

Corporate Dollar Debt and Global Trades: The Role of Firm Heterogeneity*

Junhyong Kim[†]

Annie Soyeon Lee[‡]

Saiah Lee[§]

This Version: September 2024

Abstract

We examine how dollar debt and firm heterogeneity influence exchange rate pass-through to global trades. Using Korean firm-level balance sheet and transaction-level customs data, we find that after the 1997 devaluation, small exporters with higher foreign currency debt tend to reduce their export quantities and raise prices. In contrast, for large exporters, higher foreign currency debt results in higher export quantities and lower prices. Financial frictions constrain small firms, limiting production. Large firms face less disruption in production and increase exports to overcome liquidity shortages. Panel data from 2001-2020 further support the balance sheet effect of dollar debt on exports.

JEL Classification Codes: F31, F34

Keywords: global trades, export prices, exchange rate pass-through, financial channel, foreign currency debt

*We are grateful to Valentina Bruno, Charles Engel, April Franco, Yueran Ma, Diego Perez and seminar and conference participants at Ulsan National Institute of Science and Technology, North America Econometric Society Summer Meeting 2024, KER International Conference 2024, and Asian Econometric Society Meeting 2024 for helpful comments and suggestions.

[†]Email: junkim3994@kdi.re.kr, Korea Development Institute

[‡]Email: annie.lee.econ@gmail.com, Johns Hopkins University

[§]Email: saiahlee@unist.ac.kr, Ulsan National Institute of Science and Technology

1 Introduction

There is a long list of theoretical and empirical work suggesting that exchange rate depreciations could be contractionary due to the negative balance sheet effect of foreign currency liabilities.¹ When the domestic currency depreciates, firms with foreign currency debt face higher debt burden and reduced net worth, potentially limiting their production capacity. This balance sheet effect of foreign currency debt could be more pronounced for exporters as they tap more into international financial markets. On the other hand, domestic currency depreciation often boosts the profitability of exporting. This increased profitability could induce exporters to sell more products abroad, helping them alleviate liquidity shortages caused by higher foreign currency debt burden. Hence, it is not very obvious how exporters may adjust their production upon the depreciation of domestic currency when they are indebted in foreign currency debt. More so, very little is known about whether firm-level heterogeneity exists in firms' responses.

This paper seeks to answer two key questions. First, how does domestic currency depreciation affect exporters indebted in foreign currency? Second, do large exporters respond differently from small exporters? While previous research focuses mostly on the negative balance sheet effects on firms' net worth, investment, and gross sales, very few explore the balance sheet effect of dollar debt on exports, notwithstanding seldom exploring both export quantities and *prices*.² Moreover, exploring the heterogeneity across firm size, we highlight how firms may adjust their production and prices differently to the balance sheet deterioration upon the depreciation.

It is noteworthy that our empirical investigation is only viable due to the richness of firm-level balance sheet information, including their currency composition of assets and liabilities, for both listed and *non-listed* firms, *combined with* the granular transaction-level customs data on export quantities and prices. The insight we get from unraveling the balance sheet channel of dollar debt in shaping the exchange rate pass-through to exporters' activities would be of great importance

¹See [Krugman \(1999\)](#), [Céspedes et al. \(2004\)](#), [Aguilar \(2005\)](#), [Kim et al. \(2015\)](#), [Kalemli-Ozcan et al. \(2016\)](#), [Bruno and Shin \(2023\)](#), and [Kim and Lee \(2024\)](#).

²Highlighting one of the few works on the contractionary effect of depreciation on exports, [Bruno and Shin \(2023\)](#) show that exporters lower their export quantities more when they are reliant on credits from dollar-funded banks.

to policymakers, especially in emerging markets, as their domestic currency often experiences a sudden depreciation against dollar and their liability is highly dollarized.

To shed light on these questions, we exploit a large unexpected devaluation episode in Korea in 1997 to identify and analyze the balance sheet effect of foreign currency debt on export quantities and prices. During the last quarter of 1997, the value of the US dollar surged from about 917 to 1,695 Korean won, taking market participants by surprise. The financial hedging in Korea was non-existent, as the exchange for trading financial derivatives was only set up in 1999 after the Asian Financial Crisis. Most foreign currency loans extended to firms were unhedged. The accumulation of *unhedged* short-term foreign currency liabilities by firms, combined with a sudden and significant depreciation of the won, provides a valuable setting to study the effects of negative balance sheets on exporters' production of goods and their price setting.

We employ a unique dataset that merges the Korean firm-level balance sheet data (KISVALUE) with the Korean customs data to study the effect of corporate dollar credit on the exchange rate pass-through to global trades. The KISVALUE dataset collects the panel data on the annual balance sheet of listed and non-listed firms. And, we merge them with the transaction-level customs data at the firm – HS10 product – destination country – year level (and quarter for some analyses). The merged dataset contains rich information about 2,375 Korean exporters in 1996, most importantly including its currency composition of debt at the firm-level and its exporting price and quantity at the firm – HS10 product – destination country – year level (and quarter for some analyses).

With this unique dataset, we first investigate the role of foreign currency debt on the annual changes in export prices and export quantities after a large devaluation of Korean won against the U.S. dollar at the end of 1997. We find that the effect of foreign currency debt on export quantities and prices differ across firm size. For smaller firms, higher foreign currency debt leads to lower export quantities and higher prices, whereas for larger firms, it results in higher export quantities and lower prices after the devaluation of domestic currency. As we highlight in Section 5, smaller firms with high foreign currency debt burden face lower net worth and working capital after the devaluation, and this balance sheet deterioration constrains a small firm's production capacity,

leading to lower output and higher price. Large firms, on the other hand, might not face production disruptions despite significant exposure to foreign currency debt. As a result, they tend to boost their exports to generate more cash flows especially when they need liquidity because of their high foreign currency debt levels. In Section 5, we lay out a simple model that highlights these mechanisms, rationalizing these empirical patterns.

Further examining the quarterly dynamics of export quantities and prices before and after the devaluation, we find that the negative balance sheet effect on exporters becomes apparent after the devaluation, with significant heterogeneity between small and large firms. Before the devaluation, no discernible effects of foreign currency debt exposure are observed. The dynamic responses of export quantities and prices confirm that what we have observed with the annual data is not driven by different pre-devaluation trends in export quantities and their prices across firms with varying amount of foreign currency debt and size. Moreover, the dynamic responses show that the balance sheet of dollar debt has persistent effects on export quantities and export prices, having more lasting negative effects on quantities.

We then show that firms indebted in foreign currency have indeed suffered from a larger decline in net worth after the devaluation. They also have experienced a larger drop in the growth rates of total variables costs and capital. On top of that we see that both import quantities and import values have fallen more for those firms with higher foreign currency debt ratios. A larger decline in the amount of inputs employed by firms with large amounts of foreign currency debt, further supporting that firms with more foreign currency debt suffer from tighter financial constraints, which constrains on how much they can produce, reducing amount of inputs used and goods produced and sold. This negative effect of foreign currency debt exposure on inputs used in the production disappears for larger firms as they tend to be less financially constrained than smaller firms.

We present a simple two-period model that explains how and why increased debt burden, resulting from foreign currency debt exposure after the domestic currency depreciation, affects small and large firms differently. During the large devaluation period, both small and large exporters with higher foreign currency debt face higher debt burden. In response to the shortage of liquidity due to

larger debt payments, large firms could expand their export sales to reap the increased profitability of exporting, generating higher cashflows today, even at the expense of future cashflows, as they do not face constraints on their production capacity. In contrast, smaller exporters suffer more severely from the balance sheet deterioration, which limits their production capacity and forces them to reduce export sales.

Finally, by extending the merged dataset to cover the more recent period of 2001 – 2020, we reaffirm the balance sheet effect of dollar debt on the exchange rate pass-through to export quantities and prices.³ The findings from the panel regressions are meaningful in that it shows that the financial channel of dollar debt is not only present in a particular moment in the history but also in more recent periods with more developed financial markets in Korea. It is evident that the balance sheet channel of dollar debt plays a critical role of shaping the exchange rate pass-through to international prices and international trade dynamics.

Related Literature. Our paper speaks to two strands of literature in open macroeconomy: one on the contractionary effects of liability dollarization on the macroeconomy and the other on the exchange rate pass-through to prices. We unravel the balance sheet channel of dollar debt through which the exchange rate shock passes through to export prices.

There is a large literature on the degree of exchange rate pass-through to prices.⁴ Many papers have explored the the role of invoicing currency and its implications for the exchange rate pass-through to prices: [Devereux and Engel \(2002\)](#); [Engel \(2006\)](#); [Goldberg and Tille \(2008\)](#); [Gopinath et al. \(2010\)](#); [Goldberg and Tille \(2016\)](#); [Corsetti et al. \(2018\)](#); [Drenik and Perez \(2021\)](#) and [Mukhin \(2022\)](#). Others emphasize the role of imported inputs in shaping the degree of exchange rate pass-through to domestic prices: [Goldberg and Campa \(2010\)](#) and [Amiti et al. \(2019\)](#). Moreover, a large body of work focuses on the relationship between the nominal and the real exchange rate (see, for example, [Engel \(1993\)](#); [Engel \(1999\)](#); [Burstein et al. \(2005\)](#); [Gopinath et al. \(2011\)](#); [Crucini and Telmer \(2012\)](#); and [Broda and Weinstein \(2008\)](#)). Our paper complements

³The data before 2001 are available, but we choose our sample period such that it excludes the period of the dot-com bubble burst.

⁴See an extensive survey of this topic in [Burstein and Gopinath \(2014\)](#).

this large literature by investigating the balance sheet channel of dollar debt through which the exchange rate shock affects the exporters' price settings.

Many theoretical and empirical papers have documented the contractionary effects of liability dollarization on their macroeconomy in emerging market economies upon the depreciation of their domestic currencies (see, for example, [Krugman \(1999\)](#); [Céspedes et al. \(2004\)](#); [Aguilar \(2005\)](#); [Gilchrist and Sim \(2007\)](#); [Kim et al. \(2015\)](#); [Kalemli-Ozcan et al. \(2016\)](#); [Desai et al. \(2008\)](#); [Korinek \(2011\)](#) and [Alfaro et al. \(2019\)](#)). Importantly, recent papers investigate the role of dollar borrowing in shaping international trades, empirically in [Bruno and Shin \(2023\)](#); [Casas et al. \(2023\)](#) and [Kohn et al. \(2020\)](#).⁵ [Bruno and Shin \(2023\)](#) explore how firms that rely more on credit from dollar-funded banks lower their exports more upon dollar appreciation. Our analysis investigates the role of the actual currency composition of firms' liabilities in shaping the global trades. Our paper focuses on how the exporters' balance sheet deterioration due to their dollar liabilities change their export quantities and prices after an unexpected exchange rate depreciation, rather than the consequence of a negative bank credit supply shock to exporters. In fact, we see that our empirical results remain intact when controlling for bank fixed effects. Moreover, closest to our work is [Casas et al. \(2023\)](#), where the authors document that exporters in Colombia do not reduce their exports nor imports upon the devaluation even when firms have high foreign currency debt exposure. We believe that our empirical findings about firm heterogeneity may hint us why [Casas et al. \(2023\)](#) might have not identified the financial channel of dollar debt for an *average sized* exporter in Colombia.⁶ Moreover, both [Bruno and Shin \(2023\)](#) and [Casas et al. \(2023\)](#) neglect the implication of the financial channel of dollar debt for international prices, an area that is under-investigated in the literature. We would like to fill the gap by exploring how firms' export quantities and *prices* change after a large devaluation depending on the indebtedness in dollars and examine heterogeneity across firm size.⁷

⁵More generally, the effect of financial shocks on exports is studied by [Amiti and Weinstein \(2011\)](#) and [Niepmann and Schmidt-Eisenlohr \(2017\)](#), focusing on the effect of a negative credit supply shock on firms' exports.

⁶Relatedly, exporting sectors in Colombia are primarily energy and agricultural sectors, while Korean exports are predominantly manufactured goods.

⁷A contemporaneous work by [Ma and Schmidt-Eisenlohr \(2023\)](#) explores a similar mechanism using aggregate import and export price indices for 54 countries.

The rest of our paper is organized as follows. Section 2 describes our data and presents key descriptive statistics. Section 3 describes the baseline empirical analysis and highlights the role of foreign currency debt in shaping the export quantities and prices during the devaluation period. We also emphasize the importance of considering firm size heterogeneity in analyzing the impact of dollar credit on global trades. We then show that firms indebted in foreign currency indeed have experienced the deterioration of their net worth and a large decline in their inputs used for their production such as variable inputs, capital stock and imported inputs. Section 4 examines more recent periods from 2001 to 2020 and shows that the results presented in Section 3 remain intact. Section 5 provides a simple two-period model to understand the different responses in prices and quantities across firm sizes to the liquidity shortage caused by high foreign currency debt exposure. The last section concludes.

2 Data

2.1 Korean Firm-level Balance Sheet Data and Customs Data

Identifying the negative balance sheet effect of dollar debt on export quantities and prices during a large unexpected devaluation episode in Korea in 1997, we employ a unique dataset that combines the Korean firm-level balance sheet data from the KISVALUE dataset with the Korean customs data.

The Korean firm-level balance sheet data include firms with assets larger than 6 billion won as they are required to report audited financial statements to the Financial Supervisory Commission.⁸ The reported annual financial statements are then compiled by NICE (formerly the Korea Information Service Inc., KIS).

The KISVALUE dataset has a few attractive features that allow us to explore the role of firms' foreign currency debt in the exchange rate pass-through to export quantities and their prices. First, it covers a large number of both large listed and small, medium-sized non-listed firms, and the

⁸The asset threshold has changed over time: 7 billion KRW in 1998 and 10 billion KRW in 2009.

number of exporting firms that go into our sample in 1996 is 2,375. It is crucial to have smaller firms in the sample as we are interested in the effect of financial constraints on firms' exports. Second, most importantly, it contains the information on the currency composition of debt, critical for constructing each firm's foreign currency debt exposure before an unexpected large devaluation. Lastly, a wide set of firm-level variables are included in the dataset, such as the currency composition of *liquid assets*, sales, total costs and total assets. We mitigate the concerns about endogeneity by controlling for the firm-level covariates documented in literature, which may affect the currency composition of debt.

We then combine the firm-level balance sheet data with the Korean customs data.⁹ The merged dataset then contains rich information about 2,375 exporting firms, most importantly including its currency composition of debt and its exporting price and quantity at the firm - HS10 product - destination country level.¹⁰ This is one of the very few attempts in the literature to combine the data on the *currency composition of both assets and liabilities* at the firm-level and the customs data on exporting prices and quantities at a *granular transaction level*: firm - product - destination country level.

The Korean customs data that we employ in Section 3 include around 26,000 observations for exports and around 22,000 observations for imports, and each observation is at the firm f - trade type k (export/import) - product HS10 code i - destination/origin country d - year t level. Each observation includes the export/import value and weight, which determine the price per kg. For the panel data analysis in Section 4, we have around 1.90 million observations for exports and around 1.85 million observations for imports. Each observation is at the firm f - trade type k (export/import) - product HS10 code i - destination/origin country d - year t level. Most of these transactions are invoiced in dollar.¹¹

⁹We accessed the customs data from the Korea Trade Statistics Promotion Institute (KTSPi) with an approval of the Korea Customs Service with disclosure restrictions. We extracted the balance sheet data of exporting firms in the KISVALUE dataset for the sample years. The KTSPi merged the KISVALUE dataset with its customs data within its facility. The merged dataset was not shared with us. We developed and wrote the code for the data analysis, and KTSPi carried out the execution under our close supervision and guidance. We extend our sincere gratitude to the staff members at the KTSPi and the Korea Customs Service for their support.

¹⁰Exporting price is defined by export value divided by export volume.

¹¹86 and 81 % of exports and imports are invoiced in the U.S. dollar in 1996-2020.

The summary statistics for the data used in regressions in Section 3 and Section 4 are summarized in Tables 21 – 27, and Tables 28 and 29 in the Online Appendix.

2.2 Summary Statistics: FC Borrowing

To highlight the relevance of foreign currency debt among exporting firms, we summarize the patterns of foreign currency borrowing among exporters vs. non-exporters in Table 1. As we see in the table, the share of firms with positive foreign currency debt is 57.5% for exporters while 20.6% for non-exporters. In other words, at the extensive margin, we observe that foreign currency borrowing is indeed more pervasive among exporters.

However, conditional on borrowing in foreign currency, the share of total debt denominated in foreign currency does not vary between exporters and domestic firms. Moreover, as shown in Table 2, we observe a slight difference in average export shares and no discernible difference in average import shares among exporters with foreign currency debt vs. without foreign currency debt. We believe that this observation is consistent with what one would expect if there is a certain fixed cost that firms need to pay to tap the international capital markets and imply that natural hedging is not the key determinant of the currency composition of debt among exporters. We find a very similar data pattern when exploring the data of 2000–19, presented in Tables 11 and 12 in the Appendix.

Table 1: FC Borrowing Among Exporters vs. Non-Exporters

	Share of Firms with FC Debt	FC Debt Ratios	FC Debt Ratio (>0)
Non-Exporters	20.6%	4.7%	22.9%
Exporters	57.5%	13.0%	22.6%

Notes: FC debt ratio is the foreign currency debt to total debt ratio. Exporters are the firms with positive exports in 1996. All variables are their values in 1996. The last column shows the average foreign currency debt ratio conditional on holding a positive amount of foreign currency debt.

Table 2: Export and Import Share Among FC Borrowers vs. Non-FC Borrowers

	Export Share	Import Share
Zero FC debt	17.1%	16.8%
Positive FC debt	19.2%	17.2%

Notes: This table shows the average export and import shares among exporters with and without foreign currency debt. Export share is the export to sales ratio. Import share is the share of imported inputs to total variable costs.

Moreover, we compute the firm-level correlations between foreign currency debt ratios and other firm-level characteristics among exporters in 1996. We clearly see that firm size has a strong positive correlation with the foreign currency debt to total debt ratio, much of it arising from an extensive margin of foreign currency debt issuance. Surprisingly, we find very little correlation with export to total sales ratio; so as aforementioned, there is little support of natural hedging motives behind the foreign currency debt issuance.¹²

Table 3: Firm-Level Correlations between FC debt and Other Firm-level Characteristics

	FC Debt Ratio	FC Debt Ratio > 0
	(1)	(2)
Import Share	0.11	0.18
Export Share	0.05	0.04
Size	0.29	0.14
Leverage	-0.06	-0.15
ST Debt Ratio	-0.21	-0.33
Cash Ratio	-0.01	0.08
FC Cash Ratio	0.17	0.15

Notes: The table shows how the foreign currency debt to total debt ratios are correlated with regressors in the regressions presented in Section 3. Regressors are their values in 1996 and include import share (the share of imported inputs to total variable costs); export to sales ratio; size (log of sales); leverage (total debt to total assets ratio); ST debt ratio (short-term debt to total debt ratio); cash ratio (cash to total assets ratio); and FC cash ratio (FC cash to total cash ratio). Column (1) shows the correlation between variables in the whole sample, and Column (2) shows those with subsample of firms with positive FC debt.

3 Exporters with Dollar Debt after Devaluation

3.1 Baseline Analysis: Annual Data

We begin our analysis by exploring the negative balance sheet effect on export prices and quantities during the 1997 large devaluation episode in Korea using annual customs data and balance sheet data. Specifically, we estimate the following equations for firm f , product HS10 code i , destination country d :

¹²We report the time series of the correlations in 2001-19 in Table 13 in the Appendix, and we find a very similar pattern.

$$\begin{aligned}\Delta_{97-98}\ln(y_{f,i,d}) = & \alpha_{s(f)} + \alpha_d + \beta_0 FC\ Debt\ Ratio_{f,96} + \beta_1 FC\ Debt\ Ratio_{f,96} \times Size_{f,96} \\ & + \beta_2 X_{f,96} + \beta_3 X_{f,96} \times Size_{f,96} + \varepsilon_{f,i,d},\end{aligned}\quad (1)$$

where the dependent variable is the log change in y from 1997 to 1998. y is the export quantity or the export price in the destination currency. All the regressors are at their values in 1996. The main regressors in our analysis are FC debt ratio and the interaction between FC debt ratio and firm size. We measure firm size as log of total sales. The interaction term reflects the idea that the balance sheet effect would be smaller for larger, financially less constrained firms, motivated by [Kim and Lee \(2024\)](#). We control for additional firm-level variables, X_f , in order to deal with a potential endogeneity issue. Specifically, X_f includes share of imported inputs to total variable costs, sales share (export sales of firm f selling product i to country d over total Korean firms' exports to a market, where a market is defined as product HS4 code by destination country), leverage (total debt to total assets ratio), short-term debt ratio (short-term debt to total debt ratio), cash to total assets ratio, FC cash to total cash ratio, and export to sales ratio. We also control for sector and country fixed effects. Each sector is identified with a five-digit KSIC code (Korea Standard Industrial Classification).

From the baseline results in Table 4, we find strong evidence of negative balance sheet effect on the exporting firms. As seen in Column 1, firms with higher exposure to foreign currency debt experience a larger decline in export quantities, suggesting that even exporters suffer from the negative balance sheet effects of dollar debt. This impact is particularly pronounced for smaller firms, which face higher degree of financial constraints. Specifically, when a firm's size decreases by one standard deviation, the negative effect of foreign currency debt on export quantities increases by 0.24 percentage points.¹³ Column 3 shows the how firm-level export price changes in response to the negative balance sheet effect during the large devaluation period. Firms with higher exposure

¹³The average and the standard deviation of firm sizes are 17.21 and 1.44, respectively.

to foreign currency debt tend to set higher export prices. This result suggests that higher foreign currency debt exposure constraints a firm's production capacity, increasing the price of goods exported. Similar to the quantity adjustments, the negative balance sheet effect is more stronger for smaller firms. Specifically, when a firm's size decreases by one standard deviation, the effect of dollar debt on export prices is larger in size by 0.05 percentage points. We also include each firm's main bank fixed effects to mitigate the concern that it is merely capturing the effect of a negative bank credit supply shock. That is, a specific bank could have extended more foreign currency loans to firms before the devaluation, and this bank may have reduced its credit supply more to these firms after the devaluation. As shown in Columns 2 and 4, the results remain very similar quantitatively, even with bank fixed effects. This result may suggest that our findings capture the negative balance sheet effects of foreign currency debt due to higher debt burden rather than a consequence of a negative bank credit supply shock. Additionally, we confirm that our results are intact after controlling for the currency of invoicing, as shown in Table 30 in the Online Appendix.

Table 4: The Role of FC Debt: Export Quantities and Prices

	ΔQ_{97-98}		Δp_{97-98}	
	(1)	(2)	(3)	(4)
FC Debt Ratio	-2.8014*** (0.8657)	-3.0436*** (0.8948)	0.6632*** (0.2517)	0.7066*** (0.2610)
FC Debt Ratio \times Size	0.1655*** (0.0482)	0.1768*** (0.0499)	-0.0373*** (0.0140)	-0.0401*** (0.0145)
Size	-0.0277 (0.0365)	-0.0304 (0.0385)	0.0064 (0.0103)	0.0071 (0.0109)
Adjusted R^2	0.0446	0.0465	0.2874	0.2874
Bank FE	No	Yes	No	Yes
Observations	26888	26626	26888	26626

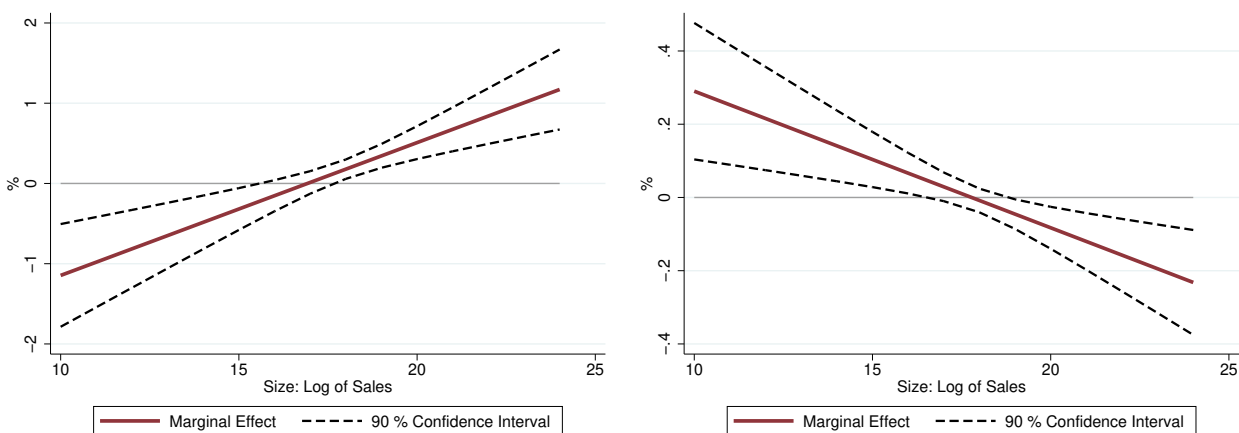
Notes: Robust standard errors are reported in the parentheses. The dependent variables are growth rates of export quantities and prices from 1997 to 1998, reported in Columns (1) and (2) and Columns (3) and (4), respectively. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure 1 also shows how the effect of foreign currency debt on export quantity and price changes by firm size, computed based on the estimation results shown in Table 4. The figure shows the change in export quantities and prices from 1997 to 1998.¹⁴ For the firms whose sales are at the

¹⁴We find that the results are robust when we consider the changes from 1996 to 1998.

bottom 10% in 1996, one percentage point increase in the foreign currency debt ratio leads to 0.20 percentage points larger decrease in export quantities and 0.08 percentage points higher increase in the export prices, compared to their prices in 1997. The effects of foreign currency debt exposure on export quantities and prices become smaller in size when firm size gets larger. Interestingly, we observe an opposite effect for larger firms: the positive effect of foreign currency debt on export quantity and negative effect on export prices for very large firms. Specifically, for firms at top 90% of the size distribution, one percentage point increase in the foreign currency debt ratio leads to 0.36 percentage points higher increase in the export quantities and 0.05 percentage points lower decrease in export prices after the devaluation. Large firms indebted in foreign currency debt may not face tighter financial constraints and disruption in their production unlike smaller firms. Larger firms, therefore, are likely to produce and sell more to generate additional cashflows, even if it means sacrificing future cashflows, as they face liquidity shortages due to its foreign currency debt exposure. Higher quantities of goods exported by larger exporters have resulted in lower export prices. Section 5 provides a simple two-period model that rationalizes our empirical findings – firms react differently to the depreciation of the domestic currency, depending on their firm size and foreign currency debt exposure.

Figure 1: Marginal Effect on Export Quantities and Prices: Heterogeneity Across Firm Size



Notes: The figure on the left shows the marginal effect of FC debt exposure on firm's export quantity across firm size (log of sales). The figure on the right shows the marginal effect of FC debt exposure on firm's export price depending on firm size (log sales). The dashed lines show the 90 percent confidence intervals of the marginal effects. The graphs are computed based on the results in Table 4. The dashed lines show the 90 percent confidence intervals.

Our analysis highlights the role of foreign currency debt exposure and firm heterogeneity in shaping the exchange rate pass-through to international trades and their prices. The export quantity and price responses of exporting firms, varying with their foreign currency debt exposure, imply that varying levels of foreign currency debt may contribute to the relative price dispersions in the destination markets, which may in turn alter resources allocations, which could potentially lead to efficiency losses.

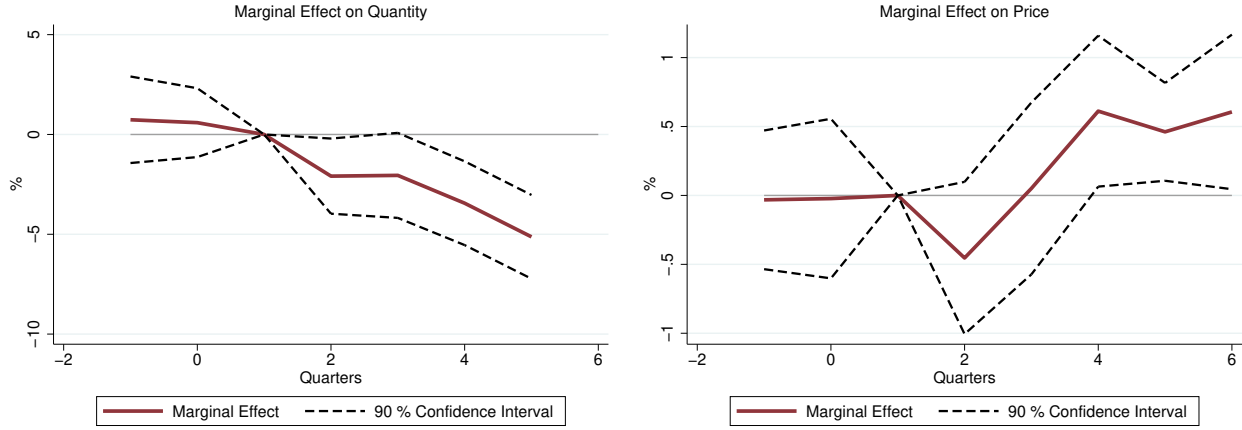
3.2 Dynamic Responses of Export Quantities and Prices

In this section, we examine the dynamic responses of export quantities and prices using quarterly customs data before and after the large devaluation. Specifically, we estimate the following equations for firm f , product HS10 code i , destination country d :

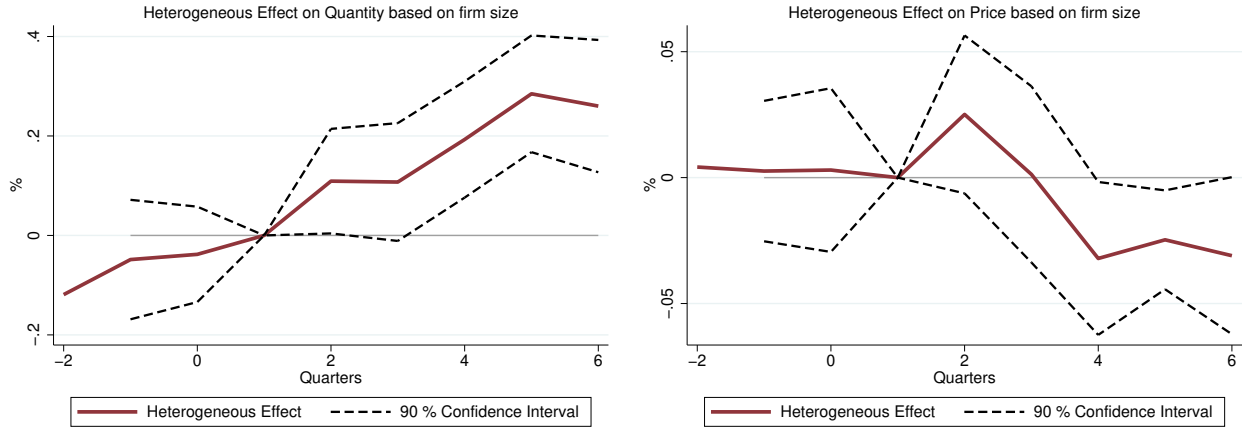
$$\begin{aligned} \Delta_{97Q3+h-97Q3} \ln(y_{f,i,d}) = & \alpha_{s(f),h} + \alpha_{d,h} + \beta_{0,h} FC\ Debt\ Ratio_{f,96} + \beta_{1,h} FC\ Debt\ Ratio_{f,96} \times Size_{f,96} \\ & + \beta_{2,h} X_{f,96} + \beta_{3,h} X_{f,96} \times Size_{f,96} + \varepsilon_{f,i,d,h}, \end{aligned} \quad (2)$$

where the dependent variable is the log change in y , h quarters before and after 1997Q3. We examine $h \in \{-3, \dots, 0, \dots, 6\}$, 3 quarters before to 6 quarters after the base period of 1997Q3, immediately preceding the large devaluation in Korea. y is the export quantity or the export price in the destination currency. All the regressors are at their values in 1996. Our key coefficients of interest are $\beta_{0,h}$ and $\beta_{1,h}$ for each $h \in \{-3, \dots, 0, \dots, 6\}$, indicating the dynamics of the balance sheet effect of dollar debt on quantities and prices. Investigating the change in export quantities and prices before the devaluation, we can also explore whether there is a pre-trend in exporter's decision depending on the foreign currency debt exposure.

Figure 2: Dynamic Effects of Foreign Currency Debt on Export Prices and Quantities
Upper Panel: Dynamic Effects on Export Prices and Quantities



Lower Panel: Heterogeneity Across Firm Size



Notes: The dependent variable is the log change in export quantities and prices relative to 1997Q3 level. The top panels plot $\beta_{0,h}$, and the bottom panels plot $\beta_{1,h}$ estimated in Equation (2). The figures on the left are the estimates of export quantities, and those on the right are the estimates of export prices. The graphs are computed based on the results in Tables 15 and 17 in the Appendix. The shaded area represents the 90% confidence interval with robust standard errors.

Figure 2 shows the regression results of Equation (2) with export quantity as a dependent variable. The coefficient estimates $\beta_{0,h}$ and $\beta_{1,h}$ are *not statistically different from zero* for $h \in \{-3, -2, -1\}$. That is, we could not find any evidence of systematic differences in the quantity adjustment before the devaluation periods across firms' foreign currency debt ratios. The negative balance sheet effect of dollar debt on export quantities becomes evident after the devaluation; firms with higher foreign currency debt ratios reduce their export quantities. For an average size firm, the balance sheet effect constrains the production, leading to a decrease in export volumes. In particu-

lar, one percentage point increase in foreign currency debt exposure decreases the export quantity, relative to the pre-devaluation level, more by 0.21 percentage points right after the devaluation and the negative impact on export quantities remains sizable afterwards. The bottom panel shows the negative effect on export quantities is more pronounced for smaller firms. In particular, if firm size decreases by one standard deviation, the negative balance sheet effect on export quantity gets larger by 0.16 percentage points.

Figure 2 shows the baseline results for export price responses. For $h \in \{-3, -2, -1, 1, 2\}$, the coefficient estimates $\beta_{0,h}$ and $\beta_{1,h}$ are *not statistically different from zero*. Similar to the quantity adjustments, firms with varying degree of FC debt ratio in 1996 do not show any systematic differences in their pricing decisions before the large devaluation. This result provides evidence supporting the absence of differential pre-trends across firms with different FC debt indebtedness. The balance sheet effect of dollar debt on export prices becomes apparent three quarters after the base period; firms with higher foreign currency debt exposure tend to increase their export prices. In addition, the bottom panel shows that the balance sheet effect of dollar debt on export prices is more pronounced for smaller firms. Specifically, for an average size firm, one percentage point increase in FC debt ratio leads to 0.06 percentage point higher increase in export prices compared to their pre-devaluation prices in 1997Q3. The effect of FC debt on export prices remains at a similar magnitude until the fifth quarters following the base period. If firm size gets smaller by one standard deviation, the negative balance sheet effect on price becomes larger by 0.05 percentage points. The price response is less immediate and persistent than quantity responses. We confirm that our results are intact after controlling for the main bank fixed effects, as shown in Tables 16 and 18 in the Appendix.

3.3 Adjusting Imports and Other Inputs

In this section, we further examine how firms adjust their inputs upon a devaluation when indebted in foreign currency. The set of analyses below strengthen our argument that the negative balance sheet effects of dollar debt have disrupted the production of goods sold, affecting their use of

inputs into the production. Given that firm-level variables on their balance sheets are available at the annual frequency, we estimate the below equation:

$$\begin{aligned}\Delta_{97-98}\ln(y_f) = & \alpha_{s(f)} + \beta_0 FC Debt Ratio_{f,96} + \beta_1 FC Debt Ratio_{f,96} \times Size_{f,96} \\ & + \beta_2 X_{f,96} + \beta_3 X_{f,96} \times Size_{f,96} + \varepsilon_f,\end{aligned}\quad (3)$$

where the dependent variable is the log change in y from 1997 to 1998.¹⁵ We examine the responses of firms' net worth and inputs used for their production, total variable costs and capital.

We then investigate how a firm changes imported intermediate inputs, both quantities and their values, depending on foreign currency debt burden. Specifically, we estimate the following equations for firm f , product HS10 code i , destination country d :

$$\begin{aligned}\Delta_{97-98}\ln(y_{f,i,d}) = & \alpha_{s(f)} + \alpha_d + \beta_0 FC Debt Ratio_{f,96} + \beta_1 FC Debt Ratio_{f,96} \times Size_{f,96} \\ & + \beta_2 X_{f,96} + \beta_3 X_{f,96} \times Size_{f,96} + \varepsilon_{f,i,d},\end{aligned}\quad (4)$$

where the dependent variable is the log change in y from 1997 to 1998. y is the import quantity or the import value at firm f , HS-10 product i and origin country d level in units of the U.S. dollar.

We are interested in if firms indeed have experienced a deterioration in their net worth and reduced their use of inputs when indebted in foreign currency. Moreover, we examine if smaller firms among exporters are the most affected by the devaluation and adjust their production and hence, inputs the most. All the explanatory variables are as of 1996. We control for other firm-level characteristics that could potentially correlate with foreign currency debt exposure. X_f includes share of imported inputs to total variable costs, leverage (total debt to total assets ratio), short-term debt ratio (short-term debt to total debt ratio), cash to total assets ratio, FC cash to total cash ratio,

¹⁵For net worth, we compute the change in net worth from 1997 to 1998, normalized by total assets in 1997, as net worth can be negative.

and export to sales ratio. Estimating Equation (4), we also control for its sales share – the import value of firm f purchasing product HS10 code i from country d over total Korean firms' imports from a market, where a market is defined as product HS4 code by origin country. The sector fixed effects are also included in both sets of the estimations.

In Table 5, we see that indeed firms have experienced a fall in net worth growth when they have borrowed more in foreign currency debt. The fall in net worth growth is smaller when firm size is larger. Moreover, firms with high foreign currency debt exposure prior to the devaluation adjust their inputs actively, shown in Columns 3 and 5. Firms use less both variable inputs and capital, and more so as their firm sizes are smaller. As shown in Columns 2, 4, and 6, the results remain very similar quantitatively, even with bank fixed effects.

Table 5: FC Debt and Other Firm-Level Variables						
	$\Delta Networth_{97-98}$		$\Delta VariableCost_{97-98}$		$\Delta Capital_{97-98}$	
	(1)	(2)	(3)	(4)	(5)	(6)
FC Debt Ratio	-0.6608*** (0.2304)	-0.6683*** (0.2267)	-0.9677** (0.4894)	-1.0594** (0.4723)	-1.1194** (0.4581)	-1.0458** (0.4488)
FC Debt Ratio \times Size	0.0406*** (0.0132)	0.0391*** (0.0129)	0.0603** (0.0272)	0.0649** (0.0262)	0.0608** (0.0258)	0.0564** (0.0252)
Size	-0.0110 (0.0120)	-0.0001 (0.0115)	-0.0131 (0.0227)	-0.0058 (0.0211)	0.0506* (0.0272)	0.0463* (0.0253)
Adjusted R^2	0.0847	0.0797	0.2163	0.2106	0.0421	0.0392
Bank FE	No	Yes	No	Yes	No	Yes
Observations	1964	1947	1966	1947	1966	1953

Notes: Robust standard errors are reported in the parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

On top of what we see in Table 5, we also see the adjustment in their imported intermediate inputs. Table 6 summarizes the responses of import quantities and import values upon a devaluation at the end of 1997. We see that indeed firms have reduced their imports more when their debt is tilted more towards foreign currency. The negative balance sheet effect on imports is larger as firm size is smaller. Columns 2 and 4 confirm that our results are quantitatively very similar with bank fixed effects.

Table 6: Change in Import Quantity and Value

Imports	ΔQ_{97-98}		ΔV_{97-98}	
	(1)	(2)	(3)	(4)
FC Debt Ratio	-1.9817*** (0.7629)	-2.2130*** (0.7649)	-1.7973*** (0.6933)	-1.9589*** (0.6970)
FC Debt Ratio \times Size	0.1062*** (0.0417)	0.1175*** (0.0418)	0.0939** (0.0378)	0.1017*** (0.0380)
Size	-0.0473 (0.0433)	-0.0126 (0.0425)	-0.0492 (0.0403)	-0.0186 (0.0392)
Adjusted R^2	0.0363	0.0366	0.0433	0.0435
Bank FE	No	Yes	No	Yes
Observations	22251	22096	22367	22212

Notes: Robust standard errors are reported in the parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

In sum, we see a large decline in inputs employed by firms with large amounts of foreign currency debt. It further supports the idea that firms with more foreign currency debt suffer from tighter financial constraints, which constrains on how much they can produce, reducing amount of inputs used and goods produced and sold. This negative effect of foreign currency debt exposure on inputs used in the production disappears for larger firms as they tend to be less financially constrained than smaller firms.

4 Panel Regression Analysis

To highlight that the financial channel of dollar debt is not associated with a particular period in the past, we estimate the exchange rate pass-through to export quantities and prices in more recent periods. This section employs the panel data of both listed and non-listed firms from 2001 to 2020.¹⁶ Each observation is at the firm f -product HS10 i -destination country d -year t . We estimate the below Equation (5):

¹⁶The dependent variable is the growth rate of a variable y ; therefore, year t starts at 2002 and ends at 2020.

$$\begin{aligned}
\Delta_\tau \ln(y_{f,i,d,t}) = & \alpha_{s(f)} + \alpha_{d,t} + \alpha_{b(f,t),t} + \beta_0 \text{FC Debt Ratio}_{f,t-\tau} + \beta_1 \text{Size}_{f,t-\tau} \\
& + \beta_2 \text{FC Debt Ratio}_{f,t-\tau} \times \text{Size}_{f,t-\tau} \\
& + \beta_3 \text{FC Debt Ratio}_{f,t-\tau} \times \Delta_\tau e_{\$t} + \beta_4 \text{Size}_{f,t-\tau} \times \Delta_\tau e_{\$t} \\
& + \beta_5 \text{FC Debt Ratio}_{f,t-\tau} \times \Delta_\tau e_{\$t} \times \text{Size}_{f,t-\tau} \\
& + \gamma_0 X_{f,t-\tau} + \gamma_1 X_{f,t-\tau} \times \Delta_\tau e_{\$t} + \gamma_2 X_{f,t-\tau} \times \Delta_\tau e_{\$t} \times \text{Size}_{f,t-\tau} + \epsilon_{i,f,d,t},
\end{aligned} \tag{5}$$

where the dependent variable is the log change in y from year $t - \tau$ to year t . y is the export price in the destination currency or its export quantity. Since we do not observe firm f 's exports of product HS10 i to destination country d every year, we look at the export price and quantity changes from year $t - \tau$ to year t , where τ varies for each observation of firm f 's exports of product HS4 i to destination country d in year t . $e_{\$t}$ is the Korean won price of dollar. An increase in the exchange rate is therefore a depreciation of KRW against the U.S. dollar. X_f includes firm-level variables: import share (imports to cost of sales ratio), sales share (export sales of firm f selling product i to country d over total Korean firms' exports to a market, defined as product HS4 code by destination country), leverage, short-term debt ratio, cash ratio, FC cash ratio, and export share (exports to total sales ratio). Our key coefficients of interest are β_3 and β_5 . In all specifications, we include sector s fixed effects and destination country d by year t fixed effects in the regressions, where sectors are defined by the KSIC industry codes. We also include each firm's main bank (which could vary across time) by year fixed effects in some specifications to show that the results are not driven by the transmission of bank credit supply shocks.

Tables 7 and 8 summarize the results, qualitatively consistent with what we have found with the event study analysis during the Asian Financial Crisis. In Table 7, we see that firms lower their export quantities more when their debt is tilted towards FC upon the depreciation of Korean won. The fall in export quantities is smaller when firm size is larger. Moreover, in Table 8, when firms are indebted in FC debt, they raise their destination prices more upon the depreciation of Korean won against the U.S. dollar. The magnitude of the increase is smaller when firm size is larger.

The same mechanism manifest in Section 3 is also revealed in the panel regression analyses with more recent and longer period data. In Columns 3 and 4 of Tables 7 and 8, we also show that the estimated effects are qualitatively and quantitatively similar even when controlling for each firm's main bank by year fixed effects. This empirical result highlights that our results are not driven by their exposure to certain banks who may have lent more in foreign currency to these firms but rather captures the consequence of the balance sheet deterioration on firms' production and pricing.

Table 7: Panel Regression of Export Quantity Changes on FC Debt

Dependent Variables:	Export Quantities			
	(1)	(2)	(3)	(4)
FC Debt Ratio	-0.1010** (0.0440)	-0.1010 (0.0644)	-0.1658*** (0.0458)	-0.1658** (0.0682)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	-1.5997*** (0.5180)	-1.5997** (0.6280)	-1.8210*** (0.5335)	-1.8210*** (0.6372)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times$ Size	0.0795*** (0.0264)	0.0795** (0.0330)	0.0914*** (0.0273)	0.0914*** (0.0335)
FC Debt Ratio \times Size	0.0041* (0.0023)	0.0041 (0.0034)	0.0074*** (0.0024)	0.0074** (0.0036)
Adjusted R^2	0.0155	0.0155	0.0160	0.0160
Observations	1902611	1902611	1820447	1820447
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: In all specifications, we include sector and country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) include each firm's main bank by year fixed effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Panel Regression of Export Price Changes on FC Debt

Dependent Variables:	Export Prices			
	(1)	(2)	(3)	(4)
FC Debt Ratio	0.0010 (0.0074)	0.0010 (0.0100)	0.0033 (0.0077)	0.0033 (0.0101)
FC Debt Ratio $\times \Delta E_{KRW/\$}$	0.3457*** (0.0882)	0.3457*** (0.1201)	0.4134*** (0.0909)	0.4134*** (0.1213)
FC Debt Ratio $\times \Delta E_{KRW/\$} \times \text{Size}$	-0.0197*** (0.0044)	-0.0197*** (0.0064)	-0.0243*** (0.0046)	-0.0243*** (0.0065)
FC Debt Ratio $\times \text{Size}$	0.0000 (0.0004)	0.0000 (0.0005)	-0.0001 (0.0004)	-0.0001 (0.0005)
Adjusted R^2	0.0355	0.0355	0.0361	0.0361
Observations	1902611	1902611	1820447	1820447
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: In all specifications, we include sector and country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) include firm's main bank by year fixed effects. We estimate a similar set of regressions with export prices in units of the U.S. dollar, and the results are shared in Table 32 in the Online Appendix. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Then, we estimate Equation 5 with import quantities and import values as dependent variables. y is import quantity or import value in units of the origin country currency. Since we do not observe firm f 's imports of product HS10 i from origin country d every year, we look at the import quantity and value changes over year t and year $t - \tau$, where τ varies for each observation of firm f 's imports of product HS10 i from origin country d in year t . We control for the same set of firm-level variables $X_{f,t-\tau}$, where sales share now is defined as the value of firm f importing HS10 product i from country d over total Korean firms' imports from a market, where a market is defined as HS4 product code by origin country. We include sector s fixed effects and destination country d by year t fixed effects in the regressions.

Similar to what's shown in the baseline analysis in Section 3, import quantities and values decrease when firms are more indebted in FC debt and fall less when firm size is larger. This empirical pattern is consistent with how the production is constrained when firms borrow more in FC debt upon a large depreciation of domestic currency, and therefore, employ less production inputs, including imported inputs. The results are robust to controlling for main bank by year fixed

effects.

Table 9: Panel Regression of Import Quantity Changes on FC Debt

Dependent Variables:	Import Quantities			
	(1)	(2)	(3)	(4)
FC Debt Ratio	-0.1448*** (0.0460)	-0.1448** (0.0619)	-0.1164** (0.0475)	-0.1164* (0.0642)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	-1.7651*** (0.5456)	-1.7651*** (0.6004)	-1.5845*** (0.5574)	-1.5845*** (0.6083)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0855*** (0.0284)	0.0855*** (0.0318)	0.0753*** (0.0291)	0.0753** (0.0324)
FC Debt Ratio $\times \text{Size}$	0.0083*** (0.0024)	0.0083** (0.0033)	0.0067*** (0.0025)	0.0067* (0.0034)
Adjusted R^2	0.0092	0.0092	0.0097	0.0097
Observations	1854015	1854015	1780851	1780851
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: In all specifications, we include sector and country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) include each firm's main bank by year fixed effects. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Panel Regression of Import Value Changes on FC Debt

Dependent Variables:	Import Values			
	(1)	(2)	(3)	(4)
FC Debt Ratio	-0.1438*** (0.0456)	-0.1438** (0.0613)	-0.1118** (0.0471)	-0.1118* (0.0633)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	-1.9738*** (0.5412)	-1.9738*** (0.6110)	-1.8154*** (0.5529)	-1.8154*** (0.6166)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0956*** (0.0282)	0.0956*** (0.0323)	0.0863*** (0.0288)	0.0863*** (0.0329)
FC Debt Ratio $\times \text{Size}$	0.0081*** (0.0024)	0.0081** (0.0033)	0.0063** (0.0025)	0.0063* (0.0034)
Adjusted R^2	0.0105	0.0105	0.0110	0.0110
Observations	1854015	1854015	1780851	1780851
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: In all specifications, we include sector and country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) include each firm's main bank by year fixed effects. We estimate a similar set of regressions with import values in units of the U.S. dollar, and the results are shared in Table 36 in the Online Appendix. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Overall, our panel regressions with more recent sample periods reaffirm the relevance of the financial channel of dollar debt in shaping the exchange rate pass-through to export quantities and prices.¹⁷

5 A Simple Two-Period Model

This section presents a simple model that rationalizes our empirical findings. A simple two-period model illustrates how firms may react differently to the depreciation of the domestic currency, depending on their firm size and foreign currency debt exposure. Specifically, after the devaluation, for smaller firms, higher foreign currency debt leads to lower export quantities and higher prices, whereas for larger firms, it results in higher export quantities and lower prices.

Exporters live two periods, 1 and 2. At the beginning of period 1, each firm starts with the capital stock k , debt level d and cash holding T . λ fraction of d is denominated in dollars and the rest are in domestic currency. There are two types of exporters – small and large. A small exporter owns a lower level of capital stock than a large exporter: $k_{small} < k_{large}$. We assume that both small and large exporters have the same debt to capital and cash to capital ratios ($\frac{d}{k}$ and $\frac{T}{k}$, respectively). That is, their cash holdings T and debt d are proportional to their initial levels of capital stock k . Therefore, consistent with the empirical findings, our analysis explores the effect of the currency composition of debt (λ) on firms' production of output and their output prices, conditional on their leverage and cash to asset ratios.

After an exchange rate shock is realized, i.e., $\xi > 1$, firms need to pay back their debt and use the remaining cash to hire labor, i.e., $wn \leq T - d(\xi\lambda + 1 - \lambda)$. This assumption captures the idea that the balance sheet deterioration due to the large depreciation restricts the firm's production capacity through the working capital channel (Kim and Lee, 2024). Firms can also produce more by borrowing $a \geq 0$ to acquire additional capital stock at the interest rate, r . In period 1, firms consume what they produce and export and any cash holdings left after paying back their debt and

¹⁷The results are robust when estimating the regression 5 at the firm - product - destination/origin country - currency - year level with currency fixed effects. The result are reported in Tables 37 – 42 in the Online Appendix.

wage bills.

In period 2, firms pay the cost of borrowing for the additional capital stock, $(1+r)a$ and consume the remaining capital stock $k+a-(1+r)a=k-ra$. Hence, in order to compensate their liquidity shortage, each firm can generate extra cash flows in period 1 at the expense of the cash flow in the following period. This feature is in line with the inventory adjustment channel (for instance, [Kim \(2021\)](#)), where firms experiencing a liquidity shortage increase today's cash flows by liquidating inventories at the expense of tomorrow's cash flows. We normalize the price of final consumption goods in both periods to one.

Small and large firms solve the following problem given k, d, T and exchange rate ξ :

$$\begin{aligned} & \max_{c_1, c_2, y, a, n} U_1(c_1) + U_2(c_2) \\ & s.t. \ c_1 = \xi p(y)y - d(\lambda \xi + (1-\lambda)) - wn + T, \quad c_2 = k - ra \\ & \quad y = z(k+a)^\alpha n^{1-\alpha}, \quad y = Dp^{-\eta}, \quad wn \leq T - d(\xi\lambda + 1 - \lambda) \end{aligned}$$

We assume that utility functions for periods 1 and 2 are $U_1(c) = \ln(c)$, $U_2(c) = \nu c$, respectively.¹⁸ In line with the previous studies, the elasticity parameter η is set to 4 (see [Gopinath and Itskhoki \(2010\)](#) and [Kim and Lee \(2024\)](#), for example), and the net interest rate r and ξ is set to 0.08 and 2.0 to match the data counterparts, respectively. The capital share α is set to 0.33. Without loss of generality, we assume $z = 1$, $D = 1$, and $w = 1$. The initial values of capital stock for small and large firms $k_{small} < k_{large}$ are set such that small firms face binding working capital constraint, but large firms do not. Small and large firm have the same cash to capital and debt-to-capital ratios.¹⁹

¹⁸The assumption of a linear utility in period 2 is not necessary but imposed for algebraic simplicity.

¹⁹We arbitrarily set $T = k$, $d = 0.2k$, and $\nu = 0.3$ such that it shows the mechanism that we would like to show clearly. We set $k_{small} = 0.5\bar{k}$ and $k_{large} = 2.0\bar{k}$, where $\bar{k} = \frac{\theta\alpha}{r}$.

Large Exporter. Assuming that working capital constraints are not binding, a large firm's optimal decision of a satisfy the following equation:

$$\begin{aligned} \Phi_1(k+a)^{\frac{\theta-1}{1-\theta(1-\alpha)}} U'_1(c_1) &= rU'_2(c_2) \\ \Rightarrow \frac{\Phi_1(k+a)^{\frac{\theta-1}{1-\theta(1-\alpha)}}}{\Phi_2(k+a)^{\frac{\theta\alpha}{1-\theta(1-\alpha)}} + T - d(\xi\lambda + 1 - \lambda)} &= vr \end{aligned} \quad (6)$$

, where $\Phi_1 = \frac{\alpha}{1-\alpha} (\theta(1-\alpha)\xi)^{\frac{1}{1-\theta(1-\alpha)}}$, $\Phi_2 = \frac{1-\theta(1-\alpha)}{\theta(1-\alpha)} (\theta(1-\alpha)\xi)^{\frac{1}{1-\theta(1-\alpha)}}$, and $\theta = \frac{\eta-1}{\eta}$.

The left-hand side of Equation (6) represents the marginal benefit of an additional borrowing a , while the right-hand side reflects the marginal cost of doing so. The marginal benefit decreases as a rises, due to (1) decreasing marginal product of capital and (2) decreasing marginal utility of consumption. In addition, the marginal utility of consumption increases with a larger foreign currency debt burden λ , capturing a greater degree of liquidity shortage due to the increase in debt burden. This leads to an increase in borrowing a , thereby increasing production in order to generate extra cash flows. On the other hand, the marginal cost of borrowing is constant at vr due to our assumption of quasi-linear utility function.

The graphical illustration of the marginal benefits with different level of λ and marginal cost as a function of additional capital a , is depicted in Figure 3. As λ increases, the marginal benefit of additional a is larger and hence, firms acquire more capital and increase their production.

Figure 3: Marginal Benefit and Marginal Cost of Additional a

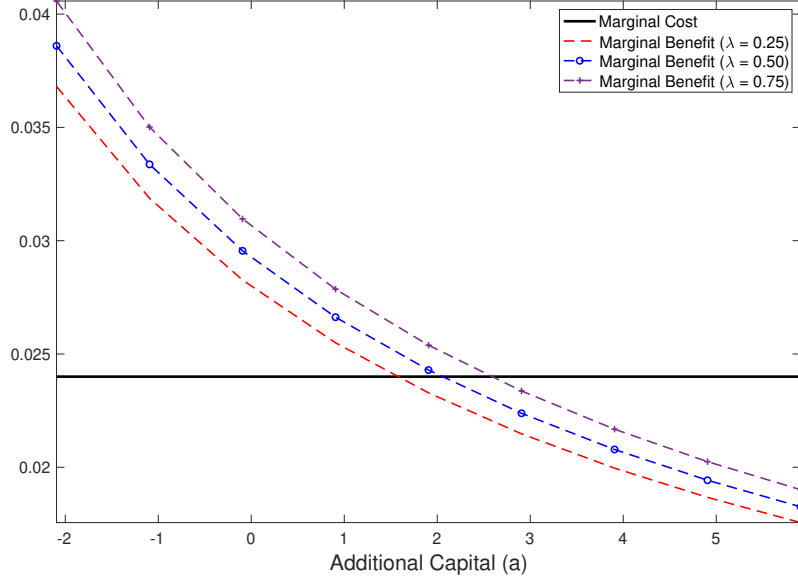
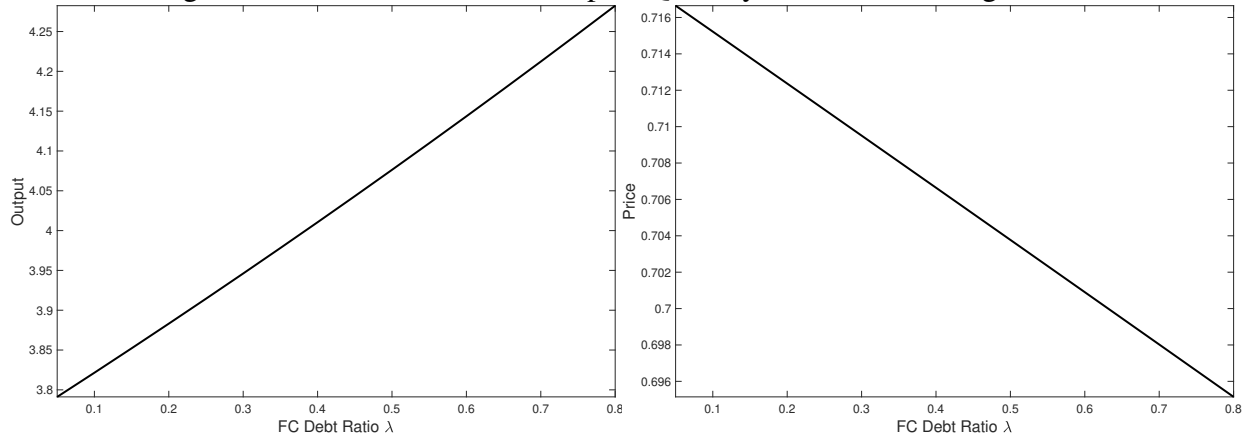


Figure 4 shows a complete picture of how a large firm's decisions vary by its foreign currency debt ratio λ . As illustrated above, large exporters produce more and charge lower prices as their foreign currency debt ratio increases. This result arises from the facts that (i) larger firms are less affected by the balance sheet deterioration compared to smaller firms, so their production capacity is not restricted and (ii) they would like to produce more to generate additional cash flows when facing liquidity shortages due to higher debt burden.

Figure 4: Effect of FC debt on Export Quantity and Price for Large Firms

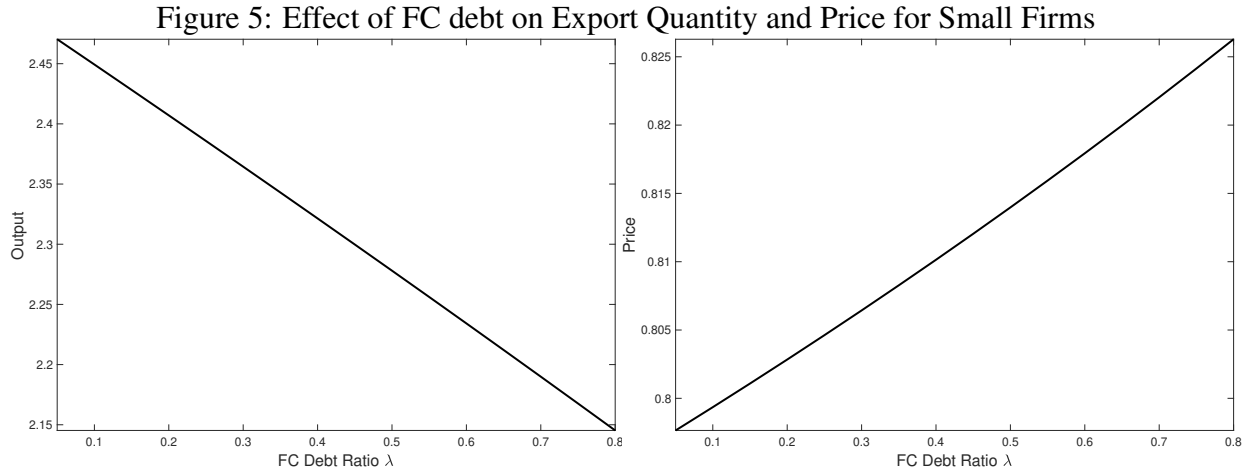


Small Exporter Assuming that working capital constraint are binding, a small firm's optimal decisions can be expressed as following closed form solutions:

$$n = T - d(\xi\lambda + 1 - \lambda), \quad a = \frac{2\alpha\theta}{r} - k,$$

$$\text{and } y = \left(\frac{2\alpha\theta}{r}\right)^\alpha (T - d(\xi\lambda + 1 - \lambda))^{1-\alpha}$$

As a firm's foreign currency debt burden λ increases, its ability to hire labor is directly affected due to the working capital constraint. This lower working capital reduces labor demand, and subsequently leads to a decrease in the production of small exporters. Figure 5 illustrates how a small firm's output and price vary with its foreign currency debt ratio λ .



In contrast to the response of large exporters, small exporters produce less and charge higher prices as their foreign currency debt ratio increases. Although they both face higher debt burden due to their foreign currency debt exposure, small firms are not able to expand their export sales as they have limited amount of working capital to start with. Therefore, the increased debt burden imposes an even tighter working capital constraint on smaller firms, forcing them to produce less. As a result, in response to the devaluation, small exporters with high foreign currency debt produce less output and sell at higher prices.

In sum, our simple two-period model successfully explains how and why increased in debt

burden, resulting from foreign currency debt exposure after the domestic currency depreciation, affects small and large firms differently. During the large devaluation period, small and large exporters with higher foreign currency debt both face higher debt burden and shortage of liquidity. However, large firms with higher foreign currency debt could expand their export sales and generate higher cashflows today as they do not face constraints on their production capacity. In contrast, smaller exporters with higher foreign currency debt are severely affected by the balance sheet deterioration, which restricts their production capacity, forcing them to reduce export sales.

6 Conclusion

This paper analyzes the role of dollar debt and firm heterogeneity in shaping the response of exporters to exchange rate fluctuations. We exploit large devaluation in Korea in 1997 and a unique dataset merging Korean firm-level balance sheet data with transaction-level Korean customs data to identify the balance sheet effect of foreign currency debt on exporters. Our analysis highlights different responses of small and large exporters: small exporters with high levels of foreign currency debt tend to reduce their export quantities and raise their prices, while large exporters indebted in foreign currency debt increase their export quantities and lower their prices. As we highlight in our simple model in Section 5, smaller firms burdened with substantial foreign currency debt experience a decline in net worth and working capital following the devaluation, which limits their production capacity and leads to reduced output and increased prices. In contrast, large firms, despite their significant foreign currency debt exposure, may not encounter constraints on their working capital and hence production. Consequently, they often increase their exports to generate more cash flows, even if it comes at the cost of future cash flows, particularly when they require liquidity due to high levels of foreign currency debt. Furthermore, we show that firms highly indebted in foreign currency debt lower the amount of inputs used for the production, including imported inputs. Our panel data analysis, spanning 2001-2020, further confirms that the effect of dollar debt on global trades still presents in more recent periods.

Our findings suggest that not all exporters could benefit from the boosted export profitability after a large depreciation. For small firms, currency depreciation leads to production disruptions when they are more indebted in foreign currency. Large firms, on the other hand, could expand their sales more, responding to increased debt burden. This heterogeneity in firms' responses to depreciation could lead to an unexpected resource reallocation from smaller to larger exporters. The optimal policy response in the very setting would be interesting and of merit on its own, but we will leave it for future research. We believe that the insights gained from exploring the effect of dollar debt on the exchange rate pass-through to global trades are of significant relevance to policymakers in emerging markets, where domestic currencies often experience sudden depreciation against the dollar, and liabilities are highly dollarized.

References

- Aguiar, M. (2005). Investment, devaluation, and foreign currency exposure: The case of Mexico. *Journal of Development Economics*, 78(1):95–113.
- Alfaro, L., Asis, G., Chari, A., and Panizza, U. (2019). Corporate debt, firm size and financial fragility in emerging markets. *Journal of International Economics*, 118:1–19.
- Amiti, M., Itskhoki, O., and Konings, J. (2019). International shocks, variable markups, and domestic prices. *Review of Economic Studies*, 86(6):2356–2402.
- Amiti, M. and Weinstein, D. E. (2011). Exports and financial shocks. *Quarterly Journal of Economics*, 126(4):1841–1877.
- Broda, C. and Weinstein, D. E. (2008). Understanding international price differences using barcode data. Technical report, National Bureau of Economic Research.
- Bruno, V. and Shin, H. S. (2023). Dollar and exports. *Review of Financial Studies*, 36(8):2963–2996.
- Burstein, A., Eichenbaum, M., and Rebelo, S. (2005). Large devaluations and the real exchange rate. *Journal of Political Economy*, 113(4):742–784.
- Burstein, A. and Gopinath, G. (2014). International prices and exchange rates. *Handbook of International Economics*, 4:391–451.
- Casas, C., Meleshchuk, S., and Timmer, Y. (2023). The dominant currency financing channel of external adjustment.
- Céspedes, L. F., Chang, R., and Velasco, A. (2004). Balance sheets and exchange rate policy. *American Economic Review*, 94(4):1183–1193.
- Corsetti, G., Crowley, M. A., Han, L., et al. (2018). Invoicing and pricing-to-market: A study of price and markup elasticities of UK exporters. Technical report, CEPR Discussion Papers.

- Crucini, M. J. and Telmer, C. I. (2012). Microeconomic sources of real exchange rate variability. Technical report, National Bureau of Economic Research.
- Desai, M. A., Foley, C. F., and Forbes, K. J. (2008). Financial constraints and growth: Multi-national and local firm responses to currency depreciations. *Review of Financial Studies*, 21(6):2857–2888.
- Devereux, M. B. and Engel, C. (2002). Exchange rate pass-through, exchange rate volatility, and exchange rate disconnect. *Journal of Monetary Economics*, 49(5):913–940.
- Drenik, A. and Perez, D. J. (2021). Domestic price dollarization in emerging economies. *Journal of Monetary Economics*, 122:38–55.
- Engel, C. (1993). Real exchange rates and relative prices: An empirical investigation. *Journal of Monetary Economics*, 32(1):35–50.
- Engel, C. (1999). Accounting for us real exchange rate changes. *Journal of Political Economy*, 107(3):507–538.
- Engel, C. (2006). Equivalence results for optimal pass-through, optimal indexing to exchange rates, and optimal choice of currency for export pricing. *Journal of the European Economic Association*, 4(6):1249–1260.
- Gilchrist, S. and Sim, J. W. (2007). Investment during the korean financial crisis: a structural econometric analysis. Technical report, National Bureau of Economic Research.
- Goldberg, L. S. and Campa, J. M. (2010). The sensitivity of the cpi to exchange rates: Distribution margins, imported inputs, and trade exposure. *Review of Economics and Statistics*, 92(2):392–407.
- Goldberg, L. S. and Tille, C. (2008). Vehicle currency use in international trade. *Journal of International Economics*, 76(2):177–192.

- Goldberg, L. S. and Tille, C. (2016). Micro, macro, and strategic forces in international trade invoicing: Synthesis and novel patterns. *Journal of International Economics*, 102:173–187.
- Gopinath, G., Gourinchas, P.-O., Hsieh, C.-T., and Li, N. (2011). International prices, costs, and markup differences. *American Economic Review*, 101(6):2450–86.
- Gopinath, G. and Itskhoki, O. (2010). Frequency of price adjustment and pass-through. *Quarterly Journal of Economics*, 125(2):675–727.
- Gopinath, G., Itskhoki, O., and Rigobon, R. (2010). Currency choice and exchange rate pass-through. *American Economic Review*, 100(1):304–336.
- Kalemli-Ozcan, S., Kamil, H., and Villegas-Sanchez, C. (2016). What hinders investment in the aftermath of financial crises: Insolvent firms or illiquid banks? *Review of Economics and Statistics*, 98(4):756–769.
- Kim, J. and Lee, A. S. (2024). Liability dollarization and exchange rate pass-through to domestic prices.
- Kim, R. (2021). The effect of the credit crunch on output price dynamics: The corporate inventory and liquidity management channel. *Quarterly Journal of Economics*, 136(1):563–619.
- Kim, Y. J., Tesar, L. L., and Zhang, J. (2015). The impact of foreign liabilities on small firms: Firm-level evidence from the korean crisis. *Journal of International Economics*, 97(2):209–230.
- Kohn, D., Leibovici, F., and Szkup, M. (2020). Financial frictions and export dynamics in large devaluations. *Journal of International Economics*, 122:103257.
- Korinek, A. (2011). The new economics of prudential capital controls: A research agenda. *IMF Economic Review*, 59(3):523–561.
- Krugman, P. (1999). Balance sheets, the transfer problem, and financial crises. In *International finance and financial crises*, pages 31–55. Springer.

Ma, S. and Schmidt-Eisenlohr, T. (2023). The financial channel of the exchange rate and global trade.

Mukhin, D. (2022). An equilibrium model of the international price system. *American Economic Review*, 112(2):650–688.

Niepmann, F. and Schmidt-Eisenlohr, T. (2017). International trade, risk and the role of banks. *Journal of International Economics*, 107:111–126.

Appendix

FC Debt in 2000 – 2019

Table 11: FC Borrowing Among Exporters vs. Non-Exporters (2000-2019)

Year	Non-Exporters			Exporters		
	Share of Firms with FC Debt	FC Debt Ratios	FC Debt Ratio (>0)	Share of Firms with FC Debt	FC Debt Ratios	FC Debt Ratio (>0)
2000	13.2%	3.5%	26.8%	42.6%	11.8%	27.6%
2001	11.4%	3.1%	27.5%	38.6%	11.0%	28.5%
2002	12.8%	4.1%	32.4%	43.4%	13.9%	32.0%
2003	14.1%	4.6%	32.7%	46.8%	16.8%	36.0%
2004	12.5%	3.6%	29.2%	47.1%	16.6%	35.3%
2005	12.5%	3.8%	30.4%	44.6%	14.6%	32.8%
2006	13.0%	3.8%	29.3%	42.6%	13.5%	31.6%
2007	11.0%	3.5%	31.6%	37.6%	11.6%	30.9%
2008	10.2%	3.4%	33.6%	37.6%	13.1%	34.8%
2009	10.8%	3.6%	33.2%	37.1%	12.1%	32.5%
2010	9.9%	3.4%	34.4%	36.3%	12.6%	34.6%
2011	9.0%	3.1%	34.5%	33.0%	11.6%	35.3%
2012	8.3%	2.7%	31.9%	30.1%	9.8%	32.6%
2013	6.3%	1.9%	29.5%	26.1%	7.8%	29.9%
2014	5.9%	1.6%	28.0%	23.6%	7.2%	30.5%
2015	4.9%	1.4%	28.1%	21.7%	6.5%	29.9%
2016	4.5%	1.2%	27.1%	19.3%	6.0%	31.0%
2017	3.9%	1.0%	25.6%	17.7%	5.1%	28.8%
2018	3.6%	1.0%	26.6%	16.2%	4.9%	30.0%
2019	3.3%	1.0%	28.9%	15.1%	4.3%	28.6%

Notes: FC debt ratio is the foreign currency debt to total debt ratio. Exporters are the firms with positive exports in each year. All variables are their values in each year. The columns with “FC Debt Ratio (>0)” shows the average foreign currency debt ratio conditional on holding a positive amount of foreign currency debt.

Table 12: Export and Import Share Among FC Borrowers vs. Non-FC Borrowers (2000-2019)

Year	Import Share		Export Share	
	Positive FC debt	Zero FC debt	Positive FC debt	Zero FC debt
2000	18%	18%	19%	21%
2001	18%	16%	20%	21%
2002	19%	16%	20%	21%
2003	19%	17%	20%	19%
2004	19%	17%	21%	19%
2005	18%	16%	20%	18%
2006	20%	15%	20%	18%
2007	20%	15%	19%	18%
2008	23%	16%	20%	20%
2009	22%	15%	21%	20%
2010	22%	14%	21%	20%
2011	23%	14%	21%	20%
2012	21%	13%	22%	20%
2013	21%	13%	22%	20%
2014	22%	13%	21%	20%
2015	23%	13%	22%	21%
2016	23%	13%	22%	21%
2017	24%	13%	22%	22%
2018	25%	13%	21%	22%
2019	25%	14%	21%	23%

Notes: This table shows the average export and import shares among exporters with and without foreign currency debt. Export share is the export to sales ratio. Import share is the share of imported inputs to total variable costs.

Table 13: Firm-Level Correlations between FC debt and Other Firm-level Characteristics (2000-2019)

(1) Firm-Level Correlations with FC Debt Ratio

Year	Import Share	Export Share	Sale Share	Size	Leverage	ST Debt Ratio	Cash Ratio	FC Cash Ratio
2000	0.13	-0.02	0.06	0.26	0.02	-0.14	-0.03	0.04
2001	0.13	-0.02	0.01	0.21	-0.02	-0.12	0.01	0.04
2002	0.13	-0.01	0.04	0.17	-0.02	-0.07	0.05	0.02
2003	0.11	0.03	0.00	0.16	-0.02	-0.04	0.05	0.05
2004	0.10	0.04	0.04	0.19	-0.08	0.03	0.07	0.05
2005	0.12	0.05	0.06	0.20	-0.09	0.06	0.04	0.04
2006	0.14	0.03	0.04	0.19	-0.09	0.08	0.04	0.06
2007	0.14	0.02	0.06	0.24	-0.08	0.09	0.04	0.06
2008	0.19	0.01	0.04	0.19	0.00	0.07	0.07	0.05
2009	0.17	0.01	0.01	0.18	-0.02	0.09	0.07	-0.01
2010	0.21	0.00	0.02	0.18	-0.06	0.14	0.08	0.07
2011	0.20	0.01	0.02	0.14	-0.06	0.14	0.10	0.09
2012	0.18	0.02	0.03	0.13	-0.09	0.13	0.07	0.09
2013	0.18	0.01	0.03	0.16	-0.10	0.15	0.06	0.09
2014	0.20	0.01	0.04	0.17	-0.11	0.16	0.09	0.08
2015	0.21	0.00	0.02	0.17	-0.11	0.15	0.09	0.08
2016	0.21	-0.01	0.02	0.18	-0.10	0.15	0.09	0.06
2017	0.20	-0.01	0.03	0.16	-0.11	0.15	0.08	0.00
2018	0.20	-0.03	0.04	0.16	-0.10	0.16	0.05	0.00
2019	0.17	-0.04	0.02	0.16	-0.08	0.14	0.03	0.02

Notes: The table shows how the foreign currency debt to total debt ratios are correlated with regressors in the regressions presented in Section 3. Regressors are their values in each year and include import share (the share of imported inputs to total variable costs); export to sales ratio; sale share; size (log of sales); leverage (total debt to total assets ratio); ST debt ratio (short-term debt to total debt ratio); cash ratio (cash to total assets ratio); and FC cash ratio (FC cash to total cash ratio).

Continued Table 13

(2) Firm-Level Correlations with FC Debt Ratio > 0

Year	Import Share	Export Share	Sale Share	Size	Leverage	ST Debt Ratio	Cash Ratio	FC Cash Ratio
2000	0.27	0.00	0.06	0.09	-0.13	-0.22	0.15	0.03
2001	0.22	-0.02	-0.01	0.06	-0.23	-0.21	0.18	0.05
2002	0.18	-0.01	0.04	0.03	-0.20	-0.11	0.23	0.03
2003	0.15	0.03	0.02	0.05	-0.26	-0.02	0.25	0.03
2004	0.13	0.03	0.04	0.12	-0.34	0.06	0.25	0.04
2005	0.15	0.04	0.07	0.15	-0.37	0.06	0.21	0.04
2006	0.14	0.00	0.07	0.16	-0.37	0.11	0.21	0.01
2007	0.15	0.01	0.10	0.19	-0.33	0.10	0.22	0.00
2008	0.18	0.01	0.04	0.10	-0.22	0.07	0.25	0.00
2009	0.15	-0.01	0.02	0.09	-0.26	0.10	0.24	0.02
2010	0.18	-0.05	0.03	0.10	-0.32	0.18	0.26	-0.01
2011	0.16	-0.03	-0.01	0.06	-0.32	0.18	0.30	0.02
2012	0.17	-0.02	0.03	0.06	-0.38	0.16	0.28	0.02
2013	0.17	-0.04	0.04	0.11	-0.40	0.27	0.30	0.06
2014	0.18	-0.03	0.04	0.13	-0.42	0.24	0.38	0.06
2015	0.19	-0.04	0.02	0.15	-0.43	0.24	0.37	0.03
2016	0.21	-0.05	-0.02	0.16	-0.45	0.23	0.42	0.01
2017	0.16	-0.05	0.01	0.09	-0.42	0.27	0.38	0.00
2018	0.17	-0.06	0.04	0.10	-0.40	0.28	0.37	0.05
2019	0.13	-0.09	-0.03	0.12	-0.39	0.26	0.30	0.03

Notes: The table shows how the foreign currency debt to total debt ratios, conditional on borrowing in foreign currency, are correlated with regressors in the regressions presented in Section 3. Regressors are their values in each year and include import share (the share of imported inputs to total variable costs); export to sales ratio; sale share; size (log of sales); leverage (total debt to total assets ratio); ST debt ratio (short-term debt to total debt ratio); cash ratio (cash to total assets ratio); and FC cash ratio (FC cash to total cash ratio).

Additional Tables for Section 3

Table 14: FC Debt, and Export Quantities and Prices: Other Control Variables

Exports	ΔQ_{97-98}		Δp_{97-98}	
	(1)	(2)	(3)	(4)
FC Debt Ratio	-2.8014*** (0.8657)	-3.0436*** (0.8948)	0.6632*** (0.2517)	0.7066*** (0.2610)
FC Debt Ratio \times Size	0.1655*** (0.0482)	0.1768*** (0.0499)	-0.0373*** (0.0140)	-0.0401*** (0.0145)
Sale Share	-0.2610*** (0.0292)	-0.2636*** (0.0293)	0.0233*** (0.0084)	0.0222*** (0.0084)
Import Share	1.0851 (0.8035)	1.2332 (0.8234)	-0.0303 (0.2209)	-0.0820 (0.2282)
Size	-0.0277 (0.0365)	-0.0304 (0.0385)	0.0064 (0.0103)	0.0071 (0.0109)
Leverage	-0.3862 (0.8655)	-0.6205 (0.9276)	0.7211*** (0.2255)	0.6084** (0.2429)
ST Debt Ratio	0.5140 (0.6492)	0.6328 (0.6658)	-0.4124** (0.1765)	-0.3490* (0.1827)
Cash Ratio	-0.1169 (0.1600)	-0.1090 (0.1647)	0.0970** (0.0440)	0.0839* (0.0453)
FC Cash Ratio	5.9776*** (1.3411)	6.3654*** (1.4021)	0.0222 (0.3798)	-0.1833 (0.4008)
Export Share	-1.6026*** (0.5841)	-1.9211*** (0.6188)	0.4163** (0.1636)	0.4717*** (0.1774)
Import Share \times Size	-0.0563 (0.0444)	-0.0647 (0.0456)	0.0036 (0.0121)	0.0066 (0.0125)
Leverage \times Size	0.0244 (0.0487)	0.0390 (0.0523)	-0.0413*** (0.0125)	-0.0348*** (0.0135)
ST Debt Ratio \times Size	-0.0273 (0.0369)	-0.0341 (0.0379)	0.0244** (0.0099)	0.0208** (0.0103)
FC Cash Ratio \times Size	-0.3312*** (0.0707)	-0.3492*** (0.0743)	0.0025 (0.0200)	0.0136 (0.0213)
Export Share \times Size	0.0861*** (0.0330)	0.1039*** (0.0352)	-0.0240*** (0.0092)	-0.0273*** (0.0101)
Adjusted R2	0.0446	0.0465	0.2874	0.2874
Bank FE	No	Yes	No	Yes
Observations	26888	26626	26888	26626

Notes: Robust standard errors are reported in the parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 15: Dynamic Responses of Export Quantities

	h=-3	h=-2	h=-1	h=1	h=2	h=3	h=4	h=5	h=6
FC Debt Ratio	1.9611 (1.3129)	0.7368 (1.3134)	0.5910 (1.0450)	-2.0872* (1.1407)	-2.0498 (1.2905)	-3.4434*** (1.2710)	-5.1286*** (1.2714)	-4.8438*** (1.4505)	-5.7605*** (1.6031)
FC Debt Ratio \times Size	-0.1190 (0.0732)	-0.0485 (0.0728)	-0.0380 (0.0581)	0.1092* (0.0637)	0.1074 (0.0718)	0.1929*** (0.0708)	0.2848*** (0.0711)	0.2601*** (0.0806)	0.3183*** (0.0898)
Size	0.0462 (0.0568)	0.0811 (0.0528)	0.0792* (0.0456)	-0.0443 (0.0476)	0.0135 (0.0556)	-0.0695 (0.0555)	-0.1217** (0.0566)	-0.1220* (0.0630)	-0.1299* (0.0707)
Adjusted R^2	0.0165	0.0165	0.0165	0.0208	0.0397	0.0259	0.0268	0.0403	0.0326
Observations	10035	9897	10170	10114	9826	10047	11230	9684	9127

Notes: This table shows the results in Figure 2. Robust standard errors are reported in the parentheses.

Table 16: Dynamic Responses of Export Quantities (with Bank FE)

	h=-3	h=-2	h=-1	h=1	h=2	h=3	h=4	h=5	h=6
FC Debt Ratio	1.7726 (1.3141)	0.6529 (1.3288)	0.7259 (1.0553)	-1.3677 (1.1546)	-1.7036 (1.3294)	-3.3899*** (1.3032)	-5.6130*** (1.2980)	-4.9149*** (1.4909)	-5.7417*** (1.6095)
FC Debt Ratio \times Size	-0.1056 (0.0732)	-0.0417 (0.0735)	-0.0452 (0.0585)	0.0712 (0.0643)	0.0845 (0.0739)	0.1872*** (0.0726)	0.3079*** (0.0725)	0.2627*** (0.0827)	0.3127*** (0.0902)
Size	0.0897 (0.0584)	0.1286** (0.0541)	0.0944** (0.0470)	-0.0202 (0.0499)	0.0446 (0.0587)	-0.0215 (0.0584)	-0.0817 (0.0587)	-0.0981 (0.0659)	-0.1172 (0.0744)
Adjusted R^2	0.0252	0.0339	0.0184	0.0227	0.0418	0.0279	0.0287	0.0429	0.0377
Observations	9961	9824	10099	10044	9760	9980	11148	9619	9069

Notes: This table shows the results in Figure 2. Robust standard errors are reported in the parentheses.

Table 17: Dynamic Responses of Export Prices

	h=-3	h=-2	h=-1	h=1	h=2	h=3	h=4	h=5	h=6
FC Debt Ratio	-0.0495 (0.3654)	-0.0319 (0.3049)	-0.0228 (0.3508)	-0.4538 (0.3347)	0.0509 (0.3779)	0.6117* (0.3319)	0.4614** (0.2151)	0.6059* (0.3398)	-0.1824 (0.4150)
FC Debt Ratio \times Size	0.0042 (0.0206)	0.0026 (0.0169)	0.0030 (0.0197)	0.0251 (0.0190)	0.0013 (0.0212)	-0.0321* (0.0184)	-0.0247** (0.0119)	-0.0310 (0.0189)	0.0114 (0.0232)
Size	0.0077 (0.0144)	-0.0153 (0.0119)	-0.0080 (0.0123)	-0.0189 (0.0123)	-0.0079 (0.0147)	0.0075 (0.0126)	-0.0051 (0.0101)	-0.0023 (0.0141)	-0.0164 (0.0167)
Adjusted R^2	0.0848	0.0574	0.0446	0.0382	0.0982	0.0917	0.1728	0.1977	0.2564
Observations	10035	9897	10170	10114	9826	10047	11230	9684	9127

Notes: This table shows the results in Figure 2. Robust standard errors are reported in the parentheses.

Table 18: Dynamic Responses of Export Prices (with Bank FE)

	h=-3	h=-2	h=-1	h=1	h=2	h=3	h=4	h=5	h=6
FC Debt Ratio	-0.0935 (0.3840)	-0.1343 (0.3178)	-0.1033 (0.3665)	-0.5379 (0.3439)	-0.0100 (0.3828)	0.7092** (0.3379)	0.4939** (0.2215)	0.5881 (0.3591)	-0.2177 (0.4334)
FC Debt Ratio \times Size	0.0064 (0.0217)	0.0074 (0.0176)	0.0072 (0.0207)	0.0298 (0.0195)	0.0048 (0.0215)	-0.0379** (0.0188)	-0.0266** (0.0123)	-0.0305 (0.0199)	0.0133 (0.0242)
Size	0.0144 (0.0148)	-0.0193 (0.0125)	-0.0006 (0.0126)	-0.0176 (0.0124)	-0.0051 (0.0159)	0.0108 (0.0134)	0.0014 (0.0105)	0.0054 (0.0147)	-0.0106 (0.0182)
Adjusted R^2	0.0864	0.0578	0.0430	0.0408	0.1015	0.0943	0.1754	0.1620	0.2219
Observations	9961	9824	10099	10044	9760	9980	11148	9619	9069

Notes: This table shows the results in Figure 2. Robust standard errors are reported in the parentheses.

Table 19: FC Debt and Other Inputs: Other Control Variables

	$\Delta Networth_{97-98}$		$\Delta VariableCost_{97-98}$		$\Delta Capital_{97-98}$	
FC Debt Ratio	-0.6608*** (0.2304)	-0.6683*** (0.2267)	-0.9677** (0.4894)	-1.0594** (0.4723)	-1.1194** (0.4581)	-1.0458** (0.4488)
FC Debt Ratio \times Size	0.0406*** (0.0132)	0.0391*** (0.0129)	0.0603** (0.0272)	0.0649** (0.0262)	0.0608** (0.0258)	0.0564** (0.0252)
Import Share	0.2354 (0.2462)	0.3179 (0.2394)	1.0315** (0.5231)	0.9283** (0.4671)	-0.0587 (0.8205)	0.2110 (0.8000)
Size	-0.0110 (0.0120)	-0.0001 (0.0115)	-0.0131 (0.0227)	-0.0058 (0.0211)	0.0506* (0.0272)	0.0463* (0.0253)
Leverage	-0.1943 (0.3326)	0.3013 (0.3028)	0.4543 (0.6582)	0.6939 (0.5101)	0.6789 (0.7973)	0.5042 (0.6747)
ST Debt Ratio	0.0206 (0.2021)	0.0571 (0.1977)	-0.2218 (0.3858)	-0.0972 (0.3719)	0.5183 (0.4515)	0.5158 (0.4473)
Cash Ratio	0.1421*** (0.0402)	0.0992** (0.0423)	0.1052 (0.0871)	0.0639 (0.0863)	0.1259 (0.1128)	0.1027 (0.1106)
FC Cash Ratio	1.8207*** (0.4571)	1.4401*** (0.5169)	0.2114 (1.4582)	0.2978 (1.5441)	0.7039 (1.1011)	0.4313 (1.1173)
Export Share	0.1396 (0.3640)	-0.0604 (0.3503)	0.7996 (0.5384)	0.9019* (0.4995)	-0.0779 (0.7822)	0.2324 (0.7879)
Import Share \times Size	-0.0151 (0.0146)	-0.0199 (0.0142)	-0.0558* (0.0306)	-0.0491* (0.0272)	0.0071 (0.0481)	-0.0085 (0.0468)
Leverage \times Size	0.0151 (0.0199)	-0.0118 (0.0180)	-0.0224 (0.0384)	-0.0382 (0.0298)	-0.0359 (0.0470)	-0.0280 (0.0393)
ST Debt Ratio \times Size	-0.0005 (0.0122)	-0.0026 (0.0119)	0.0126 (0.0227)	0.0053 (0.0219)	-0.0257 (0.0262)	-0.0256 (0.0260)
FC Cash Ratio \times Size	-0.1025*** (0.0244)	-0.0801*** (0.0279)	-0.0040 (0.0768)	-0.0091 (0.0808)	-0.0536 (0.0618)	-0.0369 (0.0621)
Export Share \times Size	-0.0061 (0.0217)	0.0061 (0.0208)	-0.0315 (0.0315)	-0.0382 (0.0293)	0.0103 (0.0461)	-0.0087 (0.0463)
Adjusted R2	0.0847	0.0797	0.2163	0.2106	0.0421	0.0392
Bank FE	No	Yes	No	Yes	No	Yes
Observations	1964	1947	1966	1947	1966	1953

Notes: Robust standard errors are reported in the parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 20: FC Debt, and Import Quantities and Values: Other Control Variables

Imports	ΔQ_{97-98}		ΔV_{97-98}	
	(1)	(2)	(3)	(4)
FC Debt Ratio	-1.9817*** (0.7629)	-2.2130*** (0.7649)	-1.7973*** (0.6933)	-1.9589*** (0.6970)
FC Debt Ratio \times Size	0.1062** (0.0417)	0.1175*** (0.0418)	0.0939** (0.0378)	0.1017*** (0.0380)
Sale Share	-0.3349*** (0.0457)	-0.3575*** (0.0469)	-0.3439*** (0.0430)	-0.3648*** (0.0442)
Import Share	-0.7188 (0.8375)	-0.8317 (0.8311)	-1.1299 (0.7747)	-1.1661 (0.7816)
Size	-0.0473 (0.0433)	-0.0126 (0.0425)	-0.0492 (0.0403)	-0.0186 (0.0392)
Leverage	-0.1143 (1.1779)	0.6822 (1.0332)	-0.4664 (1.1287)	0.2767 (0.9973)
ST Debt Ratio	-1.1329 (0.7123)	-0.7073 (0.7114)	-0.9715 (0.6533)	-0.6320 (0.6514)
Cash Ratio	-0.2285 (0.1689)	-0.1441 (0.1695)	-0.1125 (0.1586)	-0.0494 (0.1597)
FC Cash Ratio	2.0368 (1.2686)	2.8224** (1.2672)	1.4615 (1.1993)	1.9160 (1.2505)
Export Share	1.7640* (0.9140)	1.9062** (0.8779)	1.7583** (0.8534)	1.8140** (0.8514)
Import Share \times Size	0.0330 (0.0472)	0.0386 (0.0468)	0.0555 (0.0436)	0.0574 (0.0440)
Leverage \times Size	-0.0054 (0.0674)	-0.0410 (0.0594)	0.0159 (0.0646)	-0.0171 (0.0574)
ST Debt Ratio \times Size	0.0576 (0.0402)	0.0341 (0.0402)	0.0486 (0.0370)	0.0294 (0.0370)
FC Cash Ratio \times Size	-0.1170* (0.0662)	-0.1563** (0.0661)	-0.0793 (0.0622)	-0.1031 (0.0646)
Export Share \times Size	-0.0727 (0.0525)	-0.0807 (0.0506)	-0.0740 (0.0489)	-0.0770 (0.0491)
Adjusted R2	0.0363	0.0366	0.0433	0.0435
Bank FE	No	Yes	No	Yes
Observations	22251	22096	22367	22212

Notes: Robust standard errors are reported in the parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Online Appendix

Summary Statistics of Samples in Section 3

Table 21: Summary Statistics: Regression of Export Prices

	Observations	Mean	Std
Price Change (yoy)	26888	-0.00	0.46
FC Debt Ratio	26888	0.19	0.20
Import Share	26888	0.17	0.16
Export Share	26888	0.33	0.25
Sale Share	26888	0.27	0.34
Size	26888	18.52	1.94
Leverage	26888	0.35	0.19
ST Debt Ratio	26888	0.68	0.22
Cash Ratio	26888	0.08	0.08
FC Cash Ratio	26888	0.03	0.10

Notes: The table shows the summary statistics for the data used in regressions in Section 3. Regressors are their values in 1996 and include import share (the share of imported inputs to total variable costs); export to sales ratio; sales share (export sales of firm f selling product i to country d over total Korean firms' exports to a market, defined as product HS4 code by destination country), size (log of sales), leverage (total debt to total assets ratio), ST debt ratio (short-term debt to total debt ratio), cash ratio (cash to total assets ratio), and FC cash ratio (FC cash to total cash ratio). Price change is the log export price change relative to 1997 to 1998.

Table 22: Summary Statistics: Regression of Export Quantities

	Observations	Mean	Std
Quantity Change (yoy)	26888	-0.20	1.44
FC Debt Ratio	26888	0.19	0.20
Import Share	26888	0.17	0.16
Export Share	26888	0.33	0.25
Sale Share	26888	0.27	0.34
Size	26888	18.52	1.94
Leverage	26888	0.35	0.19
ST Debt Ratio	26888	0.68	0.22
Cash Ratio	26888	0.08	0.08
FC Cash Ratio	26888	0.03	0.10

Notes: The table shows the summary statistics for the data used in regressions in Section 3. Regressors are their values in 1996 and include import share (the share of imported inputs to total variable costs); export to sales ratio; sales share (export sales of firm f selling product i to country d over total Korean firms' exports to a market, defined as product HS4 code by destination country), size (log of sales), leverage (total debt to total assets ratio), ST debt ratio (short-term debt to total debt ratio), cash ratio (cash to total assets ratio), and FC cash ratio (FC cash to total cash ratio). Quantity change is the log export quantity change from 1997 to 1998.

Table 23: Summary Statistics: Regression of Other Inputs - Net worth

	Observations	Mean	Std
Net Worth Change (yoy)	1964	0.06	0.16
FC Debt Ratio	1964	0.13	0.19
Import Share	1964	0.17	0.20
Export Share	1964	0.16	0.22
Size	1964	17.18	1.44
Leverage	1964	0.37	0.21
ST Debt Ratio	1964	0.64	0.26
Cash Ratio	1964	0.09	0.09
FC Cash Ratio	1964	0.01	0.07

Notes: The table shows the summary statistics for the data used in regressions in Section 3.3.

Table 24: Summary Statistics: Regression of Other Inputs - Variable Costs

	Observations	Mean	Std
Variable Costs Change (yoy)	1966	-0.05	0.31
FC Debt Ratio	1966	0.13	0.19
Import Share	1966	0.17	0.20
Export Share	1966	0.16	0.22
Size	1966	17.19	1.43
Leverage	1966	0.37	0.21
ST Debt Ratio	1966	0.64	0.26
Cash Ratio	1966	0.09	0.09
FC Cash Ratio	1966	0.01	0.07

Notes: The table shows the summary statistics for the data used in regressions in Section 3.3.

Table 25: Summary Statistics: Regression of Other Inputs - Capital Growth

	Observations	Mean	Std
Capital Change (yoy)	1966	-0.01	0.34
FC Debt Ratio	1966	0.13	0.19
Import Share	1966	0.17	0.20
Export Share	1966	0.16	0.22
Size	1966	17.18	1.44
Leverage	1966	0.37	0.21
ST Debt Ratio	1966	0.64	0.26
Cash Ratio	1966	0.09	0.09
FC Cash Ratio	1966	0.01	0.07

Notes: The table shows the summary statistics for the data used in regressions in Section 3.3.

Table 26: Summary Statistics: Regression of Imported Input Value

	Observations	Mean	Std
Value Change (yoy)	22367	-0.63	1.42
FC Debt Ratio	22367	0.19	0.22
Import Share	22367	0.29	0.21
Export Share	22367	0.19	0.22
Sale Share	22367	0.11	0.23
Size	22367	18.64	1.97
Leverage	22367	0.32	0.18
ST Debt Ratio	22367	0.69	0.22
Cash Ratio	22367	0.08	0.08
FC Cash Ratio	22367	0.04	0.13

Notes: The table shows the summary statistics for the data used in regressions in Section 3.3.

Table 27: Summary Statistics: Regression of Imported Input Quantity

	Observations	Mean	Std
Quantity Change (yoy)	22251	0.58	1.53
FC Debt Ratio	22251	0.19	0.22
Import Share	22251	0.29	0.21
Export Share	22251	0.19	0.22
Sale Share	22251	0.11	0.23
Size	22251	18.63	1.97
Leverage	22251	0.32	0.18
ST Debt Ratio	22251	0.69	0.22
Cash Ratio	22251	0.08	0.08
FC Cash Ratio	22251	0.04	0.13

Notes: The table shows the summary statistics for the data used in regressions in Section 3.3.

Summary Statistics of Samples in Section 4

Table 28: Summary Statistics: Panel Regressions – Exports

	Observations	Mean	Std
Price Change (%)	1902611	1.98	26.88
Quantity Change (%)	1902611	1.38	149.61
Exchange Rate Change (%)	1902611	0.10	7.02
FC Debt Ratio	1902611	0.13	0.25
Import Share	1902611	0.17	0.18
Export Share	1902611	0.36	0.26
Sale Share	1902611	0.16	0.29
Size	1902611	19.03	2.40
Leverage	1902611	0.24	0.17
ST Debt Ratio	1902611	0.74	0.29
Cash Ratio	1902611	0.06	0.06
FC Cash Ratio	1902611	0.23	2.19

Notes: The table shows the summary statistics for the data used in regressions in Section 4.

Table 29: Summary Statistics: Panel Regressions – Imports

	Observations	Mean	Std
Quantity Change (%)	1854015	0.31	150.15
Value Change (%)	1854015	1.36	148.69
Exchange Rate Change (%)	1854015	-0.06	7.46
FC Debt Ratio	1854015	0.14	0.26
Import Share	1854015	0.31	0.26
Export Share	1854015	0.19	0.24
Sale Share	1854015	0.01	0.04
Size	1854015	18.92	2.13
Leverage	1854015	0.24	0.18
ST Debt Ratio	1854015	0.74	0.30
Cash Ratio	1854015	0.06	0.07
FC Cash Ratio	1854015	0.17	2.82

Notes: The table shows the summary statistics for the data used in regressions in Section 4.

Additional Tables for Section 3

Table 30: FC Debt, and Export Quantities and Prices: Invoicing Currency and Bank FE

Export	ΔQ_{97-98}		Δp_{97-98}	
	(1)	(2)	(3)	(4)
FC Debt Ratio	-2.5843*** (0.9471)	-2.7482*** (0.9822)	0.6041** (0.2647)	0.6391** (0.2751)
FC Debt Ratio \times Size	0.1538*** (0.0527)	0.1607*** (0.0547)	-0.0338** (0.0147)	-0.0359** (0.0153)
Sale Share	-0.2777*** (0.0318)	-0.2791*** (0.0319)	0.0168* (0.0087)	0.0156* (0.0087)
Import Share	1.2397 (0.8938)	1.4323 (0.9124)	-0.0016 (0.2382)	-0.0599 (0.2455)
Size	-0.0244 (0.0401)	-0.0238 (0.0422)	0.0122 (0.0109)	0.0117 (0.0116)
Leverage	-0.1299 (0.9285)	-0.1910 (0.9889)	0.7523*** (0.2350)	0.6250** (0.2536)
ST Debt Ratio	0.4833 (0.7011)	0.6105 (0.7186)	-0.3188* (0.1846)	-0.2632 (0.1910)
Cash ratio	-0.1236 (0.1710)	-0.1113 (0.1758)	0.1066** (0.0447)	0.0951** (0.0461)
FC Cash Ratio	5.6870*** (1.5548)	6.1468*** (1.6257)	0.1837 (0.4138)	-0.0251 (0.4343)
Export Share	-1.7552*** (0.6363)	-1.9802*** (0.6692)	0.4608*** (0.1685)	0.5220*** (0.1825)
Import Share \times Size	-0.0651 (0.0494)	-0.0752 (0.0505)	0.0022 (0.0131)	0.0055 (0.0135)
Leverage \times Size	0.0082 (0.0523)	0.0131 (0.0558)	-0.0426*** (0.0130)	-0.0353** (0.0141)
ST Debt Ratio \times Size	-0.0278 (0.0398)	-0.0346 (0.0409)	0.0192* (0.0104)	0.0161 (0.0108)
FC Cash Ratio \times Size	-0.3125*** (0.0812)	-0.3329*** (0.0851)	-0.0061 (0.0219)	0.0051 (0.0231)
Export Share \times Size	0.0950*** (0.0360)	0.1072*** (0.0381)	-0.0265*** (0.0095)	-0.0302*** (0.0104)
Adjusted R2	0.0379	0.0393	0.2784	0.2784
Currency FE	Yes	Yes	Yes	Yes
Bank FE	No	Yes	No	Yes
Observations	26737	26476	26737	26476

Notes: Robust standard errors are reported in the parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Additional Tables for Panel Regressions in Section 4

Table 31: Panel Regression of Export Price Changes on FC Debt: Other Variables

Dependent Variables:	Export Prices			
	(1)	(2)	(3)	(4)
Import Share	0.0860*** (0.0115)	0.0860*** (0.0138)	0.0766*** (0.0122)	0.0766*** (0.0141)
Sale Share	-0.0031 (0.0053)	-0.0031 (0.0060)	-0.0025 (0.0054)	-0.0025 (0.0059)
Size	0.0021*** (0.0004)	0.0021*** (0.0005)	0.0023*** (0.0004)	0.0023*** (0.0005)
Leverage	0.0696*** (0.0126)	0.0696*** (0.0161)	0.0752*** (0.0133)	0.0752*** (0.0171)
ST Debt Ratio	0.0408*** (0.0058)	0.0408*** (0.0072)	0.0409*** (0.0060)	0.0409*** (0.0075)
Cash Ratio	-0.0121 (0.0334)	-0.0121 (0.0460)	0.0428 (0.0360)	0.0428 (0.0463)
FC Cash Ratio	-0.0139*** (0.0042)	-0.0139*** (0.0049)	-0.0102** (0.0040)	-0.0102** (0.0046)
Export Share	-0.0427*** (0.0090)	-0.0427*** (0.0106)	-0.0454*** (0.0098)	-0.0454*** (0.0114)
Import Share $\times \Delta E_{KRW}/\$$	2.0860*** (0.1454)	2.0860*** (0.1854)	1.6332*** (0.1516)	1.6332*** (0.1805)
Sale Share $\times \Delta E_{KRW}/\$$	0.1751** (0.0761)	0.1751* (0.0919)	0.1641** (0.0771)	0.1641* (0.0885)
Size $\times \Delta E_{KRW}/\$$	0.0019** (0.0008)	0.0019 (0.0013)	0.0018** (0.0008)	0.0018 (0.0013)
Leverage $\times \Delta E_{KRW}/\$$	1.9290*** (0.1407)	1.9290*** (0.2570)	2.0328*** (0.1466)	2.0328*** (0.2550)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	0.2759*** (0.0612)	0.2759*** (0.0789)	0.2700*** (0.0631)	0.2700*** (0.0789)
Cash Ratio $\times \Delta E_{KRW}/\$$	4.7656*** (0.4559)	4.7656*** (0.6094)	4.2776*** (0.4733)	4.2776*** (0.6163)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.1418*** (0.0477)	-0.1418** (0.0556)	-0.1050** (0.0454)	-0.1050** (0.0525)
Export Share $\times \Delta E_{KRW}/\$$	-0.7895*** (0.0941)	-0.7895*** (0.1170)	-0.7754*** (0.0967)	-0.7754*** (0.1150)

Continued Table 31

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1150*** (0.0078)	-0.1150*** (0.0103)	-0.0889*** (0.0082)	-0.0889*** (0.0100)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0102** (0.0040)	-0.0102** (0.0048)	-0.0094** (0.0041)	-0.0094** (0.0046)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1220*** (0.0079)	-0.1220*** (0.0149)	-0.1279*** (0.0082)	-0.1279*** (0.0149)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0190*** (0.0032)	-0.0190*** (0.0043)	-0.0186*** (0.0033)	-0.0186*** (0.0043)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.2779*** (0.0249)	-0.2779*** (0.0341)	-0.2512*** (0.0259)	-0.2512*** (0.0346)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0081*** (0.0026)	0.0081*** (0.0030)	0.0060** (0.0025)	0.0060** (0.0029)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0478*** (0.0050)	0.0478*** (0.0064)	0.0470*** (0.0052)	0.0470*** (0.0063)
Import Share $\times \text{Size}$	-0.0050*** (0.0006)	-0.0050*** (0.0008)	-0.0045*** (0.0007)	-0.0045*** (0.0008)
Sale Share $\times \text{Size}$	0.0003 (0.0003)	0.0003 (0.0003)	0.0002 (0.0003)	0.0002 (0.0003)
Leverage $\times \text{Size}$	-0.0043*** (0.0007)	-0.0043*** (0.0009)	-0.0046*** (0.0007)	-0.0046*** (0.0010)
ST Debt Ratio $\times \text{Size}$	-0.0022*** (0.0003)	-0.0022*** (0.0004)	-0.0022*** (0.0003)	-0.0022*** (0.0004)
Cash Ratio $\times \text{Size}$	-0.0005 (0.0018)	-0.0005 (0.0026)	-0.0035* (0.0020)	-0.0035 (0.0026)
FC Cash Ratio $\times \text{Size}$	0.0008*** (0.0002)	0.0008*** (0.0003)	0.0006*** (0.0002)	0.0006** (0.0003)
Export Share $\times \text{Size}$	0.0021*** (0.0005)	0.0021*** (0.0006)	0.0023*** (0.0005)	0.0023*** (0.0006)
Observations	1902611	1902611	1820447	1820447
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: In all specifications, we include sector and country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table 32: Panel Regression of Export Price Changes in USD on FC Debt

Dependent Variables:	Export Prices in USD			
	(1)	(2)	(3)	(4)
FC Debt Ratio	0.0010 (0.0074)	0.0010 (0.0101)	0.0025 (0.0078)	0.0025 (0.0102)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	0.2507*** (0.0889)	0.2507** (0.1261)	0.3005*** (0.0917)	0.3005** (0.1274)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times$ Size	-0.0131*** (0.0045)	-0.0131* (0.0067)	-0.0168*** (0.0046)	-0.0168** (0.0068)
FC Debt Ratio \times Size	0.0000 (0.0004)	0.0000 (0.0005)	-0.0001 (0.0004)	-0.0001 (0.0005)
Import Share	0.0938*** (0.0116)	0.0938*** (0.0141)	0.0851*** (0.0123)	0.0851*** (0.0143)
Sale Share	-0.0091* (0.0053)	-0.0091 (0.0061)	-0.0088 (0.0054)	-0.0088 (0.0060)
Size	0.0021*** (0.0004)	0.0021*** (0.0005)	0.0021*** (0.0004)	0.0021*** (0.0005)
Leverage	0.0645*** (0.0127)	0.0645*** (0.0162)	0.0682*** (0.0134)	0.0682*** (0.0171)
ST Debt Ratio	0.0437*** (0.0058)	0.0437*** (0.0074)	0.0424*** (0.0061)	0.0424*** (0.0076)
Cash Ratio	-0.0131 (0.0336)	-0.0131 (0.0464)	0.0357 (0.0363)	0.0357 (0.0468)
FC Cash Ratio	-0.0151*** (0.0044)	-0.0151*** (0.0052)	-0.0108*** (0.0041)	-0.0108** (0.0048)
Export Share	-0.0488*** (0.0090)	-0.0488*** (0.0109)	-0.0517*** (0.0099)	-0.0517*** (0.0117)
Import Share $\times \Delta E_{KRW}/\$$	2.2344*** (0.1472)	2.2344*** (0.1936)	1.8047*** (0.1535)	1.8047*** (0.1880)
Sale Share $\times \Delta E_{KRW}/\$$	0.1065 (0.0771)	0.1065 (0.0956)	0.0945 (0.0781)	0.0945 (0.0924)
Size $\times \Delta E_{KRW}/\$$	-0.0090*** (0.0008)	-0.0090*** (0.0027)	-0.0089*** (0.0008)	-0.0089*** (0.0027)
Leverage $\times \Delta E_{KRW}/\$$	1.8540*** (0.1424)	1.8540*** (0.2614)	1.9663*** (0.1483)	1.9663*** (0.2587)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	0.3361*** (0.0621)	0.3361*** (0.0911)	0.3496*** (0.0641)	0.3496*** (0.0918)
Cash Ratio $\times \Delta E_{KRW}/\$$	4.0485*** (0.4618)	4.0485*** (0.6178)	3.4814*** (0.4794)	3.4814*** (0.6253)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.1622*** (0.0506)	-0.1622*** (0.0589)	-0.1192** (0.0474)	-0.1192** (0.0551)
Export Share $\times \Delta E_{KRW}/\$$	-0.9635*** (0.0953)	-0.9635*** (0.1238)	-0.9194*** (0.0979)	-0.9194*** (0.1209)

Continued Table 32

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1227*** (0.0079)	-0.1227*** (0.0107)	-0.0980*** (0.0083)	-0.0980*** (0.0104)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0075* (0.0041)	-0.0075 (0.0050)	-0.0067 (0.0041)	-0.0067 (0.0048)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1183*** (0.0080)	-0.1183*** (0.0152)	-0.1246*** (0.0083)	-0.1246*** (0.0152)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0221*** (0.0032)	-0.0221*** (0.0049)	-0.0227*** (0.0033)	-0.0227*** (0.0049)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.2401*** (0.0252)	-0.2401*** (0.0345)	-0.2086*** (0.0262)	-0.2086*** (0.0350)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0091*** (0.0028)	0.0091*** (0.0032)	0.0067*** (0.0026)	0.0067** (0.0030)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0555*** (0.0051)	0.0555*** (0.0068)	0.0530*** (0.0053)	0.0530*** (0.0067)
Import Share $\times \text{Size}$	-0.0055*** (0.0006)	-0.0055*** (0.0008)	-0.0051*** (0.0007)	-0.0051*** (0.0008)
Sale Share $\times \text{Size}$	0.0007** (0.0003)	0.0007** (0.0003)	0.0007** (0.0003)	0.0007** (0.0003)
Leverage $\times \text{Size}$	-0.0040*** (0.0007)	-0.0040*** (0.0009)	-0.0042*** (0.0007)	-0.0042*** (0.0010)
ST Debt Ratio $\times \text{Size}$	-0.0023*** (0.0003)	-0.0023*** (0.0004)	-0.0022*** (0.0003)	-0.0022*** (0.0004)
Cash Ratio $\times \text{Size}$	-0.0003 (0.0018)	-0.0003 (0.0026)	-0.0031 (0.0020)	-0.0031 (0.0026)
FC Cash Ratio $\times \text{Size}$	0.0009*** (0.0002)	0.0009*** (0.0003)	0.0006*** (0.0002)	0.0006** (0.0003)
Export Share $\times \text{Size}$	0.0025*** (0.0005)	0.0025*** (0.0006)	0.0027*** (0.0005)	0.0027*** (0.0006)
Observations	1902611	1902611	1820447	1820447
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: In all specifications, we include sector and country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table 33: Panel Regression of Export Quantity Changes on FC Debt: Other Variables

Dependent Variables:	Export Quantities			
	(1)	(2)	(3)	(4)
Import Share	-0.1007 (0.0671)	-0.1007 (0.1023)	-0.0843 (0.0708)	-0.0843 (0.1056)
Sale Share	0.2408*** (0.0299)	0.2408*** (0.0377)	0.2585*** (0.0307)	0.2585*** (0.0385)
Size	-0.0041* (0.0023)	-0.0041 (0.0037)	0.0005 (0.0025)	0.0005 (0.0040)
Leverage	0.4230*** (0.0731)	0.4230*** (0.1095)	0.5009*** (0.0774)	0.5009*** (0.1153)
ST Debt Ratio	-0.2123*** (0.0324)	-0.2123*** (0.0470)	-0.2042*** (0.0339)	-0.2042*** (0.0504)
Cash Ratio	0.4783** (0.1920)	0.4783 (0.3271)	0.5346** (0.2094)	0.5346 (0.3432)
FC Cash Ratio	-0.0635*** (0.0171)	-0.0635*** (0.0226)	-0.0609*** (0.0170)	-0.0609*** (0.0220)
Export Share	0.0379 (0.0519)	0.0379 (0.0841)	0.0338 (0.0566)	0.0338 (0.0849)
Import Share $\times \Delta E_{KRW}/\$$	-5.5590*** (0.8693)	-5.5590*** (1.1989)	-6.5978*** (0.9046)	-6.5978*** (1.1981)
Sale Share $\times \Delta E_{KRW}/\$$	-0.8363* (0.4418)	-0.8363* (0.5033)	-0.6476 (0.4479)	-0.6476 (0.5111)
Size $\times \Delta E_{KRW}/\$$	-0.0048 (0.0047)	-0.0048 (0.0064)	-0.0071 (0.0048)	-0.0071 (0.0064)
Leverage $\times \Delta E_{KRW}/\$$	-4.7553*** (0.8500)	-4.7553*** (1.1240)	-3.7508*** (0.8846)	-3.7508*** (1.2088)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	1.3441*** (0.3628)	1.3441*** (0.5009)	1.0422*** (0.3751)	1.0422** (0.5057)
Cash Ratio $\times \Delta E_{KRW}/\$$	-7.2090*** (2.7037)	-7.2090* (3.8051)	-7.0329** (2.8123)	-7.0329* (3.9417)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.6350*** (0.2047)	-0.6350** (0.2569)	-0.6074*** (0.2029)	-0.6074** (0.2502)
Export Share $\times \Delta E_{KRW}/\$$	6.1214*** (0.5613)	6.1214*** (0.8127)	6.5218*** (0.5769)	6.5218*** (0.8325)

Continued Table 33

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.3072*** (0.0474)	0.3072*** (0.0662)	0.3729*** (0.0495)	0.3729*** (0.0665)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0515** (0.0238)	0.0515* (0.0274)	0.0415* (0.0241)	0.0415 (0.0278)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.2737*** (0.0481)	0.2737*** (0.0648)	0.2166*** (0.0501)	0.2166*** (0.0696)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0769*** (0.0192)	-0.0769*** (0.0268)	-0.0588*** (0.0199)	-0.0588** (0.0273)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.4302*** (0.1494)	0.4302** (0.2134)	0.4291*** (0.1559)	0.4291* (0.2213)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0358*** (0.0111)	0.0358** (0.0141)	0.0343*** (0.0110)	0.0343** (0.0138)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.3532*** (0.0306)	-0.3532*** (0.0449)	-0.3751*** (0.0315)	-0.3751*** (0.0460)
Import Share $\times \text{Size}$	0.0072** (0.0036)	0.0072 (0.0057)	0.0063 (0.0039)	0.0063 (0.0059)
Sale Share $\times \text{Size}$	-0.0377*** (0.0016)	-0.0377*** (0.0020)	-0.0386*** (0.0016)	-0.0386*** (0.0020)
Leverage $\times \text{Size}$	-0.0267*** (0.0041)	-0.0267*** (0.0062)	-0.0311*** (0.0043)	-0.0311*** (0.0065)
ST Debt Ratio $\times \text{Size}$	0.0092*** (0.0017)	0.0092*** (0.0026)	0.0088*** (0.0018)	0.0088*** (0.0028)
Cash Ratio $\times \text{Size}$	-0.0197* (0.0106)	-0.0197 (0.0183)	-0.0242** (0.0116)	-0.0242 (0.0192)
FC Cash Ratio $\times \text{Size}$	0.0035*** (0.0010)	0.0035*** (0.0013)	0.0034*** (0.0010)	0.0034*** (0.0012)
Export Share $\times \text{Size}$	-0.0083*** (0.0029)	-0.0083* (0.0047)	-0.0084*** (0.0031)	-0.0084* (0.0047)
Observations	1902611	1902611	1820447	1820447
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: In all specifications, we include sector and country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table 34: Panel Regression of Import Quantity Changes on FC Debt: Other Variables

Dependent Variables:	Import Weights			
	(1)	(2)	(3)	(4)
Import Share	-0.2139*** (0.0558)	-0.2139*** (0.0785)	-0.2537*** (0.0597)	-0.2537*** (0.0821)
Sale Share	0.2008*** (0.0469)	0.2008*** (0.0567)	0.2217*** (0.0479)	0.2217*** (0.0570)
Size	-0.0061** (0.0024)	-0.0061* (0.0036)	-0.0043* (0.0026)	-0.0043 (0.0040)
Leverage	0.3354*** (0.0778)	0.3354*** (0.1039)	0.4288*** (0.0831)	0.4288*** (0.1089)
ST Debt Ratio	-0.0690* (0.0355)	-0.0690 (0.0515)	-0.0695* (0.0370)	-0.0695 (0.0540)
Cash Ratio	0.4935** (0.2061)	0.4935 (0.3291)	0.4673** (0.2212)	0.4673 (0.3451)
FC Cash Ratio	-0.0229** (0.0099)	-0.0229** (0.0103)	-0.0307*** (0.0107)	-0.0307** (0.0122)
Export Share	0.0813 (0.0562)	0.0813 (0.0878)	0.1101* (0.0598)	0.1101 (0.0941)
Import Share $\times \Delta E_{KRW}/\$$	0.8207 (0.6940)	0.8207 (0.8388)	0.8892 (0.7217)	0.8892 (0.8325)
Sale Share $\times \Delta E_{KRW}/\$$	0.5533 (0.6941)	0.5533 (0.8186)	0.5375 (0.7031)	0.5375 (0.8296)
Size $\times \Delta E_{KRW}/\$$	-0.0278*** (0.0038)	-0.0278*** (0.0065)	-0.0281*** (0.0039)	-0.0281*** (0.0065)
Leverage $\times \Delta E_{KRW}/\$$	-2.0840** (0.9628)	-2.0840** (0.9905)	-2.2239** (1.0007)	-2.2239** (1.0245)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	-0.8460** (0.3903)	-0.8460 (0.5552)	-0.9864** (0.4014)	-0.9864* (0.5396)
Cash Ratio $\times \Delta E_{KRW}/\$$	-4.2374 (2.8084)	-4.2374 (3.7720)	-4.1309 (2.9027)	-4.1309 (3.9675)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.2162** (0.0967)	-0.2162** (0.1038)	-0.2924*** (0.1033)	-0.2924** (0.1186)
Export Share $\times \Delta E_{KRW}/\$$	1.6014*** (0.5989)	1.6014* (0.8190)	1.8765*** (0.6110)	1.8765** (0.8489)

Continued Table 34

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0373 (0.0381)	-0.0373 (0.0456)	-0.0407 (0.0398)	-0.0407 (0.0456)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0211 (0.0372)	-0.0211 (0.0440)	-0.0206 (0.0377)	-0.0206 (0.0445)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.1200** (0.0543)	0.1200** (0.0555)	0.1312** (0.0564)	0.1312** (0.0572)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0431** (0.0210)	0.0431 (0.0292)	0.0511** (0.0216)	0.0511* (0.0287)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.2624* (0.1556)	0.2624 (0.2113)	0.2581 (0.1612)	0.2581 (0.2228)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0126** (0.0053)	0.0126** (0.0057)	0.0167*** (0.0057)	0.0167** (0.0065)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1053*** (0.0318)	-0.1053** (0.0453)	-0.1182*** (0.0325)	-0.1182** (0.0470)
Import Share $\times \text{Size}$	0.0082*** (0.0030)	0.0082* (0.0044)	0.0104*** (0.0033)	0.0104** (0.0045)
Sale Share $\times \text{Size}$	-0.0410*** (0.0025)	-0.0410*** (0.0029)	-0.0421*** (0.0025)	-0.0421*** (0.0030)
Leverage $\times \text{Size}$	-0.0218*** (0.0043)	-0.0218*** (0.0058)	-0.0271*** (0.0046)	-0.0271*** (0.0061)
ST Debt Ratio $\times \text{Size}$	0.0027 (0.0019)	0.0027 (0.0027)	0.0024 (0.0020)	0.0024 (0.0029)
Cash Ratio $\times \text{Size}$	-0.0211* (0.0113)	-0.0211 (0.0181)	-0.0185 (0.0122)	-0.0185 (0.0190)
FC Cash Ratio $\times \text{Size}$	0.0012** (0.0006)	0.0012** (0.0006)	0.0017*** (0.0006)	0.0017** (0.0007)
Export Share $\times \text{Size}$	-0.0086*** (0.0031)	-0.0086* (0.0048)	-0.0103*** (0.0033)	-0.0103** (0.0052)
Observations	1854015	1854015	1780851	1780851
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: In all specifications, we include sector and country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table 35: Panel Regression of Import Value Changes on FC Debt: Other Variables

Dependent Variables:	Import Values			
	(1)	(2)	(3)	(4)
Import Share	-0.1763*** (0.0553)	-0.1763** (0.0786)	-0.2145*** (0.0592)	-0.2145*** (0.0824)
Sale Share	0.2238*** (0.0466)	0.2238*** (0.0561)	0.2366*** (0.0476)	0.2366*** (0.0563)
Size	-0.0061** (0.0024)	-0.0061* (0.0036)	-0.0045* (0.0026)	-0.0045 (0.0040)
Leverage	0.3722*** (0.0770)	0.3722*** (0.1022)	0.4638*** (0.0823)	0.4638*** (0.1062)
ST Debt Ratio	-0.0639* (0.0352)	-0.0639 (0.0509)	-0.0685* (0.0366)	-0.0685 (0.0533)
Cash Ratio	0.5169** (0.2039)	0.5169 (0.3260)	0.4739** (0.2190)	0.4739 (0.3422)
FC Cash Ratio	-0.0235** (0.0096)	-0.0235** (0.0104)	-0.0333*** (0.0095)	-0.0333*** (0.0116)
Export Share	0.0430 (0.0557)	0.0430 (0.0856)	0.0652 (0.0594)	0.0652 (0.0919)
Import Share $\times \Delta E_{KRW}/\$$	1.0406 (0.6887)	1.0406 (0.8549)	1.1221 (0.7167)	1.1221 (0.8311)
Sale Share $\times \Delta E_{KRW}/\$$	0.8066 (0.6909)	0.8066 (0.8163)	0.7460 (0.7006)	0.7460 (0.8321)
Size $\times \Delta E_{KRW}/\$$	-0.0279*** (0.0037)	-0.0279*** (0.0063)	-0.0334*** (0.0038)	-0.0334*** (0.0054)
Leverage $\times \Delta E_{KRW}/\$$	-1.3495 (0.9563)	-1.3495 (0.9999)	-1.3156 (0.9937)	-1.3156 (1.0457)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	-0.8016** (0.3872)	-0.8016 (0.5710)	-0.7479* (0.3982)	-0.7479 (0.5506)
Cash Ratio $\times \Delta E_{KRW}/\$$	-4.7254* (2.7778)	-4.7254 (3.7595)	-5.6022* (2.8696)	-5.6022 (3.9677)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.2403*** (0.0931)	-0.2403** (0.1035)	-0.3381*** (0.0888)	-0.3381*** (0.1107)
Export Share $\times \Delta E_{KRW}/\$$	1.8399*** (0.5936)	1.8399** (0.7948)	2.3446*** (0.6058)	2.3446*** (0.8190)

Continued Table 35

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0516 (0.0379)	-0.0516 (0.0463)	-0.0576 (0.0396)	-0.0576 (0.0454)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0359 (0.0370)	-0.0359 (0.0437)	-0.0353 (0.0376)	-0.0353 (0.0444)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0662 (0.0539)	0.0662 (0.0560)	0.0652 (0.0560)	0.0652 (0.0585)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0399* (0.0208)	0.0399 (0.0302)	0.0375* (0.0215)	0.0375 (0.0294)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.2944* (0.1540)	0.2944 (0.2109)	0.3435** (0.1595)	0.3435 (0.2230)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0139*** (0.0051)	0.0139** (0.0057)	0.0192*** (0.0049)	0.0192*** (0.0061)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1151*** (0.0315)	-0.1151*** (0.0441)	-0.1410*** (0.0322)	-0.1410*** (0.0455)
Import Share $\times \text{Size}$	0.0060** (0.0030)	0.0060 (0.0043)	0.0081** (0.0032)	0.0081* (0.0045)
Sale Share $\times \text{Size}$	-0.0422*** (0.0025)	-0.0422*** (0.0029)	-0.0428*** (0.0025)	-0.0428*** (0.0029)
Leverage $\times \text{Size}$	-0.0242*** (0.0043)	-0.0242*** (0.0057)	-0.0293*** (0.0046)	-0.0293*** (0.0060)
ST Debt Ratio $\times \text{Size}$	0.0025 (0.0019)	0.0025 (0.0027)	0.0024 (0.0019)	0.0024 (0.0029)
Cash Ratio $\times \text{Size}$	-0.0230** (0.0112)	-0.0230 (0.0179)	-0.0195 (0.0121)	-0.0195 (0.0188)
FC Cash Ratio $\times \text{Size}$	0.0013** (0.0005)	0.0013** (0.0006)	0.0018*** (0.0005)	0.0018*** (0.0006)
Export Share $\times \text{Size}$	-0.0065** (0.0030)	-0.0065 (0.0047)	-0.0078** (0.0032)	-0.0078 (0.0051)
Observations	1854015	1854015	1780851	1780851
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: In all specifications, we include sector and country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table 36: Panel Regression of Import Value Changes in USD on FC Debt

Dependent Variables:	Import Values in USD			
	(1)	(2)	(3)	(4)
FC Debt Ratio	-0.1392*** (0.0456)	-0.1392** (0.0612)	-0.1070** (0.0472)	-0.1070* (0.0631)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	-2.0126*** (0.5413)	-2.0126*** (0.6034)	-1.8667*** (0.5529)	-1.8667*** (0.6072)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times$ Size	0.0993*** (0.0282)	0.0993*** (0.0320)	0.0907*** (0.0288)	0.0907*** (0.0324)
FC Debt Ratio \times Size	0.0079*** (0.0024)	0.0079** (0.0032)	0.0061** (0.0025)	0.0061* (0.0034)
Import Share	-0.1780*** (0.0553)	-0.1780** (0.0785)	-0.2145*** (0.0592)	-0.2145*** (0.0824)
Sale Share	0.2177*** (0.0466)	0.2177*** (0.0562)	0.2366*** (0.0476)	0.2366*** (0.0563)
Size	-0.0062*** (0.0024)	-0.0062* (0.0036)	-0.0045* (0.0026)	-0.0045 (0.0040)
Leverage	0.3745*** (0.0770)	0.3745*** (0.1023)	0.4638*** (0.0823)	0.4638*** (0.1062)
ST Debt Ratio	-0.0659* (0.0352)	-0.0659 (0.0508)	-0.0685* (0.0366)	-0.0685 (0.0533)
Cash Ratio	0.5287*** (0.2040)	0.5287 (0.3259)	0.4739** (0.2190)	0.4739 (0.3422)
FC Cash Ratio	-0.0246** (0.0096)	-0.0246** (0.0104)	-0.0333*** (0.0095)	-0.0333*** (0.0116)
Export Share	0.0358 (0.0557)	0.0358 (0.0858)	0.0652 (0.0594)	0.0652 (0.0919)
Import Share $\times \Delta E_{KRW}/\$$	1.0017 (0.6889)	1.0017 (0.8512)	1.1221 (0.7167)	1.1221 (0.8311)
Sale Share $\times \Delta E_{KRW}/\$$	0.7730 (0.6915)	0.7730 (0.8203)	0.7460 (0.7006)	0.7460 (0.8321)
Size $\times \Delta E_{KRW}/\$$	-0.0335*** (0.0037)	-0.0335*** (0.0054)	-0.0334*** (0.0038)	-0.0334*** (0.0054)
Leverage $\times \Delta E_{KRW}/\$$	-1.1763 (0.9564)	-1.1763 (1.0090)	-1.3156 (0.9937)	-1.3156 (1.0457)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	-0.6897* (0.3873)	-0.6897 (0.5647)	-0.7479* (0.3982)	-0.7479 (0.5506)
Cash Ratio $\times \Delta E_{KRW}/\$$	-5.6300** (2.7770)	-5.6300 (3.7679)	-5.6022* (2.8696)	-5.6022 (3.9677)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.2520*** (0.0923)	-0.2520** (0.1031)	-0.3381*** (0.0888)	-0.3381*** (0.1107)
Export Share $\times \Delta E_{KRW}/\$$	2.0167*** (0.5938)	2.0167** (0.7903)	2.3446*** (0.6058)	2.3446*** (0.8190)

Continued Table 36

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0511 (0.0379)	-0.0511 (0.0462)	-0.0576 (0.0396)	-0.0576 (0.0454)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0364 (0.0371)	-0.0364 (0.0439)	-0.0353 (0.0376)	-0.0353 (0.0444)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0545 (0.0539)	0.0545 (0.0566)	0.0652 (0.0560)	0.0652 (0.0585)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0340 (0.0208)	0.0340 (0.0298)	0.0375* (0.0215)	0.0375 (0.0294)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.3450** (0.1540)	0.3450 (0.2114)	0.3435** (0.1595)	0.3435 (0.2230)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0145*** (0.0051)	0.0145** (0.0057)	0.0192*** (0.0049)	0.0192*** (0.0061)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1252*** (0.0315)	-0.1252*** (0.0438)	-0.1410*** (0.0322)	-0.1410*** (0.0455)
Import Share $\times \text{Size}$	0.0061** (0.0030)	0.0061 (0.0043)	0.0081** (0.0032)	0.0081* (0.0045)
Sale Share $\times \text{Size}$	-0.0418*** (0.0025)	-0.0418*** (0.0029)	-0.0428*** (0.0025)	-0.0428*** (0.0029)
Leverage $\times \text{Size}$	-0.0243*** (0.0043)	-0.0243*** (0.0057)	-0.0293*** (0.0046)	-0.0293*** (0.0060)
ST Debt Ratio $\times \text{Size}$	0.0026 (0.0019)	0.0026 (0.0027)	0.0024 (0.0019)	0.0024 (0.0029)
Cash Ratio $\times \text{Size}$	-0.0237** (0.0112)	-0.0237 (0.0179)	-0.0195 (0.0121)	-0.0195 (0.0188)
FC Cash Ratio $\times \text{Size}$	0.0013** (0.0005)	0.0013** (0.0006)	0.0018*** (0.0005)	0.0018*** (0.0006)
Export Share $\times \text{Size}$	-0.0061** (0.0030)	-0.0061 (0.0047)	-0.0078** (0.0032)	-0.0078 (0.0051)
Observations	1854015	1854015	1780851	1780851
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: In all specifications, we include sector and country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Panel Regressions in Section 4 with Currency Fixed Effects

Table 37: Panel Regression of Export Price Changes on FC Debt – Currency Fixed Effects

Dependent Variables:	Export Prices			
	(1)	(2)	(3)	(4)
FC Debt Ratio	0.0050 (0.0073)	0.0050 (0.0098)	0.0071 (0.0076)	0.0071 (0.0099)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	0.3649*** (0.0871)	0.3649*** (0.1170)	0.4441*** (0.0898)	0.4441*** (0.1173)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times$ Size	-0.0206*** (0.0044)	-0.0206*** (0.0062)	-0.0257*** (0.0045)	-0.0257*** (0.0063)
FC Debt Ratio \times Size	-0.0002 (0.0004)	-0.0002 (0.0005)	-0.0003 (0.0004)	-0.0003 (0.0005)
Import Share	0.0900*** (0.0113)	0.0900*** (0.0135)	0.0826*** (0.0120)	0.0826*** (0.0139)
Sale Share	-0.0046 (0.0053)	-0.0046 (0.0059)	-0.0043 (0.0054)	-0.0043 (0.0059)
Size	0.0020*** (0.0004)	0.0020*** (0.0005)	0.0022*** (0.0004)	0.0022*** (0.0005)
Leverage	0.0726*** (0.0124)	0.0726*** (0.0159)	0.0825*** (0.0131)	0.0825*** (0.0170)
ST Debt Ratio	0.0335*** (0.0057)	0.0335*** (0.0073)	0.0334*** (0.0059)	0.0334*** (0.0076)
Cash Ratio	-0.0043 (0.0330)	-0.0043 (0.0460)	0.0591* (0.0356)	0.0591 (0.0466)
FC Cash Ratio	-0.0138*** (0.0041)	-0.0138*** (0.0049)	-0.0093** (0.0039)	-0.0093** (0.0046)
Export Share	-0.0402*** (0.0089)	-0.0402*** (0.0108)	-0.0424*** (0.0097)	-0.0424*** (0.0117)
Import Share $\times \Delta E_{KRW}/\$$	2.1825*** (0.1434)	2.1825*** (0.1848)	1.7259*** (0.1496)	1.7259*** (0.1782)
Sale Share $\times \Delta E_{KRW}/\$$	0.1676** (0.0764)	0.1676* (0.0918)	0.1547** (0.0773)	0.1547* (0.0885)
Size $\times \Delta E_{KRW}/\$$	0.0024*** (0.0007)	0.0024* (0.0013)	0.0024*** (0.0008)	0.0024* (0.0013)
Leverage $\times \Delta E_{KRW}/\$$	1.8522*** (0.1391)	1.8522*** (0.2560)	1.9539*** (0.1449)	1.9539*** (0.2534)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	0.3078*** (0.0604)	0.3078*** (0.0784)	0.2981*** (0.0623)	0.2981*** (0.0795)
Cash Ratio $\times \Delta E_{KRW}/\$$	4.5916*** (0.4518)	4.5916*** (0.6176)	4.1022*** (0.4689)	4.1022*** (0.6279)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.1403*** (0.0472)	-0.1403** (0.0553)	-0.0959** (0.0442)	-0.0959* (0.0517)
Export Share $\times \Delta E_{KRW}/\$$	-0.8030*** (0.0929)	-0.8030*** (0.1185)	-0.8041*** (0.0955)	-0.8041*** (0.1159)

Continued Table 37

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1195*** (0.0077)	-0.1195*** (0.0103)	-0.0931*** (0.0081)	-0.0931*** (0.0099)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0098** (0.0040)	-0.0098** (0.0048)	-0.0089** (0.0041)	-0.0089* (0.0047)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1178*** (0.0078)	-0.1178*** (0.0149)	-0.1237*** (0.0081)	-0.1237*** (0.0148)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0211*** (0.0031)	-0.0211*** (0.0043)	-0.0205*** (0.0032)	-0.0205*** (0.0043)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.2680*** (0.0246)	-0.2680*** (0.0344)	-0.2416*** (0.0256)	-0.2416*** (0.0351)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0080*** (0.0026)	0.0080*** (0.0030)	0.0055** (0.0024)	0.0055* (0.0028)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0483*** (0.0050)	0.0483*** (0.0065)	0.0483*** (0.0051)	0.0483*** (0.0064)
Import Share $\times \text{Size}$	-0.0052*** (0.0006)	-0.0052*** (0.0007)	-0.0049*** (0.0006)	-0.0049*** (0.0008)
Sale Share $\times \text{Size}$	0.0003 (0.0003)	0.0003 (0.0003)	0.0003 (0.0003)	0.0003 (0.0003)
Leverage $\times \text{Size}$	-0.0045*** (0.0007)	-0.0045*** (0.0009)	-0.0050*** (0.0007)	-0.0050*** (0.0010)
ST Debt Ratio $\times \text{Size}$	-0.0018*** (0.0003)	-0.0018*** (0.0004)	-0.0018*** (0.0003)	-0.0018*** (0.0004)
Cash Ratio $\times \text{Size}$	-0.0008 (0.0018)	-0.0008 (0.0026)	-0.0044** (0.0019)	-0.0044* (0.0026)
FC Cash Ratio $\times \text{Size}$	0.0008*** (0.0002)	0.0008*** (0.0003)	0.0005** (0.0002)	0.0005** (0.0003)
Export Share $\times \text{Size}$	0.0020*** (0.0005)	0.0020*** (0.0006)	0.0021*** (0.0005)	0.0021*** (0.0006)
Observations	1945654	1945654	1861932	1861932
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: The observation is at the level firm - product HS10 - destination country - invoicing currency - year. In all specifications, we include sector, currency, country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) also include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table 38: Panel Regression of Export Price Changes in USD on FC Debt – Currency Fixed Effects

Dependent Variables:	Export Prices in USD			
	(1)	(2)	(3)	(4)
FC Debt Ratio	0.0051 (0.0074)	0.0051 (0.0099)	0.0062 (0.0077)	0.0062 (0.0100)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	0.2693*** (0.0880)	0.2693** (0.1234)	0.3290*** (0.0907)	0.3290*** (0.1240)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times$ Size	-0.0139*** (0.0044)	-0.0139** (0.0065)	-0.0181*** (0.0046)	-0.0181*** (0.0066)
FC Debt Ratio \times Size	-0.0002 (0.0004)	-0.0002 (0.0005)	-0.0003 (0.0004)	-0.0003 (0.0005)
Import Share	0.0975*** (0.0114)	0.0975*** (0.0138)	0.0904*** (0.0121)	0.0904*** (0.0141)
Sale Share	-0.0103* (0.0053)	-0.0103* (0.0060)	-0.0103* (0.0055)	-0.0103* (0.0060)
Size	0.0020*** (0.0004)	0.0020*** (0.0005)	0.0020*** (0.0004)	0.0020*** (0.0005)
Leverage	0.0682*** (0.0125)	0.0682*** (0.0160)	0.0761*** (0.0132)	0.0761*** (0.0170)
ST Debt Ratio	0.0358*** (0.0057)	0.0358*** (0.0075)	0.0347*** (0.0059)	0.0347*** (0.0078)
Cash Ratio	-0.0052 (0.0332)	-0.0052 (0.0465)	0.0518 (0.0358)	0.0518 (0.0473)
FC Cash Ratio	-0.0149*** (0.0043)	-0.0149*** (0.0051)	-0.0100** (0.0040)	-0.0100** (0.0048)
Export Share	-0.0454*** (0.0089)	-0.0454*** (0.0110)	-0.0478*** (0.0097)	-0.0478*** (0.0119)
Import Share $\times \Delta E_{KRW}/\$$	2.3482*** (0.1453)	2.3482*** (0.1922)	1.9176*** (0.1516)	1.9176*** (0.1850)
Sale Share $\times \Delta E_{KRW}/\$$	0.0953 (0.0774)	0.0953 (0.0956)	0.0804 (0.0783)	0.0804 (0.0927)
Size $\times \Delta E_{KRW}/\$$	-0.0086*** (0.0008)	-0.0086*** (0.0027)	-0.0085*** (0.0008)	-0.0085*** (0.0028)
Leverage $\times \Delta E_{KRW}/\$$	1.7382*** (0.1410)	1.7382*** (0.2607)	1.8492*** (0.1468)	1.8492*** (0.2576)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	0.3760*** (0.0614)	0.3760*** (0.0934)	0.3850*** (0.0633)	0.3850*** (0.0949)
Cash Ratio $\times \Delta E_{KRW}/\$$	3.8424*** (0.4569)	3.8424*** (0.6273)	3.2774*** (0.4743)	3.2774*** (0.6399)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.1604*** (0.0500)	-0.1604*** (0.0585)	-0.1112** (0.0463)	-0.1112** (0.0543)
Export Share $\times \Delta E_{KRW}/\$$	-0.9852*** (0.0940)	-0.9852*** (0.1266)	-0.9554*** (0.0966)	-0.9554*** (0.1229)

Continued Table 38

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1280*** (0.0078)	-0.1280*** (0.0106)	-0.1033*** (0.0082)	-0.1033*** (0.0102)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0069* (0.0041)	-0.0069 (0.0050)	-0.0059 (0.0041)	-0.0059 (0.0048)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1119*** (0.0079)	-0.1119*** (0.0152)	-0.1181*** (0.0082)	-0.1181*** (0.0151)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0244*** (0.0032)	-0.0244*** (0.0050)	-0.0248*** (0.0033)	-0.0248*** (0.0051)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.2285*** (0.0249)	-0.2285*** (0.0349)	-0.1974*** (0.0260)	-0.1974*** (0.0358)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0090*** (0.0027)	0.0090*** (0.0032)	0.0062** (0.0025)	0.0062** (0.0030)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0564*** (0.0050)	0.0564*** (0.0070)	0.0547*** (0.0052)	0.0547*** (0.0068)
Import Share $\times \text{Size}$	-0.0057*** (0.0006)	-0.0057*** (0.0008)	-0.0053*** (0.0007)	-0.0053*** (0.0008)
Sale Share $\times \text{Size}$	0.0007*** (0.0003)	0.0007** (0.0003)	0.0007*** (0.0003)	0.0007** (0.0003)
Leverage $\times \text{Size}$	-0.0042*** (0.0007)	-0.0042*** (0.0009)	-0.0047*** (0.0007)	-0.0047*** (0.0010)
ST Debt Ratio $\times \text{Size}$	-0.0018*** (0.0003)	-0.0018*** (0.0004)	-0.0018*** (0.0003)	-0.0018*** (0.0004)
Cash Ratio $\times \text{Size}$	-0.0007 (0.0018)	-0.0007 (0.0026)	-0.0040** (0.0020)	-0.0040 (0.0026)
FC Cash Ratio $\times \text{Size}$	0.0009*** (0.0002)	0.0009*** (0.0003)	0.0006** (0.0002)	0.0006** (0.0003)
Export Share $\times \text{Size}$	0.0023*** (0.0005)	0.0023*** (0.0006)	0.0025*** (0.0005)	0.0025*** (0.0007)
Observations	1945654	1945654	1861932	1861932
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: The observation is at the level firm - product HS10 - destination country - invoicing currency - year. In all specifications, we include sector, currency, country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) also include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table 39: Panel Regression of Export Quantity Changes on FC Debt – Currency Fixed Effects

Dependent Variables:	Export Quantities			
	(1)	(2)	(3)	(4)
FC Debt Ratio	-0.0723* (0.0438)	-0.0723 (0.0656)	-0.1403*** (0.0455)	-0.1403** (0.0686)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	-1.5463*** (0.5158)	-1.5463** (0.6459)	-1.7801*** (0.5314)	-1.7801*** (0.6538)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times$ Size	0.0774*** (0.0262)	0.0774** (0.0339)	0.0896*** (0.0271)	0.0896*** (0.0344)
FC Debt Ratio \times Size	0.0026 (0.0023)	0.0026 (0.0035)	0.0061*** (0.0024)	0.0061* (0.0036)
Import Share	-0.1051 (0.0666)	-0.1051 (0.1034)	-0.1010 (0.0701)	-0.1010 (0.1040)
Sale Share	0.2233*** (0.0300)	0.2233*** (0.0381)	0.2367*** (0.0307)	0.2367*** (0.0388)
Size	-0.0057** (0.0023)	-0.0057 (0.0038)	-0.0009 (0.0025)	-0.0009 (0.0039)
Leverage	0.3287*** (0.0723)	0.3287*** (0.1075)	0.4084*** (0.0765)	0.4084*** (0.1123)
ST Debt Ratio	-0.1883*** (0.0320)	-0.1883*** (0.0476)	-0.1759*** (0.0335)	-0.1759*** (0.0512)
Cash Ratio	0.3579* (0.1902)	0.3579 (0.3268)	0.4725** (0.2074)	0.4725 (0.3444)
FC Cash Ratio	-0.0581*** (0.0168)	-0.0581** (0.0226)	-0.0588*** (0.0169)	-0.0588*** (0.0223)
Export Share	0.0418 (0.0516)	0.0418 (0.0851)	0.0402 (0.0561)	0.0402 (0.0844)
Import Share $\times \Delta E_{KRW}/\$$	-5.2587*** (0.8615)	-5.2587*** (1.2021)	-6.3386*** (0.8962)	-6.3386*** (1.1898)
Sale Share $\times \Delta E_{KRW}/\$$	-0.6345 (0.4434)	-0.6345 (0.5145)	-0.3998 (0.4494)	-0.3998 (0.5235)
Size $\times \Delta E_{KRW}/\$$	-0.0056 (0.0047)	-0.0056 (0.0065)	-0.0069 (0.0048)	-0.0069 (0.0065)
Leverage $\times \Delta E_{KRW}/\$$	-4.8232*** (0.8453)	-4.8232*** (1.0904)	-3.8847*** (0.8792)	-3.8847*** (1.1651)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	1.4014*** (0.3600)	1.4014*** (0.5143)	1.1290*** (0.3721)	1.1290** (0.5194)
Cash Ratio $\times \Delta E_{KRW}/\$$	-7.7072*** (2.6711)	-7.7072** (3.7266)	-7.2394*** (2.7784)	-7.2394* (3.9068)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.5898*** (0.2008)	-0.5898** (0.2556)	-0.5976*** (0.2019)	-0.5976** (0.2517)
Export Share $\times \Delta E_{KRW}/\$$	5.8542*** (0.5569)	5.8542*** (0.8423)	6.3457*** (0.5723)	6.3457*** (0.8593)

Continued Table 39

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.2869*** (0.0469)	0.2869*** (0.0664)	0.3548*** (0.0490)	0.3548*** (0.0660)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0410* (0.0238)	0.0410 (0.0279)	0.0283 (0.0242)	0.0283 (0.0284)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.2790*** (0.0478)	0.2790*** (0.0628)	0.2251*** (0.0498)	0.2251*** (0.0670)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0811*** (0.0190)	-0.0811*** (0.0276)	-0.0652*** (0.0197)	-0.0652*** (0.0281)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.4528*** (0.1476)	0.4528** (0.2090)	0.4341*** (0.1541)	0.4341** (0.2194)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0331*** (0.0109)	0.0331** (0.0141)	0.0337*** (0.0109)	0.0337** (0.0139)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.3354*** (0.0303)	-0.3354*** (0.0467)	-0.3627*** (0.0313)	-0.3627*** (0.0477)
Import Share $\times \text{Size}$	0.0075** (0.0036)	0.0075 (0.0057)	0.0072* (0.0038)	0.0072 (0.0058)
Sale Share $\times \text{Size}$	-0.0375*** (0.0016)	-0.0375*** (0.0020)	-0.0382*** (0.0016)	-0.0382*** (0.0021)
Leverage $\times \text{Size}$	-0.0211*** (0.0040)	-0.0211*** (0.0061)	-0.0257*** (0.0043)	-0.0257*** (0.0064)
ST Debt Ratio $\times \text{Size}$	0.0081*** (0.0017)	0.0081*** (0.0026)	0.0075*** (0.0018)	0.0075*** (0.0028)
Cash Ratio $\times \text{Size}$	-0.0131 (0.0105)	-0.0131 (0.0183)	-0.0208* (0.0115)	-0.0208 (0.0193)
FC Cash Ratio $\times \text{Size}$	0.0032*** (0.0009)	0.0032** (0.0013)	0.0033*** (0.0009)	0.0033*** (0.0013)
Export Share $\times \text{Size}$	-0.0084*** (0.0029)	-0.0084* (0.0048)	-0.0086*** (0.0031)	-0.0086* (0.0047)
Observations	1945654	1945654	1861932	1861932
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: The observation is at the level firm - product HS10 - destination country - invoicing currency - year. In all specifications, we include sector, currency, country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) also include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table 40: Panel Regression of Import Quantity Changes on FC Debt – Currency Fixed Effects

Dependent Variables:	Import Weights			
	(1)	(2)	(3)	(4)
FC Debt Ratio	-0.1903*** (0.0453)	-0.1903*** (0.0609)	-0.1701*** (0.0469)	-0.1701*** (0.0623)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	-1.7149*** (0.5352)	-1.7149*** (0.6219)	-1.5786*** (0.5473)	-1.5786** (0.6281)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times$ Size	0.0833*** (0.0278)	0.0833** (0.0327)	0.0757*** (0.0285)	0.0757** (0.0332)
FC Debt Ratio \times Size	0.0108*** (0.0024)	0.0108*** (0.0032)	0.0096*** (0.0025)	0.0096*** (0.0033)
Import Share	-0.2096*** (0.0549)	-0.2096*** (0.0761)	-0.2275*** (0.0586)	-0.2275*** (0.0811)
Sale Share	0.1805*** (0.0472)	0.1805*** (0.0576)	0.2022*** (0.0482)	0.2022*** (0.0578)
Size	-0.0071*** (0.0024)	-0.0071** (0.0035)	-0.0041 (0.0025)	-0.0041 (0.0039)
Leverage	0.2685*** (0.0765)	0.2685*** (0.1032)	0.3638*** (0.0819)	0.3638*** (0.1115)
ST Debt Ratio	-0.0386 (0.0349)	-0.0386 (0.0560)	-0.0326 (0.0364)	-0.0326 (0.0587)
Cash Ratio	0.4120** (0.2023)	0.4120 (0.3149)	0.4479** (0.2174)	0.4479 (0.3370)
FC Cash Ratio	-0.0195* (0.0102)	-0.0195* (0.0117)	-0.0288** (0.0117)	-0.0288* (0.0150)
Export Share	0.0312 (0.0552)	0.0312 (0.0875)	0.0632 (0.0587)	0.0632 (0.0932)
Import Share $\times \Delta E_{KRW}/\$$	0.9826 (0.6806)	0.9826 (0.8352)	1.2102* (0.7070)	1.2102 (0.8247)
Sale Share $\times \Delta E_{KRW}/\$$	0.9149 (0.7004)	0.9149 (0.8380)	0.9201 (0.7097)	0.9201 (0.8521)
Size $\times \Delta E_{KRW}/\$$	-0.0247*** (0.0038)	-0.0247*** (0.0064)	-0.0250*** (0.0038)	-0.0250*** (0.0064)
Leverage $\times \Delta E_{KRW}/\$$	-1.7989* (0.9468)	-1.7989* (1.0285)	-1.8197* (0.9846)	-1.8197* (1.0807)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	-0.9967*** (0.3835)	-0.9967* (0.5467)	-1.2053*** (0.3946)	-1.2053** (0.5317)
Cash Ratio $\times \Delta E_{KRW}/\$$	-3.6945 (2.7626)	-3.6945 (3.7362)	-4.1630 (2.8572)	-4.1630 (3.8823)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.1693* (0.1023)	-0.1693 (0.1190)	-0.2622** (0.1176)	-0.2622* (0.1499)
Export Share $\times \Delta E_{KRW}/\$$	1.7022*** (0.5858)	1.7022** (0.7574)	1.9832*** (0.5979)	1.9832** (0.7825)

Continued Table 40

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0442 (0.0373)	-0.0442 (0.0457)	-0.0563 (0.0389)	-0.0563 (0.0456)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0395 (0.0375)	-0.0395 (0.0450)	-0.0405 (0.0380)	-0.0405 (0.0456)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.1004* (0.0533)	0.1004* (0.0581)	0.1044* (0.0555)	0.1044* (0.0608)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0504** (0.0206)	0.0504* (0.0289)	0.0619*** (0.0212)	0.0619** (0.0284)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.2254 (0.1529)	0.2254 (0.2083)	0.2535 (0.1585)	0.2535 (0.2168)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0099* (0.0057)	0.0099 (0.0066)	0.0150** (0.0065)	0.0150* (0.0083)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1089*** (0.0310)	-0.1089*** (0.0416)	-0.1218*** (0.0317)	-0.1218*** (0.0431)
Import Share $\times \text{Size}$	0.0077*** (0.0030)	0.0077* (0.0042)	0.0088*** (0.0032)	0.0088** (0.0045)
Sale Share $\times \text{Size}$	-0.0405*** (0.0025)	-0.0405*** (0.0030)	-0.0416*** (0.0025)	-0.0416*** (0.0030)
Leverage $\times \text{Size}$	-0.0179*** (0.0043)	-0.0179*** (0.0058)	-0.0232*** (0.0046)	-0.0232*** (0.0063)
ST Debt Ratio $\times \text{Size}$	0.0010 (0.0018)	0.0010 (0.0030)	0.0004 (0.0019)	0.0004 (0.0032)
Cash Ratio $\times \text{Size}$	-0.0165 (0.0111)	-0.0165 (0.0173)	-0.0175 (0.0120)	-0.0175 (0.0186)
FC Cash Ratio $\times \text{Size}$	0.0011* (0.0006)	0.0011 (0.0007)	0.0016** (0.0007)	0.0016* (0.0008)
Export Share $\times \text{Size}$	-0.0057* (0.0030)	-0.0057 (0.0048)	-0.0076** (0.0032)	-0.0076 (0.0051)
Observations	1905985	1905985	1830375	1830375
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: The observation is at the level firm - product HS10 - destination country - invoicing currency - year. In all specifications, we include sector, currency, country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) also include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table 41: Panel Regression of Import Value Changes on FC Debt – Currency Fixed Effects

Dependent Variables:	Import Values			
	(1)	(2)	(3)	(4)
FC Debt Ratio	-0.1856*** (0.0449)	-0.1856*** (0.0605)	-0.1584*** (0.0465)	-0.1584** (0.0616)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	-1.8880*** (0.5307)	-1.8880*** (0.6318)	-1.7689*** (0.5426)	-1.7689*** (0.6356)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times$ Size	0.0913*** (0.0275)	0.0913*** (0.0332)	0.0845*** (0.0282)	0.0845** (0.0337)
FC Debt Ratio \times Size	0.0105*** (0.0023)	0.0105*** (0.0032)	0.0089*** (0.0024)	0.0089*** (0.0033)
Import Share	-0.1685*** (0.0543)	-0.1685** (0.0761)	-0.1865*** (0.0581)	-0.1865** (0.0814)
Sale Share	0.2018*** (0.0470)	0.2018*** (0.0575)	0.2223*** (0.0479)	0.2223*** (0.0576)
Size	-0.0067*** (0.0024)	-0.0067* (0.0035)	-0.0039 (0.0025)	-0.0039 (0.0040)
Leverage	0.3100*** (0.0757)	0.3100*** (0.1016)	0.4024*** (0.0810)	0.4024*** (0.1094)
ST Debt Ratio	-0.0308 (0.0346)	-0.0308 (0.0559)	-0.0264 (0.0361)	-0.0264 (0.0589)
Cash Ratio	0.4373** (0.2001)	0.4373 (0.3102)	0.4421** (0.2153)	0.4421 (0.3327)
FC Cash Ratio	-0.0199** (0.0101)	-0.0199* (0.0119)	-0.0303*** (0.0105)	-0.0303** (0.0145)
Export Share	0.0027 (0.0547)	0.0027 (0.0858)	0.0343 (0.0582)	0.0343 (0.0912)
Import Share $\times \Delta E_{KRW}/\$$	1.1658* (0.6751)	1.1658 (0.8375)	1.4239** (0.7017)	1.4239* (0.8122)
Sale Share $\times \Delta E_{KRW}/\$$	1.0698 (0.6968)	1.0698 (0.8318)	1.0629 (0.7062)	1.0629 (0.8471)
Size $\times \Delta E_{KRW}/\$$	-0.0246*** (0.0037)	-0.0246*** (0.0062)	-0.0246*** (0.0038)	-0.0246*** (0.0063)
Leverage $\times \Delta E_{KRW}/\$$	-1.1492 (0.9402)	-1.1492 (1.0273)	-1.1724 (0.9772)	-1.1724 (1.0758)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	-0.9544** (0.3807)	-0.9544* (0.5556)	-1.0960*** (0.3917)	-1.0960** (0.5421)
Cash Ratio $\times \Delta E_{KRW}/\$$	-4.0093 (2.7324)	-4.0093 (3.6801)	-4.6740* (2.8261)	-4.6740 (3.8350)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.1914* (0.1008)	-0.1914 (0.1219)	-0.2966*** (0.1028)	-0.2966** (0.1448)
Export Share $\times \Delta E_{KRW}/\$$	2.0306*** (0.5804)	2.0306*** (0.7388)	2.3510*** (0.5924)	2.3510*** (0.7636)

Continued Table 41

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0561 (0.0370)	-0.0561 (0.0456)	-0.0699* (0.0386)	-0.0699 (0.0447)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0494 (0.0373)	-0.0494 (0.0445)	-0.0497 (0.0379)	-0.0497 (0.0451)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0517 (0.0530)	0.0517 (0.0578)	0.0553 (0.0551)	0.0553 (0.0603)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0474** (0.0205)	0.0474 (0.0295)	0.0552*** (0.0211)	0.0552* (0.0291)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.2468 (0.1514)	0.2468 (0.2054)	0.2840* (0.1569)	0.2840 (0.2142)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0111** (0.0056)	0.0111 (0.0068)	0.0168*** (0.0057)	0.0168** (0.0080)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1235*** (0.0307)	-0.1235*** (0.0408)	-0.1384*** (0.0314)	-0.1384*** (0.0422)
Import Share $\times \text{Size}$	0.0053* (0.0030)	0.0053 (0.0042)	0.0064** (0.0032)	0.0064 (0.0045)
Sale Share $\times \text{Size}$	-0.0417*** (0.0025)	-0.0417*** (0.0030)	-0.0428*** (0.0025)	-0.0428*** (0.0030)
Leverage $\times \text{Size}$	-0.0205*** (0.0042)	-0.0205*** (0.0057)	-0.0257*** (0.0045)	-0.0257*** (0.0062)
ST Debt Ratio $\times \text{Size}$	0.0006 (0.0018)	0.0006 (0.0030)	0.0001 (0.0019)	0.0001 (0.0032)
Cash Ratio $\times \text{Size}$	-0.0185* (0.0110)	-0.0185 (0.0171)	-0.0179 (0.0119)	-0.0179 (0.0183)
FC Cash Ratio $\times \text{Size}$	0.0011* (0.0006)	0.0011 (0.0007)	0.0016*** (0.0006)	0.0016** (0.0008)
Export Share $\times \text{Size}$	-0.0042 (0.0030)	-0.0042 (0.0047)	-0.0060* (0.0032)	-0.0060 (0.0050)
Observations	1905985	1905985	1830375	1830375
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: The observation is at the level firm - product HS10 - destination country - invoicing currency - year. In all specifications, we include sector, currency, country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) also include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.

Table 42: Panel Regression of Import Value Changes on FC Debt – Currency Fixed Effects

Dependent Variables:	Import Values in USD			
	(1)	(2)	(3)	(4)
FC Debt Ratio	-0.1810*** (0.0449)	-0.1810*** (0.0603)	-0.1539*** (0.0465)	-0.1539** (0.0613)
FC Debt Ratio $\times \Delta E_{KRW}/\$$	-1.9387*** (0.5308)	-1.9387*** (0.6225)	-1.8338*** (0.5427)	-1.8338*** (0.6242)
FC Debt Ratio $\times \Delta E_{KRW}/\$ \times$ Size	0.0957*** (0.0276)	0.0957*** (0.0328)	0.0897*** (0.0282)	0.0897*** (0.0332)
FC Debt Ratio \times Size	0.0103*** (0.0023)	0.0103*** (0.0032)	0.0087*** (0.0024)	0.0087*** (0.0033)
Import Share	-0.1694*** (0.0544)	-0.1694** (0.0761)	-0.1846*** (0.0582)	-0.1846** (0.0814)
Sale Share	0.1968*** (0.0470)	0.1968*** (0.0577)	0.2169*** (0.0479)	0.2169*** (0.0577)
Size	-0.0067*** (0.0024)	-0.0067* (0.0035)	-0.0039 (0.0025)	-0.0039 (0.0040)
Leverage	0.3115*** (0.0757)	0.3115*** (0.1019)	0.4035*** (0.0810)	0.4035*** (0.1094)
ST Debt Ratio	-0.0327 (0.0346)	-0.0327 (0.0559)	-0.0284 (0.0361)	-0.0284 (0.0588)
Cash Ratio	0.4477** (0.2002)	0.4477 (0.3102)	0.4518** (0.2153)	0.4518 (0.3328)
FC Cash Ratio	-0.0213** (0.0100)	-0.0213* (0.0119)	-0.0322*** (0.0104)	-0.0322** (0.0145)
Export Share	-0.0041 (0.0547)	-0.0041 (0.0859)	0.0274 (0.0583)	0.0274 (0.0913)
Import Share $\times \Delta E_{KRW}/\$$	1.1240* (0.6751)	1.1240 (0.8384)	1.4026** (0.7017)	1.4026* (0.8134)
Sale Share $\times \Delta E_{KRW}/\$$	1.0480 (0.6973)	1.0480 (0.8349)	1.0431 (0.7067)	1.0431 (0.8500)
Size $\times \Delta E_{KRW}/\$$	-0.0293*** (0.0037)	-0.0293*** (0.0054)	-0.0292*** (0.0038)	-0.0292*** (0.0054)
Leverage $\times \Delta E_{KRW}/\$$	-0.9606 (0.9401)	-0.9606 (1.0353)	-0.9494 (0.9770)	-0.9494 (1.0869)
ST Debt Ratio $\times \Delta E_{KRW}/\$$	-0.8146** (0.3807)	-0.8146 (0.5461)	-0.9307** (0.3916)	-0.9307* (0.5317)
Cash Ratio $\times \Delta E_{KRW}/\$$	-4.8926* (2.7312)	-4.8926 (3.6919)	-5.5753** (2.8245)	-5.5753 (3.8490)
FC Cash Ratio $\times \Delta E_{KRW}/\$$	-0.2074** (0.1005)	-0.2074* (0.1216)	-0.3171*** (0.1022)	-0.3171** (0.1444)
Export Share $\times \Delta E_{KRW}/\$$	2.2356*** (0.5806)	2.2356*** (0.7366)	2.5837*** (0.5926)	2.5837*** (0.7601)

Continued Table 42

Import Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0555 (0.0370)	-0.0555 (0.0458)	-0.0706* (0.0386)	-0.0706 (0.0448)
Sale Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.0505 (0.0374)	-0.0505 (0.0447)	-0.0510 (0.0379)	-0.0510 (0.0453)
Leverage $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0392 (0.0530)	0.0392 (0.0583)	0.0409 (0.0551)	0.0409 (0.0610)
ST Debt Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0399* (0.0204)	0.0399 (0.0290)	0.0463** (0.0211)	0.0463 (0.0285)
Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.2962* (0.1513)	0.2962 (0.2062)	0.3349** (0.1568)	0.3349 (0.2151)
FC Cash Ratio $\times \Delta E_{KRW}/\$ \times \text{Size}$	0.0120** (0.0056)	0.0120* (0.0067)	0.0179*** (0.0057)	0.0179** (0.0080)
Export Share $\times \Delta E_{KRW}/\$ \times \text{Size}$	-0.1351*** (0.0307)	-0.1351*** (0.0406)	-0.1517*** (0.0314)	-0.1517*** (0.0420)
Import Share $\times \text{Size}$	0.0054* (0.0030)	0.0054 (0.0042)	0.0064** (0.0032)	0.0064 (0.0045)
Sale Share $\times \text{Size}$	-0.0413*** (0.0025)	-0.0413*** (0.0030)	-0.0424*** (0.0025)	-0.0424*** (0.0030)
Leverage $\times \text{Size}$	-0.0206*** (0.0042)	-0.0206*** (0.0057)	-0.0258*** (0.0045)	-0.0258*** (0.0062)
ST Debt Ratio $\times \text{Size}$	0.0007 (0.0018)	0.0007 (0.0030)	0.0002 (0.0019)	0.0002 (0.0032)
Cash Ratio $\times \text{Size}$	-0.0192* (0.0110)	-0.0192 (0.0171)	-0.0184 (0.0119)	-0.0184 (0.0183)
FC Cash Ratio $\times \text{Size}$	0.0012** (0.0006)	0.0012* (0.0007)	0.0018*** (0.0006)	0.0018** (0.0008)
Export Share $\times \text{Size}$	-0.0038 (0.0030)	-0.0038 (0.0047)	-0.0057* (0.0032)	-0.0057 (0.0050)
Observations	1905985	1905985	1830375	1830375
Main Bank x Year FE	No	No	Yes	Yes
Standard Errors	Robust	Clustered	Robust	Clustered

Notes: The observation is at the level firm - product HS10 - destination country - invoicing currency - year. In all specifications, we include sector, currency, country by year fixed effects. In Columns (1) and (3), robust standard errors are reported in the parentheses. In Columns (2) and (4), clustered standard errors are reported in the parentheses. The cluster is at the country by year. Columns (3) and (4) also include each firm's main bank by year fixed effects. * p<0.1, ** p<0.05, *** p<0.01.