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Resolving the Paradox of Social Standards and Export Competitiveness

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Abstract

Over the last decade there has been increasing international pressure on countries to raise social standards (i.e., production standards based on environmental and labor conditions). Currently, the World Trade Organization does not allow countries to impose minimum standards on imports based on environmental or labor standards because it is assumed to undermine competition. There is no consensus in the empirical literature, however, to support this claim. In fact, the evidence suggests that while stronger environmental standards hurt competitiveness, stronger labor standards do the opposite. This paper offers one possible explanation for this paradox. In a simple model of incomplete information, externally-imposed standards may either increase or decrease the competitiveness of infant firms from developing countries depending on the degree of complementarity between the standard and the production of high-quality goods.

1. INTRODUCTION

One popular argument against the establishment of international "social standards" (i.e., production standards based on labor or environmental concerns) is that it will harm developing countries. Forcing developing countries to adhere to the higher production standards of their wealthier trading partners is assumed to hurt the competitiveness of its firms and reduce its exports. This is an especially powerful argument since developing countries are typically endowed with infant firms attempting to gain a foothold in established world markets. Without the benefit of an international reputation, infant firms must have lower costs in order to induce consumers to experience their product for the first time.

This is one of the reasons why the World Trade Organization (WTO) has been reticent to allow countries to impose trade barriers on the basis of lax social standards.[1] The WTO refers to these "low standards" as non-conforming processes and production methods (PPMs). While WTO rules allow countries to regulate observable product quality (ISO 9000 standards), standards based on PPMs have generally been viewed with suspicion.[2] Their reasoning is based on the fact that PPM standards are not directly related to product quality. As a result, social standards, like those related to labor and the environment, are assumed to harm foreign competition.

Empirical research, however, does not unanimously support this logic. In their extensive review of the literature on trade and the environment, Copeland and Taylor (2004) conclude that the bulk of existing empirical studies support the claim that tighter environmental standards hurt competitiveness. However, studies of the effect of labor standards on trade do not reach the same conclusion. Van Beers (1988) finds no evidence that adherence to higher labor standards leads to a decrease in exports of labor-intensive goods. Even more recent evidence shows that

countries with higher labor standards actually appear to have an export advantage.[3] Kucera and Sarna (2006) find a robust, positive relationship between stronger labor rights associated with Freedom of Association and Collective Bargaining (FACB) and total manufacturing exports.

Herein lays the paradox: studies of the effects of environmental standards on exports generally find a negative relationship while recent studies on the effects of labor standards on exports find evidence of either no relationship or a strong positive one.

Though a literature exists on the general issue of social standards and export competitiveness, none of the existing models can explain these contradictory empirical findings. In general, models assuming perfect competition and complete information predict that higher standards will hurt competitiveness.[4] However, if the market is imperfectly competitive, then higher standards in one country can actually aid the competitiveness of domestic firms. However, such models cannot explain why environmental standards and labor standards might have different effects on export competitiveness. More recently, Rege (2000) analyzes a related issue in the context of incomplete information. Rege considers a very special case in which consumers have a strong preference for goods produced with environmentally-friendly processes. Not surprisingly, under this assumption higher social standards help exports by providing firms a more reliable signal. But Rege's model does not satisfactorily explain the empirical differences on the effects of labor and environmental standards either. If consumers really have such strong preferences for socially-responsible goods in general, both environmental and labor standards should enhance a country's export competitiveness.

As we see, the existing theoretical literature offers little insight into this empirical paradox. The purpose of this paper is to offer a theoretical explanation capable of reconciling the paradoxical results obtained in the empirical literature. As we show, the key to reconciling

the empirical results lies in the nature of the markets themselves and the PPM standards

proposed. While the effect of process standards on vertically-differentiated product markets in

the presence of incomplete information has been studied in the industrial organization literature,[5]

it has yet to be applied to models of international trade. The most relevant paper for the present

context is Shapiro's (1986) analysis of the relative effects of process (input) standards on

markets vertically differentiated by quality. Following his logic, the marginal cost of compliance

is assumed to be higher for low-quality producers than for high-quality producers. Ultimately,

this assumption leads directly to theoretical predictions that are capable of explaining the

empirical paradox surrounding the effects of social standards on export competitiveness.

2. THE MODEL

One of the most controversial subjects of debate in international trade concerns the

effects of minimum PPM standards on non-conforming exports from LDCs. For example,

recent bilateral trade negotiations between the USA and Peru and Panama have included the

imposition of minimum labor standards for all exported goods to the USA. Like earlier pacts

with countries like Cambodia and Jordan, many believe such PPM requirements will diminish

the competitiveness of exports from these LDCs to the USA. To investigate such claims, we

restrict our analysis to understanding the effect of externally-imposed PPM standards on the

competitiveness of infant firms from LDCs that wish to export to perfectly competitive foreign

markets. Though a number of closely-related models exist, the setup in this paper is based on

Grossman and Horn's (1988) seminal model of incomplete information and infant industries.[6]

Assume a world consisting of two countries, North and South, where each produces a

vertically-differentiated "experience good." An experience good is one in which consumers only

learn about its quality when it is consumed for the first time. The North (the developed country) is endowed with a set of perfectly competitive incumbent firms, while the South (the less-developed country) is endowed with a set of new entrants. Given the recent and dramatic rise in the share of LDC exports in experience goods, this is a realistic assumption.[7]

Each country manufactures a vertically-differentiated experience good whose exact quality can be ascertained only after consumption. So, while the quality of the goods produced by the incumbent Northern firms is known by Northern consumers based on past consumption experiences, the quality of the new entrant firms from the South is unknown in the initial period.[8] It is assumed that all consumers of the experience good are located in the North. This assumption allows us to analyze the problem from the point of view of the export-oriented developing country attempting to compete in an established perfectly competitive world market.

The model consists of two periods. Southern firms are new entrants into a perfectly competitive market consisting of a large number of Northern firms with established reputations. Because of this, Northern consumers have full information about the quality of goods from the North, but incomplete information about the quality of goods produced by Southern firms in the first period (infancy). Only in the second period (maturity) do consumers know the quality of goods from the South. Prior to the first period, the North chooses to impose a PPM standard (r) on all imports from the South.[9] Southern firms then decide whether to produce and what level of quality to choose. They make this choice given their firm-specific exogenous efficiency parameter (θ) and the costs of complying with international process standards (r).

Of course, the production of the experience good in the South generates a negative externality on a quasi-public "social good" in that country. This could be the pollution generated from production that damages the environment or the child labor used in production that reduces

the country's literacy levels. If the South values this social good (public education or the environment), damage due to the negative externality would require domestic regulation to maximize net social welfare. Optimally, this should be done such that the marginal cost of abatement is equal to the marginal social benefit of abatement. However, for the purposes of this paper, the South, perhaps due to their lack of economic development, is assumed to place no value on the externality produced by the social good. As a result, the government of the South is assumed to be maximizing net social welfare by not regulating or taxing domestic production.

This assumption is clearly not an accurate representation of policy in LDCs, but a simplifying assumption.[10] Most importantly, though, this simplification is consistent with the central question of the paper. This assumption ensures that the imposition of any PPMs by the North on production in the South is not socially optimal from the South's point of view. In other words, the PPMs imposed by the North are not correcting an inefficiency that the South has not addressed. These PPMs can be thought of as exogenously-imposed "over-regulation" of Southern production. Again, this is the implicit assumption made by those who argue that forcing the South to adhere to the higher PPM standards of the North will necessarily harm the South. For example, the imposition of the proposed minimum labor standards by the USA on Peru and Panama are not meant to correct a market failure in those countries.

2.1. Southern Infant Firms

Each firm produces one unit of an experience good each period they produce. This experience good is differentiated by quality (q), where firms producing higher quality goods naturally incur higher marginal costs than low-quality producers for a given level of θ. Firms are indexed by θ, where θ represents the exogenous efficiency parameter for each firm,

determined by firm-specific characteristics, such as R&D, that take place prior to the first period. The cumulative density function of θ's among the set of potential entrants is denoted by $F(\theta)$, and the marginal density function $f(\theta)$ is constrained by $f(\cdot) > 0$ over the range $[\theta^{\min}, \theta^{\max}]$.[11] Each firm has production costs of $\theta\, c(q)$ per period, where q represents the quality of the good produced and $c', c'' > 0$.

Since θ is assumed to lower the cost of production, variations in θ across firms determine a firm's propensity to produce a given level of quality. Since the marginal cost of quality is increasing, only the more productive firms (firms with an exogenously low θ) will find it profit-maximizing to produce higher quality goods. In period one, each firm makes a once-and-for-all decision to produce at quality level q to maximize profits over both periods.[12] A firm of type θ chooses quality, $q(\theta)$. Note here that there exists an international minimum product quality standard, q_0, below which any quality is directly observable before purchase.[13] Since any quality less than the mandated minimum is directly observable by consumers prior to experience, Northern consumers will never buy a good of quality less than q_0. Furthermore, given that firms choosing to produce low-quality goods will not survive into the second period, they have no incentive to produce any quality above the minimum quality (q_0). These one-period producers are referred to as "fly-by-nights." Alternatively, if a firm finds it in their best interest to invest in quality (and earn profits in the second period), they choose the quality $q = \hat{q}(\theta) > q_0$ that maximizes their two-period profits. Unlike fly-by-nights, these "reputable" firms are willing to invest in the costly infrastructure required to remain competitive over a long period of time. Fly-by-nights, by their nature, will not take on such investments since they will not survive infancy to recoup such costs. In general, we will denote the quality of goods produced by reputable firms as q^R while the fly-by-night firms produce q_0.[14]

2.2 International Standards

In addition to the costs of production ($\theta c(q)$), Southern firms incur an exogenously imposed compliance cost (*r*) associated with a PPM standard imposed by the North. But unlike taxes, compliance costs are not constant across all Southern firms. The key assumption here is that the marginal cost of compliance is related to the firm's choice of output quality. In fact, the assumption of such a relationship is not unique. Building on Akerloff's (1970) seminal work on adverse selection and moral hazard in models with asymmetric information, Shapiro (1986) analyzed the effects of input standards on the production of quality goods. Using the example of occupational licensing as his input standard, he argued that even if the standard has no *direct* relationship to product quality, it can affect production decisions *indirectly* since the marginal cost of meeting standards differs across producers. Specifically, Shapiro argued that the marginal cost of meeting process standards is higher for producers of low quality than for high quality. The primary reason for this is that low quality producers will only survive one period regardless of whether they meet the standard. Unlike high-quality producers, their compliance costs cannot be spread over two periods. High quality producers, on the other hand, incur the costs associated with investment in their human capital regardless of whether it is regulated by the government. As such, the cost of compliance falls relatively heavily on producers of low quality.

The recent example of Cambodia helps to illustrate the case. In 1999 the United States and Cambodia signed a bilateral trade agreement that essentially forced Cambodia to allow the International Labor Organization (ILO) to certify working conditions in its factories. Cambodia's garment makers had to pay significant fees to set up ILO monitors. As

manufacturing costs increased, many potential new factories chose to set up in Indonesia, Vietnam and Bangladesh. Since these countries were not forced to meet the ILO standards, their production costs remained below that of Cambodia (Prasso 2004). Logic would lead us to deduce that the firms that chose to avoid Cambodia were those with low levels of efficiency and high compliance costs. But not all firms avoided the high standards. High quality manufacturers, the ones more likely to find it in their long-term interest to maintain favorable working conditions, were better prepared for compliance. Unlike their fly-by-night counterparts, these producers were not hurt by new standards. If fact, since 1999 Cambodia's garment exports have more than tripled and their international reputation has significantly improved (Prasso 2004).

Following Shapiro's (1986) reasoning, it is assumed that the imposition of PPM standards imposes a relatively smaller marginal cost for reputable firms than for fly-by-nights. The cost of compliance for each firm producing a given level of quality is given by $\lambda(q)r$. In general, as the quality level chosen by firms increases, the cost of compliance with the PPM standard ($\lambda(q)r$) decreases at a decreasing rate ($\lambda' < 0, \lambda'' > 0$). Furthermore, assume there is a range of standards of type j where $0 \leq \lambda_j(q) \leq 1$. Again, following Shapiro (1986), $\lambda_j(q)$ is assumed to vary with the degree of complementarity between the process standard r_j and the product quality q. For example, if a high quality producer meets the standard regardless of whether it is legally required, then $\lambda(q^R) = 0$. On the other hand, if the standard in question is not met even partially by any firm prior to regulation, then $\lambda(q^R) = \lambda(q_0) = 1$. In this extreme case, all firms regardless of quality would face the maximum compliance costs of r. In general, however, we can imagine some standards exist in which high quality firms at least partially meet even prior to external mandates.

Thus, it appears reasonable to imagine a set of standards which high quality firms choose to meet prior to regulation. In other words, the production of high-quality goods and the acceptance of high social standards are complements. Thus, when external minimum standards are imposed, the cost of compliance for high quality firms is less than that for low quality producers. This implies that for such standards $\lambda(q^R) < \lambda(q_0)$.

2.3. Northern Consumers

Northern consumers are assumed to value only the objective quality of the experience good. They *do not* value the social quality of production. This assumption is fundamentally different than that which has been used in some of the recent environmental literature (Rege 2000, Conrad 2005). Only by making this assumption can the effects of social regulation (non-quality related PPMs) be distinguished from quality-related standards (e.g., ISO 9000 standards) that directly affect consumer demand.[15] Since the purpose of this paper is to investigate whether being forced to meet exogenous PPM standards hurts the competitiveness of Southern firms, this distinction is critical. Moreover, it is arguably more realistic compared to previous research.

Assume that Northern consumers value product quality at the rate of γ, and demand one unit of output ($q(\theta)$) per period. Recall that in the first period Northern consumers have no information about the true quality of the Southern (infant) good, but do have full information about goods produced by the incumbent firms from the North. Suppose that Northern consumers obtain a surplus equal to U^* by consuming their established domestic goods. Thus in the absence of barriers to trade, these consumers will only buy goods produced by the infant Southern firms if the expected introductory price/quality combination offers them at least U^* in surplus. The first-period price depends on consumer expectations about the quality q^e.[16] In the

presence of incomplete information and a large number of competitive rivals in the world, infant firms from the South are forced to behave as price takers in the introductory period, even though they produce differentiated products. Thus in the first-period all Southern firms (fly by nights as well as reputable) get the same price which is given by

(1) $p = \gamma q^e - U^*$.

In the second period consumers have complete information about the true quality of each firm. Thus, while reputable Southern firms are able to charge higher prices for higher quality goods, the fly-by-night producers are unable to survive. With no barriers to trade, the second-period equilibrium prices are given by

(2) $z = \gamma q(\theta) - U^*$,

where z is the price of the good made by a firm of type θ.

2.4. Equilibrium

Having defined equilibrium prices, the Southern firm's problem can be solved. At the beginning of period one, each firm of type θ must decide (1) whether to enter the world market and (2) what level of quality to produce. If a firm produces their total costs are $\theta\ c(q) + \lambda(q)r$. Since the international market is perfectly competitive, new entrants are price takers in the first period, and thus in period one each Southern firm will earn profits given by

(3) $\Pi_1(\theta) = p - \theta\ c(q) - \lambda(q)r$.

If the firm chooses a reputable strategy, it will earn the following second-period profits

(4) $\Pi_2(\theta^R) = z - \theta^R c(q) - \lambda(q)r$.

The discounted two-period profit function for reputable firms is given by

(5) $\Pi(\theta^R) = \Pi_1(\theta^R) + \delta\ \Pi_2(\theta^R),$

where δ is the discount factor $(\delta < 1)$.

    Each reputable firm chooses quality to maximize equation 5 given θ. Thus, for a reputable firm, the first-order condition implies

(6) $\delta\gamma = (1+\delta)\big(\theta\ c'(q) + \lambda'(q)r\big),$

where $\theta\ c'(q) > 0, \lambda'(q)r < 0$. Note that to ensure equilibrium it is necessary to restrict our analysis to cases such that $\theta\ c'(q) > |\lambda'(q)r|$. Using equations 3-6, the discounted profits for a reputable firm are given by

(7) $\Pi_2^R(\theta^R) = p - \theta^R c(\hat{q}(\theta)) - \lambda(\hat{q})r + \delta\Big(\gamma\hat{q}(\theta) - U^* - \theta^R c(\hat{q}(\theta)) - \lambda(\hat{q})r \Big)$

where $\hat{q}(\theta)$ is the level of quality that solves equation 6 for a reputable firm. This is the profit-maximizing quality for a firm of type θ.

    Since firms that choose a fly-by-night strategy only survive one period, fly-by-nights maximize one-period profits (equation 3) by producing the minimum non-observable quality, q_0. Thus the profit function for a fly-by-night firm is given by

(8) $\Pi_1^F(\theta^F) = p - \theta^F c(q_0) - \lambda(q_0)r.$

    Figure 1 shows the envelope of the profit functions for each type of firm where both profit functions are decreasing with θ ($\partial\Pi_2^R / \partial\theta < 0$ and $\partial\Pi_1^F / \partial\theta < 0$). Furthermore, the incentive to establish a high reputation is found to be decreasing with θ. That is,

$\dfrac{\partial(\Pi_2^R - \Pi_1^F)}{\partial\theta} = -(1+\delta)c(\hat{q}) + c(q_0) < 0.$ This means that firms with low θ values are the ones that have a propensity to produce high quality and this propensity declines with increases in θ. Note that θ represents previous levels of R&D and investment that each firm is predisposed to

when deciding which quality level to choose. Therefore, at low levels of θ, the profit envelope of high-quality producers is always steeper and above the profit envelope of low-quality producers.

Figure 1: Equilibrium
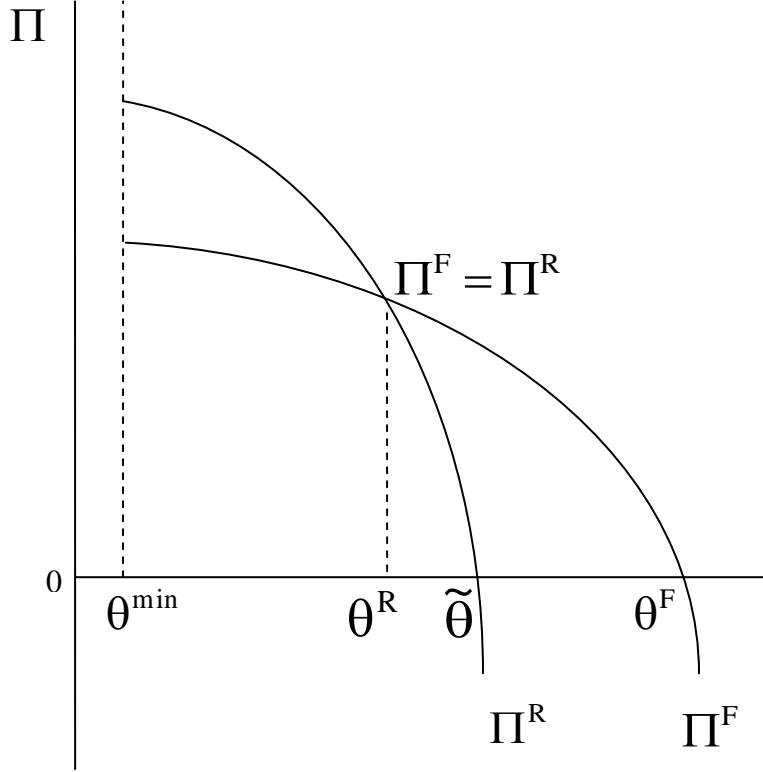
At the margin, a firm with efficiency parameter θ^R is indifferent between choosing to produce either high or low quality. At the margin, then it must be true that $\Pi^F(\theta^R) = \Pi^R(\theta^R)$ (see Figure 1). Using equations 7 and 8, this implies

$$(9) \qquad \theta^R(1+\delta)\big(c(\hat{q}(\theta)) - c(q_0)\big) = \delta(\gamma\hat{q} - U^*) - r\big((1+\delta)\lambda(\hat{q}) - \lambda(q_0)\big).$$

Furthermore, since fly-by-night firms survive only one period and there are no barriers to entry, the marginal fly-by-night must make zero profits ($\Pi^F(\theta^F)=0$). From equation 8 this implies

$$(10) \qquad p = \theta^F c(q_0) + \lambda(q_0)r.$$

Solving equations 9 and 10 for θ^R and θ^F respectively generates values for the quantity of

each type of Southern firm in equilibrium. As shown in Figure 1, the high-quality (most

efficient) producers operate in the range $[\theta^{\min}, \theta^R]$ while low quality producers exist in the range

$[\theta^R, \theta^F]$. This equilibrium highlights the basic problem of moral hazard. Firms endowed with

$\theta \in [\theta^R, \tilde{\theta}]$ possess the efficiency necessary to earn a profit by producing high quality. However,

because of the information asymmetries facing new entrants, they find it more profitable to

produce low quality goods for one period and exit in period two. In other words, even though

such firms have the capabilities to survive into the second period and be competitive

internationally, they choose instead to pursue a fly-by-night strategy.[17]

3. COMPETITIVENESS AND INTERNATIONAL STANDARDS

With the model now defined, the effect of internationally-imposed PPM standards on the

competitiveness of the Southern infant firms can be analyzed. Competitiveness in the context of

this model includes both the *number of firms* choosing to produce quality goods and, therefore,

the *average quality* of the goods exported by the South. Since only high quality producers can

survive in the long run, ultimately the overall quality of exports from infant firms in the South is

what determines whether the South can compete in the world market under free trade.

Proposition: *The imposition of exogenous production standards will increase the competitiveness of Southern firms when the complementarity between the standard and the production of quality goods is relatively large but decrease competitiveness when the complementarity is small.*

   Proof:

          When Northern consumers have rational expectations they calculate the average

   quality of Southern goods and expect to receive this quality on average when they import

from the South. Thus, the average quality of goods produced by the South in period one

can be written as

$$(11) \quad \overline{q} = \frac{1}{F(\theta^F)} \left\{ \int_{\theta_{\min}}^{\theta^R} \hat{q}(\theta) dF(\theta) + q_0 \left(F(\theta^F) - F(\theta^R) \right) \right\},$$

where $F(\theta^F)$ is the cumulative distribution of all Southern firms and $F(\theta^R)$ is the

cumulative distribution of the firms producing high quality (see Figure 1). From equation

11, the change in average quality in response to the imposition of PPMs is:

$$(12) \quad \frac{\partial \overline{q}}{\partial r} = \frac{1}{F(\theta^F)} \left\{ (q^R - q_0) f(\theta^R) \frac{\partial \theta^R}{\partial r} + (q_0 - \overline{q}) f(\theta^F) \frac{\partial \theta^F}{\partial r} \right\}.$$

Given that $q^R > q_0$ and $q_0 < \overline{q}$, the sign of equation 12 depends on the signs of

$\partial \theta^R / \partial r$ and $\partial \theta^F / \partial r$. These partial derivatives represent how the number of reputable

and fly-by-night firms, respectively, changes in response to the new PPM standard.

Solving equations 9 and 10 for θ (under the condition that $\Pi^R(\theta^R) = \Pi^F(\theta^R)$ and

$\Pi^F(\theta^F) = 0$) and differentiating with respect to r yields the following:

$$(13) \quad \frac{\partial \theta^F}{\partial r} = \frac{-\lambda(q_0)}{c(q_0)} < 0;$$

$$(14) \quad \frac{\partial \theta^R}{\partial r} = \frac{\lambda(q_0) - (1+\delta)\lambda(\hat{q})}{[(1+\delta)c(\hat{q}) - c(q_0)]} > 0 \; \forall \; \lambda(\hat{q}) < \frac{\lambda(q_0)}{(1+\delta)}.$$

Thus, when $\lambda(\hat{q}) < \dfrac{\lambda(q_0)}{(1+\delta)}$, both $\dfrac{\partial \theta^R}{\partial r} > 0$ and $\partial \overline{q} / \partial r > 0$.

QED

As equation 13 shows, fly-by-night firms are unambiguously hurt when they are forced to

meet the costs of higher standards. Their profits decline and many are driven out of business (the

envelope function Π^F shifts leftward in Figure 2).   Contrary to the effect on fly-by-nights, the effect on the number of reputable firms (equation 14) is ambiguous. The sign depends on $\lambda(\hat{q})$, which is determined by the complementarity between the production of high quality goods and the standard imposed.

Within the range of standards where $\lambda(\hat{q})$ is significantly small, the number of reputable firms will actually increase with the imposition of higher international standards ($\frac{\partial \theta^R}{\partial r} > 0$). In other words, if the PPM standard imposes a relatively smaller cost of compliance on high-quality firms ($\lambda(\hat{q})$) relative to fly-by-nights ($\lambda(q_0)$), then the number of firms choosing to produce goods of high quality will increase.

Though counterintuitive at first, while profits decrease for high quality firms, more infant firms actually choose to produce higher quality goods. There is a relatively large decrease in profits if they pursue a fly-by-night strategy, but only a small decrease in profits if they choose to produce high quality products. This is shown in Figure 2 as a relatively small leftward shift of Π^R and a larger leftward shift of Π^F. The key is that imposition of the PPM standard changes the behavior of the firms at the margin that have been endowed with ample efficiency to produce high quality goods (firms in the range $\theta \in [\theta^R, \tilde{\theta}]$ in Figure 1). Now that all firms are forced to adhere to more stringent standards in period one, these firms endowed with $\theta \in [\theta^R, \tilde{\theta}]$ have less incentive to pursue a fly-by-night strategy; it is now more profitable to produce high quality goods.

Figure 2: Equilibrium when the Cost of Compliance for Reputable Firms is Small
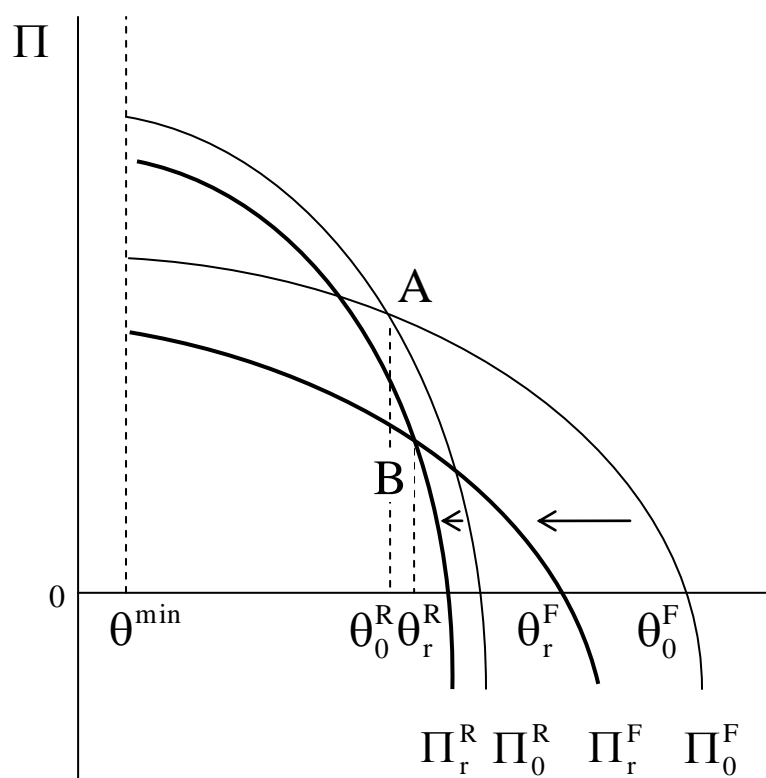
Under these conditions, the competitiveness of the South will improve in the long run since the number of firms choosing to produce high quality goods increases in the initial period. This also insures that equation 12 will be positive ($\partial \overline{q} / \partial r > 0$). Since the number of firms producing high-quality goods has increased relative to the fly-by-nights, the average quality of goods produced by the South is unambiguously positive.

Increases in average quality will also have a permanent effect on a country's competitiveness. Chisik (2002, 2003) shows that when consumers have incomplete information about product quality, reputational comparative advantage can be more important in determining the pattern of trade than advantages relating to production costs. In addition, Das and DeLoach (2003) show that since consumers are likely to make inferences about the expected quality of new products based on past experience with related goods from the same country, positive reputation spillovers can be generated when more firms are encouraged to pursue a reputable

strategy during infancy. This can also lead to improved competitiveness for firms in related industries from that same country. These reputation effects are likely to be even more important for less-developed countries.

4. POLICY IMPLICATIONS

The model generates predictions consistent with recent empirical work on the effect of social standards on export competitiveness. But it also offers an important policy recommendation: some internationally-imposed PPM standards can actually improve the competitiveness of less-developed countries as they attempt to enter world markets. Contrary to the prevailing view of the WTO, compliance with PPM standards can increase the number of high-quality firms entering the market, ultimately increasing the average quality of goods exported from less-developed countries. But this result only holds under the conditions generated in equation 14. The key is the degree of complementarity between the proposed PPM standard and process determining high-quality production. To illustrate this point, consider the following examples of PPMs that are often discussed in the literature.

A typical environmental standard that falls into the category of PPMs involves mandatory scrubber systems to control air pollution. When such a standard is imposed, firms must make significant investments in pollution-abatement infrastructure. But such systems control only the by-product of production. As a result, regardless of the quality of the good being produced, it is difficult to imagine that these infrastructure costs would be any different for high-quality producers versus their low-quality counterparts. So, if the costs are identical the number of firms of both quality type decreases. As a result, it is likely this type of PPM standard would diminish the competitiveness of firms from LDCs in the long run. This is consistent with the bulk of

empirical evidence that finds a negative relationship between higher environmental standards and exports.

In contrast, the logic differs when we turn to labor standards. Consider the relative skill level of the labor inputs required to produce quality. The greater the skill of labor required for production, the more likely it is that high quality producers will pay efficiency wages, offer more benefits, better working conditions, etc. In such cases, meeting stringent international labor standards would impose a relatively small cost on high-quality firms, but a relative large cost on fly by nights. For example, consider the differences between electronics and textiles. Many electronics require relatively highly-skilled workers. Most textiles do not. If a PPM standard mandating "livable wages" for workers was imposed, countries heavily endowed with textiles would more likely be hurt while countries heavily dependent on electronics might be helped. This prediction is consistent with the recent evidence showing that higher labor standards are positively related to manufacturing exports.

5. CONCLUSION

The empirical literature concerning the effects of environmental and labor standards on export competitiveness yields mixed results. While evidence suggests that higher environmental standards hurt exports, there is also some evidence that higher labor standards may increase exports. For the first time, this paper offers a simple theoretical model of trade that is capable of explaining this paradox.

Of course, it is important to understand the conditions that generate the model's predictions. The model is restricted to situations where firms are new entrants into an established international market and face a reputational comparative disadvantage due to the lack

of information of their product quality. This is more likely to hold for developing countries than for developed ones. Ultimately, the effect of social standards on the competitiveness of these countries depends on the degree of complementarity between high quality production and the proposed standard. Among other factors, this complementarity depends on both the type of PPM and the industry to which it is imposed.

These results offer an important challenge to popular thinking about the effects of social standards on trade, particularly with respect to ongoing North-South debates. The WTO's rationale against the imposition of international production standards related to social concerns is based on its effect on competition. They assume a country's exports will be less competitive if forced to adhere to more stringent standards imposed by another. This paper shows this logic to be overly simplistic. Rather than outlawing all PPM standards, the WTO should distinguish between standards that complement product quality versus those that do not.

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Notes

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[1] This is not to say that the WTO does not support fundamental labor standards. In fact, the WTO confirmed its support for international labor standards at the Singapore ministerial conference of 1996 (Doumbia-Henry and Gravel 2006). Their position is that the establishment and enforcement of such standards is the role of the ILO. Nevertheless, the issue regarding the extent to which standards based on PPMs unduly harms competition is still controversial.

[2] Under the General Agreement on Tariffs and Trade 1994, member countries are prohibited from enacting standards with respect to PPMs that discriminate against exports from another country in favor of "like products" from either domestic sources or exports of a third country. Such restrictions are also covered under the Technical Barriers to Trade agreement (Beaulieu and Gaisford 2002). While exceptions may exist (e.g., Article XX of the GATT), it is clear that it is the intent of the WTO to prohibit disguised protectionism.

[3] The literature on labor standards and exports is sparse because of the difficulty in measuring standards. Until recently, most studies were forced to use ratifications of ILO conventions as a proxy for adherence to labor standards. This measure has obvious flaws since it does not measure enforcement. Only recently has there been an attempt to measure enforcement (see Kucera and Sarna 2006).

[4] Ulph (1999) for an overview of this literature.

[5] See Leland (1979), Shapiro (1983), Shapiro (1986), and Ronnen (1991).

[6] For other models that rely on a similar framework, see Mayer (1984), Bagwell and Staiger (1989), Bagwell (1991), Chen (1991), Skeath (1995), Chisik (2003) and Das and DeLoach (2003).

[7] For example, US imports from Asian and Pacific countries (excluding Japan, Australia and New Zealand) are now dominated by goods such as beverages, manufactures, apparel, cosmetics and pharmaceuticals. Using data from the U.S. Department of Commerce (2008), we estimate that between 1990 and 2005 alone, the share of all Asian exports to the US that are experience goods has risen from 38% to 58%.

[8] For tractability of the model, we have eliminated the possibility that Northern firms can outsource production of their name-brand goods to the South. Implicitly, our model assumes such activities do not eliminate the problem faced by infant firms in the South. This is not entirely unreasonable. Quality and reputation are clearly valued even in the production of outsourced goods. In such cases, the "consumer" in the North is actually the Northern firm that imports the goods and resells them under their own brand name. Consequently, consistent with the assumptions of the present model, fly-by-night firms from the South will not be able to meet the quality demanded by Northern brand name retailers in the long run.

[9] There could be a number of possible reasons for this. It could simply be an effort to protect its industries from Southern competition. Or, it could be a welfare-maximizing decision. For example, if consumption of the good produces a transboundary negative externality (e.g.

pollution), it would be welfare-improving to impose some sort of regulation on imports from the South.

[10] Obviously LDCs value social standards. For example, India has worked for years to eliminate child labor. PROGRESA (now called Oportunidades) is a major program of the Mexican government aimed reducing problems like malnutrition, morbidity, school dropout rates and unhealthy living conditions. Moreover, it is clearly not the case that all labor and environmental standards are imposed by developed countries. Nevertheless, it is true that many developed countries want to impose even tougher standards on their less-developed counterparts. That alone justifies the strong assumption maintained in this model.

[11] This allows for moral hazard in the firm's choice of quality, while the heterogeneity across firms in the cost of providing quality effectively introduces adverse selection.

[12] This assumption is consistent with the Grossman and Horn (1988) setup. This assumption rules out the possibility of moral hazard in the second period of the model. In a finite period model, all agents face a moral hazard problem. In this model, without this assumption all reputable firms that survived the first period would clearly 'cheat" and produce low-quality goods once they have established their reputation for quality.

[13] This is analogous to ISO 9000 quality standards, whereby any firms that do not adhere to this minimum standard cannot engage in international trade.

[14] We have ruled out performance uncertainty and quality randomness in production.
[15] For example, firms that fail to meet ISO 9000 standards would obviously have difficulty competing with firms that do meet these minimum quality standards. But firms that fail to meet PPM standards could well have an advantage since their costs are lower.

[16] Following Grossman and Horn (1988), Chen (1991) and Skeath (1995) we assume that consumers have rational expectations of quality. This rules out arbitrary pessimistic expectations that would eliminate low quality producers in the first period.

[17] From the point of view of a policy maker in the South, this is inefficient. The best policy, of course, would be to find a way to provide international consumers with perfect information about the quality of goods produced from this country. Barring that, policy makers would prefer to find a way to provide incentives to productive firms to choose high quality and limit entry of those less productive, low quality firms. However, the Southern policy makers do not have the necessary information to do this. Historically, indiscriminate protection of all infant industries has not been successful without the ability to reward the high quality producers and punish the low quality producers. However, this is not possible under incomplete information.