

Creating the Safety Tariff: COVID-19 and the New Trade Policy

Michihiro HINO*

** Faculty of Law, Economics and Humanities, Kagoshima University, Japan; hino@leh.kagoshima-u.ac.jp*

Abstract

This study aimed to propose that a new global tariff (the Safety Tariff) should be introduced to respond to global risks such as pandemics.

The Safety Tariff is a new tariff on medical products and personal protective equipment and imported intermediate goods necessary for their production, and governments must import these goods by funding its tariff revenue. The analysis confirms that the Safety Tariff is a measure that can mitigate the decrease in consumption of personal protective equipment in the event of a pandemic through the effect of “increasing output” and “increasing government inventory.”

Keywords: Safety Tariff (ST), COVID-19, Trade policy

JEL Classification Numbers: F13, F 64, F 68

1. Introduction

This study aimed to recommend that a new tariff, namely the Safety Tariff (ST), should be introduced globally as a mitigation measure against global risks such as the COVID-19 pandemic. The ST is a tariff policy designed to address the social need for goods that are essential to sustain social life during a pandemic emergency. It is a new tariff imposed on medical products and personal protective equipment (PPE) and the imported intermediate goods necessary for their production. And governments must import these goods by funding its tariff revenue.

The COVID-19 pandemic occurred in 2020, resulting in a stagnation of international trade. The pandemic has exposed (1) the magnitude of the risks inherent in international economic activity and (2) that there are no measures in the World Trade Organization (WTO) rules to address the risk. In other words, the weaknesses of the WTO rules were exposed. However, the argument that we should stop relying on international trade and produce everything domestically fails to (1) understand the characteristics of modern global production structures in which intermediate goods are actively traded and (2) correctly recognize the magnitude of the costs that would be incurred (permanently in this case) by not engaging in free trade. In short, it is a view that has no practical relevance. The pragmatic view is how to maintain and expand free trade while managing risks.

The problem of this pandemic goes beyond the issue of private costs. It is not just a matter of production stoppages and bankruptcies of production-related companies but also a matter of health hazards and the regulation and self-regulation of economic activities on a large scale. In other words, it is a social problem. Therefore, it is necessary to address this issue in several layers. In this study, the international dimension of the measures will be proposed.

The ST has the following significance: First, it demonstrates the peacetime role of governments in controlling social costs. Second, it is a common response strategy for all countries in the world. Both developed countries and developing countries can benefit from its policy effects. The ST induces certain changes in the production and consumption patterns of all countries in the world and provides emergency preparedness.

Representative previous studies dealing with COVID-19 and international trade include Hayakawa and Mukunoki (2020) who examined the damage caused by COVID-19 and the increase or decrease in imports and exports of the country in question and Baldwin and Evenett (2020) who analyzed the realities and problems with the trade restrictive measures adopted by countries in the aftermath of the pandemic. These results are significant in their own right; however, they are post-pandemic empirical and current analyses based on the existing discipline, not analyses that propose new knowledge on rule design, such as mitigation measures. Hino (2021a) argued the essence of the ST in a way that is compact. This study provides a more detailed and systematic analysis of the ST¹.

This article is structured as follows. In Section 2, we rethink the significance of international economic activity. It will be a task to identify, in the first instance, the need for the division of labor, but also to loosen the need for it, and to identify the minimum conditions necessary to hedge the risks. Section 3 provides a theoretical examination. Using a partial equilibrium model, we first identify the conditions that arose under the COVID-19 pandemic, and then analyze the effects of the ST using the Yamamoto model (Yamamoto 1974), which explicitly addresses the spending of tariff revenues. Section 4 concludes this article and presents suggestions for future studies.

2. Necessity of International Economic Activities

The outbreak of the COVID-19 pandemic was devastating in many directions, and it highlighted the risks inherent in international economic activities. These risks may be broadly divided into (1) logistical risks, (2) production risks, and (3) policy risks. Logistical risks refer to the risks involved in transporting goods across national borders. Production risks refer to a situation where intermediate goods become difficult to import and the production of both goods for export and goods for domestic sale is halted. Policy risks refer to a situation in which countries impose restrictions on exports in order to secure the domestic use of countermeasures against the COVID-19 pandemic, which have become difficult to obtain and scarce. Even if the transport and

production risks do not emerge, the emergence of policy risks alone would push international economic activity into a critical situation. In fact, 85 countries and regions had imposed export restrictions in order to secure the scarce PPE (CCSA 2020). As a result, the import of PPE had become increasingly difficult. However, WTO rules have a “General Exception” provision, which has failed to control policies that could expose policy risks².

All of these risks became apparent in the COVID-19 pandemic, though with a significant time lag. The result was an “international trade shocks” that caused international trade to stagnate. This shock created two additional shocks: a supply shock and a demand shock, and the demand shock intensified the supply shock.

In the first place, why do we need international economic activities that involve so many risks? An essential reason is that there are resources that cannot be procured within the country (in the region). The resource endowment is naturally not uniform across the world. Resources that cannot be procured domestically must be procured (i.e., imported) from abroad. The doctrine of the universal economy, described by Viner (1991) as the longest-lived theory, deals with this very subject³. The country concerned then would need funds to purchase its resources. If there are scarce resources in this country, it may be possible to exchange them for resources. If not, however, the export of goods and services is necessary to obtain the funds. Thus, imports and exports would become inevitable.

It has been the theory of international trade since the Ricardian model, which showed that there are benefits in importing goods and resources, even if they can be procured domestically. Along with its regularity, economic benefits have been explained and proven in various ways.

The opposite of international economic activity is autarky. Autarky would be able to consume as much as could be produced (there is no divergence between production and consumption). International economics usually focuses on the international division of labor in its analysis; however, in the case of the COVID-19 pandemic, the domestic division of labor must also be taken into account. This is because the domestic movement of the nations would have led to an epidemic of COVID-19. The analysis of the domestic division of labor is not, strictly speaking, the subject of international economics, although some discussion may be added. In the future, the real mobility of all people will not become irrelevant, even if the remote lifestyle is established. Rather, consumer goods and services must be moved in order to curb the real movement of people. However, in the current state of affairs, where artificial intelligence and robots are not yet sufficiently widespread, they will not move automatically. Human power must intervene in whatever form. It might be best if the people concerned could only move within their living area. This would require the development of a sophisticated and complex division of labor. In the end, the division of labor would not be denied.

In the past, when the Spanish flu epidemic broke out, gatherings were banned for a few years, although traffic has since resumed. In other words, a distinction will have to be made between responding to emergencies and responding to peacetime. The lesson to be learned from a pandemic is to make it less likely that a state of emergency will occur, and to prepare for measures during peacetime to mitigate the negative

impact of a state of emergency when it does occur. This study is a policy recommendation on the latter, focusing on trade policy to secure medical products and personal protective equipment (PPE).

Health care workers, logisticians, etc., must be engaged in social activities, even in the event of a pandemic. The creation of an environment that provides a minimum level of safety for those people would ease the intensity of the shock. It is also meant to be a preparation for when international trade shocks occur and imports are halted. Moreover, as a supplementary implication, for consumers, protecting an environment that allows for the requisite number of PPE would weaken the need for excessive self-restraint in all activities and would allow for moderate activity.

3. The Economic Effects of the Safety Tariff

In this section, we analyze the economic effects of the ST. We adopt a partial equilibrium model for X goods, which are representative of PPE. The advantage of the partial equilibrium model is that it can explicitly deal with the factors of change in social surplus, although it is difficult to identify the general trend. Since the economic effects of the ST should be understood through comparisons with shocks rather than with open economies, let us first analyze what happened in the current shock.

Figure 1 shows the supply and demand situation for X goods in a country (small country) before the occurrence of the international trade shocks. Price are P_w , and imports are AB .

The market demand curve Q_d and the market supply curve Q_s are defined according to standard assumptions, as follows.

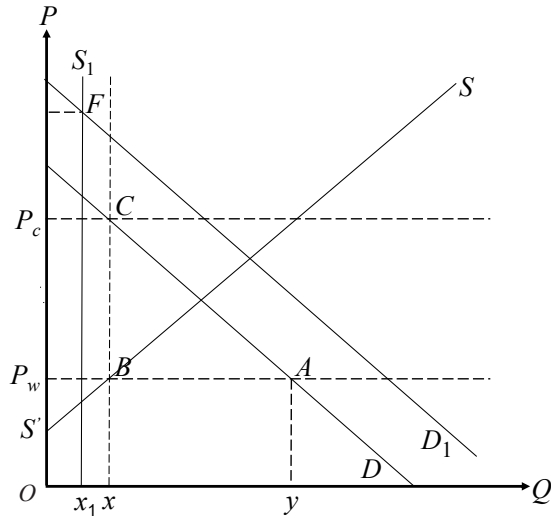
$$Q_d = f(P, P_o, I, TA, N_b, E_d) \quad (1.1)$$

$$Q_s = f(P, P_i, I, TE, N_s, E_s) \quad (1.2)$$

Where P is the price of the X good in question, P_o is the price of other goods, I is the consumer's income, TA is the consumer's preference, N_b is the number of buyers, E_d is the consumer's expectation, P_i is the price of the intermediate good, TE is the technology, N_s is the number of sellers, and E_s is the seller's expectation.

To simplify the analysis, we assume (1) that the tariff rate before the international trade shocks is zero, and (2) that the foreign supply curve before the international trade shocks is infinite in elasticity.

Figure 1. Impact of international trade shocks



3.1 Occurrence of international trade shocks

The COVID-19 pandemic caused international trade shocks, bringing import AB to zero. Hence, consumption fell from y to x , the point of domestic production. In the general theory assumption, a new equilibrium is established by price adjustment. However, quantity adjustment has become the standard form of adjustment in the modern era; resale has filled the demand-supply gap, while P_w remains in place. The reseller purchased X from the seller at P_w and sold it to the consumer at a price of P_c .

However, the impact of international trade shocks did not end there. The supply shock was triggered by international trade shocks. P_i first soared. Then, as the availability of intermediate goods became more difficult and the production of X goods decreased, N_s also decreased. As a result, the supply curve S shifted to the left side and further became perpendicular to the origin in proportion to the degree of difficulty in continuing production. The supply curve S_1 , which is vertical, indicates that the production is beyond x_1 . Of course, as the situation where production could not be resumed persisted, the supply curve was to gradually approach the origin even further.

In addition, demand shocks occurred. Two typical demand shocks occurred during this period. The rapid spread of remote lifestyles led to a sharp increase in demand for information and communication equipment. However, these are not included in the X goods covered in this analysis. The other case is the sharp rise in demand for X goods due to the COVID-19 pandemic. The pandemic had a particularly strong impact on N_b and E_d . The demand for these products has skyrocketed to reduce the risk of infection in the business and in daily life. Needless to say, the unprecedented event of the pandemic had a strong impact on the TA . As a result, the demand curve was shifted upward to D_1 and the consumption point was F .

Strictly speaking, the various shocks have led to a sharp contraction in economic activity, with many

consumers losing some or all of their income. In other words, I declined, thereby creating pressure to shift the demand curve downward. However, the demand curve shifted upward as the effect of N_b prevailed over that pressure. Since the original price of X good was not high, the effect of the decrease in I was limited, despite the price increase.

However, the following factors further complicated the situation. The surge in demand and limited supply stimulated resale. In other words, E_d and E_s were not only regulators of the demand-supply gap, but also created the causes of the gap. Rising prices shifted the demand curve further upward by overheating speculation and making consumption increasingly difficult, and expectations of further overheating put a limit on supply. S_1 moved even closer to the origin.

Even more inconveniently, the price spikes caused by such resale could increase the social surplus. First, let us review the changes in welfare before and after the international trade shocks. At the stage when the international trade shocks occurred, there was a consumer surplus loss of $\triangle BAC$. The producer surplus became $\square S'BP_w$, and the resale rents became $\square P_wBCP_e$. In this situation, as long as there is an upward shift in the demand curve due to higher prices from resale and an increase in the number of consumers (NB) who still want to consume, the point of consumption will shift vertically upward from C . As a result, there was no increase or decrease in consumer surplus and producer surplus. It would only increase the resale rents and thus the social surplus. In short, the various problems caused by the pandemic would eventually reach the distribution problem⁴.

In reality, the shift in the demand curve as well as the verticalization of the supply curve due to the onset of production stoppages and the restriction of supply through resale dramatically reduced the social surplus. However, this study is not concerned much about this phenomenon. In the process of reducing the social surplus, (1) it had become difficult to consume X goods (not only for households but also for workers), which had increased the risk of infection (and caused many health hazards), and (2) the defense of this had been to generate excessive self-restraint in economic activity. Obviously, it is difficult to determine what is defined as “excessive.” If you are not certain about the COVID-19 pandemic, it is reasonable to follow the “precautionary principle” to deal with it. As the risk of infection decreases, the degree of restraint in economic activity may decrease proportionately. Therefore, although difficult to define rigorously, we may consider the degree of self-restraint in economic activity to be excessive self-restraint resulting from the increased risk of infection caused by the difficulty of obtaining PPE.

In some developed countries, masks, one of the PPE, were distributed by the government with instructions to produce them. While this policy was intended to alleviate the demand-supply gap, a rather noteworthy policy effect occurred through its impact on E_d and E_s . As expectations about the profits from resale changed (i.e., the speculative fever cooled), X goods were released into the market, and this fact shaped expectations about further price erosion in the future, leading to a further collapse in the price of X goods. The government’s distribution policy can be assessed to have had some effect.

However, there is some room for doubt regarding the government's direction of the production of those goods. It would be a contradiction to dictate the production of goods that could not be produced, even though demand had been soaring and firms had a strong incentive to produce. It is difficult to assert that goods produced through the use of substitute intermediate goods are substitutes that can be utilized for their intended purpose.

To put it bluntly, there is no need for the government to dictate production. The release of inventory is sufficient to change expectations and close the demand-supply gap accordingly. Once the shock eases, the private sector will begin to produce those goods in earnest. Even if it is difficult to import intermediate goods, ingenuity (change in TE) will provide goods that have the quality and functionality to compete successfully.

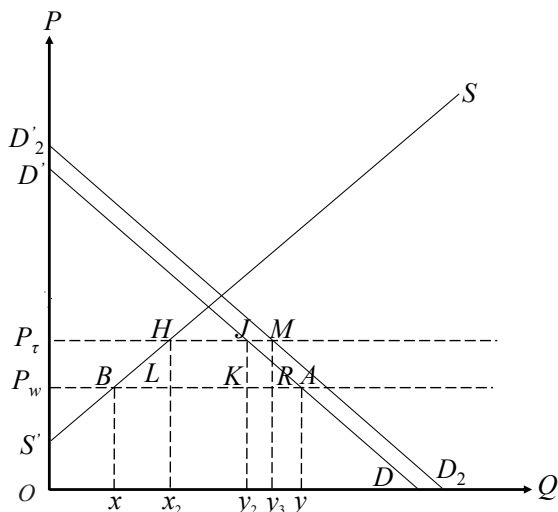
3.2 Effects of the ST

The use of the tariff revenue is usually not explicitly dealt with and is (or was) assumed to be returned to the public in some way⁵. This study also recommends that the government should make use of tariff revenues to purchase tariff-imposed goods for stockpiling (of course, the target of the stockpile could be the intermediate goods needed to produce X goods domestically); thus, we must explicitly address the use of tariff revenues. In Yamamoto (1974), the use of tariff revenue is explicitly addressed⁶. In this article, we extend this Yamamoto model and analyze it.

The assumptions of the Yamamoto model have the following characteristics: (1) Assume that the elasticity of the foreign supply is infinite. (2) It does not matter whether tariff revenues are spent directly by the government or redistributed to the private sector and later spent by the private sector; Yamamoto states that the reason for this is that it has no effect on the final result. (3) Intermediate goods (imports of raw materials) are not taken into account (another model is under consideration). (4) Tariffs are not prohibitive levels. (5) It is a small country model. (6) To the extent that tariffs are imposed, the elasticity of supply and demand is assumed to be constant.

We would like to add something about (2). This has two conditions: (i) a matter of preference and (ii) the presence or absence of tariffs on imports financed by tariff revenues. In the case of private sector imports, of course, there is a tariff. However, this is not necessarily the case for government expenditure. In the Yamamoto model, there is no tariff on imports due to tariff spending.

Figure 2. Effects of the ST



In this study, we do not need to consider (i), and for the sake of simplicity, we take the same steps with regard to (ii). Other assumptions of the Yamamoto model (1), (3), (4), (5), and (6) are not unreasonable and will be treated in the same way.

The conclusions regarding changes in social surplus in the Yamamoto model are as follows: Although it is not easy to find the conditions under which the social surplus increases or decreases, it is possible for the social surplus to increase if the elasticity of demand is very small. However, it may not simply be argued that tariffs provide a benefit because this result is due to the unnatural assumption that the elasticity of the demand curve is constant and continues upward indefinitely. It should be noted that the main consideration in this study is the change in the quantity of X goods, while the social surplus is only a secondary consideration.

Figure 2 shows the situation when the ST is imposed. The tariff level of the ST is $\tau (1 > \tau > 0)$. The price increases from P_w to $P_\tau = P_w(1 + \tau)$, and the amount of tariff revenue, $\square LKJH$, increases demand. In other words, the amount of expenditure on X good is increased by $\square y_2y_3MJ$, which is an area equal to $\square LKJH$, and the demand curve shifts to the right and becomes D_2 . As a result, the equilibrium point is M , imports are $y_3 - x_2$, domestic production is x_2 , and domestic consumption is y_3 , of which $y_3 - y_2$ is the government inventory.

The imposition of the ST has reduced domestic consumption by $y - y_3$, while domestic production has increased by $x_2 - x$. Imports decreased by $(y - y_3) + (x_2 - x)$ after imposing the ST, although they increased by $y_3 - y_2$, due to the effect of tariff revenue.

As mentioned above, the ST has two noteworthy effects. First, it has the effect of “increasing output”: it stimulates the domestic production of X goods. Second, it has the effect of “increasing government inventory.” These two effects increase domestic production and inventories in peacetime, mitigating the sharp decline in consumable X goods, even in the event of international trade shocks.

The problem, of course, is that if international trade shocks occur and imports of the intermediate goods necessary for the production of X goods are halted, we will not be able to reap all the benefits of the x_2 - x increase in domestic production. However, X goods are representative of PPE-related goods, including intermediate imported goods that are essential for the production of these goods. In other words, the ST is imposed on these intermediate goods as well, and the government inventory is built up. Thus, even if imports stop, domestic production can continue with the release of intermediate goods that have been stockpiled by the government⁷.

The imposition of the ST changes the social surplus. The change depends on the magnitude of the relationship between the increase in consumer surplus, $\square JMD'_{2D}$, and $\square BAMH$. In most cases, the social surplus would be reduced. In addition, the imposition of the ST would result in a net reduction in the amount of demand for y - y_3 when compared to peacetime. How might we assess this consequence? The purpose of the ST is primarily to ensure that the social needs of PPE are met and to create an environment to do so, even in the face of international trade shocks. It is not a policy that pursues economic benefits in peacetime. An increase in government inventories is a form of emergency preparedness. The significance of the effect of increased output is not only the direct effect but also the indirect effect. International trade shocks have had a strong impact on the characteristics of modern global value chains. The development of the global value chain has led to the consolidation of production bases (Javorcik 2020). The impact of the shock would have been somewhat mitigated if there had been a diversification of the production base. This “somewhat” indicates the difficulty and/or ambiguity of balancing risk and cost. Conventional international trade theory, with a few exceptions, takes cost minimization as its supreme proposition. However, it should be noted that the pursuit of cost minimization is one of the causes of the enormous costs incurred. Of course, the option of pursuing domestic production as the opposite of cost minimization would also be unwise. The country would constantly bear huge costs and would not be able to achieve its goals. Both options would fail to have the idea of balancing risk and cost.

The ST would require all countries to bear the cost of hedging part of the risk of international trade shocks in advance to compensate for the amount of social need. In short, the cost of worsening welfare, or the cost of reducing the amount of demand for y - y_3 , could be interpreted as representing a risk premium for international trade shocks.

3.3 Conditions for Increases

We would consider the conditions for increasing the effect of the ST. The increase in output Γ depends on the elasticity of supply in the country $\varepsilon(=P_r/S^*AS/AP_r)$. Thus,

$$\Gamma = \varepsilon S_0 \tau \quad (2.1)$$

Here, S_0 indicates the initial value of the country's supply. The more ε it is, the higher Γ becomes. In developed countries, ε is generally high, so high Γ can be expected.

On the other hand, the increase in government inventory, Z can be calculated using the following equation, since $\square LKJH$ and $\square y_2y_3MJ$ are equal:

$$Z = \frac{\{(1 - \eta\tau)D_0 - (1 + \varepsilon\tau)S_0\}\tau}{P_w(1 + \tau)} \quad (2.2)$$

$$= \alpha \frac{(D_0 - S_0) - (\eta D_0\tau + \varepsilon S_0\tau)}{P_w} \quad (2.3)$$

$$\alpha = \frac{\tau}{1 + \tau}$$

where D_0 is the initial value of the country's demand, η ($=P_\tau/D^*AD/AP_\tau$) is the elasticity of supply in the country, $\eta D_0\tau$ is the consumption distortion loss, which corresponds to the reduction in domestic consumption resulting from the tariff being imposed, and $\varepsilon S_0\tau$ is the production distortion loss, which corresponds to the increase in domestic output resulting from the tariff being imposed. Thus, Z is higher for (1) larger initial differences in demand and supply (i.e., more imports), (2) smaller consumption and production distortion losses, and (3) lower P_w .

From the above, it can be said that the effect is stronger in countries with a chronically large gap in domestic consumption relative to domestic production. Of course, this effect occurs even if S_0 is zero (in which case Γ is also zero). It should be noted that the effect of Z becomes smaller when consumption distortion losses are large. In short, the effect of increasing government inventories can be expected to occur in all countries, especially in developing countries where production conditions are less favorable.

With respect to P_w , careful consideration must be given. A decrease in P_w can allow for more imports and increase Z . Since this study considers a small country model, P_w does not change as a result of the imposed ST. However, since the ST is a worldwide tariff policy, there will be a shift in the demand-supply balance on a global scale, which will put downward pressure on P_w after the policy is implemented. In the medium to long term, supply should be adjusted and settle at a level close to the natural price. Although the ST may restrict world trade to some extent, its effect should not lead to limiting international competition. Maintaining international trade and ensuring competitive conditions will contribute to maintaining the prices of the X goods at a certain level.

From equations (2.1) and (2.3), the ST effect, θ is

$$\begin{aligned}
 \theta &= \Gamma + Z \\
 &= \Gamma + \alpha \frac{(D_0 - S_0) - (\eta D_0 \tau + \Gamma \tau)}{P_w} \\
 &= \left(1 - \frac{\alpha}{P_w}\right) \varepsilon S_0 \tau + \alpha \frac{(D_0 - S_0) - \eta D_0 \tau}{P_w}
 \end{aligned}$$

Here, $1 > \alpha > 0$ is a parameter. Thus, we have

$$1 - \frac{\alpha}{P_w} > 0$$

Therefore, as Γ increases, so does θ .

We attempt to estimate the effects of the ST. If we increase the ST, α approaches 1. However, if we make it to a prohibitive level, the effect of Z does not occur (which, of course, contradicts assumption (4)). In this study, we propose a consumption tax equivalent of 10%. This is because it is a level that is acceptable to the consumer, and because it is expected to have some effect.

The effect of increasing output and government inventory depends on the elasticity and volume of demand and supply; therefore, the effects of each country are not the same. In addition, a large amount of data is needed to calculate accurate figures. However, it is relatively easy to calculate the maximum effect of increasing government inventory that can be expected for all countries.

For example, let us consider Japanese masks as a case study. The volume of imported masks is 4.972 billion (2019)⁸. If $P_w=14$ yen⁹, and τ is 0.1, then α is 0.09, and Z is 32.2 million.

Further assumptions can also be made and calculated in greater detail. Since masks are not a luxury good, it would be acceptable to assume that $1 > \eta$. Taking into account Japan's production capacity (assuming peacetime), we can assume that $\varepsilon > 1$. Based on the above, let $\eta = 0.9$ and $\varepsilon = 1.1$. Domestic production is 1.483 billion (2019)¹⁰; therefore, $Z = 27.4$ million, and $\Gamma = 163.1$ million. This means that $\theta = 190.5$ million.

Whether this number is considered low or high is a matter of debate. In 2020, under the initiative of the Prime Minister, 85 million masks were distributed to all households in Japan. If we take this number of masks distributed as one criterion, then θ is a sufficient number. Moreover, Z is the quantity to be devoted to inventory, which, of course, accumulates over time.

Based on the above analysis, we would like to reaffirm the purpose of the ST, which is not to set a new tariff level per se but, rather, to ensure the social needs of the X good. However, the social need, as mentioned above, depends on the economic situation of each country (initial quantity and elasticity of demand and supply), and the degree and duration of the shock. Therefore, it is difficult to define a social need unambiguously. In the first instance, it would be safe to define the pre-shock level as a social need. It would be ideal if this volume could be secured even after a shock, although demand would likely increase more (not

only due to increased real demand but also due to resale). Therefore, it must be said that it is difficult to ensure all social needs at any given time. Securing the minimum quantity deemed necessary becomes a feasible numerical goal. The ST is a viable means of contributing to a minimum extent, not a universal solution. It is only one of the mitigation measures in the international dimension, and the domestic measures should be taken separately.

Finally, we present a proposal for the ST taxation scheme. Given the unique economic situation of each country (e.g., unlikely to expect Γ) and to increase the likelihood of achieving an agreement, the ST should look to operate in a two-stage approach. In other words, it would provide for a uniform tax for all countries and a range of additional tax rates (β), which could be raised at the discretion of each country.

As an example, the following could be defined as

$$\tau = 0.1 + \beta \quad (3.1)$$

Here, $0.1 > \beta > 0$ is a parameter.

4. Conclusion

The study analyzed the effects and characteristics of the ST, a new tariff that should be introduced worldwide to address global risks. Although the cases used in this study were mainly from Japan, they captured characteristics common to many countries, albeit with some dissimilarities.

The ST is an effective trade policy against international trade shocks. However, this policy would worsen the country's welfare. This welfare deterioration can be interpreted as corresponding to a risk premium for international trade shocks. The ST is a measure to mitigate the rapid deterioration of welfare in emergencies and can be concluded as a second-best policy.

The ST is a measure that facilitates countries to secure their social needs on a global scale, and thus has the effect of constraining export restriction measures implemented by many countries in 2020. In other words, by incorporating the ST into the rules in advance, policy risks could be mitigated. In this way, it can be expected to function as a safety net to maintain the international trading system even in times of emergency.

Although the model presented in this study is primitive, it has played a role in explaining the effects of the ST. Further extensions and refinements are possible, such as by setting import penetration and import functions. It should also consider clarifying the scope of its application by identifying the goods to be covered (and, if necessary, defining a new goods classification).

By the way, would the ST setting mean a retreat of globalization? This depends on the definition of retreat; if we define retreat as the opposite of the advancement of globalization, then we can say no. The ST is oriented toward an objective that goes beyond a one-dimensional interpretation of progress and regression. It is an issue to be managed on a different axis than the axis indicating the degree of liberalization and a means

of risk management to ensure sustainability¹¹. This sustainability includes not only environmental sustainability but also health and life sustainability, with particular emphasis on the latter. We should consider how much up to which the new rules for risk management are acceptable¹².

Reference

- Baldwin, R. and di Mauro, B. W. et al. (2020) *Economics in the time of COVID-19*, A VoxEU.org eBook, CEPR Press.
- BIS (2020) *The Green Swan: Central banking and financial stability in the age of climate change*, Basel.
- CCSA (2020) “How COVID-19 is changing the world: a statistical perspective,” 2, New York.
- Hayakawa, K. and Mukunoki, H. (2020) “Impacts of covid-19 on international trade: evidence from the first quarter of 2020,” *IDE Discussion Paper*, 791,1-26.
- Hino, M. (2019) *Economic Analysis of Environmental Goods Negotiation and Trade: An Examination of the Environmental Effects of the Utilization for International Trade*, Bunshindo Publishing Corporation, Tokyo(in Japanese).
- Hino, M. (2021a) “New directions in trade policy against pandemic risk,” *Review of environmental economics and policy studies*, 14:29-32 (in Japanese).
- Hino, M. (2021b) “A Comprehensive Study on the Background Factors of Safety Tariffs,” *Journal of University of Nagasaki*,54(4):51-72 (in Japanese).
- Irwin, D.A. (1996) *Against the Tide: An Intellectual History of Free Trade*, Princeton University Press, Princeton.
- Javorcik, B. (2020) “Global supply chains will not be the same in the post COVID-19 world” in Baldwin, R. and di Mauro, B. W. et al. (2020).
- Kojima, K. (1993) “The Effects of Trade Policy,” *Surugadai economic studies*, 3(1):77-131 (in Japanese).
- Markusen, J. R., Melvin, J.R., Kaempfer, W.H. and Maskus, K.E. et al. (1995) *International Trade: Theory and Evidence*, McGraw-Hill, New York.
- Viner, J. (1991) *Essays on the Intellectual History of Economics*, Edited by Irwin, D.A., Princeton University Press, Princeton.
- WTO (2020) “Export Prohibitions and Restrictions,” Geneva.
- Yamamoto, S. (1974) *A Theory of Trade Policy*, Toyo Keizai Inc, Tokyo (in Japanese).

¹ See Hino(2021b) for the detail of the background factors of the ST.

² Article 20(b) was the most used basis for export restriction measures (WTO 2020).

³ According to Irwin (1996), this theory of the universal economy was developed by philosophers and theologians in the first few centuries A.D. It is a precursor to the HOS (Heckscher-Ohlin-Samuelson) model of an economic theory.

⁴ Furthermore, economic inequality may be the backdrop for the overheating of resale. As pointed out in the BIS (2020), economic inequality may make it difficult to implement policies that address the risks. Of course, the ST would be no exception. As discussed below, the imposition of the ST would mean an increase in consumption taxes for that rate. The burden on lower income groups would be greater. Even if a political backlash is generated, it is a natural thing to do. In short, efforts to reduce economic inequality are significant in their own right; however, they also have the effect of making it easier to deal with social and economic problems.

⁵ The general effects of a tariff policy in a partial equilibrium model are as follows: (1) Import tariffs on X goods raise both the price charged to consumers and the price received by production. It has the same effect on consumers as a consumption tax and the same effect on producers as a production subsidy. (2) It gives the government tariff revenue. The area of the reduced consumer surplus and the area of tariff revenue that constitutes the social surplus generated by the imposition of tariffs is always larger in the former than in the small country model; thus the social surplus is

exacerbated. In this respect, production subsidies are more desirable because they do not distort consumption and therefore have a lower degree of welfare deterioration (Markusen et al. 1995).

⁶ According to Kojima (1993), Yamamoto (1974) was the only one to attempt such an analysis.

⁷ One might also assume that the expansion of routine domestic production would increase the amount of intermediate goods stored domestically. This is, however, an expected effect.

⁸ The source of the data is the website of the Japan Satellite Materials Industry Association (<http://www.jhpia.or.jp/data/data7.html> [accessed 2020.11.28]).

⁹ We referred to the data on the website of Zaikosokuho.com (<https://zaikosokuho.com/stats/mask> [accessed 2021.12.30]).

¹⁰ The source of the data is the same as the quantity of masks imported.

¹¹ In the WTO, the environmental goods negotiations are among the negotiating themes that aim to achieve the trade-environment-development, triple-win. See Hino (2019) for a full history of the environmental goods negotiations and the effects of trade in environmental goods.

¹² The Bank for International Settlement (BIS 2020) has repeatedly emphasized that we are required to change our paradigm in order to address the risk of incurring significant costs. We agree with this statement of the BIS (2020).