Export Experience and the Choice of Invoice Currency: Evidence from Questionnaire Survey for Japanese SMEs[†]

Mizuki GOTO
Graduate School, Hitotsubashi University, Japan

Kazunobu HAYAKAWA
Development Studies Center, Institute of Developing Economies, Japan

Satoshi KOIBUCHI
Faculty of Commerce, Chuo University, Japan

Taiyo YOSHIMI[*]
Faculty of Economics, Chuo University, Japan

Abstract: This study examines determinants of the invoice currency with a focus on the effect of export experience based on the questionnaire survey for Japanese small and medium enterprises (SMEs) in the manufacturing industry. We find that exporters who have a long experience in exporting tend to switch the invoice currency from Japanese yen to foreign currencies. The interpretation is that export experience provides firms with the know-how to deal with the exchange rate risk and enables firms to use foreign currencies in their exports. This effect survives even if firms intermittently export from their first exports. We also find that the yen is more likely to be chosen in the first export when the age of the exporter is higher, the sales value of the exporter is smaller, the exporter has an initiative in the determination of the invoice currency and the exporter started exporting before the global financial crisis in 2007.

Keywords: Invoice currency; Export dynamics; Questionnaire survey; SMEs; Japan
JEL Classification: F1; F3

[†] We would like to thank Dai Mi, Jianwei Xu and Shajuan Zhang. We also thank seminar participants at Kobe University, Japan Society of Monetary Economics and Research Institute of Economy, Trade and Industry (RIETI) for helpful comments and suggestions. We acknowledge financial support from Chuo University Joint Research Grant and the JSPS KAKENHI Grant (JP20H01518). All remaining errors are ours.
[*] Corresponding author. Faculty of Economics, Chuo University, 742-1 Higashinakano, Hachioji-shi, Tokyo, 192-0393, Japan. Email: yoshimi@tamacc.chuo-u.ac.jp.

1. Introduction

The currency used in invoicing of trade defines who takes the short-run exchange rate risk in international trade. The type of the invoice currency is generally classified into three types: producers' currency pricing (PCP) where the exporter's currency is used in invoicing, local currency pricing (LCP) where the importer's currency is used, and vehicle currency pricing (VCP) where the internationalized third currency is used. As known, the US dollar is mostly used in the case of VCP and many researchers call this phenomenon the dominant currency paradigm (DCP) in international trade.[1] To reveal how and what currencies are employed in international trade, many researchers investigate the determinants of invoice currency. Our study is related to at least two pieces of literature. One is the literature on the choice of invoice currency. For instance, as a seminal theoretical analysis, Engel (2006) investigates how the invoice currency is determined based on the profit-maximizing motivation of exporters. Gopinath et al. (2010) introduce the dynamic perspective into the framework of Engel (2006) and conduct a detailed empirical analysis of the choice of invoice currency with the firm-level data of the US. In addition, Chung (2016) considers how exporters' dependence on imported inputs affects their choice of the invoice currency using the firm-level data for the United Kingdom. Devereux et al. (2017) investigate the role of firms' market share in the choice of the invoice currency using Canadian data.

Among many potential determinants, we focus on the effect of firms' export experience on the choice of the invoice currency. This aspect has rarely been examined in this literature. To the best of our knowledge, the only research on this aspect is Hayakawa et al. (2019) which theoretically and empirically investigate the relationship between the length (years) of Thai firms' export experience and changes in the invoice currency from the first export to the current export. In this study, we conducted a questionnaire survey for Japanese small and medium enterprises (SMEs) to examine the effect of firms' export experience on the choice of the invoice currency. The reason why we focused on SMEs is that learning effects through export experience on firms' activities may be clearer in relatively small companies. In large companies, we expect, other elements are complicatedly related to each other and it may be difficult to identify the learning effect. In this survey, we sent the questionnaire to 2,100 SMEs and accepted responses from 9 November 2019, to 31 January 2020. The respondence rate is 14.1%. By using the unique dataset constructed using these responses, we examine how the length of firms' export experience affects a change in the invoice currency from the year when firms started exporting to the present (the year of 2019).

Our expectation for the effect of the export experience on the choice of the invoice currency is as follows. In the literature of export dynamics, it is pointed out that export starters tend to begin with a small number/value of exports, then continue to export if they

[1] See Gopinath et al. (2020) for instance.

expect from the first export that their overseas business will produce sufficiently positive gains (Albornoz et al., 2016). The important insight of this argument is that firms learn from their initial experiences and, given the know-how they gained from the experience, they decide on their present behavior. Inspired by this insight, we explore the learning effect of export experience on the choice of the invoice currency. In particular, we expect that firms switch from PCP to foreign currency pricing (FCP, which includes LCP and VCP) after sufficient export experiences. Experienced exporters have knowledge not only of the economic situations of destination countries but also of exchange rate risks. Therefore, it might be a natural expectation that more experienced exporters are more likely to use FCP. FCP brings the exchange rate risk to the exporter but can attract a demand by risk-averse importers. More clearly, if exporters choose PCP and impose the exchange rate risk on importers, importers may decrease their demand not to take a large exchange rate risk. This behavior of risk-averse importers has not been treated sufficiently although it is naturally predicted from studies such as Wolak and Kolstad (1991) and Coppejans et al. (2007).[2] Export experience may mitigate the disadvantage of FCP for exporters through the accumulation of the know-how to treat the exchange rate risk and increase the relative advantage of FCP to attract demand. In sum, as our testable empirical proposition, it is expected that firms switch PCP from FCP after accumulating export experiences.

This study has three advantages to Hayakawa et al. (2019). The first advantage is that we directly ask respondent firms the year of their first exports. Hayakawa et al. (2019) regard the first year of exports as the year in which each firm first appears during their sample period from 2007 to 2011. Thus, there remains a possibility that firms first exported before 2007. We resolve this issue by asking about the first year of exports directly in the questionnaire survey.[3] Also, in addition to the export experience, we define other conventional determinants using the questionnaire results. For instance, we identify the type of importer (trading companies, group companies, or nongroup companies) in the first and current exports, and investigate how changes in the type of the importer affect a change in the invoice currency. A change in the invoice currency can happen because the importer changes. We can control for this element. Also, we define exporting SMEs' initiative for the invoice currency by directly asking the major determiner (exporter or importer) in the negotiation. Many researchers point out that the bargaining power is an undoubted determinant of the invoice currency but it has been rarely examined because defining this variable is difficult.[4] Our initiative variable can be regarded as a modest

[2] See Wolak and Kolstad (1991) and Coppejans et al. (2007) theoretically demonstrate that risk-averse agents decrease demand for products whose prices are uncertain in advance.

[3] The clear advantage of Hayakawa et al. (2019) to our study is that they employ comprehensive Customs data of Thailand. As a result, the number of observations in their estimations reaches nearly 0.8 million. In contrast, our questionnaire is focused on Japanese SMEs in the manufacturing industry. Therefore, Hayakawa et al. (2019) and this study are complements.

[4] For example, Goldberg and Tille (2013) consider how bargaining between exporters and importers affects the choice of invoice currency and export prices. Devereux et al. (2017) partially tackle this issue using market shares

proxy for the exporter's bargaining power. The second advantage is that we deal with the sample selection bias in the choice of the invoice currency in the first export. Our main dependent variable is the dummy variable that takes one if the invoice currency was changed from one currency to another. Especially, we mainly investigate the impact of years of export on the likelihood that the exporter switched from PCP (yen pricing) to FCP, expecting a positive impact. Therefore, basic Probit estimation leads to a sample selection bias in the choice of the invoice currency in the first export. We tackle this issue using the Heckman-Probit estimation and confirm the robustness of our empirical result. The third advantage is that we use SMEs' financial information provided by Teikoku Data Bank to see how firms' financial status is related to their invoice currency choice. For example, we can identify "main banks" which have a primarily financial relationship with each SME. If the main bank has international networks, firms may access the foreign exchange market more easily. We examine this possibility. In addition, we identify the sales and the labor productivity of each SME which may impact the choice of the invoice currency.

Our empirical analysis provides the following findings. It is revealed that exporters who have a long experience in exporting tend to switch the invoice currency from Japanese yen to foreign currencies. We interpret this result that firms accumulate the know-how to deal with the exchange rate risk after export experience and switch their main invoice currencies to foreign currencies which enable exporters to accept a demand from their local customers. This tendency survives even if exporters do not continuously export from when they started exporting. It is also found that, in the selection of the invoice currency in the first export, PCP is more likely to be chosen when the invoice currency is mostly chosen by the exporter (i.e. the exporter has the initiative in the choice of the invoice currency). We also find that the yen is more likely to be chosen in the first export when the age of the exporter is higher, the sales value of the exporter is smaller, the exporter has an initiative in the determination of the invoice currency and the exporter started exporting before the global financial crisis in 2007.

The rest of this paper is organized as follows. The next section presents a brief overview of the questionnaire survey. Section 3 shows our baseline results. In Section 4, we deal with the sample selection bias using the Heckman-Probit model. Section 5 performs some robustness checks and Section 6 concludes this paper.

2. Questionnaire Survey

We conducted a questionnaire survey for Japanese SMEs from 9 November 2019, to 31 January 2020.[5] The aim of the survey is to know how the invoice currency is determined from the exporter's point of view. Especially, we explored how their choice of

of exporters and importers.

[5] Also refer to Goto et al. (2021) for the detail of the questionnaire survey. In Goto et al. (2021), we display some other tables and investigate determinants of invoice currency with a focus on firms' financial constraints.

invoice currency, the scheme of exchange rate risk management, and the financial status changed after they continued exporting for years. We sent the questionnaire to 2,100 companies and the respondence rate is 14.1%. Our questionnaire includes many questions related to the choice of the invoice currency in the first and current exports. Table 1 provides some questionnaire results.

=== Table 1 ===

The top panel of Table 1 shows that, for exports to Asian countries (China, Thailand, and other Asian countries), 387 respondents among 510 (about 76%) answer that they use the Japanese yen the most. According to the public data reported by the Japanese Ministry of Finance (MOF), the share of yen-invoicing in Japan's exports to Asian countries is around 50%. The MOF data includes not only SMEs but also large listed companies. Therefore, it is expected that the share of yen-invoicing is higher in exports by SMEs than exports by large companies which are included in the MOF data. The interpretation is that SMEs are not enough capable of the risk of exchange rate fluctuations and prefer PCP to FCP.

The middle panel of Table 1 presents how the respondence companies changed their main invoice currency from the time when they start exporting (i.e. first exports) to the current export. The panel shows that approximately 90.8% of respondents did not change the main invoice currency. This result is consistent with the finding of some existing studies such as Ogawa and Sasaki (1998) that there is inertia in the use of currency. It is notable that the remaining 9.2% changed their main invoice currency.

The bottom panel shows how the invoice currency is usually determined. We used the answer to this question to define the degree of the exporter's initiative in the determination of the invoice currency. Surprisingly, 74.9% of respondents answered that the currency that they (respondents) prefer is usually chosen. In contrast, the share of SMEs who answer that importers have a primary role to determine the invoice currency is only 3.9%.

Other than these answers, we obtained much additional information. For instance, we have information on the type of major trading partner, major export product, and major invoice currency both in the first and current exports for each destination country. We also know the year of the first export for each destination. Therefore, we can calculate the length (years) of export experience of each SME for each destination.

3. Baseline Analysis

3.1. Empirical Framework

Based on the questionnaire survey, we define our empirical variables. Table 2

provides descriptive statistics of the variables, and Figures 1 and 2 present the distribution of our experience variables.

=== Table 2 and Figures 1 and 2 ===

Our main dependent variables is the dummy variable $SWITCH_{fd}$, which takes 1 if exporter f switched from PCP in the first export to FCP in the current export for destination country d, and otherwise 0. Note that each observation has the firm-destination dimension and our dataset is cross-sectional. We firstly investigate the effect of export experience on $SWITCH_{fd}$ focusing on observations where PCP is chosen in the first export. The following is the baseline equation in our empirical investigation:

$$SWITCH_{fd} = a + b\ln(Experience)_f + cv_{fd} + FEs + \epsilon_{fd}. \quad (1)$$

We estimate this equation using the Probit model. $\ln(Experience)_f$ is (the log of) the length (years) of export experience. This variable represents the number of years from the firm's first-export year to the present year (i.e., 2019). This variable is defined at the firm level and this definition is the same as Hayakawa et al. (2019). To see the robustness, we also use $\ln(Experience2)_{fd}$ which is defined as (the log of) the length of the firm's export to each destination country. Thus, $\ln(Experience2)_{fd}$ is defined at the firm-destination level. Exporters might switch from PCP to FCP after they accumulate sufficient export experience. Thus, we expect a positive sign for b. v_{fd} is the vector of other control variables and c is its coefficient. For fixed effects (FEs), we employ industry and region Fes in the baseline estimation.[6] We do not employ a firm FE in the baseline estimation because our main explanatory variable $\ln(Experience)_f$ is defined at the firm level. Nevertheless, we try a firm FE using $\ln(Experience2)_{fd}$ which is defined at the firm-destination level. In addition, we do not employ destination country FE in the baseline estimation because we face crucial decrease of the number of samples in Probit estimations if we use a country FE. In fact, using a firm FE also leads to a significant decrease of the number of samples. Therefore, we estimate the ordinary least square (OLS) model using firm and country FEs to see the robustness of our results. ϵ_{fd} is the disturbance.

3.2. Baseline Results

[6] For industry, we follow the definition by TDB. Regions are Africa (Egypt and the Republic of South Africa), America (Brazil, Canada, Chile, Mexico, Panama, Peru, Puerto Rico and Uruguay), Asia (Indonesia, Korea, Sri Lanka, Malaysia, the Philippines, Singapore, Thailand, Taiwan, Vietnam), China, EU (Switzerland, Czech Republic, Denmark, Luxembourg, Poland, Sweden, Turkey and the UK), Euro Area (Belgium, Germany, Spain, Finland, France, Ireland, Italy, Netherland and Portugal), Pacific (Australia and New Zealand) and the US.

Table 3 shows estimation results for equation (1). Columns (I) to (VI) employ the Probit model, and (VII) and (VIII) employ the OLS model. In all columns, we focus on observations where exporters started exporting under PCP. Column (I) includes $\ln(Experience)_f$, $DifferentImp_{fd}$, and $DifferentProd_{fd}$ with industry and region FEs. $DifferentImp_{fd}$ is the dummy variable which takes 1 if the type of importer is changed from the first export to the current export and otherwise 0. It is reasonable to assume that the importer is changed when the type of the importer is changed. Thus, we can regard that the importer is changed when this dummy variable takes the value 1. $DifferentProd_{fd}$ is the dummy variable which takes 1 if the type of product is changed from the first export to the current export and otherwise 0. The coefficients for these dummies can take either sign. We check these signs to find a fact for Japanese SMEs. Column (I) shows that $\ln(Experience)_f$ has a significant positive impact on the probability that firms switch from PCP to FCP. Also, $DifferentImp_{fd}$ has a positive coefficient implying that the currency tends to be switched from the PC to the FC when the type of the importer changes. We will show that this tendency is observed also for cases where the currency is switched from the FC to the PC. Therefore, the positive sign of the coefficient observed here only indicates that changes in the type of importer may lead to changes in the invoice currency. $DifferentProd_{fd}$ does not have any significant impact.

=== Table 3 ===

Columns (II) and (III) break down the different importer type dummy. In particular, columns (II) includes the dummy variable which takes one if the type of importer changes from a trading company (called "Shosha" in Japanese) to other types ($ToNonShosha_{fd}$). It is well known that transactions with trading companies are usually invoiced in the domestic currency because these transactions are domestically conducted. Consistent with this evidence, $ToNonShosha_{fd}$ has a positive coefficient. In columns (III), we employ the dummy variable which takes one if the type of importer changes from non-group companies which do not have capital ties with the exporter to a group company. This variable does not have any significant impact.

In columns (IV) and (V), we control for the rate of changes in sales and productivity, respectively. $dln(Sales)_f$ employed in column (IV) is the difference in the log of sales from the start year to 2019. As smaller firms do not have a capacity to accept the exchange rate risk, these firms may prefer PCP to FCP, implying a negative coefficient of this variable.[7] Nevertheless, the coefficient is not significant hence the sign is negative as

[7] Hayakawa et al. (2019) present evidence that export prices are lower under PCP in Thai exports. This evidence implies that there are no other choices for exporters but to put lower export prices to accept sufficient demand when they employ PCP. In other words, PCP is the invoicing scheme that negatively affects the demand from risk-averse importers.

expected. Column (IV) adds the difference in the logged sales, $dln(Sales)_f$, to column (I). We find that the coefficient for this additional variable is not significantly estimated, indicating that a change in sales does not let exporters who started with PCP reconsider the invoice currency. This insignificance might stem from the fact that changes in sales are not sufficiently large in our sample. In fact, the mean of this explanatory variable is only 0.25 as shown in Table 2. In column (V), the difference in the logged productivity is employed. Here we define the productivity by the ratio of the sales to the number of employees. This variable does not have any significant impact maybe because, as shown in Table 2, the rate of growth in the productivity is only 15 percent on average in our sample.

Column (VI) replaces the firm level experience ($Experience_f$) with the firm-destination level experience ($Experience2_{fd}$), and show that the firm-destination level experience does not have a significant impact. This result implies that the accumulation of the know-how in the management of exchange rate risks might start from when firms start exporting regardless of destinations. Given this result, we will mainly use the firm level experience in the following robustness checks.

Columns (VII) and (VIII) employ OLS models so that we avoid decreasing the number of samples with inclusion of more detailed FEs. Column (VII) includes region and firm FEs. Major results do not differ from column (I): $Experience_f$ has a positive impact, $DifferentImp_{fd}$ has a positive impact, and $DifferentProd_{fd}$ does not have a significant impact. Column (VIII) includes destination country and firm FEs jointly with the firm-destination level experience $Experience2_{fd}$. Results do not change quantitatively from column (VI). In sum, our main findings do not significantly depend on the choice of FEs.

4. Dealing with the Sample Selection Bias

4.1. Empirical Strategy

Estimation results in the previous section might suffer from the sample selection bias because we focused on observations where firms started exporting under PCP. To overcome this sample selection bias, we employ the Heckman-Probit model in which the selection of invoice currency in the first export is explicitly examined. Our selection equation describes firms' decision on whether to start exporting with PCP or not (i.e., FCP):

$$y_{PCP} = \pi_{PCP} - \pi_{FCP} = x\beta + u_{PCP}$$

$$\text{where } y_{PCP} = \begin{cases} 1 & if \quad y_{PCP} > 0 \\ 0 & if \quad y_{PCP} \leq 0 \end{cases}.$$

These equations indicate that firms choose to export under PCP if the gross profit from

exporting under PCP (π_{PCP}) dominates that under FCP (π_{FCP}). Vector x includes various elements that affect the gap between these profits. Specifically, x contains $Experience_f$, $DifferentImp_{fd}$, and $DifferentProd_{fd}$ that have significant impacts in the baseline estimations shown in Table 3. Vector β indicates coefficients to be estimated. u_{PCP} is the error term.

Next, the outcome equation describes the firms' decision on whether to switch from PCP to FCP given that they started exporting under PCP:

$$y_{SWITCH} = \pi'_{FCP} - \pi'_{PCP} = z\gamma + u_{SWITCH}$$

$$\text{where } y_{SWITCH} = \begin{cases} 1 & if \quad y_{SWITCH} > 0 \quad and \quad y_{PCP} > 0 \\ 0 & if \quad y_{SWITCH} \leq 0 \quad and \quad y_{PCP} > 0 \end{cases}.$$

The equation indicates that firms switch to FCP if the gross profits from exporting under FCP (π'_{FCP}) are greater than those under PCP in future periods (π'_{PCP}). Vector z includes various elements that affect the gap between these profits. Vector γ indicates coefficients to be estimated. u_{SWITCH} is the error term. For error terms, we assume

$$u_{PCP} \sim N(0,1), \qquad u_{SWITCH} \sim N(0,1).$$

y_{SWITCH} can be defined if y_{PCP} is unity. Therefore, this model is effectively a probit model with sample selection (Heckman-Probit) discussed in Van de Ven and Van Pragg (1981).

z contains six variables. First, we employ the log of the age of the exporter when it started exporting ($\ln(Age)_f$). Second, we employ the log of sales when the firm started exporting, $\ln(Sales0)_f$, to examine the size effect. Larger firms may be more capable to exchange rate risks, thus the coefficient is expected to become negative. To check the robustness, we also used the log of the number of employees, and the log of labor productivity which is defined as the ratio of sales to the number of employees although we do not report as the results do not change much. Third, we employ the dummy variable $Initiative_f$ which which takes 1 if the SME chooses "The currency your company prefers is chosen" to the question presented in the bottom panel of Table 1 and 0 for other two options. If the exporter has a significant initiative, it is more likely that the invoice currency is PC so that the exporter can avoid the exchange rate risk. Thus, we expect a positive impact of this variable. Fourth, we employ the dummy variable $Shosha_{fd}$ which takes 1 if the type of importer is a trading company. As we discussed above, it is known that Japanese yen tend to be used in exports through trading companies because the contract between trading companies and Japanese exporters is domestically signed. Thus, we expect a positive impact. Fifth, we introduce the dummy variable $CityBank_f$ which takes 1 for firms whose main banks are city banks (Mizuho, Mitsubishi UFJ, Sumitomo Mitsui, Resona or Saitama Resona) and otherwise 0.[8] These city banks are supposed to

[8] Uchida et al. (2008) point out that large companies tend to have borrowing relationship with city banks, indicating the multicollinearity between $CityBank_f$ and $\ln(Sales0)_f$. Nevertheless, major results do not change

provide better options to avoid exchange rate risks (such as forward exchange contract) for their customers, thus we expect a negative impact of this variable. Sixth, we introduce the dummy variable $AfterGFC_f$ which takes 1 if the exporter started exporting on and after 2008. After the GFC occurred in 2007, it is expected that the degree of risk aversion increased and firms prefer using international currencies such as the USD. Thus, we expect a negative impact of this variable.

4.2. Results

Column (I) of Table 4 shows the results of the Heckman-Probit estimation without FEs. Same as the baseline estimation, in the outcome equation, $Experience_f$ and $DifferentImp_{fd}$ have positive impacts. $DifferentProd_{fd}$ does not have any significant impact. The Chi-squared statistics show that the likelihood of the Heckman-Probit model is significantly larger than the basic Probit model, indicating the presence of sample selection bias in our baseline estimations. The signs of coefficients for all explanatory variables in the selection equation are consistent with our expectation although the impact of $CityBank_f$ is not significant. In column (II), the region FE is included both in selection and outcome equations.[9] Major results do not differ from column (I).

=== Table 4 ===

5. Robustness Checks

In this section, we perform variety of robustness checks. First, there may be a discussion that experienced firms switch the invoice currency just because there were many chances (many years) to reconsider the invoice currency. To answer this caveat, we examine the opposite switch of the invoice currency, that is, FCP to PCP. We define the dummy variable $SWITCH2_{fd}$ which takes 1 if the invoice currency is switched from FCP to PCP and 0 otherwise. Then, we estimate the Heckman-Probit model where the selection equation investigates the determinants of the probability that the FCP is chosen in the first export. We employ same explanatory variables that are used in the previous section. Columns (III) and (IV) of Table 4 show the estimation results. We confirm that the experience does not have a significant impact in both columns. Therefore, firms' export experience enhances themselves to switch from PCP to FCP but not for opposite direction of switch. Intuitively, the impacts of most explanatory variables in the selection equation are opposite to those in columns (I) and (II).

Table 5 shows the results of other robustness checks. Industry and region FEs are used in all columns. In column (I), we include the interaction term between the log of

much if we exclude $\ln(Sales0)_f$ to avoid the multicollinearity.

[9] The convergence is not obtained if we introduce more detailed FEs.

experience and the dummy variable which takes one for observations where firms started exporting after the revision of Foreign Exchange and Foreign Trade Act in 1998. In this revision, restrictions on foreign exchange transactions were removed and agents other than banks were allowed to deal with foreign exchange transactions. The interaction term does not have any significant impact, indicating that the effect of the export experience on the probability of currency switch is not affected by the revision of this law.

=== Table 5 ===

In columns (II) and (III), we dropped outliers. Specifically, in column (II), we drop observations with the upper and lower one percentile of the log of experience. As a result, estimation samples are limited to those with 4 to 64 years of export experience. In column (III), we remove samples with the top quartile of the length of export experience to avoid the estimation bias generated by exporters with long export experience. By doing this, samples are limited to those with less than 30 years of export experience. As shown major findings do not change.

It can be expected that exact years of export experience do not affect the likelihood of switch from the PC to the FC while exporters with relatively long experience tend to switch the currency. To see this possibility, we employ rougher measure of the export experience in column (IV). In particular, we employ the dummy variable which takes one if the log of experience is larger than its mean (20.8 years). Also in this case, the results do not change much.

In column (V), we exclude observations where the destination country is the U.S. as the USD has a distinguish position as a dominant currency in international trade as stated by the literature of DCP and the USD is the local currency in the U.S. Thus, we suppose that we should differentiate the U.S. from other destination countries. In fact, the number of samples is not reduced much because Asian countries such as China and Thailand are the destination country for the majority of observations. The results do not change much although the coefficient for the log of export experience slightly decreases.

In column (VI), we introduce the interaction term of the dummy variable $Discontinue_f$ and the export experience. $Discontinue_f$ takes 1 if the firm answer that it does not continuously exported from its first year of export to the current year. The coefficient for this interaction term is not significant indicating that the effect of export experience survives if firms intermittently export from their first exports.

In the questionnaire survey, we asked the import-side information. We utilize this information in columns (VII) and (VIII). Specifically, (VII) includes the dummy variable which takes one if the firm not only exports but also imports ($Importer_f$), and (VIII) includes the dummy variable which takes one if the firm is an importer and it uses FCs in importing ($ImportFC_f$). As shown in the table, only $ImportFC_f$ has significant positive impact implying that it is more likely that this firm switches from the PC to the FC if a firm

uses the FC in imports. We interpret this result that firms try to marry the exchange rate risk in export and import sides.

Columns (IX) focuses on observations of firms' first exports. More concretely, we dropped observations where the destination country is second and subsequent destination for respective firm. Also in this case, the positive impact of export experience survives although the coefficient becomes somewhat lower than other columns.

6. Concluding Remarks

This study examines the determinants of the probability that the invoice currency is changed from first export to current export using a unique dataset based on the questionnaire study for Japanese SMEs. We find that exporters who have longer experience of exporting tend to switch from PCP to FCP. It is also found that PCP is more likely to be chosen in the first export when the age of the exporter is higher, the sales is smaller, the exporter has a significant initiative, exports are conducted through trading companies, and firms started exporting before the GFC.

This study focuses on positive investigations of the learning effect in the choice of the invoice currency, which has been rarely considered. Nevertheless, there are some policy implications. Internationalization of a currency in trade should be conducted considering firms' profit maximization incentives. Our empirical results present the fact that well-experienced exporters prefer FCP to PCP. This indicates that there is a potential benefit to employ FCP (maybe internationalized currencies such as the USD and euro) not only for importers but also for exporters that has not been sufficiently discussed in the literature. Internationalization of national currency brings a significant seigniorage to the government. However, promoting the use of national currency with the ignorance of this potential benefit of FCP may not be successful. From the result obtained in this study, enforcing exporters' initiative leads to a promotion of the use of national currency. Thus, government's support for exporting firms to differentiate their products may help the internationalization of national currency in trade.

References

Albornoz, F., Calvo Pardo, H., Corcos, G., and Ornelas, E., 2012, Sequential Exporting, *Journal of International Economics*, 88(1): 17–31.

Chung, W., 2016, Imported Inputs and Invoicing Currency Choice: Theory and Evidence from UK Transaction Data, *Journal of International Economics*, 99, 237–250.

Coppejans, M., Gilleskie, D., Sieg, H., and Strumpf, K., 2007, Consumer Demand under Price Uncertainty: Empirical Evidence from the Market for Cigarettes, *Review of Economics and*

Statistics, 89, 510–521.

Devereux, M., Dong, W., and Tomlin, B., 2017, Importers and Exporters in Exchange Rate Pass-through and Currency Invoicing, *Journal of International Economics*, 105: 187–204.

Engel, C.M., 2006, Equivalence Results for Optimal Pass-Through, Optimal Indexing to Exchange Rates, and Optimal Choice of Currency for Export Pricing, *Journal of the European Economics Association*, 4(6), 1249–1260.

Friberg, R., and Wilander, F., 2008, The Currency Denomination of Exports — A Questionnaire study, *Journal of International Economics*, 75: 54–69.

Goldberg, L.S., and Tille, C., 2013, A Bargaining Theory of Trade Invoicing and Pricing, NBER Working Paper 18985.

Gopinath, G., Itskhoki, O., and Rigobon, R., 2010, Currency Choice and Exchange Rate Pass-Through, *American Economic Review*, 100:1, 304–336.

Gopinath, G., Boz, E., Casas, C., Díez, F.J., Gourinchas, P.-O., and Plagborg-Møller, M., 2020, Dominant Currency Paradigm, *American Economic Review*, 110:3, 677–719.

Goto, M., Hayakawa, K., Koibuchi, S., and Yoshimi, T., 2021, Invoice Currency Choice under Financial Constraints and Bargaining: Evidence from Japanese SMEs, RIETI Discussion Paper Series 21-E-080.

Hayakawa, K, Laksanapanyakul, N., Matsuura, T., and Yoshimi, T., 2019, Export Dynamics and the Invoicing Currency, ERIA Discussion Paper Series ERIA-DP-2018-14.

Heckman, J.J, 1974, Shadow Prices, Market Wages, and Labor Supply, *Econometrica*, 42, 679–694.

Ogawa, E., and Sasaki, Y. N., 1998, Inertia in the Key Currency, *Japan and the World Economy*, 10(4), 421–439.

Uchida, H., Udell, G. F., and Watanabe, W., 2008, Bank Size and Lending Relationshipt in Japan, *Journal of the Japanese and International Economics*, 22, 242–267.

Van de Ven, W.P.M.M., and Van Pragg, B.M.S., 1981, The Demand for Deductibles in Private Health Insurance: A Probit Model with Sample Selection, *Journal of Econometrics*, 17, 229–52.

Wolak, F., and Kolstad, C., 1991, A Model of Homogeneous Input Demand under Price Uncertainty, *American Economic Review*, 81: 514–538.

Table 1. Some Questionnaire Results

What is the most frequently used currency in exporting?						
Country	Number of valid responses	Japanese yen	US dollar	Euro	Importer's currency	Other
China	175	126	35	0	13	1
Thailand	115	95	17	0	3	0
Other Asian countries	209	166	38	0	4	1
Oceania	11	8	2	0	1	0
Total	510	395	92	0	21	2

How did your company changed the main invoice currency from when the company start exporting?	
	Number of valid responses
Main currency has not changed much	257
Main currency changed from Japanese yen to foreign currencies	15
Main currency changed from foreign currencies to Japanese yen	11
Total	283

How does your company usually determines the invoice currency in exporting?	
	Number of valid responses
The currency your company prefers is chosen	212
The currency your counterpart (importer) prefers is chosen	56
Other	15
Total	283

Source: Authors' computation.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
PCP0	676	0.70	0.46	0	1
LCP0	699	0.11	0.32	0	1
PCP1	699	0.66	0.48	0	1
LCP1	699	0.11	0.31	0	1
US	699	0.16	0.37	0	1
Switch	448	0.06	0.24	0	1
Switch2	177	0.12	0.32	0	1
ln(Experience)	699	2.83	0.67	0.69	4.16
ln(Experience2)	697	2.46	0.81	0	4.16
DifferentImp	627	0.16	0.36	0	1
ToNonShosha	627	0.05	0.21	0	1
ToGroup	627	0.02	0.15	0	1
DifferentProd	629	0.05	0.22	0	1
d ln(Sales)	667	0.25	0.54	-1.22	2.23
d ln(Productivity	667	0.13	0.46	-1.20	2.86
ln(Age)	688	3.47	0.70	0	4.67
ln(Sales0)	667	7.70	1.32	4.64	11.16
Initiative	696	0.74	0.44	0	1
Shosha	699	0.27	0.45	0	1
CityBank	699	0.45	0.50	0	1
AfterGFC	699	0.52	0.50	0	1
After1998	699	0.77	0.42	0	1
ExperienceLong	901	0.53	0.50	0	1
Discontinue	683	0.09	0.28	0	1
Importer	901	0.94	0.23	0	1
ImportFC	901	0.46	0.50	0	1

Source: Authors' computation.

Table 3. Determinants of the probability that the invoice currency has been changed from PC (in first exports) to FC (in current exports) (Dependent variable: *SWITCH*)

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
	Probit	Probit	Probit	Probit	Probit	Probit	OLS	OLS
ln(Experience)	0.03***	0.03*	0.05**	0.02**	0.02**		0.03*	
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)		(0.02)	
ln(Experience2)						0.01		-0.03
						(0.01)		(0.02)
DifferentImp	0.20***			0.24***	0.24***	0.22***	0.20***	0.20***
	(0.06)			(0.07)	(0.07)	(0.07)	(0.05)	(0.06)
ToNonShosha		0.24***						
		(0.11)						
ToGroup			0.11					
			(0.12)					
DifferentProd	-0.02	-0.01	-0.00	-0.02*	-0.02**	-0.02*	-0.09	-0.26**
	(0.01)	(0.03)	(0.04)	(0.01)	(0.01)	(0.01)	(0.06)	(0.10)
d ln(Sales)				-0.00				
				(0.01)				
d ln(Productivity)					-0.00			
					(0.01)			
Industry FE	YES	YES	YES	YES	YES	YES	YES	NO
Region FE	YES	YES	YES	YES	YES	YES	NO	NO
Country FE	NO	NO	NO	NO	NO	NO	YES	YES
Firm FE	NO	NO	NO	NO	NO	NO	NO	YES
No. Obs.	325	325	325	307	307	325	417	353
R-squared	0.36	0.28	0.22	0.39	0.39	0.34	0.24	0.70

Source: Authors' computation. Estimation results for equation (2).

Notes: Pseud R-squared and adjusted R-squared are reported for Probit and OLS, respectively. ***, **, and * indicate 1%, 5%, and 10% significance, respectively. Robust standard errors are shown in parentheses.

Table 4. Heckman-Probit estimation

	(I)		(II)		(III)		(IV)	
	Selection	Outcome	Selection	Outcome	Selection	Outcome	Selection	Outcome
Dependent variable	*PCP0*	*Switch*	*PCP0*	*Switch*	*FCP0*	*Switch2*	*FCP0*	*Switch2*
ln(Experience)		0.02*		0.00**		-0.00		-0.02
		(0.01)		(0.00)		(0.03)		(0.03)
DifferentImp		0.07***		0.01***		0.10*		0.10*
		(0.02)		(0.00)		(0.05)		(0.06)
DifferentProd		-0.05		-0.00		-0.04		-0.030
		(0.03)		(0.00)		(0.07)		(0.06)
ln(Age)	0.06*		0.07**		-0.06**		-0.06**	
	(0.03)		(0.03)		(0.03)		(0.03)	
ln(Sales0)	-0.05***		-0.06***		0.03**		0.04**	
	(0.02)		(0.02)		(0.01)		(0.02)	
Initiative	0.42***		0.44***		-0.34***		-0.35***	
	(0.04)		(0.04)		(0.04)		(0.04)	
Shosha	0.20***		0.20***		-0.15***		-0.16***	
	(0.05)		(0.05)		(0.05)		(0.05)	
CityBank	-0.04		-0.06		0.07*		0.08**	
	(0.04)		(0.04)		(0.04)		(0.04)	
AfterGFC	-0.14***		-0.14***		0.14***		0.14***	
	(0.04)		(0.04)		(0.04)		(0.04)	
Region FE	NO	NO	YES	YES	NO	NO	YES	YES
Rho	1.00		1.00		0.32		0.34	
	(0.00)		(0.00)		(0.32)		(0.31)	
Chi-squared statistics	7.35***		976.03***		0.87		1.00	
No. Obs.	596		596		613		613	
Log pseudolikelihood	-376.02		-348.63		-345.38		-318.08	

Source: Authors' computation.

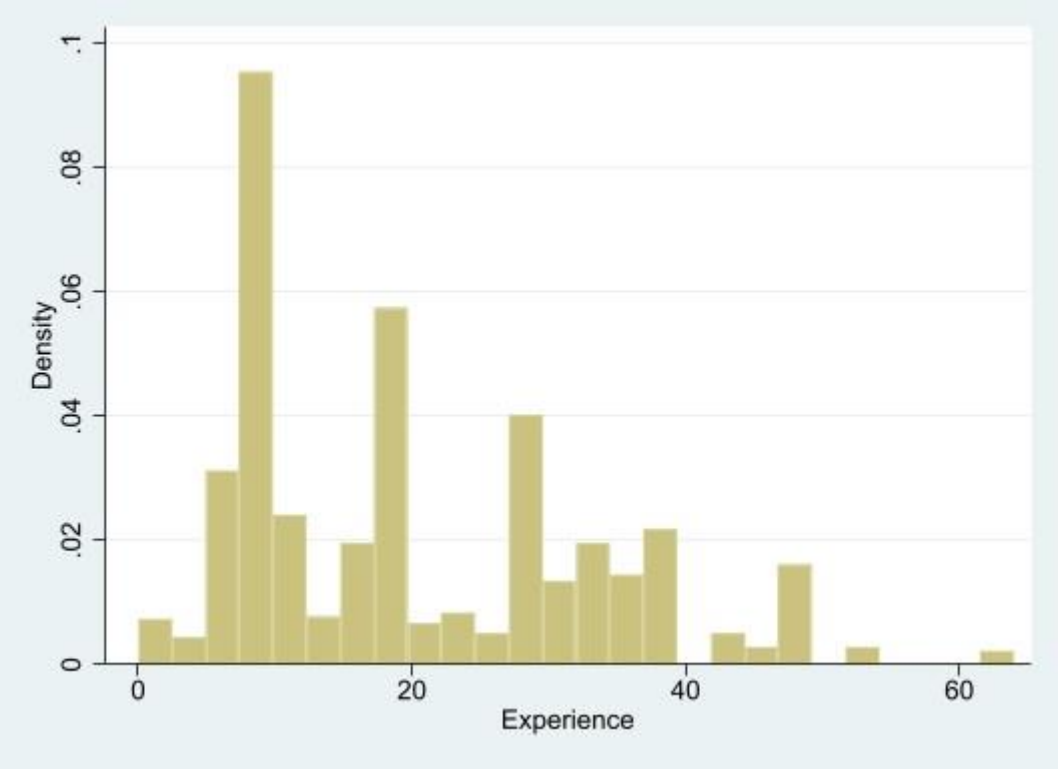
Table 5. Robustness check

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)
	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit	Probit
ln(Experience)	0.03***	0.03***	0.00**		0.02***	0.03***	0.02***	0.02**	0.00**
	(0.01)	(0.01)	(0.00)		(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
*ln(Experience)*After1998*	0.00								
	(0.00)								
ExperienceLong				0.03**					
				(0.02)					
*ln(Experience)*Discontinue*						-0.01			
						(0.01)			
DifferentImp	0.20***	0.20***	0.04***	0.22***	0.25***	0.20***	0.20***	0.18***	0.012
	(0.06)	(0.06)	(0.03)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.01)
DifferentProd	-0.02	-0.02	-0.00*	-0.02	-0.02*	-0.02	-0.02	-0.02	
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	
Importer							-0.01		
							(0.02)		
ImportFC								0.03**	
								(0.02)	
No. Obs.	325	323	204	325	280	321	325	325	125
R-squared	0.37	0.36	0.43	0.35	0.40	0.37	0.37	0.38	0.33

Source: Authors' computation. Estimation results for equation (3).

Notes: Pseud R-squared is reported. Industry and region FEs are used in all columns. ***, **, and * indicate 1%, 5%, and 10% significance, respectively. Robust standard errors are shown in parentheses. Each specification conducts the following robustness check: (I) includes the interaction term between the log of experience and the dummy variable which takes one for observations where firms started exporting after the revision of Foreign Exchange and Foreign Trade Act in 1998; (II) drops observations with the upper and lower one percentile of the log of experience; (III) drops observations with the top quartile of the log of experience; (IV) includes the dummy variable which takes one if the log of experience is larger than its mean; (V) drops exports to the U.S.; (VI) includes the interaction term between the log of experience and the dummy variable which takes one if the firm intermittently exported from its first export; (VII) includes the dummy variable which takes one if the firm is also an importer; (VIII) includes the dummy variable which takes one if the firm is an importer and it uses FCs in importing; (IX) focuses on observations of first exports.

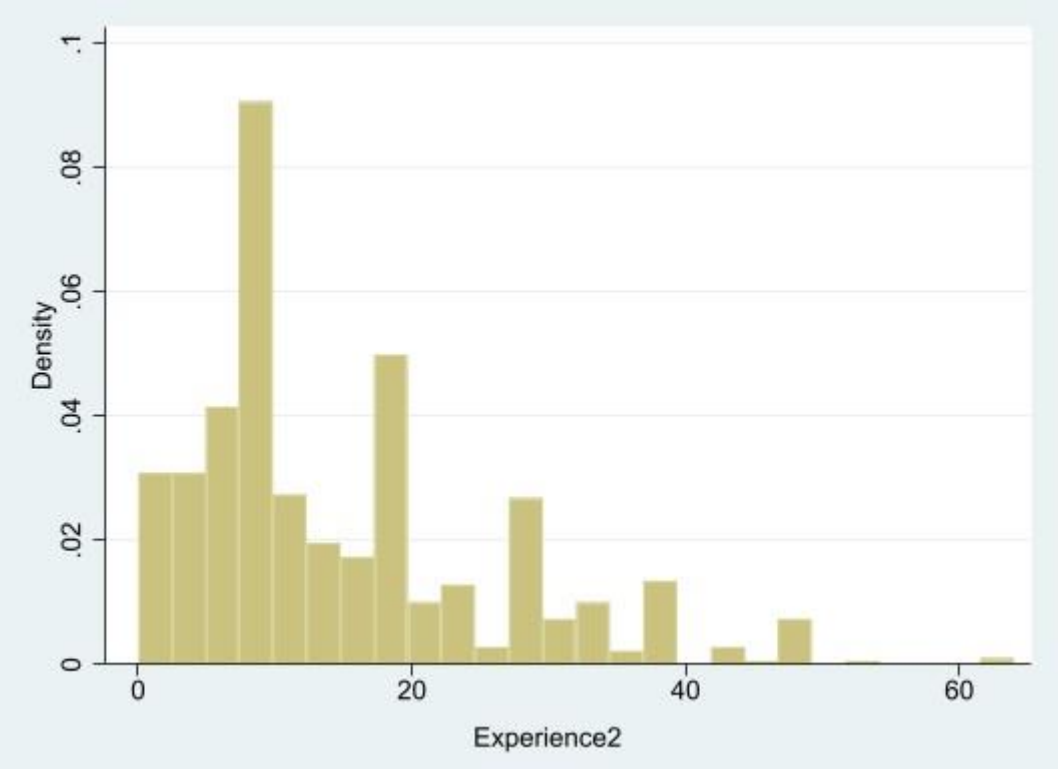
Figure 1. Distribution of *Experience*



Source: Calculated by the authors.

Notes: The figure shows the distribution of *Experience*.

Figure 2. Distribution of *Experience2*



Source: Calculated by the authors.

Notes: The figure shows the distribution of *Experience2*.