

Original Paper

Have International Trade and Tourism Been Affected by the COVID-19? The Case of Japan

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Abstract

The relationship between international trade and exchange rates has been discussed a lot in the past. In general, depreciation (appreciation) of the currency promotes (reduces) exports, and depreciation (appreciation) of the currency reduces (promotes) imports. This idea has also been supported all over the world empirically, however, two issues have recently occurred, namely COVID-19 and inflation. Both of them have impacted the world economy. This study examines the effects of these issues on international trade in Japan. The empirical results show that the relationship between COVID-19 and international trade was not found to be significant in Japan. Moreover, inflation in Japan has not significantly damaged exports. Of course, these two issues have damaged some sectors of the economy, however, international trade has not significantly declined. Japan has suffered damage due to a temporary decline in international trade and damage to supply chains, but the damage was successfully minimized. Tourism has had restrictions imposed, however, the number of infected persons and domestic policies to prevent the pandemic have not significantly impacted inbound travel.

Keywords

COVID-19, exchange rate, tourism, trade

1. Introduction

The relationship between exchange rates and international trade account or current account has received a lot of attention and has been discussed in a variety of academic fields. On the other hand, this issue has also received significant attention in the business world. For example, in the 1980s, exports from Japan to US had expanded rapidly and trade friction occurred. In September 1985, the Plaza Accord was signed among major developed countries to prevent currency depreciation against the US dollar. In particular, exports that have traditionally been thought to be linked negatively with appreciation of the currency were focused. In Japan, exports had been damaged in reality a few years later and recession occurred.

It has been said that the Japanese economy depends on exports. Domestic currency depreciation is commonly thought to expand exports and lead to economic growth. Equity market participants, in many cases, appreciate exchange rate depreciation, and when the depreciation occurs, Japanese equity prices rise as Japan is an export-oriented country.

On the other hand, the relationship between international trade and exchange rates should be examined carefully. For example, after the Plaza Accord, the yen appreciated surely, however, exports had not decreased for a few years. Moreover, during the Abenomics era (from 2013), monetary expansion and depreciation of the yen had been promoted, however, international trade does not become surplus. So, the standard relationship might not always hold. Moreover, COVID-19 occurred and inflation occurred from the year of 2020. These issues have not been examined fully.

This study examines the relationship between international trade and exchange rate for the case of Japan. Moreover, COVID-19 and inflation are also considered in the examination of this issue. It is structured as follows. Following this introduction, section 2 reviews existing papers on this topic. Section 3 provides a theoretical view to examine this issue and empirical analyses are performed in section 4. Finally, a brief summary is provided in section 5.

2. Existing Studies on This Issue

There are many related studies about the relationship between exchange rates and international trade presented until now. This study examines the issue using recent Japanese data. Tunggal and Kadir (2015) revealed that there are long-term relationships between exchange rates and money stock, income, interest rate and current account for Malaysia. Hanslin, Lein, and Schmidt (2016) suggested that the elasticities of demand and the ones of exchange rate changed hugely in Switzerland. Aman et al. (2017) found that exchange rate has led to economic growth positively through the increasing of exports. Haider and Adil (2017) revealed that the real exchange rate does not have impacts on exports. Iwaisako and Nakata (2017) showed that the economic shocks and exchange rate direction do not cause shocks and reports that this fact explains why exports changed in Japan. Kurtovic, Halili, and Maxhuni (2017) found the existence of J-curve on international trade in Austria, Croatia, and Germany. Mahmood, Al Khateeb, and Ahmad (2017) indicated that Saudi rial's depreciation causes increasing of international exports in the field of industry. Moslares and Ekanayake (2018) revealed that exports have positive influences on economic growth and have also impacts on the real exchange rates negatively. Lourenco and Vasconcelos (2019) revealed that appreciation of exchange rate does not reduce exports in Brazil. Shah et al. (2022) found that China's real exchange rate volatility and misalignment have positive impacts on China's real exchange rate misalignments.

The spillover effects have gained attention and been examined. Mario (1992) showed that the delinking between exchange rate and international trade mobility reduced the technological gap between the trading partners. Kato (2015) revealed that technology-intensive goods reflect real exchange rates movements to a greater extent in China and Taiwan than in other countries. Rose (2018) found that quantitative easing

policy have an influence on exports. Pizada (2019) confirmed that exchange rate shocks have significant positive impacts on exports. Wang and Xu (2022) suggested that the exchange rate of different economies shows a significant consistency in the change of spillover on oil prices.

The relationship between exchange rate volatility and exports has also been examined for a long time. It is an old and new topic of international trade. Kroner and Lastrapes (1993) confirmed that the estimated coefficient of the impact of volatility on exports is not significant by employing the traditional estimation method. Kurihara (2013) showed that exchange rate fluctuations caused a negative influence on international trade in developing economies. Pino, Tas, and Sharma (2016) found that exchange rate volatility has an impact on export not only in the short-term but also in the long-term. Barseghyan and Hambarzumyan (2018) revealed that the exchange rate volatility is considered to be a significant factor in exports. Beckmann (2018) found clear results of a relationship between exchange rates and economic fundamentals, and also reported that monetary approach is hold. Lin, Shi, and Ye (2018) stated that volatility of exchange rate has a negative impact. Chang, Raiput, and Bhutto (2019) suggested that the influence of exchange rate volatility on U.S. exports cannot be shown. Caglayan et al. (2021) showed that the reaction of the export to exchange rate shocks is positively linked to exchange rate volatility, however, the penetration into export markets prevents the economy from real exchange rate shocks. Zeng et al. (2022) demonstrated that the higher uncertainty of RMB exchange rate, led by the policy change, declined Chinese exporters' reaction of investment to their demand shocks. The relationship between exchange rate volatility and international trade had appeared to be negative, but recent studies have been inconclusive. The mixture can be explained that the promotion of hedging strategies against exchange rates may be linked with the results.

For the relationship between international trade and COVID-19, there have been few studies until now because not much time has passed. Only the volume of international has been presented. More generally, epidemic outbreaks have often led to a decline in the number of tourists in spectator countries, even if only temporarily (Novelli et al., 2018; Siu & Wong, 2004). For tourism, there are not many studies (Brau et al., 2011; Brida et al., 2016). Hoarau (2022) revealed a positive link between COVID-19 spread and inbound tourism visitors. In the early stages of the prevalence, international tourism could be acknowledged widely as one of the main elements responsible for the pandemic. Konstantin et al. (2020) found that the prevalence had negative impacts on the demand and supply side of international trade, on the other hand, international trade restrictions and exchange rate fluctuations had no influence on Swiss trade. Karan and Bhavesh (2022) showed that there have been risk influences on the stock and exchange markets.

3. Theoretical Analysis

This study examines the relationship between exchange rate and international trade empirically. In general, as confirmed in section 2, depreciation (appreciation) of the currency promotes (reduces) exports, and depreciation (appreciation) of the currency reduces (promotes) imports. Using recent data, these

common ideas for Japan are checked first. Also, as domestic prices in Japan have been rising, these effects on international trade should be examined. This study considers a situation.

Apart from this, one big issue has occurred, namely COVID-19. The volume of international trade has shrunk, however, the relationship between COVID-19 and international trade should be examined carefully. This study employs two variables, namely the number of infected persons and policies which the Japanese government conducted.

Moreover, Japan now cannot profit from exports which had been provided by manufacturing industries. Instead, Japan has been obtaining profit from interests, dividends, and tourism. Tourism is added as a dependent variable and the relationship between the tourism and exchange rate is examined. Finally, the relationship between COVID-19 and tourism is also examined.

4. Empirical Analyses

To examine the issues provided in section 3, regression analyses were conducted. First, these three regressions are performed.

$$\text{Trade} = \alpha + \beta \text{exchange rate} + \varepsilon \quad (1)$$

$$\text{Export} = \alpha + \beta \text{exchange rate} + \gamma \text{domestic price} + \varepsilon \quad (2)$$

$$\text{Service} = \alpha + \beta \text{exchange rate} + \gamma \text{domestic price} + \varepsilon \quad (3)$$

Trade denotes export plus import of Japan. Yen/US dollar exchange rate is employed for all of the regressions. Consumer price index is used as domestic price for these estimations. Monthly data is used. The sample period is 2010m1-2022m12. Data source are as follows. Trade, export, and service are from Ministry of Finance, Japan. Exchange rates are from IMF's International Financial Statistics. Domestic prices are from Ministry of Internal Affairs and Communication in Japan. Each equation is estimated by the least squares. The results are in Table 1.

Table 1. Relationship between International Trade and Exchange Rate, Domestic Prices

	(1)	(2)	(3)
C	11419.68*** (2.7908)	-83700.83*** (-2.7019)	6435.844 (0.5587)
Exchange rate	-118.2286*** (-3.0544)	309.0948*** (5.0498)	13.8003 (0.6064)
Domestic price		1151.982*** (3.1076)	-103.4821 (-0.7508)
Adj.R2	0.0510	0.5995	-0.0093
F-statistic	9.3291	117.0196	0.2844
Prob (F-statistic)	0.0026	0.0000	0.7528
Akaike info criterion	20.6346	20.2301	18.2514

Durbin-Watson stat	0.9369	1.9532	1.9532
Independent variable	Trade (export+import)	Export	Service
Sample period	2010m1-2022m12	2010m1-2022m12	2010m1-2022m12

Note. *** denotes significance at 1%, ** denotes at 5%, and * denotes at 10% respectively.

The estimation results are good except for equation (3). Depreciation of yen promotes exports. On the other hand, for the case of using service account as an independent variable, the results are not positive. One reason is that services are, in general, not traded internationally.

Moreover, tourism is employed as an independent variable. Japan, as a country, has been transitioning from manufacturing industries to tourism, interest rates, and dividends. To analyze this, it would be necessary to consider the effects of COVID-19 on tourism. So, the number of infected persons and quasi-emergency measures/state of emergency in Japan are also included as explanatory variables.

$$\text{Tourism} = \alpha + \beta \text{exchange rate} + \gamma \text{domestic price} + \varepsilon \quad (4)$$

$$\text{Tourism} = \alpha + \beta \text{exchange rate} + \gamma \text{domestic price} + \delta \text{Number of infected persons} + \zeta \text{quasi-emergency measures/state of emergency} + \varepsilon \quad (5)$$

$$\text{Export} = \alpha + \beta \text{exchange rate} + \gamma \text{domestic price} + \delta \text{Number of infected persons} + \zeta \text{quasi-emergency measures/state of emergency} + \varepsilon \quad (6)$$

The result of the equation (4) is almost expected. Depreciation of the yen promotes inbounds (travelers toward Japan), however, domestic prices are positively related with inbounds. As Japanese prices had not raised much until 2021, the effects may be limited.

On the other hand, the results of equations (5) and (6) are not positive. In particular, both of the variables, namely, number of infected persons and quasi-emergency measures/state of emergency have not had significant impacts on tourism and exports. Deterministic elements of inbounds have been exchange rates instead of COVID-19 related issues.

It may be a surprise that no causal relationship was found between the number of travelers and the number of people infected with the COVID-19. This may be due to the impression that Japan is a safe country and due to the fact that the number of infected people was not so large in Japan, but it seems that the government's immigration and departure restrictions had a direct and strong impact on inbound tourism.

Table 2. Tourism between International Trade and Exchange Rate, Domestic Prices

	(4)	(5)	(6)
C	-24626.48*** (-5.6429)	-38954.43*** (-5.4288)	458433.3
Exchange rate	12.9952 (1.5071)	-32.5981*** (-4.2953)	1297.921*** (4.3968)
Domestic price	241.7093***	427.2911***	-5373.920*

	(4.6285)	(5.4211)	(-1.7528)
Number of infected persons		-2.97E-05	0.0001
		(-0.7953)	(0.7055)
		17.0246	835.8178
Quasi-emergency measures/state of emergency		(0.2363)	(0.2983)
Adj.R2	0.4677	0.5383	0.6815
F-statistic	67.2251	10.9082	19.1835
Prob (F-statistic)	0.0000	0.0000	0.0000
Akaike info criterion	16.3103	13.4199	20.7417
Durbin-Watson stat	0.2290	0.7929	1.0057
Independent variable	Tourism	Tourism	Export
Sample period	2010m1-2022m12	2020m1-2022m12	2020m1-2022m12

Note. *** denotes significant at 1%, ** denotes at 5%, and * denotes at 10% respectively.

5. Conclusion

This study examined the relationship between international trade and exchange rates. Empirical analyses re-confirmed that depreciation (appreciation) of the currency promotes (reduces) exports, and depreciation (appreciation) of the currency reduces (promotes) imports between the case of Japan. Recently, two issues have occurred, namely COVID-19 and inflation when analyzing international trade. Both of them would surely hit trade in Japan. However, the empirical results show that a significant relationship between COVID-19 and international trade cannot be found in Japan. Moreover, inflation in Japan has not damaged exports. These two issues damaged the economy in some sectors, however, international trade has not significantly declined. Japan has suffered damage due to a temporary decline in international trade and damage to supply chains, but the damage was successfully minimized. Tourism has had restrictions imposed, however, the number of infected persons and domestic policies to prevent the pandemic have not significantly impacted inbound significantly.

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