

# Social Dumping and International Trade\*

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## Abstract

In this paper, I investigate the effects of social dumping in a North-South trade model when firms strategically interact in the output market. The South firm practices social dumping due to its monopsonistic power in the labour market. I show that, contrary to a common complaint by firms in developed countries, social dumping by the South firm is beneficial to the North firm. The South firm, on the other hand, may be better off by not practicing social dumping. North consumers suffer from social dumping. Imposing social clause tariffs or labour standards results in conferring a strategic advantage on the South firm, whereas it may improve social welfare in the North.

*Keywords:* social dumping; monopsony; oligopsony; labour standards; social clause tariffs; Cournot oligopoly.

*JEL classification:* F12; F13; J42; J80; L13.

**A preliminary draft. Please do not quote without author's permission. Comments and suggestions are welcome.**

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# 1 Introduction

*Social dumping* refers to a situation in which firms that are located in countries where labour standards are lax produce and export goods at excessively low prices by using unduly cheap labour under poor working conditions (Corden and Vousden, 2001). Those firms practice dumping in international markets by exploiting lax labour standards at the expense of workers. For example, Nike, a famous sportswear company, was accused of the abusive labour practices of its contractors, such as low wages, long working hours, verbal abuse, and unsafe working conditions, in Indonesia, China, Vietnam, and other developing countries.<sup>1</sup> GAP, a popular apparel company, was also accused of low wages and poor health and safety conditions in factories of its contractors in several countries, including Bangladesh, Indonesia, Lesotho, and Mexico.<sup>2</sup>

In the case of multinational enterprises (MNEs), social dumping also means “the decision of a home firm to serve the domestic market through a plant located in a foreign country, where workers’ protection does not meet home standards and labor costs are thus significantly lower” (Cordella and Grilo, 2001: p. 645). Social dumping is not just the choice of firms. It is argued that the governments of developing countries often set lax labour standards “to create a competitive cost advantage for their own industries” (Sinn, 2001: p. 3) or to attract MNEs. Such behaviour of the governments may result in a “race to the bottom.”

In order to prevent social dumping and protect firms located in developed countries from the threat of “unfair competition” arising from social dumping, labor unions in European countries and other developed countries and human rights activists argue that “market access in the North should be conditioned on raising labor standards in the South” (Golub, 1997: p. 20). The legal linkage between labour standards and trade restrictions is sometimes referred to as “social clauses.” For example, the 1988 Trade

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<sup>1</sup>See, for example, reports by the Global Alliance for Workers and Communities, an international coalition dedicated to improving the workplace experiences, particularly in Asia, at <http://www.theglobalalliance.org/>.

<sup>2</sup>A report by Union of Needletrades, Industrial and Textile Employees (UNITE) revealed working conditions in GAP factories based on interviews with employees in GAP factories (UNITE, 2002). UNITE was merged with HERE in 2004, forming UNITE HERE.

Act of the United States (U.S.) made systematic denial of internationally recognized worker rights by foreign countries an unfair trade practice and liable for U.S. counter-measures (Brown, Deardorff, and Stern, 1996). Labour standards are divided into core labour standards (CLS), which are widely accepted by most of the countries,<sup>3</sup> and other labour standards, which are less universally accepted (Brown, Deardorff, and Stern, 1996, 1998).<sup>4</sup> The latter includes a minimum wage, limitations on hours of work, and occupational safety and health rights in the workplace. Adoption of a particular type of social clauses in international trade agreements has been proposed and discussed.<sup>5</sup> However, developing countries argue that such social clauses are disguised protectionism. In particular, social clauses with regard to labour standards other than CLS are disputable.

In order to examine the effects of social dumping, it is important to know the sources of social dumping. Maskus (1997) and Martin and Maskus (2001) point out that one potential source of social dumping is the monopsonistic labour markets in developing countries. When firms have monopsony power in labour markets, they pay their workers wage rates below the marginal value product of labour. Since this situation can be interpreted as “dumping,” the monopsonistic labour markets are considered to be a source of social dumping. In fact, the imperfect competition in labour markets has recently been a hot issue in the literature (Boal and Ransom, 1997; Bhaskar, Manning, and To, 2002). A number of studies find empirical evidence of imperfectly competitive labour markets. These studies include estimation of elasticity of labour supply to individual firm (Sullivan, 1989; Boal, 1995; Staiger, Spetz, and Phibbs, 1999), comparison of labour market concentration and the wage level (Link and Landon, 1976), positive employment effects of minimum wages (Card and Krueger, 1994), and inter-industry wage differentials (Krueger and Summers, 1988; Gibbons and Katz, 1992).

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<sup>3</sup>According to OECD (1996), CLS include (i) prohibition of forced labour; (ii) elimination of exploitative use of child labour; (iii) nondiscrimination in employment; (iv) freedom of association; and (v) the right to organize and bargain collectively. The international consensus on CLS stems from the acceptance and ratification of United Nations Covenants and Conventions as well as the Conventions of the International Labor Organization (ILO).

<sup>4</sup>There is a large literature on labour standards and trade. See, for example, Abe and Zhao (2005), Bagwell and Staiger (1999, 2001), Bhagwati (1995), Brown (2001), Martin and Maskus (2001), Maskus (1997), and Srinivasan (1995).

<sup>5</sup>See, for example, de Wet (1995). See also Leary (1996) and Brown, Deardorff, and Stern (1996) for a survey of social clauses in international trade agreements.

The main purpose of this paper is to examine the effects of social dumping in international markets when social dumping stems from monopsonistic labour markets. The importance of the interaction between the strategic relationship of firms in the output market and the monopsonistic power in the labour market is emphasized. This is mainly because, as is seen from examples of Nike and GAP, in many cases firms practicing social dumping also have some market power in the output market.<sup>6</sup> In this paper, I construct a simple duopoly model with asymmetric labour markets. Two firms located in different countries in which conditions of labour markets are different. In one country, the labour market is perfectly competitive, whereas in the other country the labour market is monopsonistic. This asymmetry in the labour markets affects the strategic relationship of firms in the output market. I also examine the effects of various policies, such as tariffs and labour standards, by the government of the country in which the output market is located. I only consider the case in which the output market is located in the country whose firm does not practice social dumping.

The major results in this paper are as follows. First, I show that in the monopsonistic labour market social dumping is practiced in the sense that the wage rate is below the marginal value product of labour. It is shown that, when the output market is under Cournot competition, the firm that practices social dumping may ironically suffer from its own social dumping. Under some plausible conditions, it could earn higher profits by not practicing social dumping. The rival firm that does not conduct social dumping, on the other hand, actually benefits from the other firm's social dumping.

Second, when social welfare in the country where the output market is located is reduced by the foreign firm's social dumping, its government may have an incentive to implement some policies to improve domestic welfare. I show that each of three policy instruments, namely, ad valorem tariffs, social clause tariffs, and labour standards, may improve domestic welfare. Social clause tariffs are tariffs on imports of goods produced under social dumping in order to narrow down the gap between the competitive level of wage rate and the actual one paid by the foreign firm. However, the effects of these

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<sup>6</sup>For example, Nike holds 36 per cent of market share in the U.S. athletic footwear market and 33 per cent in the global athletic footwear market, according to Sporting Goods Intelligence (<http://www.sginews.com/>).

policies on domestic and foreign firm's profits are different. An ad valorem tariff works as a tool to shift rents from the foreign firm to the domestic firm. A social clause tariff, on the other hand, works against the domestic firm. It may or may not increase profits of the firm that practices social dumping, depending on the conditions in the labour market. Labour standards, which increase the wage paid by the firm engaging in social dumping, hurt the domestic firm and help the foreign social-dumping firm.

The results in this paper brings out the striking contrast between social dumping and *ecological dumping*,<sup>7</sup> which refers to a "situation in which a government uses lax environmental standards to support domestic firms in international markets" (Rauscher, 1994: p. 823). The existing studies have shown that ecological dumping is typically seen when the output market is imperfectly competitive and that ecological dumping actually confers a competitive advantage on domestic firms in international markets (Conrad, 1993; Barrett, 1994; Kennedy, 1994; Rauscher, 1994). By contrast, I show that social dumping arising from the monopsonistic labour market may be harmful to the firm that practices social dumping and is beneficial to the rival firm. This surprising result holds only when firms interact strategically with each other in the output market.

A number of existing studies are related to this paper. Naghavi (2005) is most closely related to this paper. Like this paper, he investigates the consequences of asymmetric labour markets in a North-South trade model. In the South, the labour market is oligopsonistic, while it is perfectly competitive in the North. Unlike this paper, however, he assumes that the North firm can choose its plant location in either country and focuses on the effects of oligopsony in the South labour market on the North firm's location choice. He shows that the North firm is not always attracted to the South. However, he does not analyze how the market outcomes differ, depending on the conditions in the South labour market. He does not examine the effects of tariffs, either.

Cordella and Grilo (2001) also examine whether firms in the North choose to relocate their plants to low wage countries whose labour conditions do not meet North standards. They explore how the adoption of a social clause affects firms' relocation decisions. They

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<sup>7</sup>Ecological dumping is alternatively called "eco-dumping" or "environmental dumping."

model social clause as a requirement of additional payment to South workers to narrow down the wage gap between the two countries. Their paper is different from mine in that their main concern is on the effects of social clause on firms' relocation decisions.<sup>8</sup> Moreover, they do not consider the role of oligopsony in labour markets.

Maskus (1997) and Martin and Maskus (2001) also analyze the effects of monopsony in the labour market. These two papers also examine the effects of tariffs on imports from the country in which the labour market is under monopsony. However, since they do not consider the strategic interaction between firms in the output market, the relationship between imperfect competition in the output market and social dumping in the input market is not clarified by their analysis.<sup>9</sup>

Corden and Vousden (2001) examine the effects of improving labour standards in the export sector of developing countries. Although their main purpose is to analyze the effects of improving labour standards in the export sector on the wage differential between the export and import sectors, they also explore the interaction between the monopsonistic labour market and terms-of-trade effects. However, the strategic interaction between firms in the output market is again not considered.

The interaction of oligopoly in the output market and oligopsony in the factor markets is analyzed by Okuguchi (1998, 2000). He considers the model in which firms that play Cournot competition in the output market are oligopsonists in the factor market. His model is different from mine in that firms share the same factor market. In my case, since firms are located in different countries, they do not share the same factor market.

The remainder of the paper is organized as follows. Section 2 sets up the model. Section 3 examines the effects of social dumping. Section 4 analyzes the effects of tariffs and labour standards. Section 5 concludes.

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<sup>8</sup>Leahy and Montagna (2000) investigate MNEs' location choices from the viewpoint of the governments in developing countries. They show that the governments of developing countries have an incentive to engage in social dumping in the sense of banning labour union in the short run to attract MNEs and extract higher rents in the long run.

<sup>9</sup>In the trade literature, the effects of the monopsony and oligopsony power in primary factor markets (Feenstra, 1980; Markusen and Robson, 1980; McCulloch and Yellen, 1980) and in intermediate good markets (Devadoss and Song, 2003a, b) have been examined in general equilibrium models with perfectly competitive final good sectors. Kuroda (2004) examines the effects of local content protection in a small open economy with monopsonistic local intermediate good market. See also Bhagwati, Panagariya, and Srinivasan (1998, Chapter 24).

## 2 The Model

There are two countries: Country N and Country S. In each country, one firm is located. Call these firms firm N and firm S. These firms produce a homogenous good. Let  $y^N$  and  $y^S$  be firms N and S's output, respectively. Labour is the only production factor. For simplicity, I assume that one unit of labour is required to produce one unit of output. That is,  $y^i = l^i$ ,  $i = N, S$ , where  $l^i$  is employment by firm  $i$ .

I assume that labour markets in the two countries are completely separated and that workers do not move beyond the border. The labour market in Country N is competitive and hence the wage rate in Country N is fixed at  $w^N$ . The labour market in Country S is, on the other hand, monopsonistic.<sup>10</sup> Firm S realizes that it faces an upward-sloping labour supply curve. The inverse labour supply that firm S faces is given by

$$w^S = w(l^S) = \gamma + \beta l^S, \quad (1)$$

where  $w^S$  is the wage rate paid by firm S,  $\gamma > 0$ , and  $\beta > 0$ . As is well known, the wage rate paid by the monopsony firm is less than the marginal value product of labour. I interpreted this situation as the firm practicing social dumping.

The output market is duopolistic. I assume that firms compete in quantities in Cournot fashion. For simplicity, I assume that the output market exists only in Country N. The inverse demand in the market in Country N is given by

$$p(y) = a - y, \quad (2)$$

where  $y \equiv y^N + y^S$  and  $a > 0$ . Firm  $i$ 's profit,  $\pi^i(y^N, y^S)$ , is then given by

$$\pi^i(y^N, y^S) = (p(y) - w^i)y^i, \quad i = N, S. \quad (3)$$

Consumer's surplus in Country N,  $CS^N$ , is given by

$$\begin{aligned} CS^N &= \int_0^y p(t) dt \\ &= y^2/2. \end{aligned} \quad (4)$$

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<sup>10</sup>In the subsequent analysis, I also consider the case in which firm S behaves as a price taker in the labour market as a benchmark.

Social welfare in Country N,  $W^N$ , is measured by the sum of firm N's profit and consumer's surplus, i.e.,  $W^N = \pi^N + CS^N$ . When the government of Country N imposes any tariffs on imports, tariff revenue is added to the social welfare measure.

The government of Country N implements various policies, which will be examined in section 4. I only consider the case in which the government commits to a certain policy before firms act. Throughout the paper, the government of Country S is assumed to be passive and allow its domestic firm to practice social dumping unless Country N requires labour standards on its imports.

### 3 Social Dumping

In this section, I analyze the effects of firm S's practicing social dumping. As will be shown below, the strategic interaction between firms in the output market plays an important role to determine the effects of social dumping.

From the first-order condition (FOC) for profit maximization, firm N's reaction function is given by

$$y^N(y^S) = \frac{a - w^N - y^S}{2}. \quad (5)$$

Firm S's reaction function is, on the other hand, given by

$$y^S(y^N) = \frac{a - \gamma - y^N}{2(1 + \beta)}. \quad (6)$$

Assuming interior solutions, outputs and profits in Nash equilibrium (NE) are respectively given by

$$y_c^N = \frac{(1 + 2\beta)a - 2(1 + \beta)w^N + \gamma}{3 + 4\beta}, \quad y_c^S = \frac{a + w^N - 2\gamma}{3 + 4\beta}, \quad (7)$$

$$\pi_c^N = (y_c^N)^2, \quad \pi_c^S = (1 + \beta)(y_c^S)^2, \quad (8)$$

where the subscript  $c$  indicates equilibrium variables in the case of Cournot competition in the output market. Interior solutions require

$$2\gamma - a < w^N < \frac{(1 + 2\beta)a + \gamma}{2(1 + \beta)}. \quad (9)$$

Consumer's surplus and social welfare in Country N are respectively given by

$$CS_c^N = \frac{(2(1 + \beta)a - (1 + 2\beta)w^N - \gamma)^2}{2(3 + 4\beta)^2}, \quad (10)$$

$$W_c^N = \frac{2(6\beta^2 + 8\beta + 3)(a - w^N)^2 - (4\beta a - (3 + 4\beta)w^N + 3\gamma)(w^N - \gamma)}{2(3 + 4\beta)^2}. \quad (11)$$

As a benchmark I consider a case in which firm S is a price taker in the South labour market. In this case, firm N's reaction function does not alter and hence is given by (5).

Firm S's reaction function in this case is, on the other hand, given by

$$y^S(y^N) = \frac{a - \gamma - y^N}{2 + \beta}. \quad (12)$$

Outputs and profits in NE are then given by

$$\tilde{y}_c^N = \frac{(1 + \beta)a - (2 + \beta)w^N + \gamma}{3 + 2\beta}, \quad \tilde{y}_c^S = \frac{a + w^N - 2\gamma}{3 + 2\beta}, \quad (13)$$

$$\tilde{\pi}_c^N = (\tilde{y}_c^N)^2, \quad \tilde{\pi}_c^S = (\tilde{y}_c^S)^2, \quad (14)$$

respectively, where a tilde ( $\tilde{\cdot}$ ) indicates variables in the case where firm S is a price taker in the labour market in Country S. Interior solutions require

$$2\gamma - a < w^N < \frac{(1 + \beta)a + \gamma}{2 + \beta}. \quad (15)$$

Note that since  $((1 + \beta)a + \gamma)/(2 + \beta) < ((1 + 2\beta)a + \gamma)/2(1 + \beta)$ , (15) is stronger than (9). Consumer's surplus and social welfare in Country N are respectively given by

$$\widetilde{CS}_c^N = \frac{((2 + \beta)a - (1 + \beta)w^N - \gamma)^2}{2(3 + 2\beta)^2}, \quad (16)$$

$$\widetilde{W}_c^N = \frac{(3\beta^2 + 8\beta + 6)(a - w^N)^2 - (2\beta a - (3 + 2\beta)w^N + 3\gamma)(w^N - \gamma)}{2(3 + 2\beta)^2}. \quad (17)$$

From (7) to (17), the following proposition is obtained.

**Proposition 1** *Under Cournot competition in the output market, (i) firm N benefits from firm S's social dumping; (ii) firm S earns higher profits by not practicing social dumping if  $\beta$  is low; (iii) the employment by firm S is lower when firm S practices social dumping; and (iv) Country N suffers from social dumping by firm S if  $w^N$  is high.*

*Proof.* (i) From (7) and (13), it yields that  $y_c^N - \tilde{y}_c^N = \beta(a + w^N - 2\gamma)/(3 + 2\beta)(3 + 4\beta) > 0$  using (9). Thus,  $\pi_c^N - \tilde{\pi}_c^N = (y_c^N)^2 - (\tilde{y}_c^N)^2 > 0$ . (ii) From (8) and (14), it follows that  $\pi_c^S - \tilde{\pi}_c^S = (a + w^N - 2\gamma)^2\beta(4\beta^2 - 3)/(3 + 2\beta)^2(3 + 4\beta)^2$ . Thus,  $\pi_c^S \leq$  (*resp.*  $>$ )  $\tilde{\pi}_c^S$  if and only if  $\beta \leq$  (*resp.*  $>$ )  $\bar{\beta}$ , where  $\bar{\beta} = \sqrt{3}/2 \approx 0.866$ . (iii) Using (7) and (13), it yields that  $l_c^S - \tilde{l}_c^S = y_c^S - \tilde{y}_c^S = -2\beta(a + w^N - 2\gamma)/(3 + 2\beta)(3 + 4\beta) < 0$ . (iv) Comparing (11) with (17) yields  $W_c^N - \tilde{W}_c^N = (a + w^N - 2\gamma)\beta\{\beta(9 + 8\beta)a - (8\beta^2 + 27\beta + 18)w^N + 18(1 + \beta)\gamma\}/2(3 + 2\beta)^2(3 + 4\beta)^2$ . Thus,  $W_c^N \leq$  (*resp.*  $>$ )  $\tilde{W}_c^N$  if and only if  $w^N \geq$  (*resp.*  $<$ )  $\bar{w}^N$ , where  $\bar{w}^N = (\beta(9 + 8\beta)a + 18(1 + \beta)\gamma)/(8\beta^2 + 27\beta + 18)$ . Since  $\bar{w}^N$  satisfies (9),  $w^N \geq \bar{w}^N$  and  $w^N < \bar{w}^N$  are both non-empty. ■

A surprising result in this proposition is that firm N *benefits* rather than suffers from firm S's social dumping. Firm S, on the other hand, is *not always* better off by practicing social dumping. In particular, if  $\beta$  is approximately lower than 0.866, firm S earns higher profits by not practicing social dumping. This makes a sharp contrast with the result in the case of competitive output market. As is well known, if the output market is perfectly competitive, a firm earns higher profits under monopsony than under price taker. The strategic interaction between two firms in the output market makes this difference.

When firm S has a monopsony power in the labour market, it takes into account the fact that, given firm N's output, it can increase its profits by *reducing* employment from the competitive level. However, since the output is proportional to the employment level, this choice decreases firm S's output level for a given level of firm N's output. This means that firm N is now facing a less-aggressive rival and hence that it can expand its output because outputs are strategic substitutes. Consequently, firm N's output in NE is higher and firm S's output in NE is lower under monopsonistic labour market.

Figure 1 depicts reaction curves of the two firms.  $R^N$  indicates firm N's reaction curve.  $R^S$  and  $\tilde{R}^S$  indicate firm S's reaction curves with and without social dumping, respectively. As drawn in the figure, by practicing social dumping, firm S's reaction curve shifts inward, changing the Nash equilibrium point from  $\tilde{E}_c$  to  $E_c$ . As a result,  $y^N$  in NE becomes higher and  $y^S$  in NE becomes lower.

Although firm S's social dumping causes its output to contract, it increases the mark-

up. With social dumping, the mark-up is given by  $\lambda_c \equiv p_c - w_c^S = (a + w^N - 2\gamma)(1 + \beta)/(3 + 4\beta)$ . Without social dumping, on the other hand, the mark-up is given by  $\tilde{\lambda}_c \equiv \tilde{p}_c - \tilde{w}_c^S = (a + w^N - 2\gamma)/(3 + 2\beta)$ . Thus, it follows that

$$\lambda_c - \tilde{\lambda}_c = \frac{(a + w^N - 2\gamma)\beta(1 + 2\beta)}{(3 + 2\beta)(3 + 4\beta)} > 0.$$

Firm S's monopsony power in the labour market becomes higher as the labour supply becomes less elastic, i.e., as  $\beta$  becomes higher. It holds that  $\partial(\lambda_c - \tilde{\lambda}_c)/\partial\beta = (a + w^N - 2\gamma)(28\beta^2 + 36\beta + 9)/(3 + 2\beta)^2(3 + 4\beta)^2 > 0$ . Thus, when  $\beta$  is low, the effect of a reduction in the output dominates that of an increase in mark-up by practicing social dumping. Hence, firm S's profit is lower under social dumping. As  $\beta$  becomes higher, the effect of an increase in mark-up by social dumping tends to dominate that of a reduction on the output, yielding higher profits for firm S by social dumping.

Although firm S's social dumping is good for firm N, it may not be good for Country N as a whole, because consumers in Country N suffer from firm S's social dumping. In particular, when  $w^N > (\beta(9 + 8\beta)a + 18(1 + \beta)\gamma)/(8\beta^2 + 27\beta + 18)$ , the loss in consumer's surplus dominates the gain in firm N's profits and hence social welfare in Country N is lowered by social dumping.

## 4 Tariffs and Labour Standards

In the previous section, I show that when the output market is imperfectly competitive, social dumping by firm S benefits firm N. However, since social welfare in Country N may be lower when firm S practices social dumping, the government of Country N may have an incentive to implement policy to improve domestic welfare. In this section, I consider three policy instruments. I first consider usual tariffs on imports. Although the case of ad valorem tariffs is examined, qualitative results do not alter even when specific tariffs are chosen. Second, I consider so-called *social clause tariffs*. These tariffs are imposed as a fraction of the difference between the competitive and the actual level of wage in Country S. Social clause tariffs are aimed at correcting social dumping by imposing tariffs. Finally, I consider labour standards.

#### 4.1 Ad valorem tariffs

I first consider ad valorem tariffs on imports. Let  $t$  be an ad valorem tariff imposed by the government of Country N on imports from abroad.

When a tariff is imposed, firm S's profit is given by

$$\pi^S(y^S, y^N; t) = ((1-t)p(y) - w^S(y^S)) y^S. \quad (18)$$

From the FOC, firm S's reaction function in this case is given by

$$y^S(y^N) = \frac{(1-t)(a - y^N) - \gamma}{2(1-t + \beta)}. \quad (19)$$

Firm N's reaction function remains the same, which is given by (5). Then, assuming interior solutions, outputs and profits in NE are respectively given by

$$y_t^N = \frac{(1-t + 2\beta)a - 2(1-t + \beta)w^N + \gamma}{3(1-t) + 4\beta}, \quad y_t^S = \frac{(1-t)(a + w^N) - 2\gamma}{3(1-t) + 4\beta}, \quad (20)$$

$$\pi_t^N = (y_t^N)^2, \quad \pi_t^S = (1-t + \beta)(y_t^S)^2, \quad (21)$$

where the subscript  $t$  indicates equilibrium variables in the case of ad valorem tariffs. Consumer's surplus and tariff revenue in Country N,  $TR^N$ , are respectively given by

$$CS_t^N = \frac{\{2(1-t + \beta)a - (1-t + 2\beta)w^N - \gamma\}^2}{2(3(1-t) + 4\beta)^2},$$

$$TR_t^N = \frac{t\{(1-t + 2\beta)(a + w^N) + \gamma\}\{(1-t)(a - \gamma) - 2\gamma\}}{(3(1-t) + 4\beta)^2}.$$

Social welfare in Country N in this case is given by  $W_t^N = \pi_t^N + CS_t^N + TR_t^N$ .

The effects of a small ad valorem tariff are shown in the following proposition:

**Proposition 2** *A small ad valorem tariff on imports of goods by Country N has the usual rent-shifting effect. That is, it raises firm N's profits and reduces firm S's profits. It may also improve Country N's social welfare.*

*Proof.* Differentiate  $\pi_t^N$  with respect to  $t$  and evaluate the derivative at  $t = 0$  to yield

$$\left. \frac{\partial \pi_t^N}{\partial t} \right|_{t=0} = \frac{2(2\beta(a + w^N) + 3\gamma)((1 + 2\beta)a - 2(1 + \beta)w^N + \gamma)}{(3 + 4\beta)^3} > 0,$$

using (9). Similarly, differentiate  $\pi_t^S$  with respect to  $t$  and evaluate the derivative at  $t = 0$  to obtain

$$\left. \frac{\partial \pi_t^S}{\partial t} \right|_{t=0} = -\frac{(a + w^N - 2\gamma)((8\beta^2 + 12\beta + 3)(a + w^N) + 2(3 + 2\beta)\gamma)}{(3 + 4\beta)^3} < 0.$$

Differentiating  $W_t^N$  with respect to  $t$  and evaluating the derivative at  $t = 0$  yields

$$\left. \frac{\partial W_t^N}{\partial t} \right|_{t=0} = \frac{\Gamma}{(3 + 4\beta)^3},$$

where  $\Gamma \equiv (2\beta(a + w^N) + 3\gamma)(2\beta a - (3 + 2\beta)w^N + 3\gamma) + (3 + 4\beta)(a + w^N - 2\gamma)((1 + 2\beta)(a + w^N) + \gamma)$ . If  $w^N < (2\beta a + 3\gamma)/(3 + 2\beta)$ ,  $\Gamma > 0$  holds, where  $\bar{w}^N < (2\beta a + 3\gamma)/(3 + 2\beta) < ((1 + \beta)a + \gamma)/(2 + \beta)$ , where  $\bar{w}^N$  is defined in the proof of Proposition 1. Moreover,  $\Gamma$  can be rewritten as  $\Gamma = (4\beta^2 + 4\beta + 3)(w^N)^2 + 2\{(8\beta^2 + 7\beta + 3)a - 2(4\beta^2 + 4\beta + 3)\gamma\}w^N + (12\beta^2 + 10\beta + 3)a^2 - (16\beta^2 + 4\beta + 3)a\gamma - (8\beta - 3)\gamma^2$ . Let  $w_1$  and  $w_2$  be two solutions of  $\Gamma = 0$ , where  $w_1 < w_2$ . Then,  $\partial W_t^N / \partial t|_{t=0} > 0$  if and only if  $w^N < w_1$  or  $w_2 < w^N$ . ■

Proposition 2 shows that a small ad valorem tariff in this context works in a way similar to how it works in the standard models of strategic trade policy.<sup>11</sup> It has a rent-shifting effect and may also be used as a tool to improve domestic welfare.

## 4.2 Social clause tariffs

I now turn to the case of social clause tariffs. When a social clause tariff is imposed, firm S's effective wage is given by

$$\begin{aligned} w_\tau^S &= w^S + \tau(w^{S*} - w^S) \\ &= (1 - \tau)w^S + \tau w^{S*}, \end{aligned} \tag{22}$$

where  $\tau$  is a social clause tariff rate and  $w^{S*}$  is the wage rate when firm S is a price taker in the labour market, given the imperfectly competitive output market.  $w^{S*}$  is given by

$$\begin{aligned} w^{S*} &= \gamma + \beta \tilde{y}_c^S \\ &= \frac{\beta(a + w^N) + 3\gamma}{3 + 2\beta}, \end{aligned}$$

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<sup>11</sup>With respect to the effects of tariffs in the standard models of strategic trade policy, see, for example, Helpman and Krugman (1989, Chapter 6).

where  $\tilde{y}_c^S$  is given by (13).

When a social clause tariff is imposed, firm S's profit is given by  $\pi_\tau^S = (p - w_\tau^S)y^S$ . From the FOC, firm S's reaction function in this case is given by

$$y^S(y^N) = \frac{(3 + 2\beta)(a - \gamma - y^N) - \beta\tau(a + w^N - 2\gamma)}{2(3 + 2\beta)(1 + (1 - \tau)\beta)}. \quad (23)$$

Then, assuming interior solutions, outputs and profits in NE are respectively given by

$$y_\tau^N = \frac{(3 + 2(1 - \tau)\beta)((1 + 2\beta)a - 2(1 + \beta)w^N + \gamma) - 3\beta\tau(a - w^N)}{(3 + 2\beta)(3 + 4(1 - \tau)\beta)}, \quad (24)$$

$$y_\tau^S = \frac{(a + w^N - 2\gamma)(3 + 2(1 - \tau)\beta)}{(3 + 2\beta)(3 + 4(1 - \tau)\beta)}, \quad (25)$$

$$\pi_\tau^N = (y_\tau^N)^2, \quad (26)$$

$$\pi_\tau^S = (1 + (1 - \tau)\beta) (y_\tau^S)^2, \quad (27)$$

where the subscript  $\tau$  indicates equilibrium variables in the case of social clause tariffs.

Consumer's surplus and tariff revenue in Country N are respectively given by

$$CS_\tau^N = \frac{(3 + 2(1 - \tau)\beta)^2(2(1 + \beta)a - (1 + 2\beta)w^N - \gamma) - 3\beta\tau(a - w^N)^2}{2(3 + 2\beta)^2(3 + 4(1 - \tau)\beta)^2}, \quad (28)$$

$$TR_\tau^N = \frac{2\tau(1 - \tau)(a + w^N - 2\gamma)\beta^2}{(3 + 2\beta)(3 + 4(1 - \tau)\beta)}, \quad (29)$$

$$W_\tau^N = \pi_\tau^N + CS_\tau^N + TR_\tau^N. \quad (30)$$

Using (24) to (30), I obtain the following proposition concerning the effects of a small social clause tariff:

**Proposition 3** *A small social clause tariff by Country N necessarily reduces firm N's profits, whereas it improves Country N's social welfare if  $w^N$  is high. Moreover, it increases firm S's profits if  $\beta$  is low and reduces them if  $\beta$  is high. It always raises employment by firm S.*

*Proof.* Differentiate  $\pi_\tau^N$  with respect to  $\tau$  and evaluate the derivative at  $\tau = 0$  to yield

$$\left. \frac{\partial \pi_\tau^N}{\partial \tau} \right|_{\tau=0} = -\frac{6\beta(a + w^N - 2\gamma)((1 + 2\beta)a - 2(1 + \beta)w^N + \gamma)}{(3 + 2\beta)(3 + 4\beta)^3} < 0,$$

using (9). Differentiating  $W_t^N$  with respect to  $\tau$  and evaluating the derivative at  $\tau = 0$  yields

$$\left. \frac{\partial W_\tau^N}{\partial \tau} \right|_{\tau=0} = \frac{\beta(a + w^N - 2\gamma)\Lambda}{(3 + 2\beta)(3 + 4\beta)^3},$$

where  $\Lambda \equiv 32\beta^3 + 48\beta^2 + 18\beta + 3((3 + 2\beta)w^N - 2\beta a - 3\gamma)$ . It is easily shown that  $\Lambda > 0$  if  $w^N > (2\beta a + 3\gamma)/(3 + 2\beta)$ , which satisfies (15). Moreover, differentiate  $\pi_\tau^S$  with respect to  $\tau$  and evaluate the derivative at  $\tau = 0$  to obtain

$$\left. \frac{\partial \pi_\tau^S}{\partial \tau} \right|_{\tau=0} = -\frac{\beta(a + w^N - 2\gamma)^2(8\beta^2 + 6\beta - 3)}{(3 + 2\beta)(3 + 4\beta)^3}.$$

It is shown that  $\partial \pi_\tau^S / \partial \tau|_{\tau=0} \geq$  (*resp.*  $<$ )  $0$  if and only if  $\beta \leq$  (*resp.*  $>$ )  $\hat{\beta}$ , where  $\hat{\beta} = (\sqrt{33} - 3)/8 \approx 0.3431$ . Finally, differentiate  $y_\tau^S$  with respect to  $\tau$  and evaluate the derivative at  $\tau = 0$  to yield

$$\left. \frac{\partial y_\tau^S}{\partial \tau} \right|_{\tau=0} = \frac{6\beta(a + w^N - 2\gamma)}{(3 + 2\beta)(3 + 4\beta)^2} > 0.$$

■

This proposition implies that, unlike the case of ad valorem tariffs, a small social clause tariff *does* confer a strategic advantage on firm S by *reducing* its market power in the labour market. In fact, a small social clause tariff allows firm S to commit to a higher employment level, which in turn means a higher output level, for a given level of firm N's output. Because of this, the tariff hurts firm N. Nevertheless, it improves social welfare in Country N if  $w^N$  is high, because it increases consumer's surplus and also generates tariff revenue. As  $w^N$  is higher, firm N's market share becomes smaller. Thus, if  $w^N$  is high, the loss in firm N's profits is dominated by the gain in consumer's surplus and tariff revenue, and hence social welfare in Country N is improved by the small social clause tariff. The effect of a small social clause tariff on consumer's surplus can be seen by differentiating (28) with respect to  $\tau$  and evaluating the derivative at  $\tau = 0$ :

$$\left. \frac{\partial \text{CS}_\tau^N}{\partial \tau} \right|_{\tau=0} = \frac{3(a + w^N - 2\gamma)\beta(2(1 + \beta)a - (1 + 2\beta)w^N - \gamma)}{(3 + 2\beta)(3 + 4\beta)^3} > 0,$$

using (9) and  $y_c = y_c^N + y_c^S = (2(1 + \beta)a - (1 + 2\beta)w^N - \gamma)/(3 + 4\beta) > 0$ . Despite the strategic advantage conferred by the tariff, firm S does not always benefit from a small social clause tariff. This is because its mark-up is reduced by the tariff, which can be confirmed by differentiating  $\lambda_\tau \equiv p - w_\tau^S$  with respect to  $\tau$  and evaluating the derivative at  $\tau = 0$ :

$$\left. \frac{\partial \lambda_\tau}{\partial \tau} \right|_{\tau=0} = -\frac{(a + w^N - 2\gamma)\beta(8\beta^2 + 12\beta + 3)}{(3 + 2\beta)(3 + 4\beta)^2} < 0.$$

Proposition 3 also implies that a small social clause tariff may yield a Pareto improvement in the sense that both countries are better off. This is possible because a small social clause tariff improves the economic efficiency of the global economy by mitigating the monopsony distortion in the labour market in Country S.

Since social clause tariffs primarily aim to correct the distortion in the labour market abroad, it may be argued that tariff revenues should be rebated to the country of origin. In that case, tariff revenue is not counted as part of Country N's social welfare. However, if  $w^N > (2\beta a + 3\gamma)/(3 + 2\beta)$  (which is lower than  $((1 + \beta)a + \gamma)/(2 + \beta)$  in (15)), a small social clause tariff still improves Country N's social welfare, which is confirmed by differentiating  $\pi_\tau^N + CS_\tau^N$  with respect to  $\tau$  and evaluating the derivative at  $\tau = 0$ :

$$\left. \frac{\partial}{\partial \tau} (\pi_\tau^N + CS_\tau^N) \right|_{\tau=0} = -\frac{3\beta(a + w^N - 2\gamma)(2\beta a - (3 + 2\beta)w^N + 3\gamma)}{(3 + 2\beta)(3 + 4\beta)^3}.$$

The right hand side of this equation is positive if and only if  $w^N > (2\beta a + 3\gamma)/(3 + 2\beta)$ .

### 4.3 Labour standards

In this subsection, I consider labour standards as a policy instrument. Suppose that certain labour standards are imposed in international trade agreements. Or, alternatively, suppose that Country N unilaterally requires non-discriminatorily certain labour standards to imports of goods from abroad. In either story, the effect of imposing labour standards is to increase wage paid by firm S.<sup>12</sup>

Let  $\bar{w}$  be the wage rate when firms comply with the labour standards. When the labour standards are binding for firm S,  $\bar{w} \geq w_c^S$ , where  $w_c^S \equiv \gamma + \beta y_c^S$  is the wage rate paid by firm S when it practices social dumping under Cournot competition in the output market. Note that  $y_c^S$  is given by (7).

When the labour standards are imposed, firm S's profit maximization problem is expressed as

$$\max_{y^S} \pi^S = (p(y) - w^S(y^S))y^S \quad \text{s.t.} \quad w^S(y^S) \geq \bar{w}.$$

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<sup>12</sup>Corden and Vousden (2001) take a similar approach. They argue that the effects of raising minimum wages, improving labour conditions, and allowing the operation of labour unions can be captured by an increase in the real wage.

From the FOC, firm S's reaction function in this case is given by

$$y^S(y^N) = \begin{cases} \frac{a - \gamma - y^N}{2(1 + \beta)}, & \text{if } y^N \leq \frac{a\beta + (2 + \beta)\gamma - 2(1 + \beta)\bar{w}}{\beta}, \\ \frac{\bar{w} - \gamma}{\beta}, & \text{if } y^N > \frac{a\beta + (2 + \beta)\gamma - 2(1 + \beta)\bar{w}}{\beta}. \end{cases} \quad (31)$$

I assume that firm S perfectly complies with the labour standards and does not consider the possibility of hidden violations of the standards.

Assuming that the labour standards are not binding for firm N, the reaction function of firm N is not affected and hence is given by (5). When  $\bar{w} \geq w_c^S$  holds, outputs and profits in NE, where both firms stay in the market, are respectively given by

$$y_s^N = \frac{\beta(a - w^N) - \bar{w} + \gamma}{2\beta}, \quad y_s^S = \frac{\bar{w} - \gamma}{\beta}, \quad (32)$$

$$\pi_s^N = (y_s^N)^2, \quad \pi_s^S = \frac{\{\beta(a + w^N) + \gamma - (1 + 2\beta)\bar{w}\}(\bar{w} - \gamma)}{2\beta^2}, \quad (33)$$

where the subscript  $s$  indicates equilibrium variables in the case under labour standards. Country N's consumer's surplus and social welfare in this case are respectively given by

$$CS_s^N = \frac{(\beta(a - w^N) + \bar{w} - \gamma)^2}{8\beta^2}, \quad (34)$$

$$W_s^N = \frac{3\beta^2(a - w^N)^2 + (\bar{w} - \gamma)\{3(\bar{w} - \gamma) - 2\beta(a - w^N)\}}{8\beta^2}. \quad (35)$$

Now, the following proposition shows the effects of the labour standards that marginally increases  $w^S$  from  $w_c^S$ .

**Proposition 4** *Requiring labour standards to firm S, which marginally increases  $w^S$  from  $w_c^S$ , is always beneficial to firm S and harmful to firm N. It, however, improves Country N's social welfare if  $w^N$  is high.*

*Proof.* Differentiate  $\pi_s^S$  with respect to  $\bar{w}$  and evaluate the derivative at  $\bar{w} = w_c^S$  to obtain

$$\left. \frac{\partial \pi_s^S}{\partial \bar{w}} \right|_{\bar{w}=w_c^S} = \frac{a + w^N - 2\gamma}{2\beta(3 + 4\beta)} > 0.$$

Similarly, differentiating  $\pi_s^N$  with respect to  $\bar{w}$  and evaluating the derivative at  $\bar{w} = w_c^S$  yields

$$\left. \frac{\partial \pi_s^N}{\partial \bar{w}} \right|_{\bar{w}=w_c^S} = -\frac{(1 + 2\beta)a - 2(1 + \beta)w^N + \gamma}{\beta(3 + 4\beta)} < 0,$$

using (9). Moreover, differentiate  $W_s^N$  with respect to  $\bar{w}$  and evaluate the derivative at  $\bar{w} = w_c^S$  to obtain

$$\left. \frac{\partial W_s^N}{\partial \bar{w}} \right|_{\bar{w}=w_c^S} = -\frac{2\beta a - (3 + 2\beta)w^N + 3\gamma}{2\beta(3 + 4\beta)}.$$

It is easy to show that  $\partial W_s^N / \partial \bar{w} \big|_{\bar{w}=w_c^S} > 0$  if and only if  $w^N > (2\beta a + 3\gamma)/(3 + 2\beta)$ , which is lower than  $((1 + \beta)a + \gamma)/(2 + \beta)$  in (15). ■

Proposition 4 implies that, similar to social clause tariffs, the imposition of labour standards confers a strategic advantage on firm S. This is because it allows firm S to commit to a higher employment level than the level without standards. Firm N suffers from labour standards, because it responds to an increase in  $y^S$  by reducing  $y^N$ . Figure 2 depicts the case of labour standards. The thin line of  $R^S$  indicates firm S's reaction curve without labour standards. The thick line that bends at  $E_c$  indicates firm S's reaction curve with labour standards of  $\bar{w} = w_c^S$ , which is denoted by  $R_s^S$ . The Nash equilibrium point remains at  $E_c$ . As labour standards are raised from the level corresponding to  $\bar{w} = w_c^S$ , the flat part of  $R_s^S$  shifts up, as is drawn by the thick dotted line in the figure. As a result, the NE point moves to  $E'_s$ , yielding a lower  $y^N$  and a higher  $y^S$ .

Unlike the case of social clause tariffs, however, firm S benefits from labour standards that marginally increases  $w^S$  from  $w_c^S$ , regardless of the value of  $\beta$ . The reason is that in the case of labour standards firm S can commit to a certain level of employment without worrying about the response in the wage rate. In the case of social clause tariffs, by contrast, the magnitude of the response in the wage rate for changing the employment level matters. As a result, labour standards have a stronger commitment effect and hence are beneficial to firm S, regardless of  $\beta$ .

Similar to the case of social clause tariffs, Country N is better off by requiring labour standards if  $w^N$  is high, despite the loss in firm N's profits. This is because the gain in consumer's surplus dominates the loss in firm N's profits if  $w^N$  is high.

## 5 Conclusions

In this paper, I have examined the effects of social dumping in the context of international trade when the output market is duopolistic. Social dumping arises from firm's monopsonistic power in the labour market.

I have shown that, contrary to a common complaint by firms in developed countries, social dumping by the rival firm is actually beneficial to the firm that does not practice social dumping. The firm practicing social dumping is not always better off by its own monopsonistic power in the labour market. If the labour supply is sufficiently elastic, the firm can earn higher profits by committing itself to behaving as a price taker in the labour market. Consumers suffer from social dumping. Thus, if the output market is located in the country in which the labour market is perfectly competitive, social welfare in that country may be lower when the foreign firm practices social dumping, despite the gain in the domestic firm's profits.

I have considered three policy instruments to improve domestic social welfare when the foreign firm practices social dumping. These policy instruments are (i) tariffs on imports, (ii) social clause tariffs for correcting the low wage of the foreign firm due to social dumping, and (iii) labour standards to raise the wage rate of the foreign firm. I have shown that social clause tariffs and labour standards are harmful to the domestic firm, while tariffs on imports are beneficial to it. Requiring labour standards always makes the foreign firm better off, and imposing social clause tariffs is also beneficial to the foreign firm if the foreign labour supply is sufficiently elastic. Whether or not these policies improve domestic welfare depends on the level of the domestic wage rate. If the domestic wage rate is sufficiently high, both of social clause tariffs and labour standards improve domestic welfare.

The counterintuitive results in this paper are attributed to the strategic interaction between firms in the output market. Thus, the structure of the output market is crucial to the effects of social dumping on equilibrium outcomes.

While social dumping and ecological dumping may seem to be similar, I have emphasized the difference between these two types of dumping. Under the imperfect competi-

tion in the output market, a firm is better off by practicing ecological dumping and its rival firm is worse off. I have shown that this is not the case when firms practice social dumping rather than ecological dumping.

In this paper, I have used a very simply model to address a point. The analysis can be generalized to have an oligopolistic output market and/or an oligopsonistic labour market with preserving major qualitative results.

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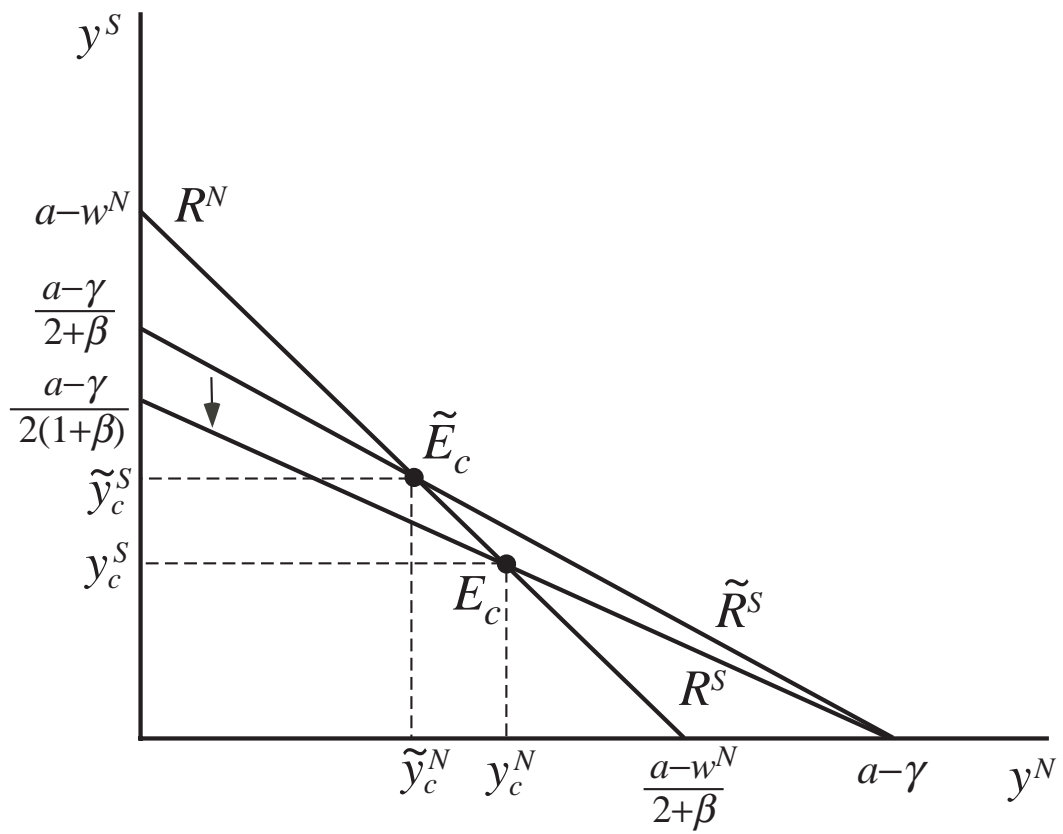


Figure 1: Reaction curves with and without firm S's monopsonistic power

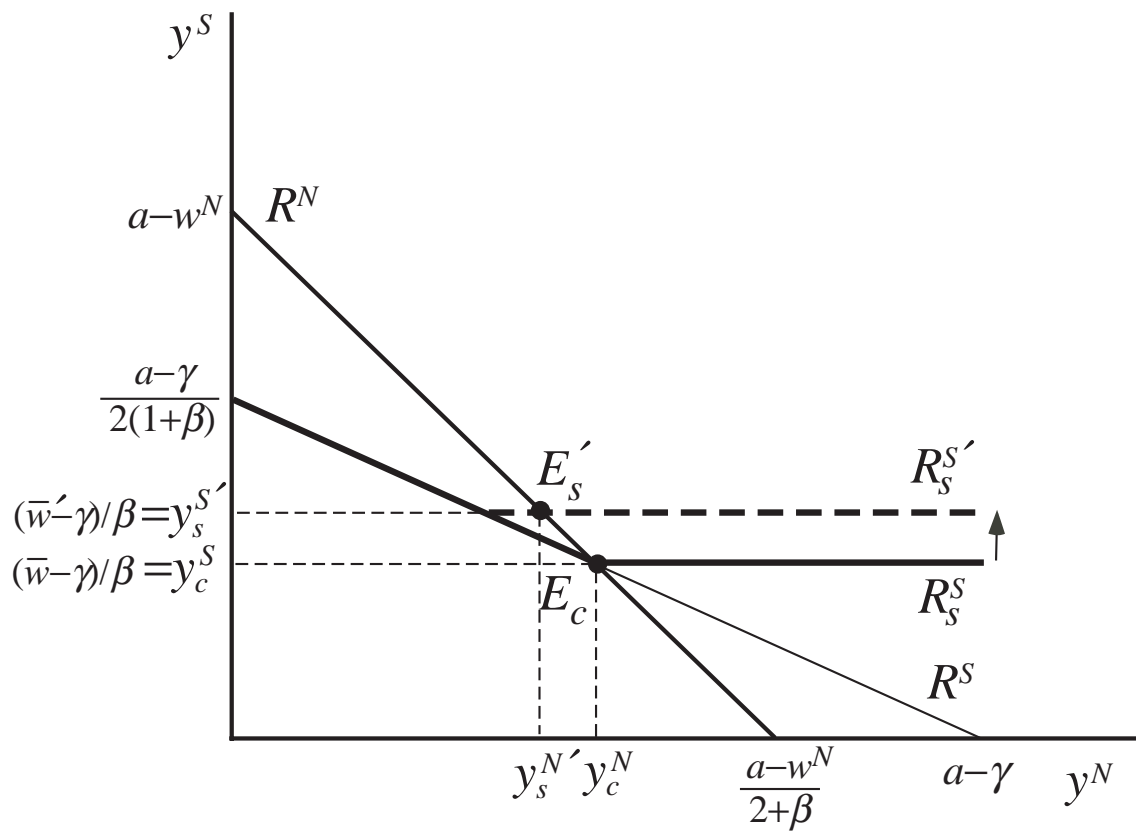


Figure 2: The effects of labour standards