The effects of Fair Trade when productivity differences matter

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Abstract

This paper uses a heterogeneous firms model to scrutinize the alleged aim of Fair Trade to help the most disadvantaged producers in developing countries. Incorporating important aspects of Fair Trade in a two-good heterogeneous firm model we show that the more productive firms will join Fair Trade arrangements. Presuming that the least advantaged producers are those with lowest productivity, it thus appears that Fair Trade cannot live up to its expectations.

1 Introduction

Fair Trade can be best described as a movement that applies fairness principles in the supply chain from poor local smallholders in developing countries to consumers in rich developed countries. The concept is put to practice by Fair Trade Organizations (FTOs), replacing middlemen in the supply chain and offering long-term trading relationships. Fair Trade has known a continuous world-wide growth over the past decades, both in sales and volume (e.g. FLO, 2010). Sales of certified products grew by 483 percent from 1998, amounting to US$ 1.6 billion in 2005 (Raynolds and Long, 2007: 20-21). In less than two decades, fair trade "has grown from an obscure niche market to a globally recognized phenomenon" (Murray and Raynolds, 2007: 5).

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The aim of Fair Trade is "to offer the most disadvantaged producers in developing countries the opportunity to move out of extreme poverty through creating market access under beneficial rather than exploitative terms" (Nicholls & Opal, 2005: 6). This is accomplished by paying local producers a stable, guaranteed minimum price for decent coverage of production and living costs, as well as by providing them with a development premium for local projects to improve social, economic and environmental infrastructure. FTOs charge higher prices for comparable products in rich consumer markets to facilitate these above market payments.

Economic analyses of the impact of Fair Trade have concentrated on the claims FTOs make, primarily regarding the alleged effects on income levels of the targeted group and the efficiency by which this is reached. Theoretical contributions include analyses of the distorting effects of using price floors as a mechanism to increase local producers' incomes (Lindsey, 2004; LeClair, 2002), the efficiency of fair trade as a vehicle of transferring income to the poor (Yanchus and De Vanssay, 2003), the effect privileged market access for fair trade producers has on other producers, locally or abroad (Maseland and de Vaal, 2008), and the verdict that fair trade outperforms free trade in alleviating poverty in developing countries (Maseland and de Vaal, 2002). Fair trade has also been assessed on its potential to eradicate monopsony powers and other market imperfections in supply chains (Hayes, 2006). Stähler and Richardson (2007) analyze the effect of the supply chain on fair trade suppliers' competitiveness. A first comprehensive empirical study of the effects of fair trade on local incomes is given in Rueben (2008).

This paper uses a heterogeneous firms model to scrutinize the alleged aim of Fair Trade to help the most disadvantaged producers in developing countries. We use the two-good heterogeneous firm model version of Bernard et al. (2003) and incorporate important characteristics of Fair Trade. In the model, producers decide whether to produce a Plain Good (PG) or a Fair Trade (FT) good. PG production is the default for any firm entering the market, but producers may switch to FT good production. Taking heed of the special traits of the Fair Trade movement, we assume that FT production is different from PG production in the following ways. First, FT products are produced by adhering to better, yet also more costly production standards. On the other hand, FT producers receive higher prices for their goods, which consumers of these products in rich countries are willing to pay. Second, we assume that the decision to start producing FT goods is clouded with some ambivalence on part of local producers. After all, entering a FT arrangement will imply abandoning familiar production methods and producing for different markets. We model these transition costs as an additional entry cost to the one that must be incurred by any firm that wants to produce. Finally, since Fair Trade also provides for a sustainable trading relationship, it makes it less likely that FT firms are hit by an unexpected negative shock. Accordingly, we assume that the stochastic survival rate of FT firms is higher than for PG firms.

Our analysis shows that Fair Trade leads to a selection effect and that it will be the most productive firms that will join Fair Trade arrangements. The reason is that the higher production costs make FT production only a more profitable option than PG production provided a firm's productivity level exceeds some threshold level of indifference. As is standard in heterogeneous firms models, these firms will then also receive the highest profits. Presuming that the least advantaged producers are those with lowest productivity, it thus appears that Fair Trade cannot live up to its expectations. Furthermore, the additional entry cost opposes a barrier to Fair Trade that matters most for the lowest and least productive producers. The uncertainties involved with adapting to the different standards of Fair Trade thus increase the selection effect, moving Fair Trade even further away from its goal. Fair Trade thus results in a paradox. When it succeeds in its inherent workings – better standards, secure trade channels, and so on – the benefits will go to the better off, not to the least advantaged.

What is more, if the possibilities of Fair Trade are not known to producers in advance, firms already producing benefit disproportionately in the form of pure profits. In a setting of poor developing countries with few and dispersed Fair Trade operations, this is not an unlikely scenario. The information effect arises because upon deciding to start up production, firms form false expectations regarding future profits. New firms weigh the initial entry cost against the net present value of future profits, but are unaware that these could be higher due to fair trade production. As a consequence, fewer firms will find it profitable to enter and excess profits for incumbent firms result, for FT firms and PG firms alike. Which category benefits the most depends on the strength of the selection effect. A higher selection threshold implies less FT firms and hence a lower share of pure profits for existing FT firms.

The structure of the paper is as follows. Section 2 introduces the key aspects of fair trade for the demand and supply relations in a heterogeneous firms model. Section 3 elaborates on the entry and exit decisions of firms in view of fair trade posibilities. Section 4 discusses equilibrium focussing on the importance of having prior information on fair trade for outcome. Section 5 concludes.

2 Modelling Fair Trade and heterogeneous firms

Key to the success of Fair Trade is that some consumers have a preference for a category of products produced by a higher standard, willing to pay higher prices for it. Other consumers care less or are indifferent with respect to such fairness characteristics, seeing fair trade goods as any other good. We stylize this by assuming there are two categories of goods – fair trade goods and plain goods – yielding different utility to different types of consumers – ethical consumers and ordinary consumers. We assume a fixed division of both types of consumers in society, with $0 < a < 1$ being the share of ordinary consumers and $1 - a$ the share of ethical consumers.[1] It is modelled as a demand shift parameter: a higher value of a implies a smaller share of society has ethical preferences. We therefore assume that either group of consumers has an absolute preference for either of the goods categories: by assuming a to be fixed, ethical consumers cannot become ordinary consumers and vice versa (hence 'demand shift parameter ').

Both groups' consumption adds to societal utility U in the following way:

$$U = \left[aC_{pg}^{\upsilon} + (1-a)C_{ft}^{\upsilon}\right]^{1/\nu}, \tag{1}$$

where $C_i, i \in \{pg, ft\}$, is a consumption index of different varieties from either the plain good category or the fair trade goods category and where υ is the CES substitution parameter. This way of modeling is similar to the utility function of Bernard et al. (2003)[2].

For any other value than 0.5, the demand shift parameter provides asymmetry in utility from consuming products from a certain product category. The elasticity of substitution between categories is $\psi = 1/(1-\upsilon) > 1$. The elasticity of substitution is important since even though consumers have absolute ideas on which category of goods they prefer, actual consumption also depends on prices. The relative size of the two groups in society is not sufficient for fully conceptualizing fair trade demand of consumers; the elasticity of substitution completes the picture.

Each product category consists of a multitude of varieties, indicated by the consumption index C:

$$C_i = \left[\int_{\omega \epsilon \Omega_i} c_i(\omega)^{\rho} d\omega\right]^{1/\rho},$$

where $c_i(\omega)$ is consumption of specific variety ω within the full set Ω_i of varieties of category $i \in \{pg, ft\}$ produced. Varieties within a category are imperfect substitutes, with elasticity $\sigma = 1/(1-\rho) > 1$. To focus on the difference in categories, preferences within a category are assumed to be constant and equal for both categories. In other words, the attractiveness of alternative varieties within a product category is constant and the same

[1] The assumption that a is between 0 and 1 is necessary for having both categories produced.

[2] Though Bernard et al. (2003) speak of a representative consumer. Bernard et al. (2010) assume consumers have a preference between many different categories and many varieties (products). For our purposes it suffices to only model preferences for two types of products though.

for ethical and ordinary consumers. Furthermore, we will make the standard assumption that the elasticity within a category is larger than the elasticity across categories: $\sigma - \psi > 0$.[3]

We denote the price a consumer pays for a product variety by $p_i(\omega)$, The price index of a particular category of goods becomes:

$$P_i = \left[\int_{\omega \epsilon \Omega_i} p_i(\omega)^{1-\sigma} d\omega \right]^{1/1-\sigma}. \tag{2}$$

Consumers of either category maximize their utility by spending

$$r_i(\omega) = R_i \left[\frac{p_i(\omega)}{P_i} \right]^{1-\sigma} \tag{3}$$

on each variety ω. In this expression, $R_i = C_i \cdot P_i$ denotes overall spending on a particular category. Using $R = R_{pg} + R_{ft}$ to denote total expenditures in society, CES-utility function (1) implies:

$$\frac{R_{ft}}{R} = \frac{\left(\frac{1-a}{a}\right)^{\psi} \left(\frac{P_{ft}}{P_{pg}}\right)^{1-\psi}}{1 + \left(\frac{1-a}{a}\right)^{\psi} \left(\frac{P_{ft}}{P_{pg}}\right)^{1-\psi}} = \frac{K}{1+K} \tag{4}$$

with K defined as $\left(\frac{1-a}{a}\right)^{\psi} \left(\frac{P_{ft}}{P_{pg}}\right)^{1-\psi}$. The expenditure share of plain good products is then $1/(1+K)$. The importance of the demand shift parameter a in determining societal expenditure on fair trade goods is clear since $dR_{ft}/da < 0$: the expenditure share of fair trade goods increases when a larger share of consumers value fair trade products (lower a). What's more, (4) also reflects that the preference for the fair trade good is the willingness to pay more for the fair trade good: to keep fair trade's expenditure share constant, a higher share of ethical consumers in society ($da < 0$) must go together with a higher price index for fair trade goods:

$$dR_{ft} = 0 \Longleftrightarrow (1-a)\frac{da}{a} = \frac{(1-\psi)}{\psi} \frac{dP_{ft}}{P_{ft}}.$$

Also on the supply side, Fair Trade has implications. For instance, the desire of Fair Trade to offer better trading conditions does imply some extra constraints on local producers. Requiring certain standards of production is just one of these constraints.

[3]Even though we analyze a situation in which ethical consumers are present, we still believe this assumption holds. It is at least consistent with the extreme position in which ethical consumers would not be willing to susititute fair trade goods for plain goods at all ($\psi \to 0$). A more serious concern therefore would be the assumed symmetry in preferences across types of consumers. Most likely, $\sigma - \psi$ will have a different value for ethical consumers than for ordinary consumers, an issue we will ignore.

Other constraints involve becoming part of a cooperative in order to be able to benefit from the fair trade arrangement, implying additional organization and information costs. Essentially then, becoming part of the Fair Trade production chain will be costly to firms, affecting variable and fixed costs of production. On the other hand, there are also clear benefits involved. For instance, being part of a democratically organized cooperative yields counterweight to monopsonic middlemen in the distribution chain of products, whereas the provision of a direct channel to rich Western consumer markets saves distribution costs. These benefits, however, seem to relate more to the decision to enter the fair trade arrangement, rather than affecting production decisions directly (see the next section). We therefore model fair trade as being more costly to produce than plain goods, using a parameter s to mark the difference (mnemonic for standard).

Accordingly, the production function for firms producing fair trade varieties and plain good varieties is given by:

$$l_i(\varphi, s) = \left(f + \frac{q_i(\varphi)}{\varphi}\right) s_i$$

for $i \in \{pg, ft\}$ and where we assume $s_{ft} > s_{pg} > 0$. The production function gives the total amount of labour l that is required to produce output q of the variety the firm produces. There are increasing returns to scale at the firm level due to a fixed cost of production f. The variable costs of production are normalized to one, but depend on the productivity of the particular firm, denoted by $\varphi > 0$. Since $s_{ft} > s_{pg}$, a firm in fair trade requires higher labour input than an equally productive firm in plain good production.

We will assume that once firms have decided for which category they will produce their products, they cannot switch to the other category (see next section). By the same token, we assume that firms that produce fair trade products cannot sell these products without the Fair Trade label. Mixed-firm strategies are therefore ruled out. This makes sense in view of the fact that fair trade production requires different standards and organizational arrangements than plain good production, so that switching to a different mode of production would require new fixed costs.

We also assume that wages are equalized across sectors, assuming a perfectly working labour market. The aspect of Fair Trade that it also pays (more) decent wages is included by the higher price fair trade producers receive due to the higher labour standard, in comparison to ordinary production. The wage rate will serve as numéraire in our model, $w = 1$ henceforth.

Firm profits are given by

$$\pi_i = r_i - \left(f + \frac{q_i(\varphi)}{\varphi}\right) s_i$$

and, using (3), profit maximization leads to the familiar outcome that price is a fixed mark-up over marginal cost:

$$p_i(\varphi) = \frac{1}{\rho}\frac{s_i}{\varphi}. \tag{5}$$

Ceteris paribus, the price for fair trade products is higher than for plain good products, while within each product category, more productive producers charge lower prices. We assume that these prices are c.i.f. prices for reaching foreign markets – because that is eventually the relevant comparison for local producers. Any difference in costs of reaching far away markets between fair trade and plain good producers could be easily incorporated, but we ignore it because it would serve a similar function as the difference in s_i.

Given the pricing rule, firm profits and firm revenue can be written as:

$$\pi_i = \frac{r_i(\varphi)}{\sigma} - f s_i \qquad \text{and} \qquad r_i(\varphi) = R_i \left[\frac{s_i}{\rho\varphi P_i}\right]^{1-\sigma}. \tag{6}$$

As standard in the heterogeneous firm literature, firm revenues and profits are increasing in productivity levels:

$$\frac{r_i(\varphi')}{r_i(\varphi)} = \left(\frac{\varphi'}{\varphi}\right)^{\sigma-1} > 1, \forall \varphi' < \varphi. \tag{7}$$

As such, it is immediate that the least well-off among producers (in either category) would be the least productive firms. Whether a firm of (low) productivity is better off under fair trade than under plain good production is not clear yet:

$$\frac{r_{ft}(\varphi')}{r_{pg}(\varphi)} = K \cdot \left[\frac{\varphi'}{\varphi} \cdot \frac{s_{pg}}{s_{ft}} \cdot \frac{P_{ft}}{P_{pg}}\right]^{\sigma-1}. \tag{8}$$

However, for equal mass of fair trade firms and plain good firms, profits would be lower for fair trade producers unless a large enough share of consumers has a preference for fair trade goods:

$$\frac{r_{ft}(\varphi')}{r_{pg}(\varphi)} = \left[\left(\frac{1-a}{a}\right)^{\psi}\left(\frac{M_{pg}}{M_{ft}}\right)^{\frac{\sigma-\psi}{\sigma-1}}\left(\frac{s_{ft}}{s_{pg}}\frac{\varphi}{\varphi'}\right)^{1-\psi}\right] \tag{9}$$

for $\varphi = \varphi'$ and where we used (2) and firms' optimal pricing rule (5).

3 Productivity and the decision to enter Fair Trade

The essence of entry and exit of firms is as in standard heterogeneous firm models. That is, firms learn about their productivity once they have entered the market and then decide to produce or not, depending on whether or not their productivity yields positive profits. This basic mechanism is the same for all firms, irrespective of whether they end up producing plain goods or fair trade goods. Though fair trade production has an ethical concern, its main aspect is still profitability (Nicholls and Opal, 2005; Moore, 2004). This also applies to the decision of firms within which category of goods to produce. When a firm knows its productivity, it will start weighing the advantages of becoming a fair trade firm or not. Given a firm's productivity, the comparison involves a comparison of future profits of both production schemes. This is different from Bernard et al. (2003), where the decision for which category to produce depends on single period profits. The reason is that we will argue that fair trade production is characterized by a lower chance of death, but also that it has additional entry costs. As we will show, this creates a gap between the outcomes of a single period profit comparison, and a comparison based on expected future profits. Since a firm's productivity is held constant during its lifetime, once a firm has chosen for a particular production mode there is no incentive to switch back.

It is also standard in the heterogeneous literature firms to assume that firms can be hit by an exogenous shock leading to bankruptcy. The possibility of such a shock is modeled into a probability of exit (i.e. chance of death) for firms (Melitz, 2003; Bernard et al., 2003). We assume that the chance of facing a bad shock is smaller within the fair trade category than within the plain good category. This may be because of fair trade arrangements guarantee minimum prices or better access to financial markets, but also because fair trade's aim is to engage in long-term relationships with local producers.

Letting $0 < \theta < 1$ denote the chance of death for a plain good firm, we assume:

$$\theta_{ft} = X_d \theta$$

with $0 < X_d < 1$ fair trade's relative chance of death.

However, becoming a fair trade firm also involves additional entry costs. A farmer choosing to join the cooperative will forfeit on its standard way of producing. Especially for farmers who can barely survive this may be too much of a risk to take, by lack of suitable fall-back options (Nicholls & Opal, 2005). The risk of switching is a consequence of leaving the classical buyer system, which despite its drawbacks at least provides certainty. The monopsonic buyer in the classical system visits the farmer once a year and the question that lies ahead for the farmer is, will the new cooperation follow through on the promises made, will it be a trustworthy partner? Furthermore, switching implies changing production methods, for instance towards more sustainable ways of production. Finally, it would imply "switching from growing a crop that your grandfather grew to a higher-priced crop that no one in your village has ever grown before" (ibid: 19). We model these uncertainty costs as an additional entry costs e_{ft} that must be faced by each farmer that decides to become a fair trade producer. The fair trade entry costs should be seen separately from the general market entry costs e, also timewise. However, both entry costs have in common that they become sunk once incurred.

The sequence of entry and exit is then as follows. Before a firm starts up it must pay an entry cost e for becoming a firm. The firm then learns about its productivity level and either quits for having a too low productivity level or stays as either a plain good firm or as a fair trade firm, the latter depending on a trade-off between a lower chance of death and additional entry cost. The decision to enter the market and which type of goods to produce can then be seen as a three-step procedure. Before finding out their productivity level, each potential entrant calculates an expected value of future earnings, which is a probability-weighted average of the potential earnings of becoming a plain good firm and a fair trade firm. The actual decision which type of firm to become is made after a firm has learned about its productivity. Then it may also decide to exit the market, which will happen when it finds out that is has a too low productivity level to earn positive profits. We therefore see entrant firms as rational entities that are able to make all sorts of what-if calculations, basing the decision what to produce on a comparison between their actual productivity level (which they find out about once they have incurred the entry costs) and the what-if schemes they constructed. Though this may seem too far-fetched, especially in a developing country setting, it aligns the analysis to standard practice in the heterogeneous firms literature.

The first calculation is to list under what conditions production will be profitable. Irrespective of the category a firm will choose, firms must earn non-negative profits. This defines a production indifference value of productivity φ^* for either category below which firms would not produce:

$$\frac{r_i(\varphi_i^*)}{\sigma} \geq fs_i \tag{10}$$

for $i \in \{pg, ft\}$. This is the standard outcome that operational profits should at least be equal to a firm's fixed cost of production. A priori it is not clear which category has the lowest value of φ^*. Though for low enough levels of productivity we know that $\pi_{ft} < \pi_{pg}$ must hold—by virtue of $\pi_{ft}(0) = -fs_{ft} < \pi_{pg}(0) = -fs_{pg}$—it depends on the elasticity of profits with respect to φ which category shows positive profits first. As will be explained below however, it must be that $\varphi_{ft}^* > \varphi_{pg}^*$.

The second calculation is to determine conditions that make it profitable to produce fair trade goods rather than plain goods or vice versa. Once a firm knows its productivity, and provided the profitable production condition (10) holds, this decision depends on whether the expected difference in future profits between fair trade and plain good production is equal or higher to the additional entry costs of fair trade. Expected future profits are obtained by taking the net present value of all future profits, correcting for the chance of death:[4]

$$\pi_{pg}^{F}(\varphi \geq \varphi_{pg}^{*}) = \frac{1}{\theta}\pi_{pg}(\varphi) \qquad \text{and} \qquad \pi_{ft}^{F}(\varphi \geq \varphi_{ft}^{*}) = \frac{1}{\theta_{ft}}\pi_{ft}(\varphi). \tag{11}$$

Let φ^{**} represent the value of productivity where the difference between future profits of a fair trade firm and that of a plain good firm is just equal to the cost for entering the fair trade market. This marks the point of indifference for a firm between production methods, yielding a category indifference productivity value:[5]

$$\pi_{ft}(\varphi^{**}) = X_d \pi_{pg}(\varphi^{**}) + \theta_{ft} e_{ft}. \tag{12}$$

The difference in chance of death lowers the required difference in profits for being indifferent between production methods ($X_d < 1$), the higher entry costs raises it.[6] The non-deductable character of the additional entry cost means that it is not part of the single period profit function therefore e_{ft} is presented as a separate term in the comparison between future profits. A lower chance of death for a fair trade firm has a similar effect as a higher productivity level in the sense that it makes it easier to pay the entry cost for fair trade production.

Given that there are preferences for ordinary goods and for fair trade goods in society, equilibrium requires that both product categories must be produced. This puts constraints on the cut-off points identified in (10) and (12). First, it helps explain why it must be that $\varphi_{ft}^{*} > \varphi_{pg}^{*}$. Suppose, for arguments's sake, that the ordering is reversed. This implies that the elasticity of fair trade profits with respect to φ must be higher than that for plain good profits. Any firm with $\varphi_{ft}^{*} < \varphi < \varphi_{pg}^{*}$ would then become a fair trade firm since its productivity would fall short of profitable plain good production. Moreover since $\theta_{ft} < \theta$, the elasticity of future profits of fair trade firms will exceed that of plain good firms by more . Consequently, fair trade's future profits would always be higher and also firms with productivity $\varphi_{ft}^{*} < \varphi_{pg}^{*} < \varphi$ would not decide to become plain good firms.[7]. This is different if instead $\varphi_{ft}^{*} > \varphi_{pg}^{*}$ holds. as a similar line of reasoning would reveal. With plain goods always be produced first, from now on we define $\varphi_{pg}^{*} \equiv \varphi^{*}$ and denote the general entry cost as those for entering as a plain good firm: $e = e_{pg}$.

[4] In line with Melitz' original model, time discounting of future profits is not implemented as the chance of death has qualitatively a similar effect (Melitz, 2003: 1702).

[5] We assume that in the case of equal profitability, the firm will become a fair trade firm.

[6] The additional entry cost consists of additional risk but it is directly compared with profits. This is easier than expressing the entry costs in units of risk and add a risk to profit conversion parameter. With this method the important qualitative effect yet to see remains: a threshold lies before fair trade production. Such a threshold is absent in Bernard et al. (2003).

[7] Unless the additional entry cost of fair trade would be extremely high, as can be verified from our graphical representation below.

A sufficient condition for existence of φ^{**} is then that the elasticity of fair trade future profits to φ exceeds that of plain good production. This requires:

$$d\pi_{ft}^F/d\varphi > d\pi_{pg}^F/d\varphi \Longleftrightarrow dr_{ft}/d\varphi > \frac{\theta_{ft}}{\theta} dr_{pg}/d\varphi$$

which, using (6) and (4), is equivalent to:

$$\frac{\theta}{\theta_{ft}} \left(\frac{P_{ft}}{P_{pg}}\right)^{\sigma-\psi} \left(\frac{s_{pg}}{s_{ft}}\right)^{\sigma-1} > \left(\frac{a}{1-a}\right)^{\psi}. \tag{13}$$

For having fair trade production, there should be a preference for fair trade products and the cost of producing fair trade must not be too high. The lower chance of death works to increase the likelihood of having fair trade, as expected. The condition is consistent with the formal requirement for $\varphi_{ft}^* > \varphi_{pg}^*$, see the appendix. Note also that if φ^{**} exists, it must be that: $\varphi^{**} > \varphi^*$.

Proposition 1 *To have both plain goods and fair trade produced in equilibrium requires that the zero-profit cutoff productivity of plain good production φ_{pg}^* is lower than the zero-profit cutoff productivity of fair trade production φ_{ft}^* and that condition (13) holds.*

If condition (13) holds, there will be a value $\varphi = \varphi^{**}$ beyond which firms prefer to produce fair trade goods.[8] This implies that high-productivity firms self-select in becoming fair trade firms, whereas low productivity firms produce plain goods.

Proposition 2 *When both types of goods are produced, firms with productivity $\varphi^* < \varphi < \varphi^{**}$ will produce plain goods and firms with productivity $\varphi > \varphi^{**}$ will produce fair trade goods.*

The situation that arises is depicted in Figure 1 below. The horizontal axis lays out productivity levels, the vertical axis represents single period profits or future profits, depending on the curve portrayed. These are the what-if schemes each potential entrant calculates prior to learning its productivity. Figure 1 is drawn such that the single period profit lines of the two categories already converge, which is however not required for the

[8] To see this formally, we evaluate relative future profits in this point. Let $\varphi' > \varphi^{**}$, then for the category indifference condition (12) to be true, $\pi_{ft}^F(\varphi') > \pi_{pg}^F(\varphi')$:

$$\frac{1}{\theta_{ft}} \frac{r_{ft}(\varphi')}{\sigma} - \frac{1}{\theta} \frac{r_{pg}(\varphi')}{\sigma} > \frac{1}{\theta_{ft}} f s_{ft} - \frac{1}{\theta} f s_{pg} + e_{ft}.$$

Assuming (12) holds and using (6) to get $r_c(\varphi')/r_c(\varphi^{**}) = (\varphi'/\varphi^{**})^{\sigma-1}$, it follows that

$$\left(\frac{\varphi'}{\varphi^{**}}\right)^{\sigma-1} \left[\frac{1}{\theta_{ft}} \frac{r_{ft}(\varphi^{**})}{\sigma} - \frac{1}{\theta} \frac{r_{pg}(\varphi^{**})}{\sigma}\right] > \frac{1}{\theta_{ft}} \frac{r_{ft}(\varphi^{**})}{\sigma} - \frac{1}{\theta} \frac{r_{pg}(\varphi^{**})}{\sigma}.$$

should hold, which is the case since $\varphi' > \varphi^{**}$.

analysis to hold. To have both categories produced, expected future profit lines must converge though. They always start at $\pi_c(\varphi) = 0$ as firms with negative profits in a single period go out of business. The difference in slopes between future profit lines and single period profit lines is due to the ratio of death. Given the difference in chances of death, the slope of future fair trade profits diverges more from the single period profit line than the plain good variant. Entry costs for fair trade can be introduced by means of a shadow line below $\pi^F_{ft}(\varphi)$, as if they were a one-time-for-all additional fixed costs. The indifference productivity level φ^{**} is then at the intersection of this shadow line with $\pi^F_{pg}(\varphi)$. This point lies to the right of ϕ^*, and is for positive profits. Note however that actual profits earned are not represented by the shadow line, since e_{ft} becomes sunk once it has been incurred.

We also note that the productivity level that sustains fair trade production yields higher single period profits for plain good producing firms: $\pi_{pg}(\varphi^{**}) > \pi_{ft}(\varphi^{**})$. This is the consequence of including other elements than just differences in production standards for determining which product to produce. Moreover, the required positive jump in future profits at φ^{**} represents the fact that one is careful about the switch to fair trade. On one hand, the plain good producer faces lower prices but certainty, on the other hand there is the uncertainty of switching, despite the outlook of a better price. Therefore when the transition is made, profits must jump up. The difference in single period profits at φ^{**} also marks the choice between certainty and profitability: due to more certainty in future, firms are willing to face lower profits today.

(Insert Figure 1 about here)

4 Equilibrium and information requirements

Given that entrants know what would be optimal to do once knowing their productivity, they may calculate expected lifetime earnings and confront these with the entry cost for starting up a firm, including the possibility of additional entry cost for fair trade production. To make this assessment, firms need information on the probability of the alternative options upon entry (direct exit, plain good production, fair trade production). We first deal with this in the standard fashion of the heterogeneous firm literature, as in Melitz (2003), and then verify the consequences of not knowing about the possibility of fair trade prior to entry. In a setting of poor developing countries with few and dispersed Fair Trade operations, this is not an unlikely scenario.

We assume an ex ante probability density function of productivities $g(\varphi)$ and associated cumulative distribution function $G(\varphi)$. It follows that the ex-ante probabilities of successful entry, plain good production and fair trade production are, respectively, $1 - G(\varphi^*)$, $G(\varphi^{**}) - G(\varphi^*)$, and $1 - G(\varphi^{**})$. Taking into account that the distribution changes due to the exit of firms, the ex post probability distributions of productivities in either category become:

$$\mu(\varphi_{pg}) = \frac{g(\varphi)}{G(\varphi^{**}) - G(\varphi^*)} \text{ and } \mu(\varphi_{ft}) = \frac{g(\varphi)}{1 - G(\varphi^{**})}. \tag{14}$$

This determines average productivity levels in each market, which can be used to calculate aggregate variables. Average productivity only depends on the productivity distribution $g(\varphi)$ and the cut-off points (Bernard et al. (2003):

$$\tilde{\varphi}_{pg}(\varphi^*, \varphi^{**}) = \left[\frac{1}{G(\varphi^{**}) - G(\varphi^*)} \int_{\varphi^*}^{\varphi^{**}} \varphi^{\sigma-1} g(\varphi) d\varphi\right]^{1/\sigma-1} \tag{15}$$

$$\tilde{\varphi}_{ft}(\varphi^{**}) = \left[\frac{1}{1 - G(\varphi^{**})} \int_{\varphi^{**}}^{\infty} \varphi^{\sigma-1} g(\varphi) d\varphi\right]^{1/\sigma-1} \tag{16}$$

where a tilde above a variable denotes average values. Since fair trade firms are firms with $\varphi > \varphi^{**}$ it follows that average productivity in fair trade is higher than in plain good production: $\tilde{\varphi}_{ft} > \tilde{\varphi}_{pg}$.

With full information about all options available, prior to entry the expected value of the firm is the probability weighted average of $\tilde{\pi}_{pg} = \pi_{pg}(\tilde{\varphi}_{pg})$ and $\tilde{\pi}_{ft} = \pi_{ft}(\tilde{\varphi}_{ft})$, taking into account the respective chances of death. Entry stops when this value is equal to the expected entry costs:

$$\nu_e = \frac{G(\varphi^{**}) - G(\varphi^*)}{\theta} \tilde{\pi}_{pg} + \frac{1 - G(\varphi^{**})}{X_d \theta} \tilde{\pi}_{ft} = e_{pg} + [1 - G(\varphi^{**})] e_{ft}. \tag{17}$$

Since this model deals with two types of firms, the fixed costs of entry are separated between the inevitable general entry cost of becoming a (plain good) firm, and the entry cost of becoming a fair trade firm. The latter carries a probability since only firms with productivity higher or equal than φ^{**} will decide to become fair trade firms, which is not clear ex ante.

As customary we will assume steady state equilibrium of entry and exit. This means that for every type of firm that dies a similar kind of firm enters. Let M_{pg} and M_{ft} be the mass of firms of plain good firms and fair trade firms respectively, denoting entrants to the market with M_e. Steady-state equilibrium then implies

$$\theta M_{pg} = [G(\varphi^{**}) - G(\varphi^*)] M_e \qquad \text{and} \qquad X_d \theta M_{ft} = [1 - G(\varphi^{**})] M_e. \tag{18}$$

The probalilities in (18) reiterate that firms decide on which type of firm to become after they have entered.

The model is closed by assuming that the labor market clears. Labor is the sole input in our model and all revenue earned must be paid to labor. Since the wage rate was set to one (numeraire), this implies $L = L_e + L_p = R$, where L_e and L_p denote labor used for entry and labor used in production, respectively. Total profits earned are $\Pi = M_{pg}\tilde{\pi}_{pg} + M_{ft}\tilde{\pi}_{ft}$, which in equilibrium must match the costs of entry – else more firms would desire to enter. It therefore holds that:

$$L_p = R - \Pi \qquad \text{and} \qquad L_e = \Pi.$$

L_e includes the additional entry costs for those firms that decide to become a fair trade firm:

$$L_e = M_e e_{pg} + [1 - G(\varphi^{**})] M_e e_{ft}$$

and labour market equilibrium implies:

$$M_{pg}\tilde{\pi}_{pg} + M_{ft}\tilde{\pi}_{ft} = M_e e_{pg} + M_e[1 - G(\varphi^{**})]e_{ft}. \tag{19}$$

In the appendix we show that the model can be reduced to a system of four equations that can be solved for the endogenous variables φ^*, φ^{**}, P_{pg} and P_{ft}. Here we proceed by discussing what happens when entrants would only learn about the possibility of engaging in fair trade after they have entered as a plain good firm. This leaves the decision to stay in the market and/or to become a fair trade firms in tact – once firms have entered they get to know that fair trade is an option – but clearly it has consequences for the decision to enter the market or not. Without knowing about the possibility of fair trade, the free entry condition would become:

$$\nu_e' = \frac{G(\varphi^{**}) - G(\varphi^*)}{\theta}\tilde{\pi}_{pg}' + \frac{1 - G(\varphi^{**})}{\theta}\tilde{\pi}_{pg}' = e_{pg}. \tag{20}$$

where we use a "′" to indicate variables that might change due to wrong information. The notable difference between (20) and the original free entry condition (17) is the absence of average fair trade profits, as well as the absence of the expected entry costs of fair trade. Moreover, average profits may change, depending on the implied changes in price indices. The values for the cut-off points φ^* and φ^{**} remain the same: the what-if schemes of the previous section become known once firms have entered and found out about their productivity.

Without prior knowledge of fair trade production possibilities the expected value of a firm will decrease: $v_e' < v_e$. To see this it is key to understand that without the right information potential entrants will base their ex ante calculations on a version of Figure 1 that only includes (future) profits for plain good firms. Hence they believe profitability to be lower than it will actually be, expecting a lower mass of incumbent firms. To see this formally consider Figure 2 below. The figure depicts the expected value of entry as a negative function of the number of incumbent firms.[9] The full information scenario is depicted by M, at the intersection of v_e and $e_{pg} + (1 - G(\varphi^{**}))e_{ft}$. Having limited information implies lower expected entry costs, and, as we will show, a lower value of the firm. To make the argument we draw $v_e(\tilde{\varphi} = \varphi^{**})$ as a special case for the full information scenario, giving the value of the firm if the net benefit of fair trade to the average firm just matches the additional entry cost. Logically, if fair trade does not bring additional benefits, the number of firms is invariant to having the right information or not. Hence, the curves for the incomplete information scenario must also intersect at M'. Since $e_{pg} < e_{pg} + (1 - G(\varphi^{**}))e_{ft}$, it must be that $v_e' < v_e(\tilde{\varphi} = \varphi^{**})$, as depicted by the dashed lines. Clearly, average productivity of fair trade will exceed φ^{**} and hence v_e will be higher than this borderline case, resulting in $v_e' < v_e$ and $M' < M$.

(Insert Figure 2 about here)

The consequence is that when fair trade is not anticipated, fewer firms will enter the market than is required for labor market equilibrium. With a fixed overall labor supply, this implies either unemployment of $L - (L_e' + L_p) > 0$, or a decline in real wages that ensures that L_p increases to match the decline in L_e. In either case, the relative position of laborers in society deteriorates. When unemployment arises this would manifest itself through a portion of the labor force receiving no wage income at all, as well as through excess profits that will arise for firms. With real wages unchanged L_p, R and Π are the same as before, implying $\Pi - L_e' > 0$. When the adjustment occurs through a decline in real wages, total profits fall to L_e', which matches the required entry costs. These adverse effects can be prevented by announcing the possibility of fair trade to potential entrants.

Proposition 3 *Local labor markets will be adversely affected by the existence of Fair Trade if potential producers are not aware of the possibility of engaging in Fair Trade arrangements prior to making their entry decisions.*

5 Conclusion

The moment fair trade arrangements are introduced, the more productive firms in society would want to switch to fair trade production. Though confronted with an additional

[9] Average profits decline in the number of firms: $d\tilde{\pi}_i/dP_i = (\sigma - 1)(\tilde{\pi}_i + fs_i)/P_i > 0$ and $dP_i/dM_i = \frac{1}{1-\sigma}P_i/M_i < 0$.

entry cost, besides higher costs of production, for them the benefits of a lower chance of death for future profits are highest. Fair trade entails a clear selection effect. While reaching out to help the least well-off in society, the firms attracted to the arrangement are the larger, more productive firms. This conclusion is reached in a framework where firms differ in their productivity and where Fair Trade is portrayed as a sustainable alternative to ordinary production arrangements, both in terms of labor standards as well as in terms of enduring partnerships. The paradoxical results is that when fair trade succeeds in its inherent workings, the benefits will go to the 'wrong' set of producers. What's more, when the possibility of fair trade is not commonly known to new firms prior to entry, too few firms will enter leading to a real wage decline and/or excess profits for incumbent firms.

To resolve these issues may require unorthodox measures. One solution would be to set a maximum profit level for the FT firms FTOs want to work with. This would at least make Fair Trade unattractive for the most productive firms around, though it is not clear what it would imply for the level of productivity required to profitably enter fair trade arrangements. Another, more direct solution is to strengthen the admission criteria to fair trade arrangements. FTOs may want to (re)consider which firms they allow to enter the partnership. To counter the selection effect a strong selection policy may be warranted. Finally, FTOs could invest in reducing the entry costs to their partnerships by providing assistance to local producers or by increasing the survival rate of FT producers. In combination with a well-chosen profit ceiling, this would imply better access for low-productive firms, while keeping the most productive out.

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A Mathematical derivations

A.1 Consistency of φ^{**}-condition and $\varphi^*_{ft} > \varphi^*_{pg}$ condition

To determine a condition for $\varphi^*_{ft} > \varphi^*_{pg}$, we use (8) and (10) to obtain:

$$\begin{aligned}
\frac{r_{ft}(\varphi^*_{ft})}{r_{pg}(\varphi^*_{pg})} \quad &= \quad K \cdot \left[\frac{\varphi^*_{ft}}{\varphi^*_{pg}} \cdot \frac{s_{pg}}{s_{ft}} \cdot \frac{P_{ft}}{P_{pg}}\right]^{\sigma-1} = \frac{f\sigma s_{ft}}{f\sigma s_{pg}} \\
&\Longrightarrow \quad \frac{\varphi^*_{ft}}{\varphi^*_{pg}} = \left[\left(\frac{1-a}{a}\right)^{-\psi}\left(\frac{P_{ft}}{P_{pg}}\right)^{\psi-\sigma}\right]^{1/(\sigma-1)} \left[\frac{s_{ft}}{s_{pg}}\right]^{\sigma/(\sigma-1)}
\end{aligned}$$

Hence, $\varphi^*_{ft} > \varphi^*_{pg}$ if:

$$\left[\left(\frac{P_{ft}}{P_{pg}}\right)^{\psi-\sigma}\right]\left[\frac{s_{pg}}{s_{pft}}\right]^{-\sigma} > \left(\frac{1-a}{a}\right)^{\psi}$$

The condition for existence of fair trade production (13) can be written as:

$$\underbrace{\frac{\theta}{\theta_{ft}}}_{>1}\underbrace{\left(\frac{s_{ft}}{s_{pg}}\right)}_{>1} > \left(\frac{a}{1-a}\right)^{\psi}\left(\frac{P_{ft}}{P_{pg}}\right)^{\psi-\sigma}\left(\frac{s_{pg}}{s_{ft}}\right)^{-\sigma}.$$

If $\varphi^*_{ft} > \varphi^*_{pg}$ holds then the right-hand-side is at least twice the value of $\left(\frac{a}{1-a}\right)^{\psi}$. The left-hand-side is clearly larger than one, as indicated. Both conditions are therefore not inconsistent.

A.2 Model solution

To solve the model, we follow Bernard et al. (2003) in terms of procedure. First, we substitute the expression for relative firm revenue (8) in the category indifference condition (12), using $r_{pg}(\varphi^{**}) = (\varphi^{**}/\varphi^*)^{\sigma-1}r_{pg}(\varphi^*)$ from (7) and applying the zero-profit cut-off condition (10). This yields:

$$\left(\frac{\varphi^{**}}{\varphi^*}\right)^{\sigma-1} = \frac{\dfrac{s_{ft}}{s_{pg}} + \dfrac{X_d\theta e_{ft}}{f s_{pg}} - \dfrac{\theta_{ft}}{\theta}}{\left(\dfrac{1-a}{a}\right)^{\psi}\left(\dfrac{P_{ft}}{P_{pg}}\right)^{\sigma-\psi}\cdot\left(\dfrac{s_{pg}}{s_{ft}}\right)^{\sigma-1} - \dfrac{\theta_{ft}}{\theta}} \tag{A.1}$$

which is larger than one since $\varphi^{**} > \varphi^*$. By (13) the denominator is positive. Disadvantageous cost and price developments for fair trade production will increase the minimum productivity requirement for becoming a fair trade firm relative to what it takes to profitably enter the market.

The relative price index ratio can be expressed as:

$$\frac{P_{ft}}{P_{pg}} = \left(\frac{M_{ft}}{M_{pg}}\right)^{1/1-\sigma}\frac{s_{ft}}{s_{pg}}\frac{\tilde{\varphi}_{pg}}{\tilde{\varphi}_{ft}} = \left[\frac{\int_{\varphi^{**}}^{\infty}\varphi^{\sigma-1}g(\varphi)d\varphi}{\int_{\varphi^*}^{\varphi^{**}}\varphi^{\sigma-1}g(\varphi)d\varphi}\right]^{\frac{1}{1-\sigma}}\frac{s_{ft}}{s_{pg}}\left(\frac{1}{X_d}\right)^{\frac{1}{1-\sigma}} \tag{A.2}$$

where we applied (18) and the expressions for average productivity (15)-(16). Logically, the price index ratio is increasing in fair trade's relative labour standard by the fixed mark-up pricing rule. Likewise, a higher average productivity for fair trade products decreases its relative price ratio. When fair trade's relative chance of death X_d lowers, its price ratio will decline because fewer firms will exit, ceteris paribus entry. We note that with $\varphi^{**} > \varphi^*$ and $X_d < 1$ it is not clear whether fair trade goods carry higher prices, despite $s_{ft} > s_{pg}$. Though one of the central tenets of the fair trade movement is that consumers pay higher prices for goods that are produced under fair circumstances, the self-selection of high-productivity firms in fair trade arrangements makes that this is neither a necessary, nor required.

The next step is to express the (17) in relative prices and cut-off points. Using (9), (7), and (10), while applying the expressions for average productivity (15)-(16), we get:

$$\begin{aligned}\tilde{\pi}_{pg} &= \left[\left(\frac{\tilde{\varphi}_{pg}}{\varphi^*}\right)^{\sigma-1} - 1\right] f s_{pg} \\ \tilde{\pi}_{ft} &= \left[\left(\frac{1-a}{a}\right)^{\psi}\left(\frac{P_{ft}}{P_{pg}}\right)^{\sigma-\psi}\left(\frac{s_{pg}}{s_{ft}}\cdot\frac{\tilde{\varphi}_{ft}}{\varphi^*}\right)^{\sigma-1} - \frac{s_{ft}}{s_{pg}}\right] f s_{pg}.\end{aligned}$$

Upon substitution, the free entry condition (17) becomes:

$$\begin{aligned}&\frac{f s_{pg}}{\theta}\left[\int_{\varphi^*}^{\varphi^{**}}\left[\left(\frac{\varphi}{\varphi^*}\right)^{\sigma-1} - 1\right] g(\varphi)d\varphi\right] \\ &+\frac{f s_{pg}}{X_d\theta}\int_{\varphi^{**}}^{\infty}\left[\left(\frac{1-a}{a}\right)^{\psi}\left(\frac{P_{ft}}{P_{pg}}\right)^{\sigma-\psi}\left(\frac{s_{pg}}{s_{ft}}\right)^{\sigma-1}\left(\frac{\varphi}{\varphi^*}\right)^{\sigma-1} - \frac{s_{ft}}{s_{pg}}\right] g(\varphi)d\varphi \quad \text{(A.3)} \\ = \;& e_{pg} + e_{ft}\int_{\varphi^{**}}^{\infty} g(\varphi)d\varphi.\end{aligned}$$

Equilibrium conditions (A.1) and (A.2) combined determine a unique value of relative goods prices and the relative cut-off point.[10] Together with equation (A.3) above and with (19) in the main text, they solve for φ^*, φ^{**}, P_{pg}, and P_{ft}.

[10] From equation (A.1) it follows that P_{ft}/P_{pg} is monotonically declining in φ^{**}/φ^*: $\sigma > \psi > 0$, noting that the denominator of (A.1) is positive. It ranges from a value of $P_{ft}/P_{pg} = [s_{ft}/s_{pg} + X_d\theta e_{ft}/(f s_{pg})]^{1/(\sigma-\psi)}\,[a/(1-a)]^{\psi/(\sigma-\psi)}\,(s_{ft}/s_{pg})^{(\sigma-1)/(\sigma-\psi)} > 0$ when $\varphi^{**}/\varphi^* = 1$ to a lower value of $P_{ft}/P_{pg} = X_d\,[a/(1-a)]^{\psi/(\sigma-\psi)}\,(s_{ft}/s_{pg})^{(\sigma-1)/(\sigma-\psi)} > 0$ when φ^{**}/φ^* goes to infinity. From (A.2) it follows that P_{ft}/P_{pg} is increasing in φ^{**}/φ^*, ranging from zero if φ^{**}/φ^* approaches one to infinity if φ^{**}/φ^* approaches infinity. This proof is in line with Bernard et al. (2003).

Figure 1. Productivity cut-off points

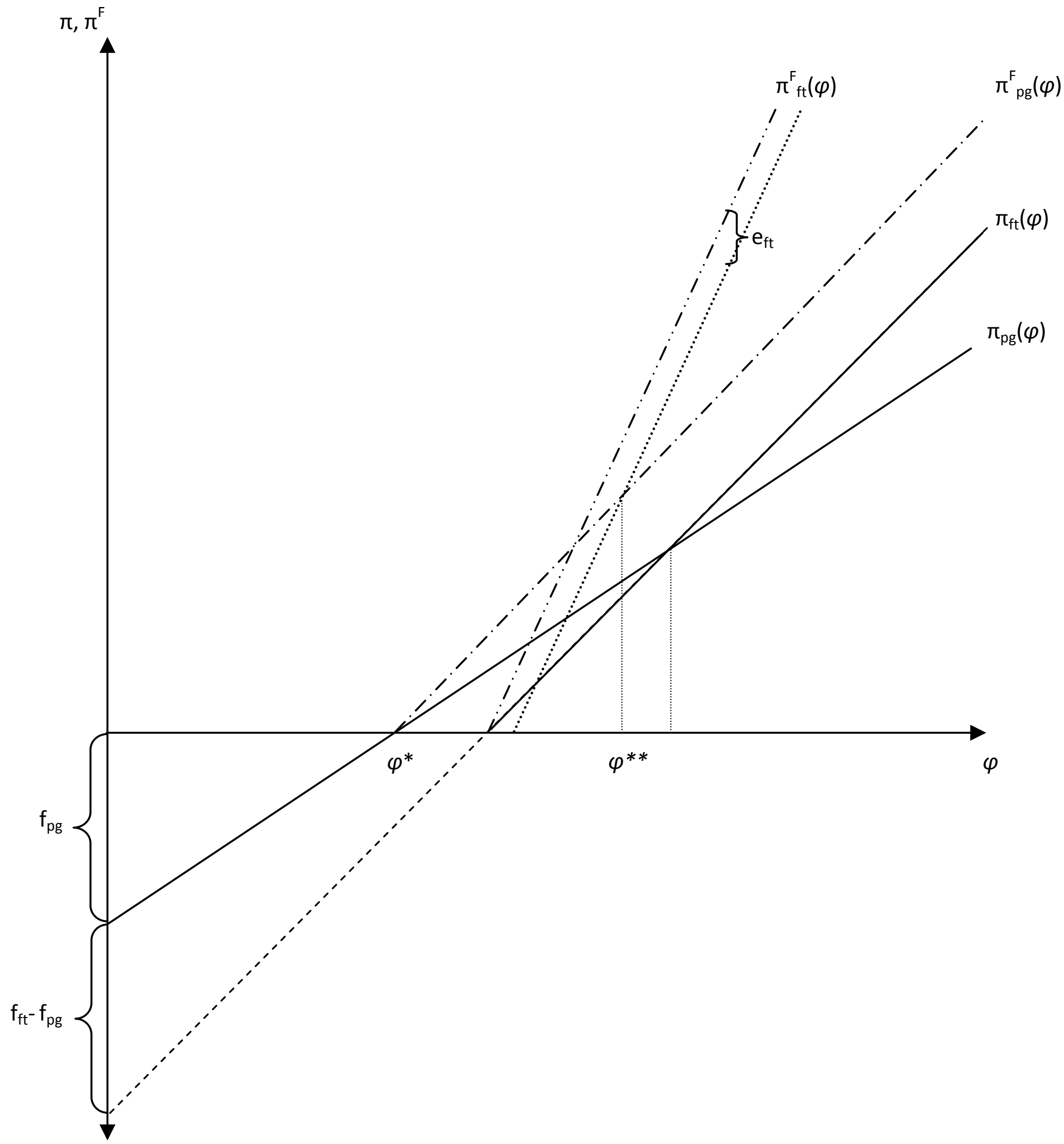

Figure 2: Expected value of a firm