ABSTRACT: I examine how international trade affects an economy’s ethical disposition and property rights institutions. International trade has no ethical or institutional impact on economies that are in a moral equilibrium. In economies in an immoral equilibrium, on the other hand, international trade leads to an ethical and institutional deterioration. Despite this negative effect, the case for free trade holds. Although international trade does not eliminate (and may increase) inter-country inequality, it can raise the welfare of economies in either equilibrium. The model may offer new insights into the pattern of corruption in Latin America.

JEL Classification Codes: K, F1, O.
1. INTRODUCTION

The case for free trade is very strong in economic theory. Developing countries, however, complain that they sometimes fail to realize the impressive gains from trade that economists promise (Rodrik [2001], Stiglitz [2002]). There is a new popular intellectual wave in the developing world that informally points to the lack of strong private property rights as the source of this failure (De Soto [2000]). International trade, the argument runs, cannot function in the way that standard economics predicts unless developing countries establish strong institutions for the protection of private property rights. As Hernando De Soto [2000, 2001] points out,

“Latin Americans do not have to be reminded. On at least four occasions since their independence from Spain in the 1820s, they have tried to become part of global capitalism and failed ... At the consumer level, the Latin Americans imported all sorts of goods, from English tweed suits and Church shoes to Model T Fords; they learned English and French by listening to the radio or records; they danced the Charleston and the Lambeth Walk, and chewed Chiclets gums. But they never produced much live capital.”¹ ... “So our thesis is, basically, the reason it does not work for the majority is because the system can only work with property rights.”²

A related stream of informal literature emphasizes a society’s moral disposition and work ethic as important determinants of economic prosperity (Weber [1930], Landes [1998]). According to this approach, although institutional parameters — such as the strength of private property rights — are important, they stem from and are thus secondary to a society’s ethical disposition. For example, Max Weber [1930] notes that

“The universal reign of absolute unscrupulousness in the pursuit of selfish interests by the making of money has been a specific characteristic of precisely those countries whose bourgeois-capitalistic development, measured according to Occidental standards, has remained backward. As every employer knows, the lack of conscienziosita of the laborers of such countries, for instance Italy as compared with Germany, has been, and to

¹ De Soto [2000], p. 208.
a certain extent still is, one of the principal obstacles to their capitalistic development. Capitalism cannot make use of the labor of those who practice the doctrine of undisciplined liberum arbitrium, any more than it can make use of the business man who seems absolutely unscrupulous in his dealings with others …”\textsuperscript{3}

This paper constructs a formal model that connects the two approaches and examines how international trade affects a country’s ethical disposition and property rights institutions. It is shown that when a country’s initial institutions are weak, openness to international trade leads to even weaker protection of private property rights and an even more unfavorable ethical disposition. Despite this negative voracity effect, however, international trade may generate overall economic benefits. Furthermore, the voracity effect of international trade does not occur in countries that initially have strong property rights institutions.

The model has two basic ingredients. First, there are increasing returns to scale in production. I adopt the standard monopolistic competition framework (Dixit and Stiglitz [1977]), where consumers value product variety, while firms manufacture differentiated goods and face increasing returns to scale. The second important ingredient is the presence of two types of agents in the population, producers and predators. The two types have different sets of skills. Producers have developed the ability to contribute to manufacturing by providing productive labor. Predators, on the other hand, specialize in rent seeking, trying to appropriate the property of producers, and have developed the relevant skills. Given that most major ethical systems in the world — for example, Christianity, Judaism, Islam, Buddhism, Confucianism, Hinduism — strictly consider appropriation to be an immoral activity, the proportion of predators in the population defines an economy’s ethical disposition in the model. An agent makes his ethical choice — i.e., his choice whether to become a producer or a predator — with perfect foresight aiming at the maximization of his personal utility.

The leader of the group — i.e., producers or predators — that prevails politically determines the strength of producer property rights in the country. There is thus both a moral and an immoral equilibrium in the analysis. In the moral equilibrium the

\textsuperscript{2} De Soto [2001].
proportion of producers in the population is high, allowing producers to prevail politically and establish strong institutions for the protection of producer property rights. The level of output of such an economy is high. In the immoral equilibrium, on the other hand, the group of predators prevails politically and determines the legal and institutional regime. The economy generates low level of output.

International trade has no effect on a society’s ethical disposition and property rights institutions so long as a society is in a moral equilibrium. The leader of producers always chooses the highest possible level of property protection. In a country that is in an immoral equilibrium, on the other hand, openness to international trade generates a voracity effect, causing an ethical deterioration — i.e., an increase in the proportion of predators in the population — and a reduction in the strength of producer property rights.

In particular, the leader of predators faces a trade-off when he determines producer property rights. Weak property rights allow predators to appropriate a large fraction of the property of producers. At the same time, however, weak producer property rights effectively reduce the size of the economy’s labor force and the variety of products that are manufactured by inducing producers to spend more time on hiding their property, rather than on manufacturing. Because international trade makes domestic economies of scale and domestic product variety less important, it allows the leader of predators to set weaker producer property rights. Furthermore, the anticipation of weaker producer property rights encourages a larger number of agents to become predators, rather than producers.

In the analysis, international trade does not lead to utility equalization (and may even sometimes widen the inequality gap) between economies in a moral and economies in an immoral equilibrium. Utility equalization cannot occur without domestic ethical and institutional changes; a country in an immoral equilibrium can fully catch up only if it switches to a moral equilibrium. Nevertheless, the case for free trade still holds in the model. At least when an economy in an immoral equilibrium is sufficiently open and engages in open trade with a sufficiently large outside world, it increases its utility because gaining access to world product variety outweighs the economy’s ethical and institutional deterioration.

3 Weber [1930], p. 61.
The effects of trade liberalization in Latin America in the 1990s are a good example of the model’s predictions. As table 1 shows and section 6 discusses in detail, among countries with weak property rights institutions in continental America, full members of a free trade area — MERCOSUR or NAFTA — exhibit the most corruption — i.e., the highest proportion of predators and the weakest protection of property rights in equilibrium, — while non-members (least open to international trade) exhibit the least corruption and associate members are in the middle, which is consistent with the conclusions of the model. In addition, as the model implies, a country that is sufficiently open to international trade raises its welfare despite the increased corruption; the average GDP of full members is higher than that of associate members or non-members. Among countries with strong property rights institutions, on the other hand, the degree of openness to international trade does not appear to affect the level of corruption (Table 2), which is also in harmony with our theoretical results.

In the model the voracity effect of international trade is driven by the existence of increasing returns to scale in manufacturing. Thus another important implication of the analysis is that among open economies with weak property rights institutions, countries with a larger population size tend to exhibit less corruption — i.e., big is beautiful — because the voracity effect of trade is less pronounced. Again, the analysis may offer new insights into the mechanics of corruption in Latin America. As Table 3 shows, population size is an excellent predictor of corruption in countries that have weak property rights institutions and are full members of a free trade area — NAFTA or MERCOSUR. Country rankings with respect to corruption are identical to country rankings with respect to population. Furthermore, as our model predicts, the importance of country size appears to be diminishing in the group of NAFTA or MERCOSUR members with strong property rights institutions (Table 4).

The implications of the model also relate to previous empirical research. Corruption and institutional inefficiency, as depicted in the model by the prevalence of predators in the immoral equilibrium, are associated with a low level of economic prosperity, which is consistent with the empirical results of Treisman [2000], Acemoglu, Johnson and Robinson [2001, 2002] and Guiso, Sapienza and Zingales [2003]. As the Chicago School interest group theory points out, the government is a common medium
for property appropriation; the size of government may be a proxy for the degree of appropriation in an economy. The model’s conclusions are thus in harmony with the empirical findings of Cameron [1978] and Rodrik [1998] that first, international trade is associated with a larger government and second, the link between international trade and the size of government is stronger in countries that are likely to be in an immoral equilibrium — for example, countries with a high product concentration of exports.

The model’s predictions can probably be tested more easily by examining trade between regions in the same country, rather than trade between different countries. The effects of a federal political system (cross-jurisdiction trade) are equivalent to those of international trade, while the effects of a unitary political system are equivalent to those of a closed economy. The conclusions of the model are consistent with the empirical finding that a federal political system leads to more corruption than a unitary political system (Goldsmith [1999], Treisman [2000], Gerring and Thacker [2004]).

The paper is most closely related to the theoretical literature on rent seeking and appropriation. In particular, Murphy, Shleifer and Vishny [1991, 1993], Acemoglu [1995] and Grossman and Kim [2000] explore the impact of rent seeking on the allocation of talent. It is shown that when an economy inherits an unfavorable allocation of talent (significant corruption), it provides greater rewards for rent seeking and reaches an equilibrium that has a high level of such behavior. I extend this literature in two ways. First, this paper introduces endogenous property rights institutions into the rent seeking framework and thus explores the role of institutions, as well as the link between institutional structure and skill allocation (or ethical disposition).4 Second, and perhaps more importantly, this model allows for trade between countries and examines the interplay between rent seeking and international trade. It is shown that a country’s openness to international trade affects its institutional structure, strength of private property rights and allocation of talent.

In a different vein, Anderson and Marcouiller [2002], Grossman and Helpman [2002], and Anderson and Bandiera [forth] focus on the reverse question, namely the impact of property rights institutions on international trade. The existence of weak

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4 In the model, an economy’s institutional structure is the outcome of a political battle between different social groups. In this way, the analysis relates to the literature on social conflict (Acemoglu [2005a,b]).
property rights institutions and corruption may facilitate the efforts of special interest groups to influence a country’s government and erect protectionist barriers at the expense of consumers. Furthermore, corruption can enhance the risk that is inherent in international transactions, discouraging foreign firms from exporting their goods to a country. Overall, domestic institutional inefficiency and corruption lead to a lower volume of international trade. By examining the opposite problem — i.e., the effects of international trade on institutional efficiency and corruption, — this paper offers new insights into the interplay between the two.

Another related stream of research examines the link between foreign aid and corruption in less developed countries. As the size of foreign aid grants that are fought over by interest groups increases, redistribution efforts are heightened and corruption worsens (Tornell and Lane [1999], Alesina and Weder [2002]). This paper has a different focus than the foreign aid literature, demonstrating that openness to international trade (rather than foreign aid) may cause a voracity effect in an immoral economy. Furthermore, the voracity effect in this paper entails entirely different mechanics than in the existing literature. In the model, the voracity effect is based on the presence of increasing returns in production and the interaction between two ethical groups, producers and predators. In the foreign aid literature, on the other hand, the voracity effect is not associated with increasing returns or morality. Instead, it stems from the prisoner’s dilemma of multiple interest groups face in the battle for fiscal redistribution.

The paper consists of seven sections. Section 2 describes the basic model, and section 3 solves for the equilibrium of the basic model. Section 4 extends the basic model to incorporate international trade. Section 5 examines the welfare effects of international trade. Section 6 discusses the empirical implications of the analysis. Finally, section 7 presents some conclusions.

2. THE BASIC MODEL

The economy is populated by $L$ agents. There are a large number of goods produced, although smaller than the potential range of products. As in the standard model of monopolistic competition (Dixit and Stiglitz [1977]), it is assumed that all
potential goods enter symmetrically into the utility function. All agents have the same utility function

\[ U = \sum_i c_i^\rho, \]  

where \( c_i \) is consumption of the \( i^{th} \) good and \( 0 < \rho < 1 \). For simplicity, it is assumed that \( \rho = 1/2 \).

There is only one factor of production, labor — similarly to Krugman [1979, 1980, 1981], for example. There is free entry of firms, and each firm manufactures one good. All goods face the same cost function

\[ l_i = a + \beta x_i, \]  

where \( l_i \) is the amount of labor that is used in producing the \( i^{th} \) good, \( x_i \) is the output of the \( i^{th} \) good and \( a, \beta > 0 \). It follows that as in the standard model of monopolistic competition, production entails both a fixed and a variable cost.

Although all agents have the same utility function, they differ in their set of skills. In particular, there are two types of agents in the population, producers (\( P \)) and predators (\( R \)). Both producers and predators aim at maximizing their personal utility, but they build up different skills and thus pursue utility maximization in different ways. Producers develop the ability to contribute to the production of goods, but do not have appropriation skills. A producer receives a wage by providing up to one unit of labor. Predators, on the other hand, lack the ability to provide labor or contribute to production; instead, they develop an aptitude for rent seeking activities, attempting to appropriate the property of producers.\(^5\)

It thus follows that producers behave morally, while predators behave immorally. Defining immoral behavior as an agent’s propensity to appropriate the belongings of others is in harmony with most major ethical systems in the world. In the Old Testament,

\[^5\] Murphy, Shleifer and Vishny [1993], Acemoglu [1995] and Grossman and Kim [2000], among others, also construct models where there are both producers and predators in the population.
for example, the 8th Commandment, points out that “Thou shalt not steal,” while the 10th Commandment stresses that “Thou shalt not covet thy neighbor’s house, …, nor his ox, nor his ass, nor anything that is thy neighbor’s.” Stealing and appropriation are also strictly condemned by the Koran, as well as by the teachings of Buddhism, Confucianism, Hinduism and other important religions.

An agent chooses his ethical type — producer or predator — at the beginning of the game. Agents make their ethical decisions with perfect foresight, aiming at maximizing their individual expected utility. The acquisition of skills constitutes a long-term training process that can only start early. For this reason, an agent’s ethical choice at the beginning of the game is irreversible and his particular ethical type characterizes him for the entire game.

The long-term nature of skill development in the model and the rather inflexible agent behavior that logically follows is in the spirit of Stigler and Becker [1977] who point out that long-term skills cause rational agents to commit to a rather rigid course of action. Furthermore, the long-term nature of ethical choices is stressed by several social scientists and economists (e.g., Freud [1907], Frank [1987]). As the ancient Greek philosopher Heraclitus emphasizes, “a man’s character is his fate.”

I turn now to the legal system that governs the economy. Society establishes laws and institutions that fix the strength of producer property rights. Strong property rights institutions offer greater protection (than weak property rights institutions) to producers against predators. The strength of producer property rights is denoted by \( d \), which implies that each producer is granted legal rights to a fraction \( d \) of his property. A producer, on the other hand, does not have legal property rights to the remaining share \( 1 - d \) of his belongings, which are vulnerable to appropriation. We have \( d \in [d, \overline{d}] \) and \( 0 \leq d < \overline{d} \leq 1 \).

Producers may hide some of their belongings that lack legal property protection to prevent their appropriation. Thus, aside from property rights institutions, another important factor in the distribution of output is the amount of time \( e \) that a producer chooses to spend on hiding (and thus protecting) his property from predators, where \( 0 \leq e \leq 1 \). An amount of time \( e \) that is allocated to hiding efforts allows a producer to conceal a fraction \( z(e) \) of his entire property from predators. Predators are unable to
locate and claim such hidden belongings even if a producer does not have legal property rights to them. We have $\frac{\partial z(e)}{\partial e} > 0$ and $\frac{\partial^2 z(e)}{\partial e^2} \leq 0$. The concavity of $z(e)$ ensures the existence of equilibrium. Because a producer has only one unit of time available, he provides $1 - e$ units of productive labor when he spends a time $e$ on property hiding. Overall, a producer maintains possession of a fraction $d + z(e)$ of his property — the property to which he has legal rights and the property that he manages to conceal. The remaining fraction $1 - d - z(e)$ is equally distributed among all predators.

Because in the standard model of monopolistic competition free entry leads to zero profits for firms (Dixit and Stiglitz [1977]), predators can only prey upon the property of producers, rather than upon the non-existent profits of firms. The assumption of zero firm profits is consistent with ample empirical evidence that firm profits constitute only a small fraction of a country’s output (Mankiw [2003], Bureau of Economic Analysis [2006]). The target of predators in the model is thus producer property, rather than firm profits.

Given the very long-term nature of ethical choices — an agent starts developing the skills that are relevant to his ethical type at the beginning of the game — decisions about property right institutions and the legal system are made in the model after agents have chosen their ethical types. Thus, ethical decisions constitute a longer-term commitment than legal decisions.

The two groups — producers and predators — engage in a political battle to gain control of the economy’s government and impose self-serving legal rules for the strength of producer property rights $d$. The prevailing group chooses the level of $d$ in the economy. In the political contest between producers and predators strength lies in numbers. Specifically, the leader of producers determines the economy’s legal system,

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6 Predators, on the other hand, always spend their entire time on trying to appropriate the property of producers.

7 The assumption that each predator obtains an equal share of the total appropriated output is standard in the literature and can be made for simplicity and without loss of generality. A similar assumption is made, for example, by Murphy, Shleifer and Vishny [1993] and Grossman and Kim [2000].

8 According to the Bureau of Economic Analysis [2006], for example, firm accounting profits constituted 12 percent of U.S. GDP in the third quarter of 2005. Furthermore, the actual economic profits of firms tend to be significantly lower than recorded accounting profits (Mankiw [2003]). Accounting profits do not consider various opportunity costs or the rental price of firm capital.

9 Ades and Di Tella [1999], on the other hand, adopt a partial (rather than a general) equilibrium framework and examine the efforts of bureaucrats to appropriate abnormal firm profits.
— i.e., the level of $d$ — if the fraction of producers in the population is above a threshold value $\bar{\theta}$ ($\theta^p \geq \bar{\theta}$), where $0 < \bar{\theta} < 1$. If, on the other hand, $\theta^p < \bar{\theta}$, the legal system is selected by the leader of predators. This process is in the spirit of the social conflict literature (e.g., Acemoglu [2005a,b]), which stresses that an economy’s legal and institutional structure is determined by the prevalent social group — either the group of producers or predators in our model.

The implementation of a legal system of property rights entails administrative costs; organizing and operating a country’s legal infrastructure utilizes productive resources. Because the operation of a country’s property rights institutions constitutes a productive activity, the governor of a country — regardless of whether he is the leader or producers or the leader of predators — needs to rely on producer skills to run these institutions. If the operation of a legal system requires a total amount $T$ of producer time, the governor forces each producer to spend an amount of time $T/(\theta^p L)$ on operating the country’s legal system. However, given that in practice the administrative costs of a country’s legal infrastructure tend to be very low compared with a country’s output, I assume for simplicity that $T$ is equal to zero. This is a standard assumption in the appropriation literature (e.g., Murphy, Shleifer and Vishny [1991, 1993], Acemoglu [1995], Tornell and Lane [1999]).

The conclusions of the paper would be similar if $T$ were strictly positive — regardless of whether $T$ were a constant or an increasing or decreasing function of $d$ — so long as $T$ were not prohibitively high. Furthermore, there is significant anecdotal evidence that in practice, $T$ may often be decreasing in the strength of producer property rights $d$ ($\partial T/\partial d < 0$), rather than being a constant. De Soto [2000], for example, discusses several cases where the operation of weak property rights institutions is more onerous and resource-consuming than the operation of strong property rights institutions. The results of this paper would be even stronger if $T$ were strictly positive.

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10 For example, De Soto [2000] performed an experiment where his research team tried to obtain legal authorization to build a house on state-owned land in Peru. The process took six years and eleven months and required 207 administrative steps in fifty-two government offices. To obtain a legal title for the same plot of land required 728 administrative steps. The operations of weak property rights institutions (such as in Peru) can thus be significantly more resource-consuming than the operations of strong property rights institutions.
and decreasing in \( d \), instead of being equal to zero.\(^{11}\) Thus the simplifying assumption that \( T \) is zero can be made without loss of generality.

We have a five-stage game:

Stage 1: Each agent chooses his ethical type and begins acquiring the skills relevant for his type.

Stage 2: The population sets up a legal system that determines the strength of producer property rights.

Stage 3: Each producer chooses the amount of time that he will spend on hiding his property.

Stage 4: Production takes place. Producers use their wages to buy goods.

Stage 5: Predators try to appropriate a fraction of the property of producers.

### 3. EQUILIBRIUM OF THE BASIC MODEL

To solve for the equilibrium, I proceed by backward induction.

#### 3.1. Production Decisions

A producer maximizes his utility function subject to his budget constraint

\[
\text{Max } \sum_i \left\{ \left[ d + z(e) \right] c_i \right\}^{1/2} + \lambda [1 - e] w - \sum_i p_i c_i \Rightarrow c_i
\]

\[
p_i = \frac{1}{2} \lambda^{-1} \left[ d + z(e) \right]^{1/2} c_i^{-1/2}, \tag{3}
\]

where \( p_i \) is the price of good \( i \), \( c_i \) is the amount of good \( i \) that is bought by the producer, \( w \) is the wage rate that is paid for one unit of labor and \( \lambda \) is the marginal utility of income.

\(^{11}\) The establishment of weak property rights institutions would amount to a reduction in the size of the country’s population because the governor of the country would need to employ a large amount of producer time (compared with strong institutions) to operate the legal system. As section 4.4 will explain, the effects of international trade may be more pronounced when the size of a country’s population is smaller.
Because all producers are identical, the market demand for the \(i^{th}\) good is

\[
p_i = \frac{1}{2} \lambda^{-1}[d + z(e)]^{1/2} \left(\frac{x_i}{\theta^p L}\right)^{-1/2},
\]

(4)

where \(x_i\) is the output of the \(i^{th}\) good. It follows that each firm \(i\) faces a demand curve with an elasticity \(\varepsilon\) that is equal to \(-2\). A firm maximizes its profit when its marginal revenue is equal to its marginal cost. We thus have \(p_i = 2\beta w\). Furthermore, given that \(\beta\) and \(w\) are the same for all firms, all goods \(i\) have the same price \(p\), i.e., \(p_i = p\).

As in the standard monopolistic competition model, given that entry is free, in equilibrium each firm earns a zero profit (Dixit and Stiglitz [1977]). It follows that

\[
\Pi_i = px_i - (a + \beta x_i)w = 0 \Rightarrow
\]

(5)

Given that \(a\) and \(\beta\) are the same for all firms, each firm \(i\) produces the same output \(x\), i.e., \(x = x_i\).

Finally, the full employment condition states that

\[
(1 - e)\theta^p L = \sum_{i=1}^{n} a + \beta x_i.
\]

(6)

From (5) and (6) it follows that

\[
n = \frac{(1 - e)\theta^p L}{a + \beta x} = \frac{(1 - e)\theta^p L}{2a}.
\]

(7)
3.2. Choice of $e$ by Producers

Because the economy’s population is large, an individual producer’s choice of $e$ has a negligible effect on $n$. A producer thus faces the following maximization problem

$$\text{Max } n\{[d + z(e)](1-e)c\}^{1/2},$$

$$e$$

where $c$ is the amount of each product that is bought by the producer if he provides one unit of labor. The producer’s interior solution is given by

$$\frac{\partial z(e)}{\partial e} (1-e) - [d + z(e)] = 0. \quad (9)$$

Expression (9) implicitly defines $e(d)$, the level of $e$ that is chosen by a producer taking the strength of producer property rights $d$ as given. It is straightforward to verify that the second-order condition is met. Furthermore,

$$\frac{\partial e(d)}{\partial d} = \left[\frac{\partial^2 z(e)}{\partial e^2} (1-e) - 2 \frac{\partial z(e)}{\partial e}\right]^{-1} < 0. \quad (10)$$

**Lemma 1:** The time $e$ that a producer spends to hide his property is decreasing in the strength of producer property rights $d$, i.e. $\frac{\partial e}{\partial d} < 0$.

When producer property rights are strong, a producer does not need to spend much time hiding his property from predators. A producer thus contributes more to production by providing a larger amount of labor.

3.3. Choice of $d$ by the Population

When the proportion of producers in the population is weakly higher than $\bar{\theta}$, i.e., when $\theta^p \geq \bar{\theta}$, producers gain control of the economy’s government, and a producer-
friendly legal regime is established. The leader of producers chooses the level of \( d \) to maximize producer utility. The maximization problem is

\[
Max \ \left\{ \left[ d + z(e(d)) \right] \frac{x}{\theta^p L} \right\}^{1/2} \left[ 1 - e(d) \right] \frac{\theta^p L}{2a} . \tag{11}
\]

For all \( d \in [d, \bar{d}] \), we have\(^{12}\)

\[
\frac{1}{2} [d + z(e(d))]^{(-1/2)} \left[ 1 + \frac{\partial z(e)}{\partial e} \frac{\partial e(d)}{\partial d} \right] \left[ 1 - e(d) \right] - [d + z(e(d))]^{1/2} \frac{\partial e(d)}{\partial d} > 0 . \tag{12}
\]

The leader of producers thus chooses the maximum level of property rights protection \( d \), i.e., we always have a corner solution where \( d \) is set equal to \( \bar{d} \). In this way, each producer maintains possession of the maximum proportion of his property by spending the least amount of time on property hiding. Furthermore, when \( d \) is equal to \( \bar{d} \), the variety that is available to producers, i.e., the number of available products \( n \), is maximized.

When, on the other hand, the proportion of producers in the population is lower than \( \bar{\theta} \), i.e., when \( \theta^p < \bar{\theta} \), predators gain control of the economy’s government, and a predator-friendly legal regime is established. The leader of predators chooses the level of \( d \) to maximize predator utility. The maximization problem is

\[
Max \ \left\{ \left[ 1 - d - z(e(d)) \right] \frac{x}{(1 - \theta^p)L} \right\}^{1/2} \left[ 1 - e(d) \right] \frac{\theta^p L}{2a} \Rightarrow 
\]

\[
\frac{1}{2} \left[ 1 + \frac{\partial z(e)}{\partial e} \frac{\partial e(d)}{\partial d} \right] \left[ 1 - e(d) \right] - \left[ 1 - d - z(e(d)) \right] \frac{\partial e(d)}{\partial d} = 0 . \tag{13}
\]

\(^{12}\) We have \( 1 + \left( \frac{\partial z(e)}{\partial e} \right) \left( \frac{\partial e(d)}{\partial d} \right) = \left[ 1 - e(d) \right] \left( \frac{\partial^2 z(e)}{\partial e^2} \right) / \left[ \left[ 1 - e(d) \right] \left( \frac{\partial^2 z(e)}{\partial e^2} \right) - 2 \left( \frac{\partial z(e)}{\partial e} \right) \right] > 0 . \)
Expression (13) implicitly defines the strength of producer property rights $d^*$ in a predator-friendly regime. It is straightforward to verify that the second-order condition is met.

As expression (13) implies, the leader of predators faces a trade-off when he chooses the level of $d$. A low level of $d$ has two opposing effects on predators:

(a) Positive Effect: It allows predators to appropriate a higher fraction of the property of producers (i.e., $-\left[1 + \frac{\partial z(e)}{\partial e} \frac{\partial e(d)}{\partial d} \frac{[1 - e(d)]}{2} \right] < 0$).\(^\text{13}\)

(b) Negative Effect: It induces producers to spend more time to hide their property and thus reduces the amount of labor that is available for production. In this way, the economy incurs the disadvantages of low-scale production; the variety of goods that are manufactured in the economy is reduced (i.e., $-[1 - d - z(e)] \frac{\partial e(d)}{\partial d} > 0$).

The leader of predators weighs both effects when he chooses the level of $d^*$. To bring out clearly the interplay between the two effects, I assume that $d < d^* < \bar{d}$, i.e., equation (13) has an interior solution.

3.4. Agent Type Decisions

There are two equilibria in the game. In the moral equilibrium, a proportion $\bar{d} + z(e(\bar{d}))$ of all agents choose to become producers.\(^\text{14}\) Then, producers establish a producer-friendly property rights institutions, setting $d$ equal to $\bar{d}$ in stage 2. The

\(^{13}\) *Supra* note 12.

\(^{14}\) In equilibrium, the utility of a producer is equal to the utility of a predator; otherwise, agents would have an incentive to switch. If the proportion of producers in the population were higher than $\bar{d} + z(e(\bar{d}))$, the utility of predators would be higher than the utility of producers. Similarly, if the proportion of producers were lower than $\bar{d} + z(e(\bar{d}))$, the utility of producers would be higher than the utility of predators. We can only have a moral equilibrium when the proportion of producers is exactly equal to $\bar{d} + z(e(\bar{d}))$. 

number of goods that are manufactured is \( \tilde{n}^* = [1 - e(\bar{d})][\bar{d} + z(e(\bar{d}))]L / 2a \), and the utility of each agent in the end of the game is \( \tilde{u}^* = (x / L)^{1/2} \tilde{n}^* \).

In the immoral equilibrium, the proportion of producers is \( \tilde{d}^* = \frac{d^* + z(e(d^*))}{\bar{d} + z(e(\bar{d}))} \). Predators establish a predator-friendly legal regime, setting \( d \) equal to \( d^* \) in stage 2. The number of products that are manufactured is \( n^* = [1 - e(d^*)][d^* + z(e(d^*))]L / 2a \). The utility of each agent — producer or predator — in the end of the game is \( u^* = (x / L)^{1/2} n^* \).

To ensure the existence of both a moral and an immoral equilibrium, it is assumed that \( d^* + z(e(d^*)) < \bar{d} + z(e(\bar{d})) \). This implies that when the proportion of producers is \( \bar{d} + z(e(\bar{d})) \), the legal regime and property rights institutions are chosen by producers. Furthermore, when the proportion of producers is \( \bar{d} + z(e(\bar{d})) \), the legal regime is chosen by predators.

**Lemma 2:** The proportion of producers in the population is \( \bar{d} + z(e(\bar{d})) \) in the moral equilibrium and \( d^* + z(e(d^*)) < 1 \) in the immoral equilibrium, where \( \bar{d} + z(e(\bar{d})) > d^* + z(e(d^*)) \).

The moral equilibrium Pareto dominates the immoral equilibrium because the variety of products that are manufactured in the economy is greater \( (\tilde{n}^* > n^*) \). Intuitively, in the moral equilibrium the allocation of skills in the population is more conducive to economic prosperity (than in the immoral equilibrium). A large number of producers leads to economies of scale and eventually enhances the range of available products in the economy. In addition, the establishment of strong property rights institutions in the moral equilibrium further reinforces the realization of scale economies; such institutions allow producers to divert less time from production to property hiding. Both equilibria are possible, however, because agents make ethical decisions simultaneously in stage 1 and are thus unable to coordinate.

**Lemma 3:** The moral equilibrium Pareto dominates the immoral equilibrium.
4. INTERNATIONAL TRADE

The basic model examined a closed economy. We now extend the analysis to incorporate international trade. There are two countries, home and foreign, that open trade with each other at zero transportation cost. For simplicity, it is assumed that the two countries have identical tastes and technologies. Tastes and technologies are the same as in the basic model. As section 4.5 will explain, the conclusions are similar when the trading countries have different tastes, technologies or factor endowments (as in Heckscher-Ohlin trade) so long as production continues to entail increasing returns to scale.

In each country, local predators prey upon local producers and compete with them for taking control of the local government. A country’s government establishes national property rights institutions. As in most standard trade theory models — both comparative advantage (Samuelson [1948]) and imperfect competition (Krugman [1979, 1980, 1981] models — labor cannot move between countries. For this reason, predators are unable to appropriate the property of producers in other countries; such producers live in different geographical areas and fall within different institutional jurisdictions. Furthermore, similarly to the closed economy model, the standard monopolistic competition framework implies free entry for firms, which leads to zero firm profits in equilibrium (Dixit and Stiglitz [1977]). It follows that even if foreign firms sell their goods in the home country, local predators are unable to appropriate non-existent foreign firm profits.

The home and foreign country is populated by $L$ and $L^F$ agents respectively. To solve for the equilibrium, I proceed by backward induction. Also, to examine the effects of international trade, I focus on the home country. The results for the foreign country are similar.

4.1. Production Decisions and Choice of $e$

By following the same procedure as in the basic model, we can see that in both countries, each firm $i$ produces an output $x$ that is equal to $a/\beta$. We also have
\[ n = \frac{(1 - e)\theta^p L}{2a}, \quad (14a) \]
\[ n^F = \frac{(1 - e^F)\theta^{PF} L^F}{2a}, \quad (14b) \]

where \( n \) and \( n^F \) is the number of products that are manufactured in the home and the foreign country respectively.

The utility of a producer and a predator at home is
\[ (n + n^F)\{[d + z(e)]sx/(\theta^p L)\}^{1/2} \]
and
\[ (n + n^F)\{[1 - d - z(e)]sx/[(1 - \theta^p) L]\}^{1/2} \]
respectively, where \( s \) is the home country’s share in world production. We have \( s = n/(n + n^F) \). Furthermore, international trade has no effect on \( e(d) \). In the home country, \( e(d) \) is implicitly defined by expression (10), as in the basic model.

4.2. Choice of \( d \) by the Population

When the proportion of producers in the home population is weakly higher than \( \bar{\theta} \), i.e., when \( \theta^p \geq \bar{\theta} \), producers gain control of the home country’s government and establish a producer-friendly legal regime. We always have a corner solution where the leader of producers sets \( d \) equal to \( \bar{a} \), as in the basic model. It follows that international trade has no effect on producer property rights in countries with producer-friendly property rights institutions.

**Proposition 1:** International trade has no effect on the choice of \( d \) in countries with producer-friendly legal regimes.

When, on the other hand, the proportion of producers in the population is lower than \( \bar{\theta} \), i.e., when \( \theta^p < \bar{\theta} \), predators gain control of the home country’s government and establish a predator-friendly legal regime. The maximization problem of the leader of predators is

\[ 15 \text{ Supra note 8.} \]

19
Expression (15) implicitly defines the strength of producer property rights $d^{**}$ in a predator-friendly legal regime. It is straightforward to verify that the second-order condition is met.

When $d$ is equal to $d^{*}$, first-order condition (15) becomes

$$\left[1-d-z(e(d))\right]^{1/2} \frac{\theta^p L}{2a} \left[1+\frac{\partial z(e) \partial e(d)}{\partial d} \right] \frac{1-e(d)}{2} -\left[1-d-z(e)\right]^{1/2} = 0.$$  \hspace{1cm} (16)

It follows that $d^{**} < d^{*}$. International trade leads to weaker producer property rights in a country with predator-friendly property rights institutions.

**Proposition 2:** International trade reduces the strength of producer property rights in countries with predator-friendly legal regimes, i.e., $d^{**} < d^{*}$.

The idea is that international trade generates a voracity effect by reducing the negative impact of a low $d$ on the economy. Because international trade makes the range of foreign goods available at home, it makes the size of the home labor force $(1-e)\theta^p L$ less important. The home country is in less need to realize domestic economies of scale and manufacture a wide variety of products. As a result, predators are less concerned
about the impact of weak producer property rights on domestic labor availability, i.e., the impact of $d$ on $e(d)$, and choose a lower level of $d$.

The analysis implies that international trade between two immoral economies cannot substitute for a political union of the two countries. When an immoral home economy open trades with an immoral foreign economy, neither leader takes into account the negative impact of weak domestic property rights on agents (producers or predators) in the other country — the reduced domestic product variety also impacts agents in the other country. Both leaders thus choose excessively weak producer property rights from a cooperative standpoint. If the two immoral economies united into a single country, on the other hand, there would be a single predator leader that would contemplate the effects of his actions on the entire population of predators. For this reason, a political union leads to stronger producer property rights — the same property rights as a closed economy — than international trade.

4.3. Agent Type Decisions

As in the basic model, there are two equilibria in the game. In the moral equilibrium, a proportion $\overline{d} + z(e(\overline{d}))$ of agents choose to become producers. The number of products that are manufactured at home is $\tilde{n}^{**} = [1 - e(\overline{d})][\overline{d} + z(e(\overline{d}))]L/2a$, and the utility of each agent — producer or predator — in the end of the game is $\tilde{u}^{**} = \{[\tilde{n}^{**}/(\tilde{n}^{**} + n^F)](x/L)^{1/2}(\tilde{n}^{**} + n^F)\}$. In the immoral equilibrium, on the other hand, the proportion of producers in the population is $d^{**} + z(e(d^{**}))$. The number of products that are manufactured at home in the immoral equilibrium is $n^{**} = [1 - e(d^{**})][d^{**} + z(e(d^{**}))]L/2a$, and the utility of each agent — producer or predator — in the end of the game is $u^{**} = \{[n^{**}/(n^{**} + n^F)](x/L)^{1/2}(n^{**} + n^F)\}$.

It follows that international trade does not affect the proportion of producers in the moral equilibrium. It reduces, however, the proportion of producers in the immoral equilibrium, i.e., $d^{**} + z(e(d^{**})) < d^* + z(e(d^*))$. We have $d^{**} + z(e(d^{**})) < d^* + z(e(d^*))$ because $d^{**} < d^*$ and $\partial(d + z(e(d))))/ \partial d > 0$.16 Thus

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16 Supra note 12.
international trade adversely affects the ethical disposition of a country that is in an immoral equilibrium, increasing the proportion of predators in the population.

**Proposition 3:** In the moral equilibrium, international trade has no effect on the proportion of producers in the population. In the immoral equilibrium, international trade reduces the proportion of producers in the population, i.e.,

\[
d** + z(e(d**)) < d^* + z(e(d^*)).
\]

Because international trade leads to weaker producer property rights in an immoral economy (through the voracity effect), it also reduces the proportion of producers in its population. The expectation of weaker producer property rights induces more agents to become predators, rather than producers. International trade thus causes a further ethical deterioration in a country that is in an immoral equilibrium.

### 4.4. Country Size

The voracity effect of international trade is driven by the existence of increasing returns to scale in production. For this reason, the magnitude of the voracity effect depends on the size of an immoral economy, i.e., the size of domestic population \(L\). When \(d\) is equal to \(d**\), the derivative of expression (15) with respect to \(L\) is\(^{17}\)

\[
\{[-1 - \frac{\partial z(e)}{\partial e} \frac{\partial e(d)}{\partial d}][1 - e(d)] - 2[1 - d - z(e(d))\frac{\partial e(d)}{\partial d}]\} \frac{\partial e(d)}{\partial d} \frac{[1 - e(d)]^{\theta p}}{2\alpha} > 0. \tag{17}
\]

It follows that in an open immoral economy, the equilibrium strength of producer property rights \(d**\) is increasing in the size of domestic population \(L\). International trade leads to a less drastic weakening of producer property rights and a less drastic ethical deterioration when the size of an immoral economy is larger. When an economy is in a moral equilibrium, on the other hand, the size of domestic population does not affect the

\(^{17}\)When \(d\) is equal to \(d**\), we have

\[
[1 + \frac{\partial z(e)}{\partial e} \frac{\partial e(d)}{\partial d}][1 - e(d)] = -[1 - d - z(e(d))\frac{\partial e(d)}{\partial d}(2n + n_p)/(n + n_p) < -2 - [1 - d - z(e(d))]\frac{\partial e(d)}{\partial d}.
\]
strength of producer property rights (which is always equal to $\tilde{d}$) or the proportion of producers (which is always equal to $\tilde{d} + z(e(\tilde{d}))$).

**Proposition 4:** In an open immoral economy, producer property rights are stronger and the proportion of producers in the population is higher when the country’s size $L$ is larger. In an open moral economy, the strength of producer property rights and the proportion of producers in the population do not depend on the country’s size $L$.

As I explained above, international trade generates a voracity effect by making the size of the home labor force less important and thus reducing the negative impact of a low $d$ on the economy. This effect is more pronounced when the size of the home population $L$ is small. When a small economy gains access to a range of foreign goods, it experiences a more marked extension of its market than a large economy.\(^\text{18}\)

### 4.5. Comparative Advantage

The analysis assumes that both countries have the same tastes, technologies and factor endowments; there are no comparative advantages. This assumption is made for simplicity and without any loss of generality. In particular, Krugman [1981] shows that it is straightforward to extend the standard monopolistic competition model of trade to account for comparative advantage. In Krugman [1981], there are two industries and two types of labor. Type 1 labor can be used only in industry 1, while type 2 labor can be used only in industry 2; a large number of differentiated products can be produced within each industry. As in the standard model of monopolistic competition, manufacturing a good (either an industry 1 or an industry 2 good) entails both a fixed setup cost and a constant variable cost. Then, the country that has a higher proportion of type 1 (type 2) labor becomes a net exporter of the first (second) industry’s products. There is both

\(^{18}\) In a moral or an immoral closed economy, on the other hand, country size $L$ has no impact whatsoever on the strength of producer property rights or the proportion of producers in the population. The derivative of expressions (12) and (13) with respect to $L$ is zero.
inter-industry and intra-industry trade between the two countries, and the extent of intra-industry trade depends on the countries’ similarity in factor proportions.\footnote{Similarly, Krugman [1980] examines the case where consumers in the two countries have different tastes. When local consumers have a strong preference for an industry’s products, the country becomes a net exporter of these products.}

The conclusions of our paper would be qualitatively similar if the monopolistic competition model were extended to allow trading countries to have different tastes, technologies or factor endowments — as, for example, in Krugman [1980, 1981]. The crucial element that drives our results is the existence of increasing returns to scale in manufacturing. As long as manufacturing entails increasing returns, it does not matter whether countries engage in intra-industry or inter-industry trade.

Assume, for example, that international trade allows an immoral economy to be a net exporter of the products of one industry (say, widgets) in which it has a comparative advantage over other countries. Similarly to the basic model, if there were no international trade, the need for domestic economies of scale and domestic product variety (in both widget and non-widget industries) would to some extent limit the ability or desire of predators to impose weak property rights. However, international trade gives the country access to a wide range of foreign goods (especially in industries other than widgets), making domestic scale economies less important. International trade thus generates a voracity effect similarly to the basic model.

\subsection*{4.6. Federal and Unitary Political Systems}

Although the model focuses on international trade, the same results hold for trade among regions within the same country. In particular, let us assume that home and foreign are two regions in the same country, rather than two different countries. In a federal political system, each region sets its own legal rules for the protection of producer property rights. In a unitary system, on the other hand, the strength of producer property rights in the entire country — i.e., in both regions — is determined by a central government. Then, in a federal political system, there is trade between regions under different political and legal jurisdictions, which is equivalent to trade between countries in an international context. Similarly, a unitary political system is equivalent to a closed...
economy or a political union, where the entire market is within one political jurisdiction. Proposition 5 follows naturally from propositions 2 and 3.

**Proposition 5:** Compared with a unitary political system, a federal political system reduces the strength of producer property rights \((d^{**} < d^*)\) and the proportion of producers in the population \((d^{**} + z(e(d^{**})) < d^* + z(e(d^*)))\) in regions that are in an immoral equilibrium.

Furthermore, when a region is in a moral equilibrium, the strength of producer property rights is \(\bar{d}\) and the proportion of producers in the population is \(\bar{d} + z(e(\bar{d}))\) regardless of whether there the country has a unitary or a federal political system.

5. WELFARE EFFECTS OF INTERNATIONAL TRADE

This section examines the effects of international trade on the utility of agents. It is straightforward to see that international trade increases the utility of agents in a moral equilibrium. Although the real wage \(w/p\) remains unchanged at \(1/(2\beta)\), the range of products that is available to agents is extended.\(^{20}\) Furthermore, international trade does not affect the proportion of producers in the population or the strength of producer property rights.

**Proposition 6:** International trade increases the utility of agents in a moral equilibrium.

In an immoral equilibrium, on the other hand, international trade generates two opposing effects. As before, international trade gives home consumers access to the range of products that are produced in the foreign country. At the same time, however, international trade also leads to weaker producer property rights and a more adverse ethical disposition (i.e., a lower proportion of producers) at home. The former effect counters the latter.

\(^{20}\) The variety effect is also described in detail in the literature on trade and imperfect competition (e.g., Krugman [1979, 1980, 1981]).
It can be shown that at least in the case where an immoral economy is sufficiently open — i.e., in the case where the economy imports a sufficiently large number of goods from other countries, — international trade increases the utility of agents in the economy. In particular, let us examine the extreme case where a home country completely opens its borders and trades with a very large outside world where \( n^F \rightarrow \infty \). Then, it is straightforward to see that first-order condition (15) becomes equal to \(-\infty\).

It follows that when the number of foreign goods is sufficiently large — for example, in the extreme case where \( n^F \rightarrow \infty \), — the leader of predators faces a negative first-order condition for all \( d \in [d_\text{min}, \tilde{d}] \). We thus have a corner solution where the lowest possible level of \( d \) is chosen, i.e., \( d \) is set equal to \( \overline{d} \). We must note that the reason the strength of property rights \( d \) has a lower bound \( \overline{d} \) is the existence of physical constraints. If, for example, the lower bound \( \overline{d} \) is zero, the strength of property rights cannot be negative. It is physically impossible for an agent to lack legal rights to property that he does not have.

Let us now assume that the number of foreign imports is sufficiently large so that the strength of producer property rights at home is set equal to \( \overline{d} \). Then, further increasing the size of the outside world with which the home country trades raises the utility of home agents. Home agents gain access to a wider variety of foreign products (as in the standard model of monopolistic competition), while the greater volume of international trade does not cause any changes in the country’s property rights institutions or ethical disposition (because there is a corner solution for \( d \)). In the extreme case where \( n^F \rightarrow \infty \), for example, the utility of a home agent approaches \( \infty \).

\[
\lim_{n^F \to \infty} \left( \frac{[1-e(d)]z(e(d))L/2a}{[1-e(d)]z(e(d))L/2a+n^F} x/L \right)^{1/2} \left\{ [1-e(d)]z(e(d))L/2a+n^F \right\} = \infty. \tag{18}
\]

Given that the utility of home agents is increasing in \( n^F \) (as long as \( n^F \) is sufficiently large to lead to a corner solution \( \overline{d} \) for \( d \)), at least when the home economy is sufficiently open — i.e., the number of foreign imports is sufficiently large — international trade leads to higher utility for home agents than autarky.
**Proposition 7:** At least in the case where an immoral economy is sufficiently open and engages in open trade with a sufficiently large outside world, international trade increases the utility of home agents.

Intuitively, the ethical disposition and property rights effect of international trade is capped, while the variety effect is not. In particular, the lowest level of $d$ that can be chosen by the leader of predators is $d_0$; even if the interior solution to (15) is negative, we have a corner solution where $d$ is $d_0$. The variety effect, on the other hand, is not capped. As the country becomes more open and engages in free trade with a larger number of partners, domestic consumers continue to benefit from the greater range of foreign products that become available. It follows that when a country open trades with a sufficiently large outside world the uncapped variety effect outweighs the capped property rights and ethical disposition effect, and international trade increases the utility of home agents.

**5.1. Country Convergence**

I now examine whether international trade causes countries to converge or diverge. For simplicity and without any loss of generality, I compare agent utility in two countries that are populated by the same number of agents $L$. Then, in a world with closed economies, the ratio of agent utility in a moral economy to agent utility in an immoral economy is

$$\frac{\tilde{u}^*}{u^*} = \frac{\tilde{n}^*}{n^*}. \quad (19)$$

Let us now assume that both of these countries engage in open trade with a very large outside world where $n^F \to \infty$. The ratio of agent utility in a moral economy to agent utility in an immoral economy becomes
\[ \lim_{n^* \to \infty} \frac{\tilde{u}**}{u**} = \left( \frac{n**}{n** + n^*} \right)^{1/2} = \left( \frac{n**}{n**} \right)^{1/2}. \]  

Given that \((\tilde{n}*/n**)^{1/2} > 1\), international trade does not lead to utility equalization between a country in a moral and a country in an immoral equilibrium. Although the wage rate per unit of labor, \(w\), is equalized, the amount of productive labor is lower in a country in an immoral equilibrium. For one thing, in an immoral equilibrium, the proportion of producers in the population is lower. Also, each producer diverts more time from production to property hiding.

**Proposition 8:** International trade does not lead to utility equalization between a country in a moral and a country in an immoral equilibrium.

Proposition 8 contradicts the conclusion of several articles in the trade and imperfect competition literature (e.g., Krugman [1979, 1981]) or the trade and comparative advantage literature (e.g., Samuelson [1948]) that international trade equalizes utility among countries.

The effects of international trade on the size of the gap between countries in a moral and countries in an immoral equilibrium are ambiguous. Depending on the specific functional form of \(z(e)\), international trade may either widen or narrow the utility gap between countries in a moral and an immoral equilibrium, i.e., \((\tilde{n}**/n**)^{1/2}\) may be either higher or lower than \(\tilde{n}*/n*\). International trade generates two opposing effects. First, it leads to even weaker producer property rights and an even more adverse ethical disposition in a country that is in an immoral equilibrium, increasing the utility gap between moral and immoral equilibria. Second, a country in an immoral equilibrium is in greater need of and benefits more from gaining access to world product variety; this effect may narrow the gap between moral and immoral equilibria. Overall, the impact of international trade on the degree of inter-country inequality is ambiguous.

The ambiguous effects of trade can also be illustrated in a simple numerical example. Suppose that \(z(e) = ke\), where \(2/3 \leq k \leq 4/3\) (to ensure the existence of an interior solution in the immoral equilibrium). Furthermore, to simplify the calculations, I
assign specific numerical values to \( \bar{d} \) and \( \bar{d} \) — for example, \( \bar{d} \) is set equal to zero and \( \bar{d} \) is set equal to 1. By following the same procedure as in the model, we can see that in the absence of trade, we have \( d^* = (4 - 3k) / 3 \), \( e(d^*) = (6k - 4) / (6k) \) and \( \theta^p* = 2 / 3 \) in an immoral equilibrium. In a moral equilibrium, we have \( \bar{d}^* = 1 \), \( e(\bar{d}^*) = 0 \) and \( \bar{\theta}^p* = 1 \). The ratio of agent utility in a moral to an immoral equilibrium is \( \tilde{n}^* / n^* = 9k / 4 \).

When a small country in an immoral equilibrium engages in open trade with the entire world economy, on the other hand, we have \( d^{**} = 0 \), \( e(d^{**}) = 1 / 2 \) and \( \theta^{p**} = k / 2 \). Similarly, in a moral country that engages in international trade, we have \( \bar{d}^{**} = 1 \), \( e(\bar{d}^{**}) = 0 \) and \( \bar{\theta}^{p**} = 1 \). The ratio of agent utility in a country in a moral to a country in an immoral equilibrium is \( (\tilde{n}^{**} / n^{**})^{1/2} = 2 / k^{1/2} \).

International trade widens the utility gap between a country in a moral and a country in an immoral equilibrium when \( (\tilde{n}^{**} / n^{**})^{1/2} > \tilde{n}^* / n^* \Rightarrow 2 / k^{1/2} > 9k / 4 \Rightarrow k < 0.92 \). The gap is narrowed, on the other hand, if \( k > 0.92 \). It follows that depending on the specific functional form of \( z(e) \), international trade may either widen or narrow the utility gap between a country in a moral and a country in an immoral equilibrium.

Overall, the analysis shows that the complaints of several developing countries about the lack of gains from international trade (Rodrik [2001], Stiglitz [2002]) may be justified only in relative terms. Trade does not cause an economy in a moral equilibrium and an economy in an immoral equilibrium to converge (and may even cause the economies to diverge); only when it is accompanied by domestic ethical and institutional reform can trade lead to convergence. In absolute terms, however, international trade may increase the utility of agents in all economies.

6. EMPIRICAL IMPLICATIONS

The paper has several testable empirical implications. Some of these implications are consistent with previous empirical findings while others are new. In the model, a society’s ethical disposition and property rights institutions are crucial for economic prosperity. This is consistent with ample empirical research that demonstrates the
importance of these factors (Treisman [2000], Acemoglu, Johnson and Robinson [2001, 2002], Guiso, Sapienza and Zingales [2003]). Because, however, the general link between morality, property rights institutions and economic performance has been examined in the existing theoretical literature (Murphy, Shleifer and Vishny [1991, 1993], Acemoglu [1995, 2005a,b], Kanatas and Stefanadis [2006]), I will focus more on the new implications that this model brings out.

I will first discuss the predictions of the model for the importance of country size. The analysis implies that in the presence of international trade, a large economy in an immoral equilibrium tends to exhibit stronger property rights institutions and a more favorable ethical disposition — for example, less corruption — than a small economy in an immoral equilibrium (proposition 4). Size, on the other hand, does not play a role in economies that are in a moral equilibrium. Implication 1 follows.

Implication 1: Among open economies with weak property rights institutions, countries with a larger population size tend to exhibit less corruption.

Implication 1 has not been tested in the empirical literature yet. It is completely consistent, however, with the effects of free trade on Latin American countries. In particular, Tables 3 and 4 show the Corruption Perceptions Index (CPI) for all full members of a free trade area — NAFTA or MERCOSUR — in America. There is ample anecdotal evidence (Harrison [1997]) that among these members, Brazil, Argentina, Mexico, Paraguay and Venezuela have weak property rights institutions — their CPI score is lower than 5 (Transparency International [2006]). Canada, the United States and Uruguay, on the other hand, have strong property rights institutions — their CPI score is higher than 5 (Transparency International [2006]). As Table 3 shows, for countries with weak property rights institutions, the size of the population is an excellent predictor of the level of corruption. Country rankings with respect to population are identical to country rankings with respect to corruption. For countries with strong property rights institutions (Table 4), on the other hand, population size does not appear to be an important predictor of corruption. The pattern of corruption in the Americas is thus consistent with the predictions of our model.
I will now discuss the implications of the model for the link between international trade and domestic property rights institutions or morality. The model implies that openness to international trade may have a negative impact on the ethical disposition or the institutional efficiency of an economy that is in an immoral equilibrium. At the same time, a related stream of literature focuses on the reverse problem, demonstrating that weak property rights institutions and corruption can have an negative impact on trade (Anderson and Marcouiller [2002], Grossman and Helpman [2002], Anderson and Bandiera [forth]); corruption may encourage domestic special interest groups to erect protectionist barriers at the expense of consumers or may make cross-border transactions riskier. For this reason, given that openness to international trade may both affect and be affected by a country’s ethics or institutions, it is difficult to interpret a measured correlation between trade and institutions or between trade and corruption in a meaningful way.\footnote{Ades and Di Tella [1999] and Treisman [2000], for example, estimate that openness to international trade is negatively correlated to corruption. As Treisman [2000] acknowledges, however, it is hard to determine the direction of causation in this correlation.}

A simple way to solve this causality problem is to focus on trade between regions in the same country, rather than trade between countries. As section 4.6 explains, the effects of a federal political system are equivalent to those of international trade. A unitary political system, on the other hand, is equivalent to a political union or a closed economy. Therefore, the model implies that a federal political system tends to be associated with more corruption than a unitary political system; the association is stronger in a corrupt country. There appears to be no causality puzzle in such a correlation. Given the long-term and inflexible nature of a country’s fundamental political traditions, it is unlikely that the degree of corruption determines whether the political system is federal or unitary. It is highly likely that causality runs in one direction only: the federal or unitary nature of the political system affects corruption, which allows us to test the conclusions of our model. Implications 2 and 3 follow.

**Implication 2:** A federal political system leads to a less moral society with weaker property rights institutions — for example, a society with more corruption — than a unitary political system.
Implication 2 is consistent with the empirical findings of Goldsmith [1999], Treisman [2000] and Gerring and Thacker [2004] that corruption is higher in federal than in unitary countries.

**Implication 3:** The effect of a federal political system on corruption (implication 2) is stronger in a country that exhibits more corruption.

Implication 3 has not been tested in the empirical literature yet.

As I explained above, because openness to international trade both affects and is affected by an economy’s ethical disposition and institutions, we need to interpret any measured correlations very cautiously. With this reservation, there are some empirical results that appear to support the conclusions of the model. Implications 4, 5 and 6 follow.

**Implication 4:** Among countries with weak property rights institutions, members of free trade areas tend to exhibit more corruption than non-members.

Implication 4 has not been tested in the empirical literature yet. It is completely consistent, however, with the pattern of corruption in Latin America. In particular, from the 1950s to the 1980s most Latin American countries heavily protected their domestic industries, erecting significant trade barriers. In the 1990s, on the other hand, protectionist policies were to a large extent reversed, giving way to trade liberalization (Krugman and Obstfeld [2003]). Two free trade areas have been formed since 1990, MERCOSUR and NAFTA.

As I explained above in implication 1, the only countries that have strong property rights institutions in the Americas are Canada, the United States, Chile and Uruguay. Table 1 compares countries in continental America that have weak property rights institutions and display three different degrees of openness to international trade; countries are either full members of a free trade area (most open), or associate members (less open) or non-members (least open). As the model predicts, full members exhibit the most corruption, while non-members exhibit the least corruption.
Furthermore, as the model implies, a country that is sufficiently open to international trade raises its welfare despite the increased corruption; the average GDP of full members is higher than that of associate members of non-members. Finally, Table 2 shows that among countries with strong property rights institutions, being a full member, an associate member or a non-member of a free trade area does not appear to affect the degree of corruption, which is consistent with the predictions of the model.

Implication 5: Greater openness to international trade leads to a larger government.

According to the Chicago School interest group theory, the size of government may be a proxy for the degree of appropriation in a society. One of the methods that predators can use to appropriate the property of producers is government fiscal transfers; the government may seize a part of the property of producers and redistribute it to predators.\(^\text{22}\) As Peltzman [1980] points out, “incentives to redistribute wealth politically are the more important determinants of the relative size and growth of the public and private sectors.”\(^\text{23}\) And, “the size of government responds to the articulated interests of those who stand to gain or lose from politicization of the allocation of resources.”\(^\text{24}\)

Implication 5 is consistent with the empirical results of Cameron [1978] and Rodrik [1998], who demonstrate that openness to international trade causes an increase in government spending, domestic (i.e., non-international-trade-related) government tax revenues and government employment as a share of the labor force.\(^\text{25}\)

Implication 6: The effect of openness on the size of government (implication 5) is stronger in an economy that is in an immoral equilibrium — for example, in an economy that exhibits a higher product concentration of exports.

It is straightforward to show that an immoral equilibrium entails a higher concentration in a country’s exports than a moral equilibrium; an economy in an immoral

\(^{22}\) The empirical analysis of Goel and Nelson [1998] shows that higher government expenditures (after controlling for police expenditures and other factors that deter corruption) are associated with more corruption. The 1996 regression of Treisman [2000] also finds a positive correlation between the two.

\(^{23}\) Peltzman [1980], p. 221.

\(^{24}\) Peltzman [1980], p. 287.

\(^{25}\) Rodrik [1998] interprets his results as an indication that more open economies face greater exposure to external risks, and thus government intervention constitutes a form of social insurance. Rodrik’s [1998]
equilibrium incurs the disadvantages of low scale production. The Herfindahl-Hirschman Index of the export sector — the sum of the squared market shares of each firm in the sector — is higher in the immoral than the moral equilibrium ($1/n^{**} > 1/n^{**}$). Implication 6 is consistent with the empirical findings of Rodrik [1998], who shows that the effect of openness on the size of government is stronger in countries with a higher product concentration of exports.

7. CONCLUSION

The link between international trade and private property rights is an important policy issue yet is not fully understood in formal economic theory. This paper has developed a simple model to examine how international trade affects an economy’s ethical disposition and domestic institutions for the protection of property rights. It is shown that international trade has no ethical or institutional impact on economies that are in a moral equilibrium. In economies that have reached an immoral equilibrium, on the other hand, international trade generates a voracity effect, leading to an even more adverse ethical disposition — i.e., a higher share of predators in the population — and even weaker institutions for the protection of private property rights. Despite these negative effects, the case for free trade still holds in the model. Although international trade does not eliminate (and may sometimes increase) inter-country inequality, it can raise the utility of both moral and immoral economies by giving them access to world product variety.

In general, while the interplay between morality, property rights and international trade is a very broad and contested topic, most of the related discussion is currently informal. For this reason, the construction of theoretical models that formalize the debate is a necessary step for the evaluation of the strengths and weaknesses of all relevant arguments. Only after economic theory becomes clear and transparent will empirical research be in a position to reach definitive conclusions.

and this paper’s interpretations do not contradict each other and may both partly account for the expanded role of the government in an open economy.
REFERENCES


<table>
<thead>
<tr>
<th>Category</th>
<th>Mean Corruption Perceptions Index (CPI) in 2005</th>
<th>Mean GDP per capita in $ (Purchasing Power Parity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Members of NAFTA or MERCOSUR (Brazil, Mexico, Argentina, Venezuela, Paraguay)</td>
<td>2.88</td>
<td>8,680</td>
</tr>
<tr>
<td>Associate Members of NAFTA or MERCOSUR (Colombia, Peru, Ecuador, Bolivia)</td>
<td>3.12</td>
<td>4,925</td>
</tr>
<tr>
<td>Non-Members of NAFTA or MERCOSUR (Costa Rica, El Salvador, Belize, Panama, Suriname, Honduras, Nicaragua, Guatemala, Guyana).</td>
<td>3.22</td>
<td>5,311</td>
</tr>
</tbody>
</table>

**TABLE 1:** Countries with Weak Property Rights Institutions in Continental America.

Sources: Transparencency International [2006] (CPI Range: 0 – 10, 0: Most Corrupt, 10: Least Corrupt), Central Intelligence Agency [2006] (GDP).
| Full Members of NAFTA or MERCOSUR (Canada, United States, Uruguay) | 7.3 | 28,200 |
| Associate Members of NAFTA or MERCOSUR (Chile) | 7.3 | 11,300 |
| Non-Members of NAFTA or MERCOSUR | — | — |

**TABLE 2:** Countries with Strong Property Rights Institutions in Continental America.

<table>
<thead>
<tr>
<th>Corruption Rank</th>
<th>Country</th>
<th>Corruption Perceptions Index (CPI) in 2005</th>
<th>2005 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brazil</td>
<td>3.7</td>
<td>186,112,794</td>
</tr>
<tr>
<td>2</td>
<td>Mexico</td>
<td>3.5</td>
<td>106,202,903</td>
</tr>
<tr>
<td>3</td>
<td>Argentina</td>
<td>2.8</td>
<td>39,537,943</td>
</tr>
<tr>
<td>4</td>
<td>Venezuela</td>
<td>2.3</td>
<td>25,375,281</td>
</tr>
<tr>
<td>5</td>
<td>Paraguay</td>
<td>2.1</td>
<td>6,347,884</td>
</tr>
</tbody>
</table>

**TABLE 3:** Full Members of NAFTA or MERCOSUR with Weak Property Rights Institutions


<table>
<thead>
<tr>
<th>Corruption Rank</th>
<th>Country</th>
<th>Corruption Perceptions Index (CPI) in 2005</th>
<th>2005 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Canada</td>
<td>8.4</td>
<td>32,805,041</td>
</tr>
<tr>
<td>2</td>
<td>United States of America</td>
<td>7.6</td>
<td>295,734,134</td>
</tr>
<tr>
<td>3</td>
<td>Uruguay</td>
<td>5.9</td>
<td>3,415,920</td>
</tr>
</tbody>
</table>

**TABLE 4:** Full Members of NAFTA or MERCOSUR with Strong Property Rights Institutions.