payoff), he makes human capital decisions that are independent of the equilibrium of the remaining game. Society's cultural emphasis g on guilt does not affect an agent's equilibrium amount $\hat{e}$ of human capital.

However, as is well-known, human capital is often generated internationally, rather than domestically; there is a worldwide stock of intellectual know-how that can flow across countries (e.g., Rivera-Batiz and Romer [1991]). Thus to examine the adoption of human capital from international sources, we now assume that global know-how or human capital is available for sale in an integrated world market at a price of $s > 0$ per unit.[35] For simplicity, to focus on the international dimension of human capital, we assume that there is no domestic human capital generation in this version of the model. Furthermore, we abstract from the creation of global know-how by considering the price of international human capital to be an exogenous parameter; the

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[34] Since (6) is continuous and strictly concave on the closed interval $e \in [0,1]$, it has a unique argument of the maximum on $e \in [0,1]$. Given that the first-order condition $(1-e)\partial f(e)/\partial e - f(e)$ is strictly positive when e is zero and strictly negative when e is one, we always have $\hat{e} \in (0,1)$.

[35] For example, an agent may obtain know-how from the worldwide stock by establishing international communication links or by interacting with international experts (Rivera-Batiz and Romer [1991]).

domestic economy is small and has no impact on world prices. Each agent has the opportunity to purchase international human capital in stage 1 by entering into a contract that requires him to pay the human capital provider a specified amount of output in stage 3 (when the manufacturing of output occurs). An agent that buys an amount e^I of international human capital has an amount of effective labor that is equal to $f(e^I)$.

We can see that the equilibrium rent seeking, safeguarding and ethical type decisions are identical to the base model; propositions 1 to 4 hold. Furthermore, each agent obtains a unique amount e^I* and e^I** of international human capital in the moral and in the amoral equilibrium, respectively, where e^I* and e^I** are implicitly defined by conditions (7a) and (7b), respectively.[36]

$$\frac{\partial f(e^I)}{\partial e^I}u*-s=0, \tag{7a}$$

$$\frac{\partial f(e^I)}{\partial e^I}u**-s=0. \tag{7b}$$

Then, in an interior equilibrium, moral or amoral, a greater emphasis g on guilt in society's culture reduces the adoption of human capital from international sources (since $\partial u*/\partial g<0$ and $\partial u**/\partial g<0$ according to proposition 2(ii)). There is also smaller adoption of international human capital in an interior amoral, rather than in an interior moral, equilibrium (since $u**<u*$ according to proposition 1). Overall, society's culture impacts the equilibrium amount of human capital that stems only from international, rather than from domestic sources. We summarize in proposition 5.

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[36] Conditions (7a) and (7b) are strictly decreasing in e^I. Conditions (7a) and (7b) are also strictly positive when e^I is zero and strictly negative when $e^I \rightarrow \infty$ (Inada conditions). It follows that the amounts of human capital e^I* or e^I** for which (7a) and (7b) are equal to zero are unique and strictly positive.

Proposition 5: (i) Domestic human capital generation is unaffected by the cultural emphasis g on guilt, i.e., $\partial \hat{e} / \partial g = 0$, or by the type of equilibrium, moral or amoral.

(ii) In an interior equilibrium, moral or amoral, a greater cultural emphasis g on guilt reduces the adoption of international human capital, i.e., $\partial e^I * / \partial g < 0$, $\partial e^I ** / \partial g < 0$.

(iii) There is greater adoption of international human capital in an interior moral, rather than in an interior amoral, equilibrium, i.e., $e^I * > e^I **$.

Proof: The proof is in the appendix.

Intuitively, international human capital can be purchased at a constant exogenous world price that is unaffected by domestic parameters (since the domestic economy is small). The adoption of international human capital enhances an agent's manufacturing and lobbying capabilities. A greater cultural emphasis on guilt in society's ethical system, as well as the prevalence of an amoral equilibrium, reduces the wage rate per unit of effective labor and the non-wage (pecuniary plus non-pecuniary) payoff per unit of effective labor (propositions 1 and 2). Agents are thus discouraged from purchasing international human capital (at a constant world price) to enhance their effective labor. Domestic human capital, on the other hand, is not purchased at a constant world price. Instead, its implicit price entails the opportunity cost of spending domestic labor on human capital generation, rather than on manufacturing and lobbying. Then, a greater cultural emphasis on guilt — or the resulting decreased payoff per unit of effective labor — impacts symmetrically both the benefits and the costs of domestic human capital generation, leaving the equilibrium amount of domestic human capital unchanged.

By following the same procedure, we can see that the impact of a stronger cultural emphasis p on pride on the equilibrium amount of acquired international human capital is in the same direction as the impact of a weaker emphasis on guilt, i.e., $\partial e^I * / \partial p > 0$ and $\partial e^I ** / \partial p > 0$. Furthermore, society's stronger cultural emphasis p on pride does not affect the equilibrium amount of domestic human capital, i.e., $\partial \hat{e} / \partial p = 0$.

6. ROBUSTNESS

In this section we will see that our results carry through when biology, rather than conscious choice, drives the ethical types of agents. Furthermore, our conclusions may carry through to various games in which property rights institutions are shaped by violent struggles, rather than by democratic elections.

6.1. Genetics

In the base game, agents consciously choose their ethical type, moral or amoral, in a rational manner. An alternative view, however, emphasizing biology, is that an agent's ethical type may be determined by his genes (Frank [1987]). While this is a very different perspective from optimizing behavior, it is straightforward to see that our results carry through if morality is shaped by genetics, rather than by conscious choices. As is well-known, a standard method of modeling biological evolution is the replicator equation; a biological type that earns a greater payoff also has the opportunity to engage in greater reproduction, transmitting his genes and increasing his proportion in the population (Fudenberg and Levine [1998]). Then, the moral and the amoral equilibrium in our analysis constitute the only possible evolutionary stable states to which society may converge. Since moral and amoral agents earn equal equilibrium payoffs in interior equilibria, they maintain stable proportions in the population. Furthermore, since a dominant ethical type earns a greater payoff than the other type in corner equilibria, it maintains a stable proportion that is equal to one. Thus lemmas 1 and 2 and propositions 1 through 5 in our analysis hold even if biology is the driving force of ethics.

6.2. Property Rights and Violent Struggles

In the base game, the strength of property rights $d \in \{\underline{d}, \overline{d}\}$ is determined in a democratic election where each agent has one vote. However, our results may also carry through when property rights institutions are shaped by a violent struggle (or by a lobbying struggle), rather than by voting. For example, an agent's choice z of rent seeking in stage 2 may correspond to the acquisition of "arms" — i.e., of military (or lobbying) capabilities — through which he may attempt to prey on firms. Then, in addition to using such arms in his individual rent seeking activities, an agent may also

utilize them in the general battle for the determination of society's property rights. In such an extension of the model, society adopts the level of property rights — $\underline{d}$ or $\overline{d}$ — that is supported by the larger amount of arms or by the larger firepower.

Since the number n of agents in society is large, an individual agent's firepower is a negligible proportion of society's total firepower. Thus in stage 2 an agent chooses his optimal amount z of rent seeking on the basis of his individual expropriation activities as in the base model (rather than on the basis of the general property rights battle on which he can have only a negligible effect).   The rent seeking choices of agents, the safeguarding decisions of firms and the proportion θ^M* or θ^M** of moral agents in a given (moral or amoral) equilibrium are identical to the base model. Propositions 1, 2 and 5 and lemma 2 still hold.

Furthermore, the impact of g on the establishment of property rights, or on the determination of the type of equilibrium, is qualitatively similar to the base model. Notice that according to proposition 2(i), a larger g leads to increased aggregate rent seeking in a given equilibrium $(\partial[\theta^M*\tilde{z}_j^M+(1-\theta^M*)\tilde{z}_j^A]/\partial g>0$, $\partial[\theta^M**\tilde{z}_j^M+(1-\theta^M**)\tilde{z}_j^A]/\partial g>0)$; it also leads to increased safeguarding by firms and reduced rent seeking by individual agents ($\partial\tilde{z}_j^M/\partial g<0$ and $\partial\tilde{z}_j^A/\partial g<0$ in both a moral and an amoral equilibrium). It directly follows that in a given equilibrium (moral or amoral), a larger cultural emphasis g on guilt enhances the aggregate firepower of amoral agents relative to the aggregate firepower of moral agents, i.e., $\partial[\theta^M*\tilde{z}_j^M-(1-\theta^M*)\tilde{z}_j^A]/\partial g<0$, $\partial[\theta^M**\tilde{z}_j^M-(1-\theta^M**)\tilde{z}_j^A]/\partial g<0$.[37]

As a result, there exists a unique $\underline{\underline{g}}$ (a unique $\overline{\overline{g}}$) so that a moral (amoral) equilibrium exists if and only if $g<\underline{\underline{g}}$ ($g\geq\overline{\overline{g}}$), in that moral (amoral) agents indeed possess greater total firepower than amoral (moral) agents when the strength of property rights is $\overline{d}$ ($\underline{d}$). Thus in the spirit of the base model, only a moral equilibrium (with

strong property rights $\overline{d}$) exists when the cultural emphasis on guilt is small ($g < \underline{\underline{g}}$), only an amoral equilibrium (with weak property rights $\underline{d}$) exists when the emphasis on guilt is large ($g \geq \overline{\overline{g}}$), and both equilibria exist for intermediate levels of guilt ($\underline{\underline{g}} \leq g < \overline{g}$).[38]

In the above game only individual agents, rather than firms, participated in the battle for property rights. For example, firms may choose to abstain from this battle because they are indifferent to the outcome; since markets are perfectly competitive, all the effects of property rights are fully passed on to the wages of agents in stage 3. Or, alternatively, the safeguarding expenditures of firms may be channeled to the hiding of their output, rather than to the acquisition of arms. However, our results may carry through when the safeguarding infrastructure of firms can also be utilized in the general battle for property rights. For example, suppose that agents possess a fraction α of society's decision-making authority over the establishment of property rights while firms possess the remaining fraction $1-\alpha$ of such authority.[39]

Then, if a fraction β_1 (or $1-\beta_1$) of the total firepower of individual agents and a fraction β_2 (or $1-\beta_2$) of the total firepower of firms supports the establishment of strong (or weak) property rights, the total firepower supporting the adoption of strong (or weak) property rights is $\alpha\beta_1 + (1-\alpha)\beta_2$ (or $\alpha(1-\beta_1) + (1-\alpha)(1-\beta_2)$). Society establishes strong (weak) property rights institutions when $\alpha\beta_1 + (1-\alpha)\beta_2 > \alpha(1-\beta_1) + (1-\alpha)(1-\beta_2)$ ($\alpha\beta_1 + (1-\alpha)\beta_2 \leq \alpha(1-\beta_1) + (1-\alpha)(1-\beta_2)$). Since in perfectly competitive markets agent's ownership shares in firms are historically

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[37] Since $\partial[\theta^M * \tilde{z}_j^M + (1-\theta^M *)\tilde{z}_j^A]/\partial g > 0$, $\partial \tilde{z}_j^M /\partial g < 0$ (proposition 2) and $\partial\theta^M */\partial g < 0$ (lemma 2), we necessarily have $\partial[(1-\theta^M *)\tilde{z}_j^A]/\partial g > 0$, i.e., $\partial[\theta^M * \tilde{z}_j^M - (1-\theta^M *)\tilde{z}_j^A]/\partial g < 0$. The same holds in an amoral equilibrium.

[38] For at least one equilibrium to exist for all levels of g , we must have $\underline{\underline{g}} \leq \overline{\overline{g}}$ (otherwise, no equilibrium would exist for levels of g between $\underline{\underline{g}}$ and $\overline{g}$). We can see that a sufficient (but not necessary) condition ensuring that $\underline{\underline{g}} \leq \overline{\overline{g}}$ is $\partial^3 c(z)/\partial z^3 \leq 0$.

[39] For example, in the spirit of Acemoglu [2008], α could be larger in more democratic and smaller in more oligarchic political regimes.

given, we make the standard assumption that firm ownership is symmetric; the fraction of firms that are owned by moral agents is equal to the fraction of moral agents in the population.

An agent may use his individual arms z, as well as his firm's arms m, in the general battle for the establishment of society's property rights. However, since an agent constitutes a negligible part of society, in stage 2 an agent chooses his optimal amount z of rent seeking, and an agent's firm chooses the optimal level m of safeguarding, merely on the basis of individual expropriation or safeguarding considerations (rather than on the basis of the general property rights battle). The moral or amoral equilibrium is identical to the base model; propositions 1, 2 and 5 and lemma 2 still hold. Furthermore, as we saw in the first violent struggle game, a larger cultural emphasis g on guilt enhances the aggregate firepower of individual amoral agents relative to the aggregate firepower of individual moral agents. In addition, since $\partial \theta^M * / \partial g < 0$ and $\partial \theta^M ** / \partial g < 0$ (lemma 2), a larger g enhances the aggregate firepower of firms that are owned by amoral agents relative to the aggregate firepower of firms that are owned by moral agents (given that more firms are owned by amoral agents). Thus overall, a larger cultural emphasis g on guilt increases the firepower $\alpha(1-\beta_1)+(1-\alpha)(1-\beta_2)$ that supports weak property rights relative to the firepower $\alpha\beta_1 + (1-\alpha)\beta_2$ that supports strong property rights.

It is straightforward to see that as before, there exist two unique levels of guilt, $\underset{=}{g}$ and $\overline{\overline{g}}$, so that only a moral equilibrium (with strong property rights $\overline{d}$) exists when guilt is de-emphasized ($g < \underset{=}{g}$), only an amoral equilibrium (with weak property rights $\underline{d}$) exists when guilt is emphasized ($g \geq \overline{\overline{g}}$), and both equilibria exist for intermediate levels of guilt ($\underset{=}{g} \leq g < \overline{\overline{g}}$). Similarly, the results of the base model on pride carry through to such games of violent struggle.

7. CONCLUSION

Despite being supported by some recent empirical evidence, the view of culture as a vehicle for the rule of law has received relatively little attention in formal economic

theory. We provide a simple general equilibrium model to examine how moral sentiments, guilt and pride, can shape the strength of the rule of law. We show that societies with a greater cultural emphasis on guilt may exhibit more intense rent seeking, weaker property rights institutions, reduced adoption of human capital and less overall social welfare. The impact of a cultural emphasis on pride is in the opposite direction.

Although our paper focuses on a rather narrow dimension of society's cultural moral code, i.e., on moral sentiments, we believe that it demonstrates the potential importance of additional research into the economic outcomes of culture. More formal theoretical research is necessary to explore the specific mechanisms through which culture can affect the political economy of a country and the overall level of social welfare. Such research will hopefully allow for more definitive conclusions about the possible role of culture in economic outcomes.

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APPENDIX

Proof of Lemma 1

We explain in section 3 that for a given $d \in \{\underline{d}, \overline{d}\}$, $u_N^A - u_N^M$ is a continuous and strictly increasing function of θ^M. Then, keeping $d = \underline{d}$ constant, if we have $u_N^A \geq u_N^M$ when $\theta^M = 0.5$ and $u_N^A < u_N^M$ when $\theta^M = 0$, there exists a unique $\theta^M ** \in (0, 0.5]$ for which $u_N^A = u_N^M$. Similarly, keeping $d = \overline{d}$ constant, if we have $u_N^A < u_N^M$ when $\theta^M = 0.5$ and $u_N^A > u_N^M$ when $\theta^M = 1$, there exists a unique $\theta^M * \in (0.5, 1)$ for which $u_N^A = u_N^M$. In addition, if we have $u_N^A \geq u_N^M$ when $d = \underline{d}$ and $\theta^M = 0$, it clearly follows that $\theta^M ** = 0$ (since $u_N^A > u_N^M$, $\forall \theta^M > 0$). If we have $u_N^A \leq u_N^M$ when $d = \overline{d}$ and $\theta^M = 1$, it clearly follows that $\theta^M * = 1$ (since $u_N^A < u_N^M$, $\forall \theta^M < 1$). As a result, lemmas 1a and 1b hold.

Furthermore, at least one equilibrium (moral or amoral) exists. In particular, suppose first that $u_N^A \geq u_N^M$ when $d = \underline{d}$ and $\theta^M = 0.5$. Then, we have showed that at least an amoral equilibrium exists (lemma 1a). Suppose now that $u_N^A < u_N^M$ when $d = \underline{d}$ and $\theta^M = 0.5$, so that an amoral equilibrium does not exist. We can see that a moral equilibrium always exists in this case. In particular, condition (5) implies that the level of safeguarding, $d\pi(\widehat{m}(d, \theta^M))$, is strictly increasing in the strength d of property rights. A larger d leads to a smaller $[\partial\pi(m)/\partial m][\theta^M \tilde{z}_j^M + (1-\theta^M)\tilde{z}_j^A]$, which implies a larger m (and thus a larger $d\pi(\widehat{m}(d, \theta^M))$) and/or a smaller $\theta^M \tilde{z}_j^M + (1-\theta^M)\tilde{z}_j^A$ (and thus a larger $d\pi(\widehat{m}(d, \theta^M))$ according to conditions (2a) and (2b)). In addition, an application of the envelope theorem to conditions (1a) and (1b) shows that $u_N^A - u_N^M$ is decreasing in $d\pi(\widehat{m}(d, \theta^M))$, or in d. It follows that if we have $u_N^A < u_N^M$ when $d = \underline{d}$ and $\theta^M = 0.5$, we also have $u_N^A < u_N^M$ when $d = \overline{d}$ and $\theta^M = 0.5$, which implies that a moral equilibrium exists in this case (lemma 1b). As a result, overall, at least one equilibrium, moral or amoral, exists in the game.

Proof of Proposition 1

An application of the envelope theorem to conditions (1a) and (1b) shows that in stage 2 the difference $u_N^A - u_N^M$ is a continuous and strictly decreasing function of the level $dp(m)$ of safeguarding (since $\tilde{z}_j^M < \tilde{z}_j^A$).[40] There thus exists at most one level of safeguarding $dp(m)$ for which $u_N^A - u_N^M = 0$. Lemma 1 specifies the conditions under which interior (moral or amoral) equilibria exist. In such equilibria we have $u_N^A = u_N^M$; it directly follows that such equilibria entail a level $\overline{\overline{\pi}}$ of safeguarding in stage 2, so that when $dp(m) = \overline{\overline{\pi}}$, we have $u_N^A = u_N^M$. Furthermore, since $u_N^A - u_N^M$ is a continuous and

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[40] As we explain in section 3, since both moral and amoral agents obtain the same wage, the difference $u^A - u^M$ of their payoffs is equal to the difference $u_N^A - u_N^M$ of their non-wage payoffs.

strictly decreasing function of $dp(m)$, the level of $dp(m) = \overline{\overline{\pi}}$ for which $u_N^A = u_N^M$ is unique and equal across all interior (moral or amoral) equilibria. Given that in any interior equilibrium the level $dp(m) = \overline{\overline{\pi}}$ of safeguarding is the same in stage 2 (so that $u_N^A = u_N^M$), an interior moral equilibrium strictly Pareto dominates an interior amoral equilibrium when they both exist. In particular, since $\overline{d} > \underline{d}$ and $\overline{d}p(m^*) = \underline{d}p(m^{**}) = \overline{\overline{\pi}}$, we can see that the safeguarding cost is strictly smaller in an interior moral than in an interior amoral equilibrium, i.e., $m^* < m^{**}$. It follows that the difference between an agent's payoff in a moral ($u^M* = u^A* = u*$) and an amoral ($u^M** = u^A** = u**$) equilibrium is equal to

$$u* - u** = (1 - \overline{\overline{\pi}})(\theta^M* - \theta^M**)(\tilde{z}_j^A - \tilde{z}_j^M) + (m** - m*) > 0.$$

Proof of Proposition 2
(i) We have explained in section 3 that in an interior moral equilibrium the non-wage payoffs of moral entrepreneurs are equal. We thus have

$$[1 - \overline{d}\pi(\hat{m}(\overline{d}, \theta^M*))]\tilde{z}_j^A - c(\tilde{z}_j^A) - \{[1 - \overline{d}\pi(\hat{m}(\overline{d}, \theta^M*))]\tilde{z}_j^M - c(\tilde{z}_j^M) - g\tilde{z}_j^M + p(1 - \tilde{z}_j^M)\} = 0 \tag{A1}$$

Implicitly differentiating condition (A1) and applying the envelope theorem to conditions (1a) and (1b) leads to

$$\frac{\partial[\overline{d}\pi(\hat{m}(\overline{d}, \theta^M*))]}{\partial g} = \frac{\tilde{z}_j^M}{\tilde{z}_j^A - \tilde{z}_j^M} > 0, \tag{A2}$$

given that $\tilde{z}_j^A > \tilde{z}_j^M$ (conditions (2a) and (2b)). Since the equilibrium level $[\overline{d}\pi(\hat{m}(\overline{d}, \theta^M*))]$ of firm safeguarding is strictly increasing in g, it follows directly from condition (5) that aggregate rent seeking is also strictly increasing in g, i.e., $\partial[\theta^M*\tilde{z}_j^M + (1 - \theta^M*)\tilde{z}_j^A]/\partial g > 0$. Furthermore, by following the same procedure, we can see that in an interior amoral equilibrium we have $\partial[\underline{d}\pi(\hat{m}(\underline{d}, \theta^M**))]/\partial g > 0$ and $\partial[\theta^M**\tilde{z}_j^M + (1 - \theta^M**)\tilde{z}_j^A]/\partial g > 0$.
(ii) In an interior moral equilibrium the payoff $u*$ of an agent (moral or amoral) is equal to the sum of his wage $1 - [1 - \overline{d}\pi(\hat{m}(\overline{d}, \theta^M*))][\theta^M*\tilde{z}_j^M + (1 - \theta^M*)\tilde{z}_j^A] - \hat{m}(\overline{d}, \theta^M*)$ and his non-wage payoff $[1 - \overline{d}\pi(\hat{m}(\overline{d}, \theta^M*))]\tilde{z}_j^A - c(\tilde{z}_j^A)$.[41] Since $\partial[\theta^M*\tilde{z}_j^M + (1 - \theta^M*)\tilde{z}_j^A]/\partial g > 0$ (proposition 2(i)), applying the envelope theorem to condition (3) implies that the equilibrium wage is strictly decreasing in g, i.e.,

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[41] Both moral and amoral agents earn equal payoffs in an interior equilibrium.

$\partial\{1-[1-\overline{d}\pi(\widehat{m}(\overline{d},\theta^M*))][\theta^M*\tilde{z}_j^M+(1-\theta^M*)\tilde{z}_j^A]-\widehat{m}(\overline{d},\theta^M*)\}/\partial g<0$.   Furthermore, since $\partial[\overline{d}\pi(\widehat{m}(\overline{d},\theta^M*))]/\partial g>0$ (condition (A2)), applying the envelope theorem to condition (1a) implies that the equilibrium non-wage payoff is strictly decreasing in g, i.e., $\partial\{[1-\overline{d}\pi(\widehat{m}(\overline{d},\theta^M*))]\tilde{z}_j^A-c(\tilde{z}_j^A)\}/\partial g<0$. Thus in an interior moral equilibrium an agent's equilibrium payoff — the sum of his wage and non-wage payoff — is strictly decreasing in g, i.e., $\partial u*/\partial g<0$. In the same way, we can show that in an interior amoral equilibrium an agent's payoff is strictly decreasing in g, i.e., $\partial u**/\partial g<0$.

Proof of Lemma 2

In an interior moral equilibrium, the extent of aggregate rent seeking is strictly increasing in the emphasis g of guilt, i.e., $\partial[\theta^M*\tilde{z}_j^M+(1-\theta^M*)\tilde{z}_j^A]/\partial g>0$ (proposition 2(i)), or $\theta^M*\partial\tilde{z}_j^M/\partial g+(1-\theta^M*)\partial\tilde{z}_j^A/\partial g+(\tilde{z}_j^M-\tilde{z}_j^A)\partial\theta^M*/\partial g>0$.   Furthermore, the equilibrium level of firm safeguarding is also strictly increasing in g, i.e., $\partial[\overline{d}\pi(\widehat{m}(\overline{d},\theta^M*))]/\partial g>0$ (condition (A2)), which implies that equilibrium rent seeking $\tilde{z}_j^M$ by each individual moral agent and equilibrium rent seeking $\tilde{z}_j^A$ by each individual amoral agent are strictly decreasing in g (conditions (2a), (2b)), i.e., $\partial\tilde{z}_j^M/\partial g<0$ and $\partial\tilde{z}_j^A/\partial g<0$. It follows that equilibrium aggregate rent seeking can strictly increase only with the equilibrium proportion θ^M* of moral agents in the population strictly decreasing, i.e., $\partial\theta^M*/\partial g<0$ (since $\tilde{z}_j^M-\tilde{z}_j^A<0$, condition (2a), (2b)). In the same way, we can show that in an interior amoral equilibrium we have $\partial\theta^M**/\partial g<0$.

Proof of Proposition 3

When $g=0$, conditions (1a) and (1b) imply that $\theta^M*=\theta^M**=1$. Specifically, an amoral agent could strictly increase his non-wage payoff if he switched to being moral and applied the same level z_j of rent seeking as before, experiencing positive feelings of pride (since there would be no negative feelings of guilt). He could increase his non-wage payoff even further if chose his level of rent seeking according to condition (1b). Thus all agents in the population choose to become moral. Furthermore, when $g\to\infty$, we have $\theta^M*=\theta^M**=0$. Specifically, a moral agent would choose to refrain totally from rent seeking to avoid experiencing an infinite penalty of guilt and would thus earn a non-wage payoff equal to p. Since $\sup_{z_j\in[0,1]}\{[1-\overline{d}\pi(1)]z_j-c(z_j)\}>p$ (see section 4.1), all agents in the population choose to be amoral.

The equilibrium proportion θ^M* or θ^M** of moral agents in the population is a continuous function of g. Furthermore, in an interior equilibrium we have $\partial\theta^M*/\partial g<0$ and $\partial\theta^M**/\partial g<0$ (lemma 2) while even in a corner moral (amoral) equilibrium a decrease (increase) in g further reinforces the choice of all agents to be moral (amoral) (see footnote 31). Thus since $\theta^M*=1$ when $g=0$ and $\theta^M*=0$ when

$g \rightarrow \infty$, there exists a unique $\bar{g}$ ($\bar{g} > 0$) for which $\theta^M* = 0.5$. Similarly since $\theta^M** = 1$ when $g = 0$ and $\theta^M** = 0$ when $g \rightarrow \infty$, there exists a unique $\underline{g}$ ($0 < \underline{g} < \bar{g}$ since $\theta^M* > \theta^M**$ (see footnote 23)) for which $\theta^M** = 0.5$. We have $0 < \underline{g} < \bar{g}$ since $\theta^M* > \theta^M**$ (see footnote 23). Proposition 3 directly follows.

Proof of Proposition 4
(i) It is similar to the proof of proposition 2.

(ii) When $p = 0$, conditions (1a) and (1b) imply that $\theta^M* = \theta^M** = 0$. Specifically, a moral agent could strictly increase his non-wage payoff if he switched to being amoral and applied the same level z_j of rent seeking as before, avoiding the negative feelings of guilt (since there were be no positive feelings of pride). He could increase his non-wage payoff even further if chose his level of rent seeking according to condition (1a). Thus all agents in the population choose to become amoral. Furthermore, when $p \rightarrow \infty$, we have $\theta^M* = \theta^M** = 1$ since all agents choose to become moral to experience an infinite amount of pride.

The equilibrium proportion θ^M* or θ^M** of moral agents in the population is a continuous function of p. Since $\theta^M* = \theta^M** = 0$ when $p = 0$ and $\theta^M* = \theta^M** = 1$ when $p \rightarrow \infty$, $\exists p' \in \mathbb{Z}^+$ for which $\theta^M** = 0.5$. If there are several p' for which $\theta^M** = 0.5$, we equalize $\bar{p}$ to the largest. Then, $\theta^M** > 0.5$, $\forall p > \bar{p}$. Similarly, $\exists p'' \in \mathbb{Z}^+$ for which $\theta^M* = 0.5$. If there are several p'' for which $\theta^M* = 0.5$, we equalize $\underline{p}$ to the smallest. Then, $\theta^M* \leq 0.5$, $\forall p \leq \underline{p}$. Proposition 4 directly follows.

Proof of Proposition 5
(i) It follows directly from condition (6).

(ii) According to proposition 2(ii), in interior equilibria we have $\partial u*/\partial g < 0$ and $\partial u**/\partial g < 0$. Then, proposition 5(ii) directly follows by implicitly differentiating conditions (7a) and (7b).

(iii) According to proposition 1, in interior equilibria we have $u* > u**$. Then, proposition 5(iii) directly follows by implicitly differentiating conditions (7a) and (7b).

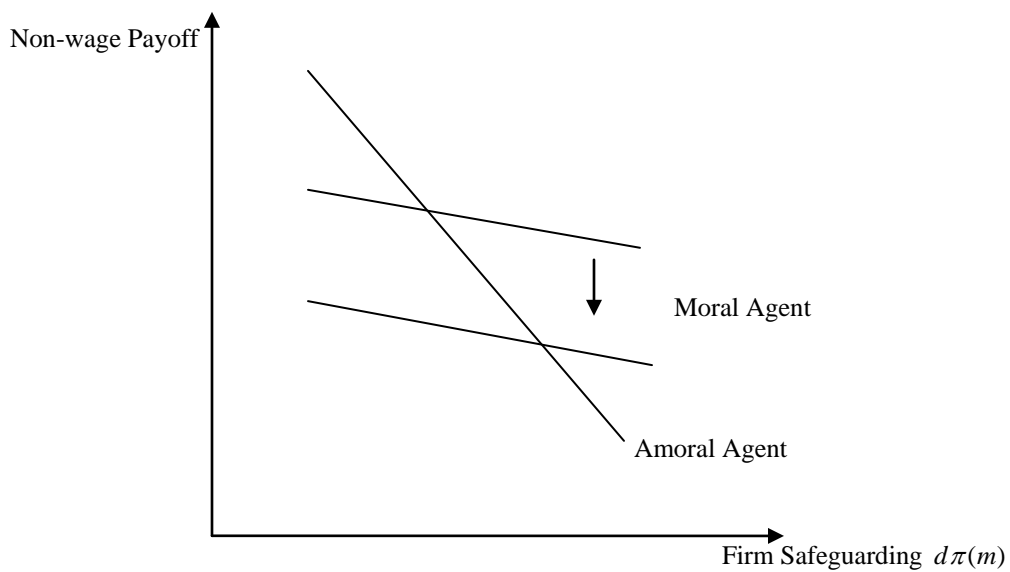| Country	Emphasis on Guilt	Rule of Law Indicator
United States	Weak	1.58
Australia	Weak	1.77
China	Strong	0.13
Taiwan	Strong	1.01

Table 1: Correlations between Culture and the Rule of Law in Some Countries.

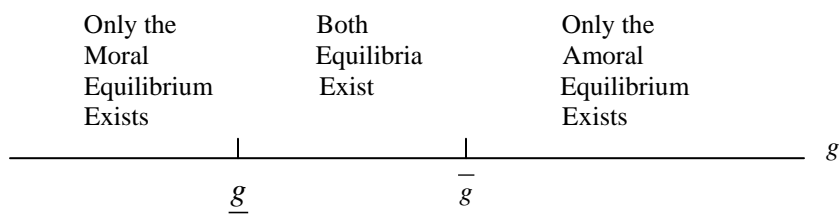<u>Data Sources:</u> World Bank [2013], Eid and Diener [2001].
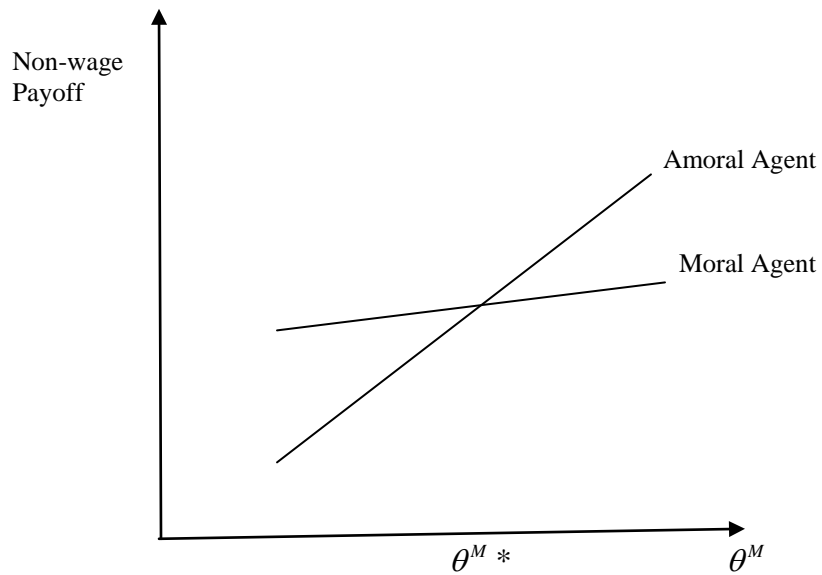
Figure 1: Proportion of moral agents in an interior moral equilibrium.

Non-wage Payoff

Moral Agent

Amoral Agent

Firm Safeguarding $d\pi(m)$

Figure 2: Effects of an increase in guilt in an interior equilibrium.

Only the
Moral
Equilibrium
Exists

Both
Equilibria
Exist

Only the
Amoral
Equilibrium
Exists

g

$\underline{g}$

$\bar{g}$

Figure 3: Existence of various equilibria.