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Backed by an Interest Group

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Effects of Adjustment Policies of the Government Backed by an Interest Group

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Abstract

The purpose of this paper is to consider the effects of the adjustment policies of governments in the developing countries that are backed by interest groups. The interest group, described as the trade union of the skilled workers in our model, is assumed to have the right to negotiate their real wage with firms and influence the amount of the lump-sum tax. We show that under some plausible assumptions, a government spending cut in industrial products might lead to an increase in the income of the rural sector as well as that in the employment of unskilled labor. Further, we show that if the government implements a spending cut because of an increase in the bargaining power of the interest group, the effect of such policies becomes ambiguous.

A government spending cut is one of the structural adjustment policies recommended by international organizations, such as the IMF and the World Bank. We argue that it is important for policy makers to analyze the power structure of governments in developing countries because the effects of stabilization policies differ according to the power structures.

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Key words: adjustment policies, interest group, right to manage model

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1. Introduction

The purpose of this paper is to consider the effects of the adjustment policies of the government in developing countries that are backed by interest groups. In order to evaluate the effects of the adjustment policies in developing countries, we need to investigate the power structure of these governments. In many developing countries, the government is inclined to adopt policies that offer special benefits to regions to where the elites come from. In other words, the government is inclined to add special burdens or taxes on the people, who the elites find easy to govern. Sometimes, the people who have been taxed or oppressed become critical of the elites and cause instability in the society by resisting the governmental policies. In order to maintain stability of society, it is important for the policy makers to heed to the tax burdens. Otherwise, the fiscal policies may give rise to unanticipated results such as severe conflicts or the eruption of civil wars. History proves that many civil wars were the result of a mistaken judgment on the part of the government regarding the behavior of some people as described hereafter.

Before summarizing the theoretical results, we need to note the historical backgrounds of developing countries. We aim to uncover some interesting researches by referring to many examples of authoritarian states.

As is well known, in the developing countries, the economy is characterized by a shortage of both public and private capital. In order to achieve an economic growth and to catch up with the developed countries, public and private investment, capital accumulation, is necessary. Hence, one of the serious and urgent problems in developing countries is evident. Who should bear the burden of the cost of capital accumulation? Sometimes this results in severe conflicts between people, as illustrated by the civil war in Russia between 1918 and 1921.¹

According to Sah and Stiglitz (1992, p3), this problem of the cost of capital accumulation was at the heart of the controversies over the corn laws in Britain in the

¹ See D'Encauss (2001), Chapter 11.

early nineteenth century and during the great debate on industrialization in the Soviet Union in the days following the October Revolution. Evgeny Preobrazhensky claimed that the state could increase its capital accumulation by moving the terms of trade against the peasants. According to Sah and Stiglitz (1992, p91), Preobrazhensky's view is mostly equivalent to taxing the rural output and increasing the prices of the manufactured products.

What was the real history of the Soviet Union? According to Davies (1991, p16), the price scissors (the ratio of the retail prices of manufactured products to the prices received by the peasants for their produce) were less favorable to the peasants in the 1920s than on the eve of the First World War. As compared to the returns on manufactured goods, the returns the peasants received for their products were relatively lesser. However, this deterioration in the terms of trade for the agricultural produce probably discouraged them from marketing their products. We need to note that the era of the new economic policies (NEP) was a market economy. In a market economy, economic incentives are required in order to encourage the peasants to increase the agricultural production. The Soviet leaderships, however, chose to adopt an administrative-command economy.

According to Davies (1998, p44-48) the capital product industries in the Soviet Union saw a vast expansion in the 1930s. While the construction of modern capital product industries in the country progressed rapidly, their agricultural production declined. Davies points out that "Dekulakisation" (the expropriation of the richer "kulak" peasants) forced approximately 5 to 6 million people from their villages into exile. A vast majority of the peasants suffered severe hardship as a result of the collectivization of agriculture and the forced requisitioning of agricultural products.

The oppression of peasants is also true of modern China. Sah and Stiglitz (1992, p3) notes that the post-Mao leaders of the People's Republic of China debated whether to reduce the implicit tax burden imposed on their peasants for the past thirty-five years.

Chow (2007, p85-86) points out the following three problems with respect to the rural poverty in China. The first is the income gap between the urban and the rural residents.

The second is the central government's bias between the urban and rural residents and the unfavorable treatment meted out to the rural residents. The central government spending on infrastructure investment in rural areas was less as compared to that in the urban areas. According to Chow, the central government investments toward developing the agricultural productivity were limited. The third is the violation of the farmers' rights by the illegal activities of the local officials. Further, Chow notes that the farmers in China are subject to illegal levies.

Ran Tao (2009, p73) argues that one of the reasons for the income gap between the city dwellers and the peasants in China is due to the household registration system ('hukou'). In China, the rural migrant workers are denied equal access to social security benefits, housing subsidies, and quality education in urban public schools for their children, which are available to those classified officially by the hukou system as 'urban residents' .

With respect to the economic situation in North Korea, Korea Institution for National Unification (KINU) interviews a large number of North Korean migrating to South Korea and supplies much valuable information. According to the KINU (2006, p171), official food rations in North Korea are distributed on a priority basis to Pyongyang, which is a special supply zone, and to a select class of elite, such as Party cadres, high government officials and the military.

As far as we know, the power structure of the governments in the former Soviet Union, China, and North Korea is almost the same. There exists a one party-system, where the dictator retains all the levels of power. The dictator's power is backed by military strength or security organizations, such as the KGB. However, one important point to be noted is that no dictator can continuously hold on to power unless he/she is supported by some ordinary people. Considering this point, we believe that the dictator's power base to rest in the city-dwellers, and not in the rural peasants. This could be the reason why dictators choose to tyrannize the rural peasants instead of the city dwellers. Almost the same is true of the dictators and authoritarian governments in some African countries. The authoritarian governments in some African countries focus on developing regions to which many government officials belong. Bates (2008, p283) points out that

the elites belonging to prosperous regions can maintain the loyalty of those belonging to less prosperous regions by channeling the benefits to them, thus forestalling armed challenges. Azam (2008, p238) notes that a part of the African elite can be viewed as collectively redistributing a share of the resources that were collected through the state apparatus or the public sector in a manner that could cause much distortion. According to Azam (2008, p246), economic reforms and structural adjustments should be designed so as to select that the most efficient ways of redistributing income between groups, while avoiding the most distort ones. Our concern is akin to that of Azam (2008).

Considering these historical facts about some developing countries, we insist that the political backing of the government requires to be modeled in order to analyze the effects of the adjustment policies in these countries. The effects of government spending cuts differ according to the types and historical backgrounds of the government because macroeconomic policies give rise to many kinds of influences on the social status and power structure of the government.

With respect to the macroeconomic models of developing countries, in many of them, Agénor provides an interesting framework that captures some of the salient features of developing countries.

Agénor and Montiel (1999, Chapter 9, p345) shows that a reduction in the government spending on imports leads to an increase in the financial assets held by the private sector, lower-skilled unemployment, and a higher output in both the formal and informal sectors; however, it also lowers unskilled employment in the formal economy. Agénor (2005) shows that if the labor unions care sufficiently about employment, and if the degree of openness is high, then in the steady state the increase in the price of government services can lead to a reduction in unemployment.

One of theoretical problems related to Agénor's papers is that in most of his papers, he assumes the absence of an import-competing sector in the formal economy. For instance, he assumes that the products manufactured in a formal economy are only sold abroad. As far as we know, this assumption is unrealistic.

Buffie (1992) analyzes the impact of the public sector price increases combined with employment cuts in a dynamic optimizing model. He concludes that problems could

arise when either the reforms are not credible or the real wage adjusts slowly to clear the labor market. Arida (1986, p189) points out that a government could be backed by and responds to specific interest groups. An interest group endowed with political leverage acts toward increasing their own share in income. Arida (1986) notes that the unsustainable attempts at exchange rate appreciation is a phenomenon referred to the political economy of government behavior.

As for an economic model of the interest groups, the right-to-manage model of the trade union is worth paying attention to because it assumes that the members of the trade union have a right to negotiate their wage levels with the firm. In many developing countries, the interest group has an access to the state power and acquires income in a number of ways. This phenomenon can be interpreted as a kind of negotiation. Booth (1995, 5.3) clearly explained the essence of the right-to-manage model. We combine Arida's concept of the interest group with the theory of the trade union, the right-to-manage model.

The reminder of the paper proceeds as follows. Section 2 discusses the model. Section 3 summarizes the main results and provides concluding remarks.

2. The Model

Consider a small open economy in which there are seven types of agents: producers in the urban and rural sectors; representative households in the urban and rural sectors; the interest group; and the government, skilled (the interest group) and unskilled workers. We assume that there are two categories of workers in the economy, skilled L_s and unskilled L_u . Production requires both skilled and unskilled labor in the urban sector. We assume the trade union of skilled workers to be the interest group because they are given the right to negotiate their real wage with the firm.

In the rural sector, production requires only unskilled labor. Production in the urban sector comprises industrial products, whereas that in the rural sector comprises agricultural products. The following sections explain both these sectors in turn; they are followed by the discussions on the behavior of the household, and of the government.

2.1 The Urban Sector

The production technology of the urban sector is given as follows. Y_u denotes the output of the urban sector.

$$Y_u = F(L_s, L_u) \quad (1)$$

We assume that the production function in the urban sector has the following characteristics, which implies a decreasing returns to scale.

$$\begin{aligned} F_{L_s} &= \frac{\partial F}{\partial L_s} \quad F_{L_u} = \frac{\partial F}{\partial L_u} \quad F_{L_s L_u} = \frac{\partial^2 F}{\partial L_s \partial L_u} \quad F_{L_s L_s} = \frac{\partial^2 F}{\partial L_s^2} \quad F_{L_u L_u} = \frac{\partial^2 F}{\partial L_u^2} \\ F_{L_s} &> 0 \quad F_{L_u} > 0 \quad F_{L_s L_s} < 0 \quad F_{L_s L_u} > 0 \quad F_{L_u L_u} < 0 \quad F_{L_s L_s} F_{L_u L_u} - (F_{L_s L_u})^2 > 0 \end{aligned} \quad (2)$$

We assume that the production function in the urban sector is a strictly concave function of both skilled and unskilled labor. The real wage of skilled workers, w_s , measured in terms of agricultural products, is determined by the negotiation between the firm and the interest group. The real wage of unskilled workers, w_u , also measured in terms of agricultural products, is determined to equilibrate the supply and demand for agricultural products. For simplicity, suppose that there is only one firm manufacturing industrial products. The relative price of industrial products with respect to agricultural products is denoted by p . The real profit of the firm in the urban sector is given as follows.

$$\pi = pF(L_s, L_u) - w_s L_s - w_u L_u \quad (3)$$

Suppose that the union of skilled workers, namely the interest group, and the firm bargain over real wage of skilled labor, w_s . The firm in the urban sector chooses the number of workers once the real wage has been determined through the bargaining

process. The outcome of the bargaining process is modeled as a generalized Nash bargaining solution.² We define the fall-back position for each party as its position if no bargain is made. For the firm, the fall-back position is zero. Because, all the skilled workers belong to the union, the firm cannot obtain any other skilled workers if it does not reach a bargain with the interest group. The fall-back position of the interest group is given by \bar{V} . The net gain for the interest group is the utility obtained from the real wage, $u(w_s)$, minus their fall-back position, \bar{V} . We write the generalized Nash bargaining solution as follows:

$$\Omega = \{u(w_s) - \bar{V}\}^\beta \pi^{1-\beta} \quad u'(w_s) > 0 \quad u''(w_s) < 0 \quad (4)$$

subject to

$$pF_{Lu}(L_s, L_u) = w_u \quad (5)$$

$$pF_{Ls}(L_s, L_u) = w_s \quad (6)$$

Here β represents the relative bargaining strength of the interest group ($0 \leq \beta \leq 1$).

From Equation (5) and (6), we obtain the following labor demand functions of the firm.³

$$L_s = L_s^D(p, w_s, w_u) \quad (7)$$

$$L_u = L_u^D(p, w_s, w_u) \quad (8)$$

The first condition for optimality is obtained as follows.

$$\begin{aligned} & \beta u'(w_s)[pF\{L_s(p, w_s, w_u), L_u(p, w_s, w_u)\} - w_u L_u(p, w_s, w_u) - w_s L_s(p, w_s, w_u)] \\ & - (1 - \beta)L_s(p, w_s, w_u)\{u(w_s) - \bar{V}\} = 0 \end{aligned} \quad (9)$$

² As for Nash bargaining, see Booth (1995, Chapter 5).

³ See Mathematical Appendix 1.

Equation (9) can be transformed into as follows.

$$\frac{\beta u'(w_s)}{u(w_s) - \bar{V}} = \frac{(1 - \beta)L_s(p, w_s, w_u)}{pF\{L_s(p, w_s, w_u), L_u(p, w_s, w_u)\} - w_u L_u(p, w_s, w_u) - w_s L_s(p, w_s, w_u)} \quad (10)$$

Equation (10) states that the percentage marginal benefit to the interest group from an increase in the wage rate of skilled labor is equal to the percentage marginal cost to the firm. For the equilibrium condition to be satisfied, both sides of Equation (10) needs to be balanced. Using Equation (9), the relation between the real wage for skilled workers and the other main variables is listed in Table 1.⁴

Table 1

	β	\bar{V}	w_u	p
w_s	+	+	−	±

Consider the case of an increase in the relative price. Both the numerator and the denominator of the right side of Equation (10) increase. Thus the result of the increase in the relative price is ambiguous. The firm in the urban sector chooses the level of employment in order to maximize its profit. Using these results, the labor demand functions for both skilled labor and unskilled labor with some plausible assumptions are obtained as shown in the following Table 2.

⁴ See Mathematical Appendix 2.

Table 2

	β	\bar{V}	w_u	p
L_s	—	—	—	\pm
L_u	—	—	—	\pm

Using these results and Equation (1), we obtain the supply function of industrial products with some of the following plausible assumptions.⁵

Table 3

	β	\bar{V}	w_u	p
Y_u	—	—	—	+

An increase in the relative price of industrial products with respect to agricultural products has dual effects on the production in the urban sector. The first one is an increase in the proceeds. The second one could be the increase in the real wage of the skilled labor. Here, we assume that the first effect is larger than the second one. The production in the urban sector decreases with the real wage of unskilled labor, the relative bargaining strength of the interest group, and the fall-back position of the interest group, increases with the relative price of industrial products with respect to agricultural products.

Table 3 is the result of a partial equilibrium analysis of the firm in the urban sector. In order to analyze the impacts of the adjustment policies for the economy, we need to

⁵ See Mathematical Appendix (3).

include the optimizing behaviors of the rural sector firm and households, and the market equilibrium conditions. A general equilibrium analysis is necessary to analyze the impacts of the adjustment policies.

2.2 The Rural Sector

The firm in the rural sector manufactures agricultural products. The production requires only unskilled labor. We also assume decreasing returns to labor in the rural sector. The production technology in the rural sector is given by the following equation.

$$Y_R = f(L_R) \quad f' > 0 \quad f'' < 0 \quad (11)$$

where Y_R denotes the output of the agricultural products, and L_R denotes the level of employment in the rural sector. For simplicity, suppose that there is only one firm in the rural sector. The real wage of unskilled labor is the same as that of unskilled labor in the urban sector. The firm's profit is given as follows.

$$\pi_R = f(L_R) - w_u L_R \quad (12)$$

The real wage is measured in terms of the agricultural products. The profit maximization yields equality between the marginal product and the real wage of unskilled labor.

$$f'(L_R) = w_u \quad (13)$$

Substituting Equation (13) into the production function, we obtain the following supply function of the firm in the rural sector.

$$Y_R = Y_R(w_u) \quad Y'_R < 0$$

(14)

2.3 The Behaviors of Households and Government

The income of the urban households is given by the output in the urban sector, Y_u . Both the urban and rural households consume industrial and agricultural products. The lump-sum tax allocated to the urban households is denoted by T_u , which is measured in terms of industrial products. The budget constraint of the urban households is given as follows.

$$pY_u = pC_u^u + C_u^R + pT_u \quad (15)$$

where C_u^u denotes the urban household's consumption of urban products and C_u^R denotes that of agricultural products, respectively. We assume that the utility function of the urban households takes the following Cobb-Douglas form.

$$U_u = (C_u^u)^\varepsilon (C_u^R)^{1-\varepsilon} \quad 0 < \varepsilon < 1 \quad (16)$$

From the first-order condition for optimality, we obtain the following.

$$C_u^u = \varepsilon Y_u - \varepsilon T_u \quad C_u^R = (1 - \varepsilon)pY_u - (1 - \varepsilon)pT_u \quad (17)$$

The lump-sum tax allocated to the rural households is denoted by T_R , which is measured using the industrial products. The disposable income of the rural households is given by $Y_R - pT_R$. The budget constraint of the rural households is given as follows

$$Y_R - pT_R = pC_R^u + C_R^R \quad (18)$$

where C_R^u denotes the rural household's consumption of the urban products and C_R^R that of agricultural products, respectively. We assume that utility function of rural

households takes the following Cobb- Douglas form.

$$U_R = (C_R^u)^\alpha (C_R^R)^{1-\alpha} \quad 0 < \alpha < 1 \quad (19)$$

From the first-order condition for optimality, we obtain the following.

$$pC_R^u = \alpha Y_R - \alpha pT_R \quad C_R^R = (1 - \alpha)Y_R - (1 - \alpha)pT_R \quad (20)$$

We assume a balanced budget and that government spending is only allocated to the industrial products. What we need to do is to reflect upon the historical facts of many developing countries, where government spending has been allocated mainly to the urban sector.

$$G = T_R + T_u \quad (21)$$

We assume that the lump-sum tax for urban households decreases with the relative bargaining strength of the interest group, β . For simplicity, we assume the following function.

$$T_u = a - b\beta^\mu \quad a > 0 \quad b > 0 \quad \mu > 0 \quad (22)$$

2.4 The Market for Industrial Products and for Agricultural Products

We assume that the net export of the industrial products, E^u , decreases with the disposable income of households in both the sectors, increases with the nominal exchange rate in terms of the home currency, e .

$$E^u = E^u(Y_u - T_u, Y_R - pT_R, e)$$

$$E_{Y_u}^u = \frac{\partial E^u}{\partial (Y_u - T_u)} < 0 \quad E_{Y_R}^u = \frac{\partial E^u}{\partial (Y_R - pT_R)} < 0 \quad E_e^u = \frac{\partial E^u}{\partial e} > 0 \quad (23)$$

The equilibrium condition of the market for the urban sector is given as follows.

$$Y_u = C_u^u + C_R^u + G + eE^u \quad (24)$$

By substituting (17), (20), (21), into (24), we obtain the following.

$$(1 - \varepsilon)pY_u = \alpha Y_R + (1 - \varepsilon)pT_u + (1 - \alpha)pT_R + eE^u \quad (25)$$

We assume that the net export of agricultural products, E^R , also decreases with the disposable income of households in both the sectors, and increases with the nominal exchange rate in terms of the home currency e .

$$E^R = E^R(Y_u - T_u, Y_R - pT_R, e) \\ E_{Y_u}^R = \frac{\partial E^R}{\partial (Y_u - T_u)} < 0 \quad E_{Y_R}^R = \frac{\partial E^R}{\partial (Y_R - pT_R)} < 0 \quad E_e^R = \frac{\partial E^R}{\partial e} > 0 \quad (26)$$

The equilibrium condition of the rural sector market is given as follows.

$$Y_R = C_u^R + C_R^R + eE^R \quad (27)$$

By substituting (17) and (20) into (27), we obtain the following equation.

$$Y_R = \frac{1}{\alpha} \{ (1 - \varepsilon)pY_u - (1 - \varepsilon)pT_u - (1 - \alpha)pT_R + eE^R \} \quad (28)$$

By substituting the supply functions of two sectors, (Equations (14), (22)), and the

results shown in Table 3 into Equations (25) and (28), we obtain the following.

$$\begin{aligned}
(1 - \varepsilon)pY_u(p, w_u, \beta, \bar{V}) \\
= \alpha Y_R(w_u) + (1 - \varepsilon)pa - (1 - \varepsilon)pb\beta^\mu + (1 - \alpha)pT_R + epE^u\{Y_u(p, w_u, \beta, \bar{V}) - a \\
+ b\beta^\mu, Y_R(w_u) - pT_R, e\}
\end{aligned} \tag{29}$$

$$\begin{aligned}
Y_R(w_u) = \frac{1}{\alpha} [(1 - \varepsilon)pY_u(p, w_u, \beta, \bar{V}) - (1 - \varepsilon)pa - (1 - \varepsilon)pb\beta^\mu - (1 - \alpha)pT_R \\
+ eE^R\{Y_u(p, w_u, \beta, \bar{V}) - a + b\beta^\mu, Y_R(w_u) - pT_R, e\}]
\end{aligned} \tag{30}$$

Using Equation (29) and (30), we obtain the equilibrium values of the relative price p and the real wage of unskilled labor, w_u . We assume the following adjustment process. The relative price of industrial products with respect to agricultural products increases when there is excess demand in the urban sector market. The real wage of unskilled labor increases when there is excess supply in the rural sector market. If we assume that the coefficients of adjustment equal 1, these adjustment processes are given by the following equations.

$$\begin{aligned}
\dot{p} = \alpha Y_R(w_u) + (1 - \varepsilon)pa - (1 - \varepsilon)b\beta^\mu + (1 - \alpha)pT_R \\
+ epE^u\{Y_u(p, w_u, \beta, \bar{V}) - a + b\beta^\mu, Y_R(w_u) - pT_R, e\} - (1 - \varepsilon)pY_u(p, w_u, \beta, \bar{V})
\end{aligned} \tag{31}$$

$$\begin{aligned}
\dot{w}_u = Y_R(w_u) - \frac{1}{\alpha} [(1 - \varepsilon)pY_u(p, w_u, \beta, \bar{V}) - (1 - \varepsilon)pa + (1 - \varepsilon)b\beta^\mu - (1 - \alpha)pT_R \\
+ eE^R\{Y_u(p, w_u, \beta, \bar{V}) - pa + pb\beta^\mu, Y_R(w_u) - pT_R, e\}]
\end{aligned} \tag{32}$$

Linearlizing Equations (31) and (32) around the steady state equilibrium ($\dot{p} = 0$ and $\dot{w}_u = 0$), we obtain the following.

$$\begin{pmatrix} \dot{p} \\ \dot{w}_u \end{pmatrix} = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix} \begin{pmatrix} p - p^* \\ w_u - w_u^* \end{pmatrix} \quad (33)$$

$$\begin{aligned} a_{11} = (1 - \varepsilon)\{-Y_u(p, w_u, \beta, \bar{v}) + a - b\beta^\mu\} + (1 - \alpha - epE_{YR}^u)T_R + eE^u\{Y_u(p, w_u, \beta, \bar{v}) - a \\ + b\beta^\mu, Y_R(w_u) - pT_R, e\} + \{-(1 - \varepsilon) + e\} \frac{\partial Y_u}{\partial p} \end{aligned} \quad (34)$$

$$a_{12} = (\alpha + epE_{YR}^u) \frac{\partial Y_R}{\partial w_u} + \{epE_{Y_u}^u - (1 - \varepsilon)p\} \frac{\partial Y_u}{\partial w_u} \quad (35)$$

$$a_{21} = -\frac{1}{\alpha} \{(1 - \varepsilon)Y_u(w_u, p, \beta, \bar{v}) - (1 - \varepsilon + eE_{YR}^R)a - (1 - \alpha + eE_{YR}^R)T_R - eE_{Y_u}^R \left(\frac{\partial Y_u}{\partial p} \right)\} \quad (36)$$

$$a_{22} = \left(\frac{\alpha - eE_{YR}^R}{\alpha} \right) \left(\frac{\partial Y_R}{\partial w_u} \right) - \frac{1}{\alpha} \{(1 - \varepsilon)p + eE_{Y_u}^R\} \left(\frac{\partial Y_u}{\partial w_u} \right) \quad (37)$$

The signs of the Equations (33), (34), (35), and (36) are ambiguous. The necessary and sufficient conditions for this system to be stable are as follows.

$$a_{11} + a_{22} < 0 \quad (37)$$

$$\Delta_2 = a_{11}a_{22} - a_{12}a_{21} > 0 \quad (38)$$

We assume that these stability conditions are satisfied. In order to illustrate the possible cases that satisfy these conditions, we exemplify one of the possible cases as follows.

$$a_{11} < 0 \quad (39)$$

$$a_{22} < 0$$

(40)

$$a_{12} \geq 0$$

(41)

$$a_{21} \geq 0$$

(42)

Inequality (39) implies that an increase in the relative price of the industrial products with respect to the agricultural products lowers the excess demand for the industrial products. We assume that in this case, the increase in the supply of industrial products is larger than the increase in the demand for the industrial products. Inequality (40) implies that an increase in the real wage of unskilled labor causes a decrease in the excess supply of the agricultural products. We assume that a decrease in the supply of agricultural products is larger than a decrease in the demand for the consumption of the agricultural products.

Inequality (41) implies that an increase in the real wage of unskilled labor causes an increase in the excess demand for the industrial products. Further, inequality (42) implies that an increase in the relative price causes an increase in the excess supply of the agricultural products. In order to satisfy the stability conditions, we assume that the absolute value of both a_{12} and a_{21} needs to be sufficiently small as compared with that of both a_{11} and a_{22} .

Noting these, we perform a comparative statics analysis in Equations (29) and (30) by using the main exogenous variables. First, consider the case of an increase in the lump-sum tax for the rural households. The results are as follows.

$$\frac{\partial p}{\partial T_R} = \frac{p}{\Delta_2} \left\{ -(1 - \alpha + epE_{YR}^u)a_{22} + \frac{a_{12}(1 - \alpha - eE_{YR}^R)}{\alpha} \right\} \quad (43)$$

$$\frac{\partial w_u}{\partial T_R} = \frac{p}{\Delta_2} \left\{ \frac{-a_{11}(1 - \alpha - eE_{YR}^R)}{\alpha} + a_{21}(1 - \alpha + epE_{YR}^u) \right\} \quad (44)$$

These results can be interpreted as follows. An increase in the lump-sum tax

for the rural households leads to a decrease in the disposable income of the rural household. Thus, there is a decrease in both the consumption and import of the industrial products in the rural households. Further, both the demand and supply of industrial products decrease. We assume that the decrease in the demand is slightly larger than that in the supply. Assuming this, we derive the following.

$$1 - \alpha + eE_{YR}^R \geq 0 \quad (45)$$

$$1 - \alpha - epE_{YR}^u \geq 0 \quad (46)$$

We have already assumed that inequalities (39), (40), (41), and (42) satisfy the stability conditions of the system. Moreover, if inequalities (45), and (46) are satisfied, we obtain the following.

$$\frac{\partial p}{\partial T_R} > 0 \quad (47)$$

Under plausible assumptions, the relative price of industrial products with respect to the agricultural products increases because of an increase in the lump-sum tax in the rural sector. Almost the same is true in the case of the real wage of unskilled workers. Assuming that $a_{11} < 0$, $a_{22} < 0$, $a_{21} \geq 0$, and inequalities (45), and (46), we obtain the following.

$$\frac{\partial w_u}{\partial T_R} > 0 \quad (48)$$

Under plausible assumptions, the real wage of unskilled labor increases owing to an increase in the lump-sum tax in the rural sector. We derive Propositions 1 and 2.

Proposition 1

If inequalities (45) and (46) are satisfied, an economy under a government that is backed by an interest group will experience an increase in the relative price of the industrial products with respect to agricultural products with an increase in the lump-sum tax in the rural sector.

Proposition 2

If inequalities (45) and (46) are satisfied, an economy under a government that is backed by an interest group will experience an increase in the real wage of unskilled labor with an increase in the lump-sum tax in the rural sector.

Keeping these results in mind, consider the effects of the adjustment policies such as government spending cuts. In our model, one of methods of the government spending cut is the reduction in the lump-sum tax for the rural households. Owing to the lump-sum tax cut, the consumption in the rural households increases. If the above-mentioned assumptions are satisfied, the real wage of unskilled labor would decrease owing to the lump-sum tax cut. The income of the rural households would increase. We thus derive Proposition 3.

Proposition 3

If the stability condition of the system and inequalities (45) and (46) are satisfied, an economy under a government that is backed by an interest group experiences an increase in the rural income owing to the adjustment policies such as lump-sum tax cut in the rural sector.

Next, we consider the effects of a lump-sum tax increase in the urban sector with the bargaining power of the interest group remaining constant. This is shown by an increase in the parameter a . Similarly, the lump-sum tax cut for the urban households is shown by a decrease in the parameter a . The results of the comparative

statics analysis are given as follows.

$$\frac{\partial p}{\partial a} = \frac{1}{\Delta_2} [-a_{22}p(1 - \varepsilon - eE_{Y_u}^u) + a_{12}\frac{p}{\alpha}(1 - \varepsilon + eE_{Y_u}^R)] \quad (49)$$

$$\frac{\partial w_u}{\partial a} = \frac{1}{\Delta_2} \left\{ -\frac{a_{11}p}{\alpha}(1 - \varepsilon + eE_{Y_u}^R) + a_{21}p(1 - \varepsilon - eE_{Y_u}^u) \right\} \quad (50)$$

Equations (49) and (50) take a positive sign if the following inequality is satisfied.

$$1 - \varepsilon + eE_{Y_u}^R \geq 0 \quad (51)$$

The parameter ε implies that the marginal propensity to consume industrial products of urban households ($0 < \varepsilon < 1$). The net export of agricultural products decreases because of an increase in the urban disposable income. Thus, inequality (51) implies that a unit increase in the disposable income of the urban households results in a less than unity increase in demand. This is also a plausible assumption. Assuming that inequality (51) holds, we can say that the lump-sum tax increase in the urban sector with a constant bargaining power results in an increase in both the relative price and the real wage of unskilled labor. Conversely, the lump-sum tax cut in the urban sector with a constant bargaining power of the interest group results in a decrease in the real wage of unskilled labor, causing an increase in the rural income. We derive Proposition 4.

Proposition 4

If the inequality (51) is satisfied, an economy under a government that is backed by an interest group experiences an increase in the rural income owing to adjustment policies such as the lump-sum tax cut in the urban sector with the bargaining power of the interest group remaining constant.

The effects of strengthening the fall-back position of the interest group are obtained as follows.

$$\frac{\partial p}{\partial \bar{V}} = \frac{\frac{\partial Y_u}{\partial \bar{V}}}{\Delta_2} [a_{22}\{(1 - \varepsilon)p - eE_{Yu}^u\} - a_{12}\{(1 - \varepsilon)p + eE_{Yu}^R\}] \quad (52)$$

$$\frac{\partial w_u}{\partial \bar{V}} = \frac{\frac{\partial Y_u}{\partial \bar{V}}}{\Delta_2} [a_{11}\{(1 - \varepsilon)p - eE_{Yu}^R\} - a_{21}\{(1 - \varepsilon)p + eE_{Yu}^R\}] \quad (53)$$

Assuming that inequality (51) holds, we can say that these equations take a positive value. An increase in the fall-back position of the interest group results in the increase in the relative price of industrial products with respect to the agricultural products under plausible assumptions. An increase in the fall-back position of the interest group results in the increase in the real wage of unskilled labor under plausible assumptions. These results can be interpreted as follows. The supply function of the urban sector moves downward owing to an increase in the fall-back position of the interest group. This results in a decrease in the aggregate supply of industrial products, leading to an increase in the relative price of the industrial products. In the rural sector, the consumption of the urban households decreases owing to the supply shock in the urban sector, leading to an excess supply of agricultural products. This results in an increase in the real wage of unskilled labor increase. We derive Propositions 5 and 6.

Proposition 5

If inequality (51) is satisfied, an economy under a government that is backed by an interest group experiences an increase in the relative price of the industrial products with respect to the agricultural products with the strengthening of the fall-back position of the interest group.

Proposition 6

If inequality (51) is satisfied, an economy under a government that is backed by an interest group will experience an increase in the real wage of unskilled labor with the strengthening of the fall-back position of the interest group.

Next, consider the case of an increase in the bargaining power of the interest group. The results of a comparative statics analysis are obtained as follows.

$$\frac{\partial p}{\partial \beta} = \frac{\left(\frac{\partial Y_u}{\partial \beta} + b\mu\beta^{\mu-1}\right)\{(1 - \varepsilon - pE_{Y_u}^u)pa_{22} - a_{12}\}}{\Delta_2} \quad (54)$$

$$\frac{\partial w_u}{\partial \beta} = \frac{\left(\frac{\partial Y_u}{\partial \beta} + b\mu\beta^{\mu-1}\right)\{a_{11} - a_{21}(1 - \varepsilon - eE_{Y_u}^u)p\}}{\Delta_2} \quad (55)$$

The second parentheses in the numerator of both (54) and (55) takes a negative sign each. We need to find out whether the following term takes a positive or negative sign.

$$\frac{\partial Y_u}{\partial \beta} + b\mu\beta^{\mu-1} = \frac{\partial Y_u}{\partial w_s} \left(\frac{\partial w_s}{\partial \beta} \right) + b\mu\beta^{\mu-1} \quad (56)$$

It is evident that $\frac{\partial Y_u}{\partial w_s}$ takes a negative sign under the ordinary type of production function. The term $\frac{\partial w_s}{\partial \beta}$ implies the effect of an increase in the bargaining power for the real wage of skilled labor. This takes a positive sign. The second term on the right side of Equation (56), $b\mu\beta^{\mu-1}$, takes a positive sign. Thus, the overall sign of Equation (56) is ambiguous. The signs of both (54) and (55) are also ambiguous. We cannot infer with certainty the signs of both (54) and (55) if we pose the plausible assumptions mentioned above.

We need to consider what Equation (56) implies. An increase in the bargaining

power of the interest group results in the increase in the real wage of skilled labor, causing a decrease in the urban income. Simultaneously, it results in a decrease in the lump-sum tax for the urban household. If the latter (decrease in the lump-sum tax for the urban households) outweighs the former (increase in the real wage of skilled labor), the disposable income of the urban households increases. This makes Equation (56) positive. The opposite holds if the former one outweighs the latter one.

If the disposable income of the urban households increases owing to an increase in the bargaining power, it creates an excess supply in the urban sector market, causing the relative price of industrial products to decrease. In addition, an increase in the disposable income of the urban households creates an excess demand in the rural sector market, causing a decrease in the real wage of unskilled labor. In this case, rural income increases with the decrease in the real wage of unskilled labor. We derive Propositions 7 and 8.

Proposition 7

In an economy under a government that is backed by an interest group, the relative price of industrial products with respect to the agricultural products decreases with an increase in the fall-back position of the interest group, if the stability condition of the system is satisfied and $\frac{\partial Y_u}{\partial \beta} + b\mu\beta^{\mu-1} > 0$.

Proposition 8

In an economy under a government that is backed by an interest group, the real wage of unskilled labor decreases with an increase in the fall-back position of the interest group, if the stability condition of the system is satisfied and $\frac{\partial Y_u}{\partial \beta} + b\mu\beta^{\mu-1} > 0$.

Next, we consider the case of depreciation in the nominal exchange rate in terms of the home currency. In this case, we obtain the followings.

$$\frac{\partial p}{\partial e} = \frac{-a_{22}p(E^u + eE_e^u) - \frac{a_{12}}{\alpha}(E^R + eE_e^R)}{\Delta_2} \quad (57)$$

$$\frac{\partial w_u}{\partial e} = \frac{a_{21}p(E^u + eE_e^u) + \frac{a_{11}}{\alpha}(E^R + eE_e^R)}{\Delta_2} \quad (58)$$

Equations (57) and (58) can both take either a positive or negative sign. Consider the effect of an increase in the nominal exchange rate to the relative price, as shown in equation (57). If the absolute value of a_{12} is sufficiently small, the sign of the numerator in (57) is positive, causing $\frac{\partial p}{\partial e}$ to take a positive sign. An increase in the nominal exchange rate causes an increase in the net export of the urban and rural sector, creating an excess demand in both sectors. This results in an upward pressure in both the industrial and the agricultural prices. If the absolute value of a_{12} is sufficiently small, this implies that the upward pressure from the market for the agricultural products is smaller than that from the market for the industrial products. Thus, the relative price of the industrial products increases. Next, consider the effect of an increase in the nominal exchange rate to the real wage of unskilled labor, as shown in equation (58). If the absolute value of a_{21} is sufficiently small, the sign of the numerator in (58) is negative, causing the real wage of unskilled labor to decrease. If the absolute value of a_{21} is sufficiently small, this implies that the pressure from the market for the industrial products is smaller than that from the market for the agricultural products. An excess demand in the market for agricultural products results in a decrease in the real wage of unskilled labor.

The depreciation in the nominal exchange rate is often included in the package of structural adjustment policies. Our results show that the depreciation in the nominal exchange rate results in the increase in the outputs in the rural and urban sectors by resulting in a respective increase and decrease in the relative price of industrial products and the real wage of unskilled labor. We derive Proposition 9.

Proposition 9

In an economy under a government that is backed by an interest group, the relative price of the industrial products with respect to the agricultural products increases because of a depreciation in the nominal exchange rate if the absolute value of a_{12} is sufficiently small. The real wage of unskilled labor decreases due to a depreciation in the nominal exchange rate if the absolute value of a_{21} is sufficiently small.

The results of comparative statics analysis with the above assumptions are summarized in Tables 4 and 5.

Table 4

	T_R	a	\bar{V}	B	e
p	+	+	+	\pm	\pm
w_u	+	+	+	\pm	\pm

Table 5

	T_R	a	\bar{V}	β	e
Y_u	\pm	\pm	\pm	\pm	\pm
Y_R	—	—	—	\pm	\pm

As noted above, if we pose some plausible assumptions, the lump-sum tax cut for the rural households results in the decrease in the relative price and the real wage of

unskilled labor. In this case, we obtain $\frac{\partial Y_R}{\partial T_R} < 0$.

We need to note that there is a difference in the effect between the two types of lump-sum tax cuts. Under plausible assumptions, the lump-sum tax cut for the rural households results in the increase in the rural income, causing the income gap between the sectors to decrease. The effect of the lump-sum tax cut because of an increase in the bargaining power of the interest group is ambiguous.

3. Concluding Remarks

We have analyzed the effects of the adjustment policies in governments that are backed by the interest groups. The skilled workers in our model, form the interest group; they have the rights to negotiate their real wage with the firm; and have some influence in determining the amount of the lump-sum tax in the urban sector. This behavior is akin to the interest groups in many developing countries because they can negotiate their income levels with the government in a number of ways. The governments in many developing countries are formed with the support of the interest groups, and thus, backed by them. The effects of the adjustment policies in the developing countries need to be analyzed by considering the power base of the government. The governments in the developing countries are inclined to heavily tax the people who do not support the high-ranked bureaucrats or politicians.

Our results suggest that adjustment policies such as the lump-sum tax cut can assist in developing the rural sector. However, if the lump-sum tax cut is because of an increase in the bargaining power of the interest group, the results of the policy effects are ambiguous.

The adjustment policy such as the government spending cut may help relieving the conflict between the urban and the rural sectors, thus assisting in avoiding the eruption of a civil war. In other words, a significant income gap between the urban and the rural sectors might be due to the increase in government expenditure for the industrial products that are financed by the rural households.

It should be noted that our results depend on the assumption that a government is backed by the interest group in the urban sector and have heavily taxed the rural sector. We need to create the micro-foundation that explains the behavior of the interest group.

Mathematical Appendix

(1)

Assume that the production function in the urban sector takes the following CES type.

$$Y_u = (aL_s^\theta + bL_u^\theta)^\gamma$$

$$0 < a < 1 \quad 0 < b < 1 \quad 0 < \theta < 1 \quad 0 < \gamma < 1$$

By performing exhaustive algebraic calculations, we obtain the following labor demand functions.

$$L_s^D = a^{\frac{1}{1-\theta}} (\gamma \theta p)^{\frac{1}{1-\gamma\theta}} (a^{\frac{1}{1-\theta}} w_u^{\frac{\theta}{1-\theta}} + b^{\frac{1}{1-\theta}} w_s^{\frac{\theta}{1-\theta}})^{\frac{\gamma-1}{1-\gamma\theta}} w_u^{\frac{\theta(1-\gamma)}{(1-\theta)(1-\gamma\theta)}} w_s^{\frac{-1}{1-\gamma\theta}}$$

$$L_u^D = b^{\frac{1}{1-\theta}} (\theta \gamma p)^{\frac{1}{1-\gamma\theta}} (a^{\frac{1}{1-\theta}} w_u^{\frac{\theta}{1-\theta}} + b^{\frac{1}{1-\theta}} w_s^{\frac{\theta}{1-\theta}})^{\frac{\gamma-1}{1-\gamma\theta}} w_u^{\frac{-1}{1-\gamma\theta}} w_s^{\frac{\theta(1-\gamma)}{(1-\gamma\theta)(1-\theta)}}$$

By substituting the above labor demand function into the original production function, we obtain the following equation.

$$Y_u = [(\gamma \theta p)^{\frac{\theta}{1-\gamma\theta}} \{a^{\frac{2-\theta}{1-\theta}} (a^{\frac{1}{1-\theta}} w_u^{\frac{\theta}{1-\theta}} + b^{\frac{1}{1-\theta}} w_s^{\frac{\theta}{1-\theta}})^{\frac{\theta\gamma-\theta}{1-\gamma\theta}} w_u^{\frac{\theta \times \theta(1-\gamma)}{(1-\theta)(1-\gamma\theta)}} w_s^{\frac{-\theta}{1-\gamma\theta}} + b^{\frac{2-\theta}{1-\theta}} (a^{\frac{1}{1-\theta}} w_u^{\frac{\theta}{1-\theta}} + b^{\frac{1}{1-\theta}} w_s^{\frac{\theta}{1-\theta}})^{\frac{\theta\gamma-\theta}{1-\gamma\theta}} w_u^{\frac{-\theta}{1-\gamma\theta}} w_s^{\frac{\theta \times \theta(1-\gamma)}{(1-\gamma\theta)(1-\theta)}}\}]^{\frac{1}{\gamma}}$$

By performing exhaustive algebraic calculations again, we obtain the following.

$$\frac{\partial L_s^D}{\partial w_u} = L_{swu} > 0$$

$$\frac{\partial L_u^D}{\partial w_s} = L_{uws} > 0$$

$$\frac{\partial Y_u}{\partial w_s} = Y_{uws} < 0$$

(2)

Using Equation (9), we define the following function ψ .

$$\begin{aligned} \psi(w_s, \beta, \bar{V}, \epsilon, p, w_u) \\ = \beta u'(w_s)[pF\{L_s(p, w_s, w_u), L_u(p, w_s, w_u)\} - w_u L_u(p, w_s, w_u) \\ - w_s L_s(p, w_s, w_u)] - (1 - \beta)L_s(p, w_s, w_u)\{u(w_s) - \bar{V}\} = 0 \end{aligned}$$

$$\frac{\partial \psi}{\partial w_s} = \beta u''(w_s)\pi + \beta u'(w_s)(-L_s) + (1 - \beta)L_{sws}\bar{V} - (1 - \beta)\{L_{sws}u(w_s) - L_s u'(w_s)\}$$

From the second-order condition for optimality, the above equation needs to take a negative value.

Performing further algebraic calculation, we obtain the followings.

$$\frac{\partial \psi}{\partial w_u} = \psi_{wu} = \beta u'(w_s)(-L_u) - (1 - \beta)L_{swu}\{u(w_s) - \bar{V}\} < 0$$

$$\frac{\partial \psi}{\partial \beta} = \psi_{\beta} = u'(w_s)\pi + L_s\{u(w_s) - \bar{V}\} > 0$$

$$\frac{\partial \psi}{\partial \bar{V}} = \psi_{\bar{V}} = (1 - \beta)L_s > 0$$

With respect to the change in the relative price, we obtain the following.

$$\frac{\partial \psi}{\partial p} = \beta u'(w_s) Y_u - (1 - \beta) L_{sp} \{u(w_s) - \bar{V}\}$$

$$L_{sp} = \frac{\partial L_s^D}{\partial p} > 0$$

The result is ambiguous. This takes a positive or a negative sign.

$$\frac{\partial w_s}{\partial \beta} = -\frac{\psi_\beta}{\psi_{ws}} > 0$$

$$\frac{\partial w_s}{\partial \bar{V}} = -\frac{\psi_{\bar{V}}}{\psi_{ws}} > 0$$

$$\frac{\partial w_s}{\partial w_u} = -\frac{\psi_{wu}}{\psi_{ws}} < 0$$

$$\frac{\partial w_s}{\partial p} = -\frac{\psi_p}{\psi_{ws}} \text{ ambiguos}$$

The supply function of the urban sector is obtained as follows.

$$Y_u = F[L_s\{p, w_s(\beta, \bar{V}, w_u, p), w_u\}, L_u\{p, w_s(\beta, \bar{V}, w_u, p), w_u\}]$$

$$\frac{\partial Y_u}{\partial w_u} = F_{Ls} \left\{ \frac{\partial L_s}{\partial w_s} \left(\frac{\partial w_s}{\partial w_u} \right) + \frac{\partial L_s}{\partial w_u} \right\} + F_{Lu} \left\{ \frac{\partial L_u}{\partial w_s} \left(\frac{\partial w_s}{\partial w_u} \right) + \frac{\partial L_u}{\partial w_u} \right\}$$

Note that $\frac{\partial L_u}{\partial w_s} \left(\frac{\partial w_s}{\partial w_u} \right)$ can take both a positive and a negative sign. The change in the demand for skilled labor induced by an increase in the real wage of unskilled labor, $\frac{\partial L_s}{\partial w_u}$, can take a positive sign as noted above. We assume the absolute value of these terms is sufficiently small so that the entire value of the change in the urban sector's income induced by an increase in the real wage of unskilled labor, $\frac{\partial Y_u}{\partial w_u}$, can take a negative sign. If we assume the Cobb-Douglas type of production function of decreasing returns, the sign of the above equation is negative.

$$Y_u = F[L_s\{p, w_s(\beta, \bar{V}, w_u, p), w_u\}, L_u\{p, w_s(\beta, \bar{V}, w_u, p), w_u\}]$$

$$\frac{\partial Y_u}{\partial p} = F_{L_s} \left\{ \frac{\partial L_s}{\partial w_s} \left(\frac{\partial w_s}{\partial p} \right) + \frac{\partial L_s}{\partial p} \right\} + F_{L_u} \left\{ \frac{\partial L_u}{\partial w_s} \left(\frac{\partial w_s}{\partial p} \right) + \frac{\partial L_u}{\partial p} \right\}$$

As noted above, $\frac{\partial w_s}{\partial p}$ can take a positive or negative sign. We assume that the absolute value of this term is sufficiently small so that the entire value of the change in the urban sector's income induced by an increase in the relative price, $\frac{\partial Y_u}{\partial p}$, can take a positive sign.

Assuming these, we obtain Table 3.

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