# Why Trade as Aid

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**Abstract**

**Very Preliminary - Comments Welcome**

Should trade policy be used as a tool for development aid? I develop a general equilibrium trade model to analyze development aid in the form of tariff reductions. I conclude that tariff reductions can be an effective form of wealth transfer, even more so than a *direct* transfer. This follows from the optimization problem of a policy maker: When tariffs are set optimally marginal costs and marginal benefits to policy makers are equal. An increase in concern for the welfare of a trading partner can therefore be accommodated through a reduction in tariffs at low costs to policy makers. This holds regardless of whether trade policy is set to maximize welfare or to satisfy political objectives and of whether there are additional trading partners. I extend the model to consider political constraints in the recipient country and show that whereas a direct transfer can worsen the extractive nature of local institutions, a reduction in tariffs will have the opposite effect.

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# 1 Introduction

Should trade policy be used as a tool for development aid? In 1979 the GATT implemented the Generalized System of Preferences (GSP) which formally exempts special preferences for developing countries from the Most Favored Nation Principle. Since then the European Union and the United States have granted special trade preferences of varying degrees and in selected product categories to more than a hundred countries. In the latest round of WTO negotiations — the Doha Round — the reduction of poverty through trade policy is considered central. Yet, though there is clear evidence that generously designed trade preferences can substantially spur exports (Frazer and Van Biesebroeck, 2010), there is little consensus on the effectiveness nor utility or optimal design of trade preferences for development purposes. In particular it is unclear whether they should be favored over direct transfers or development programs.

This paper evaluates the effectiveness of trade preferences as means for resource transfers. The analysis is based on the general equilibrium model of international trade of Bagwell and Staiger (1999) and I explicitly model the welfare of both donor and recipient countries.[1] Policy makers in both countries are presumed to set trade policy in a rational manner, potentially allowing for political considerations in addition to the welfare of a representative agent. In such a setting, the usefulness of trade policy to provide a resource transfer can be evaluated by asking the question of whether an increase in the weight placed on foreign welfare in the home objective function should result in the use of tariff reductions, direct transfers of aid, or both. I find that a direct transfer are generally dominated by tariff reductions. Furthermore, if tariffs are set unilaterally, any positive concern for foreign welfare (even lower than for home's own citizens) should be accommodated to some extent by tariff reductions. The basic intuition is simple and is seen in Figure 1 which in partial equilibrium considers the market for some good from the perspective of an importing country which does not itself produce the good. Supply by a foreign country is given by $S^*(p^*)$, where $p^*$ is foreign price. Local demand is given by $C(p)$, where $p$ is local price. Home policy makers can choose $\tau$, where $p = \tau p^*$ must hold and $\tau > 1$ is a positive tariff. Suppose the tariff is originally set such that $Q$ is the imported quantity. If the home policy maker increases the tariff such that imports falls to $Q'$, the total loss in terms of tariffs and consumer surplus is $A$, whereas the gain

[1] Throughout, 'home' country will have a concern for 'foreign' welfare and will at times be called 'donor' regardless of whether the concern for foreign welfare is accommodated through tariff reductions or direct transfers. 'Foreign' which benefits from this will be called 'recipient'.

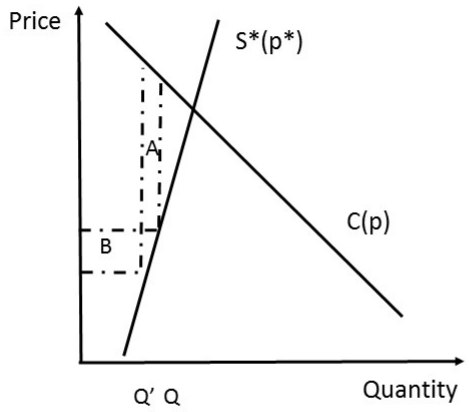



**Figure 1:** The Optimal Tariff in Partial Equilibrium. $C(p)$ is the domestic demand function and $S^*(p^*)$ is the foreign supply function. Consider an increase in tariffs which imply a reduction in imports from $Q$ to $Q'$. This will reduce local welfare (tariff revenue plus consumer surplus) by $A$, but increase welfare by $B$. The optimal tariff is set where these these two are equal for marginal tariff changes. Any reductions in tariff will therefore only have second order effect on welfare at home, but will have first order effects on welfare abroad and any concern for foreign welfare is met by a reduction in tariffs.

is $B$, resulting from a lower import price. When $A$ and $B$ are equal for marginal tariff changes, the tariff is set optimally and we get the standard result that the optimal tariff is $\tau - 1 = 1/\epsilon^*$, where $\epsilon^*$ is the supply elasticity of foreign. Now, suppose the home country values the welfare of the foreign country. How should this be accommodated by policy? Since $B$ is an inefficiency cost and $A$ a transfer from foreign to home, the home country can reduce tariffs at first order benefit to the foreign country but second order cost to the home country. Hence, any concern for foreign welfare, even if its less than that for domestic agents should result in tariff reductions. In fact, in this simple setting positive tariffs and positive transfers cannot be jointly optimal and transfers should only be used when tariffs have been reduced to zero. If the concern for foreign welfare is a fraction $0 < \tilde{\psi} < 1$ of that for domestic welfare, the corresponding optimal tariff is $\tau - 1 = (1 - \tilde{\psi})/\epsilon^*$.

The paper demonstrates that this basic insight carries through to a perfectly com-

petitive general equilibrium model in which policy makers in both home and foreign set tariffs potentially taking into account political considerations such as profits of local producers. I then introduce a third country which exports the same good as the beneficiary country, but whose welfare does not enter the welfare function of home. I show that in a baseline specification, such a country is irrelevant for policy, in the sense that trade policy towards either foreign country should be conducted as if the other country did not exist. Finally, it has long been recognized that direct transfers of aid are often misused or mostly consumed by an elite in the recipient country (Boone, 1996). I introduce two distinct groups in the recipient country: workers and an elite, where the elite has control of the government budget including the ability to tax workers and only the welfare of workers are of concern to the potential donor. I show that in such a setting direct transfers are at best ineffective and at worst counter-productive, whereas reductions in tariffs are not only efficient implicit transfers, but can reduce the taxation of workers by the elite.

This paper is a part of a literature addressing the theoretical justification for trade preferences as means of development aid. The first theoretical contribution is McCulloch and Pinera (1977) who specifically model an initial tariff as the result of rational decision making by policy makers. They find that differential tariffs could potentially benefit both the importing and the beneficiary country, by allowing the importing country to exploit market power against different exporters. Although, such an argument could be replicated here, I show that it is not necessary for the use of tariff concessions as wealth transfers. Adam and O'Connell (2004) argue that tariffs can be desirable to direct transfers if they boost exports in a sector with learning-by-doing externalities. However, they exogenously assume that in the absence of externalities direct transfers and tariff concessions are equally efficient as wealth transfers, whereas I show from first principles that they are not. The present paper is the first to derive the cost and benefits of trade preferences from first principles in a general equilibrium model of trade, and the first to include specific concerns about subgroups of the population in the recipient country.

The paper further relates to an extensive empirical literature on whether the implementation of GSPs has spurred export growth. Romalis (2003) and Frazer and Van Biesebroeck (2010) find a significant impact of GSP's on trade volumes. Others have argued that the effects of special preferences has so far remained limited as most programs come with strict requirements on rules-of-origin of inputs (Brenton and Ikezuki, 2004).

Section 2 presents the basic model and Section 3 extends it to include an additional country whose welfare does not enter the utility function of home. Section 4 introduces political economy constraints in the recipient country and Section 5 concludes.

# 2 The Model

## 2.1 The Economic Environment

I initially consider a two-sector two-country perfectly competitive general equilibrium model based on Bagwell and Staiger (1999), and will treat extensions with multiple countries and political constraints in recipient country below. There are two goods, $x$ and $y$ where $x$ is the natural import of home (no *) and $y$ the natural import of foreign (*). Production of both goods take place under increasing opportunity costs such that the production set in each country is strictly concave. Let $p_x$ and $p_y$ denote the domestic prices in home of good $x$ and $y$, respectively. Defining the relative price of $x$ as $p \equiv p_x/p_y$, let production in home be $Q_i(p)$ for $i = x, y$ with $Q'_x(p) > 0$ and $Q'_y(p) < 0$. Perfect competition ensures: $pQ'_x(p) + Q'_y(p) = 0$. Domestic prices in foreign are given by $p^*_x$ and $p^*_y$ with a relative domestic price of $p^* \equiv p^*_x/p^*_y$ and analogous production functions for foreign of $Q^*_x(p^*)$ and $Q^*_y(p^*)$. The world price of $x$ is $p^*_x$ and of $y$, $p_y$, such that the relative world price is $p^w = p^*_x/p_y$. Both home and foreign can impose (gross) tariffs such that for home $p = \tau p^w$ and for foreign $p^* = p^w/\tau^*$.

Representative agents in home and foreign have preferences that can be represented by $u(C_x, C_y)$ and $u^*(C^*_x, C^*_y)$, respectively. Letting $I$ be income (measured in units of $y$) I can write consumption as $C_i(p, I)$, for $i = x, y$. Naturally $pC_x + C_y = I$. Corresponding expressions exist for foreign. Total tariff revenue in home (measured in good $y$ ) is therefore $(C_x(p, I) - Q_x(p))(p - p^w)$. In addition to collecting tariff revenue the government in home donates $T \geq 0$ (also measured in good $y$) to foreign. In both countries, government surplus (deficits) is redistributed to (are taxed through lump sum taxation from) the representative agent. This leaves total income in home, $I(p, p^w, T)$ and foreign, $I^*(p^*, p^w, T)$ implicitly defined as:

$$I = p^w Q_x(p) + Q_y(p) + C_x(p, I)(p - p^w) - T, \tag{1}$$

$$I^* = p^w Q_x(p^*) + Q_y(p^*) + C^*_x(p^*, I^*)(p^* - p^w) + T. \tag{2}$$

Let $M(p, p^w, T) \equiv C_x(p, I(p, p^w, T)) - Q_x(p)$ denote home import of $x$ and $EX(p^*, p^w, T) \equiv Q_x(p^*) - C_x^*(p^*, I^*(p^*, p^w, T))$ denote foreign export of $x$. Walras' law ensures that market clearing for $x$ is sufficient to determine equilibrium, such that — by using $p = p^w\tau$ and $p^* = p^w/\tau^*$ — market clearing determines the world price purely as a function of policy choice variables:

$$M(p^w\tau, p^w, T) = EX(p^w/\tau^*, p^w, T).$$

I denote the resulting world price by $\tilde{p}^w(\tau, \tau^*, T)$. As Bagwell and Staiger (1999), I rule out Lerner and Metzler paradoxes by imposing restrictions on functional forms to ensure $dp/d\tau > 0 > dp^*/d\tau^*$ and $\partial\tilde{p}^w/\partial\tau < 0 < \partial\tilde{p}^w/\partial\tau^*$. For future reference I define the import elasticity of home wrt. $\tau$ as $\epsilon_\tau^M \equiv \partial log(M(\tau p^w, p^w, T))/\partial log(\tau)$, the elasticity of world prices, $\epsilon^M \equiv \partial log(M(\tau p^w, p^w, T))/\partial log(p^w)$, and the export elasticity of foreign as $\epsilon^X \equiv \partial log(EX(p^w/\tau^*, p^w, T))/\partial log(p^w)$.

## 2.2 The Representative Agent's Welfare

Letting $V(p, I)$ denote the indirect utility function of the representative agent in home with $V_I \equiv \partial V/\partial I$ and $C'_{x,p} \equiv \partial C_x/\partial p$, I get:

$$\frac{dV(p, I(p, p^w, T))}{dp^w} = -V_I(C_x - Q_x), \tag{3}$$

$$\frac{dV(p, I(p, p^w, T))}{dp} = -V_I(p - p^w)(C'_{x,p} - Q'_x). \tag{4}$$

Equation (3) states the standard negative terms-of-trade effect of a higher world price of $x$, which serve to transfer wealth from home to foreign: Holding domestic prices, $p$, constant, the representative agent is indifferent between a transfer of $dT$ and an increase in world prices of $dp^w = dT/(C_x - Q_x)$. As an analogous expression exists for the foreign representative agent, holding local foreign prices constant he is likewise indifferent between the same transfer and a change in world prices.[2] Equation (4) reveals the standard distortion from imposing tariffs on local prices. When $(p - p^w) > 0$ home consumption of $x$ is inefficiently low and home production inefficiently high. Further

[2]The empirical literature on trade preferences (Frazer and Van Biesebroeck, 2010 and Mattoo et al. 2003) are chiefly concerned with whether trade preferences spur export revenue. As changes in foreign export revenue are given by $d[p^w(Q_x^* - C_x^*)]/dp^w = (Q_x^* - C_x^*) + p^w d(Q_x^* - C_x^*)dp^w$ this overestimates the welfare consequences.

increasing domestic prices will increase the distortion.

## 2.3 Government Objectives

The objective function of policy makers may depend on political objectives. I specify this as an additive term $\Omega(p)$, with $\Omega' \geq 0$. In addition the objective function depends positively on the welfare of the foreign representative agent through the term $\psi V^*$. The optimal policy response to an increase in $\psi$ will be of central interest in this paper. With this I can write the home country's objective function as $W = V + \Omega + \psi V^*$.

In the following, I make explicit the objective function's dependence on local prices, $p, p^*$, the relative world price, $p^w$, the transfer from home to foreign, $T$, and the weight in home's welfare function on foreign welfare, $\psi$ by writing: $W(p, p^*, p^w, T; \psi)$. Note, that, although the home representative agent receives higher welfare when terms of trade improve, $dV/dp^w < 0$, I do not in general restrict the sign of $dW/dp^w$. The home government has two instruments, $\tau$ and $T$, at its disposal. For given foreign tariff, $\tau^*$, it solves the problem $max_{\tau,T,p^w} W(\tau p^w, p^w/\tau^*, p^w, T; \psi)$ subject to $p^w = \tilde{p}^w(\tau, \tau^*, T)$ to get:

$$\frac{dW}{d\tau} = V_I(p - p^w)(C'_{x,p} - Q'_x)p^w + \Omega' p^w + \frac{dW}{dp^w}\frac{\partial \tilde{p}^w}{\partial \tau} = 0, \tag{5}$$

$$\frac{dW}{dT} = -(V_I - \psi V_I^*) + \frac{dW}{dp^w}\frac{\partial \tilde{p}^w}{\partial T} \leq 0, \tag{6}$$

with equality if $T > 0$ and

$$\frac{dW}{dp^w} = V_I(p - p^w)(C'_{x,p} - Q'_x)\tau - (V_I - \psi V_I^*)(C_x - Q_x) + \Omega'\tau, \tag{7}$$

where I put sufficient conditions on $V, V^*, \Omega$ to ensure that this problem has a unique solution (details in appendix). Each of the three terms of equation (5) represents an effect of increasing the tariff: the first term is the standard distortionary effect of introducing a wedge between domestic and world prices, the second the possibly politically motivated reasons for increasing local prices in home, and the third the effect of lowering world prices. This latter effect is in equation (7) in turn shown to consist of a change in domestic distortion, a terms-of-trade transfer and the political effects of changes in world prices. Equation (6) sums the consequences of a direct transfer on home and foreign welfare as well as the resulting terms-of-trade effect.[3] I can show the following lemma

[3]The size and sign $\partial \tilde{p}^w/\partial T$ of Equation (6) is directly related to the famous debate of the Transfer-

**Lemma 1.** *Consider the set of first-order conditions (5) and (6). For $\tau^* \geq 1$, a solution can feature positive tariffs and positive transfers $\tau > 1, T > 0$ only if*

*a) There are political consideration to the policy decision $\Omega' > 0$ and*

*b) Terms-of-trade consequences are reversed for the policy maker, $dW/dp^w > 0$.*

*Proof.* Appendix X □

To see why, consider first part a) of the lemma and suppose that there were no political considerations in trade policy, $\Omega' = 0$. In such a case, combining equations (6) and (7) shows that a positive transfer can only be optimal if $V_I - \psi V_I^* = 0$, that is if to the policy maker the marginal value of income of the home and foreign representative agents are equal and terms-of-trade movements therefor irrelevant: $dW/dp^w = 0$. In such case, equation (5) demonstrates that the only effect of raising tariffs above 1, is the negative distortion on prices in home and hence, $\tau > 1$ with $T > 0$ cannot be a solution. Necessary conditions for the joint use of transfers and trade policy is therefore both consideration for foreign welfare, $\psi$, and positive political considerations, and in such a case only if they are sufficiently strong to outweigh the representative home agent's preferences for lower world prices, $dV/dp^w < 0$. If this is not the case, the concern for foreign welfare should be accommodated by reductions in tariffs until $\tau = 1$ and only thereafter by positive transfers. In the following, I assume that conditions are not such that $\tau > 1, T > 0$ though qualitatively nothing of what follows depends on this. Assumption: Preferences and production technology are such that a zero transfer is optimal: $T = 0$. In this case, the solution to the first order condition of (5) and (7) delivers a reaction function $\tau(\tau^*, \psi)$. It is (implicitly) defined by.

$$\tau - 1 = \left[1 - \frac{\psi V_I^*}{V_I}\right] / \epsilon^{EX} - \frac{\Omega' \tau}{V_I (C_x - Q_x)} \frac{\epsilon^{EX} + \epsilon_\tau^M - \epsilon^M}{\epsilon_\tau^M \epsilon^{EX}}, \tag{8}$$

where elasticities are defined as above. The expression is most easily interpreted by first considering the simple case of no concern for foreign welfare ($\psi = 0$) and no political considerations ($\Omega' = 0$). In this case, the optimal tariff comes from the standard balancing of terms-of-trade transfers and domestic distortions and the standard result that (net) tariffs should be the inverse of the foreign export elasticity, $\tau - 1 = 1/\epsilon^{EX}$, arises.

Problem between Keynes and Ohlin in the 1920's. The crux of the argument was whether movements in the terms-of-trade between Germany and the victors would move in such a way to make the actual cost of the transfer higher than the direct cost ($|dW/dT| > |\partial W/\partial T|$ in this model). Whether there are additional positive (or negative) effects from terms-of-trade movements is not consequential for the argument that follows.

With a concern for foreign welfare, the value of the terms-of-trade transfer is reduced by $\psi V_I^*/V_I$, the relative concern for foreign welfare and tariffs are correspondingly lower. If $\psi V_I^*/V_I = 1$ foreign and home welfare are equally weighted and the optimal (net) tariff is $\tau = 1$.

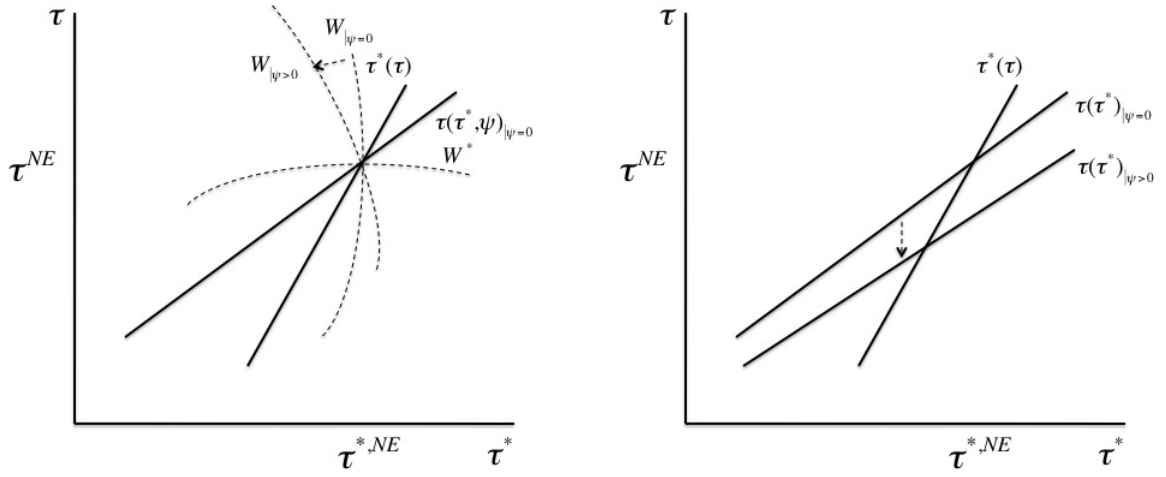
To interpret the expression when political considerations are present, note that for a marginal increase in world prices, $\Omega'\tau/(V_I(C_x - Q_x))$, reflects the relative value of political gains from higher domestic prices and the resulting terms-of-trade cost to the representative agent. The last fraction reflects the change to domestic prices from changes in world prices brought about by increases in tariffs. The extent to which tariffs affect domestic prices are a function of the elasticity of demand wrt to $\tau$, $\epsilon_\tau^M$ ($\leq 0$), and the import and export elasticities, $\epsilon^M$ and $\epsilon^{EX}$.

Defining the objective function of the foreign policy maker analogously — except without concern for the utility of the representative agent in home — delivers a corresponding reaction function $\tau^*(\tau)$. The two reaction function are illustrated in figure 2a. I assume that there is a unique intersection of the response functions and label this Nash Equilibrium $(\tau^{NE}, \tau^{*,NE})$. Both response functions are upwards sloping, but $\tau^*(\tau)$ is steeper. As shown in Bagwell and Staiger (1999) it is important that the Nash equilibrium is inefficient. This is most easily seen by drawing the iso-welfare curves associated with $(\tau^{NE}, \tau^{*,NE})$ for both home and foreign.[4] By the feature of being a best response function, the iso-welfare curve of home must be vertical and the iso-welfare curve of foreign horizontal at the optimum, i.e. in an optimum small changes in own tariffs have second order effect on own welfare. As a Pareto efficient point requires tangency of the iso-welfare curves it is clear that $(\tau^{NE}, \tau^{*,NE})$ is not Pareto efficient. There exist points to the Southwest that would be preferred by both home and foreign. The role of GATT rules in achieving this is the central focus of Bagwell and Staiger (1999), whereas I presently am concerned with the extent to which trade policy should be affected by concern for foreign welfare, $\psi$. This immediately leads to the following proposition:

**Proposition 1.** *An increase in home's concern for foreign welfare will always induce a downward shift of home's reaction function:*

$$\partial\tau\left(\tau^*, \psi\right)/\partial\psi < 0,$$

[4]For lack of a better term I call these iso-welfare curves, although strictly speaking they trace out points where the objective function of the policy makers $W$, and not the welfare function of the representative agent, $V$, takes a constant value.




**(a)** The Nash Equilibrium for $\psi = 0$

**(b)** An Increase in Concern for Foreign Welfare, $\psi$

**Figure 2:** The Response to an Increase in Concern for Foreign Welfare, $\psi$. (a) The initial (unique) Nash equilibrium is at the intersection of the response function $\tau^*(\tau)$ and $\tau(\tau^*, \psi)$, where the iso-welfare function of home is vertical and the iso-welfare function of foreign is horizontal. Any increase in concern for foreign welfare, $\psi$, will pivot the iso-welfare curve for home counter-clockwise implying that a point south of $\tau^{NE}$ is the best response. (b) This shifts the response function of home downwards and a new equilibrium feature lower tariffs in both home and foreign.

*and the Nash Equilibrium will feature lower overall tariffs:*

$$d\tau^{NE}/d\psi < 0,\ d\tau^{*,NE}/d\psi < 0.$$

*Proof.* xxx □

Any concern for the welfare of the foreign representative agent, should be reflected in trade policy by a reduction in tariffs. Figure 2a illustrates the intuition for an increase from $\psi = 0$. As noted in the Nash equilibrium home's iso-welfare curve is vertical as marginal costs and marginal benefits are equal. From the first order condition of equation (5) it follows that an increase in $\psi$ will increase the marginal costs of increasing tariffs: $d^2W/(d\tau d\psi)|_{\tau=\tau^{NE},\tau^*=\tau^{*,NE}} < 0$ and the tariff must be reduced.

The analysis above assumed that both countries set their tariffs unilaterally. However, tariffs are today typically set through international negotiations. The consequences of this are captured in the following remark

*Remark.* Let $\tau(\tau^*, \psi)$ be the optimal unilateral tariff. For any $\tau$, $1 < \tau < \tau(\tau^*, \psi)$ there

exists a $\psi < V_I/V_I^*$, above which any further increase in $\psi$ would be accomodated by reductions in tariff.

When tariffs are not set unilaterally, it no longer holds that any concern for foreign welfare should be accomodated by a reduction in tariffs. Tariff reductions are, however, still efficient in that there exists a range of values of $\psi$ that imply a lower weight on foreign than domestic utility, but which still imply that tariff reductions are desirable.

# 3 Three Countries

In the following, I extend the model to allow for three countries: home, country '$A$', and country '$B$'. Both $A$ and $B$ are natural exporters of good $x$, whereas home continues to be the natural exporter of good $y$. $A$ and $B$ are identical except for size, such that everything in country $A$ is scaled by $\lambda$ and everything in $B$ is scaled by $(1-\lambda)$ and otherwise completely described as 'foreign' above. Home country cares about welfare in country $A$ by $\psi^A$ and not for country $B$: $\psi^B = 0$. To simplify things, I continue to disregard a direct transfer, $T = 0$, and assume that neither $A$ nor $B$ impose tariffs. As product $x$ produced in $A$ and $B$ are perfect substitutes it must hold that $\tau^A p^A = p = \tau^B p^B$. Using this, with world market clearing for good $x$ gives $\tilde{p}^A(\tau^A, \tau^b)$ and $\tilde{p}^B(\tau^A, \tau^B)$. Hence, I can define an objective function analogously to above as $W = V + \Omega + \psi^A V^A$ and show the following proposition:

**Proposition 2.** *Consider the optimization problem of the home policy maker facing country A and B* $max_{\tau^A,\tau^B,p^A,p^B} W(\tau^A, \tau^B, p^A, p^B)$ *subject to* $p^A = \tilde{p}^A(\tau^A, \tau^B)$ *and* $p^B = \tilde{p}^B(\tau^A, \tau^B)$.

*Part A) Optimal tariffs are implicitly given by:*

$$\tau^i - 1 = \left[1 - \frac{\psi^i V_I^{*i}}{V_I}\right] / \epsilon^{EX^i} - \frac{\Omega'\tau}{V_I(C_x - Q_x)} \frac{\epsilon^{EX^i} + \epsilon_\tau^M - \epsilon^M}{\epsilon_\tau^M \epsilon^{EX^i}},$$

*where a superscript* $i = A, B$ *denotes the analogous values from equation 8.*

*Part B) Higher concern for welfare of citizens in country A is always accommodated by lower tariffs:* $d\tau^A/d\psi^A < 0$.

*Part C) In general, the effect of higher concern for foreign welfare in country A on tariffs for country B are ambiguous, but*

*i) If there are no political concerns,* $\Omega' = 0$ *and* $\epsilon^{EX^B}$ *is constant, there is no effect:* $d\tau^B/d\psi^A = 0$.

*ii) If home preferences are quasi-linear (with demand for $x$ being independent of income: $\epsilon^M - \epsilon^M_\tau = 0$), political concerns are proportional to producer revenue, $W = \beta p Q_x(p)$, export elasticity in $B$ is constant and $\epsilon^M_\tau$ is constant, then a higher concern for country $A$ welfare will lower tariffs on country $B$: $d\tau^B/d\psi^A < 0$.*

*Proof.* XXX □

Part A of the proposition demonstrates that the same intuition for the optimal tariff of equation (8) carries through to the case of two trading partners, and Part B shows that an increase in concern for welfare in country $A$ is again always accommodated by a decrease in tariffs towards country $A$. The question of how such a higher concern should affect the tariffs towards country $B$ is treated in Part C. One might think that an optimal policy response to an increase in $\psi^A$ would be to encourage exports from country $A$ both by lower direct tariffs, but also by increasing tariffs on country $B$. In the case of no political constraints (and constant export elasticity in $B$), this is not so and tariffs on country $B$ are invariant to the concern for country $A$.[5] As tariffs are set so as to maximize utility of trading with country $B$, changing these tariffs is always dominated by changing the direct tariff with country $A$. Naturally, this does *not* imply that country $B$ will be unaffected. Lower tariffs in country $A$ will direct trade from $B$ to $A$ and lower $p^A$. When political constraints are introduced the situation is more complicated. For the case described in Part C) ii, an increase in concern for country $A$ will be accommodated by lower $\tau^A$. This will reduce domestic prices which encourages more imports and reduces domestic production. This reduces the relative value of political considerations, which as a consequence reduces tariffs on country $B$.

# 4 The Political Economy of Tariff Reductions

It has long been recognized that there are important interplays between institutions and the efficacy of aid. Burnside and Dollar (2000) argue that foreign aid has a positive impact on growth when developing countries conduct good public policy (See Easterly, 2003 and the references therein for a qualifying discussion of that result.) Boone (1996) presents a theoretical model in which politicians in a recipient country maximize the welfare of a wealthy elite. He finds that in such a model foreign aid does not affect

[5] A constant export elasticity does not only require constant demand and production elasticities, but also that they are identical in absolute value. Though not necessarily the most reasonable assumption it helps to clarify the intuition.

the incentive to invest and will be wholly consumed by the elite. He finds support for these predictions in that whereas foreign aid does increase government expenditures in recipient countries, it does not increase investment nor improve conditions for the poor. In the following, I demonstrate that including such political economy constraint in the present model only increases the relative utility of tariff reductions over direct foreign aid.

## 4.1 The Economic Environment

I base my analysis on the model with three countries of Section 3. To make the point the clearest, I make a number of simplifying assumptions: i) The home country is only interested in the welfare of country $A$ and only in that of a particular subgroup, the workers (as described below): $\psi^B = 0$, ii) Country $B$ provides good $x$ infinitely elastically at (exogenous) price $p^B$ (corresponding to linear production technology in country $B$ in the production of both $x$ and $y$. iii) Home country does not have political considerations: $\Omega = 0$, and finally iv) neither $A$ nor $B$ impose tariffs. v). Preferences in $A$ are homothetic and I can write $V(p^A, I^A) = v(p^A)I^A$ for any subgroup in $A$ with income $I^A$ (and likewise for consumption: $C_x(p, I^A) = c_x(p)I^A$). None of these assumptions are crucial for the results, but relaxing them would make for a substantially more complicated exposition.

The model is extended with several elements of Boone (1996): There are two groups in society: The *elite* and the *workers*. The elite has control of the government and can tax official income of workers at constant rate $t \in [0, 1]$. The only use for public funds is to increase the consumption set of the elite.[6] The only factors of production are capital, $K$, wholly owned by the elite and labor, $L$, wholly provided by the workers. Production of $x$ and $y$ is competitive and features constant returns to scale production technologies both using capital and labor. Though all variables in the following concern country $A$, for ease of notation I suppress superscript, $A$, except for the local price $p^A$. Letting, $r$ denote the return to capital and $w$ the return to labor, I use the unit cost functions associated with the constant returns to scale production technologies:

$$c^x(w, r) = 1,$$

[6]Boone (1996) focuses on capital accumulation and taxes are distortionary by discouraging (efficient) capital accumulation. He is only concerned with positive and not normative analysis. Hence, though his model is a dynamic (Ramsey) model of capital accumulation little is lost by him focusing on steady states. Introducing dynamics here would require considering transitions between steady states, so I continue to focus on a static model and instead introduce a tax that is distortionary by discouraging production in the official sector.

$$c^y(w,r) = p^A.$$

The stock of capital is exogenously given at $\bar{K}$ and can only be used in the production of good $x$ and $y$. The stock of labor is endogenous. Each of a mass of 1 workers has one unit of labor which he can employ in the production of $x$ or $y$ at a utility cost of $c(l) = 1/\gamma l^\gamma$, $\gamma > 2$.[7] The stock of labor employed in production is $L \in [0,1]$. Throughout I will consider an economy in the cone of diversification such that production is active in both sectors. Letting $c_i^x$ denote the derivative with respect to cost of factor $i = w, r$ I get:

$$c_w^x x + c_w^y y = L,$$

$$c_r^x x + c_r^x y = \bar{K}.$$

The Stolper-Samuelson theorem then guarantees that $(dw/dp^A)(p^A/w) = (1-\theta^x)/(\theta^y - \theta^x)$, where $\theta^i$ refers to the labor share in sector $i$. Within the cone of diversification, changes to factor stocks (in particular stock of labor) has no impact on factor prices. Utility of capitalist is $v(p^A)I_K^A$, and of workers $v(p^A)I_L^A - (1/\gamma)l^\gamma$, where $I_i^A$, $i = L, K$ is the income of group $i$ in country $A$ and $l$ is the labor supply for the representative worker.

With two subgroups, I will consider two types of transfers, one directly to the government as in Boone (1996) and one directly to the workers. The former can be considered as general foreign aid in the form of grants to government projects or government loans. The latter is transfers directly targeted at workers without the direct management of the government, such as development projects managed by NGOs on the ground. Recall, that in Section 2 the transfer was measured in terms of units of $y$. In the following I change notation slightly and let transfers be measured in utility units. Naturally, this does not change the economic environment for any of the agents, but does facilitate the following lemma. Transfers directly to government and workers are denoted $T$ and $T_L$, respectively.

## 4.2 The Political Equilibrium

The elite has complete control over the government and the government budget is part of their income. Hence: $v(p^A)I_K^A = v(p^A)\left(r\bar{K} + tI_L^A + T/v(p^A)\right)$. Worker income is then

[7] Alternatively, the workers have access to a concave home production function of $(1-(1/\gamma)(1-l)^\gamma)$ with an output that is additive in the utility function.

earned income plus transfer from abroad less taxes and $v(p^A)I_L^A = v(p^A)(1-t)(wl + T_L/v(p^A))$. Hence, given transfers $T, T_L$ and factor returns $w, r$ the elite maximizes its own welfare

$$max_{t,l} v(p^A)\left[r\bar{K} + t\left(wl + T_L/v(p^A)\right)\bar{L}\right] + T, \tag{9}$$

$$s.t.\, l = argmax_{\tilde{l}}(1-t)\left[v(p^A)w\tilde{l} + T_L\right] - (1/\gamma)\tilde{l}^{\gamma}. \tag{10}$$

The unique solution to the problem is given in the following lemma

**Lemma 2.** *Consider the problem described by equations (9) and (10).*

*Part A)*

*i) Optimal labor by workers is given by:*

$$l(p^A, t, w) = (v(p^A)(1-t)w)^{1/(\gamma-1)},$$

*ii) and optimal labor tax on workers is (implicitly) given by:*

$$t = \frac{(\gamma-1)\left[1 + \frac{T_L}{v(p^A)wl(p^A,t,w)}\right]}{\gamma + (\gamma-1)\frac{T_L}{v(p^A)wl(p^A,t,w)}}.$$

*Part B)*

*i) An increase in general transfers, $T$, has no impact on supplied labor, taxes or welfare of workers.*

*ii) An increase in transfers to workers, $T_L$, increases labor taxes and reduces labor supplied. Worker welfare always increases less than one-for-one with transfers: $d(v(p^A)I_L^A)/dT_L \leq 1/\gamma^2$. At low levels of transfer worker welfare is increasing in transfers: $d(v(p^A)I_L^A)/dT_L|_{T_L=0} = 1/\gamma^2$, but decreasing for higher levels: $lim_{T_L\to\infty} d(v(p^A)I_L^A)/dT_L < 0$.*

*iii) An increase in prices, p, weakly decreases labor taxes (strictly if $T_L > 0$), increases labor supply, and increases worker welfare if and only if $\theta_y > \theta_x$.*

*Proof.* XX □

The optimal labor supply follows directly from the first order condition of (10) and the optimal tax by using the labor supply function in the elite's maximization problem. Since making a transfer does not alter either condition, the model replicates the result of Boone (1996) that a direct transfer increases the consumption of elites one-for-one part B,i. To see why direct transfers might be counter-productive, note that the Elite faces

the problem of standard taxation that a higher tax rate discourages work. However, for the transfer no such problem exists. Hence, the important role played by $T_L/(wl)$, the ratio of transfers to earned income for workers: when all income is earned, $t = (\gamma - 1)/\gamma$, whereas for $T_L/(v(p^A)wl) \to \infty$, $t \to 1$. An increase in direct development aid therefore increases the share of worker's income that is not earned, makes income less elastic to taxation and increases the taxes, which reduces labor supply. Worker income never increases one-for-one with the transfer (and in fact, for these parameter restrictions always less than $1/\gamma^2 < 1/4$). For low initial transfers the direct wealth increasing effect of taxes dominates and worker welfare increases, whereas for already high transfers the higher taxes dominates and worker welfare is reduced.

Note, that the effect on worker welfare from higher prices is given by:

$$\frac{d(v(p^A)I_L^A)}{dp^A}p^A = v(p^A)\left[\frac{\theta_y}{\theta_y - \theta_x} - p^A c_x(p^A)\right]wl - \left[v(p^A)wl + T_L\right]\frac{dt}{dp^A}.$$

The expression combines the three effects of higher prices. First, the Stolper-Samuelson result that higher prices translates more than one-for-one into higher wages, though the increase in real wages is lower as prices of the consumption of good 1 are higher as well. As the expenditure share on good $x$ it must hold that $p^A c_x(p^A) < 1$, so the overall effect on welfare is positive. Unlike the results presented in Sections 2 and 3 this is so regardless of whether the country is a net exporter of good $y$. The third term reflect that when sector $y$ is labor-intensive, $\theta_y - \theta_x > 0$, wages increase which implies that a higher share of workers' income is earned and hence the distortionary effect of taxes is higher. The elite responds by reducing taxes which increases welfare (Naturally, labor supply changes as well, but the envelope theorem ensures that the marginal effect of this change is zero).

**Proposition 3.** *Consider the optimization problem of the home policy maker facing country A and B with political constraints in A: $max_{\tau^A,\tau^B,p^A,T_L,T}W(\tau^A,\tau^B,p^A,p^B,T_w,T)$ subject to $p^A = \tilde{p}^A(\tau^A,\tau^B)$ for the case of a labor-intense sector y,$\theta_y > \theta_x$*

*Part A) The optimal solution features no tariffs on country B: $\tau^B = 1$ nor any direct transfers to the government of country A.*

*Part B) Transfers directly to workers is never optimal, $T_L = 0$.*

*Part B). Tariffs on country A are decreasing in $\psi^A$: $d\tau^A/\psi^A < 0$.*

*Proof.* XXX □

The fact that there are no tariffs on country $B$ is a consequence of the exogenous $p^B$ and the fact that there are no political concerns at home. That $T = 0$ is optimal follows directly from Lemma 2: the local Elite will consume the transfer one for one and home puts no weight on their welfare. For Part B, note that with exogenous prices on good $x$ from country $B$ the local price in home is $p = p^B$ and trade policy does not introduce any local distortions and from the perspective of home the cost of a transfer and a reduction in tariffs are equivalent. Combined with Lemma 2 this implies that a direct transfer to workers is never optimal, though import subsidies, $\tau^A < 1$ might be.

# 5 Conclusion

Should tariff reductions be used as a means of develoment aid? I show that generally the answer is yes. Tariff reductions can be an efficient form of wealth transfer and typically more so than a direct transfer. This conclusion is further reinforced when political constraints in the recepient country are taken into account: Whereas a direct transfer to subgroups can lead to further taxation by a local elite, a reduction in tariffs can have the opposite effect. This is because, unlike a direct transfer, an indirect transfer through tariff reductions can only take place if the local workers are incentivized to produce the exported goods, which constraints taxation.

The present paper has left out several important aspects of the current discussion over GSPs. Most prominently, the role of rules-of-origens requirements and trade in intermediate goods have been ignored. Further, technology has been taken as a given, whereas the rethetoric supporting much development aid often focuses on encouraging local gorwth. These are all important topics for future research.

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