

# FAIR TRADE: Product Differentiation and Warm Glow Effect

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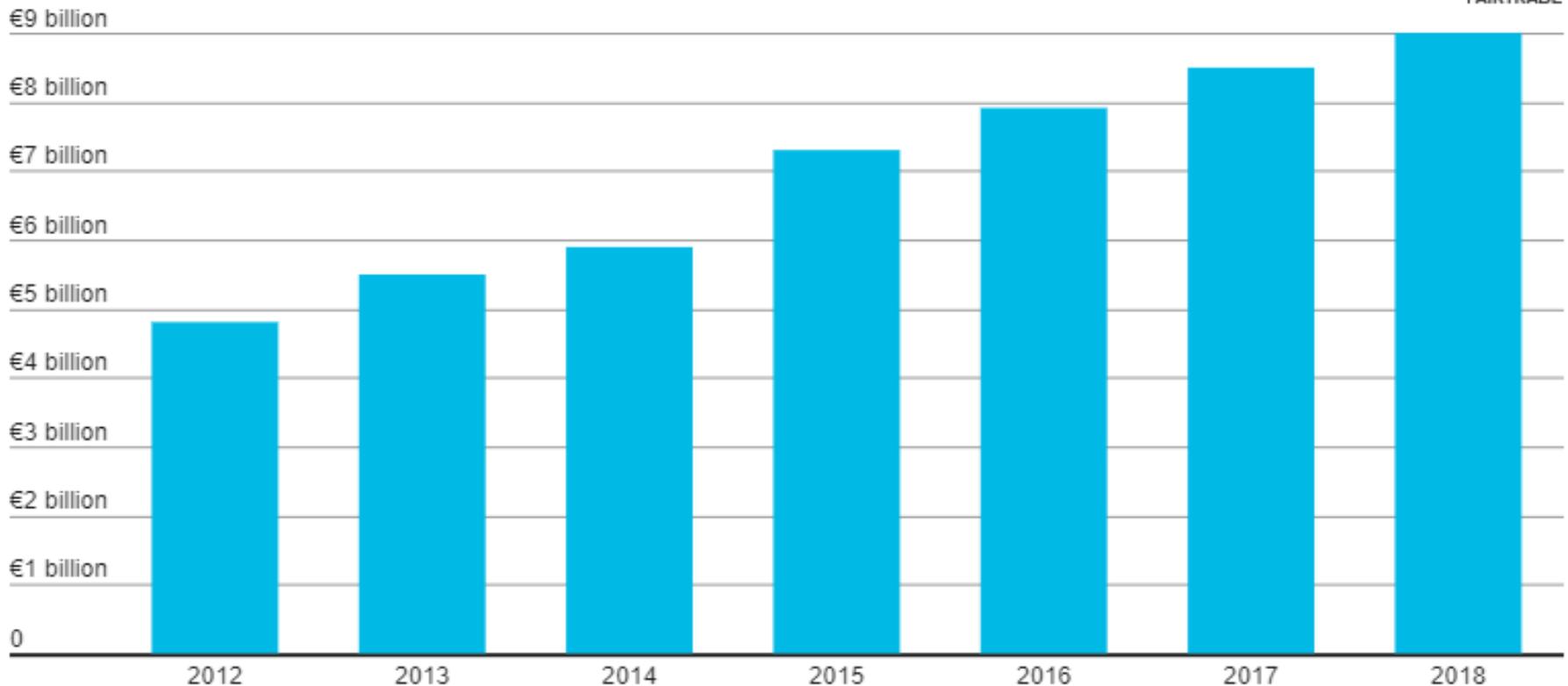


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# Motivation

**1,713,117 farmers and workers in the Fairtrade system in 2017**

FAIRTRADE ESTIMATED GLOBAL SALES, RECENT YEARS



Source: <https://www.fairtrade.net/impact/global-sales-overview>

**FAIR TRADE** is  
*a trading partnership*

**seeks**

*• better trading conditions*  
*• alternative distributing channel with a fair price*

**to**

*increase welfare of initial producers from poorer regions*

**Mechanism of FT**  
*Providing information to consumers by labeling final goods assuming warm glow effect*



**BUT!** FT does not guarantee that the FT final good will be sold at a higher price

it is not clear if the FT program is practically beneficial

# Objectives

- ❑ This paper theoretically analyzes welfare implications of the fair trade program
- ❑ We applied key features of FT such as the institutionalization of the fair trade producers, negotiations over the FT wage, the warm glow
  
- ❑ Main goals:
  - to find fair trade existence conditions
  - to show how FT affects the participants of the program (FT firm, FT producers) and the other actors (non-FT firms, non-FT producers)
  - to show what effect FT would have on the welfare of developed and developing countries.
  - to demonstrate the role of the warm glow and the role of product differentiation

# Key results of the paper

- ✓ FT exists if a consumer in the developed country distinguishes between the FT and non-FT goods and warm glow is sufficiently high.
- ✓ FT is always beneficial for its direct participants and it can also be favorable even for non-FT producers and non-FT firms.
- ✓ warm glow positively affects the FT producers' wage and the welfare of the developing country, but it has no impact on the welfare of the developed country.
- ✓ under FT, the welfare of the developing country increases, and the welfare of the developed country under FT can get higher if product differentiation is sufficiently close to perfect.

# Literature review (analytical papers)

## **Podhorsky (2015) – “A Positive Analysis of Fairtrade Certification”**

- i. FT decreases the intermediaries' market power and even non-FT farmers receive a higher wage than in the absence of FT
- ii. FT can be more efficient way to transfer income to farmers than a direct aid

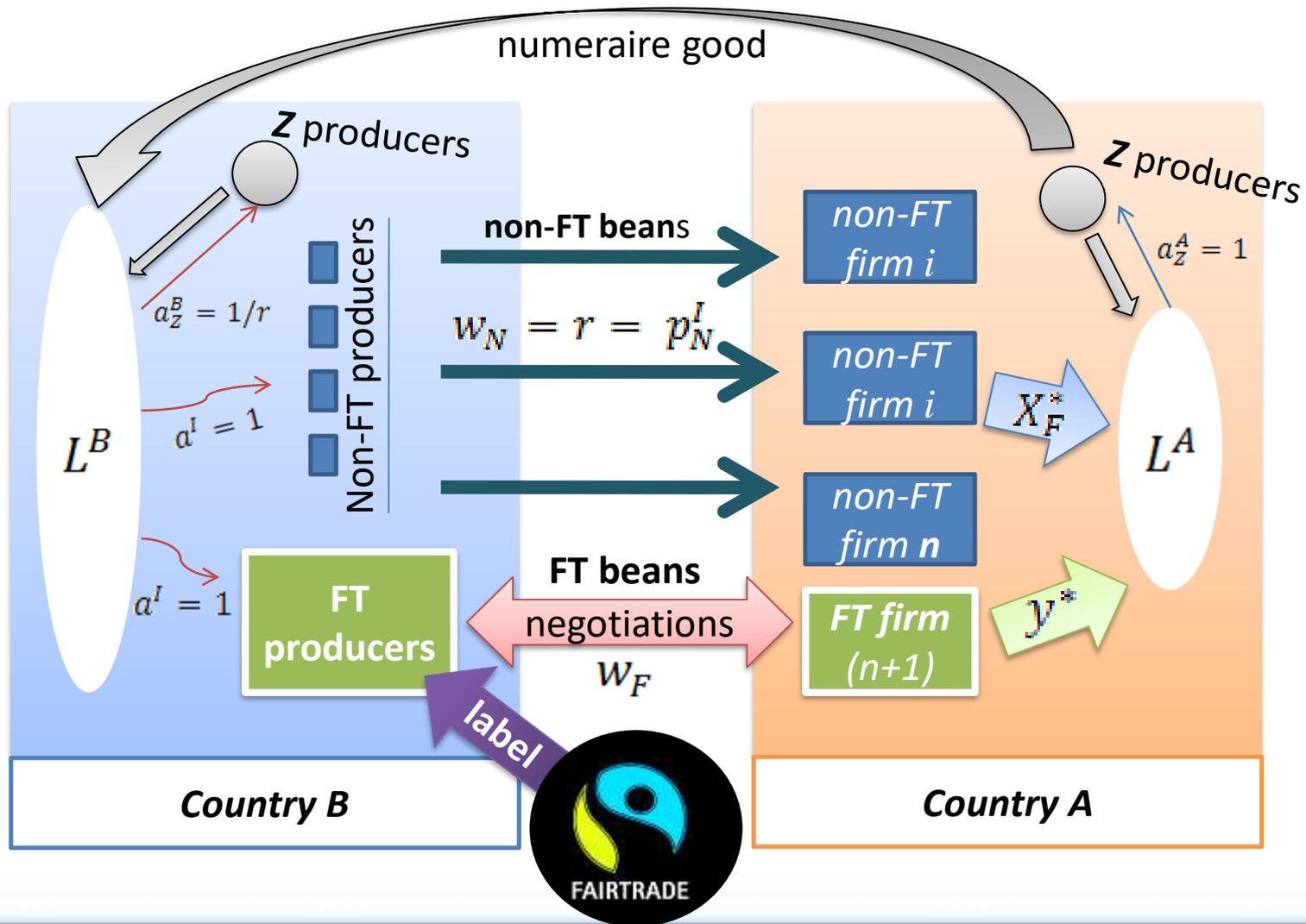
## **Richardson and Stähler (2014) – “Fair Trade”**

- i. to make FT rewarding there must be large warm glow or strong economic integration or combination of both.
- ii. the wage paid to FT producers decreases over proportionally as each producer reduces its efforts

# Novelty of this paper

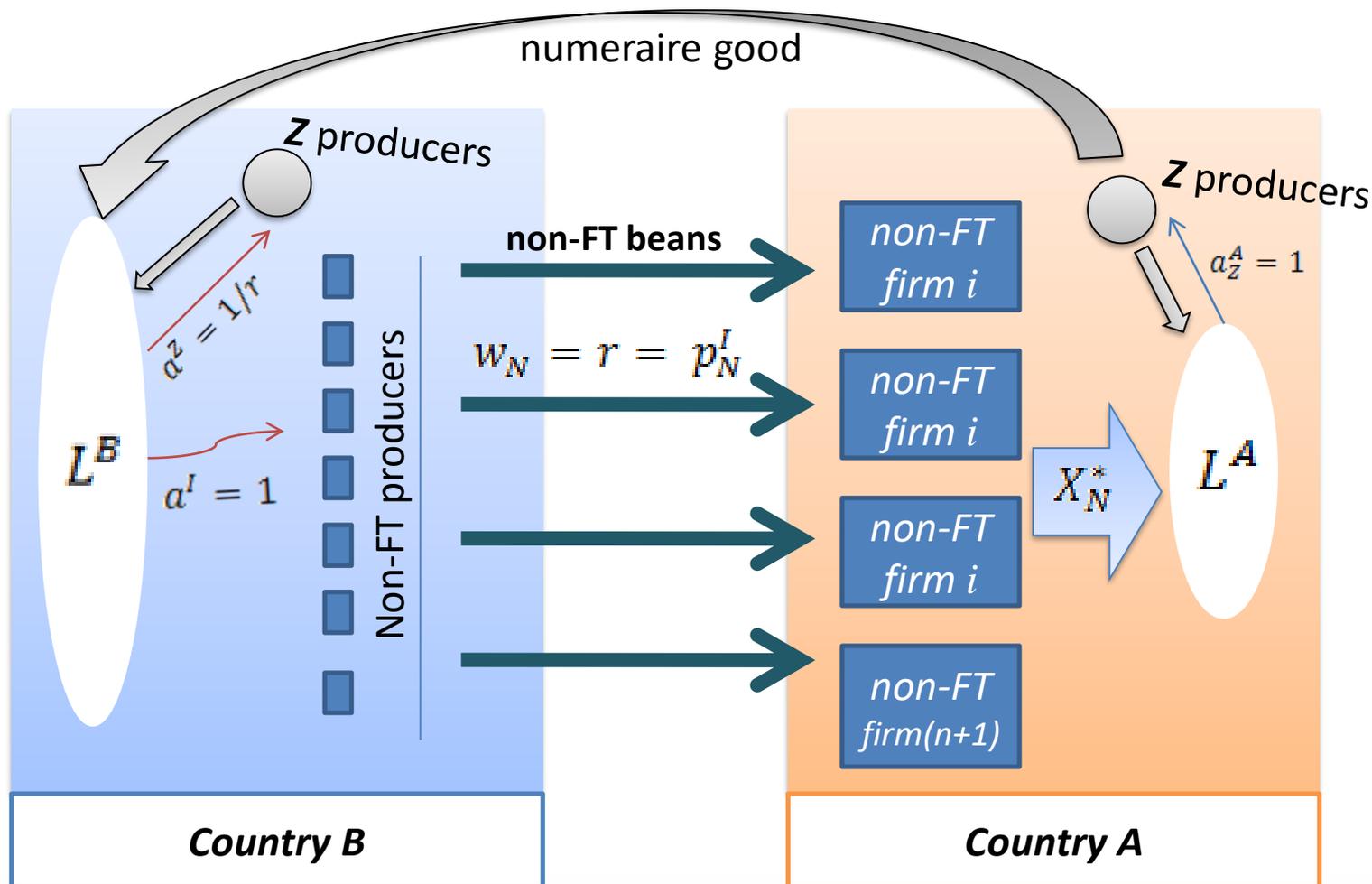
- ❑ deriving existence conditions of the FT program
- ❑ focusing upon the effects of final goods differentiation and the warm glow
- ❑ deriving condition when the non-FT firms and the non-FT producers can gain from FT existence
- ❑ welfare implication of FT for both developed and developing countries
- ❑ new interpretation of the warm glow: a final consumer considers how large the difference between the wages of the FT producers and non-FT ones
- ❑ the FT producers' wage is decided via negotiations

# Model Setup F case



# Model Setup

# N case



# Structure

1. Final goods market
2. Second stage: **successful negotiations** and **threat points**
3. First stage: **equilibrium wage** of FT producers
  - ➡ FT existence condition
4. Is FT beneficial for the FT firm?
5. When can non-FT producers and firms gain from FT existence?
6. Welfare analysis:
  - ➡ Prices for the final goods under the FT
  - ➡ Welfare of the developing country under the FT
  - ➡ Welfare of the developed country under the FT
7. Comparative statics. Effect of the warm glow:
  - ➡ On the wage of the FT producers
  - ➡ On the supplies of the FT and non-FT goods
  - ➡ On the welfare of the developed and the developing countries

# Final goods market

## Utility of representative consumer in country A

$$U^A = a(X + y) - \frac{1}{2}(X^2 + 2\gamma Xy + y^2) + \delta(w_F - w_N)y + Z^A \quad (1)$$

$X$  – the non-FT coffee total consumption

$y$  – the FT coffee consumption

$Z^A$  – the numeraire good consumption

$w_F$  – the wage of the FT producers

$w_N$  – the wage of the non-FT producers

$\gamma \in [0,1]$  – the degree of substitution between the non-FT and the FT coffee

$\delta(w_F - w_N)y$  – warm glow effect

## Budget constraint

$$pX + qy + Z^A = I^A \quad (2)$$

$p$  – price of non-FT coffee,  $q$  – price of the FT coffee,

$I^A$  – an income of country A

|                       | Case N   | Case F   |
|-----------------------|--|--|
| <b>Total supply</b>   | $(X, y) = \left( \sum_{i=1}^{n+1} x_i, 0 \right) \equiv (X_N, 0),$ | $(X, y) = \left( \sum_{i=1}^n x_i, y \right) \equiv (X_F, y),$           |
| <b>Inverse demand</b> | $p_N = a - X_N$  | $p_F = a - X_F - \gamma y$ $q = a - y - \gamma X_F + \delta (w_F - w_N)$ |

## Second stage (Successful negotiations)

Profits of non-FT firms and the  $(n + 1)$ th firm

$$\pi_i = (p_F - r)x_i, \quad i = 1, \dots, n \quad (9)$$

$$\pi_{n+1} = (q - w_F)y. \quad (10)$$

Equilibrium supplies

$$x_F^* = \frac{2(a - r) - (a + \delta(w_F - r) - w_F)\gamma}{2(n + 1) - \gamma^2 n} \quad (13)$$

$$y^* = \frac{(n + 1)(a + \delta(w_F - r) - w_F) - \gamma n(a - r)}{2(n + 1) - \gamma^2 n} \quad (14)$$

Equilibrium profits

$$\pi_{n+1} \equiv \pi^F = (y^*)^2, \quad \pi_i \equiv \pi^{NF} = (x_F^*)^2 \quad i = 1, \dots, n$$

# Threat points (Unsuccessful negotiations)

Negotiations failed



The  $(n+1)$ th firm enters non-FT market

Profits of all firms

$$\pi_i^0 = (p_N - r)x_i, \quad i = 1, \dots, n + 1 \quad (17)$$

Equilibrium output of each firm

$$x_N^* = \frac{a - r}{n + 2} \quad (19)$$

Profits in equilibrium

$$\pi_i^0 \equiv \pi^0 = (x_N^*)^2, \quad i = 1, \dots, n + 1 \quad (20)$$

# First Stage - *Reasoning of the model*

- Key features of the fair trade is *the Fairtrade Minimum Price (FMP)*
  - when the market price is higher than the FMP, producers receives the price negotiated with a fair trade firm
  - even when the FMP exceeds a market price, FMP is treated as a *benchmark* and the price is decided by negotiations basing on the quality (cannot be less then FMP)
- *Nash bargaining* is applied to derive the price of the input that may be sold as the FT product.

# First Stage

## *Nash bargaining product*

$$V = (w_F - r)(\pi^F - \pi^0) \quad (21)$$

F.O.C. with respect to  $w_F$ :

$$(y^*)^2 + 2y^* \frac{(n+1)(\delta-1)}{2(n+1) - \gamma^2 n} (w_F - r) - (x_N^*)^2 = 0 \quad (23)$$

Equilibrium wage of the FT producers

$$w_F^*(\delta, \gamma, r, n)$$

The S.O.C. is satisfied when  $\delta < 1$

**Lemma 1.** *If a consumer in the developed country distinguishes between the FT and non-FT coffee, then  $w_F^* > r$*

$$\gamma \in [0; 1) \quad \Rightarrow \quad \left. \frac{\partial V}{\partial w_F} \right|_{w_F=r} > 0 \quad \Rightarrow \quad w_F^* > r$$

$$\gamma = 1 \quad \Rightarrow \quad \left. \frac{\partial V}{\partial w_F} \right|_{w_F=r} = 0 \quad \Rightarrow \quad w_F^* = r$$

**Lemma 2.** *The output of the  $(n + 1)$ th firm is positive, when the warm glow is taking the value from the range  $(\underline{\delta}, 1)$*

$$\delta > 1 - \frac{((1 - \gamma)n + 1)(a - r)}{(n + 1)(w_F^* - r)} \equiv \underline{\delta}$$

# Fair trade existence condition

*lemma 1 and lemma 2*

**Proposition 1.** *Fair trade exists, if a consumer in the developed country distinguishes between the FT and the non-FT commodities and the warm glow effect is within the range:  $(\underline{\delta}, 1)$*

|                     | $\delta < \underline{\delta}$ | $\delta > \underline{\delta}$ |
|---------------------|-------------------------------|-------------------------------|
| $\gamma \in [0; 1)$ | ✘                             | FT                            |
| $\gamma = 1$        | ✘                             | ✘                             |

# Is FT beneficial for the FT firm?

*Proposition 2. Under FT the supply and the profit of the (n+1) firm (FT firm) are greater than in the case of FT inexistence.*

**F.O.C. (23)**

$$(y^* - x_N^*)(y^* + x_N^*) = -2y^* \frac{(n+1)(\delta-1)}{2(n+1) - \gamma^2 n} (w_F^* - r)$$

$$\delta < 1$$

$$y^* > 0$$



$$y^* - x_N^* > 0$$



$$\pi^F > \pi^0$$

# Do non-FT producers and non-FT firms gain from FT existence?

**Proposition 3.** Under FT the supply of non-FT good exceeds its supply in the case of FT inexistence, if  $\gamma < 2/n$

$$x_F^* - x_N^* = - \frac{(a - r)(1 - \gamma)(\gamma n - 2) - \gamma(1 - \delta)(w_F^* - r)(n + 2)}{((2 - \gamma^2)n + 2)(n + 2)}$$

$$\gamma < \frac{2}{n}$$



$$x_F^* - x_N^* > 0 \quad (34)$$

- non-FT firms and producers can gain from existence of the FT
- The less number of non-FT firm at the market, the easier the condition  $\gamma < 2/n$  can be fulfilled.

$$n \leq 2$$



$$x_F^* > x_N^* \text{ for any } \gamma \in [0, 1).$$

# Prices of the final commodities under FT

*Proposition 4. Prices of coffee are higher under FT.*

$$q^* - p_F^* = (1 - \gamma)(X_F^* - y^*) + \delta(w_F^* - r) \quad (35)$$

$$X_F^* - y^* = \frac{(n - 1)(a - r) + (\gamma n + \gamma + 1)(1 - \delta)(w_F^* - r)}{(2 - \gamma^2)n + 2} > 0 \quad (36)$$



$$q^* > p_F^*$$

$$p_F^* - p_N^* = \frac{(1 - \gamma)(2 - n\gamma)(a - r)}{((2 - \gamma^2)n + 2)(n + 2)} + \frac{\gamma(w_F^* - r)(1 - \delta)}{((2 - \gamma^2)n + 2)} \quad (39)$$

$$\gamma < \frac{2}{n} \quad \Rightarrow \quad p_F^* > p_N^*$$

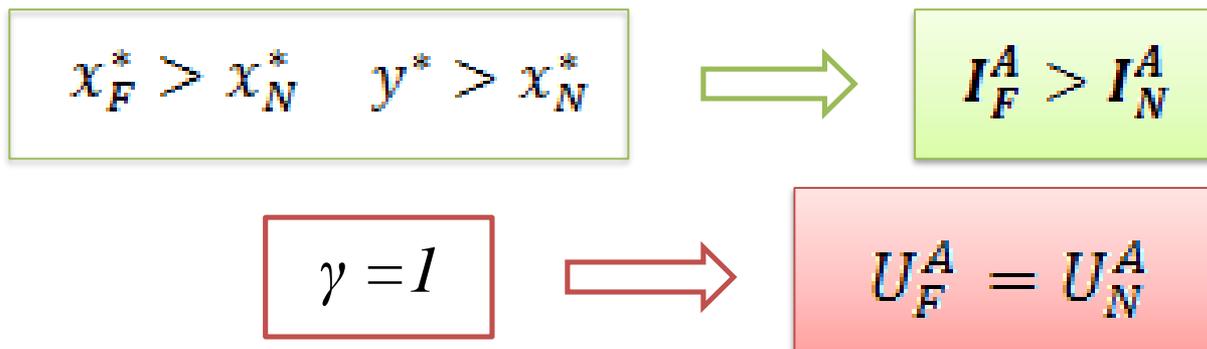
$$\Rightarrow \quad q^* > p_F^* > p_N^*$$

*Prices of coffee are higher under FT*

# Welfare of the developed country under FT

$$U_F^A = \frac{1}{2} ((nx_F^*)^2 + 2\gamma nx_F^*y^* + (y^*)^2) + \underbrace{n(x_F^*)^2 + (y^*)^2 + L^A}_{I_F^A}$$

$$U_N^A = \frac{1}{2} ((nx_N^*)^2 + 2nx_N^*x_N^* + (x_N^*)^2) + \underbrace{(n+1)(x_N^*)^2 + L^A}_{I_N^A}$$



➤ **BUT** it is ambiguous whether the developed country gains from implementing the FT program or not in general case

# Welfare of the developed country in case of full differentiation

$$x_F^*|_{\gamma=0} \equiv \widehat{x}_F$$

Sufficient condition for  $U_F^A|_{\gamma=0} > U_N^A$

$$\widehat{x}_F^2 \left( \frac{1}{2}n^2 + n \right) > (x_N^*)^2 \left( \frac{1}{2}n^2 + 2n \right) \quad (49)$$

$$n > -1 \frac{1}{3}$$

always 

$$U_F^A|_{\gamma=0} > U_N^A$$

**Proposition 5.** *Although price of coffee is higher under FT, the welfare of the developed country becomes higher under FT in case of full product differentiation .*

# Welfare of the developing country under FT

**Proposition 6 .** *Welfare of the developing country becomes higher under the FT program.*

**In case N** the welfare of country B

$$U_N^B = I_N^B = rL^B \quad (53)$$

**In case F** the welfare of country B

$$U_F^B = I_F^B = r(L^B - y^*) + w_F^* y^* = rL^B + (w_F^* - r)y^* \quad (54)$$

$$w_F^* > r \quad \Rightarrow \quad U_F^B > U_N^B$$

# Comparative statics. Effect of warm glow

*Proposition 7. In case of FT existence warm glow always positively affects the wage of FT farmers*

Denoting F.O.C. (23) as  $F$

$$dF(w_F, \delta) = \frac{\partial F}{\partial w_F} dw_F + \frac{\partial F}{\partial \delta} d\delta = 0$$

$$\frac{dw_F^*}{d\delta} = - \frac{2 \frac{(n+1)(w_F^* - r)}{2(n+1) - \gamma^2 n}}{2 \frac{(n+1)(\delta - 1)}{2(n+1) - \gamma^2 n}} = \frac{w_F^* - r}{1 - \delta} \quad (59)$$

**Proposition 8.** Warm glow has no effect on the supply of FT coffee.

$$y^* = \frac{(n+1)(w_F^* - r)(\delta - 1) + ((1-\gamma)n+1)(a-r)}{(2-\gamma^2)n+2} \quad (14)$$

$$\frac{dw_F^*}{d\delta} = \frac{w_F^* - r}{1-\delta} \quad (59)$$



$$\frac{dy^*}{d\delta} = \frac{\partial y^*}{\partial \delta} + \frac{\partial y^*}{\partial w_F^*} \frac{dw_F^*}{d\delta} = \underbrace{\frac{(n+1)(w_F^* - r)}{(2-\gamma^2)n+2}}_{\text{a positive direct effect}} + \frac{(n+1)\cancel{(\delta-1)}(w_F^* - r)}{(2-\gamma^2)n+2 \cancel{(1-\delta)}} = 0$$

-1

a negative effect via increasing of MC

**Proposition 9.** Warm glow has no effect on the supply of non-FT coffee.

$$x_F^* = \frac{(2 - \gamma)(a - r) - (\delta - 1)(w_F^* - r)\gamma}{(2 - \gamma^2)n + 2} \quad (13)$$

$$\frac{dw_F^*}{d\delta} = \frac{w_F^* - r}{1 - \delta} \quad (59)$$



$$\frac{dx_F^*}{d\delta} = \frac{\partial x_F^*}{\partial \delta} + \frac{\partial x_F^*}{\partial w_F^*} \frac{dw_F^*}{d\delta} = \underbrace{\frac{-(w_F^* - r)\gamma}{(2 - \gamma^2)n + 2}}_{\text{a negative direct effect}} + \underbrace{\frac{(1 - \delta)\gamma}{(2 - \gamma^2)n + 2} \frac{(w_F^* - r)}{(1 - \delta)}}_{\text{a positive effect via increasing MC of the FT firm (rival)}} = 0$$

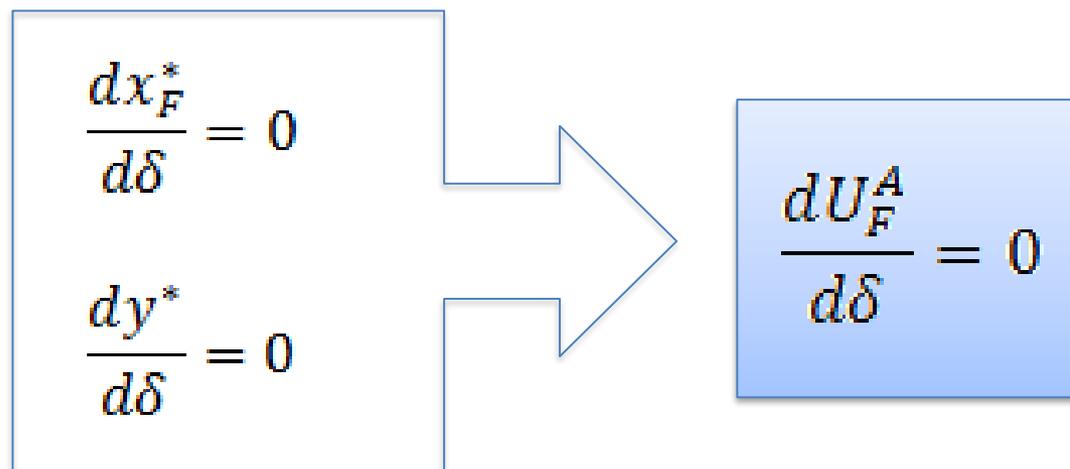
**a negative  
direct effect**

**a positive effect via increasing  
MC of the FT firm (rival)**

# *Warm glow effect on the welfare of the developed country*

Welfare of the developed country

$$U_F^A = \frac{1}{2} ((nx_F^*)^2 + 2\gamma nx_F^*y^* + (y^*)^2) + n(x_F^*)^2 + (y^*)^2 + L^A$$



## Warm glow effect on the welfare of the developing country

**Proposition 10.** Warm glow has a positive effect on the income of the FT producers and on the total welfare of the developing country.

Income of FT producers  $I_{FT}^0 = w_F^* y^*$

$$\frac{dI_{FT}^0}{d\delta} = \frac{dw_F^*}{d\delta} y^* + \frac{dy^*}{d\delta} w_F^* = \left( \frac{w_F^* - r}{1 - \delta} \right) y^* > 0$$

Welfare of the developing country in case F  $I_F^B = rL^B + (w_F^* - r)y^*$

$$\frac{dI_F^B}{d\delta} = \frac{d(rL^B + (w_F^* - r)y^*)}{d\delta} = \left( \frac{w_F^* - r}{1 - \delta} \right) y^* > 0$$

# Summary

- i. The FT program will exist if a consumer in the developed country distinguishes the FT coffee from the non-FT coffee and the warm glow is higher than the *threshold*.
- ii. The warm glow positively affects the FT producers wage as well as the welfare of the developing country.
- iii. The warm glow has no effect on the supply of the FT coffee and the non-FT one and the welfare of the developed country.
- iv. FT is beneficial for its direct participants (FT producers and FT firm)

# Summary

- v. FT can be beneficial even for non-FT producers and non-FT firms if  $\gamma < 2/n$
- vi. The welfare of the **developing** country becomes higher under the FT program
- vii. In case when product differentiation is sufficiently close to perfect ( $\gamma = 0$ ), in spite of higher prices for the final goods, the welfare of the **developed** country will become higher under FT

## *Concluding remarks*

### *Possible further extensions of the model*

- Generalization of utility function
- Include into analysis certification and trading costs
- Endogenous substitution rate
- Implementing trade policy