学位論文及び審査結果の要旨

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論文の要旨

Japanese economy has witnessed very large and rapid changes of the nominal exchange of the yen vis-à-vis the U.S. dollar, and the exchange risk management is strategically important for Japanese firms.

Previously, Japan was well known for its large trade surplus form the 1980s. However, Japanese trade balance turned into deficit in 2011 because of economic crisis, accompanied with the large depreciation of the Japanese yen vis-à-vis the U.S. dollar. In contrast, in the end of 2012, the Japanese government initiated economic stimulus policy package, so-called Abenomics. This package put an end to the yen appreciation trend and dramatically turned the yen toward large depreciation. In fact, although the yen dollar exchange rate in October 2012 is 78.97, it became 97.73 in October 2013. Moreover, the yen dollar exchange rate touched around 120 in 2015.

Despite large depreciation of the Japanese yen, Japan continued to recode a large trade deficit up to early 2015 (Figure 1-1). When we see figure of trade balance, it looks improved from mid-2014. It is assumed this improvement of Japanese trade balance is likely due to a sharp decline in the world oil price from the mid-2014. Some surveys assert that the reduction of the Japanese trade deficit was caused by J-curve effect. On the other hand, this dissertation argues that it was unlikely due to the J-curve effect, because Japanese export quantity did not exhibit a clear upward trend in response to the sharp depreciation of the yen (Figure 1-2).

This dissertation is based on the research question why Japanese export quantity has become

less responsive to exchange rate depreciation. Following previous studies, this survey suggests the answer of this research question is closely related to the pricing strategy of Japanese exporters in reaction to large fluctuation in the yen.

Therefore, this dissertation consists of three independent research papers; "Exchange Rate Pass-Through and Export Competitiveness," "Invoicing Currency Choice and Export Competitiveness: New Evidence from Japanese Export Firms" and "Invoice Currency Choice and Exports: Why Do Japanese Exports Become Unresponsive to Exchange Rate Changes?"

(1) Chapter1: "Exchange Rate Pass-Through and Export Competitiveness"

This paper aims to investigate possible effects of export competitiveness on the exchange rate pass-through (ERPT) in Japanese exports. In contrast to the previous studies, this paper construct the explanatory variables for export competitiveness to examine the determinants of ERPT: first, the market share of Japanese exports at an industry level constructed by the highly disaggregated commodity level export data and, second, the research and development (R&D) variable constructed by the firm-level R&D expenses. This paper estimates the time-varying ERPT by the Kalman filter technique and conduct a panel analysis to test the hypothesized relationship between the ERPT and the export competitiveness variables. This paper also investigates whether the above hypothesized relationship differs between the yen appreciation and depreciation periods. The empirical results of this paper imply that export competitiveness significantly affects the ERPT strategy of Japanese exporters and also have different impact between yen appreciation and depreciation periods

(2) Chapter2: "Invoicing Currency Choice and Export Competitiveness: New Evidence from Japanese Export Firms"

This paper aims to investigate possible effects of export competitiveness on exchange rate pass-through (ERPT) in Japanese exports. Recent studies such as Shimizu and Sato (2015) investigate the reason why Japanese trade deficit continued to increase from 2012 to 2015 even though the Japanese yen started to depreciate substantially from the end of 2012. Shimizu and Sato (2015) empirically showed that the J-Curve effect did not work well in Japan using the autoregressive distributed lag (ARDL) model, and also that Japanese exporters has strong tendency to pursue the pricing-to-market (PTM) behavior during the yen depreciation period from the end of 2012. Anecdotal evidence suggests that during the unprecedented yen appreciation period, Japanese firms left production of high-tech or differentiated products in Japan, while low-tech or less-differentiated products with high price-elasticity were moved to overseas production base. Thus, this paper may hypothesize that Japanese exporters can continue exports of differentiated products during the yen appreciation period by raising the export price itself (i.e., high ERPT), while they chose the PTM behavior during the yen depreciation period due to their strong export competitiveness. This paper tests the above hypothesis and attempts to show that export competitiveness affects regime-dependent ERPT

behavior of Japanese export firms. This survey constructs new explanatory variables for export competitiveness to examine the determinants of ERPT: first, the market share of Japanese exports at an industry level constructed by the highly disaggregated commodity level export data and, second, the research and development (R&D) variable constructed by the firm-level R&D expenses. This dissertation collects the firm-level data from annual security reports of 831 Japanese major manufacturing firms. Moreover, this paper chooses 50 products from major export manufacturing, "transport equipment," "electric and electronic products," "general machinery (general purpose, production and business-oriented machinery)," and "chemical and related products." We matched the data between 831 firms and 50 products, and finally constructed the product-level explanatory variables that reasonably reflect firm characteristics in Japanese exports of 50 products. To my knowledge, this is the first study that used firm-level information extensively to construct the explanatory variables for an analysis of determinants in ERPT. To empirically test the above hypothesis, this paper estimates the time-varying parameter of exchanger rate pass-through by the Kalman filter technique. In addition, this paper uses the fixed effect method and conduct a panel analysis to investigate hypothesized relationship between ERPT and the export competitiveness of Japanese exporters at a commodity level. This paper also investigates whether the above hypothesized relationship differs between the yen appreciation and depreciation periods. The Empirical results of this paper reveal that the R&D expenditure, which is a possible source of export competitiveness, is a major determinant of exporters' pricing behavior with our hypothesis. As a result, this paper reveal that Japanese exporters with strong export competitiveness can adjust their pricing behavior in response to a strong trend of yen appreciation or depreciation.

(3) Chapter3: "Invoice Currency Choice and Exports:Why Do Japanese Exports Become Unresponsive to Exchange Rate Changes?"

The third part of dissertation reveals the determinates of export quantity movement from 2003 to 2018. As an exploratory variable, this paper utilizes commodity specific invoice share and proxy variable of export competitiveness. The main purpose of this paper is to empirically investigate what causes recent unresponsiveness of Japanese export quantity to exchange rate changes by using 35 product-level data on Japan's export quantity collected from the Ministry of Finance, Japan. Using disaggregated export data is not new, but we make the following three novel contributions. First, this paper collects firm-characteristic data from annual securities reports of 427 Japanese manufacturing firms and constructed the firm-characteristic variables for corresponding 35 export products, such as firms' R&D expenditure (as possible source of export competitiveness) and foreign sales ratio (FSR; as possible measure of firms' overseas production and sales activities). Second, this paper uses the data on invoice currency for 35 export products to consider how invoice currency choice affects export quantity. Following Ito et al. (2016 and 2018), we estimated the share of invoice currency (both yen and the U.S. dollar)

for 35 product-level exports. Recent studies such as IMF (2019), Adler et al. (2020), Boz et al. (2020) argued that the choice of invoice currency as well as global value chains (GVCs) could affect the degree of exchange rate effect on trade, but these studies typically employ a country-level aggregated data on invoice currency choice for a large-scale panel analysis, because more disaggregated data at an industry or commodity level is not readily available (Adler et al. 2020; Boz et al. 2020; Gopinath et al. 2020). Third, we employ product-specific real effective exchange rate (REER) to measure the degree of export elasticity to exchange rates. We use export quantity data that is not destination specific and, hence, we use Japan's REER data for empirical analysis. Following Sato et al. (2013, 2020), we collect industry-level producer price index (PPI) for 28 destination countries and Japan's PPI for 35 export products to construct product-specific REERs. Our empirical analysis demonstrates three results. First, the empirical evidence reveals the difference among the Pre-GVC period (2003-2008), the Post-GVC period (2011-2018) and the whole sample (2003-2018) in terms of the determinants of export quantity fluctuation. During the Pre -GVC period, the REER appreciation (depreciation) tends to have negative (positive) effect on Japan's export quantity. This result is consistent with previous studies. Furthermore, the foreign sales ratio has a positive impact on export quantity. This result means export firms which have large foreign sales ratio tend to increase export quantity due to foreign activity like global value chains or large foreign market share. On the other hand, in the Post-GVC and the whole period, the REER appreciation (depreciation) have negative (positive) effect on export quantity. The Japanese yen invoiced export tend to have negative coefficient. As shown by Ito et al. (2018), more than 50 percent of Japan's exports are invoiced in U.S. dollars and other advanced country's currencies, while the yen accounts for at most more than 30 percent of Japan's total exports. Thus, as long as U.S. dollar invoiced exports account for the largest share, Japanese exports would not improve in response to REER depreciation of the yen. The empirical results of this paper also reveal that the REER volatility has negative effect on Japan's export quantity. As long as Japanese export firms face larger exchange rate volatility, Japan's export quantity is likely to decline. In addition, higher R&D expenditure will lead to an increase in export quantity. If Japanese firms continue to promote R&D expenditure and export competitiveness, the export quantity is likely to increase.

Pleas see reference of each papers, when you want to see the detail information.

審査結果の要旨

本論文は、日本の輸出と為替レートの関係を、(1)為替レートのパススルー、(2)貿易建値通貨の選択、そして(3)日本の輸出数量の決定要因、の観点から実証分析を行った 3 つの章で構成されている。その概要と評価は以下の通りである。

第 1 章では日本の輸出における為替レートのパススルー率の決定要因を、第 2 章では輸出の

建値通貨比率の決定要因をパネル推定によって分析した。積極的な研究開発投資によって競争力を高めた輸出企業は、2007～12 年の歴史的な円高局面で短期的には円建て比率を高めて為替リスクを回避しながら、中長期的にはパススルー率を低下させ、利潤を縮小させても輸入国通貨建て輸出価格を安定させる行動をとった。他方で 2013 年からの円安局面では、海外売上高比率が高く、積極的に海外での生産販売を拡大している企業ほど、円安による為替差益の一部を犠牲にして輸入国通貨建て輸出価格を引き下げていること、特に欧米市場で積極的に生産販売を行っている企業ほど米ドル建て輸出比率を高めていることを明らかにした。第 3 章では日本の輸出数量の決定要因をパネル推定によって分析している。円の実質為替レートのボラティリティが大きいほど、そして円建て輸出比率が高いほど日本の輸出数量が減少するが、研究開発投資が大きい企業の輸出品目ほど為替変動と円建て輸出による負の影響を弱め、輸出数量の低下が抑えられている。他方で、日本企業が積極的に海外での生産販売活動を拡大し、海外売上高比率を高めても、それが日本の輸出数量を有意に増加させる結果は得られなかった。

本論文の特徴は、800 社を超える日本の製造業輸出企業の有価証券報告書を基に企業情報を収集して、企業の為替戦略を反映する説明変数を輸出品目ごとに構築した点にある。日本の主要な輸出 50 品目を対象として、各品目の代表的な輸出企業を選定し、各企業の研究開発投資や海外売上高比率データに基づいて独自に説明変数を構築している点がオリジナルな貢献である。日本企業が海外での生産販売を拡大しても、日本の輸出は拡大しない。むしろ研究開発投資を増加させ、輸出競争力を強化することが、為替レートの変動や円建て比率が輸出数量に及ぼす負の影響を低下させ、日本の輸出数量の増加に貢献しうることが示されている。日本の輸出数量の拡大は、政府の経済政策においても重要な課題であり、政策的な観点からも本論文の分析結果は高く評価できる。

本論文の各章は今後適切な改訂を行えば、査読付き学術雑誌に投稿し、掲載されることが可能な水準にあると考えられる。本論文審査委員一同は、本学府の博士号審査基準③に照らして、吉元宇楽氏の学位請求論文 “Exchange Rate and Japanese Exports: New Evidence of Export Pricing, Competitiveness, and Invoice Currency” が博士（経済学）の学位を授与するに値するものと判断する。

令和 3 年 1 月 26 日

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参考：吉元宇楽氏の指導委員会の構成員は以下の通りである。

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