The Effects of Fair Trade on Rural-Urban Migration and Unemployment

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Abstract

This paper analyses effects of fair trade (FT) implementation in a rural area of a small open developing country theoretically. By introducing the FT agricultural sector with minimum fixed FT wage into *Harris-Todaro model*, we analyze effects of the world FT price fluctuations and changes of the minimum FT wage on migration between rural and urban areas, the wage of the non-FT agriculture sector, GDP and on the urban unemployment. The analysis shows that when the minimum FT wage is high, an increase of the world FT price would contribute to the urban unemployment reduction, but at the same time it would push down the wage of the non-FT agricultural sector. In addition, the minimum FT wage itself might reduce employment in both agricultural sectors and increase unemployment rate that would deepen misbalance in the developing country.

Keywords: Fair trade, Rural-Urban Migration, Unemployment

1. Introduction

Agriculture plays a big role for well-being of developing countries. About 80% of the world's poor live in rural areas. As a result, it is common for agriculture to serve as a base for the economies of emerging regions. For example, such countries as Guatemala and Colombia tend to see a large number of people engaging in coffee planting. Nevertheless, the world price of coffee is extremely volatile being determined daily at the stock exchanges, and developing countries are not able to affect these world prices. During previous few years one can witness a crucial drop in the coffee price. The price of coffee beans in 2011 reached $2.99 per pound that was a pick for the previous 25 years. However, since then the price has changed drastically, and in 2018 *the New York C price* for coffee (*New York Arabica Coffee Price*) decreased below $1 per pound for the first time since 2006, that is considered to be unfairly low and farmers fail to sustain appropriate level

of living. In the following years the price has varied between $0.89 per pound and $1.36 per pound, showing the overall volatility of the coffee industry and the trend of the coffee price falling down[1].

Since the main source of income for rural population of a developing country is an employment at the agriculture sector, individuals who live and work in rural areas have a lack of alternatives for earning their livings inside a rural area. Therefore, due to the volatility of world prices of agricultural commodities, there has been a decline in income of agriculture sector workers. As a result, having small number of alternatives inside rural area, its population ought to move to urban area expecting higher wages. Thus, there often can be observed an intense outflow of labor force from rural towards urban areas within a developing country. This *Rural-Urban migration* is seen as a phenomenon that causes misbalance of economy and results in overpopulation of urban regions of a developing country causing unemployment.

Problems of urban unemployment in developing countries with a migration between rural urban areas was originally analyzed by Harris and Todaro (1970). They introduced a basic theoretical framework that has been extended by many authors since then. Plenty of papers have contributed to analysis of rural-urban migration by extending Harris-Todaro model (H-T) in order to elaborate measures for reducing unemployment in urban regions or increase welfare of the rural population. For instance, Corden-Findlay (1975) and McCool (1982) conducted analysis of wage subsidies on wage rates: only on manufacturing wages, only on agricultural wages and simultaneously on both sectors' wages. According to their results, a subsidy to wages in the manufacture sector lowers the wage rate of the agricultural sector. Also a raise of unemployment was determined as an effect of decreased capital intensities and an increased wage differential. Calvo (1978) incorporated *Trade Union* into urban sector that maximizes the difference between its members' income and what they would get in rural area. This allowed deriving endogenous urban wage. Djajić (1985) showed that in a small open economy where labor forces can choose whether to acquire skills or to remain being unskilled, it is possible to reduce unemployment by subsidizing education and health services. In this setting unemployment decreases by a decline of the world rate of interest, an improvement in the technology of the sector in which the minimum wage is absent, and an increase in the efficiency of the education sector. Marjit (1991) analyzed the situation where an agricultural good is used

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1) We can see the dynamics of coffee prices at the website of Trading Economics. URL: https://tradingeconomics.com/commodity/coffee (Accesed 2021/02/27).

as an input of a manufactural sector. He demonstrated that the wage subsidy to the manufactural sector increases employment in both urban and rural employment. However, Kakimoto (1991) extended this further by allowing factor substitution and concluded that the manufacture wage subsidy does not necessary result in an improvement of the rural employment. Sarbajit (2006) introduced an extended H-T model with agricultural dualism and a non-traded final agricultural commodity. The author drew a conclusion that a reduction in unionized wage may increase the rural wage and it may improve the situation with unemployment in the urban region. Okawa (2011) suggested an extension of the H-T model in which home and foreign duopolists compete in a Cournot fashion in urban sector. He derived conditions that determine the effect of production subsidies to domestic and foreign firms on the urban unemployment.

In this paper we introduce the fair trade program into analysis of the rural-urban migration. Fair trade serves as one of the mechanism for compensating price volatility for the farmers who joined the FT cooperative by ensuring minimum wages[2]. However, farmers can still experience an insecure position even after being certified as the FT ones. It is trivial that decent prices of coffee beans can ensure farmers to stay and work in rural areas. And vice versa, due to the declined coffee beans prices, coffee growers have to quit farming and migrate into urban areas in order to search for a job out of agriculture where they can earn one's living. Currently, it is a debatable point between the FT umbrella organizations (e.g. *Fairtrade USA, Fairtrade International*) and local communities, whether a forced rise of the minimum FT wage can be beneficial for local communities or, in contrast, it might lead, for instance, to a reduction of market share of the FT farms and worsening of the actual state of the rural region. Consequently, the world FT price fluctuations and the change of institutionally fixed FT minimum wage are both supposed to have multiple effects and became the focus of this analysis.

In order to tackle this problem theoretically, we introduce an alternative agricultural sector, the fair trade agricultural sector, into setting of the traditional H-T model. There is a minimum wage in the FT agricultural sector in a rural area as well as in the manufacturing sector in an urban area. The main goal of this research is to find out whether fair trade is able to cope with the problem of unemployment in the urban area and whether it contributes to wage improvement of the non-FT agricultural sector.

The main results of this paper are as follows. We show that when the minimum FT

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2) A certified fair trade coffee has had a minimum price of $1.60 per pound since 2011.

wage is relatively low, an increase of the world FT price has a negative impact on the labor force of the non-FT agricultural sector but it improves the wage of the non-FT sector. However, if the minimum FT wage is relatively high, the world FT price improves the employment of the non-FT agriculture sector but negatively affects the wage of the non-FT sector. Also we conclude that if the minimum FT wage is relatively high, an increase of the FT world price reduces unemployment in the urban area. Considering the effects of the minimum FT wage itself, the paper shows that if the minimum FT wage does not exceed urban expected wage, it negatively affects the wage of the non-FT agriculture sector. Next, we find that if the minimum FT wage does not exceed urban expected wage, its increase enhances the employment of the non-FT agriculture sector, but at the same time it always reduces the employment of the FT sector. Finally, the paper demonstrates that when the minimum FT wage is imposed sufficiently high, an increase of the minimum FT wage worsens the situation with unemployment in the urban region.

With regards to the structure of the paper, section 2 sets up the theoretical model of a small open developing country that has both a non-FT and a FT agriculture sectors in rural area and a manufacture sector in urban area. Section 3 describes the equilibrium of the model. Section 4 is dedicated to the comparative statics analysis of the world FT price. Section 5 describes the comparative statics analysis with respect to the fixed minimum FT wage. Finally, section 6 provides concluding remarks.

2. The model setting and the equilibrium

This paper analyzes the economy of a small open developing country. There are two regions: a rural area with a non-FT agricultural good sector and a FT agricultural good sector and an urban area where a manufacturing sector is located. The model allows for a free movement of labor between two areas and, therefore, unemployment á la *Harris and Todaro* (1970) is possible in the urban area.

The production functions of the non-FT agriculture sector, the FT agriculture sector and the manufacture sector are, respectively, as follows.

$$X_A = f(L_A), \tag{1}$$

$$X_F = g(L_F), \tag{2}$$

$$M = h(L_M), \tag{3}$$

where L_A is the labor used to produce the non-FT coffee beans, L_F is the labor used to

produce the FT coffee beans, L_M is the labor (urban and migrants from the rural area) required to produce the output of the manufacture good. In addition, we have following properties of the production functions: $f' > 0, f'' < 0, g' > 0, g'' < 0, h' > 0, h'' < 0$ where " $'$ " indicates the first derivative and " $''$ " is the second derivative.

We assume that the workers employed in the FT sector are getting fixed FT wage, $\bar{w}_F$ that exceeds the wage of the non-FT farmers, w_A. However, $\bar{w}_F$ is lower than the wage paid to the manufacture workers, $\bar{w}_M$. All markets are perfectly competitive. Under the assumption that all goods are produced, from profit maximization, we derive the wages of the non-FT, the FT and the manufacturing sector, respectively:

$$w_A = p_A f', \tag{4}$$

$$\bar{w}_F = p_F g', \tag{5}$$

$$\bar{w}_M = h', \tag{6}$$

where p_A and p_F are world prices for the non-FT and the FT agriculture goods, and the world price of the manufacture good serves as a numeraire. The FT sector wage and the manufacture wage are institutionally constrained to be equal, respectively, to the fixed minimum FT wage ($\bar{w}_F$) and the fixed minimum urban wage ($\bar{w}_M$).

We define rural and urban expected wages. The expected wage in the rural area is defined as

$$w_R^e = w_A \frac{L_A}{L_R} + \bar{w}_F \frac{L_F}{L_R}, \tag{7}$$

where $L_R = L_A + L_F$ is a total rural labor force. On the other hand, the expected wage in the urban area is

$$w_U^e = \bar{w}_M \frac{L_M}{L_U}, \tag{8}$$

where $L_U = \bar{L} - L_R$ is a total urban labor force and $\bar{L}$ is a total labor endowment.

Following the logic of Harris and Todaro (1970), in the equilibrium, the expected wages of the rural area and the urban area are equalized, $w_U^e = w_R^e$. Explicitly, we have following equilibrium condition:

$$\bar{w}_M \frac{L_M}{L_U} = w_A \frac{L_A}{L_R} + \bar{w}_F \frac{L_F}{L_R}. \tag{9}$$

We have 9 equilibrium conditions and 9 unknowns. From (5) and (6), given fixed minimum the FT wage and the manufacture wage, L_F^* and L_M^* can be determined. Having L_F^* and L_M^*, from equilibrium conditions (2) and (3), we can derive the outputs of the FT agriculture good and the manufacture good, respectively.

3. The stability of the equilibrium

The labor used to produce the non-FT agriculture good, L_A^*, is derived from the equilibrium condition (9). In order to prove that this equilibrium is stable, we define the adjusting equation as

$$\dot{L}_A = \varphi\left(w_A \frac{L_A}{L_R} + \bar{w}_F \frac{L_F}{L_R} - \bar{w}_M \frac{L_M}{L_U} \right), \tag{10}$$

where $\dot{L}_A$ is a time derivative, φ is an increasing function of difference between w_R^e and w_U^e and $\varphi' > 0$.

The equilibrium is stable, if $\dfrac{\partial \dot{L}_A}{\partial L_A} < 0$. We differentiate (9) with respect to L_A and obtain

$$\frac{\partial \dot{L}_A}{\partial L_A} = \varphi'\left(\frac{\partial w_A}{\partial L_A} \frac{L_A}{L_R} + (w_A - \bar{w}_F) \frac{L_F}{L_R} - \bar{w}_M \frac{L_M}{L_U} \right) \tag{11}$$

From (4) and due to the assumption: $f'' < 0$, we have $\dfrac{\partial w_A}{\partial L_A} < 0$. Also as we initially assumed that $w_A < \bar{w}_F$. Thus, $\dfrac{\partial \dot{L}_A}{\partial L_A} < 0$ and, consequently, the equilibrium is always stable.

Having L_A^*, from equilibrium conditions (1), (4), (7) and (8) we derive, respectively, X_A^*, w_A^*, w_R^e and w_U^e.

4. The comparative statics — A change of the FT world price

4.1 The effects on the labor forces in each sector

In this subsection we determine what effects the FT world price has on the labor forces of the non-FT agriculture. Taking total differential of (5), we obtain

$$\frac{dL_F}{dp_F} = -\frac{g'}{p_F g''} > 0 \tag{12}$$

Due to the assumptions $g' > 0$ and $g'' < 0$, a rise of the FT world price encourages an increase of the FT good production, that results in enlargement of employment in the FT sector. Therefore, an increase of the world price of FT agriculture good positively affects the number of farmers employed in the FT sector. In addition, the effect of the FT world

price on the equilibrium condition (6) directly implies that $\frac{dL_M}{dp_F} = 0$. The FT world price does not affect the labor input in the manufacturing sector.

Next, we show what effect the FT world price has on the labor forces of the non-FT agriculture sector. L_A is determined by (9) and we define Φ as follows.

$$\Phi \equiv w_A \frac{L_A}{L_R} + \bar{w}_F \frac{L_F}{L_R} - \bar{w}_M \frac{L_M}{L_U} \tag{13}$$

Then, the equilibrium condition (9) is expressed as $\Phi = 0$. Taking its total differential, we obtain

$$\frac{dL_A}{dp_F} = -\frac{\partial \Phi}{\partial p_F} \bigg/ \frac{\partial \Phi}{\partial L_A} \tag{14}$$

From stability condition (11), $\frac{\partial \Phi}{\partial L_A} < 0$. We only need to define the sign of $\frac{\partial \Phi}{\partial p_F}$.

$$\frac{\partial \Phi}{\partial p_F} = \frac{dL_F}{dp_F} \left(\frac{(\bar{w}_F - w_A) L_A}{L_R^2} - \frac{\bar{w}_M L_M}{L_U^2} \right) \tag{15}$$

From (12), we have $\frac{dL_F}{dp_F} > 0$. We define function H as

$$H \equiv \frac{(\bar{w}_F - w_A) L_A}{L_R^2} - \frac{\bar{w}_M L_M}{L_U^2}. \tag{16}$$

Using the equilibrium condition (9) and the definition of the expected urban wage, H can be rearranged as follows[3].

$$H = \frac{\bar{w}_F}{L_R} - \bar{w}_M \frac{L_M}{L_U} \left(\frac{1}{L_R} + \frac{1}{L_U} \right) = \frac{1}{L_R} \left(\bar{w}_F - \frac{w^e \bar{\bar{L}}}{L_U} \right) \tag{17}$$

We have three cases. In the first case, when

$$\bar{w}_F > \frac{w^e \bar{L}}{L_U}, \tag{18}$$

the impact of the world FT price will be positive, $\frac{dL_A}{dp_F} > 0$. In the second case, when

$$\bar{w}_F < \frac{w^e \bar{L}}{L_U}, \tag{19}$$

the impact of the world FT price on L_A will be negative, $\frac{dL_A}{dp_F} < 0$. And, if

$$\bar{w}_F = \frac{w^e \bar{L}}{L_U}, \tag{20}$$

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3) In the equilibrium, we have $w_U^e = w_R^e$.

there will be no effect of the world FT price on L_A, $\dfrac{dL_A}{dp_F} = 0$. We obtain following proposition.

Proposition 1. *When the FT minimum wage is fixed at a high level* $\left(\bar{w}_F > \dfrac{w^e \bar{L}}{L_U} \right)$, *an increase of the world FT price has a positive impact on the labor force employed at the non-FT agricultural sector; however, if the FT minimum wage is low* $\left(\bar{w}_F < \dfrac{w^e \bar{L}}{L_U} \right)$, *a change of the world FT price affects L_A negatively.*

This implies that, all in all, depending on the scale of *the FT minimum wage*, its increase can be either improving for the non-FT agriculture employment or can impair it. However, since the fair trade program tends to pay sufficiently high wages to its members, it is an argument for justifying $\bar{w}_F > \dfrac{w^e \bar{L}}{L_U}$ case. Additionally, the result that under the FT program the FT agricultural sector workers receive higher wages is supported by the empirical papers of Bacon (2005) and Weber (2011).

4.2 The effect on the non-FT farmers' wage

The wage of the non-FT farmers is determined by equilibrium condition (4). Total derivative of (4) with respect to p_F is

$$\frac{dw_A}{dp_F} = p_A f'' \frac{dL_A}{dp_F} \tag{21}$$

Using assumption $f'' < 0$ and applying derived in the previous subsection results considering $\dfrac{dL_A}{dp_F}$, from (21) we obtain that for $\bar{w}_F > \dfrac{w^e \bar{L}}{L_U}$, the impact of the world FT price on the wage of the non-FT farmers is negative, $\dfrac{dw_A}{dp_F} < 0$. If $\bar{w}_F < \dfrac{w^e \bar{L}}{L_U}$, the impact is positive, $\dfrac{dw_A}{dp_F} > 0$. When $\bar{w}_F = \dfrac{w^e \bar{L}}{L_U}$, the world FT price has no impact on the non-FT farmers' wage, $\dfrac{dw_A}{dp_F} = 0$. Therefore, we formulate the proposition.

Proposition 2. *When the FT minimum wage is fixed at a high level* $\left(\bar{w}_F > \dfrac{w^e \bar{L}}{L_U} \right)$, *an*

increase of the world FT price has a negative impact on the non-FT farmers wage; how-ever, if the FT minimum wage is low $\left(\bar{w}_F < \dfrac{w^e \bar{L}}{L_U} \right)$, an increase in the world FT price im-proves w_A.

Hence, the influence of the world FT price on w_A varies depending on the *fixed FT minimum wage*. Therefore, the FT program can be either improving or aggravating for the wage of workers employed in the non-FT sector. This partly contradicts to the Podhorsky (2015) that shows theoretically that an increase of the FT wage has always positive impact on the non-FT farmers' wage.

4.3   The effect on the GDP and unemployment

We define GDP of the small open developing country as *G:*

$$GDP \equiv G = p_A X_A + p_F X_F + M. \tag{22}$$

Then, the effect of the world FT price on the GDP is as follows.

$$\frac{dG}{dp_F} = p_A f' \frac{dL_A}{dp_F} + p_F g' \frac{dL_F}{dp_F} + X_F \tag{23}$$

Manufacture sector experience no impact from fluctuation of the world FT price, while on the FT agriculture sector p_F has two effects: a direct one and an indirect one through the increase in L_F. Both effects are always positive. However, the non-FT agriculture sector is influenced differently. If $\bar{w}_F \geq \dfrac{w_U^e \bar{L}}{L_U}, \dfrac{dL_A}{dp_F} \geq 0$, so in this case the world FT price will have a positive effect on GDP. Otherwise, the effect will be ambiguous.

Proposition 3.   *When $\bar{w}_F \geq \dfrac{w_U^e \bar{L}}{L_U}$, a rise in the world FT price increases the GDP.*

Next, consider the effect on unemployment. In the urban area, due to the migration of labor force from the agricultural sectors, arises unemployment. The unemployment rate is defined as *U:*

$$U = 1 - \frac{L_M}{L_U}, \tag{24}$$

where $L_U = \bar{L} - L_U = \bar{L} - L_A - L_F$. As $\dfrac{dL_M}{dp_F} = 0$ and $\dfrac{dL_U}{dp_F} = -\dfrac{dL_A}{dp_F} - \dfrac{dL_F}{dp_F}$, the effect of the FT world price change on unemployment rate:

$$\frac{dU}{dp_F} = -\left(\frac{dL_A}{dp_F} + \frac{dL_F}{dp_F}\right)\frac{L_M}{L_U^2} \tag{25}$$

Since $\dfrac{dL_F}{dp_F} > 0$ but the sign of $\dfrac{dL_A}{dp_F}$ varies depending on the conditions (18), (19), (20),

if $\bar{w}_F \geq \dfrac{w_U^e \bar{L}}{L_U}$, the effect of the FT world price on the unemployment is negative. In

other words, when the FT minimum wage is relatively high, an increase of the FT world

price has an improving effect on the employment situation $\left(\dfrac{dU}{dp_F} < 0\right)$. However, if

$\bar{w}_F < \dfrac{w_U^e \bar{L}}{L_U}$, the effect of the FT world price can be either positive or negative. Here, we ob-

tain next proposition.

Proposition 4.　*When the FT minimum wage is relatively high, an increase in the FT world price reduces unemployment in the urban area.*

This implies that introduction of the FT sector in the rural area can be seen as a way for reducing unemployment in the urban area. However, this effect cannot always be achieved. The sufficient condition is a relatively high fixed minimum FT wage.

5. The comparative statics － A change of the FT minimum wage

5.1　The effects on the labor forces in each sector

In this subsection we will investigate how the change of the minimum FT wage can affect the number of workers in each sector.

Taking total differentiation of (5) with respect to $\bar{w}_F$, and rearranging the terms, since $g'' < 0$, we obtain

$$\frac{dL_F}{d\bar{w}_F} = \frac{1}{p_F g''} < 0 \tag{26}$$

Therefore, an increase of the fixed minimum FT wage has always a negative effect on the labor force employed in the FT sector. That is easily interpreted as $\bar{w}_F$ is marginal cost of a producer of the FT agriculture good.

Considering the effect of the minimum FT wage on the manufacture sector employment, from (6), we obtain that $\dfrac{dL_M}{d\bar{w}_F} = 0$. The minimum FT wage does not affect the

labor input in the manufacturing sector.

Next, we check the effect of changing fixed FT wage on the labor force employed by non-FT agricultural sector. From total differentiation of $\Phi = 0$, we obtain

$$\frac{dL_A}{d\bar{w}_F} = -\frac{\partial \Phi}{\partial \bar{w}_F} \Big/ \frac{\partial \Phi}{\partial L_A}, \tag{27}$$

where from the stability condition we have $\dfrac{\partial \Phi}{\partial L_A} < 0$. Therefore, in order to determine

the sign of $\dfrac{dL_A}{d\bar{w}_F}$, it is enough to investigate the sign of $\dfrac{\partial \Phi}{\partial \bar{w}_F}$.

$$\frac{\partial \Phi}{\partial \bar{w}_F} = \frac{dL_F}{d\bar{w}_F}H + \frac{L_F}{L_R} \tag{28}$$

From (26) we showed that $\dfrac{dL_F}{d\bar{w}_F} < 0$, and $\dfrac{L_F}{L_R}$ is positive[4]. Thus, $\dfrac{\partial \Phi}{\partial \bar{w}_F} > 0$ whenever H

is non-positive; the condition for non-positive H is derived from (19) and (20)

$$\bar{w}_F \leq \frac{w_U^e \bar{L}}{L_U}. \tag{29}$$

However, because $\bar{L} > L_U$ and $\bar{w}_F < \bar{w}_M$, the sufficient condition for non-positive H is $\bar{w}_F \leq w_U^e$. Therefore, if this condition holds, $\dfrac{\partial \Phi}{\partial \bar{w}_F} > 0$. Consequently, we obtain from (27)

that $\dfrac{dL_A}{d\bar{w}_F} > 0$. We have following proposition.

Proposition 5. *If the minimum FT wage does not exceed the urban expected wage, a rise of the FT wage increases employment of the non-FT agriculture sector.*

Proposition 5 emphasizes that if the FT wage is fixed at the level that is not higher than the expected wage in the country, a rise of it improves employment of the non-FT agriculture sector.

Even if the minimum FT wage is greater than $\dfrac{w_U^e \bar{L}}{L_U}$, the positive effect of it on L_A will

continue till the point when $\dfrac{\partial \Phi}{\partial \bar{w}_F} = 0$. So, we define the minimum FT wage such that

$\dfrac{\partial \Phi}{\partial \bar{w}_F} = 0$ as $\bar{w}_F^0$. Combining this with (27), we acquire that $\dfrac{dL_A(\bar{w}_F^0)}{d\bar{w}_F} = 0$. Thus only if

$\bar{w}_F > \bar{w}_F^0$, the effect of the minimum FT wage will worsen employment of the non-FT agri-

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4) We assumed that all sectors have positive production, consequently, $L_F > 0$

culture sector.

Proposition 6.　*When the minimum FT wage is fixed at sufficiently high level* ($\bar{w}_F > \bar{w}_F^0$), *it will reduce employment of the non-FT sector.*

This proposition implies that if the fair trade umbrella organizations (e.g. *Fairtrade International*) impose the minimum FT wage at too high level, this will cause an outflow of labor forces from both agriculture sectors towards urban area.

5.2　The effect on the non-FT agriculture sector wage.

Here, we will investigate how the change of the fixed FT wage influences the wage of the non-FT sector employment. Total differentiation of (4) with respect to $\bar{w}_F$ yields

$$\frac{dw_A}{d\bar{w}_F} = p_A f'' \frac{dL_A}{d\bar{w}_F}, \tag{30}$$

where $f'' < 0$. With proposition 5 we showed that whenever $\bar{w}_F \leq w_U^e$, we have $\dfrac{dL_A}{d\bar{w}_F} > 0$. As a result, if this condition holds, an increase of the fixed FT wage will have a negative impact on the wages of the non-FT farmers.

Proposition 7.　*When the minimum FT wage is fixed at a level lower than, or equal to the expected urban wage, it will impair the wage at the non-FT sector.*

From proposition 7 it is clear that the implementation of FT can worsen the wage of the farmers employed at the non-FT sector.

5.3　The effect on GDP and unemployment

In this subsection we check how an increase of the FT minimum wage affects the GDP of a small open developing country. Taking total derivative of (22) with respect to $\bar{w}_F$ we obtain

$$\frac{dG}{d\bar{w}_F} = p_A f' \frac{dL_A}{d\bar{w}_F} + p_F g' \frac{dL_F}{d\bar{w}_F}. \tag{31}$$

In general case the sign of $\dfrac{dL_A}{d\bar{w}_F}$ is not determined. From (23) we know $\dfrac{dL_F}{d\bar{w}_F} = \dfrac{1}{p_F g''} < 0$.

So, $\dfrac{dG}{d\bar{w}_F} \geq 0$ in case when

$$\frac{dL_A}{d\bar{w}_F} \geq -\frac{g'}{p_A f' g''}. \tag{32}$$

Otherwise, an increase of the minimum FT wage has a negative impact on GDP.

Next, we examine the effect of the fixed FT wage on the urban unemployment.

$$\frac{dU}{d\bar{w}_F} = -\frac{L_M}{L_U^2}\left(\frac{dL_A}{d\bar{w}_F} + \frac{dL_F}{d\bar{w}_F}\right) \tag{33}$$

From (26), $\frac{dL_F}{d\bar{w}_F} < 0$ always holds. Nevertheless, the impact of the minimum FT wages on L_A varies depending on the initial $\bar{w}_F$. In proposition 6 we concluded that when $\bar{w}_F$ is too high, it will negatively affect the employment of the non-FT sector, so in that case $\frac{dL_A}{d\bar{w}_F} < 0$. Consequently, when $\bar{w}_F > \bar{w}_F^0$, $\frac{dU}{d\bar{w}_F} > 0$. Thus, we have following proposition.

Proposition 8.   *When the minimum FT wage is imposed at sufficiently high level, it increases unemployment in the urban region.*

This proposition certainly contradicts to a common intuition that an introduction of the FT sector with fixed minimum wage into rural area will contribute to a reduction of unemployment in the urban area. Thus, this analysis showed that the FT sector conversely can even worsen the situation.

6. Concluding remarks

This paper analyzed an extended *H-T model* with two agricultural sectors in a rural area: the fair trade sector and the non-FT sector. The analysis shows that depending on the levels of the world FT price and the minimum FT wage, the fair trade program can contribute to solving different problems regarding *Rural-Urban migration*. For instance, when the minimum FT wage is sufficiently high, a rise of the FT world price contributes to a reduction of the urban unemployment, but at the same time it would impair the non-FT agricultural worker wage. However, when the minimum FT wage is low, the FT would improve the wage of the non-FT agricultural workers, but at the same time it would increase the urban unemployment.

In addition, regardless of intuition that establishing of the FT sector should increase the expected rural wage and induce movement of labor forces toward rural region reducing the urban unemployment, the analysis demonstrated that the fair trade program

might have opposite effects. First of all, if the fair trade umbrella organizations (e.g. *Fairtrade international*) increase the FT minimum wage, the number of the FT workers employed would always go down, since the wage is a marginal cost for a producer. Regarding the effect of the FT on the other sectors, we show that if the minimum FT wage is imposed at a high level, its further increase would worsen the situation with the urban unemployment. But in contrast, when the minimum FT wage is fixed at the level lower than, or equal to the expected urban wage, its growth would negatively affect the wage at the non-FT sector.

All in all, obtained theoretical results testify the prudent position of the FT umbrella organizations upon choosing an unreasonable rise of the minimum FT wage as a method for securing position of the farmers and workers in developing countries. As we could see from this analysis, an implementation of the fair trade program might reduce the non-FT agricultural wage and also an increase of the minimum FT wage might increase unemployment rate. Summing up, an increase of the FT minimum wage should be performed with a certain level of consideration towards current world FT price, otherwise it might deepen misbalance in economy of a developing country.

In this paper we simplified the production structure using only one factor production functions. This limitation can be further eased by introducing capital or land markets in the model. In terms of the future work, this model can be extended by allowing the FT umbrella organizations to maximize the difference between the FT workers' income and what they would get alternatively. Also it is possible to apply *Nash bargaining* for the FT wage determination and for job-searching process in the urban area, or to introduce an imperfect competition in the fair trade sector.

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