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Currency Valuation, Export Competitiveness, and Firm Profitability: Evidence from Bangladeshi Firm-Level Data*

Sunghee CHOI¹

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Abstract

The aim of this paper is to empirically investigate whether and how domestic currency valuation is related to firm-level export competitiveness and profitability by using the unique firm-specific dataset on Bangladeshi nonfinancial firms which have been listed continuously from 2010 to 2018. To achieve the aim of this paper, 63 exporting firms are extracted from a total of 125 firms which have been continuously listed during 2010-2018 and used as the final sample firms. The Pedroni cointegration test reveals that export and import prices of the exporting firms are cointegrated in the short-run as well as long-run. The panel dynamic ordinary least square (DOLS) analysis finds that a firm's export competitiveness is maintained by high import inputs even in the presence of depreciation of Bangladeshi currency against the US dollar. Finally, the DuPont analysis finds that the depreciated Bangladeshi currency enhances an exporter's profitability. Conclusions based on the findings are consistent regardless of exchange rate types, such as, real bilateral exchange rate and nominal or real effective exchange rate indexes. Consequently, the firm-level findings of this investigation suggest that undervaluation of home currency is essential for Bangladesh which is one of the frontier markets in South Asia whose exporting firms are mostly price followers in global markets.

Keywords: Bangladesh, Firm-Level Data, Currency Value, Export Competitiveness, Firm Profitability

JEL Classification Code: F14, F23, F31

1. Introduction

According to a conventional trade theory, depreciated home currency plays a key role in increasing exports and consequently contributes to economic growth. In fact, the path of economic growth has been witnessed in South Korea from 1970s to 1980s as well as China for over 30 years, which has been frequently cited as a role model for many developing countries managing exchange rate undervaluation. There also exists a long tradition of empirical research to support the theory and actual policies implemented.

Although the positive relationship between home currency undervaluation and exports has been explained well by country-level analyses, there are very few explanations for such firm-level analyses. Firm-level analysis on the basis of a relationship is essential for designing a more detailed policy which enables promoting firm profitability and then leading to bottom-up growth of an aggregated economy. Further, there exists little research clarifying whether a firm's global competitiveness is affected by currency valuation especially for developing economies. Difficulty in obtaining firm-level data in developing economies is expected to render such small amounts of research on a firm's competitiveness and currency valuation.

By using an unique firm-level dataset from Bangladesh, this paper seeks to find empirical evidence for two research questions: (1) whether and how Bangladeshi currency valuation affects export competitiveness of a firm (2) whether and how the valuation affects profitability of a firm. As one of the leading markets as well as an outstanding participant in the global market during the past decade¹, Bangladesh is the case that has inspired researchers to discover new evidence on South Asia which is recognized as the fastest growing region in the world during last year (World Bank,

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¹First Author and Corresponding Author. Associate Professor, Faculty of Economics and Commerce, Keimyung University, Republic of Korea [Postal Address: 1035 Dalgubeol-daero, Sindang-dong, Dalseo-gu, Daegu, Korea] Email: choisu@kmu.ac.kr

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2019). Moreover, this paper is significant in that it is the first to suggest firm-level evidence on the relationship between home currency value and a firm's profitability for a case of a large developing economy in South Asia, where market-based policies have been implemented extraordinarily during the last two decades.

Empirical analyses using the Bangladeshi firm-level data find that a firm's exporting and importing prices are positively cointegrated during the sample period from 2010 to 2018, implying that exports were not adversely affected by Bangladeshi currency appreciation which could be positively related to imports. Thus, export competitiveness of the firm's could be maintained even in the presence of domestic currency appreciation. In addition, the DuPont model analysis found that a firm's profitability measured by returns on equity was adversely affected by domestic currency valuation, meaning that Bangladeshi currency depreciation enhanced a firm's profitability whereas its appreciation harmed the profitability.

This paper provides a significant implication to exchange-rate policy makers in developing economies, that undervaluation of domestic currency matters by encouraging firms to promote exports and profitability. Because exporters in developing economies participated in global markets with price-competitive products, appreciated home currency will not help exporting performance, which will consequently harm profitability of these firms. Considering that export margins are typically thin and global competition continually squeezes profits in the textile and garment industry, exporters in developing economies, including Bangladesh will be negatively exposed to the economic environment of appreciated home currency. In conclusion, Bangladeshi exchange rate policy needs to be managed in the direction of undervaluation of home currency for enhancing export-competitiveness as well as profitability of firms which are mostly price followers in competitive global markets.

The remainder of this paper is organized as follows. In section two, this paper reviews the existing literature with focuses on the concept of price-competitiveness as well as relatively insufficient evidence from firm-level studies in developing economies about the effect of currency valuation on export and

profitability. Section three describes the data, variables, and summary statistics. Section four presents empirical results for the two research questions mentioned above. Section five suggests concluding remarks with implications.

2. Literature Review

Since competitiveness of a firm is recognized as a term with various economic concepts that cover national, industrial, regional, and enterprise capability (Kantha, 2015), how to appropriately measure it is controversial. From the perspective of international trades, competitiveness in global

markets in which a firm is involved is a key indicator. Yet, it is not conclusive to make appropriate measurement for the competitiveness because of its various measurement approaches. For example, trade-based approach suggests revealed comparative advantage (RCA) analysis and constant market share (CMS) analysis, and productivity/efficiency-based approach suggests total factor productivity (TFP) and stochastic production functions. More recently, price-based approach used relative trade prices, unit labour cost and real effective exchange rate (Zia & Mahmood, 2013). Based on the definition of firm-level competitiveness by Altomonte et al. (2011)², the global perspective approach seems to be most appropriate for measuring competitiveness of a firm in an open economy.

Although the question on measurement and definition of firm competitiveness is still debated, it is well documented in theoretical and empirical literature that the exchange rate is closely related to the global competitiveness of a firm. Abeyasingh and Yeok (1998) argue that Singapore exporters maintain competitiveness in the global market by reducing their profit margins in the presence of home currency appreciation. If there is high import content in the production of exports, then exports are not adversely affected by currency appreciation, because low imported input prices due to appreciation of currency reduce the cost of production of exportables. Fang et al. (2006) also confirmed that home currency depreciation encouraged exports in Indonesia, Japan, Korea, Singapore, Taiwan, and Thailand although export growth was weak. Alternatively, by appreciation of home currency the cost of production of exportables decreases to the extent of the import content of exports. At the same time, export price in local currency decreases with an appreciation of the currency. The net impact would depend on whether the effect of appreciation on export price offsets the effect of decrease in cost of production due to the use of low price imported inputs. Recent studies have been gradually moving to focus on the relationship between exchange rate volatility and trade margins, rather than exchange rate level and trade volume (Auboin & Ruta, 2011).

Additionally, most of the existing studies on the relationship between exchange rate and international trade competitiveness have been carried out by macroeconomic perspectives. As one of the most known approaches, Bostan et al. (2018), pointed out the "absorbance theory" which clarifies how exchange rates affect national income and international trade. Based on the theoretical approach, there exists abundant evidence from various countries and different periods. For example, Bostan et al. (2018) cited that the effect of home currency depreciation on national income and trade was manifest not at once but after a certain period of time, and Dornbusch (2000) found that the effect of exchange rate on international trade evolved with the national interest rate alteration because depreciation is expected to cause inflation. Recent studies have been

focusing on the transmission channel from exchange rate to interest rate in capital markets, international trade in goods markets, jobs in labor markets and national monetary and economic policy according to the fact that the exchange rate is recognized as the most important price in any economy because it affects all other prices (Egilsson, 2020; Frieden, 2016). Besides, the recent Asian case studies dealing with the export competitiveness consequently aimed at finding its relationship with the national economic growth. Sujianto et al. (2020) aimed at finding the effect of net exports on economic growth in Indonesia, Nguyen (2020) focused on the effect of exports on economic growth in Vietnam, and Khusainov et al. (2017) suggested the importance of export competitiveness enhanced by Eurasian economic union for economic growth in a central Asian country, Kazakhstan.

Observing that existing empirical studies do not provide abundant firm-level evidence on the relationship between an exporter's competitiveness and currency valuation especially for developing economy cases, this paper seeks to find the effect of the exchange rate on an exporter's competitiveness and profitability for a case of Bangladesh. This firm-level study contributes to filling the lack of material in the long history of the relevant literature, influenced by macroeconomic perspectives. Also, this paper is expected to provide a policy implication about the importance of currency valuation to developing economies which have

been recently implemented by a market-based exchange rate policy and following the successful path of a China and South Korea economic development.

3. Data: Exchange Rate and Sample Firms

As the exchange rate variable, we use the monthly nominal³ bilateral exchange rate of the Bangladeshi Taka against the US dollar (BDT/USD) from the Bangladesh Bank, the central bank of Bangladesh. In Figure 1, the time-series plots of the foreign exchange rate and the exchange rate changes in Bangladesh are shown; the figure shows that the exchange rate rose sharply from January 2010 to September 2011 and gradually from January 2017 to December 2018. In addition, the rate fell from October 2010 to December 2012 and the movements were stable from January 2013 to December 2016. The exchange rate data is basically the same as the one of Choi et al. (2020).

For the sample firms, this paper first retrieved 125 nonfinancial firms which had been listed continuously in the Dhaka Stock Exchange (DSE) from 2010 to 2018. Table 1 shows the firms by industry classification. The number one industry that the sample firms are affiliated with is Textile, which is consistent with the fact that Bangladesh is a significant participant in the global value chain of the apparel industry.

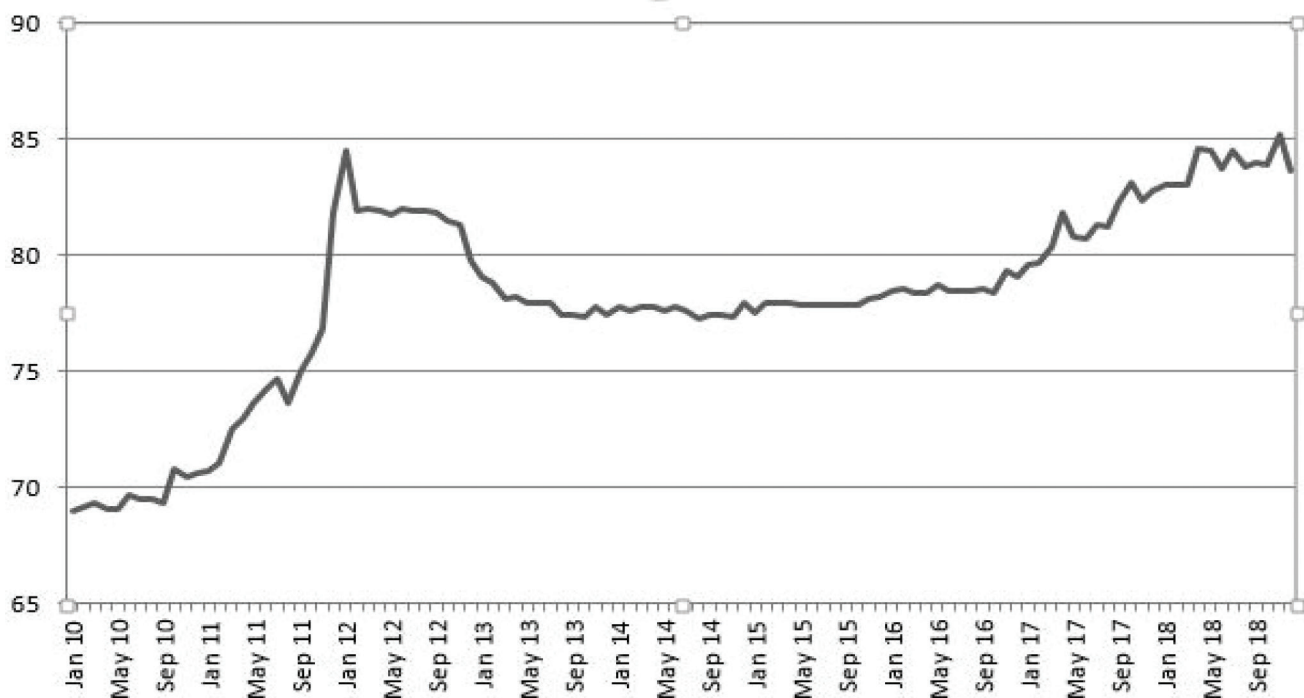


Figure 1: Monthly exchange rate of BDT/USD, 2010–2018

Source: Bangladesh Bank

Table 1: Classification of the 125 Sample Firms

Industry Name	Cement	Ceramic	Engineering	Food & Allied	IT	Fuel & Power	Jute	Paper & Printing	Pharmaceuticals & Chemicals	Service & Real Estate	Tannery	Telecommunication	Textile	Travel & Leisure	Miscellaneous	Total
No. of Firms	5	5	20	13	5	12	3	1	19	3	5	1	23	1	9	125

Source: Annual Reports of Firms, Bangladesh

Table 2: Descriptive Statistics

	No. of observations	Mean	Median	Standard Deviation	Maximum
Panel A: All firms					
Assets	1125	10793341136	1895502412	40891238109	1136276163016
Total sales	1125	5291282926	1109748903	14353111275	142160635355
MVE	1125	12604944103	1771612766	42126115558	635676153540
ROA	1125	0.04407	0.03246	0.13068	1.5029
Dividend dummy	1125	0.8311	1	0.37482	1
Capital ex./sales	1125	0.1601	0.0515	0.39868	5.728
LT debt/MVE	1125	0.5638	0.51058	0.47155	5.2342
CA/CL	1125	2.4403	1.3659	7.9784	223.786
Panel B: Exporters					
Assets	576	6564712978	1775454690	14309733844	122746301664
Total sales	576	4501246163	1493490339	7926748196	54639767000
Exports*	576	1535816829	390265616	3587429076	34490102247
MVE	576	10628294055	1501786439	29426546673	327197072589
FCD use dummy	576	0.6337	1	0.4822	1
ROA	576	0.05133	0.0307	0.1205	1.5029
Dividend dummy	576	0.8299	1	0.3761	1
Capital ex./sales	576	0.0823	0.03986	0.1456	1.5283
LT debt/MVE	576	0.55654	0.52915	0.28079	2.81
CA/CL	576	2.6562	1.3468	10.843	223.786
Panel C: Non-exporters					
Assets	549	15229934613	2214680050	56358233427	1136276163016
Total sales	549	6120173956	831874605	18848773263	142160635355
MVE	549	14678806448	2362116365	52181332887	635676153540
FCD use dummy	549	0.4681	0	0.4994	1
ROA	549	0.03645	0.03444	0.14028	0.64692
Dividend dummy	549	0.83242	1	0.37383	1
Capital ex./sales	549	0.24176	0.0811	0.5392	5.7281
LT debt/MVE	549	0.571404	0.46599	0.6109	5.2342
CA/CL	549	2.2138	1.3974	2.6662	20.4927

Source: Annual Reports of Firms, Bangladesh.

We then extracted the 63 firms with exports from the total 125 firms to examine export-competitiveness of firms and their profitability. Although all firms are exposed to exchange rate fluctuations regardless of whether they export or not,⁴ focusing on firms with exports helps estimate firm profitability exposure to exchange rate risk more precisely because the value-making structure is different between exporters and non-exporters as Choi et al.'s (2020) theoretical model explains. For example, when the domestic currency depreciates (appreciates), firms exporting price-competitive products enhance (reduce) their firm profitability by increasing relatively cheap exports, whereas non-exporters do not expect to do the same.⁵ More importantly, because it is tested how currency appreciation affects firm's exporters and its profitability later, we need to now segregate the sub-sample firms with exports from the total. Table 2 shows that descriptive statistics of the sample firms about operational and financial performance variables during the sample period. These variables are selected to use for estimating the effect of exchange rate changes on firm-level profitability, such as, return on assets (ROA). All these statistics are the same as those of Choi et al. (2020), but the subsequent analyses are for the firms with exports.

4. Empirical Analysis

4.1. Domestic Currency Valuation, Export, and Import

Following Abeyasingh and Yeok (1998); Razafimahefa and Hamori (2007); Zia and Mahmood (2013), we use the models, namely, the exchange rate appreciation and export-price competitiveness model to analyze the export-price competitiveness. We use export (Px) to reflect export-price competitiveness. This export allows estimating changes in the country's competitiveness over time (t). The long run relationship can be modeled as follows

$$\ln Px_{i,t} = \alpha_0 + \alpha_1 \ln Pm_{i,t} + \alpha_2 \ln UBC_{i,t} + \epsilon_{i,t}, \quad (1)$$

where $Px_{i,t}$ is the export of firm i in year t , $Pm_{i,t}$ is the import of firm i in year t , UBC is unit business cost, which

is a composite index of unit labour cost, fuel and utilities costs of firm i in year t . Px , Pm and UBC are expressed in Bangladeshi Taka (TK) which converted in natural logarithm. In the case of Bangladesh, export can be directly related to unit business cost (UBC) and import (Pm) in which includes the cost of importing raw materials and intermediate goods.

To investigate the causal relationships between $\ln Px$, $\ln Pm$, and $\ln UBC$, we propose to conduct vector error correction model (VECM). The VECM approach requires that the time series be fixed and the existence of cointegration among the variables to be pretested. First, we test a panel unit root to examine whether or not the variables in our model are stationary. Second, we test for cointegration among the variables employing the heterogeneous panel cointegration test developed by Pedroni (1999). Third, once cointegration relationship is established, we investigate the causal relationship between $\ln Px$, $\ln Pm$, and $\ln UBC$ by employing panel VECM. VECM is employed to discern the short-run and long-run Granger causality by applying the OLS method.

The order of the integration of the variables is examined by panel unit root tests *Fisher-ADF*, test equation is none and automatic lag selection based on standard industrial classification (SIC), which are defined by Maddala and Wu (1999) and Choi (2001). The results of these tests are reported in Table 3, indicating that the statistics significantly confirm the level values of all series are non-stationary; that is, all variables are $I(1)$. After the first differencing, it is found that all the variables are stationary at the 1% significance level.

In Table 4, [The panel A] summarizes the results of the Pedroni panel cointegration test, no intercept and automatic lag selection based on SIC, which evaluate the null against both the homogeneous and the heterogeneous alternatives. In this case, six of the eleven statistics do not reject the null hypothesis of no cointegration among three variables: $\ln Px$, $\ln Pm$ and $\ln UBC$ at the 5% level. [The panel B] provides the results of Pedroni panel cointegration test, no intercept and automatic lag selection based on SIC, between the pair: $\ln Px$ and $\ln Pm$. The cointegration tests of Pedroni indicate eight of the eleven statistics reject the null hypothesis of no cointegration relationship between the variables at the 1% or 5% significance level.

Table 3: Panel Heterogeneous Unit Root Test Results

	Maddala and Wu (1999) ADF-Fisher Chi Square		Choi (2001) ADF-Choi Z-stat	
	Level	First Difference	Level	First Difference
$\ln Px$	47.761	389.058***	7.156	-11.557***
$\ln Pm$	55.265	386.09***	5.756	-11.706***
$\ln UBC$	58.287	422.096***	4.239	-12.968***

Note: *** Denote significance at the 1% level.

Thus, it is concluded that $\ln Px$, $\ln Pm$, and $\ln UBC$ do not form a cointegrating relation whereas the export and import pair, $\ln Px$ and $\ln Pm$, do form a cointegrating relationship. Since cointegration implies causation (Granger, 1988), a finding that export and import prices are cointegrated renders strong support for our argument of the leverage provided by a high imported input content towards maintaining export competitiveness (Abeyasingh & Yeok, 1998).

Since $\ln Px$ and $\ln Pm$ are cointegrated, it is necessary to proceed to estimate the long-run cointegration coefficients using the panel DOLS approach (Kao & Chiang, 2000), pooled panel method and automatic lag selection based on SIC. Table 5, the panel parameter is 0.735 for $\ln Pm$. Because the cointegration coefficient with positive sign is statistically significant at the 1% level, it is meant that 1% increase in import raises export by around 0.735%. Also, the positive coefficient supports the argument of high imported input content towards maintaining export competitiveness (Abeyasingh & Yeok, 1998).

To identify the direction of the relationship, we estimate a panel-based error correction model and use it to conduct Granger causality tests on $\ln Px$ and $\ln Pm$. We conduct this identification by using Engle and Granger's (1987) procedure for the short-run and long-run relationships between the variables:

$$\Delta \ln Px_{i,t} = \varphi_{1,t} + \sum_{L=1}^p \varphi_{11L} \Delta \ln Px_{i,t-L} + \sum_{L=1}^p \varphi_{12L} \Delta \ln Pm_{i,t-L} + \partial_1 ect_{i,t-1} + \varepsilon_{1it} \quad (2)$$

$$\Delta \ln Pm_{i,t} = \varphi_{2,t} + \sum_{L=1}^p \varphi_{21L} \Delta \ln Px_{i,t-L} + \sum_{L=1}^p \varphi_{22L} \Delta \ln Pm_{i,t-L} + \partial_2 ect_{i,t-1} + \varepsilon_{2it} \quad (3)$$

where Δ denotes first differences and L is the optimal lag length determined by the Schwarz Bayesian Criterion. Using the specification in Eq. (2) and (3) allow us to test for both short-run and long-run causality. As Table 6 shows, in the short-run import does not Granger-cause export if and only if all the coefficients of φ_{12L} are equal to zero in Eq. (2). In the reverse case, export does not Granger-cause import if and only if all the coefficients of φ_{22L} are equal to zero in Eq. (3). Second, we implement a joint test of $ect_{i,t-1}$ and the respective interactive terms to check for the long-run causality in Eqs. (2) and (3).

By estimating the equations, (2) and (3), we could obtain the results on causality relation between two variables for the short-run as well as the long-run. It is found that a bidirectional causality running between $\ln Pm$ and $\ln Px$ in the short run because we estimated that the coefficient from $\ln Px$ to $\ln Pm$ is 3.079 at the 5% level of significance and the coefficient for adverse direction is 8.416 at the 1% significance level.

Table 4: Pedroni's Heterogeneous Panel Cointegration Test Results

	Within-dimension		Between-dimension	
	Test statistic	Weighted statistic		Test statistic
[Panel A: Three variables: $\ln Px$, $\ln Pm$ and $\ln UBC$]				
Panel v-statistic	-1.235	-4.99		
Panel rho-statistic	0.945	2.282	Group rho-statistic	4.829
Panel PP-statistic	-6.008***	-1.653**	Group PP-statistic	-13.403***
Panel ADF-statistic	-6.079***	-1.613	Group ADF-statistic	-12.958***
[Panel B: Two variables: $\ln Px$, $\ln Pm$]				
Panel v-statistic	-1.343	-4.339		
Panel rho-statistic	-5.044***	-2.18**	Group rho-statistic	2.009
Panel PP-statistic	-10.856***	-6.509***	Group PP-statistic	-14.587***
Panel ADF-statistic	-10.899***	-6.55***	Group ADF-statistic	-16.464***

Note: The null hypothesis is that the variables are not cointegrated. *** indicate statistical significance at the 1% level. ** indicate statistical significance at the 5% level.

Table 5: Panel DOLS Estimates (dependent variable is $\ln Px$)

Independent variable	Coefficient	t-Statistic
$\ln Pm$	0.735***	21.3

Note: *** denote significance at the 1% level.

Moreover, we could find the long run causality because it is estimated that the coefficient from the *ect* variable to *lnPx* is -0.146 at the 1% significance level. Therefore, based on the estimation results, we could come to two conclusions. First, there exists unidirectional long-run Granger causality from *lnPm* to *lnPx* approach. Second, both the panel short-run and long-run causality results imply that changes in import lead to changes in export which is in complete conformity with the result obtained above using the panel DOLS approach. It is worthwhile noting that, our panel short-run and long-run relationship results, which export competitiveness hypothesis is supported in Bangladesh.

4.2. Currency Valuation and Exporter's Profitability: DuPont Model Analysis

Developed in 1919 by E.I. du Pont de Nemours, the DuPont analysis, a common and straightforward method, has been widely adopted in practice for assessing factors that influence a firm's financial performance since its development. Items of a financial statement can be broken down through DuPont for the stakeholders purpose of company performance analysis (Chang et al., 2014; Liang & Yu, 2014; Palepu & Healy, 2008; Stickney & Brown, 2006; Bernstein et al., 2001). Using DuPont analysis, we breakdown ROE (Net_Income/Equity) into asset turnover (Sales/Total_Asset), sales margin (Net_Income/Sales) and leverage ratio (Total_Asset/ Equity). Classical DuPont analysis involves the break down of return on assets (ROA) and return on equity (ROE). It is theoretically argued that TK appreciation will reduce import costs of capital goods, intermediate goods and advanced technologies. Considering the reduction of production cost and strengthening of export competitiveness, it is worthwhile to explore whether TK appreciation has had a negative or positive effect on the profitability of exporters. We estimate the impact of exchange rate movement on exporters' profitability for the 64 firms with exports only. An empirical equation is specified as follows:

$$V_{i,t} = \beta_0 + Post_t + Post_t * Ex_{i,t} + \varepsilon_{i,t} \quad (4)$$

where *V* is the outcome variable, here referring to ROE, sales margin and ROA, of firm *i* in year *t*. *post* is a dummy variable whether year *t* is after TK appreciation. *Ex* is the ratio of foreign sales to total sales of firm *i* in year *t*.

Using the DuPont analysis, we investigate how exchange rate appreciation affects ROE, sales margin and ROA. Table 8 shows the regression results. TK appreciation has a significantly negative effect on the sales margin of exporters which means that the sample firms have a weak capacity for generating revenues in the presence of home currency appreciation, implying that competitiveness of the product price could be deteriorated by the appreciation. Also, we test the interaction effects between exchange rate and export, to total sales on ROE, sales margin and ROA. The results turn out that the coefficient for the ROE, sales margin and ROA are significantly negative. In other words, export profit declines for exporters. There is strong evidence that when the exchange rate appreciated, export profit decreased.

5. Conclusions

By using the 63 exporting firms out of the unique dataset of the total 125 Bangladeshi nonfinancial firms which have been listed continuously from 2010 to 2018, this paper suggests firm-level evidence how domestic currency valuation is related to a firm's export prices and profitability measured by the financial performance variable, such as, return of asset (ROA) or return of equity (ROE).

From 2010 to 2018, a long-run cointegration model showed that firm's export and import prices are cointegrated, which supports the rational argument by Abeyasingh and Yeok (1998), implying the leverage provided by a high imported input content towards maintaining export competitiveness. Also, the panel DOLS approach figured out that 1% increase in import raises export by 0.735%, which supports the argument of high imported input content towards maintaining export competitiveness. Further, using the panel-based error correction model approach, this paper confirmed the results from the panel DOLS approach and arrived at the conclusion that export competitiveness hypothesis is supported in these Bangladeshi nonfinancial exporting firms which have been continuously listed from 2010 to 2018.

Table 6: Panel DuPont Test Results for the 64 Firms with Exports

Effects of TK Appreciation on ROE			Effects of TK Appreciation on Sales Margin.		Effects of TK Appreciation on ROA	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	0.024	3.009***	0.047	6.722***	0.065	6.01***
Post	-0.025	1.511*	-0.0299	1.918**	-0.021	1.855**
Post*EX	-0.043	-2.069**	-0.037	-2.01**	-0.049	-1.702*
Adj. R ²	0.7		0.8		0.6	

Note: ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels of significance, respectively.

Most important finding on how domestic currency appreciation affects the exporting firm's export and their profitability was made by the DuPont analysis. By estimating the interaction effects between exchange rate and export to total sales on ROE, sales margin, and ROA, it is found that ROE, sales margin and ROA were negatively related to Bangladeshi currency appreciation. The result clarifies that export profit declines in the presence of domestic currency appreciation.

This paper provides a meaningful implication to exchange-rate policy makers in developing economies, that undervaluation of domestic currency is important for encouraging firms to promote exports and profitability. Because exporters in developing economies participated in global markets with price-competitive products, appreciated home currency will not help exporting performance, which will consequently harm the profitability of these firms. Considering that export margins are typically thin and global competition continually squeezes profits in the textile and garment industry, exporters in developing economies including Bangladesh will be negatively exposed to the economic environment of an appreciated home currency.

Further study still remains due to some limitations. First, it is necessary to simultaneously check the effect of exchange rate change on export price competitiveness and firm profitability. This paper has a limitation because we deal with each relationship, respectively, by panel DOLS model and DuPont model. Second, it is necessary to include other South Asian developing economies although it is very hard to obtain the firm-level data in developing economies. Enriched sample firms across different countries will enable suggesting a more generalized conclusion.

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Endnotes

- ¹ A frontier market is a type of developing economy that is more developed than the least developing economies but is not yet considered an emerging economy. Bangladesh is classified among the Next Eleven emerging market middle income economies (N-11). Bangladesh has been making efforts for advancing to an open-market economy. For example, Bangladesh established a market-based exchange rate policy in 2003 and achieved noticeable tariff reduction from 70% during 1990-1992 to 13.5% during 2004-2005 (Choi et al, 2020). In addition, Bangladeshi industries started participating significantly in the global value chain such as the apparel industry
- ²Altomonte et al (2011) defined firm-level competitiveness as the ability of firms in a given country-not of the country itself-to mobilize and efficiently employ (also beyond the country's border) the productive resources required to offer goods and services.
- ³When analysing the effect of exchange rate movements on firms in a case of Bangladesh, Choi et al (2018; 2020) it is found that the empirical results are consistent regardless of using the type of exchange rates, such as, nominal vs. real rate or bilateral BDT/USD vs. trade-weighted rate. Thus, for convenience, this paper uses the nominal bilateral exchange rate of TK against USD.
- ⁴It is easily presumed that non-exporters are also affected by exchange rate movements through import activities, the price formation of the product to respond to foreign competitors in the domestic market, and so on. In addition, the rows of FCD use dummy in Table 2 show that about more than 40% of the non-exporters used foreign currency derivatives, implying that exchange rate changes are recognized as risks to be hedged by the sample firms regardless of whether they export or not.
- ⁵Considering that an exporter's enhanced value could be offset by a non-exporter's reduced profitability, these two subsamples provide a precise understanding of the exchange rate effect on firm profitability under different exchange rate movements (e.g. exchange rate appreciation versus depreciation).