The Trade Balance-Oriented Trade Policy

Nobuyoshi TABEI

This paper explains about the trade policy that orients the trade balance. If the trade deficit deprives the employment of nation, we try the improvement of trade deficit without thinking the economic welfare of nation. We examine the right and wrong of trade balance-oriented trade policy by considering the relation of trade policy with the trade balance.

Introduction

The trade is carried out by the comparative advantage. As the comparative advantage is a difference of relative productivity in a country, an export goods necessarily exists. The country exports relatively high goods of productivity in domestic. Though this is a general explanation for the comparative advantage, we need a prior condition that the full employment is established.

As the real trade is carried out along a signal of price, it includes not only a productivity but also a monetary factor of wage and exchange rate. The productivity, price, wage and exchange rate are mutually related. If these factors do not adequately reflect the productivity, the export price of country may be not an adequate level. In extreme case there is a possibility that a country does not have an export goods. This is a problem of international competition.

In this way the comparative advantage is a problem of productivity. But if the monetary factor is added in the comparative advantage, this is a problem of international competition. Krugman (1995) says that the comparative advantage and international competition must be clearly distinguished. Though the trade is carried out by the comparative advantage, the trade balance is a matter of international competition because it contains the monetary factor. Richard (2002) explains about the trade and the balance of payment.

The trade balance does not always have to be in balance. But when the trade balance is an imbalance for long time, there is a possibility that it induces a problem. Without a relation with national economic profit in this case, an equilibrium of trade balance becomes a target of economic policy.

In this following we study the effect of a trade policy on trade balance and we think the meaning of trade balance-oriented trade policy.

1 The decision of trade balance by two country model

(1) The model

We think two country and two goods model that home country and foreign country produce goods 1 and goods 2. Home country exports goods 1 and imports goods 2. Expressed Y1 as the production of export goods in home country, L1 as the labor that engages in the production of goods 1 and a1 as the productivity of goods 1, the production Y1 of export goods is

$$Y1 = a1L1 \tag{1}$$

Expressed Y2 as the production of import goods in home country, L2 as the labor that engages in the production of goods 2 and a2 as the productivity of goods 2, the production Y2 of import goods is

$$Y2 = a2L2 \tag{2}$$

When L is the labor of nation, L is

$$L = L1 + L2$$

We suppose that the labor market is full employment. The productivity is a1>a2 and home country has a comparative advantage of goods 1. When the a1/a2 is bigger than 1 goods 1 is the comparative advantage in home country.

The export is a function of the exchange rate and the price level in foreign country. Though the price level in home country affects the import, it does not have an effect on the export. Expressed EX as the export, E as exchange rate and P^* as price level in foreign country, the export function is expressed by the next equation.

$$EX = F\ (\ E\ ,\ P^*\ ) \tag{3}$$

The export increases due to the depreciation of exchange rate and decreases due to the rise of price level in foreign country. That is why the rise of price level in foreign country induces a decrease of domestic demand and an increase of domestic supply in foreign country. As the export goods in home country is the goods 1, the export function in home country is

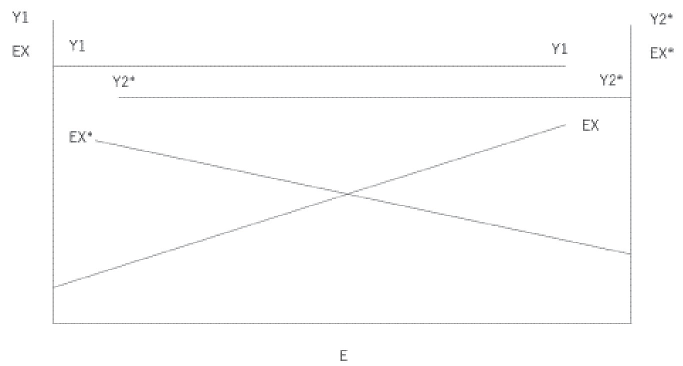
$$EX = F (E , P1^*) \qquad (4)$$

This means that the export in home country is a function of exchange rate and the price level of goods 1 in foreign country. The export in home country increases by the depreciation of exchange rate and decreases by the rise of price level of goods 1 in foreign country.

The figure 1 shows the production and export of goods 1 in home country (import goods in foreign country) by taking the production and export at the left-vertical, the exchange rate at the horizontal axis. From the equation (1) the production is a horizontality like the line Y1Y1. That is why the production only depends on the labor and it does not depend on the exchange rate. The production is decided if the labor is given under the productivity.

The line EX is right-up because the export increases due to the depreciation of exchange rate. In this model the depreciation of exchange rate only induces the increase of export, it does not affect the production. The depreciation of exchange rate only rises the ratio of export to the production. The slope of line EX shows the degree of export change to the change of exchange rate. The difference of production and export is the domestic demand. As showed on the figure 1, the export is decided if the level of exchange rate is given. When the price level in foreign country rises, the line EX shifts below and the export in home country decreases.

Figure 1



The production $Y2^*$ of export goods in foreign country is

$$Y2^* = a2^*L2^* \quad (5)$$

The production $Y1^*$ of import goods in foreign country is

$$Y1^* = a1^*L1^* \quad (6)$$

The productivity is $a1^*<a2^*$ and foreign country has a comparative advantage of goods 2. Expressed L^* as the labor in foreign country, $L1^*$ as the labor that engages in the production of goods 1 and $L2^*$ as the labor that engages in the production of goods 2,

$$L^* = L1^* + L2^*$$

We suppose that the labor market is full employment.

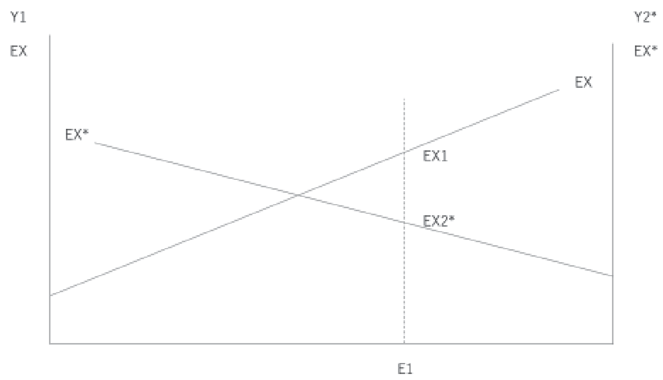
In the same as home country, the export is a function of the exchange rate and the price level in foreign country. The export increases due to the depreciation of exchange rate and decreases due to the rise of price level in foreign country. As the export goods in foreign country is the goods 2, the export function of foreign country is

$$EX^* = F\,(\,E\,,\,P2\,) \quad (7)$$

This means that the export in foreign country is a function of the exchange rate and the price level of goods 2 in home country. The export in foreign country increases due to the depreciation of exchange rate and decreases due to the rise of price level of goods 2 in home country.

When we add the production and export of foreign country at the right- vertical axis and the exchange rate at the horizontal axis, we can show the production and export of goods 2 in the foreign country on the figure 1. The line $Y2^*Y2^*$ is a horizontality from the equation (4) in the same as the equation (1). The production is decided if the labor is given under a productivity. The line EX^* is left-up because the export increases due to the depreciation of exchange rate. The slope of line EX^* shows the degree of export change to the change of exchange rate. The difference of production and export is the domestic demand in the foreign country in the same as the production of goods 1 in the

Figure 2



home country. As showed on the figure 1, the export is decided if the level of exchange rate is given. When the price level in home country rises, the line EX* shifts below and the export in foreign country decreases.

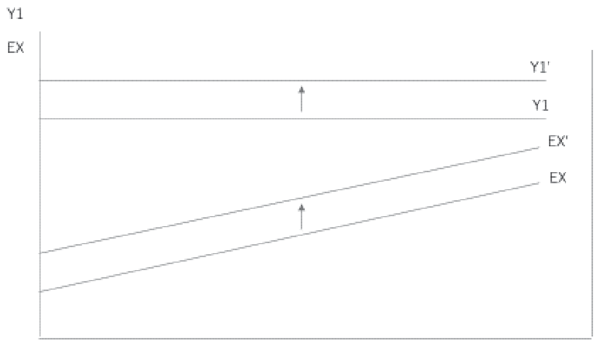
As showed on the figure 2, when the exchange rate is E1 the export in home country is EX1 (EX1 is also the import in foreign country) and the export in foreign country is EX2* (EX2* is also the import in home country). In this way the difference of EX1 and EX2* is the trade balance and the trade balance equilibrate at a point of intersection of the line EX with the line EX*.

(2) The change of labor productivity

The rise of labor productivity induces the increase of production under a given labor from the equation (1). This increase of production induces either the increase of domestic demand or the increase of export. The increase of domestic demand arises from the increase of real income in home country and the increase of export arises from the decline of price level of import goods in foreign country.

The figure 3 shows the effect of rise in labor productivity. The rise of labor productivity a1 makes the line Y1 shift upward. When the increase of production becomes entirely the domestic demand it increases due to the shift of line Y1. When the increase of production becomes the increase of export, the line EX shifts upward.

Figure 3



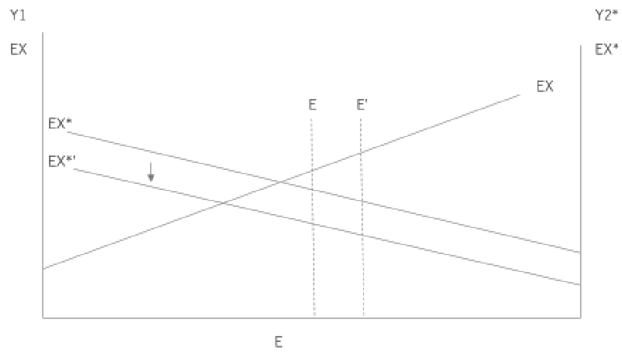
2 The effect of trade policy

(1) The effect of import tariff

We think the case that home country imposes the import tariff on the import goods 2. When the import tariff is imposed on the goods 2 the domestic price of the goods 2 rises by the part of import tariff. As the import of home country is the export of foreign country, the equation (7) is also the import function of home country. When the price of goods 2 in home country rises, the export of goods 2 in foreign country decreases (the import in home country decreases). If the rise of P2 induces the depreciation of exchange rate, the import in home country decreases more (the export in foreign country decreases).

As shown on the figure 4, the export in foreign country declines for reason that the line EX^* shifts below by the rise of price P2 in home country. In the case of making up for the decrease of import with the production in home country, the production of

Figure 4



import goods in home country increases. If the exchange rate depreciates, the line E shifts right and the import in home country decreases. As the trade balance in home country is the EX - EX*, the trade surplus increases if home country is the trade surplus.

(2) The effect of export tariff

We think the case that home country imposes the export tariff on the export goods 1. When the export tariff is imposed on the goods 1, the foreign price of the goods 1 rises by the part of export tariff. The export function in home country is the equation (4). When the foreign price of the goods 1 rises, the export of goods 1 in home country declines (the import in foreign country decreases). If the rise of P1* induces the appreciation of exchange rate, the export in home country decreases more (the import in foreign country decreases).

As shown on the figure 5, the export in home country declines for reason that the line EX shifts below by the rise of price P1* in foreign country. If the exchange rate appreciates, the line E shifts left and the export in home country decreases. As the trade balance in home country is the EX - EX*, the trade surplus decreases if home country is the trade surplus.

(3) The effect of export subsidy

We think the case that home country subsidizes on the export goods 1. When the export subsidy is given on the goods 1, the foreign price P1* of the goods 1 falls by the part of export subsidy. The export function in home country is the equation (4). When the foreign price of the goods 1 falls, the export of goods 1 in home country increases

Figure 5

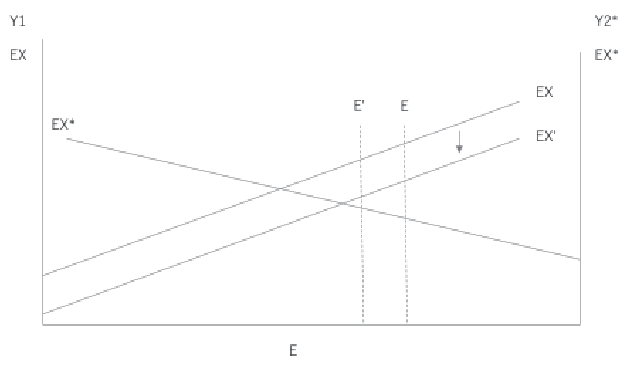
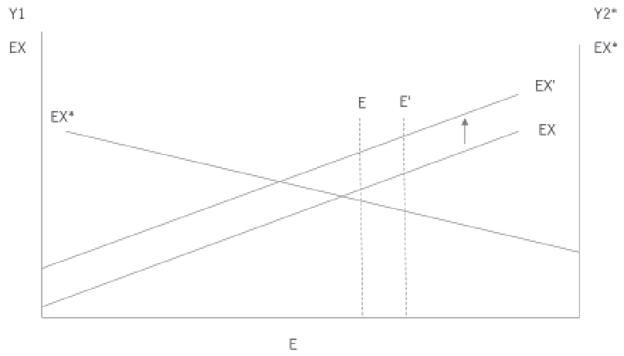


Figure 6



(the import in foreign country increases). If the fall of P1* induces the depreciation of exchange rate, the export in home country increases more (the import in foreign country increases). In this case we need the source of export subsidy.

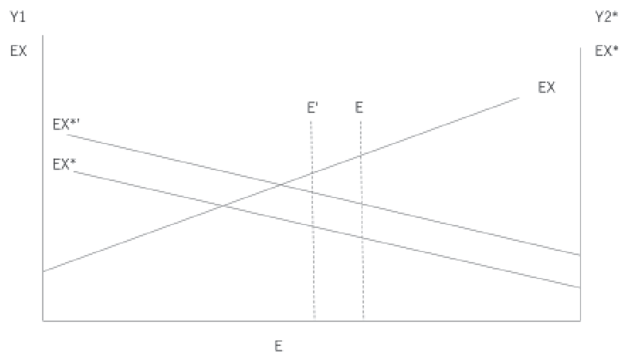
As shown on the figure 6, the export in home country increases for reason that the line EX shifts upward by the fall of price P1* in foreign country. If the exchange rate depreciates, the line E shifts right and the export in home country increases. As the trade balance in home country is the EX - EX*, the trade surplus increases if home country is the trade surplus.

(4) The effect of import subsidy

We think the case that home country subsidizes on the import goods 2. When the import subsidy is given on the goods 2, the price of the goods 2 in home country falls by the part of import subsidy. As the import in home country is the export in foreign country, the equation (7) is also the import function in home country. When the price P2 of goods 2 in home country falls, the export of goods 2 in foreign country increases (the import in home country increases). If the fall of P2 induces the appreciation of exchange rate, the import in home country increases more (the export in foreign country increases). In this case we need the source of import subsidy.

As shown on the figure 7, the export in foreign country increases for reason that the line EX* shifts upward by the fall of price P2 in home country. If the production in home country declines by the increase of import, the production Y2 of import goods in home country declines. If the exchange rate appreciates, the line E shifts left and the import in home country increases. As the trade balance in home country is the EX - EX*, the trade surplus decreases if home country is the trade surplus.

Figure 7



3　The effect of trade policy on economic welfare

(1) The effect of import tariff

As shown on the figure 8, the import decreases due to the rise of import price in import country. The rise of import price is equal to import tariff and the export price in export country is unchanged. As the export in export country decreases, the supply curve in export country shifts left. If the import price in import country rises due to the depreciation of exchange rate, the supply curve in export country shifts more left.

The economic welfare in import country decreases due to the rise of import price and the economic welfare in export country decreases due to the decline of export. As the economic welfare of both import and export country decreases, the economic welfare in whole world decreases.

(2) The effect of export tariff

As shown on the figure 9, the export price in export country rises by the part of export tariff due to the impose of export tariff. The import decreases because the import price in import country rises due to the rise of export price in export country. The export decreases consequently and the supply curve of export country shifts left by the part of export decline. If the export decreases due to the appreciation of exchange rate, the supply curve in export country shifts more left.

The economic welfare in export country depends on the scale of both the loss of export decline and the revenue of export tariff. The scale of export decline depends on the price elasticity of import demand in the import country. When the price elasticity of import demand is high, the import decreases large and the export in export country decreases large. The economic welfare in import country is a loss due to the rise of import price.

Figure 8

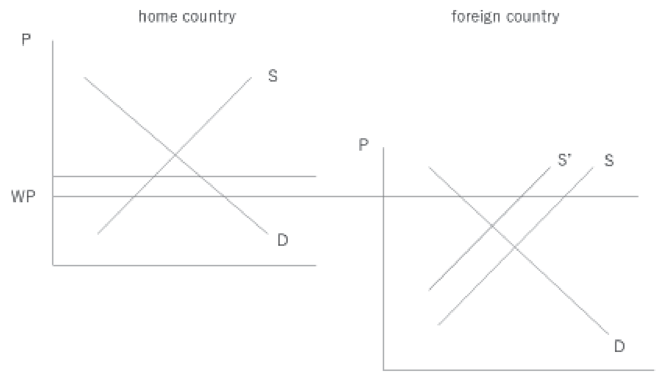


Figure 9

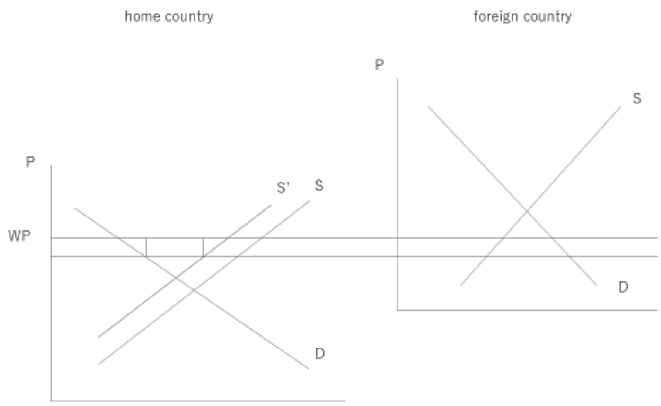
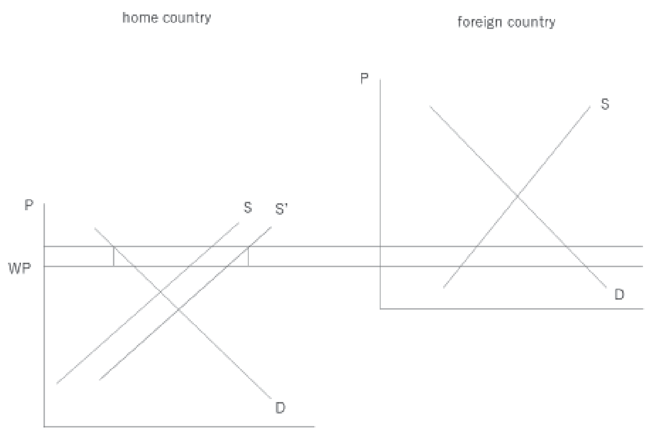


Figure 10



(3) The effect of export subsidy

As shown on the figure 10, the export price in export country falls by the part of export subsidy. Due to the fall of export price, the import price in import country falls and the import increases. The export increases consequently and the supply curve in export country shifts right by the part of export increment. If the export increases due to the depreciation of exchange rate, the supply curve in export country shifts more right.

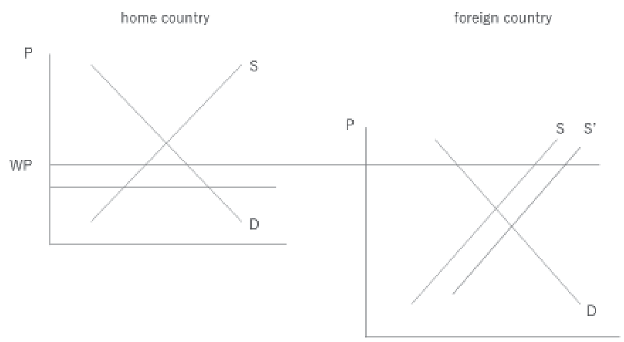
The economic welfare in export country depends on the scale of both the increase of export and the export subsidy. The scale of export increment depends on the price elasticity of import demand in the import country. When the profit of export increment is larger than the export subsidy, the economic welfare in export country may be increase. The economic welfare in import country increases due to the fall of import price.

(4) The effect of import subsidy

As shown on the figure 11, the import increases due to the fall of import price in import country. The fall of import price is equal to import subsidy and the export price in export country is unchanged. As the export in export country increases, the supply curve in export country shifts right. If the import price in import country falls due to the appreciation of exchange rate, the supply curve in export country shifts more right.

Though the economic welfare in import country increases due to the fall of import price, we need the import subsidy more than the increase of economic welfare. If we take into accounting the import subsidy, the economic welfare in import country falls necessary. In case of using the import subsidy, the import country needs the distinct purpose. The economic welfare in export country increases necessary due to the increase of export.

Figure 11



4 The interpretation about an effect of trade policy

The figure 12 is a summary of the effect of trade policy. The effect of trade policy consists of four factors in the effect of trade balance, demand and supply, tariff and subsidy, dead weight loss. When we think the effect of trade policy on the economic welfare, we take the effect of demand and supply, tariff and subsidy, dead weight loss into account. The dead weight loss occurs about all trade policy. When we think the effect of trade policy on the trade balance, we take the effect of trade balance into account.

As this figure shows only a direction of the effect of trade policy, the effect of trade policy can not be decided definitely. This is useful when we think the relation of a trade balance or an economic welfare of the trade policy with the effect of trade balance, demand and supply, tariff and subsidy.

The import tariff and export tariff have a negative effect on the export and import. They make the trade reduce. The import subsidy and export subsidy have a positive effect on the export and import. They make the trade grow. But when we think the effect of these policy on economic welfare, we need to take the effect of tariff and

Figure 12

Home country	The effect of trade balance		The effect of demand - supply		The effect of tax and subsidy		The economic welfare
	Export	Import	Domestic demand	Domestic supply	Tax	Subsidy	Dead weight loss
Import tariff		−	−	+	+		−
Export tariff	−			−	+		−
Import subsidy		+	+	−		−	−
Export subsidy	+			+		−	−

Opposing country	The effect of trade balance		The effect of demand - supply		The effect of tax and subsidy		The economic welfare
	Export	Import	Domestic demand	Domestic supply	Tax	Subsidy	
Import tariff	−			−			−
Export tariff		−	−	+			−
Import subsidy	+			+			+
Export subsidy		+	+	−			+

subsidy and the dead weight loss into account. The effect of trade policy on a trade balance and an economic welfare is not necessarily equal. Both must be definitely separated. The trade balance is an accounting problem. When we think economically the trade profit, the effect of economic welfare is more important than the effect of trade balance.

When the full employment does not realize, we need more consideration. If the domestic supply increases due to the import tariff, the domestic employment increases. If the domestic supply in foreign country increases due to the export tariff, the employment in foreign country increases. As the increase of employment is a factor of the increase of economic welfare, this is a factor that the protective trade is justified.

5 The trade balance-oriented trade policy

(1) The expand of trade imbalance

The merit of floating exchange rate system was an automatic adjustment of the trade imbalance. But this automatic adjustment mechanism does not function actually. The trade balance expanded in some countries.

The other way that adjusts the trade imbalance is an adjustment by the macro balance. The macro balance is a relation that the difference of saving and investment in whole nation equals the difference of trade balance. The country that the saving exceeds the investment is a trade surplus and the country that the investment exceeds the saving is a trade deficit. On the basis of this thought, the movement of saving and investment is important for the improvement of trade imbalance. But it is actually difficult for us to change the movement of saving and investment at will. That is why this way is not necessarily effective as an arrangement method of trade imbalance.

The expand of trade imbalance is one of important problem in the world economy and may induce the protectionism. The protectionism denies the result of trade liberalization and this is a factor of big risk in the world economy. If trade deficit country uses the protectionism policy, the protectionism extends to the world and this becomes a factor of reduction in the trade.

(2) The trade balance-oriented trade policy

What should we do for the expand of trade imbalance? The most probable measure is a protective trade policy by the trade deficit country. Is this the best measure?

The import price rises due to the impose of import tariff and the import decreases. As the import decreases due to the import tariff, this policy seems suitably for the import country. But this policy has a weakness that induces the decline of economic welfare in whole nation. Though the import tariff is admitted in the WTO, this is not necessarily suitable for the correction of trade imbalance because of the objection in opposing country. The import tariff is not the best policy in the meaning of inducing the decline of economic welfare in the import country and is not also the second best policy in the meaning of inducing the objection in opposing country.

We can think that the surplus country in the trade carries out a countermeasure through a consultation with the opposing country. The export tariff has the same effect as the import tariff by the symmetry of Lerner. As the export tariff induces the rise of export price and the decline of export, this is a correspondence with the purpose of import country. In the case of the import tariff, the import country gets the tariff revenue. In the case of the export tariff, the export country gets the tariff revenue. In the latter case the economic welfare in export country is larger than the former case. Though the export tariff is not the best policy in the meaning of decreasing the economic welfare in the export country, this is the second best policy in the meaning of getting the agreement in opposing country. This trade policy is not a protective trade policy because the both of export country and import country agree. This is a trade policy that purposes the trade balance.

The trade balance-oriented trade policy is a trade policy that achieves the purpose of trade balance by the minimize of economic welfare loss in both countries. Though this trade policy is not a protective trade policy for the reason that both countries have an agreement, this is a controlled trade in the meaning of affecting the export and import.

The trade balance-oriented trade policy has two fundamental thoughts that are the trade balance and the agreement of both countries. The trade balance does not mean an equilibrium of trade balance, but it means an easing of trade imbalance. The agreement of both countries means that it is not unilateral for every trade policy.

(3) The four stage of trade policy

The trade balance-oriented trade policy is divided up the four stage of 1) export tariff, 2) a parallel of export tariff and import subsidy, 3) import tariff, 4) a parallel of import tariff and export subsidy. The 1) and 2) are a measure for export decline and import increment in the trade surplus country. The 3) and 4) a measure for import decline and export increment in the trade deficit country. The effect of reduction in the trade surplus is that the 2) is stronger than the 1) for the trade surplus country. The effect of improvement in the trade deficit is that the 4) is stronger than the 3) for the trade deficit country.

When the trade imbalance occurs, the trade surplus country should take a measure firstly. The impose of export tariff by the trade surplus country under an agreement of the two countries is better adequate in order to avoid the protective trade than the unilateral impose of import tariff by the trade deficit country. In the case of import tariff, the import country gets the tariff revenue and in the case of export tariff, the export country gets the tariff revenue. In the case of export tariff, the export country gets the larger profit than the impose of import tariff by the import country. Next if the export tariff does not have the effect, the trade surplus country carries out the import subsidy. The source of import subsidy puts the revenue of export tariff and the scale of import subsidy is correspond to the revenue of export tariff.

When the trade imbalance does not improve by the measure of trade surplus country, the trade deficit country imposes the import tariff. In this case the tendency of protective trade strengths because the export country does not agree. The parallel of import tariff and export subsidy could strength the improvement effect of trade deficit. The source of export subsidy puts the revenue of import tariff and the scale of export subsidy is correspond to the revenue of import tariff. It is difficult to carry out the parallel of import tariff and export subsidy because the export subsidy is prohibited by the rule of WTO.

According to the degree of trade imbalance, the trade balance-oriented trade policy is carried out in the order 1) export tariff, 2) a parallel of export tariff and import subsidy, 3) import tariff, 4) a parallel of import tariff and export subsidy. As this trade policy aims at the trade balance, the economic welfare of two countries is not taken into account.

Conclusion

The type of export-led economy is one of the economic growth models. This country that accomplished a high economic growth might become the trade surplus country. When the huge trade surplus continues for the long time, the trade imbalance extends and the trade friction occurs. The trade friction induces the protectionism and it gives the negative effect to the world economy.

The protective trade policy induces the decline of economic welfare in home country. If you think firstly about the economic welfare, the protective trade policy is not adequate. The import tariff and export tariff induce the decline of economic welfare in both import and export country. Even if the export country imposes the export tariff, the economic welfare of the import country decreases.

But if the purpose of trade policy is an improvement of trade imbalance, the protective trade policy has the certain effect. Though the protective trade policy induces the decline of economic welfare in home country, the trade imbalance will be improved. If the presupposition of full employment is not realized and the improvement of trade deficit improves the employment, the protective trade policy may bring the increase of economic welfare in home country. Is the trade balance-oriented trade policy balance adequate?

The important thing is that the trade balance-oriented trade policy is never the best policy. This is the second best policy for avoiding the protective trade policy that gives the negative effect to the world economy. The trade balance-oriented trade policy is adapted only when the trade deficit country is going to carry out the protective trade policy. The enforcement in order 1) export tariff, 2) a parallel of export tariff and import subsidy by the trade surplus country, 3) import tariff, 4) a parallel of import tariff and export subsidy by the trade deficit country is desirable.

Reference

Dekle Robert, Eaton Jonathan, and Kortum Samuel (2007) "Unbalanced Trade" *American Economic Review*, May Vol. 97, 351-355.

Frankel J. A, and Romer D (1999) "Dose Trade Cause Growth?" *American Economic Review*, Vol. 89, No 3: 379-399.

International Monetary Fund (2007) "Globalization and Inequality" *World Economic Outlook*, October, 31-65.

Krugman Paul (1995) *Peddling Prosperity*, W W Norton & Co Inc.

Krugman Paul (2009) "The Increasing Returns Revolution in Trade and Geography" *American Economic Review*, June Vol. 99, 561-571.

Obstfeld M, and Rogoff K (1996) *Foundations of International Macroeconomics*, The MIT Press.

Richard E. Caves, Jeffrey A. Frankel, and Ronald W. Jones (2002) *World Trade and Payments: An Introduction*, Ninth Edition. Pearson Education.

Tabei Nobuyoshi (2016) "A method of increasing Per Capita Real Income by Twenty Times" *The Journal of Utsunomiya Kyowa University* No. 17