

The Impact of the Functional Currency System in Korea on the Value Relevance of Foreign Translation Adjustments

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This study examines whether the introduction of a functional currency system improves the value relevance of foreign translation adjustments in Korea. Companies' incomes and equities have been exposed too heavily on the changes of foreign exchange rates when these companies have transactions in foreign currencies or foreign operations. The adoption of the functional currency system is expected to minimize unexpected foreign translation adjustments from the fluctuation in foreign exchange rates and then improve the value relevance of foreign translation adjustments. We select Korean transportation and manufacturing companies which are usually highly affected by foreign currency exchange rates as a study sample. Using a return/earnings association approach, we find that the adoption of the functional currency system improves the value relevance of foreign translation adjustments for firms that designate foreign currency as a functional currency. After the adoption of the functional currency system, we do not find an incremental effect on the value relevance of foreign translation adjustments for firms that choose a local currency as a functional currency. However, for firms that choose foreign currency as a functional currency, an excessive effect from foreign exchange rates is alleviated thereby improving the value relevance of foreign translation adjustments.

Key Words: Functional currency, Foreign translation adjustment, Value relevance

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I . Introduction

Accounting rules regarding foreign currency

translation accounts have been criticized for inappropriate reflecting economic substances caused by the fluctuation in foreign exchange rates. It becomes relevant issue as Korean

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economy grows, the size of multinational firms' foreign currency-related assets and liabilities becomes bigger, and capital market openness and dependence on foreign capital increases.¹⁾ As a result, Korean multinational firms have been vulnerable to fluctuations in foreign exchange rates, leading some to call for improvements in foreign translation accounting.

Under Korean Generally Accepted Accounting Principles (K-GAAP), the volatility of foreign exchange rates significantly affects firms' value, which confuses information users of financial reports. For example, companies in the marine and air transport industry usually have greater foreign currency liabilities than foreign currency assets, resulting in fluctuating foreign currency-related gains and losses and stock prices.

To improve accounting rules for foreign currency translation, the Financial Supervisory Commission of Korea introduced the concept of the functional currency in 2008.²⁾ The

functional currency system allows companies whose proportion of foreign currency payments were high to keep their books and reports in a functional currency other than Korean currency. Although this functional currency system was introduced to improve the value relevance of financial statements, many firms remained skeptical about the effect of the new system. Even though the Korean government expected the functional currency system to prevent decreases in the book value of multinational firms that have massive amounts of foreign sales, many firms which has many domestic agencies did not welcome to adopt functional currency system.³⁾

In United States, Statement of Financial Accounting Standards (SFAS) No. 8 and 52 are related to the accounting for foreign currency translation. Under SFAS No. 8, gains and losses from currency fluctuations were reported as current income, and US firms were required to translate their foreign affiliates' accounts

1) The Korea Capital Market Institute noted three main reasons for high volatility of foreign exchange rates: high capital market openness, large dependence on foreign capital, and an immature foreign exchange market infrastructure.

2) Three different concepts of currency are used in the functional currency system. In Statement of Financial Accounting Standards (SFAS) No. 52, functional currency is defined as "the currency of the primary economic environment in which the entity operates; normally, that is, the currency of the environment in which an entity primarily generates and expends cash." Local currency is the currency used where the firm is located. Reporting currency is the currency used when reporting the financial statement. For example, a Korean parent company can decide functional currency as USD, but reports financial statements in KRW. In addition, subsidiaries located in US and China can use each local currency as functional currency of USD and CNY.

3) For instance, a news article reported that many multinational firms did not find the functional currency system attractive. Because it would not have been easy for firms to distinguish which currency is the functional currency when they also have a lot of customers in Korea. And companies are burdened by the high cost of changing the accounting system. (Seoul newspaper, 09 Feb. 2009, Available from <http://www.seoul.co.kr/news/newsView.php?id=20090209012014>; Monthly Marine Korea, 02 Mar. 2010, Available from <http://monthlymaritimekorea.com/news/articleView.html?idxno=4940>)

by the temporal method, using a fixed exchange rate regime. SFAS No. 8 was severely criticized for treating the foreign exchange gain and loss as a component of net income. Then SFAS No. 52 was an alternative solution for SFAS No. 8. SFAS No. 52 requires US companies to use the functional currency if the functional currency of foreign operations is not same as reporting currency. Then these companies translate their foreign accounts in terms of the current exchange rate, and report the changes in currency fluctuations in a cumulative translation adjustment account in the equity section of their balance sheet. If the functional currency of their foreign operations is the same as their reporting currency, they apply the temporal method and report the translation gains and losses as net income. Much research has examined its effect on US companies, whether the new accounting rule has improved the value relevance of foreign translation adjustment accounts is still a matter of debate.

Unfortunately, few studies have been conducted on the effect of the introduction of the functional currency system in Korea that could serve to guide firms. The rule of functional currency system and environment surrounding firms in Korea have difference from those in US, further study in Korean case is in need. The only available research to date is a case study of a single marine company that was required to file US Generally Accepted

Accounting Principles (US GAAP) and K-GAAP financial statements concurrently for three years because a US company bought significant proportion of the company (Park et al., 2009).

Thus, this study examines the change in the value relevance of foreign translation adjustments after the adoption of functional currency system in Korea. Using a return and earning association approach following Louis (2003) and Huang and Vlady (2012), we investigate the value relevance of foreign related adjustments. Specifically, we divide foreign related adjustments into foreign translation gain and loss in income, and foreign translation gain and loss from foreign operations reported in equity section under other comprehensive income, observing changes of value relevance on both foreign translation accounts. The results of this study show that the adoption of functional currency system improves the value relevance of foreign translation adjustments for firms that designate foreign currency as a functional currency. The new rule do not change the value relevance of foreign translation adjustments for firms that choose a local currency as a functional currency. However, for firms with foreign currency as a functional currency, transitory parts from changes in foreign exchange rates are diminished, thereby decreasing the excessive effects of foreign translation adjustments on the firms' value. This result may reflect the small sample we could use.

This research study on the adoption of this rule in the Korean case is intended to contribute new evidence to the current disagreement over whether the functional currency system has decreased the information noise related to foreign translation adjustments. Although the sample of firms that use a foreign currency as a functional currency is small, the findings should be of interest to standard-setters, practitioners, and academicians concerned with the effectiveness of the functional currency system in Korea. The results of this research could also help guide the decision making of multinational firms in Korea as to which currency to use as a functional currency, foreign currency or the local currency of the parent company.⁴⁾

The remainder of the paper is organized as follows. The next section provides background information on foreign currency related accounts, changes in foreign translation accounting after the adoption of the functional currency system, and methods of foreign translation adjustment. Section III provides a review of the current literature, Section IV presents the research hypotheses of the study, and Section V describes the sample and methodology used in the study. Section

VI presents the results of this research. Section VII summarizes the thesis and provides concluding remarks.

II. Background

2.1 Foreign currency-related accounts in financial reports

There are four kinds of foreign-related accounts reported in financial statements that occur because of changes in foreign exchange rate. Those are (a) foreign transaction gains and losses, (b) foreign translation gains and losses, (c) gains and losses on overseas operations translation, and (d) translation gains and losses from presentation.

- (a) Foreign transaction gains and losses: gains and losses when collecting foreign assets and reimbursing foreign liabilities. These figures are reported in the income statement.
- (b) Foreign translation gains and losses: gains and losses when translating monetary foreign assets and liabilities with

4) The functional currency is the currency of the primary economic environment in which the entity operates, and it is clear in most cases. However, when subsidiaries owned by Korean companies are operating in several foreign countries (for example, Mexico), their sales are in US dollar and expenses are in Mexican Peso, then managers need to decide subsidiaries' functional currency. In these foggy situations, the results of this research could help guide the decision making of multinational firms in Korea as to which currency to use as a functional currency, foreign currency or the local currency of the parent company.

appropriate foreign exchange rates. These figures are reported in the income statement.

- (c) Translation gains and losses on overseas operations: foreign currency-related gains and losses from independent foreign operations. When applying the appropriate foreign exchange rate to the assets and liabilities in balance sheet, and to the income reported in income statement, difference between asset and liability is not matched with equity, which is calculated after reflecting the income. The unmatched amount is reported in the equity section under other comprehensive income.
- (d) Translation gains and losses from presentation: when reporting the financial statements of a parent company that uses foreign currency as a functional currency, conversion is needed, and the translation amount is recorded in the equity section under other comprehensive income.

2.2 Foreign currency translation accounting

Korean companies have been allowed to adopt the functional currency system voluntarily since 2008, but the majority of Korean

firms adopted the functional currency system only with the adoption of Korean International Financial Reporting Standards (K-IFRS) in 2011. <Table 1> shows main changes related to foreign translation before and after the adoption of functional currency system.

As with K-GAAP, under K-IFRS, foreign translation gains and losses from monetary item of foreign operations are recorded as income in the separate financial statement of the subsidiary. In consolidated financial statements, however, the foreign translation gains and losses of subsidiaries are recognized in other comprehensive income as gains and losses on overseas operations translation. The accumulated account is reclassified as net income when the foreign operation is disposed.⁵⁾

Under K-IFRS, foreign operations record transactions in a functional currency and consolidate their financial statements by converting their financial statement into the reporting currency. This conversion follows several steps: (a) translating the assets and liabilities of balance sheet of the parent company with the foreign exchange rate at the date of the end of the balance sheet, (b) translating accounts in the income statement with the foreign exchange rate of the transaction date, and (c) recording the gap between the results of (a) and (b) as the translation

5) This is one of differences from the rule change in US GAAP. In SFAS No. 8, all translation gains and losses from foreign operations were recorded in the net income of parent company, but after the adoption of SFAS No. 52, those amounts were recorded under the other comprehensive income of the parent company.

〈Table 1〉 Main changes related to foreign translation before and after the adoption of functional currency system

Topic	Before the adoption of functional currency system	After the adoption of functional currency system
Concept of functional currency system	There was no concept of functional currency. Foreign transactions were recorded in KRW.	Measure firm's assets, liabilities, and business performance with functional currency. If changing functional currency, prospectively apply.
Translation of financial statements in foreign operations	If a foreign operation is independent from the parent company, the monetary/non-monetary method is applied, but the current method can be used. If a foreign operation is not independent, the monetary/non-monetary method is applied.	Apply current method when translating from functional currency to reporting currency, and report the translation amount in equity under other comprehensive income.
Net investment gain and loss on foreign operations	Gains and losses were reported as income for the year.	Report gains and losses in equity as other comprehensive income
Goodwill of foreign operations	No rule	Report difference between book value and fair value of foreign operations as an asset or liability of foreign operations.
When the end of reporting period is different between parent company and foreign operations	Apply foreign exchange rate of parent company's end of the balance sheet. If the difference in foreign exchange rates is not significant, apply the rate at the end of the subsidiary company's balance sheet.	Apply foreign exchange rate in force at the date of the end of the foreign operations balance sheet.

gains and losses from presentation in the equity section. In addition, if a parent company uses a foreign currency as its functional currency, the translation gains and losses from presentation are reported separately under other comprehensive income. But, if the functional currency of the parent company and its foreign operations are the same, then the foreign translation gains and losses become 0. 〈Table 2〉 presents examples of foreign exchange rate methods before and after the

adoption of functional currency system.

2.3 Methods related to foreign exchange rates

Three main methods are used to calculate foreign exchange rates: the monetary/non-monetary method, the current rate method, and the temporal method.

Under the monetary/non-monetary method, monetary items (e.g., cash, accounts payable and receivable, and long-term debt) are

〈Table 2〉 Examples of foreign exchange rate methods before and after the adoption of functional currency system

Functional currency of parent company	Functional currency of subsidiary	Before the adoption of functional currency system	After the adoption of functional currency system
KRW	KRW	Independent foreign operation: monetary/non-monetary method (current method is also applicable). Dependent foreign operation: monetary/non-monetary method.	Current method
	USD	N/A	Current method
	CNY	N/A	Current method
USD	USD	N/A	Translation adjustment is 0. Translation gain and loss from presentation is reported under other comprehensive income
	CNY	N/A	Current method. Translation gain and loss from presentation is reported under other comprehensive income

translated at the current rate while non-monetary items (e.g., inventory, fixed assets, and long-term investments) are translated at historical rates.

The current rate method is required for K-IFRS while monetary/non-monetary method is required for K-GAAP.⁶⁾ The current rate method is also used in the foreign translation accounting rule of SFAS No. 52 in US GAAP. The functional currency accounting in IFRS and US GAAP are not much different from

one another except when applied to highly inflationary economies.⁷⁾

Under the functional currency system, the current exchange rate, historical exchange rate, and weighted average rate for the period are applied. The current rate is applied when calculating foreign assets and liabilities, the weighted average rate is applied when calculating revenues and expenses, and the historical exchange rate is applied when calculating contributed capital. K-IFRS 1021 is

6) Under K-GAAP, if a foreign operation is either dependent or independent, the monetary/non-monetary method is required. However, when a foreign operation is independent, current method is also applicable.

7) Highly inflationary economies are defined as economies with a cumulative inflation of 100 percent or more over a 3-year period. In US GAAP, the financial statements of a foreign entity in a highly inflationary economy are to be measured as if the functional currency were the reporting currency. In IFRS, however, the financial statements of an entity whose currency is the currency of a hyperinflationary economy is stated in terms of the measuring unit current at the balance sheet date, whether the accounting rule of the entity is based on a historical cost approach or a current approach.

〈Table 3〉 Three methods of applied exchange rate

Criteria		Monetary/ Non-monetary Method	Current Method	K-IFRS Current Method	Temporal Method
Assets and Liabilities	Monetary items	Current rate	Current rate	Current rate	Current rate
	Non-monetary items	Historical rate	Current rate	If measured in fair value, the exchange rate of valuation date; if measured in historical rate, the exchange rate at the time of the transaction	If measured in current value, current rate; otherwise, historical rate
Revenues and Expenses	General	Weighted average rate	Weighted average rate	Weighted average rate	Weighted average rate
	Cost of goods sold, Depreciation				Historical rate
Contributed Capital		Historical rate	Historical rate	Historical rate	Historical rate

corresponding rule of International Accounting Standards (IAS) 21 on the effects of change in foreign exchange rates.

The temporal method is a method of foreign currency translation that uses exchange rates based on the time assets and liabilities are acquired or incurred. SFAS No. 8 in US GAAP requires the temporal method for foreign translation, which maintains the applied accounting rule, especially for non-monetary items. Details are shown in 〈Table 3〉.

III. Literature Review

As noted earlier, very little research has yet been done on this topic, the effect of func-

tional currency system in Korea. Park et al. (2009) examine the expected effect of adopting K-IFRS, focusing on the functional currency system. In a case study of a marine transportation firm, they compare the results of financial statements reported by US GAAP (functional currency system) and by K-GAAP concurrently for three years. In this case, a US firm held more than 20% of the target firm's stock, so the target firm in Korea needed to report following US GAAP as well as K-GAAP. Examining the reported foreign translation gains and losses and net income in both financial statements, the researchers find that the three-year pattern of foreign translation gains and losses was more similar with the pattern of net income using the US GAAP system.

Even though accounting rules related to functional currency system in US are different from those in Korea, findings of previous literature which examining the effect of functional currency system in US on value relevance of foreign accounts could help expecting the effect of adoption of functional currency system in Korea.

Collins and Salatka (1993) examine the relation between unexpected earnings and abnormal security returns under SFAS No. 8 and SFAS No. 52. This study, which targeted 30 multinational firms and compared their earning response coefficients (ERCs) with those of a set of non-multinational companies, finds that multinational firms have lower ERCs and argues that noise related to earnings signals is greater in multinational firms than in non-multinational firms. They also discover that the ERCs of multinational firms under SFAS No. 52 is higher than the ERCs of multinational firms under No. 8, proving that SFAS No. 52 improved earnings quality.

Soo and Soo (1994) examine whether market incorporates foreign exchange transaction and translation gains and losses when pricing equity securities, and find that the market incorporates the accounts when valuing. Furthermore, they compare the effect on foreign translation accounts of SFAS No.8 and SFAS No. 52 and prove that the market incorporates foreign translation gains and losses reported in income (SFAS No. 8) and

in equity (SFAS No. 52), although they find no significant change in valuation weight between the two standards.

Bartov (1997), comparing the effect of SFAS No. 8 and SFAS No. 52, shows that the latter has resulted in a significant improvement in valuation relevance. However, the author points out that this improvement applied only to the subset of firms that designate a foreign currency as their functional currency.

As mentioned earlier, the research about effect of functional currency system in US on value relevance of foreign translation accounts is not clear and still arguable, leaving room for questions.

Meanwhile, these prior studies demonstrate positive relation between foreign translation adjustments under either SFAS No. 8 or SFAS No. 52. In contrast, Louis (2003) claims that the foreign translation adjustment in the equity section is related to a loss of firm value, rather than positively related to change in firm value. He argues that appreciation in the local currency does not always lead to a positive foreign translation adjustment because of the effect of foreign currency fluctuations on subsidiaries is obscure. In a labor-intensive subsidiary, for example, the depreciation of the local currency makes costs lower, increasing profit margins and resulting in an inverse relationship between firm value and foreign translation adjustment in the equity section.

Huang and Vlady (2012) and Pinto (2005)

also hypothesize that translation adjustment and firm value are inversely associated. Pinto (2005), examining American multinational firms that have operations in Mexico, finds that “a depreciating currency would actually be beneficial to the overall operations since it reduces the overall cost of doing business even further” (p.115). Huang and Vlady (2012), examining the introduction of a functional currency system in Australia by multinational oil and gas firms, show that the quality of the translation accounting information is improved. Applying functional currency concepts, they find that translation adjustments under Australian Accounting Standards Board (AASB) 1012, a former standard, are negatively related to firm value, but were positively related under the new AASB 121 standard, which is modeled after IAS 1012, proving improvement in value relevance.

IV. Hypotheses Development

The functional currency system allows foreign operations to decide on a functional currency, record their bookkeeping with it, and apply the current method. Before the adoption of the functional currency system, foreign operations record foreign transactions by translating the amount into KRW, and at the end of the fiscal year, the current exchange

rate was applied to monetary assets and liabilities. Thus, different type of foreign exchange rate (historical and current exchange rate) is applied to same transaction. On the other hand, the functional currency system allows applying a foreign exchange rate only when the financial statements of foreign operations are consolidated with those of the parent company, decreasing the effect of fluctuations in foreign exchange rates.

For example, let us consider a foreign operation that obtains an asset of US \$2 by borrowing US \$1 and investing capital of US \$1. The historical exchange rate when the transaction occurred was 1,000 won (KRW) per US \$1, and it became 1,500 won per US \$1 at the end of the fiscal year. In this case, the amount of translation adjustment becomes -500 won before the adoption of the functional currency system. It is because the historical exchange rate (1,000 KRW/USD) is applied to non-monetary assets while the current rate (1,500 KRW/USD) is applied to monetary liabilities. However, under the functional currency system, companies record assets and liabilities at the functional currency (in this case, USD) until the end of the accounting period and apply the current rate (1,500 KRW/USD) to assets and liabilities, thus the amount of translation adjustment becomes 0, as shown in <Table 4> (Kwon, 2009).

Under the new system, the parent company can also use a foreign currency (other than

〈Table 4〉 An example of differences of balance sheets before and after the adoption of functional currency system

(KRW)

Before the adoption of FCS*				After the adoption of FCS			
Asset	2,000	Liability	1,500	Asset	3,000	Liability	1,500
		Capital	1,000			Capital	1,500
		Translation adjustment	-500				

*FCS: functional currency system

the reporting currency) as a functional currency, which also diminishes the effect of fluctuating foreign exchange rates on firm value, especially when the functional currencies of foreign operations and their parent company are the same. In this case, foreign translation amount becomes zero, and only translation gain and loss from presentation is shown.

Given, however, that current research findings about the effect of a functional currency system upon foreign adjustment and firm value under SFAS No. 52 are inconsistent, this study poses the following hypothesis:

H1: The introduction of a functional currency system in Korea improves the value relevance of foreign translation adjustments.

Prior research on US GAAP has also observed different effects upon firms that use foreign currency and firms that use the local currency of the parent company as functional

currencies. Collins and Salatka (1993) can not observe an increase in ERCs for those firms that use USD (local currency of parent company) as the functional currency as they shifted from SFAS No. 8 to SFAS No. 52. Bartov (1997) finds that improvement in the valuation relevance of foreign-related accounting numbers applied only to a subset of firms that designated a foreign currency as their functional currency.

These findings reflect that under the functional currency system, a firm that decides to use foreign currency as a functional currency is more likely to have foreign transactions than a firm that designates the local currency (the reporting currency of the parent company) as a functional currency, and thus more likely to be affected by changes in the foreign exchange rate. In addition, if the parent company has a foreign operation that uses the same currency as a functional currency, the translation gains and losses become 0 between the two. Thus, the testable hypothesis can be stated as follows:

H2: Foreign translation adjustments have more value relevance for firms that designate a foreign currency as their functional currency than firms that designate a local currency as their functional currency.

V. Research Methodology

5.1 Value relevance of foreign translation adjustments

This study investigates the association between foreign translation adjustments after the adoption of the functional currency system and changes in the firm value. To analyze the value relevance of the foreign translation adjustment, we use a return and earning association approach, following Louis (2003) and Huang and Vlady (2012). Unlike Bartov (1997), Collins and Salatka (1993), and Soo and Soo (1994), assuming a positive relationship between foreign translation adjustment and firm value, Louis (2003) and Huang and Vlady (2012) argue that the foreign translation adjustment in the equity section is related to a loss in firm value. Louis (2003) targets manufacturing firms and Huang and Vlady (2012) examine firms in oil and gas industry, firms which are sticky to input cost, showing negative relations between firm value

and foreign translation adjustments.

As Louis (2003) points out, the effect of the translation adjustment may capture the effect of foreign exposure. In order to alleviate the potential biases from the association between foreign exposure and the effects of the translation adjustment, foreign transaction gain and loss is incorporated in the model, which is similar to the prior research (Louis, 2003; Huang and Vlady, 2012).

A multiple regression model used in this study is shown in Equation (1), following Louis (2003) and Huang and Vlady (2012).

$$\begin{aligned}
 R_{i,t} = & \beta_0 + \beta_1 NI_{i,t} \\
 & + \beta_2 ForeignTransactionG/L_{i,t} \\
 & + \beta_3 ForeignTranslationG/L_{i,t} \\
 & + \beta_4 ForeignTranslationOCI_{i,t} + e_{i,t}
 \end{aligned}
 \quad (1)$$

Where $R_{i,t}$ is the fiscal-year return (changes in the stock price, $P_{i,t} - P_{i,t-1}$) for firm i and year t . $NI_{i,t}$ is the reported net income excluding foreign translation and transaction gain and loss. $ForeignTransactionG/L_{i,t}$ is foreign transaction gain and loss, $ForeignTranslationG/L_{i,t}$ is foreign translation gain and loss, and $ForeignTranslationOCI_{i,t}$ is foreign translation adjustment reported in other comprehensive income from translation gain and loss from foreign operations. Both sides are deflated by beginning stock price ($P_{i,t-1}$). As Louis (2003) notes, the inclusion of foreign transaction

gain and loss is to control the potential biases on translation adjustment caused by foreign exposure. The functional currency system was introduced in Korea in 2008. Knowing that Korea was expecting to adopt K-IFRS, which became voluntarily applicable from 2009 to 2010 and mandatory since 2011, some firms adopted K-IFRS earlier to apply the functional currency system instead of partially adopt it, because K-IFRS obligated the application of the functional currency system.

5.2 Sample selection and descriptive statistics

The study sample consists of firms in the manufacturing and transportation industries that are listed on the Korean Stock Exchange because these two industries are usually highly affected by foreign currency exchange rates, and firms in these industries are closely

involved to input costs in subsidiaries.⁸⁾⁹⁾ We gather information from 2005 to 2013 financial statements of firms in those industries that reported consolidated financial statement in 2013.¹⁰⁾¹¹⁾ Then, we narrow to those who report yearly data on foreign translation gains and losses or translation gains and losses from foreign operations in other comprehensive income which are not zero. The financial data are collected from Fnguide pro, and data on the year of adopting functional currency, the currency type of functional currency, gain and loss from foreign operations, and translation gain and loss from presentation were individually hand-collected from Korean disclosure system, dart.fss.or.kr. The final sample includes 1,785 firm-year observations with 314 firms.

Panel A of <Table 5> shows the number of observations by categories. The transportation

8) Collins and Salatka (1993) target 30 multinational and match domestic corporations during the SFAS No. 8 and 52 periods. Bartov (1997) targets sample firms with reported currency translation adjustments on their income statements, balance sheets, or both from COMPUSTAT. Louis (2003) targets multinational manufacturing firms that are particularly sensitive to input costs and significantly affected by foreign exchange rates. Huang and Vlady (2012) target Australian multinational firms in oil and gas industry. As we follow model of Louis (2003) and Huang and Vlady (2012), we target firms in these industry which are sticky to input costs.

9) Manufacturing firms are largely affected by labor costs in the subsidiaries, and transportation companies with foreign subsidiaries (marine and air transportation firms) are likely to incur high costs in countries where subsidiary companies are located.

10) Korean companies have been allowed to adopt the functional currency system voluntarily since 2008, and adopted it mandatorily with the adoption of Korean International Financial Reporting Standards (K-IFRS) in 2011. To investigate the effect of the functional currency system adoption, we collect data covering before and after the adoption of functional currency system, that is from 2005 to 2013. Though Korean parent companies choose Korean won as a functional currency, their subsidiaries could choose the other currency as a functional currency, bringing some effects on parent companies' financial statements. Thus, it is necessary to compare the value relevance of foreign translation adjustment before and after the adoption of the functional currency system.

11) To capture foreign translation adjustment, we use consolidated financial statements. We focus on the effect of the functional currency system and do not control consolidation effects, which could be this study's limitation.

and manufacturing industries include 79 and 1,706 firm-year observations, respectively. Of the functional currency system adopted sample of 812 observations, 30 firm-year observations designated the US dollar as the functional currency after the adoption of the functional currency system. The majority of firms that use foreign currency as a functional

currency are in the transportation industry, even though there is some research showing the positive effect of using foreign currency as functional currency.

Panel B of <Table 5> presents the descriptive statistics for the variables used in the regressions. The mean (median) return (R) for the sample is 0.210 (0.070) percent and the

<Table 5> Various Descriptive Statistics

Panel A: Number of observation (firm-year) by categories

Industry	No. of obs.	Before FCS* adoption	After FCS adoption		
			FC=KRW	FC=USD	Total
Transportation	79	32	21	26	47
Manufacturing	1,706	941	761	4	765
Total	1,785	973	782	30	812

*FCS: functional currency system

Panel B: Descriptive statistics

	Mean	Std. Dev.	25%	Median	75%
R	0.210	0.766	-0.190	0.070	0.430
$Func_D$	0.455	0.498	0.000	0.000	1.000
Cur_D	0.021	0.143	0.000	0.000	0.000
NI	0.900	29.425	0.060	1.060	3.600
$ForeignTransactionG/L$	-0.064	5.495	-0.190	0.000	0.160
$ForeignTanslationG/L$	0.070	3.551	-0.070	0.000	0.070
$ForeignTranslationOCI$	0.201	5.552	-0.100	0.000	0.060

1) Descriptive statistics are computed on the final sample of 1,785 firm-years representing 314 firms.

2) Variable definitions are as follows:

R = the fiscal-year return (changes in the stock price, $P_{i,t} - P_{i,t-1}$)

$Func_D$ = 1 if a firm adopts the functional currency system, 0 otherwise

Cur_D = 1 if a firm uses foreign currency as a functional currency after the adoption of the functional currency system, 0 otherwise

NI = net income excluding foreign translation and transaction gain and loss

$ForeignTransactionG/L$ = foreign transaction gain and loss

$ForeignTranslationG/L$ = foreign translation gain and loss

$ForeignTranslationOCI$ = foreign translation adjustment reported in other comprehensive income

All the variables, except $Func_D$ and Cur_D are deflated by beginning stock price.

mean (median) earnings (NI) is 0.900 (1.060). The foreign transaction gain and loss ($ForeignTransactionG/L$) has negative mean while both the foreign translation gain and loss ($ForeignTranslationG/L$) and the foreign translation adjustment reported in other comprehensive income ($ForeignTranslationOCI$) have positive means.

VI. Test Results

To compare the effect of the functional currency system, we first examine structural changes in the value relevance of foreign translation adjustments before and after firms' adoption of the functional currency system. Using a dummy variable, Equation (1) is modified as follows:

$$\begin{aligned}
 R_{i,t} = & \beta_0 + \beta_1 Func_D + \beta_2 NI_{i,t} \\
 & + \beta_3 NI_{i,t} * Func_D \\
 & + \beta_4 ForeignTransactionG/L_{it} \\
 & + \beta_5 ForeignTransactionG/L_{it} * Func_D \\
 & + \beta_6 ForeignTranslationG/L_{i,t} \\
 & + \beta_7 ForeignTranslationG/L_{i,t} * Func_D \\
 & + \beta_8 ForeignTranslationOCI_{i,t} \\
 & + \beta_9 ForeignTranslationOCI_{i,t} * Func_D \\
 & + e_{i,t}
 \end{aligned} \quad (2)$$

Where $R_{i,t}$ is the fiscal-year return (changes in the stock price, $P_{i,t} - P_{i,t-1}$) for firm i and

year t . $NI_{i,t}$ is the reported net income excluding foreign translation and transaction gain and loss. $ForeignTransactionG/L_{i,t}$ is foreign transaction gain and loss, $ForeignTranslationG/L_{i,t}$ is foreign translation gain and loss, and $ForeignTranslationOCI_{i,t}$ is foreign translation adjustment reported in other comprehensive income from translation gain and loss from foreign operations. Both sides are deflated by beginning stock price ($P_{i,t-1}$). $Func_D$ indicates whether a firm adopts the foreign currency system. If a firm adopts the foreign currency system, $Func_D = 1$. Otherwise, $Func_D = 0$. What we are interested in are β_7 and β_9 because these coefficients show the effect of the adoption of the functional currency system on firm value.

⟨Table 6⟩ presents the results of the regressions of return on the foreign translation adjustment. Panel A of ⟨Table 6⟩ shows the regression results before and after the adoption of the functional currency system for subsamples. After the adoption of the functional currency system, coefficients on NI , $ForeignTransactionG/L$, $ForeignTranslationG/L$, and $ForeignTranslationOCI$ are significantly positive at the 1% level whereas $ForeignTransactionG/L$, $ForeignTranslationG/L$, and $ForeignTranslationOCI$ are not significant before the adoption of the functional currency system. Panel B of ⟨Table 6⟩ shows the effect of changes in foreign exchange rates on foreign translation accounts before and after adoption

〈Table 6〉 Value relevance tests before and after adoption of functional currency system

Panel A: Subsample comparison of coefficients before and after FCS adoption

Variable	Before FCS adoption		After FCS adoption	
	Coefficient	(t-statistics)	Coefficient	(t-statistics)
<i>NI</i>	0.136	(4.64)***	0.263	(8.3)***
<i>ForeignTransactionG/L</i>	0.121	(1.72)	0.464	(12.1)***
<i>ForeignTranslationG/L</i>	0.164	(2.39)*	0.507	(12.4)***
<i>ForeignTranslationOCI</i>	0.080	(2.47)*	0.359	(10.8)***
Fixed Firm and Year Effects	Yes		Yes	
Adj R ²	0.0206		0.289	
No. of Observations	973		812	

Panel B: Full sample

Variable	Model (1)		Model (2)	
	Coefficient	(t-statistics)	Coefficient	(t-statistics)
<i>Func_D</i>			-0.103	(-1.31)
<i>NI</i>	0.145	(6.67)***	0.221	(5.11)***
<i>NI*Func_D</i>			-0.068	(-1.52)
<i>ForeignTransactionG/L</i>	0.349	(9.02)***	0.077	(1.37)
<i>ForeignTransactionG/L*Func_D</i>			0.135	(3.03)**
<i>ForeignTranslationG/L</i>	0.378	(9.63)***	0.131	(2.49)*
<i>ForeignTranslationG/L*Func_D</i>			0.145	(3.3)***
<i>ForeignTranslationOCI</i>	0.204	(9.78)***	0.023	(0.33)
<i>ForeignTranslationOCI*Func_D</i>			0.212	(2.85)**
Fixed Firm and Year Effects	Yes		Yes	
Adj R ²	0.099		0.129	
No. of Observations	1,785		1,785	

1) *, **, *** Denote significance of coefficients at the 10 percent, 5 percent, and 1 percent level, respectively, using a two-tailed test.

2) Model (1) is

$$R_{i,t} = \beta_0 + \beta_1 NI_{i,t} + \beta_2 ForeignTransactionG/L_{i,t} + \beta_3 ForeignTranslationG/L_{i,t} + \beta_4 ForeignTranslationOCI_{i,t} + e_{i,t}$$

3) Model (2) is

$$R_{i,t} = \beta_0 + \beta_1 Func_D + \beta_2 NI_{i,t} + \beta_3 NI_{i,t} * Func_D + \beta_4 ForeignTransactionG/L_{i,t} + \beta_5 ForeignTransactionG/L_{i,t} * Func_D + \beta_6 ForeignTranslationG/L_{i,t} + \beta_7 ForeignTranslationG/L_{i,t} * Func_D + \beta_8 ForeignTranslationOCI_{i,t} + \beta_9 ForeignTranslationOCI_{i,t} * Func_D + e_{i,t}$$

4) Variable definitions:

R = the fiscal-year return (changes in the stock price, $P_{i,t} - P_{i,t-1}$);

Func_D = 1 if a firm adopts the functional currency system, 0 otherwise;

NI = net income excluding foreign translation and transaction gain and loss;

ForeignTransactionG/L = foreign transaction gain and loss;

ForeignTranslationG/L = foreign translation gain and loss;

ForeignTranslationOCI = foreign translation adjustment reported in other comprehensive income.

All the variables, except *Func_D*, are deflated by beginning stock price.

of the functional currency system for the full sample. This analysis finds that the coefficients on *ForeignTransactionG/L* and *ForeignTranslation OCI* are significantly positive at the 1% level. When we include *Func_D* in Model (2), the results show that significant coefficients on *ForeignTransactionG/L* and *ForeignTranslation OCI* are due to the adoption of the functional currency system. This results suggest that the functional currency system increases the value relevance of foreign translation adjustments.

We next examine the difference between firms that use foreign currency and firms that use the local currency of the parent company as a functional currency after the adoption of the functional currency system. We classify firms that designate foreign currency as a functional currency after the adoption of the functional currency system as a treatment group, and firms that choose a local currency as a functional currency after the adoption of the functional currency system as a control group. To test the treatment effect, we use a difference-in-differences method, thus modify Equation (1) as follows:

$$\begin{aligned}
 R_{i,t} = & \beta_0 + \beta_1 Func_D + \beta_2 Cur_D \\
 & + \beta_3 Func_D * Cur_D + \beta_4 NI_{i,t} \\
 & + \beta_5 NI_{i,t} * Func_D + \beta_6 NI_{i,t} * Cur_D \\
 & + \beta_7 NI_{i,t} * Func_D * Cur_D \\
 & + \beta_8 ForeignTransactionG/L_{it} \\
 & + \beta_9 ForeignTransactionG/L_{it} * Func_D \\
 & + \beta_{10} ForeignTransactionG/L_{it} * Cur_D
 \end{aligned}$$

$$\begin{aligned}
 & + \beta_{11} ForeignTransactionG/L_{it} * Func_D * Cur_D \\
 & + \beta_{12} ForeignTranslationG/L_{i,t} \\
 & + \beta_{13} ForeignTranslationG/L_{i,t} * Func_D \\
 & + \beta_{14} ForeignTranslationG/L_{i,t} * Cur_D \\
 & + \beta_{15} ForeignTranslationG/L_{i,t} * Func_D * Cur_D \\
 & + \beta_{16} ForeignTranslationOCI_{i,t} \\
 & + \beta_{17} ForeignTranslationOCI_{i,t} * Func_D \\
 & + \beta_{18} ForeignTranslationOCI_{i,t} * Cur_D \\
 & + \beta_{19} ForeignTranslationOCI_{i,t} * Func_D * Cur_D \\
 & + e_{i,t}
 \end{aligned} \tag{3}$$

Cur_D indicates whether the functional currency is a foreign currency. *Cur_D* is 1 if a firm uses foreign currency as a functional currency after the adoption of the functional currency system, 0 otherwise. For example, if a company's functional currency is USD, *Cur_D* for this company will be 1 before and after the adoption of the new rule. Then, we compare the changes in the value relevance of this treatment group (*Cur_D*=1) with that of the control group (*Cur_D*=0). The adoption of the functional currency system brings many changes in accounting related to the foreign translation as listed in <Table 1>, but designating foreign currency as a functional currency is expected to show the dramatic changes in presentation of financial statements because current exchange rate will be applied to assets and liabilities to prepare financial statements at the end of the accounting period.

<Table 7> presents the effects of the functional currency system on the value relevance

〈Table 7〉 Value relevance test before and after adoption of functional currency system when companies use a foreign currency as a functional currency

Variable	Model (3)	
	Coefficient	(t-statistics)
<i>Func_D</i>	-0.105	(-1.23)
<i>Cur_D</i>	-0.134	(-1.56)
<i>Func_D*Cur_D</i>	0.134	(1.64)
<i>NI</i>	0.225	(5.26)***
<i>NI*Func_D</i>	-0.121	(-2.6)**
<i>NI*Cur_D</i>	11.217	(4.85)***
<i>NI*Func_D*Cur_D</i>	-11.126	(-4.81)***
<i>ForeignTransactionG/L</i>	0.102	(1.8)
<i>ForeignTransactionG/L*Func_D</i>	0.024	(0.19)
<i>ForeignTransactionG/L*Cur_D</i>	35.855	(3.53)***
<i>ForeignTransactionG/L*Func_D*Cur_D</i>	-34.280	(-3.52)***
<i>ForeignTranslationG/L</i>	0.140	(2.68)**
<i>ForeignTranslationG/L*Func_D</i>	0.055	(0.42)
<i>ForeignTranslationG/L*Cur_D</i>	81.231	(3.51)***
<i>ForeignTranslationG/L*Func_D*Cur_D</i>	-41.136	(-3.5)***
<i>ForeignTranslationOCI</i>	0.212	(2.54)*
<i>ForeignTranslationOCI*Func_D</i>	0.252	(1.47)
<i>ForeignTranslationOCI*Cur_D</i>	54.333	(3.52)***
<i>ForeignTranslationOCI*Func_D*Cur_D</i>	-54.566	(-3.54)***
Fixed Firm and Year Effects	Yes	
Adj R ²	0.15	
No. of Observations	1,785	

1) *, **, *** Denote significance of coefficients at the 10 percent, 5 percent, and 1 percent level, respectively, using a two-tailed test.

2) Model (3) is

$$\begin{aligned}
 R_{i,t} = & \beta_0 + \beta_1 Func_D + \beta_2 Cur_D + \beta_3 Func_D*Cur_D + \beta_4 NI_{i,t} + \beta_5 NI_{i,t}*Func_D + \beta_6 NI_{i,t}*Cur_D \\
 & + \beta_7 NI_{i,t}*Func_D*Cur_D + \beta_8 ForeignTransactionG/L_{i,t} + \beta_9 ForeignTransactionG/L_{i,t}*Func_D \\
 & + \beta_{10} ForeignTransactionG/L_{i,t}*Cur_D + \beta_{11} ForeignTransactionG/L_{i,t}*Func_D*Cur_D \\
 & + \beta_{12} ForeignTranslationG/L_{i,t} + \beta_{13} ForeignTranslationG/L_{i,t}*Func_D \\
 & + \beta_{14} ForeignTranslationG/L_{i,t}*Cur_D + \beta_{15} ForeignTranslationG/L_{i,t}*Func_D*Cur_D \\
 & + \beta_{16} ForeignTranslationOCI_{i,t} + \beta_{17} ForeignTranslationOCI_{i,t}*Func_D \\
 & + \beta_{18} ForeignTranslationOCI_{i,t}*Cur_D + \beta_{19} ForeignTranslationOCI_{i,t}*Func_D*Cur_D + e_{i,t}
 \end{aligned}$$

3) Variable definitions:

R = the fiscal-year return (changes in the stock price, $P_{i,t} - P_{i,t-1}$);

Func_D = 1 if a firm adopts the functional currency system, 0 otherwise;

Cur_D = 1 if a firm uses foreign currency as a functional currency after the adoption of the functional currency system, 0 otherwise;

NI = net income excluding foreign translation and transaction gain and loss;

ForeignTransactionG/L = foreign transaction gain and loss;

ForeignTranslationG/L = foreign translation gain and loss;

ForeignTranslationOCI = foreign translation adjustment reported in other comprehensive income.

All the variables, except *Func_D*, *Cur_D*, are deflated by beginning stock price.

of foreign translation adjustment of firms that designate foreign currency as a functional currency. <Table 7> reports the estimation results based on model (3). The coefficients on *ForeignTranslationG/L* and *ForeignTranslation OCI* are significantly positive at the 5% level and marginally positive at the 10% level, respectively. And the coefficients on *ForeignTranslationG/L*Func_D* and *ForeignTranslation OCI*Func_D* are not significant when foreign currency as a functional currency is used, suggesting that the adoption of the functional currency system does not change the value relevance of foreign translation adjustments for firms that choose a local currency as a functional currency. The value relevance of *ForeignTranslationG/L* and *ForeignTranslation OCI* do not differ after the adoption of the functional currency system for firms that choose a local currency as a functional currency.

The coefficients on *ForeignTranslationG/L*Cur_D* and *ForeignTranslationOCI*Cur_D* are significantly positive at the 1% level when foreign currency as a functional currency is used, suggesting that foreign translation adjustments are value relevant for firms that designate foreign currency as a functional currency. The coefficients on *ForeignTranslation G/L*Func_D*Cur_D* and *ForeignTranslation OCI*Func_D*Cur_D* are significantly negative at the 1% level when foreign currency as a functional currency is used, suggesting that the increase in value relevance of foreign

translation adjustments after the adoption of the functional currency system is less pronounced for firms that designate foreign currency as a functional currency. The results suggest that the transitory parts related to foreign exchange rates have an excessive influence on firms' value, and then the magnitude of the changes in the value relevance of transitory parts is alleviated after the adoption of the new rule.

The results are consistent with prior studies that show the improvement in the value relevance of foreign translation adjustments (Collins and Salatka, 2003; Bartov, 1997; Huang and Vlady, 2012). And this effect is based on firms using a foreign currency as their functional currency. The study involve a small number of firms which designate a foreign currency as a functional currency, so the findings should be interpreted cautiously.

VII. Concluding Remarks

This study examines the change in the value relevance of foreign translation adjustments after the adoption of the functional currency system in Korea. We follow the methodology of Louis (2003) and Huang and Vlady (2012), and divide foreign related adjustments into foreign translation gain and loss in income, and foreign translation gain and loss from

foreign operations reported in equity section under other comprehensive income, observing changes of value relevance on both foreign translation accounts.

We obtain the results that after the adoption of the functional currency system in Korea, the value relevance of foreign translation accounting information is improved, similar to that of Huang and Vlady (2012). Our analysis demonstrates the positive effect of foreign translation gains and losses on income and equity before and after the adoption of the functional currency system. Specifically, we find that foreign translation adjustments are value relevant, and this value relevance of foreign translation adjustments is not changed after the adoption of the new rule for firms that choose a local currency as a functional currency. In contrast, for firms that designate foreign currency as their functional currency, the effect of transitory parts from foreign exchange rates is diminished, thereby improving the value relevance of foreign translations adjustments. This result may reflect the small sample we could use.

Despite this limitation, this study contributes additional information on the effects of the functional currency system on the value relevance of foreign currency translation adjustments. Although many Korean companies have not welcomed the functional currency system, the results of this study appear to support the change in foreign translation

accounting rules and may provide firms that heretofore have been reluctant to designate foreign currency as a functional currency with more confidence in doing so.

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