

On the Effects of Fair-Trade on the Welfare of the Poor

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Abstract

Despite the rising importance of fair-trade, there is only a relatively small amount of academic research concerning its implications. While advocates of fair-trade claim that it improves the living conditions of the allegedly exploited poor, its opponents claim the opposite. Public discussion mostly see-saws in a dogmatic environment affected by individual views and prejudices. After reviewing the existing literature, we present a model which shows that fair-trade is welfare improving as long as the poor are sufficiently powerless with respect to those buying their products. In the case they are not, fair-trade decreases the aggregated welfare of the poor as the benefits of the producers connected with fair-trade organizations is overcompensated by the loss of those who were not lucky enough to meet such an organization. Simulations suggest that this power-threshold tends to be rather small.

Keywords: fair trade, producer's welfare, search and matching models.

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1 Introduction

In recent years, a discussion has started that free trade may not necessarily be ‘fair trade’ as it appears that quite a number of people are excluded from the benefits of globalization. Even though basic economic theory states that everybody should profit from free trade and, further, that any trade is fair, there exist several reasons why this does not necessarily hold in reality. Opponents of the current trade regime point out that it is far from being a levelled playing field and, thus, rather contributes to increasing inequality and poverty worldwide (see below a description of the main arguments). Those opponents, then, believe that, due to unequal power relations, the current system of world trade is biased against the poor and needs to be replaced by an approach that creates a levelled playing field between rich and poor countries. To many, so-called “fair-trade” seems to be a viable alternative.

For the case of a single producer, the fair-trade system in principle works as follows. The producer joins a democratically organized co-operative which obtains a fair-trade certification provided it fulfils certain minimum standards (e.g. the pursuit of ecological goals etc.). The importers of the commodity then have to buy their commodities directly from the co-operative whereby purchasing agreements need to extend beyond one harvest cycle. In addition, importers guarantee a minimum price plus a social premium above that minimum or the world market price - whichever is higher. Both, the guarantee of a minimum price and long-term agreements, then, are supposed to protect the producer from price volatilities and exploitative importers. Hence, “fair-trade” aims at improving the living conditions of the poor. Despite a rising awareness about the fair-trade movement and immense growth rates of over 40 percent in total spending on fair-trade products (FLO 2007), there is to date little research examining the claims of the fair-trade movement. In this paper, we contribute to the discussion in a theoretical model by focussing on a comparison of the welfare of producers in developing countries in situations with and without fair-trade.

The criticism on free trade mentioned above can be summarized by basically three major points. First, there is the assertion that the current trade regime does not create a win-win situation. Rather, critics hold, especially poor countries with a comparative advantage in primary commodities suffer from declining terms-of-trade. The terms-of-trade of non-oil developing countries have indeed been declining over the past four decades. Since about two-thirds of the total exports of least developed countries (LDC) consist of primary products, this is a rather troubling situation (see Oschinski, 2006). A second point of criticism is the system of tariffs and subsidies established in the industrialized countries. While average tariffs applied by the EU, the US and Japan are at rather low levels of between 3 to 4 percent, around a twelfth of all their tariff rates are above 15 percent affecting imports valued at more than 90 billion US-dollars - 60 percent of which come from developing countries (World Bank, 2002). While the US applies peak tariffs mainly to textiles and footwear, the EU and Japan put in place high tariffs on food items and other agricultural products. Additionally, subsidies work to distort trade in favor of developed countries. Subsidies paid to the agricultural sector accounted for 25 percent of farm output in the US, about 40 percent in the EU and more

than 60 percent in Japan at the beginning of this century (Oxfam, 2002). Moreover, under the common agricultural policy (CAP) of the EU export subsidies were paid for agricultural commodities distorting both world prices and markets in developing economies. It has been estimated that Latin America could have gained around 14 billion US-dollars, and Sub-Saharan Africa more than 2 billion US-dollars through a proper liberalization of the markets of industrialized nations between 2000 and 2005 (Anderson et al., 2001). A final argument against the current trade regime concerns the power of multinational companies (MNCs). Critics claim that in their search for the cheapest location of production, MNCs coerce governments of poor countries to grant them tax breaks and to turn a blind eye to both working hours and working conditions of their laborers. This results in the creation of sweatshops, turning entire countries “into industrial slums and low-wage labor ghettos, with no end in sight” (Klein, 2001).

If fair-trade in contrast to free trade indeed tackles these problems and improves the living conditions of the poor has, however, hardly been analyzed within the economic literature. Focusing on the coffee market, a number of authors find that fair-trade might have a positive impact on a small group of producers but these need not necessarily be the poorest (see, for example, Leclair, 2002, Zehner, 2002, Booth and Whetstone, 2007, Jaffe, 2007, Bacon, 2002 or McMahon, 2001). A less skeptical view is taken by Hayes (2006) who examines the impact of fair trade in a model with imperfect competition in a monopsonistic labor market environment. His results indicate that, in these circumstances, fair-trade can increase economic efficiency and the welfare of agricultural producers because the “abuse” of power can be reduced by a “fair” trading system. Maseland and de Vaal (2005) also assert that fair-trade might have a positive impact on the poor by offsetting some of the structural market failures that characterize the primary sector in a number of developing countries. Other studies find, however, that the benefits of fair-trade do not lie in the monetary realm but rather come in the form of improvements in capacity building, technical expertise and market information contributing to the empowerment of producers (and Reynolds, 2002 and Conroy, 2005).

In this paper we assess the impact of fair-trade on the welfare of the poor in developing countries. In the following sections, we present a model of an agricultural goods market in a developing country characterized by search frictions. The model borrows from labor market analysis and applies a matching setup in line with Mortensen and Pissarides (1994) to the agricultural goods market. We assume that, in a world without a fair-trade organization, producers in developing countries and the buying importers (who resell the (final) good in the developed world for the world market price) bargain over the price the producer has to sell his (primary) goods for. The smaller the producer’s bargaining power is, the lower his benefit from selling his goods is. We then introduce a fair-trade organization into this simple framework. We assume that there exists a market for goods where people are willing to pay a mark-up on the world market price whenever the goods are labelled to be “fairly” traded. The fair-trade organization guarantees each producer who is connected with it a minimum income. Further, it bargains with the importer of the good over the price the

producer receives for selling his goods, where we assume that the organization's bargaining power exceeds the producers's bargaining power. This implies that fair-trade organizations can achieve better payments for individual producers. Fair-trade organizations are assumed to be no-profit, i.e. they distribute all their income to the producer. However, they have to refinance the income they have granted the producers as long as they are/were not productive (i.e. as long as they have not yet found a buyer of their products).

Our results show that, after introducing fair-trade, producers connected with a fair-trade organization are better off than before because the organization does a better bargaining job. Those producers unable to get certified, however, are worse off. This is because, through the risk of losing the producer to a fair-trade organization, importers in the regular market will decrease the payments to the producers to compensate for the shorter average duration of a relationship. In addition, they demand a higher amount of (primary) goods as compensation. The overall effect on aggregated welfare crucially depends on the producers' bargaining power vis-a-vis the companies or middlemen buying their products, i.e. on the power to share in the revenues of the products sold to the final consumer. If the producers' bargaining power is rather small, fair-trade leads to an improvement in their overall living-conditions as the gains of fair-trade certified producers outweigh the losses of non-certified producers. In case the bargaining power exceeds a certain threshold, however, the opposite holds true because, then, the decreased payments in the regular sector become more and more important for aggregated welfare. Simulations suggest that this power threshold tends to be rather small.

In our opinion, there are two crucial findings to be derived from our analysis. First, since fair-trade only improves aggregated welfare of the poor whenever the producers' bargaining power is (very) small, fair-trade organizations need to assess carefully which producers to certify. If they expand into regions where producers' bargaining power is (too) high, they might contribute to a decrease in the overall welfare of producers which is clearly not what they are aiming at. Hence, a sound evaluation of the corresponding region ought to be conducted before the start of any certification process.

Second, even in cases where overall producer welfare increases, there will be some who lose - those who do not manage to become certified with a fair-trade organization. In these cases fair-trade organizations and certified producer co-operatives might want to think about putting in place adequate transfer mechanisms to compensate the losers - especially if the latter belong to the extremely poor.

The rest of the paper is organized as follows. In section 2, the benchmark model without a fair-trade organization is introduced. This basic model is enhanced by the existence of a fair-trade organization in section 3. Section 4 presents a welfare comparison and in section 5 a numerical example is given. Section 6 concludes. A mathematical appendix is added.

2 The Benchmark Model

In this section, we introduce the benchmark model without a fair-trade organization which we then use for further analysis. We consider an economy populated by a continuum of risk-neutral producers and importers. Time is continuous and agents discount at rate r . Producers cultivate a certain resource which they sell to the importers. Importers process this resource and, then, sell it to the world market at a market price p , where we assume that p is net of processing costs (for simplicity, it is equal across firms). We could think of coffee farmers cultivating and reaping coffee beans. These beans are sold to a roasting company that produces coffee and, then, sells it to the (final) consumer. The world market price is assumed to be exogenously given as the country under consideration is assumed to be small. The amount of primary goods sold by a producer to an importer shall be denoted with x . The producer population is assumed to have mass 1.

The market for the primary goods (e.g. coffee beans) is characterized by search frictions which means that producers and importers do not meet instantaneously but have to invest time to find each other. Modelling such search frictions relates to matching models in the manner of Mortensen and Pissarides (1994, 1999) commonly used in labor market analysis. For analytical tractability, however, we use a slightly different matching approach introduced by Garibaldi and Violante (2005). Still, this different framework retains the same features which is widely discussed in Garibaldi and Violante (2005, pp. 807-808). Therefore, these models can be deemed to be equivalent and the use of either one does not affect our results. As indicated by Zehner (2002), a model with search frictions can be considered to capture the situation on the coffee market quite well.

Like in the Garibaldi and Violante (2005) matching framework, we assume a fixed amount of matching licences v that can be rented by importers each period at cost c .¹ Thus, potential importers compete for matching licenses, while free market entry ensures that the steady state income value of a importer seeking a producer will be zero. This situation shall be labelled vacancy. Vacancies v and searching producers u meet randomly, where $\alpha > 0$ is the fixed contact rate for a producer to meet an importer. This implies that the contact rate for a vacancy can be expressed as $(\alpha u)/v$. Upon meeting, the producer-specific production level x is drawn from a cumulative distribution function $G(x)$, where $g(x)$ denotes the corresponding density function. For simplicity and without loss of generality, we assume that $x \in [0, 1]$. This idiosyncratic production level x is revealed only after the parties meet. This implies that a contact might not necessarily yield a business creation. Only when the production level exceeds some endogenously determined threshold value R is a business relation created. After a successful match, producers sell their resource to the importer which he processes and resells on the market. Matching licenses are released and immediately rented out to

¹It is indeed true that this exogenizes the number of entries of importers. However, owing the price alignment of c , the qualitative results are equivalent to those with endogenous number of importers as pointed out above. A huge advantage is that mathematics are kept a lot simpler in this setup which is fully adequate for our purpose .

another importer. However, producers are hit by idiosyncratic productivity shocks at a Poisson rate $\lambda > 0$. In the event of a shock, the business relation is destroyed (note that, while introducing endogenous destruction decisions only complicates the mathematics later on, it does not add to the analysis to follow; therefore, we abstract from this feature for simplicity) and the producer has to look for another importer.

In order to be able to analytically describe the above relationship, we have to model income flows of producers and importers over time. Then, we can derive the steady-state equilibrium. The present value of a producer's income can be expressed by the following Bellman equation

$$rW(x) = w(x) - e + \lambda [\tilde{U} - W(x)], \quad (1)$$

where $w(x)$ is the per period income the producer receives from selling the amount x to the importer (endogenously derived below). e is the disutility of providing effort to cultivate and reap the primary good x (e.g. coffee beans). Note that effort is independent of the amount x produced as we assume that, whenever producers decide to produce something, they do the best they can. (Furthermore, assuming effort to be dependent on x would not change the results derived below qualitatively.) In the case the business relation is destroyed, which occurs at rate λ , the producer receives the income stream \tilde{U} .

A producer who has no business relation meets a importer at rate α who buys his resource as long as the production level drawn upon meeting is above the threshold value. For simplicity, we assume that an unemployed producer has no alternative income (note that any positive alternative income would not change the results qualitatively as long as it stays below the maximum possible productivity level for x – which seems to be a reasonable assumption). The corresponding Bellman equation reads

$$r\tilde{U} = \alpha \left[\int_R^1 W(x) dG(x) - [1 - G(R)]\tilde{U} \right]. \quad (2)$$

We label this the producers' subsistence level. The present value of a importer's income is analogously expressed by the Bellman equation

$$rJ(x) = px - w(x) + \lambda [V - J(x)], \quad (3)$$

where p is the net price one unit of x processed and, then, sold on the market. The income flow of a vacancy, V , can be stated as

$$rV = -c + \frac{\alpha u}{v} \left[\int_R^1 J(x) dG(x) - [1 - G(R)]V \right], \quad (4)$$

where c are the importer's vacancy costs per period. Free market entry and the price alignment of matching licences, c , guarantees that $V = 0$ in steady-state. Thus, to calculate the minimum production level necessary for importers to enter the market (i.e. the threshold

value R), we have to consider that the importers' income value must at least be equal to zero, $J(R) = 0$.

Before we can do this, it still remains to be clarified how producers and importers determine the payment $w(x)$. We assume that they bargain over $w(x)$, where $\beta \in [0, 1]$ reflects the producers' bargaining power. It seems reasonable to assume that β is close to zero as small, regionally bound producers face relatively large, world-wide operating companies. Bargaining takes place at the beginning of a relationship and after each shock as there are no long-term contracts between producers and importers which seems to be quite a realistic assumption (Jaffee, 2007). In order to capture the bargaining analytically, we assume that producers and importers play a Nash-game solving

$$\arg \max w(x) = [W(x) - \tilde{U}]^\beta [J(x)]^{(1-\beta)}. \quad (5)$$

The resulting sharing rule implies

$$\beta J(x) = (1 - \beta)[W(x) - U], \quad (6)$$

which states how the importer's revenue is divided between the producer and the importer (depending on the bargaining power β). The higher β is, the greater the producer's share of the profits is. Substitution of equation (2) to (4) into the sharing rule yields after some rearranging (see Appendix A)

$$w(x) = \beta px + (1 - \beta) \left[e + \beta \frac{\alpha p}{r + \lambda} \int_R^1 (x - R) dG(x) \right]. \quad (7)$$

Substitution of equation (7) into equation (3) and bearing in mind that $J(R) = 0$ must hold in the steady-state equilibrium, we can derive

$$p \left\{ R - \frac{\beta \alpha}{r + \lambda} \int_R^1 (x - R) dG(x) \right\} = e. \quad (8)$$

Equation (8) calculates the minimum production level R necessary for a business relation between a producer and a importer to be created upon meeting. This implies that all producers producing less than R will not find a buyer of their products and basically stay unproductive. Note that the term on the lhs of equation (8) is always larger or equal to zero. This implies that an unique and stable equilibrium always exists (unless e exceeds the maximum possible value for x which we rule out by assumption as, otherwise, it would never pay to produce something). This can easily be seen by the fact that the payment the producer receives is an increasing function of the reservation productivity, R , see equation (7), whereas the present income value of a importer at reservation productivity, equation (3), decreases in R .

Given the steady-state equilibrium value for R , we are able to calculate the number of producers not having a business relationship, \tilde{u} . As producer population has mass 1, it is

clear that $\tilde{e} = (1 - \tilde{u})$ is the number of active producers. The change in the number of unproductive producers is determined by per period inflows, $\lambda(1 - \tilde{u})$, i.e. the number of relationships that is destroyed, and per period outflows, $\alpha[1 - G(R)]u$, i.e. the number of new business relations being created. In steady-state, there is a constant number of unproductive producers (i.e. the inflows and outflows are equal) which allows us to calculate

$$\tilde{u} = \frac{\lambda G(R)}{\lambda G(R) + \alpha[1 - G(R)]} \quad (9)$$

as the steady-state number of unproductive producers. From totally differentiating equation (8), it is straightforward to see that reservation productivity increases in the bargaining power of producers,

$$\frac{dR}{d\beta} = \frac{\alpha \int_R^1 (x - R) dG(x)}{r + \lambda + \beta\alpha(1 - G(R))} > 0. \quad (10)$$

This implies that, whenever producers are able to obtain a larger fraction of the match's value, importers demand a higher reservation productivity in order to create a business relation. Consequently, the number of unproductive producers increases as becomes obvious by inspection of equation (9). This is quite intuitive because, as the bargaining power of producers increases, the importer's profit decreases which gets obvious by the sharing rule, equation (6). In order to compensate for this, the importer wants to sell more products on the world market in order to (partly) compensate for this loss. Of course, as becomes clear by inspection of equation (7), the producer's per period profit increases the higher his bargaining power is.²

3 Introducing Fair-Trade

In the previous section, we have presented a model that is – as we think – able to picture an agricultural goods market in the developing world. Taking this as a benchmark scenario, we now introduce fair-trade organizations and analyze the effects that occur. We assume that fair-trade organizations make use of the fact that there are people willing to pay a higher price for the same good as long as the producers, who are allegedly exploited by the importers, are paid a “fair” price. Such an assumption is empirically backed by a variety of studies discussed below. The basic story we are about to tell goes as follows. Generally,

²As a side note, we also find by totally differentiating equation (8) with respect to R and p that, as the world market price for the primary goods decreases, reservation productivity increases which yields more inactive producers in the region considered. Those readers that may be disappointed with the results achieved in the paper concerning the efficiency of fair-trade would probably agree that protectionist policies of the developed world – as, for example, subsidizing agricultural goods and, therefore, keeping the world market price artificially low – can indeed harm the developing world's producers and worsen their living conditions (Oxfam, 2002). This shows that, while, in general, we will find no absolutely positive welfare effect of fair-trade, our model is able to picture several perceptions made in trade literature and by opponents of the current trading system.

the market is characterized by the model setup in section 2. Fair-trade organizations attract producers and label a product to be “fairly” traded which, then, is able to earn a mark-up on the world market price when sold by the importer as stated above. The fair-trade organization and the importer bargain over the per period income received by the producer. We assume that the fair-trade organization bargains from the producers perspective, i.e. it bargains a similar wage the producer would bargain. However, the organization’s bargaining power exceeds the one of the producer. Whenever a producer is signed in with a fair-trade organization, the organization pays him a certain amount in order to cover his living expenses even if he is still unproductive (which corresponds to the fair-trade standards described by FLO, 2007). As soon as the organization finds a importer who is willing to buy “fairly” traded products, the producer starts production and earns the per period income bargained by the organization. In order to re-finance the amount paid to the producer while he was still inactive, the fair-trade organization charges a fee exceeding the payment just bargained. We assume that the fair-trade organization is non-profit (implying that it is no income maximizer) but not funded exogenously. In the following sub-sections, we picture this story formally and derive equilibrium. We point out the differences to the situation without a fair-trade organization. Then, in section 4, we compare the producers’ welfare in situations with and without fair-trade organizations.

3.1 The Basic Framework

In order to describe an economy with a fair-trade organization, we model four market states and the corresponding flows (see Figure 1). Producers can be inactive, state U . They may have a business relation to a importer directly (which more or less corresponds to the scenario described in section 2), state E . Additionally, they can be signed in with a fair-trade organization, state A . The fair-trade organization looks to establish a business relation between the producer and an importer. In the case a fair-trade organization has established an business relation between a producer and a importer, we label this state T .³

The flow equilibria are given by equalizing flows into and out of states E , T , A and U , respectively. In what follows, we describe the value functions of importers, fair-trade organizations and producers in more detail and, then, derive equilibrium in the following subsection.

In state E , the present value of the importer’s income then rewrites to

$$(r + \lambda_E + \gamma_E \alpha_A) J_E(x) = px - w_E(x). \quad (11)$$

The interpretation is analogous to equation (3), where the subscript E indicates state E -specific values (we allow, for example, that $\lambda_E \neq \lambda_T$ which implies that state-specific shock arrival rates may differ). α_A is the contact rate for producers in state U with a fair-trade

³Note that the basic idea for this setup is again taken from labor market analysis. We use a modified version of the flow model presented by Neugart and Storrie (2006).

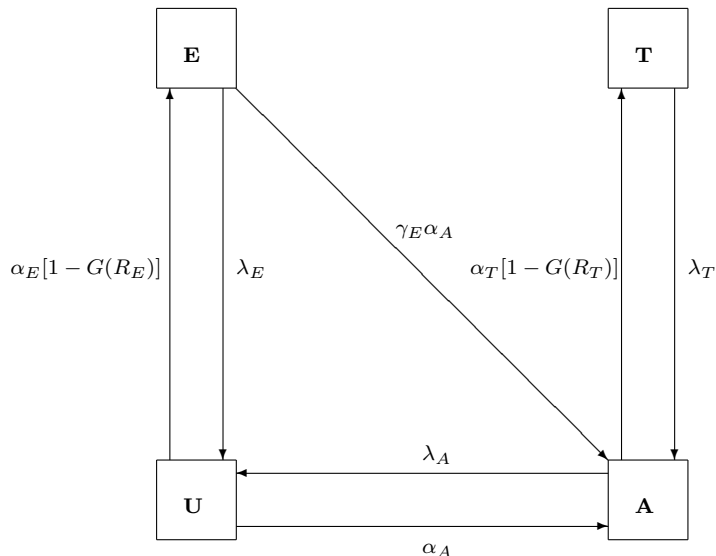


Figure 1: Market Flows

organization. Thus, in addition to the situation without fair-trade organizations, producers having a regular business relation may now meet with a fair-trade organization and abandon the current relationship at rate $\gamma_E \alpha_A$, where γ_E captures effectiveness/willingness of those producers having a regular business relationship to sign in with a fair-trade organization relative to those situated in state U .

We assume that there exists a market for fairly traded products, i.e. a market that is paying a mark-up on the world market price whenever producers benefit from this extra-payment. This assumption seems to be backed by a variety of consumer analyses which state that consumers are willing to pay “fair” prices. For example, De-Pelsmacker and Driesbeth (2006) find that, on average, consumers are willing to pay a 10% increase on the market price for products with a fair-trade label. Other studies as Arnot et al. (2006), Loureiro and Lotade (2005) or Socias-Salva and Doblás (2005) come to similar results. This implies that the present value of the income of importers who sell fairly traded products, i.e. state T , can be expressed by

$$(r + \lambda_T) J_T(x) = (1 + \rho)px - w_T(x) - \sigma. \quad (12)$$

Here, $\rho \cdot p$ is the additional per unit revenue which importers obtain from selling fair-trade labelled products. $w_T(x)$ captures the per period payment for the resource delivered by the producer to the importer which is bargained between the fair-trade organization and the importer. The fair-trade organization charges σ in order to re-finance the payments f (see below) it makes to an inactive producer.

Finally, we have to describe the value functions of the fair-trade organization. Fair-trade organization acquire producers from the pool of those producers situated in state U and

state E . Whenever a producers signs in with a fair-trade organization, the organization will fill a vacancy which we denote with A, F . However, the the producer remains unproductive until the the organization has been able to establish a business connection in state T . If that has been established, we denote this by A, P . The per period value of a filled vacancy in which the producer has not yet been assigned to an importer, state A, F , can be described by the (negative) payment of the fee f plus the option value of assigning the producer which occurs at rate $\alpha_T(1 - G(R_T))$. We assume that fair-trade organizations pay the producer a fee f^* that covers his living expenses and guarantees the same utility as being situated in state U . This is discussed in more detail below. Further, fair-trade organizations are also hit by a shock λ_A , in which case the relationship between the producer and the organization is dissolved. Thus, the according Bellman equation reads

$$[r + \lambda_A + \alpha_T(1 - G(R_T))] J^{A,F} = -f^* + \alpha_T \int_{R_T}^1 J^{A,P} dG(x). \quad (13)$$

If the producer who signed in with the fair-trade organization is assigned to a importer, the fair-trade organization, having bargained a payment $w_T(x)$ which the producer receives, gets σ each period the producer is assigned. σ^* is chosen such that the expected present income of a fair-trade organization, $J^{A,F}$, is zero. It will be derived below. Further, there is the possibility that the business relationship is destroyed in state T at rate λ_T and the producer returns to the files of the organization but is, then, unproductive. Thus, the present value of the organization's income in state A, P is given by the Bellman equation

$$(r + \lambda_T) J^{A,P} = \sigma + \lambda_T J^{A,F}. \quad (14)$$

The present value of vacancies in state E and state T can be expressed by

$$rV_j = -c_j + \frac{\alpha_j s_j}{v_j} \left[\int_{R_j}^1 J_j(x) dG(x) - [1 - G(R_j)] V_j \right], \quad (15)$$

where $j = E, T$. s_E , for example, describes the pool of producers that are looking for a regular business relationship in E and c_E describes the corresponding vacancy costs per period. Note that s_j depicts the effective number of searching producers in state j . Those producers in state U shall be denoted by u , whereas producers in state T are denoted by t , producers in state A by a and producers in state E by e , respectively. From the setup described above, we know that $s_E = u$, $s_T = a$, and $s_A = u + \gamma_E \cdot e$ (see also Figure 1). The flow value of a vacancy in state A can be stated in an analogous manner as

$$rV_A = -c_A + \frac{\alpha_A s_A}{v_A} [J^{A,F} - V_A]. \quad (16)$$

The present value of the producers' income in the corresponding states can be expressed in analogy to section 2. As producers having a regular business relation in state E now also have the chance to meet a fair-trade organization, we have to re-write equation (1) to

$$[r + \lambda_E + \gamma_E \alpha_A] W_E(x) = w_E(x) - e + \lambda_E U + \gamma_E \alpha_A W_A, \quad (17)$$

where the last term on the rhs now results because a producer with regular business relationship may join with a fair-trade organization which gives him utility W_A , and occurs at rate $\gamma_E \lambda_A$. Again, the subscript $E(A)$ indicates that these are state $E(A)$ -specific values. The interpretation is analogous to the one of equation (1). Similarly, the income flow of a producer without any business connection, equation (2), re-writes to

$$rU = \alpha_E \left[\int_{R_E}^1 W_E(x) dG(x) - [1 - G(R_E)]U \right] + \alpha_A [W_A - U] \quad (18)$$

with analogous interpretation. In addition to the interpretation in equation (2), the inactive producer may now create a business relation with a fair-trade organization which gives him utility W_A . It remains to describe the present income value of producers in states A and T . As already mentioned, we assume that producers signed in with a fair-trade organization receive the payment f per period. They have, further, the chance to establish a business relationship with an importer found by the fair-trade organization (which is denoted by $W_T(x)$). Meeting occurs at rate α_T . Given that relationships with the fair-trade organization are destroyed at rate λ_A , we can formally state this as

$$rW_A = f + \alpha_T \left[\int_{R_T}^1 W_T(x) dG(x) + [1 - G(R_T)]W_A \right] + \lambda_A [U - W_A]. \quad (19)$$

It naturally follows that the Bellman equation for producers allocated in state T must be

$$[r + \lambda_T] W_T(x) = w_T(x) - e + \lambda_T W_A. \quad (20)$$

We assume that fair-trade organizations grant a payment f^* to the inactive producer who signs in where f^* guarantees the producer the expected income of not having a business relationship (otherwise, the producer would rather want to stay unproductive). This implies $W_A = U$. Imposing this on equations (17) to (20) yields

$$[r + \lambda_E + \gamma_E \alpha_A] W_E(x) = w_E(x) - e + [\lambda_E + \gamma_E \alpha_A] U, \quad (21)$$

$$rU = \alpha_E \int_{R_E}^1 [W_E(x) - U] dG(x), \quad (22)$$

$$rW_A = f^* + \alpha_T \int_{R_T}^1 [W_T(x) - U] dG(x) \equiv rU \quad (23)$$

and

$$[r + \lambda_T] W_T(x) = w_T(x) - e - \sigma + \lambda_T U, \quad (24)$$

which will tremendously simplify our analysis. Using equation (22) and (23), we know that

$$f^* = \alpha_E \int_{R_E}^1 [W_E(x) - U] dG(x) - \alpha_T \int_{R_T}^1 [W_T(x) - U] dG(x). \quad (25)$$

For given policy parameters, the equilibrium is now a pair of reservation productivities $\{R_E, R_T\}$, a pair of payment rules $\{w_E(x), w_T(x)\}$, the optimal refinancing fee $\{\sigma\}$ as well as rental prices for matching licences, $\{c_E, c_A, c_T\}$, which simultaneously solve the equations described above. Given these values, it is then a straightforward matter to derive the fraction of producers allocated in each state, u, e, a and t (see Appendix B).

3.2 Equilibrium

As in section 2, producers and importers in the regular state (E) bargain over the producer's payment, where $\beta \in [0, 1]$ reflects the producers' bargaining power. Following section 2 and Appendix A for the derivation of the payment and the equilibrium condition, we get

$$w_E(x) = \beta p x + (1 - \beta) \left[e + \beta \frac{\alpha_E p}{r + \lambda_E + \gamma_E \alpha_A} \int_{R_E}^1 (x - R_E) dG(x) \right] \quad (26)$$

as the bargained payment in state E and

$$p \left\{ R_E - \frac{\beta \alpha_E}{r + \lambda_E + \gamma_E \alpha_A} \int_{R_E}^1 (x - R_E) dG(x) \right\} = e \quad (27)$$

as the equilibrium condition for state E . The interpretation is analogous to the one for equations (7) and (8). We see in equation (27), however, that $R_E > R$ (for $\alpha_E = \alpha$ and $\lambda_E = \lambda$) because, now, importers face the risk of losing the producer to a fair-trade organization at rate $\gamma \alpha_E$. This reduces the average duration of a business relationship and, thus, increases the importers' discounting. This implies that, in the presence of fair-trade organizations, those producers having a regular business relationship *ceteris paribus* loose compared to the situation without a fair-trade organization (for more details, see section 4).

Whenever producers are signed in with a fair-trade organization, the organization undertakes the bargaining. The fair-trade organization's bargaining power is given by $\phi \in [0, 1]$, where $\phi = \beta + \epsilon$ and $\epsilon > 0$. This implies that the organization bargains better than the producer (which seems reasonable as the organization may have the power to deny the importer in the developed world). We assume that, in undertaking the bargaining with the importer, the fair-trade organization does so from the producer's perspective, i.e. it bargains a wage equal to the one the producer would bargain if he had access to the market and the same bargaining power. This implies that the payment $w_T(x)$ results from optimizing $\arg \max w_T(x) = [W_T(x) - U]^\phi [J_T(x)]^{(1-\phi)}$, which, following the derivation in section 2 and Appendix A, yields

$$w_T(x) = \phi [(1 + \rho) p x - \sigma] + (1 - \phi) \left[e + \phi \frac{\alpha_T (1 + \rho) p}{r + \lambda_T +} \int_{R_T}^1 (x - R_T) dG(x) \right]. \quad (28)$$

Substitution into equation (12) and some rearranging yields

$$(1 + \rho) p \left\{ R_T - \frac{\phi \alpha_T}{r + \lambda_T} \int_{R_T}^1 (x - R_T) dG(x) \right\} = e + \sigma, \quad (29)$$

which solves the optimal reservation productivity in state T for any given σ . The interpretation is, thus, analogous to the one of equation (27). Nevertheless, σ remains to be determined in order to derive equilibrium in state T . As we have already pointed out, the fair-trade organization chooses σ to be able to refinance itself but not to make any profit. This implies $J^{A,F} = -f^* + \alpha_T \int_{R_T}^1 J^{A,P} dG(x) = 0$. Using equations (13) and (14) and some rearranging yields

$$f^* = \sigma \frac{\alpha_T(1 - G(R_T))}{r + \lambda_T}, \quad (30)$$

where f^* is given by equation (25). Note that the integral-terms of f^* can unambiguously be calculated from the sharing rules resulting from bargaining between producers and importers and fair-trade organizations and importers, respectively (see Appendix A). Simultaneously solving equations (29) and (30) determines the equilibrium values for R_T and σ . This implies that equilibrium is unambiguously determined by equations (27), (29) and (30).

Given the equilibrium values for R_E , R_T and σ through solving equations (27), (29) and (30), we can calculate the steady-state fraction of producers allocated in each state E , T , A and U (see Appendix B).

4 Welfare Comparison

In order to understand the effects on producers' welfare resulting from fair-trade, we must now calculate their welfare function. We first describe the producers' welfare without a fair-trade organization (referring to section 2) and, then, turn to producers' welfare in the presence of a fair-trade organization.

From the sharing rule, equation (6), we know that a producer's utility who has productivity x can be expressed as $W(x) = \frac{\beta}{(1-\beta)} J(x) + \tilde{U}$. As we know that $J(x) = \frac{(1-\beta)p(x-R)}{r+\lambda}$ (see Appendix A), this implies

$$W(x) = \beta \frac{p(x-R)}{r+\lambda} + \tilde{U},$$

where

$$\tilde{U} = p \frac{\alpha}{r} \frac{\beta}{r+\lambda} \int_R^1 (x-R) dG(x)$$

(see equation (9)). We know that \tilde{u} producers are inactive and only receive utility \tilde{U} . $\tilde{e} = (1 - \tilde{u})$ producers receive utility $W(x)$ with different productivity x , however (where x is distributed between R and 1 according to the distribution function $G(x)$). Combining the utilities of productive and inactive producers and bearing in mind the productivity

distribution, we can calculate the producers' welfare as

$$\begin{aligned}\tilde{\Omega} &= \tilde{e} \int_R^1 W(x) dG(x) + \tilde{u}U \\ &= \tilde{e} \frac{p\beta}{r + \lambda} \int_R^1 (x - R) dG(x) + p \frac{\alpha}{r} \frac{\beta}{r + \lambda} \int_R^1 (x - R) dG(x)\end{aligned}\quad (31)$$

as $\tilde{e} + \tilde{u} = 1$ which implies that all producers have at least the utility of being unproductive.

An analogous proceeding allows us to derive the the welfare producers in a world with a fair-trade organization, where

$$W_E(x) = \beta \frac{p(x - R_E)}{r + \lambda_E + \gamma_E \alpha_A} + U$$

and, equivalently, by using equation (23), in state T as

$$W_T(x) = \phi \frac{(1 + \rho)p(x - R_T)}{r + \lambda_T} + U.$$

Due to the fact that the utility of producers in states U and A is equalized according to the payment of f^* (see equations (23) and (22)), we know that

$$U = W_A = p \frac{\alpha_E}{r} \frac{\beta}{r + \lambda_E + \gamma_E \alpha_A} \int_{R_E}^1 (x - R_E) dG(x).$$

This implies that total producers' welfare in the presence of a fair-trade organization can be expressed as

$$\begin{aligned}\Omega &= e \int_{R_E}^1 W_E(x) dG(x) + t \int_{R_T}^1 W_T(x) dG(x) + (a + u)U \\ &= e \frac{p\beta}{r + \lambda_E + \gamma_E \alpha_A} \int_{R_E}^1 (x - R_E) dG(x) + t \frac{p(1 + \rho) \overbrace{(\beta + \epsilon)}^{=\phi}}{r + \lambda_T} \int_{R_T}^1 (x - R_T) dG(x) \\ &\quad + p \frac{\alpha_E}{r} \frac{\beta}{r + \lambda_E + \gamma_E \alpha_A} \int_{R_E}^1 (x - R_E) dG(x).\end{aligned}\quad (32)$$

Equations (31) and (32) represent the present value of the producers' income in the absence and in the presence of a fair-trade organization, respectively, which we use as a measure for the producers' welfare. In order to compare the producers' welfare situations with and without fair-trade organizations, we must, hence, compare equations (31) and (32).

Assume for a moment that $\beta = 0$. This implies that producers have no bargaining power at all. In regular business relations (with and without the presence of fair-trade organizations), importers are able to squeeze the payment they have to make to the producers

to a minimum. This implies that, whenever producers establish a business relation, they get compensated for the effort e but receive no additional revenue from selling the primary goods (i.e. $w(x) = w_E(x) = e$; see equations (7) and (26)). Referring to the welfare functions, this implies that all producers receive their subsistence level (which is zero as we assume that there is no alternative income for simplicity) except those who are connected with a fair trade-organization as long as $\epsilon > 0$. This implies that, whenever the producers have no bargaining power at all, aggregated welfare increases owing to fair-trade organizations, $\Omega > \tilde{\Omega}$ (see also equations (31) and (32) for $\beta = 0$).

However, as becomes quite obvious from equations (31) and (32), this must not hold true for $\beta > 0$. In the presence of fair-trade organizations, importers buying primary goods regularly from producers increase discounting due to the risk that they loose a producer to a fair-trade organization which occurs at rate $\gamma_E \alpha_E$. This implies that business relations have a shorter average duration which means that the minimum production necessary for business creation is larger in the presence of fair-trade organizations, $R_E > R$ (see also equations (8) and (27)). Hence, this decreases the expected value of a business relation $\int_{R_E}^1 J_E(x)$ in the presence of fair-trade organizations compared to the situation in absence of fair-trade organizations, $\int_R^1 J(x) \left[> \int_{R_E}^1 J_E(x) \right]$. As, for $\beta > 0$, producers receive a fraction $\beta/(1 - \beta)$ of this value in addition to their subsistence level according to the sharing rule, those producers having a regular business relation loose whenever fair-trade organizations are introduced. Therefore, $W_E(x) < W(x)$ as well as $U(= W_A) < \tilde{U}$ because inactive producers also receive a fraction of the expected value of a business relation whenever it is established (see equations (2), (22) and (23), respectively). Taking this argument to the welfare of producers, this implies that the regularly employed producers' as well as the unproductive producers' expected income decreases. To put it differently, $e \int_{R_E}^1 W_E(x) dG(x) + (a+u)U < \tilde{e} \int_R^1 W(x) dG(x) + \tilde{u}U$ (see equations (31) and (32)). Hence, neglecting the welfare of those producers having a business relation created by a fair-trade organization, the welfare decreases and those producers who were not lucky enough to meet with a fair-trade organization loose expected income.

For a fair-trade organization to still increase aggregated welfare whenever $\beta > 0$, we then know from equations (31) and (32) that the rise in welfare of those producers having established a business relation with a fair-trade organization must (over)compensate the loss of the others, $t \int_{R_T}^1 W_T(x) dG(x) > \tilde{e} \int_R^1 W(x) dG(x) + \tilde{u}U - \left[e \int_{R_E}^1 W_E(x) dG(x) + (a+u)U \right]$ (see equation (32)). The question is, does it do that? Substitution and rearranging shows that it does only if

$$\beta < t \frac{(1+\rho)\epsilon}{r+\lambda_T} \left\{ t \frac{(1+\rho)}{r+\lambda_T} + \frac{\tilde{e} + \alpha/r}{r+\lambda} \int_R^1 (x-R) dG(x) - \frac{e + \alpha_E/r}{r+\lambda_E + \gamma_E \alpha_A} \int_{R_E}^1 (x-R_E) dG(x) \right\}^{-1} \int_{R_T}^1 (x-R_T) dG(x), \quad (33)$$

where we define the rhs of inequality (33) as $\hat{\beta}$ which is the threshold value for the bargaining power of producers until which a fair-trade organization improves aggregated welfare. That

is, as long as $\beta < \hat{\beta}$, aggregated producers' welfare improves through a fair-trade organization. Whenever this condition does not hold, the loss of those producers regularly employed overcompensates the gain of the producers having a business relation through a fair-trade organization and, thus, decreases aggregated welfare. We see that $\hat{\beta}$ itself crucially depends on the bargaining power of producers, β , because the equilibrium values depend on this parameter.

To summarize what our theoretical analysis tells us, we can state that a fair-trade organization increases aggregated producers' welfare as long as the producers' bargaining power is small enough. Due to the risk of losing a producer to a fair-trade organization, importers increase discounting which reduces the value of regularly employed producers and, thus, reduces their present value of income for any positive level of bargaining power (because they receive a fraction of the expected value of a business relationship). This can, however, be compensated for by the gains of those who meet with a fair-trade organization. Whenever the bargaining power exceeds an endogenously determined threshold value, the loss can no longer be overcompensated and fair-trade organizations even decrease the aggregated producers' welfare. As equation (33) shows, we are not able to make any solid theoretical predictions about this threshold value. It basically remains a region-specific empirical question to determine the threshold value and the actual bargaining power. Nevertheless, in order to get a feeling of the magnitude, we conduct a simple simulation of the model in the following section.

5 A Numerical Example

In order to assess the question how large the power threshold β may be, we conduct a simple simulation of the model in which we assume a uniform productivity distribution for simplicity. This yields $G(x) = x$, $g(x) = 1$ and $\int_{R_j}^1 (x - R_j) dG(x) = \frac{1}{2}(1 - R_j)^2$, where $j = E, T, A, U$. The parametric specification is summarized in Table 1.

We are now interested in what happens to the aggregated welfare with and without the presence of a fair-trade organization and, especially, the welfare difference between the two situations. Before we do this, let us, however, have a brief look at the changes an increase of the producers' bargaining power has of the steady-state reservation productivities. Figures 2 to 4 show that the expected value of a business relations from a importer's point of view decreases in all states – as would be predicted by the model from totally differentiating equations (8), (27), (29) and (30) with respect to β . In order to compensate for this, the minimum production amount necessary for business creation, the corresponding reservation productivity, increases. Hence, *ceteris paribus* business creation would decrease in all corresponding states.

Figures 2 until 4 about here

Having calculated the reservation productivities in each state, R , R_E and R_T , we can now calculate the fraction of productive and unproductive producers without a fair-trade

Name	Parameter	Value
Shock Rate in Regular State	$\lambda = \lambda_E$	0.30
Shock Rate in T	λ_T	0.20
Shock Rate in A	λ_A	0.20
Arrival Rate in Regular State	$\alpha = \alpha_E$	0.20
Arrival Rate in T	α_T	0.10
Arrival Rate in A	α_A	0.15
Organizations' Bargaining Power Mark-Up	η	0.10
Relative Search Effectiveness in E	γ_E	1.00
Producers' Effort from Production	e	0.10
World Market Goods' Price (minus processing costs)	p	1.00
Mark-Up on Fairly Trade Products	ρ	0.50
Interest Rate	r	0.05

Table 1: Chosen Parameter Values

organization according to equation (9) and $\tilde{e} = (1 - \tilde{u})$ as well as the fraction of workers allocated in each state in the presence of fair-trade organizations according to the derivation in Appendix B. Substituting the corresponding reservation productivities and these fractions into equations (31) and (32), we are now able to plot aggregated producers' welfare in the absence and in the presence of fair-trade organizations, respectively. Figures 5 and 6 show that aggregated producers' welfare increases in the producers' bargaining power in both scenarios (i.e. with and without fair-trade organizations). This implies that the increase in the fraction of the total revenue from processing and selling the primary good received by the producer overcompensates the decrease of the loss of the expected value of a business relation from a importer's point of view. Note that this is not the economy's welfare but only the producers' welfare! Losses from the importers are not taken into account.

Figures 5 and 6 about here

What we are actually interested in, however, is the difference of welfare between the situation without and with fair-trade organizations. This is plotted in Figures 7 and 8, where we plotted $\Omega - \tilde{\Omega}$ (i.e. producers' welfare with fair-trade minus producers' welfare without fair-trade).

Figures 7 and 8 about here

Inspection of Figure 7 would yield the conclusion that a situation fair-trade generates a lower aggregated producers' welfare than the situation without fair-trade. As we know from equation (33) for $\beta = 0$ (i.e. directly comparing equations (31) and (32) for $\beta = 0$) that this cannot be true, we conduct another plot for very small values of β . In Figure 8

we then see that aggregated producers' welfare with fair-trade exceeds producers' welfare without fair-trade for situations where $\beta < \approx 0.002$. This implies that the threshold for the bargaining power of producers for fair-trade to increase aggregated welfare is very small.

To sum up, we can say that our simulation suggests that fair-trade only increases the aggregated producers' welfare as long as their bargaining power is very small. If, in reality, this condition holds true tends to be an empirical question for each region in which fair-trade organizations are active.

6 Conclusion

This paper assesses the impact of fair-trade on the welfare of the producers in developing countries. In our view, both the rising awareness of and high growth rates in the fair-trade sector as well as rising criticism with the current trade regime necessitate such an analysis. This is especially so since there is currently hardly any economic literature on this issue.

To analyze the potential welfare effects of fair-trade we present a model of an agricultural goods market in a developing country characterized by search frictions commonly used in labor market analysis. Our results show that after introducing fair-trade, producers connected with a fair-trade organization are better off than before. Those unable to get certified, however, are worse off. This results because owing to the presence of fair-trade organizations, the average duration of business relations between producers and importers in the regular sector decreases (because producers with a regular business relationship then have the chance to become connected with a fair-trade organization). The importer, thus, reduces discounting and, hence, reduces the payment he grants to the producer when buying his goods.

The overall effect on aggregated welfare crucially depends on the producers' bargaining power vis-a-vis the companies or middlemen buying their products, i.e. on the power to share in the revenues of the products sold to the final consumer. If the producers' bargaining power is rather small, fair-trade leads to an improvement in their overall living-conditions as the gains of fair-trade certified producers outweigh the losses of non-certified producers. In case the bargaining power exceeds a certain threshold, however, the opposite holds true. Simulations suggest that this threshold tends to be rather small.

In our opinion, there are two crucial findings to be derived from our analysis. First, since fair-trade only improves aggregated producers' welfare whenever their bargaining power is (very) small, fair-trade organizations need to assess carefully which producers to certify in which region. If they expand into regions where producers' bargaining power is (too) high, they might contribute to a decrease in the overall welfare of producers which is clearly not what they are aiming at. Hence, a sound evaluation of the corresponding region ought to be conducted before the start of any certification process.

Second, even in cases where overall producer welfare increases, there will be some who lose - those who do not manage to become certified with a fair-trade organization. In these cases fair-trade organizations and certified producer co-operatives might want to think about

putting in place adequate transfer mechanisms to compensate the losers - especially if the latter belong to the extremely poor.

Appendix

A Bargaining and Equilibrium

Substitution of equations (1), (2) and (3) into equation (6), bearing in mind that $V = 0$ in equilibrium and rearranging yields

$$\begin{aligned} w(x) &= \beta \cdot px + (1 - \beta)[e + r\tilde{U}] \\ &= \beta \left[px + \alpha\beta \int_R^1 J(x)dG(x) \right] + (1 - \beta)e, \end{aligned}$$

where we have made use of the fact that $[W(x) - U] = \frac{\beta}{(1-\beta)}J(x)$ resulting from the sharing rule, equation (6). Substituting this payment into equation (3), yields $(r + \lambda)[J(x) - J(R)] = p(x - R)$. Bearing in mind that $J(R) = 0$ in equilibrium yields

$$J(x) = p \frac{(x - R)}{r + \lambda}$$

which implies $\int_R^1 J(x)dG(x) = \frac{p}{r+\lambda} \int_R^1 (x - R)dG(x)$. Substitution into the above payment equation yields equation (7) which, substituted into equation (3) and rearranging, yields equation (8).

An analogous proceeding calculates equations (26) and (27), where

$$J_E(x) = p \frac{(x - R_E)}{r + \lambda_E + \gamma_E \alpha_A}$$

as well as equations (28) and (29), where

$$J_T(x) = (1 + \rho)p \frac{(x - R_T)}{r + \lambda_T}$$

which are useful to determine f^* , equation (25), as well as the welfare functions of section 4.

B The Fraction of Producers Allocated in Each State

Given the equilibrium values for reservation productivities in states E and T , R_E and R_T , as well as the re-financing fee from the fair-trade organization, σ , we can now calculate the steady-state fraction of producers being regularly employed, e , being unproductive, u , being

signed in with a fair-trade organization but unproductive, a , and assigned by a fair-trade organization, t , by setting their changes over time equal to zero. From Figure 1 it becomes quite apparent that the flows can be expressed as

$$\dot{u} = \lambda_E \underbrace{[1 - u - t - a]}_{=e} + \lambda_A a - \lambda_E(1 - G(R_E))u - \lambda_A u \equiv 0,$$

$$\dot{a} = \alpha_A u + \gamma_E \alpha_A \underbrace{[1 - u - t - a]}_{=e} + \lambda_T t - \alpha_T(1 - G(R_T))a - \lambda_A a \equiv 0$$

and

$$\dot{t} = \alpha_T(1 - G(R_T))a - \lambda_T t \equiv 0,$$

where $e = (1 - u - t - a)$. $\dot{y} = dy/dt$ indicates the evolution of a variable over time (where $y = u, t, a$ and, in steady-state, $\dot{y} = 0$). Writing this system of equation in matrix form yields

$$\begin{pmatrix} u \\ t \\ a \end{pmatrix} = \begin{pmatrix} -(\alpha_A + \lambda_E + \alpha_E(1 - G(R_E))) & \lambda_E & \lambda_E - \lambda_A \\ \alpha_A(1 - \gamma_E) & \lambda_T - \gamma_E \alpha_A & -(\gamma_E \alpha_A + \alpha_T(1 - G(R_T)) + \lambda_A) \\ 0 & -\lambda_T & \alpha_T(1 - G(R_T)) \end{pmatrix}^{-1} \times \begin{pmatrix} \lambda_E \\ 0 \\ 0 \end{pmatrix} \quad (34)$$

and $e = (1 - u - t - a)$. If no fair-trade organizations are active in equilibrium, $a = t = 0$, and the steady-state rate of inactive producers boils down to equation (9), where $\lambda = \lambda_E$, $\alpha = \alpha_E$ and $R = R_E$.

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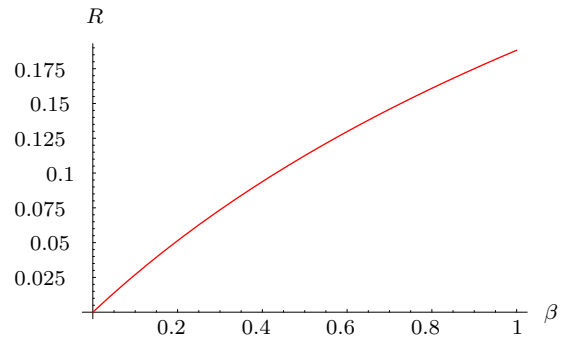


Figure 2: Reservation Prod. w/out Fair-Trade

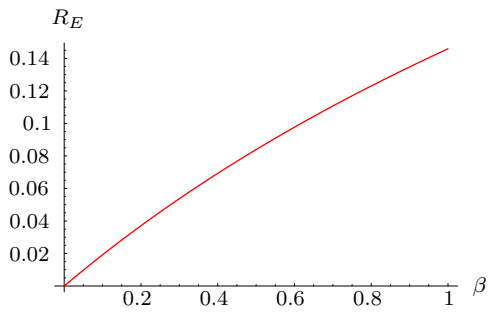


Figure 3: Res. Prod. in State E

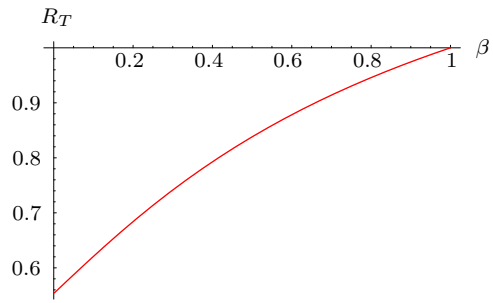


Figure 4: Res. Prod. in State T

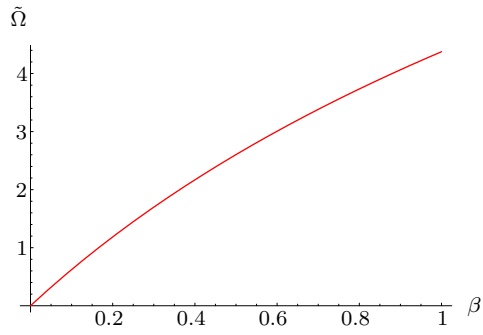


Figure 5: Welfare w/out Fair-Trade

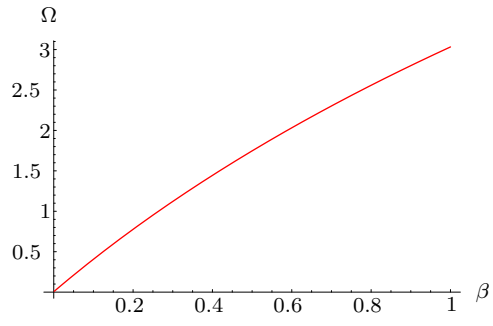


Figure 6: Welfare with Fair-Trade

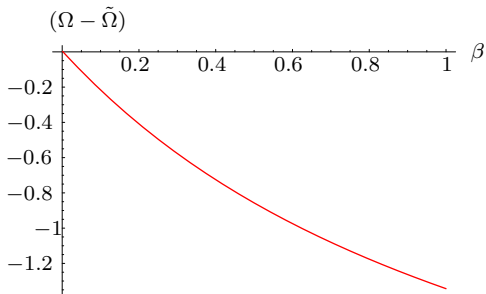


Figure 7: Welfare Difference

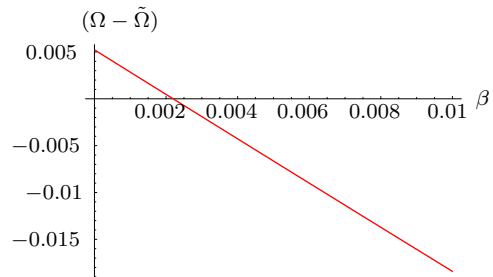


Figure 8: Welfare Difference