EXCHANGE RATE PASS-THROUGH TO IMPORT PRICES IN THAILAND: A VIEW FROM MICRODATA (Preliminary draft)

PIER Research Exchange

26 March 2021

Motivation

Exchange rate pass through (ERPT) has important implications for inflation dynamics, intl trade activities and international transmissions of shocks.

At the macro level, there is evidence of weak ERPT, but ERPT can be masked by aggregate data.

Increasing availability of detailed microdata provides evidence of strong and heterogenous ERPT effects.

Research Questions

Utilizing transactions level customs data,
we examine ERPT to import prices at the Thai border along 3 dimensions:

[1] Is ERPT related to the currency of pricing?

Theoretically, ERPT is 100% for PCP/DCP and 0% for LCP, but no difference in the LR.

Empirically, ERPT depends on the currency of invoice both in the SR and LR

- There is a strong case for DCP since most of the world trade is invoiced in USD. It is the USD value that matters to ERPT.

(eg. Gopinath et al. (2010), Gopinath (2015), Boz et al. (2017), Casas et al. (2017), Bonadio et al. (2018), Giuliano and Luttini (2019), Chen et al. (2019), Auer et al. (2020))

→ **Helps us understand the real effects of nominal exchange rate shocks as well as what ER matters for inflationary pressures**

Research Questions

[2] Are the effects of ERPT episodic?

Theoretically, ERPT is stronger during depreciation episodes and large ER changes due to for example, downward price rigidities.

Generally, this is the case empirically (eg. Frankel et al. (2012),Caselli and Roitman (2016), Kim et al. (2019))

[3] Does ERPT depend on sector/good characteristics or firm size?

Theoretically, ERPT of homogenous goods should be stronger. Due to higher market power, larger firms should experience lower ERPT.

Empirically, ERPT depends on sector and firm size (eg. Devereux et al. (2017) And Hjortsoe and Lewis (2020))

→ **Helps us understand how different types of ER shocks as well as industry composition/market structures matter for ERPT**

Data

Quarterly 2007Q1 – 2019Q4 (13 yrs.)
Observations (after cleaning): 7.45 mil.

The ID is classified by:

- Good [identified by HS-11]
- Firm [identified by IPID]
- Exporting country
- Origin country
- Unit
- Currency of invoicing

Price proxied by unit values

$$Pm_{id,t} = \frac{Import\ Value_{id,t}}{Import\ Quantity_{id,t}}$$

Cleaning method:

- Exclude obs. for which import quantity is zero
- Exclude obs. with non-classified industry, exporting country and/or source country
- Exclude 20% of obs. with the largest and smallest percentage changes in unit values
    - Trim Pm at 20 pctl and 80 pctl

Methodology

Fixed-effect panel estimation:

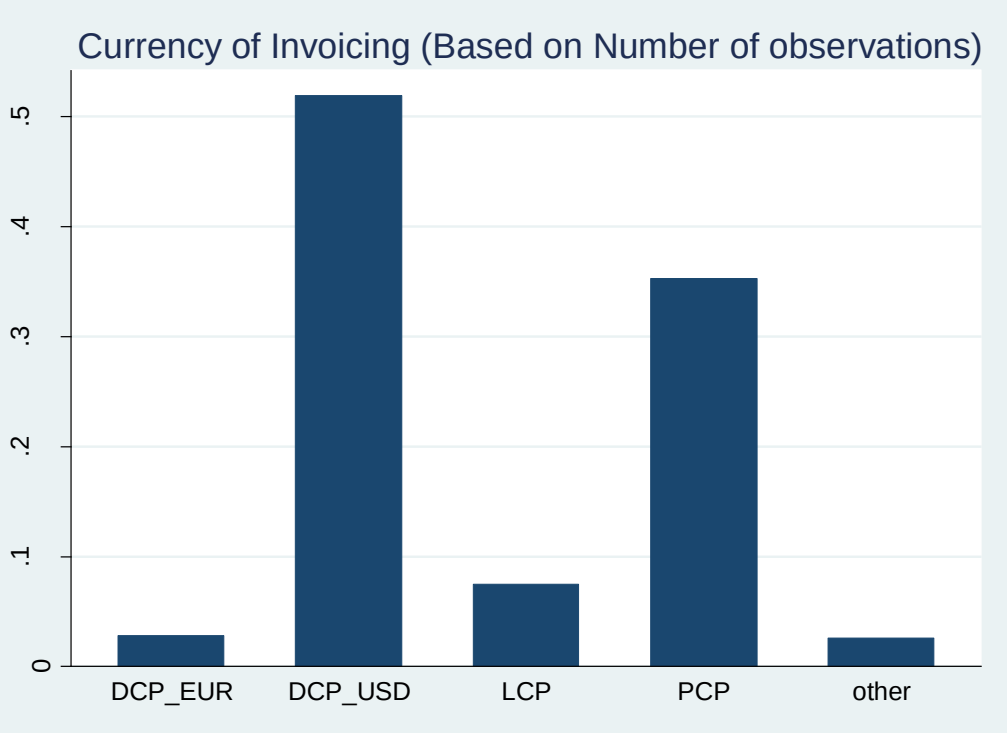
$$\Delta Pm_{id,t} = \sum_{k=0}^{8} \beta_k^{LCP} \Delta FCTHB_{x,t-k} \times D_{invoice=THB} + \sum_{k=0}^{8} \beta_k^{PCP} \Delta FCTHB_{x,t-k} \times D_{invoice=x} + \sum_{k=0}^{8} \beta_k^{DCP} \Delta USDTHB_{t-k} \times D_{invoice=USD} + \sum_{k=0}^{8} \gamma_k \Delta Z_{x,t-k} + \alpha \quad + \varepsilon_{id,t}$$

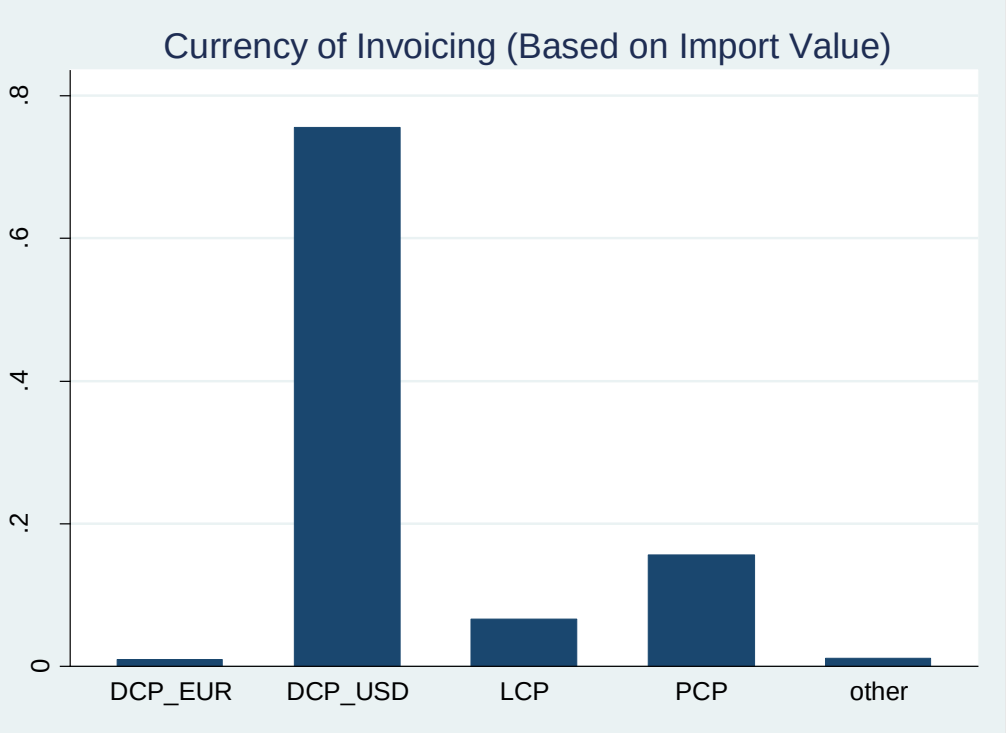
where

- P_m is import price changes in THB
- $FCTHB$ is the ER between THB and the exporter country's currency (x)
- $USDTHB$ is the ER between THB and USD
- Z is a set of control variables which includes exporters' PPI and GDP, Thailand's CPI and GDP, and oil prices
- α is a set of fixed effect, controlling for
    - id level characteristics (good-firm-exporting country-origin country-unit)
    - Seasonality (Quarterly dummies for each good and origin country combination)

[1] Is ERPT related to the currency of pricing?

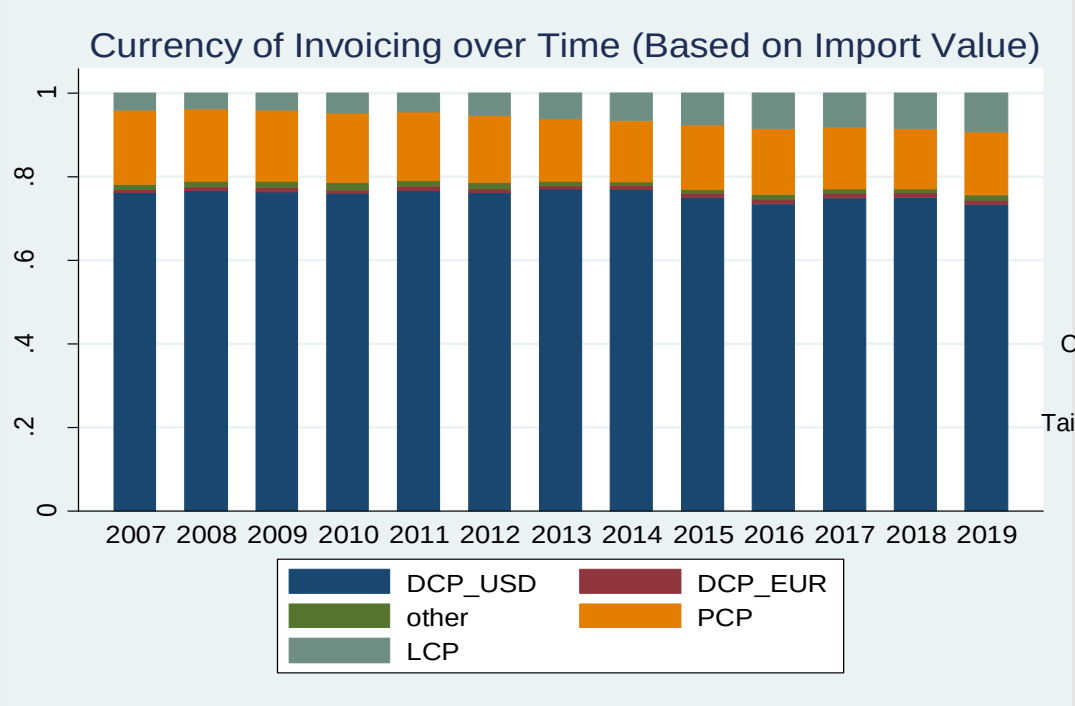
The majority of imported goods in Thailand are invoiced in USD



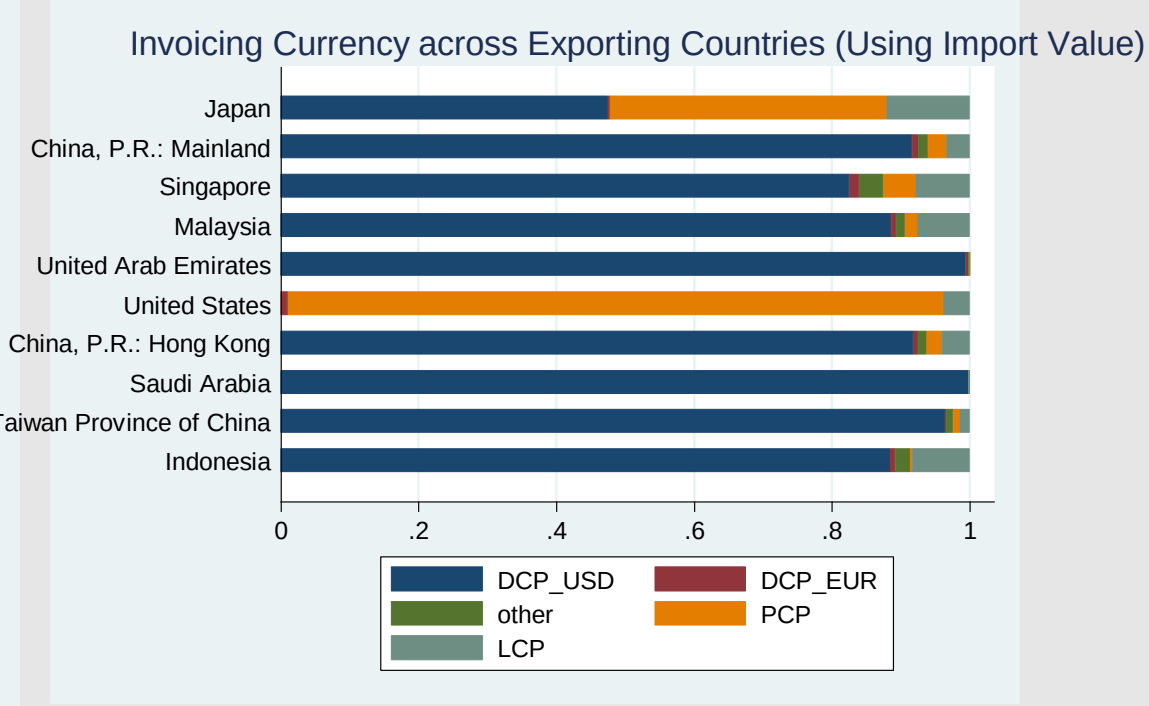


This holds across time, as well as exporting country.

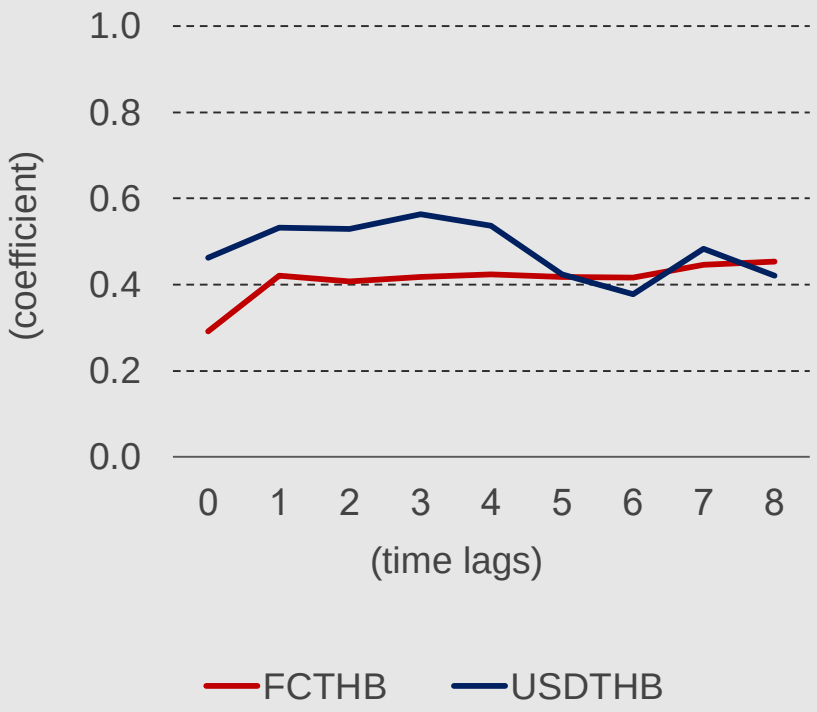
- LCP is gradually rising



- Japan, US heavily practices PCP



ERPT to import prices

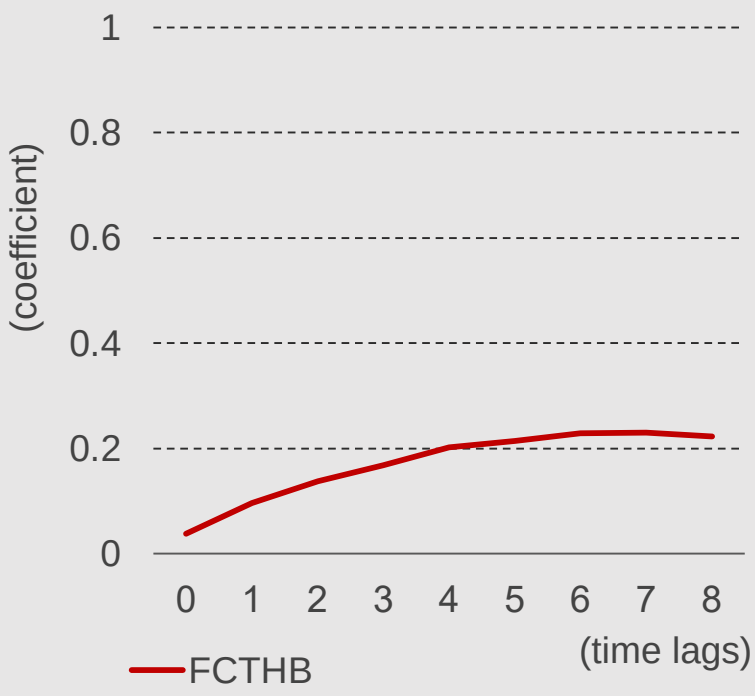


- Full-sample estimates of ERPT are moderate and incomplete [=0.5].
- Not much difference in ERPT across time horizons
- ERPT for USDTHB is comparable to FCTHB, possibly suggesting the dominant role of USD as currency of invoicing

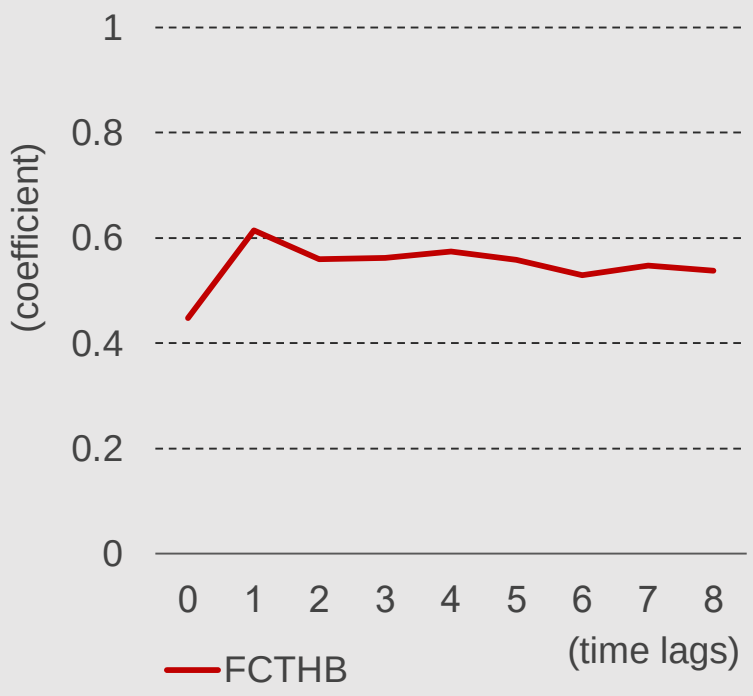
Heterogeneity across Currency of Invoicing

- ERPT much larger for PCP and DCP than LCP
- USDTHB is a relevant parity for DCP transactions
- For LCP, ERPT is zero in ST but moderate in MT, implying some convergence across currencies

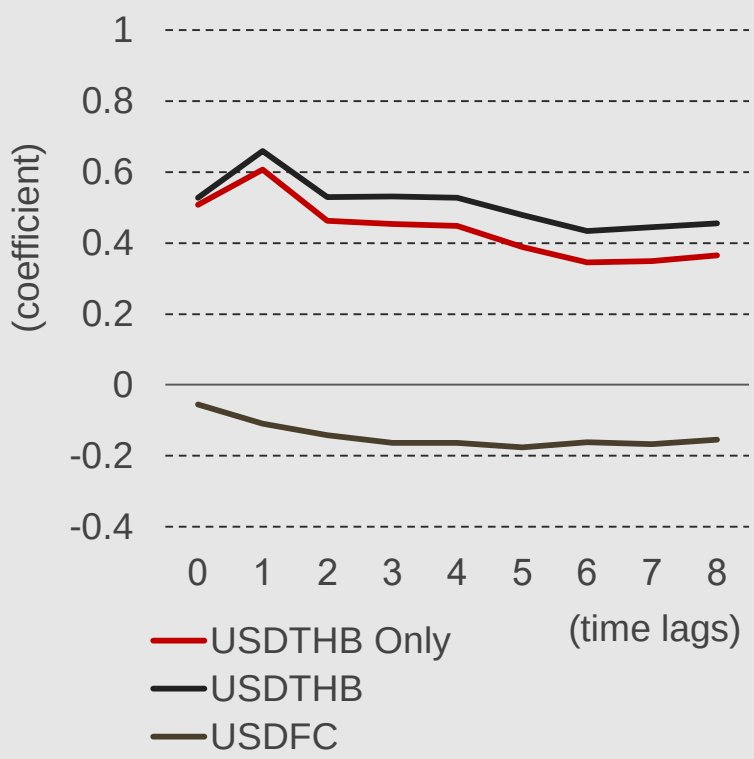
Local currency pricing (LCP)



Producer currency pricing (PCP)



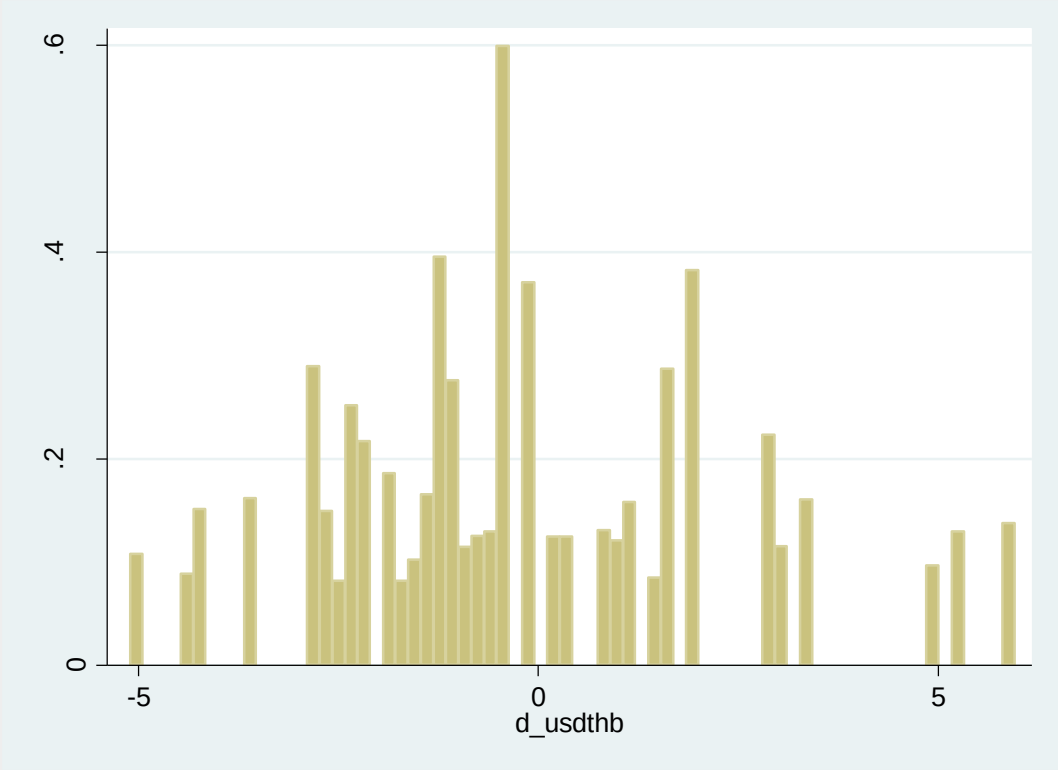
Dominant currency pricing (DCP)



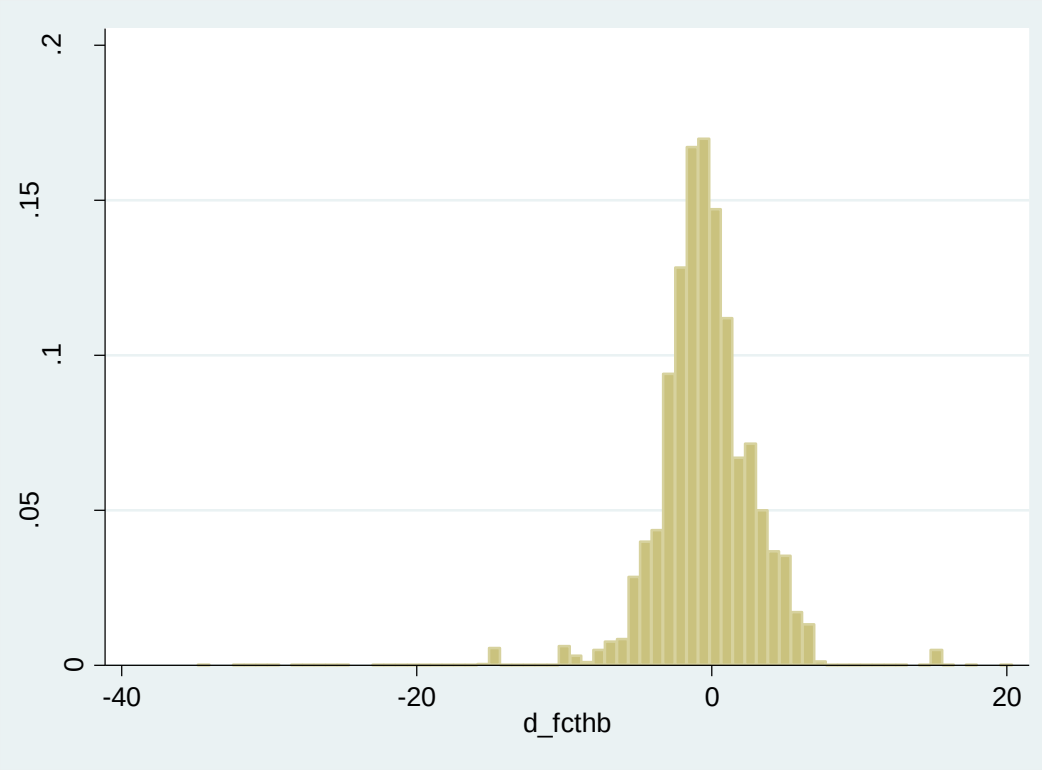
[2] Is there any asymmetry in ERPT?

Distribution of Changes in Exchange Rates

USDTHB



FCTHB



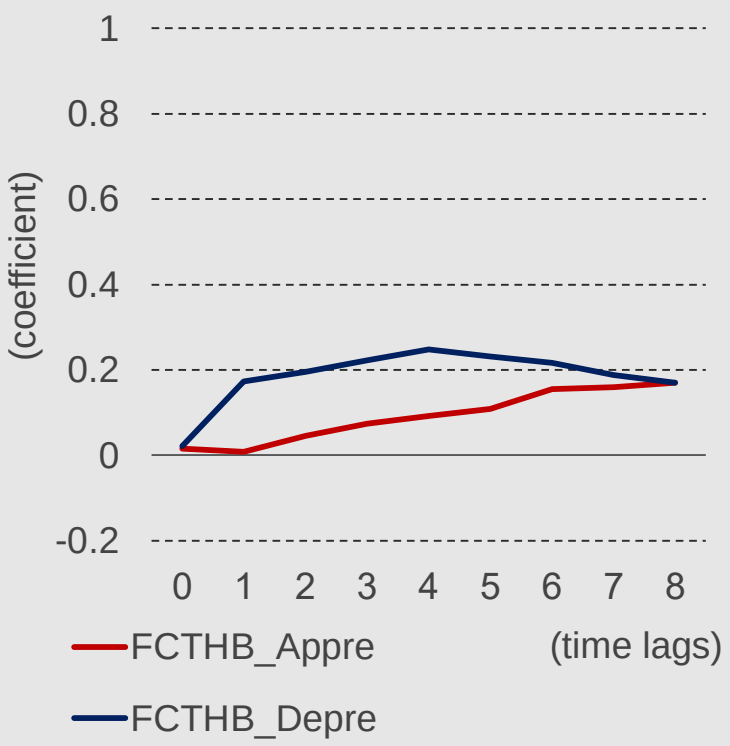
Fixed-effect panel estimation:

$$\Delta Pm_{id,t}$$
$$= \sum_{k=0}^{8} \beta_k^{LCP} \Delta FCTHB_{x,t-k} \times D_{invoice=THB} + \sum_{k=0}^{8} \beta_k^{LCP,depre} \Delta FCTHB_{x,t-k} \times D_{invoice=THB} \times D_{depre,k} +$$
$$\sum_{k=0}^{8} \beta_k^{PCP} \Delta FCTHB_{x,t-k} \times D_{invoice=x} + \sum_{k=0}^{8} \beta_k^{PCP,depre} \Delta FCTHB_{x,t-k} \times D_{invoice=x} \times D_{depre,k} +$$
$$\sum_{k=0}^{8} \beta_k^{DCP} \Delta USDTHB_{t-k} \times D_{invoice=USD} + \sum_{k=0}^{8} \beta_k^{DCP,depre} \Delta USDTHB_{t-k} \times D_{invoice=USD} \times D_{depre,k} +$$
$$\sum_{k=0}^{8} \gamma_k \Delta Z_{x,t-k} + \alpha \quad + \varepsilon_{id,t}$$

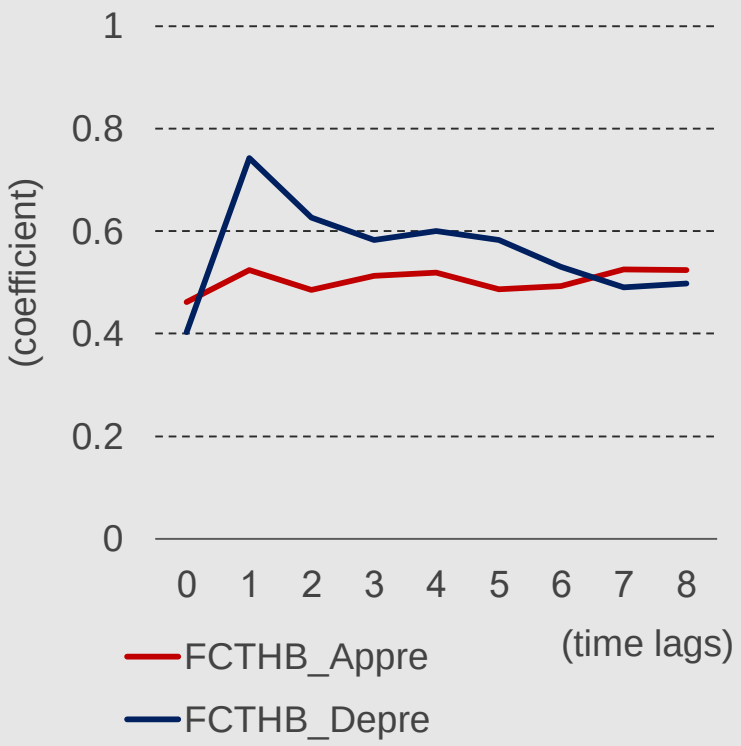
Evidence of ERPT Asymmetry

- ERPT is stronger during depreciations especially for DCP
- Importers' gains from appreciation could be lower than losses from depreciation
- Robust against all invoicing currencies but ERPT is zero for DCP in the MT

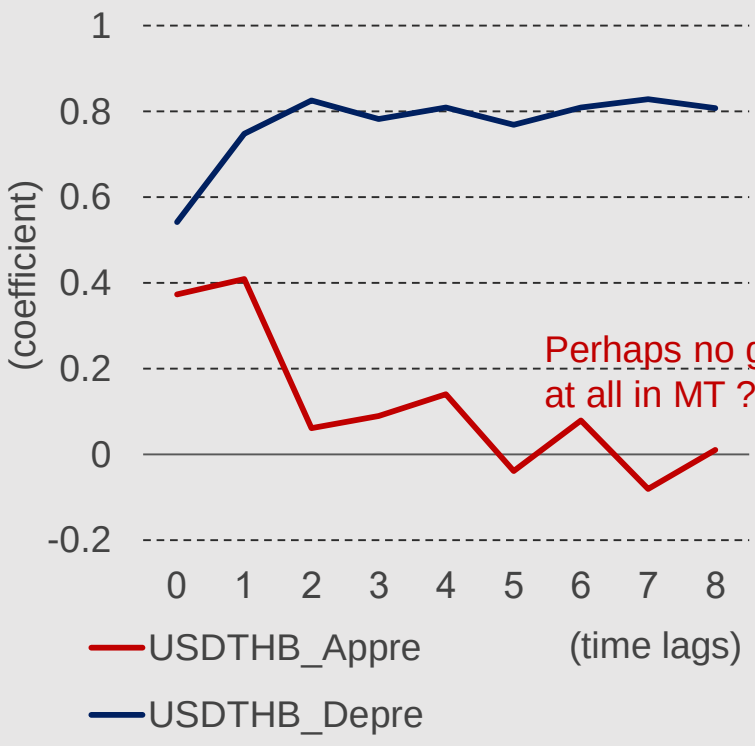
Local currency pricing (LCP)



Producer currency pricing (PCP)

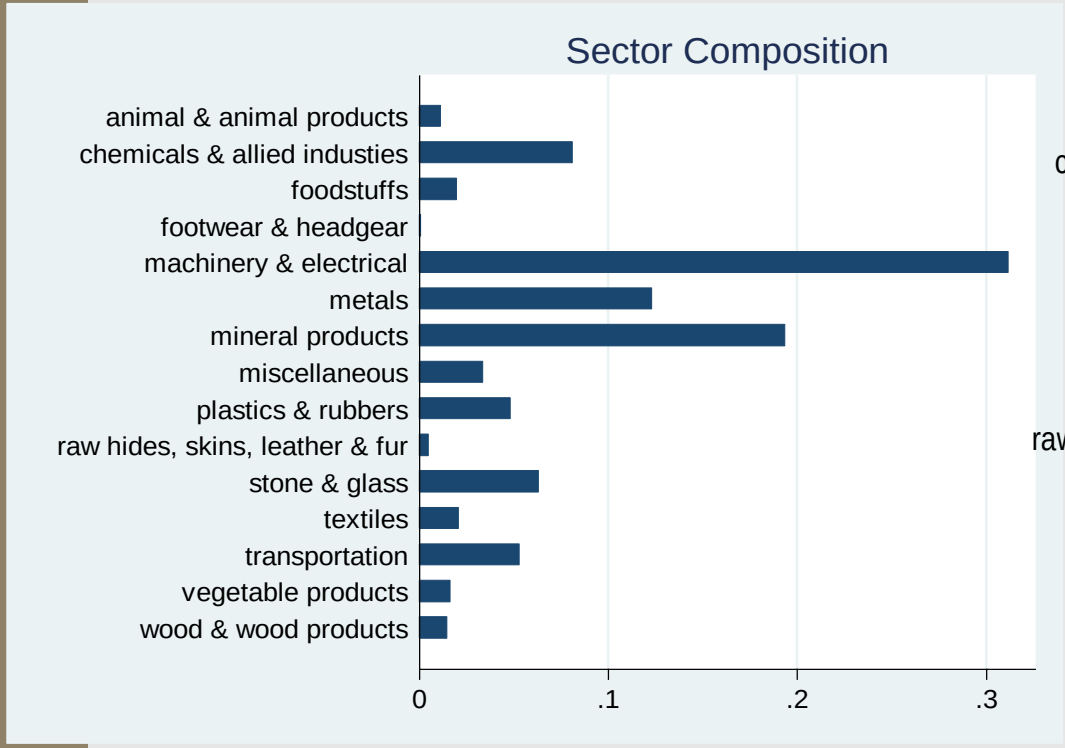


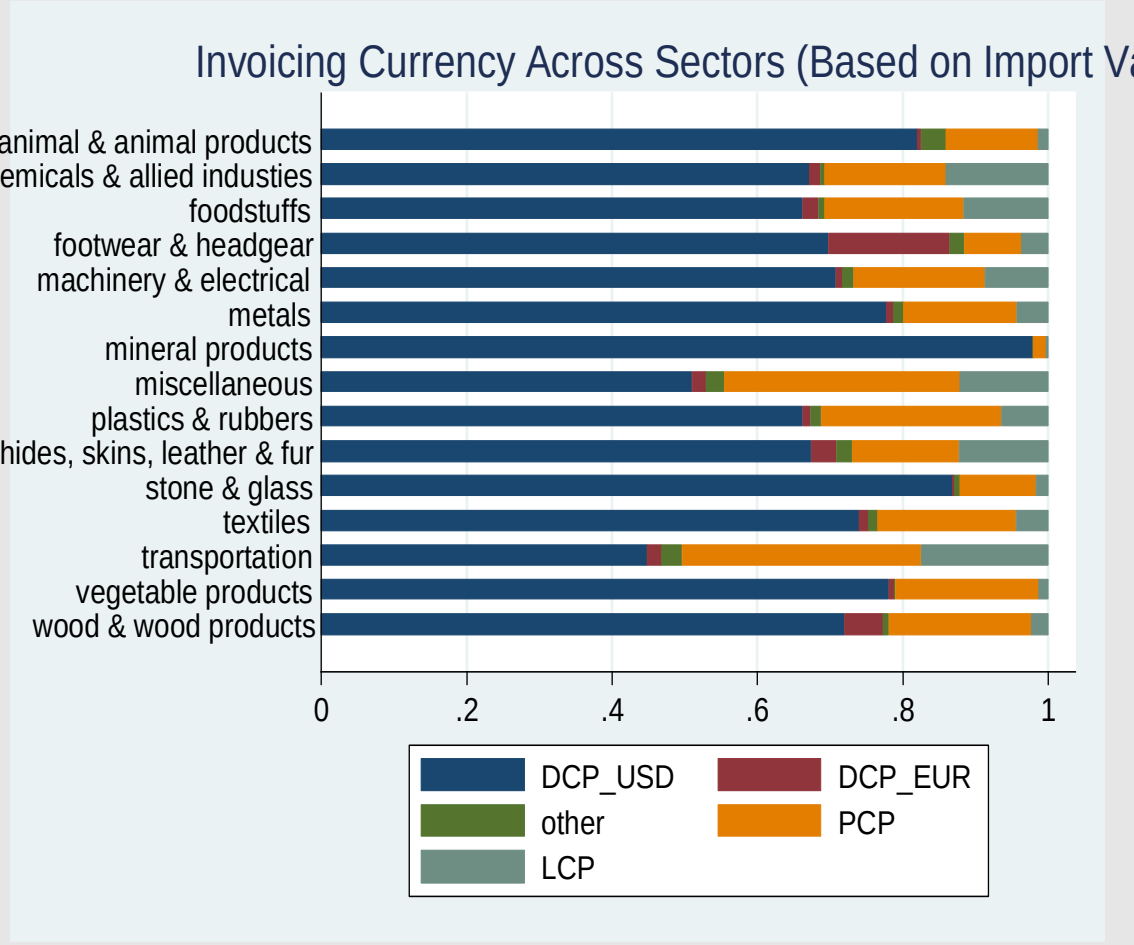
Dominant currency pricing (DCP)



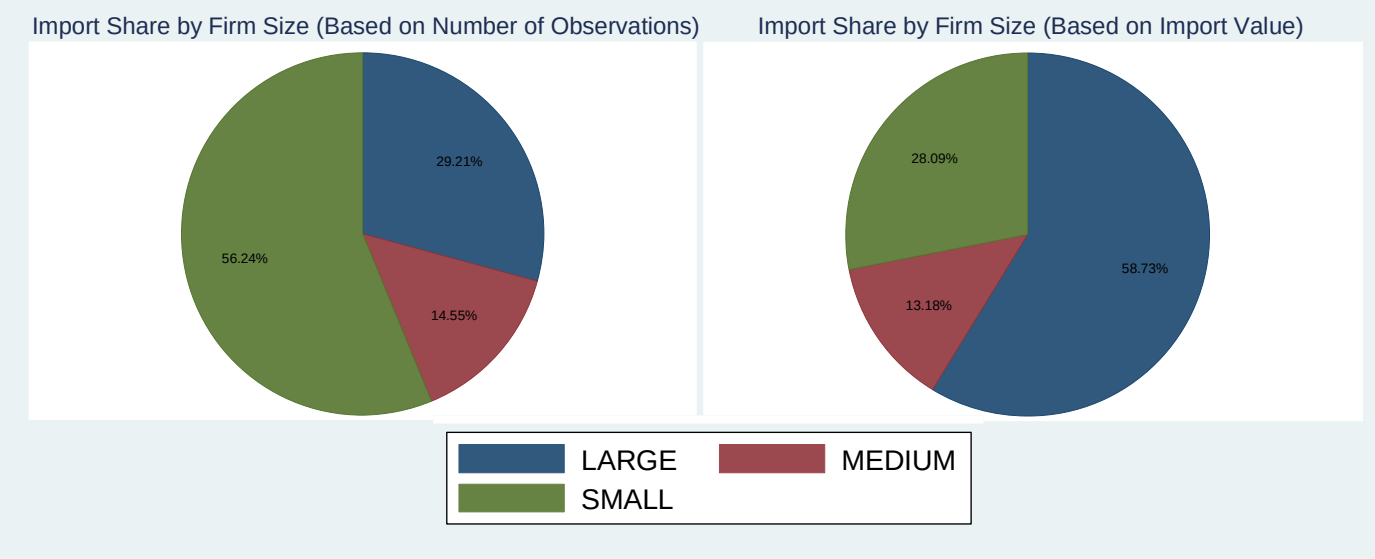
[3] Any ERPT differences across sectors/ firms?

DCP is more popular for homogenous goods

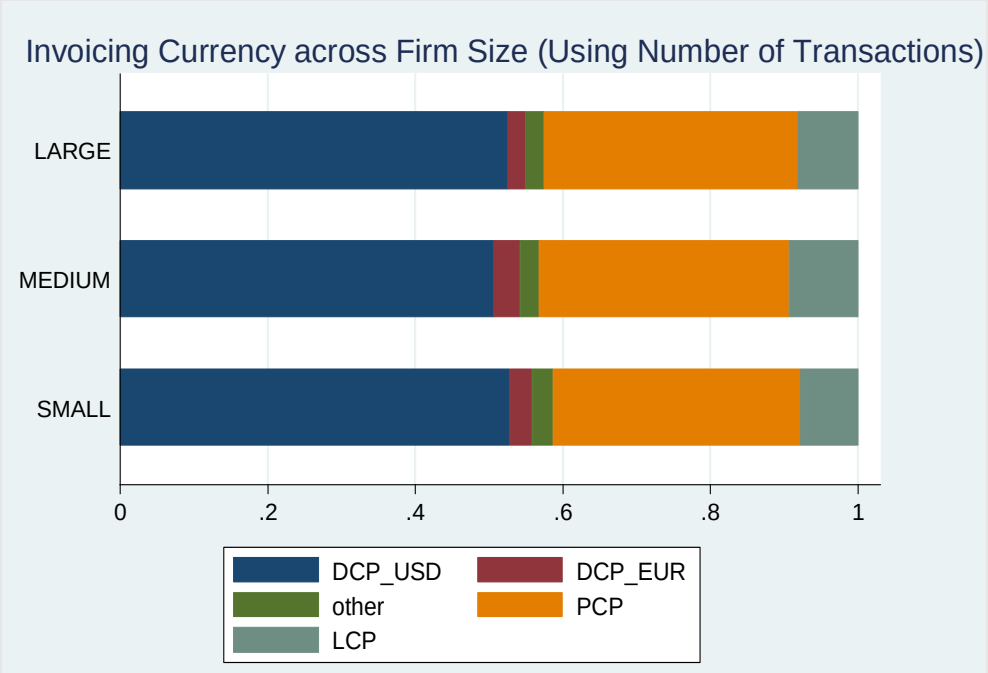


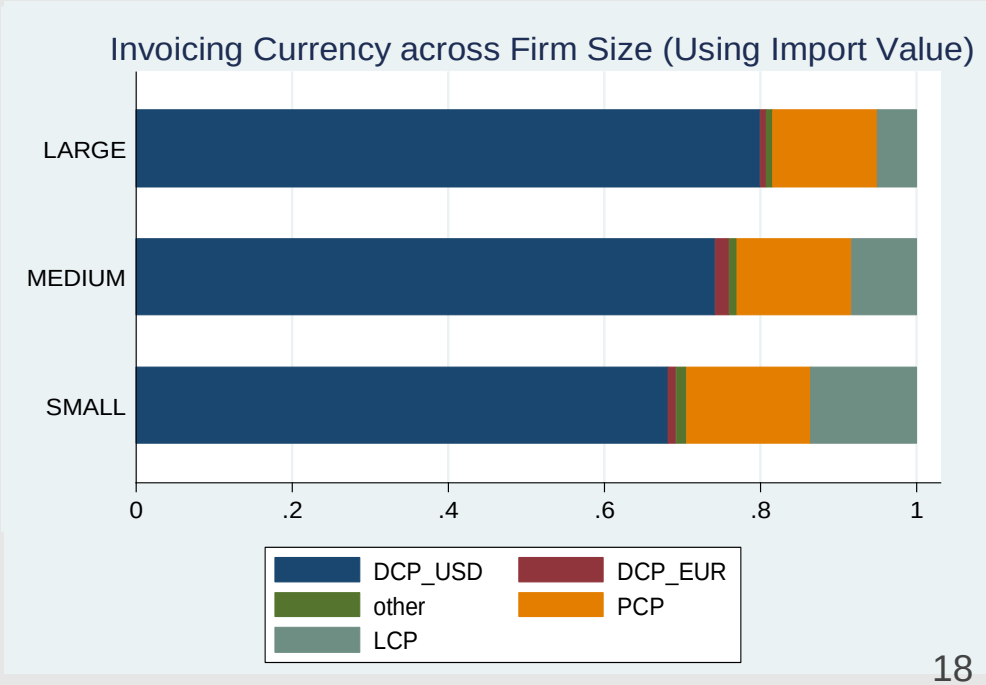


Stylized Facts



Large firms, unexpectedly, do not use more LCP!





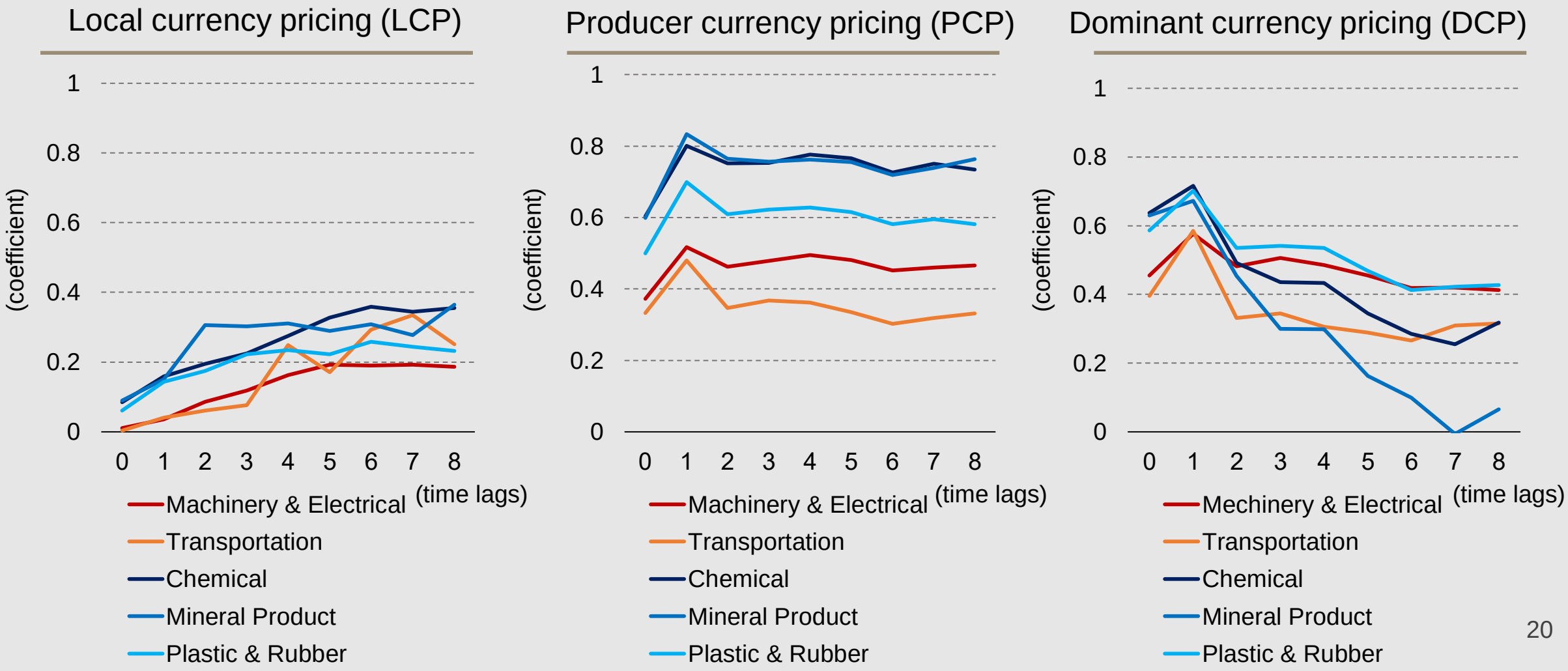
Sectoral Heterogeneity

- Invoicing effect on ERPT is robust across sectors
- Some variation of ERPT within the same invoicing

	Sectors	LCP		PCP		DCP	
		FCTHB		FCTHB		USDTHB	
		ST	MT	ST	MT	ST	MT
1	animal & animal products	0.40	0.47	0.61	0.46	0.65	0.39
2	chemicals & allied industies	0.16	0.35	0.80	0.73	0.72	0.32
3	foodstuffs	0.05	0.06	0.74	0.63	0.71	0.29
4	footwear & headgear	0.16	0.13	0.60	0.79	0.80	1.01
5	machinery & electrical	0.04	0.19	0.52	0.47	0.58	0.41
6	metals	0.08	0.10	0.54	0.41	0.51	0.28
7	mineral products	0.15	0.36	0.83	0.76	0.67	0.07
8	miscellaneous	0.12	0.24	0.53	0.44	0.57	0.33
9	plastics & rubbers	0.14	0.23	0.70	0.58	0.70	0.43
10	others	-0.01	0.05	0.54	0.55	0.50	0.30
11	stone & glass	0.01	0.12	0.50	0.38	0.60	0.31
12	textiles	0.09	0.23	0.53	0.51	0.59	0.53
13	transportation	0.04	0.25	0.48	0.33	0.58	0.32
14	vegetable products	0.45	0.65	0.72	0.57	0.48	0.09
15	wood & wood products	0.09	0.02	0.60	0.50	0.67	0.41

Sector Heterogeneity (cont'd)

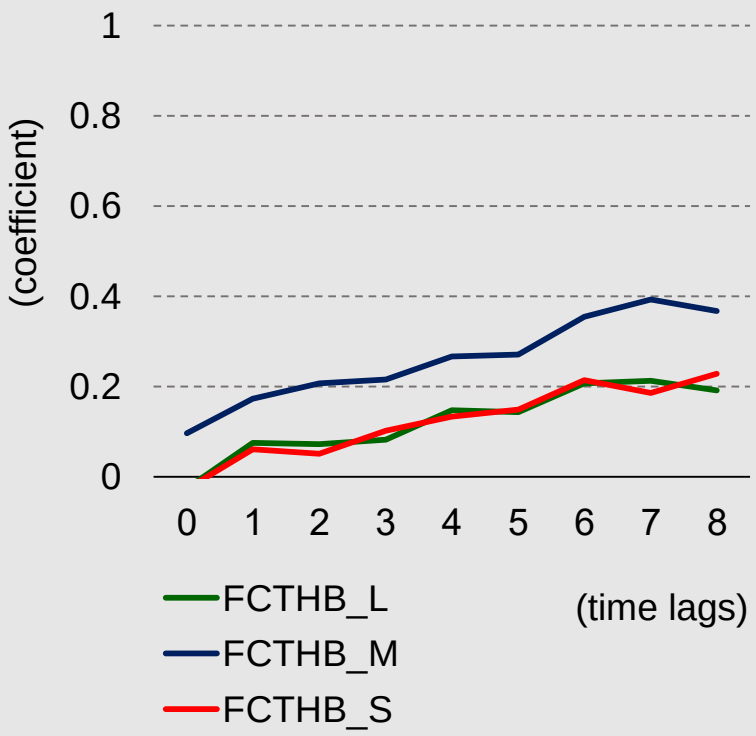
- Sectors containing only differentiated goods (e.g, machinery & electrical, and transportation) tend to show higher ERPT than homogenous-good sectors, at least the short run



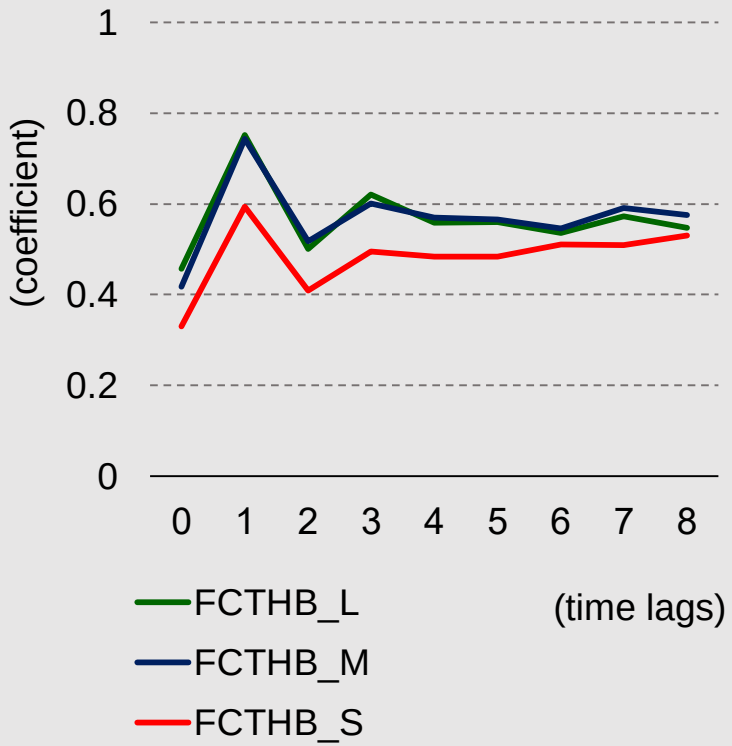
Firm Size Heterogeneity

- Invoicing effect on ERPT is robust across firm size
- Some variation of ERPT within the same invoicing
  - Surprisingly, ERPT is smaller for small firms!

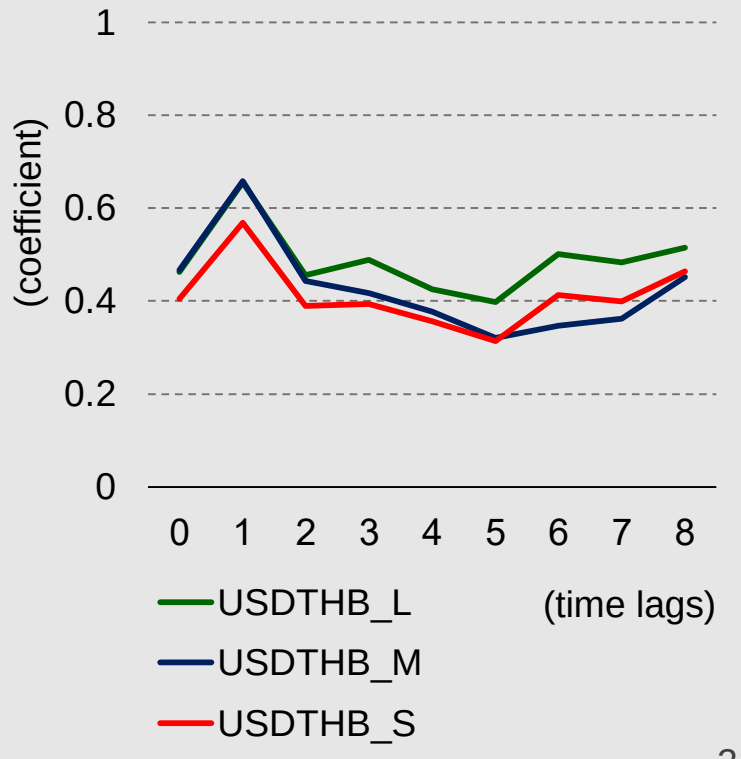
Local currency pricing (LCP)



Producer currency pricing (PCP)



Dominant currency pricing (DCP)



Takeaways

- The use of **USD** as an invoicing currency is pervasive [almost 80% of total trade value]
- Ignoring currency of invoice, **ERPT is moderate and incomplete** [0.5].
- **Currency of invoice matters for ERPT**
  - ERPT is much higher for PCP and DCP compared to LCP.
  - USDTHB is a relevant exchange rate that explains prices under DCP.
  - ERPT increases for LCP in the MT suggesting some convergence across currencies
  - The result is robust across sectors and firms although there exists some heterogeneity
- EPRT is **stronger** for depreciations and **weaker** for appreciations.
  - In the MT, ERPT for DCP is zero during appreciation episodes
- ERPT is **smaller** for small firms.