Large Dollar Exposure, Exchange Rate Movement and Firm Performance

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Invoicing Currency Matters

\checkmark Theory on the exchange rate impact on trade :

First generation: Fleming (1962), Mundell (1963), Svenson & van Wijnbergen (1989) and Obstfeld & Rogoff (1995)

Trade rigid in the producer's currency pricing (PCP)

Depreciations

Depreciations

Exchange Rate Passthrough (ERPT) to $P_M^{THB} = 1$ $\longrightarrow Q_M \downarrow$ Export goods are cheaper in term of destination currency $\longrightarrow Q_X \uparrow$ (more demand of import)

Second generation: Betts and Devereux (2000) and Devereux & Engel (2003)

Trade rigid in the local (destination) currency pricing (LCP)





$$\longrightarrow \overline{Q_M}$$
$$\longrightarrow \overline{Q_X}$$

No Expenditure Switching

Very Few Currencies Dominate

Third generation: Gopinath et al. (2010), Auer et al. (2019), Gopinath et al. (2020), Boz et al. (2022) and Gopinath & Itskhoki (2022)

- Neither PCP, nor LCP, but prices in international trade are denominated in very few currencies
- Trade rigid in the dominant currency pricing (DCP), especially USD-dominant in EMAsia
- Expenditure switching occurs mostly through cuts in imports and not increases in exports, but firm profit do fluctuate



Regional Invoicing Patterns

Source: From Boz, Casas, Georgiadis et al. (2022). The right panel constructed using data from Boz, Casas, Georgiadis et al. (2022).



Research Questions

1) Do exchange rates affect Thai firm performance (in this case, profitability) through the valuation channel? To what extent?

- Large literature on exchange rate impact on export/import prices conditional on invoicing currency (Amiti et al., 2020; Auer et al., 2019; Cravino, 2017; Gopinath et al., 2020; Devereux et al., 2017; Chen et al., 2018)
- Still a few that explore the link between pricing choice, CCY mismatch and firm profits (Barbiero, 2022; Adams and Verdelhan, 2022)

2) Is there impact heterogeneity across different firms?

- Adams and Verdelhan (2022) impact depends international trade balance and FC debt issuance
- Barbiero (2022) exports vs. domestically-oriented firms, firm size
- Alfaro et al. (2021) firm hedging choice

3) Do valuation/cash flow effects carry over to real impact on firms, i.e. investment and employment decisions?

• On firm investment (Salomao and Varela, 2021), firm leverage (Kalemli-Ozcan et al., 2021), net worth and bankruptcy (Kim et al., 2015)

The Roadmap



Data and Stylized facts



How to construct the net-invoicing-currency-weighted exchange rate (NICER)



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Tracing the mechanism: from border to firms' balance sheet



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Uncovering heterogeneous exchange rate exposure



Firm responses

Data

Using 4 big data sources merged by firm ID. For the period 2007 through 2020

- 1) Thailand **Customs** database records on universe of export and import transactions
- 2) CPFS data set contains balance sheets and income statements
- 3) **SSO** database covers employment in formal sectors
- 4) **FMST** data sets provide FX arrangement including FX transaction in spot, forward and swap



In Thailand, 80% USD invoicing for both exports and imports



Trade Value by Invoicing Currency

Ratio of USD-invoicing trade to total trade

(by country and sector)

	Animal	chemic chemic	products also alle foodst	d industre	and head	pear le	trikal	Products	Plastics	e rubber	estore	diass retue	Transf	Vegeta	Woods	twood poducts	
UAE	0.98	0.8/	0.96	0.93	0.90	0.8/	1.00	0.90	0.8/	0.85	0.92	0.93	0.79	0.95	0.93		
Australia	0.69	0.5/	0.78	0.78	0.49	0.78	0.99	0.60	0.76	0.89	0.93	0.83	0.33	0.79	0.53		
DidZi Switzorland	0.90	0.71	1.00	0.66	0.70	0.90	1.00	0.78	0.95	1.00	0.88	0.99	0.57	1.00	0.97		
Switzeriariu	0.54	0.20	0.55	0.39	0.55	0.30	0.90	0.00	0.45	0.07	0.99	0.27	0.00	0.01	0.24		
	0.80	0.55	0.61	0.72	0.50	0.55	0.90	0.61	0.57	0.04	0.00	0.51	0.30	0.00	0.00		
Hong Kong	0.53	0.69	0.77	0.66	0.96	0.56	0.90	0.01	0.75	0.90	0.92	0.73	0.92	0.50	0.31		
Indonesia	0.55	0.88	0.93	0.56	0.73	0.50	1.00	0.68	0.05	0.75	0.92	0.97	0.52	0.92	0.10		
India	0.99	0.90	0.87	0.80	0.80	0.91	0.98	0.00	0.94	0.84	0.96	0.94	0.74	0.92	0.92		
Japan	0.69	0.42	0.65	0.56	0.49	0.57	0.88	0.41	0.56	0.66	0.40	0.50	0.40	0.80	0.66		
Korea	0.98	0.88	0.94	0.83	0.90	0.87	0.96	0.86	0.94	0.83	0.87	0.96	0.76	0.95	0.81		
Malaysia	0.35	0.86	0.72	0.63	0.88	0.87	0.98	0.73	0.87	0.79	0.81	0.82	0.60	0.87	0.74		
Philippines	0.99	0.62	0.75	0.78	0.86	0.94	1.00	0.74	0.90	0.93	0.95	0.92	0.46	0.99	0.84		
Russia	0.76	0.98	0.98	0.26	0.77	0.99	1.00	0.59	0.89	0.85	0.69	0.87	0.38	0.93	0.89		
Saudi Arabia	0.98	0.99	0.98	0.97	0.95	0.89	1.00	0.89	0.93	0.91	0.93	0.95	0.92	0.99	0.93		
Singapore	0.25	0.83	0.53	0.39	0.90	0.80	0.98	0.62	0.85	0.34	0.93	0.59	0.89	0.84	0.70		
Taiwan	0.98	0.92	0.91	0.81	0.96	0.97	1.00	0.81	0.94	0.95	0.87	0.94	0.81	0.91	0.94		
US	0.98	0.79	0.94	0.87	0.95	0.97	1.00	0.91	0.93	0.97	0.95	0.96	0.81	0.98	0.98		
Vietnam	0.90	0.78	0.64	0.92	0.72	0.90	1.00	0.78	0.89	0.94	0.86	0.94	0.65	0.72	0.95		
CLM	0.13	0.36	0.38	0.31	0.50	0.58	0.75	0.48	0.46	0.83	0.61	0.51	0.49	0.48	0.69		
EU-6	0.79	0.41	0.64	0.77	0.51	0.52	0.64	0.45	0.62	0.40	0.63	0.65	0.36	0.66	0.38		

Note: EU-6 include Belgium, Germany, Spain, France, Italy and Netherlands. Sector classification

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Firms face large net USD exposure, more so for sme. Exposures become smaller when scaled by firm's total revenue

USD Exposure over Gross Trade (or Revenue) by Firm size



Note: Median net dollar exposures of exporters and importers in 2018. Positive values represent value of exported dollar-priced goods. Negative values represent value of imported dollar-priced goods. Both are normalized by total gross trade of the firm. Panel a and b show median exposires within 100 quantile bins of firm gross revenue size. Black lines and Blue dots show net exposures scaled by firm gross trade and firm gross revenue (cost), respectively.

Firm Responses

Net-Invoicing-Currency-Weighted Exchange Rate (NICER)



Methodology



Control variables include

(1) the lagged dependent variable, lagged debt-to-asset ratio,

(2) trading partner GDP, and inflation, importing-country-weighted export prices,

(3) domestic GDP, and inflation,

(4) firm, and industries fixed effects.

Large valuation effects on export and import values Moderate impact on importing firms' costs

Mechanism: At Customs and Border



	Export Value Growth			Impo	rt Value Gr	rowth	EX Revenue Growth			IM Cost Growth		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
THBUSD Changes	-0.878***			-0.343***			-0.455***			-0.250***		
Ũ	(0.047)			(0.035)			(0.034)			(0.022)		
NICER		-0.912***			-0.602***	:		-0.476***		. ,	-0.147***	
		(0.050)			(0.035)			(0.035)			(0.021)	
NICER FC			-0.771***			-0.611***			-0.569***			-0.058**
			(0.081)			(0.045)			(0.055)			(0.027)
NICER THB			-0.014			0.008			-0.001			0.010
			(0.013)			(0.041)			(0.009)			(0.026)
NICER USD			-1.087***			-0.641***			-0.437***			-0.262***
			(0.071)			(0.049)			(0.051)			(0.030)
Observations	123,675	123,675	123,675	215,672	215,672	215,672	96,566	96,566	96,566	214,728	214,728	214,728
R-squared	0.207	0.201	0.201	0.223	0.213	0.224	0.222	0.222	0.222	0.204	0.203	0.204
ID FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Ind. FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

NICER significantly explains firm profits, especially for exporters and outperforms trade-weighted index

	Exporte	r's EBIT	Importer's EBIT			
	(2)	(3)	(5)	(6)		
VARIABLES	Horse Race	NICER	Horse Race	NICER		
Trade-weighted	0.003		0.004			
0	(0.003)		(0.004)			
NICER	-0.252***		0.049***			
	(0.013)		(0.007)			
NICER FC		-0.336***		0.072***		
		(0.020)		(0.010)		
NICER THB		-0.001		0.007		
		(0.003)		(0.007)		
NICER USD		-0.188***		0.020*		
		(0.019)		(0.011)		
Observations	94,981	94,981	211,865	211,865		
R-squared	0.235	0.235	0.231	0.231		
ID FE	YES	YES	YES	YES		
Ind. FE	YES	YES	YES	YES		

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Larger exchange rate exposure for SMEs.



Adjusted for FX mismatch



Sectoral heterogeneity also evident, with non-manufacturing exporters facing greater valuation effects







Importer

Impact depends crucially on firms' trade dependency



Mean of Trade Dependency Ratio

By Sizes

		-
Exporter	Importer	_
59%	37%	
53%	30%	1
50%	28%	less exposure
	Exporter 59% 53% 50%	Exporter Importer 59% 37% 53% 30% 50% 28%

By Sectors

	Exporter	Importer
MANU	37%	19%
NON MANU	48%	35%
Trade	50%	37%
Rubber&Wood	47%	21%
Food	43%	17%
Agri	38%	16%
Apparel	37%	17%
Elec	27%	22%
Petro	26%	17%
Auto	22%	18%

Financial hedging also matters for those firms under USD invoicing



Mean of Financial Hedging Ratio

By Sizes

	Euro euro e		
	Exporter	Importer	
Small	10%	9%	
Medium	20%	17%	
Large	37% 🕈	30% 🕈 less	ex

By Sectors

	Exporter	Importer
MANU	22%	17%
NON MANU	18%	16%
Food	34%	23%
Rubber&Wood	33%	15%
Apparel	23%	16%
Petro	21%	19%
Trade	18%	16%
Agri	16%	14%
Auto	15%	18%
Elec	15%	13%

Real Effects: significant impact on investment growth

		Investme	nt Growth		Employment Growth					
	Exp	orter	Im	porter	Exp	orter	Importer			
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
NICER	-0.208***		0.011		-0.023		-0.004			
	(0.032)		(0.023)		(0.021)		(0.013)			
NICER FC		-0.100**		0.268***		0.000		0.081***		
		(0.047)		(0.030)		(0.030)		(0.017)		
NICER THB		0.005		0.010		0.001		0.032**		
		(0.008)		(0.021)		(0.007)		(0.013)		
NICER USD		-0.276***		-0.328***		-0.045		-0.075***		
		(0.047)		(0.032)		(0.031)		(0.018)		
Observations	77,518	77,518	167,741	167,741	63,722	63,722	123,811	123,811		
R-squared	0.264	0.264	0.238	0.239	0.310	0.310	0.292	0.292		
ID FE	YES	YES	YES	YES	YES	YES	YES	YES		
Ind. FE	YES	YES	YES	YES	YES	YES	YES	YES		

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Conclusion

We find significant valuation effects on firms' profits, mainly exporters, and for both USD invoicing and partner-currency invoicing

- O Heterogeneity in various dimensions : SMEs with large dependency on trade income and no financial hedging suffer most
- O Significant impact on firms' investment
- Policy Implications :
 - [1] Significant redistributional effect of FXI
 - [2] Financial hedging and Baht invoicing are key to mitigating the valuation effect
 - [3] NICER is nicer!