Global cost shock pass-through to domestic prices in Thailand: sectoral perspectives

Thitima Chucherd, Natta Piyakarchana,
Chonnithit Chaisingthong, Rangsima Srisawat

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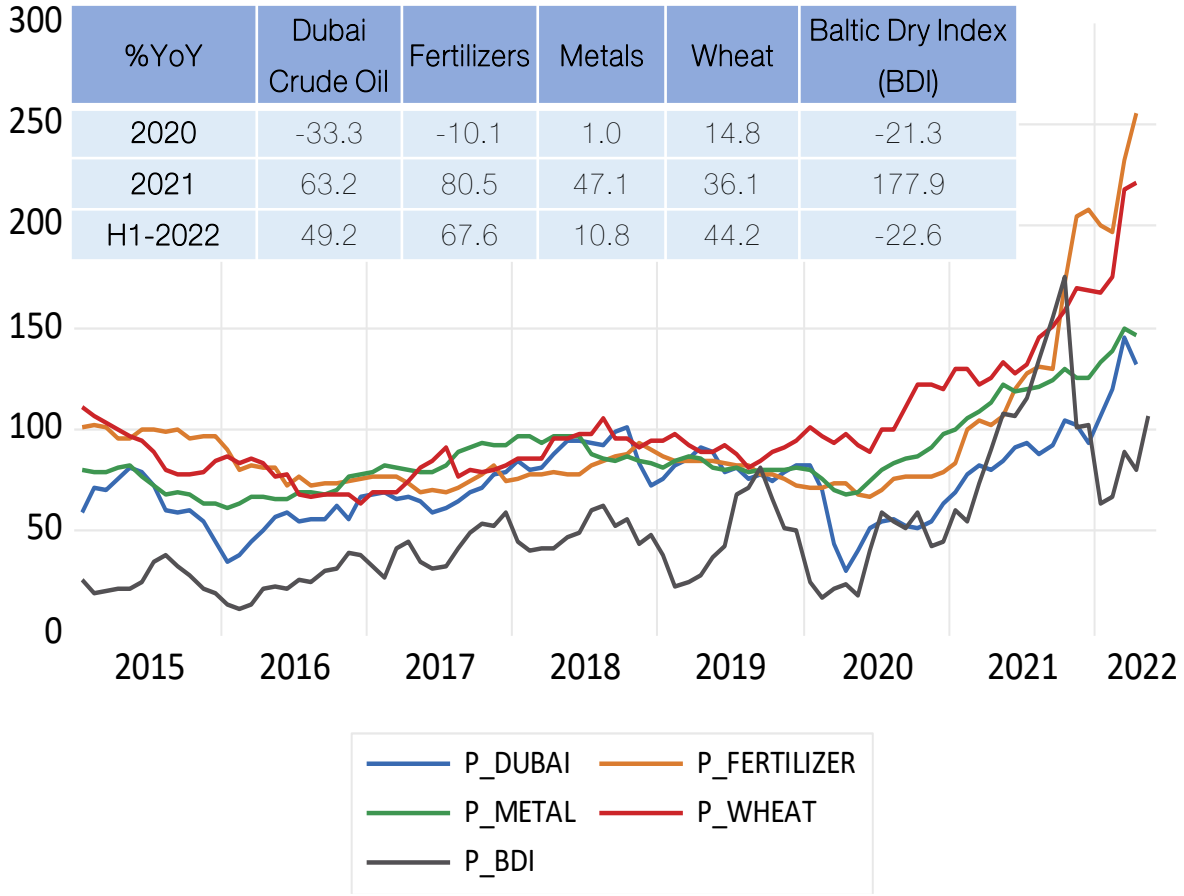
Source: https://www.aier.org/article/the-global-economy-desperately-needs-freedom/

Global supply disruptions & commodity price surges since 2021

Index (2010 =100)

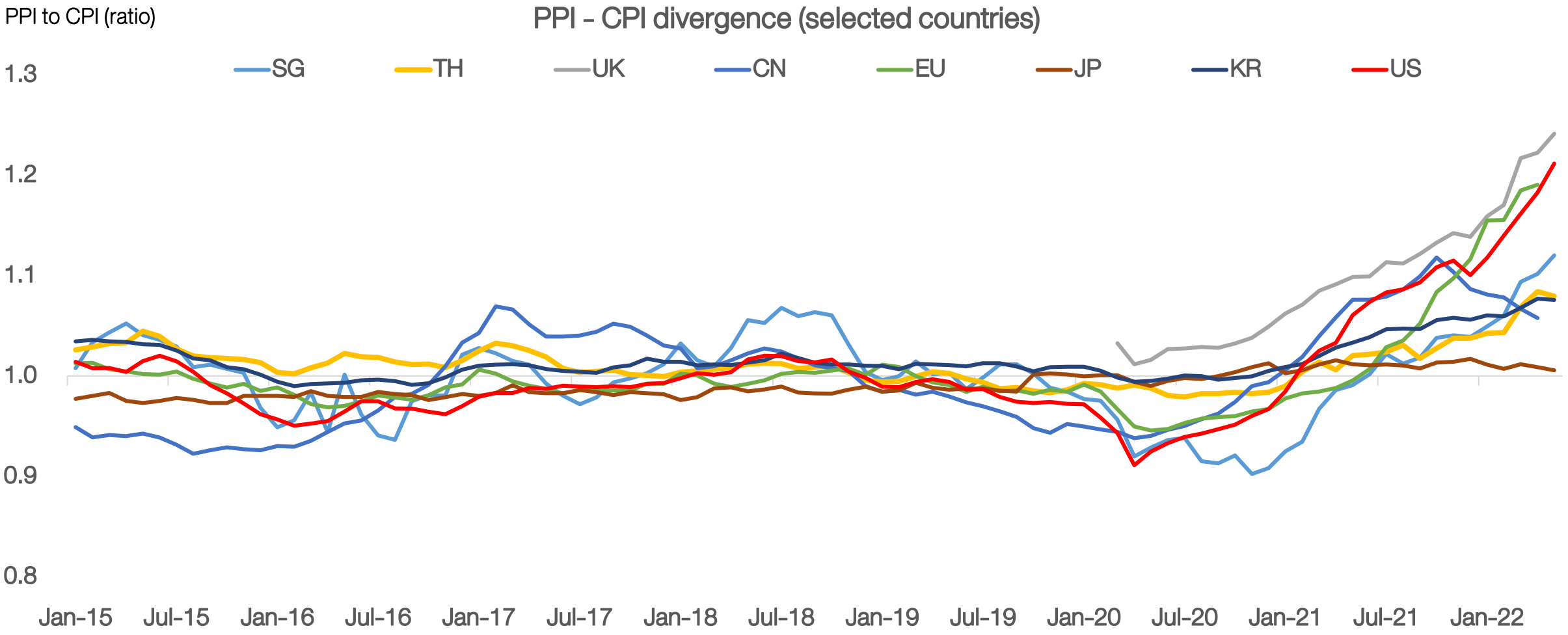
%YoY	Dubai Crude Oil	Fertilizers	Metals	Wheat	Baltic Dry Index (BDI)
2020	-33.3	-10.1	1.0	14.8	-21.3
2021	63.2	80.5	47.1	36.1	177.9
H1-2022	49.2	67.6	10.8	44.2	-22.6



How do transmission mechanisms of global supply shocks pass through domestic prices in Thailand during COVID-19?

Sectoral perspectives

Global supply shocks extremely hit producer prices, causing an extremely large divergence between PPI and CPI as a global phenomenon

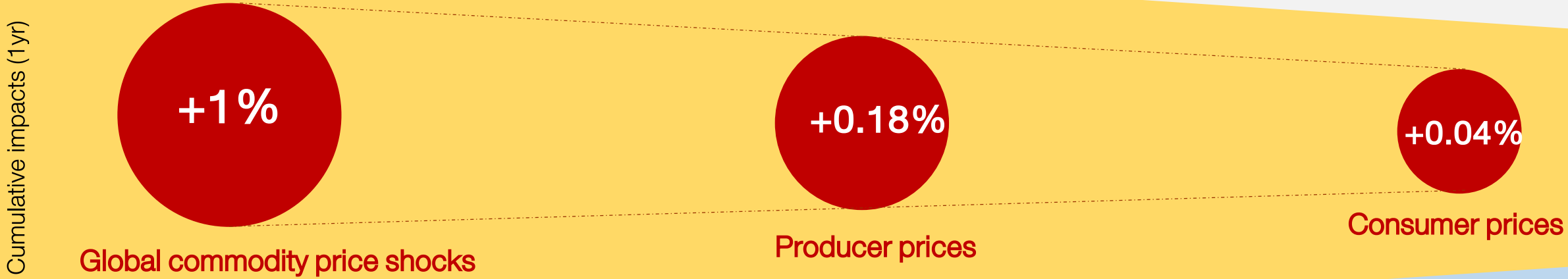


Source: CEIC

Past studies show partial passthrough from global commodity shocks to domestic prices.

Research contribution has found in sectoral perspectives.

Dilute passthrough along the pricing chain



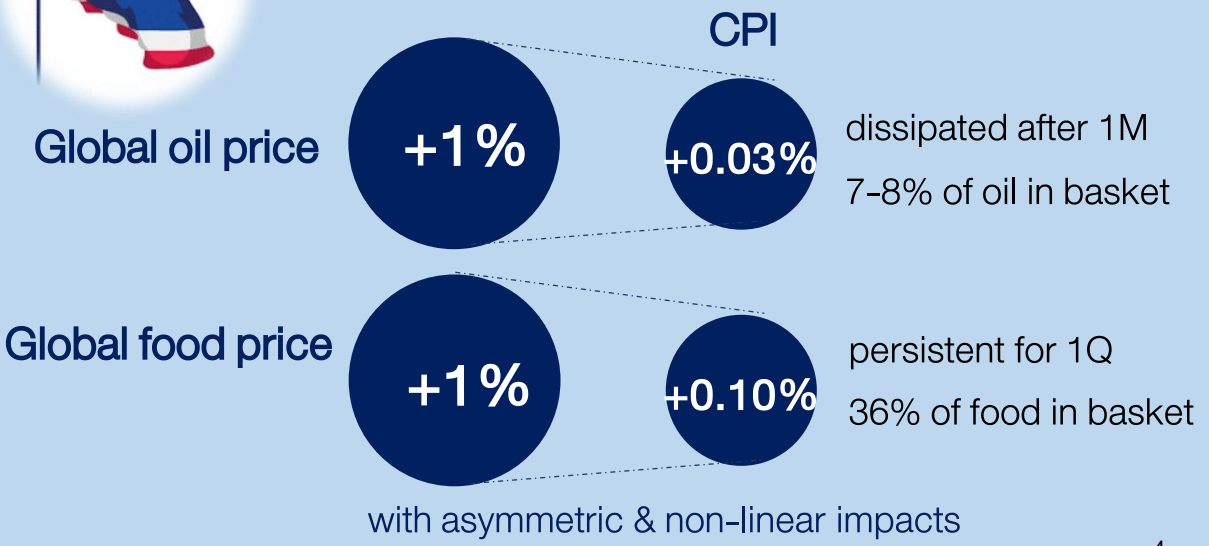
Source: Rodríguez & Zumaquero (2022), 18 AEs & 19 EMs

- **80%** of passthrough happened in **1st quarter**
- **Energy and metal shocks** have larger effects
- Passthrough in **emerging countries** is less evident
- **Passthrough factors:**

  firms' ability **to adapt with cost increases** and

  to pass higher cost on consumers under different market competitions, subsidy and price control policies

Short-lived CPI passthrough in Thailand

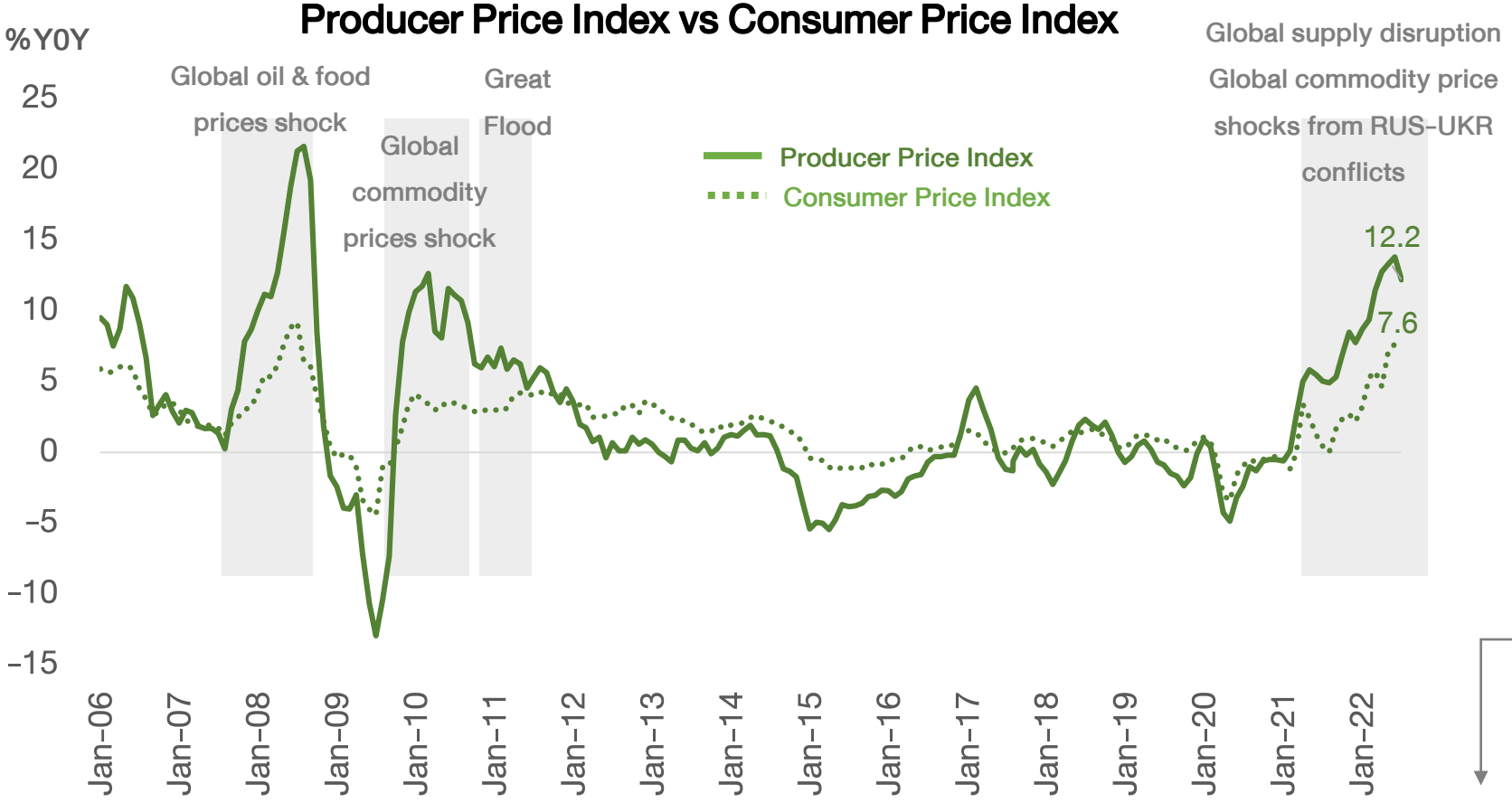


Source: Nookhwun and Worasak (2019)

PPI-CPI stylized facts

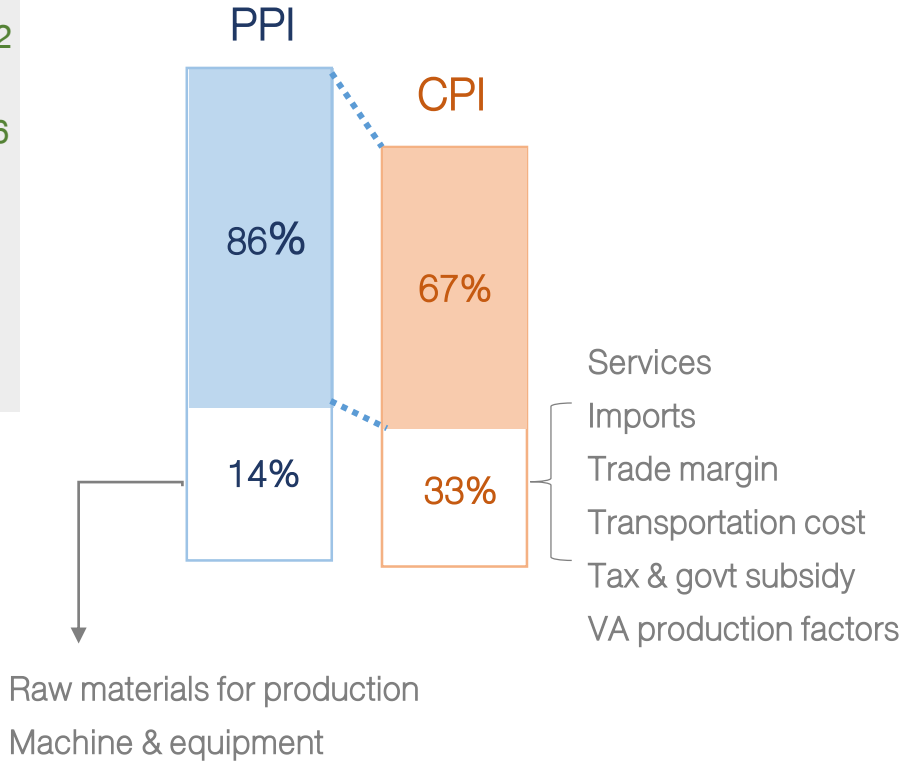
PPI and CPI in Thailand shows strong comovement, yet incomplete. More restrained cost passthrough during crisis is observed.

Producer Price Index vs Consumer Price Index



Source: Ministry of Commerce

Two-third of the CPI basket are matchable with those in PPI



Source: Ministry of Commerce, Authors' calculation

Is the PPI-CPI ratio a good indicator for inflation pressure in Thailand?

PPI leads CPI about 1-5 months reflecting pipeline pressure

Category	No. of month lag
PPI raw → PPI intermediate goods	2
PPI Intermediate → PPI finished goods	3
PPI → CPI (by sector)	
Prepared food	5
Fuel	2
Apparel	1
Tobacco	1
Construction material	2
Rice	1
Medicine	not significant
Vegetable & fruits	2
Beverages	2
Fishery	1
Meat	2
Vehicle	not significant
Furniture & equipment	not significant

Source: Authors' calculation

Data from 2002 - 2022

PPI has ability to predict CPI with lower forecast errors

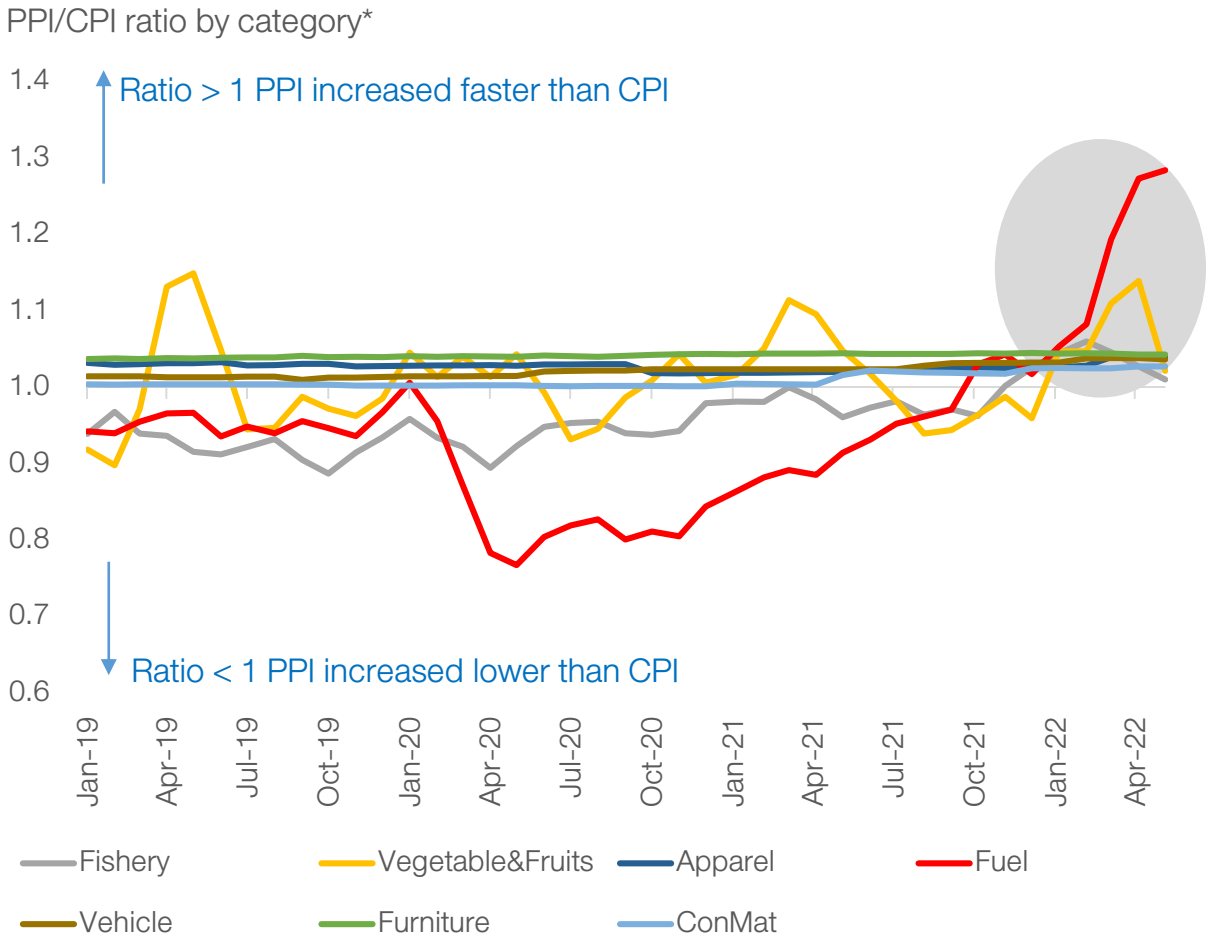
Category	Forecast errors (RMSE)*	
	Model with CPI only	Model with CPI & PPI lags
PPI raw → PPI Intermediate		
PPI Intermediate → PPI finished goods		
PPI → CPI by sector		
Prepared food	0.00959	0.00954
Fuel	0.03272	0.03230
Apparel	0.00045	0.00041
Tobacco	0.00410	0.00406
Construction material	0.00709	0.00076
Rice	0.01132	0.01001
Medicine	not significant	
Vegetable & fruits	0.03182	0.03181
Beverages	0.00258	0.00258
Fishery	0.00367	0.00328
Meat	0.04749	0.04748
Vehicle	not significant	
Furniture & equipment	not significant	

Source: Authors' calculation

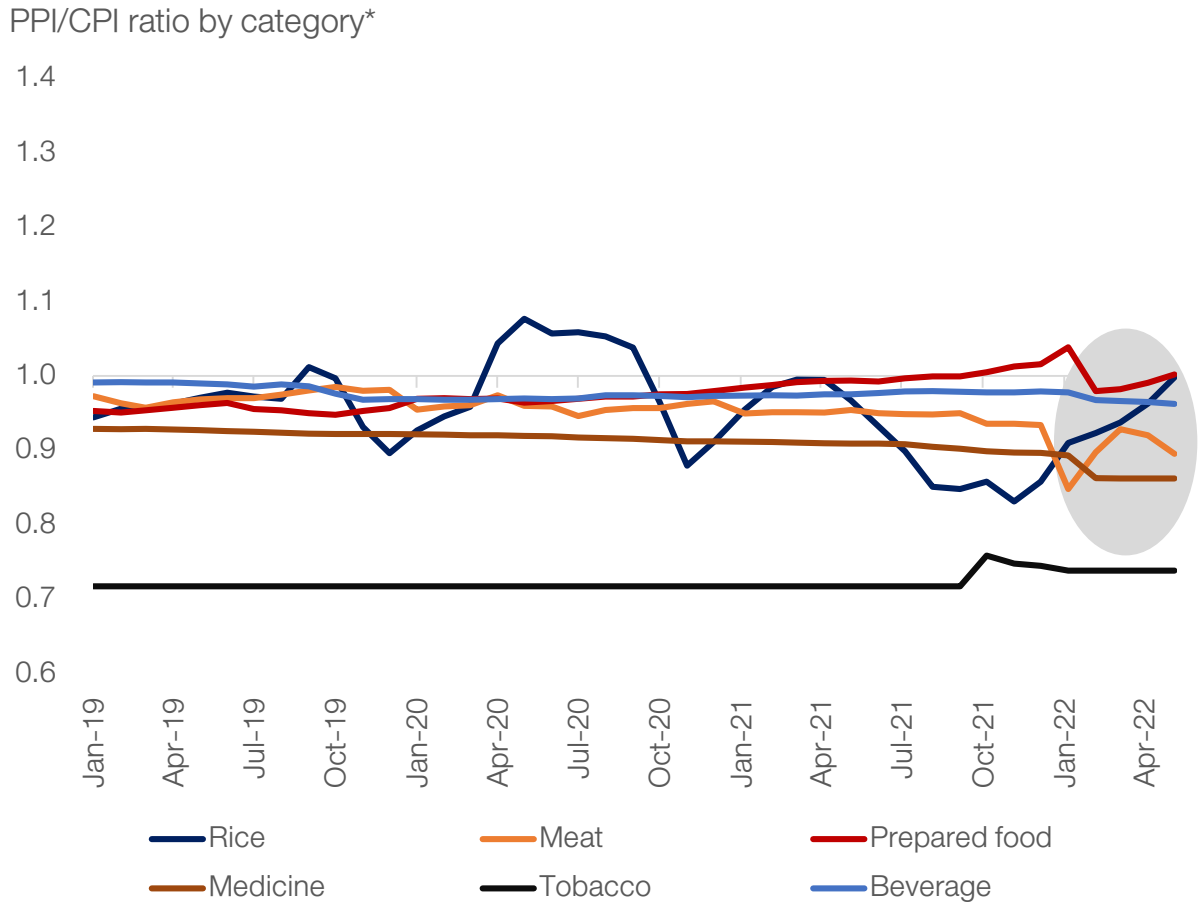
* from out-of-sample forecast (Jan21-May22)

Producers started to pass on higher costs of some product categoies to consumers early this year

Awaiting groups



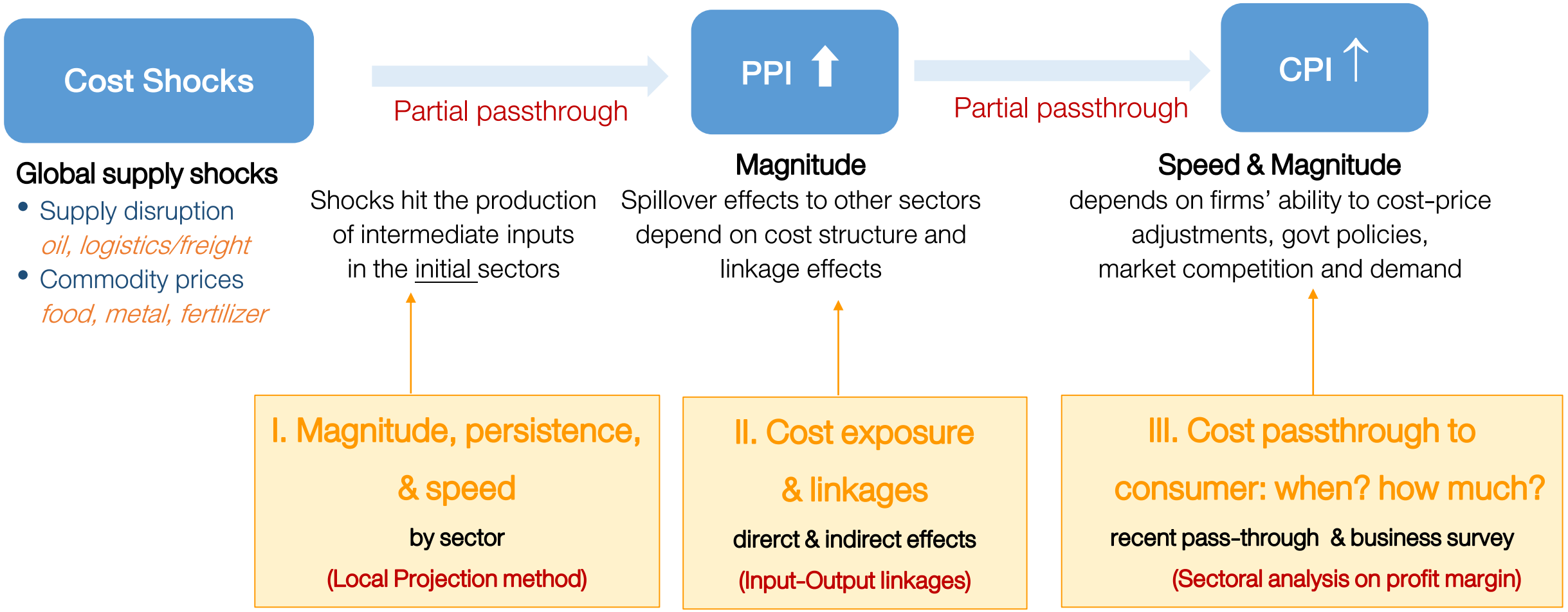
Passed-through groups



* The PPI/CPI ratio is now adjusted based on the historical cost pass-through behavior of various product categories.

Source: CEIC, Ministry of Commerce, Authors' calculation

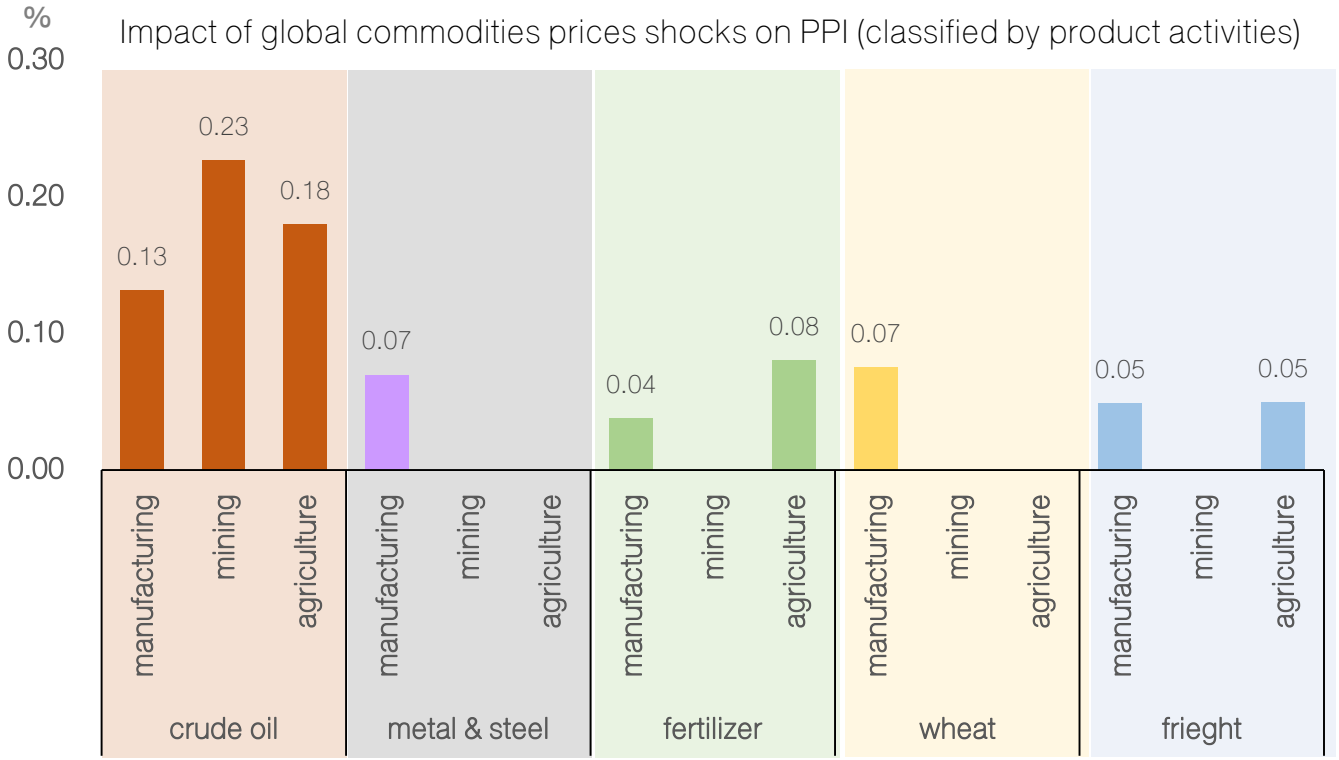
Global cost passthrough: a partial transmission framework



I. Global supply shocks partially transmit to producer prices mostly within the same quarter

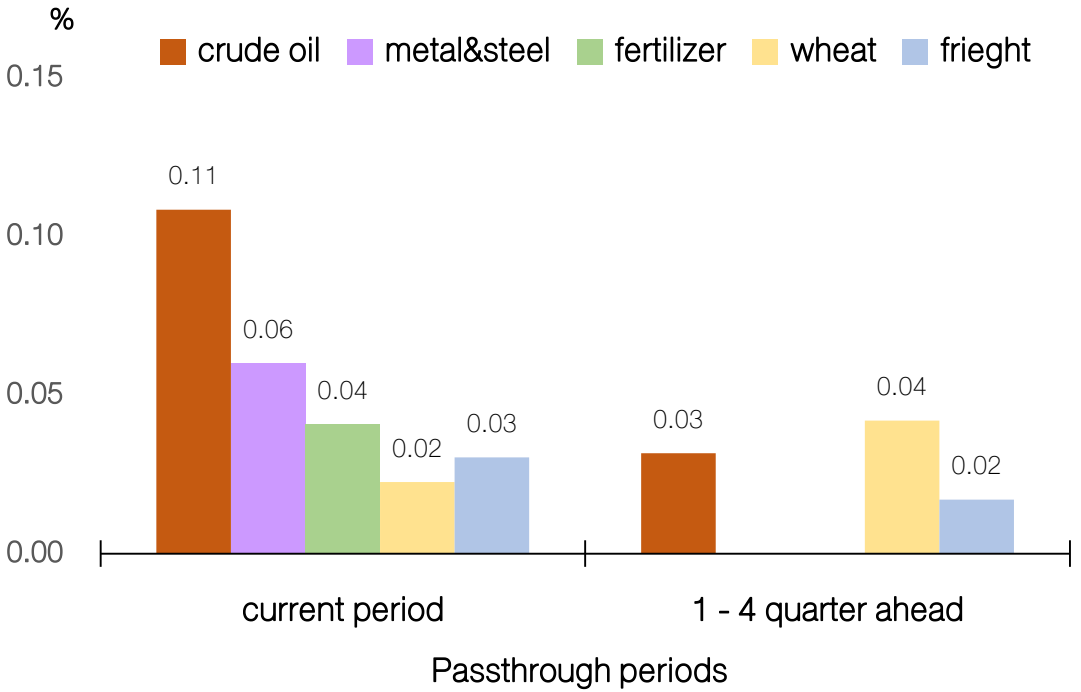
Global crude oil price shocks have greater impacts on PPI compared to other commodity prices.

Impact of global commodities prices shocks on PPI (classified by product activities)



The PPI passthrough mostly occurred within a quarter. The transmission gradually faded out after one year.

The passthrough effects of the global commodities prices on PPI

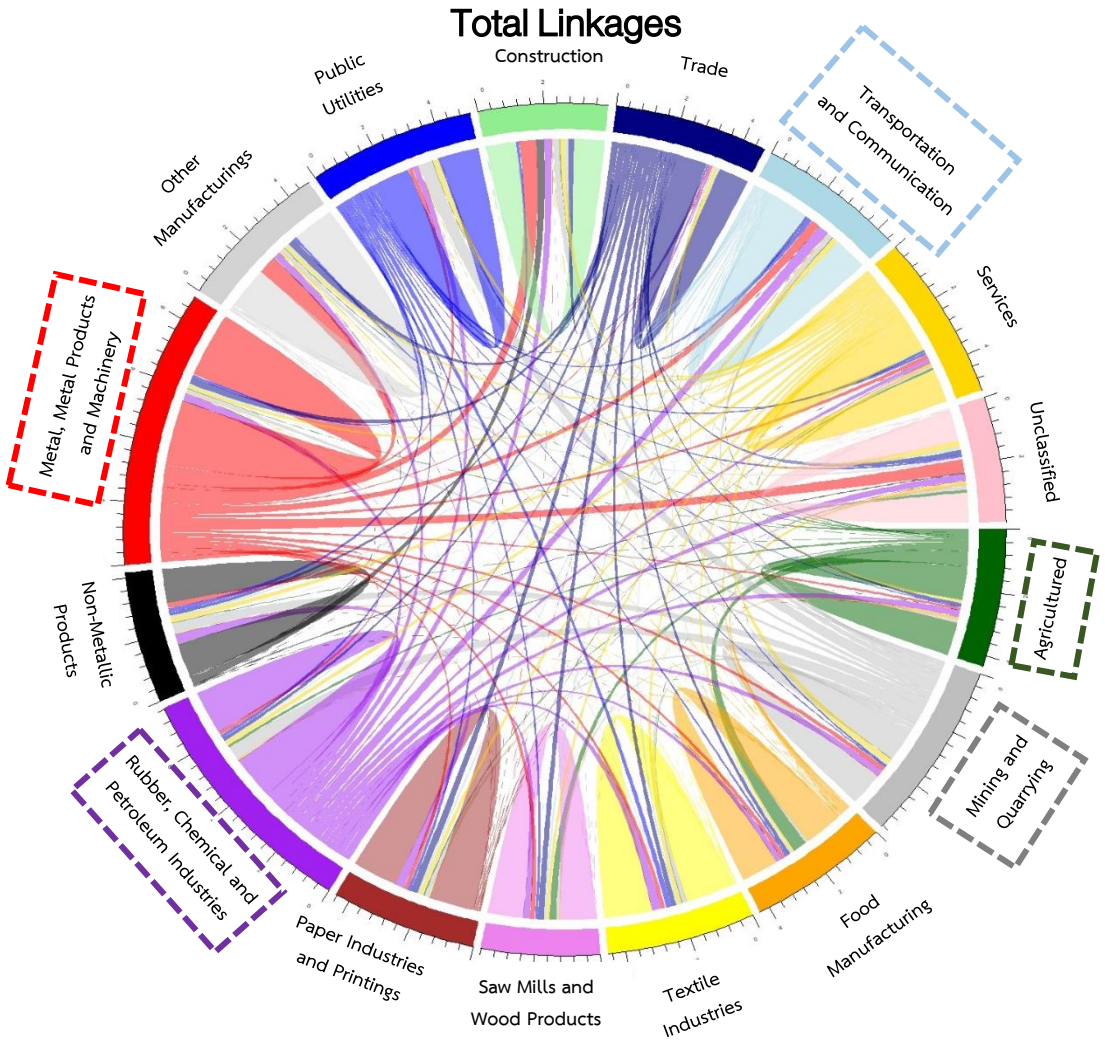


Source: Authors' calculation

Note: using impulse responses via the Local Projection model (data from Q1/2002 to Q1/202)

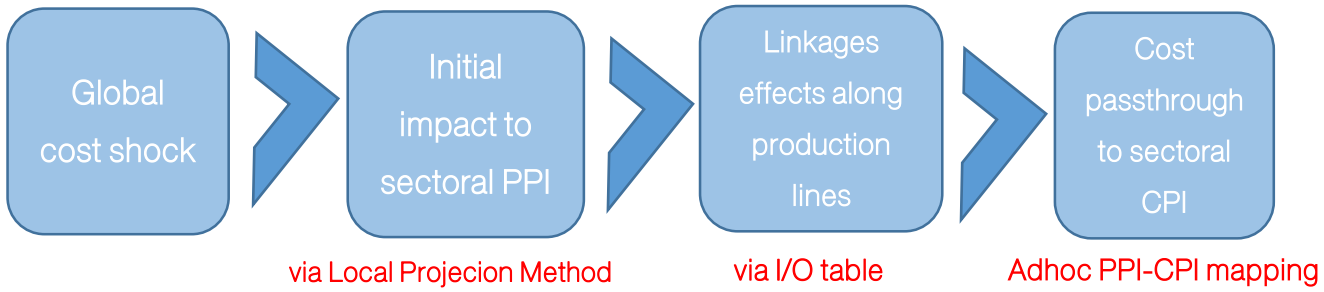
II. Cost shocks on initial sectors spin off their direct and indirect effects to other sectors

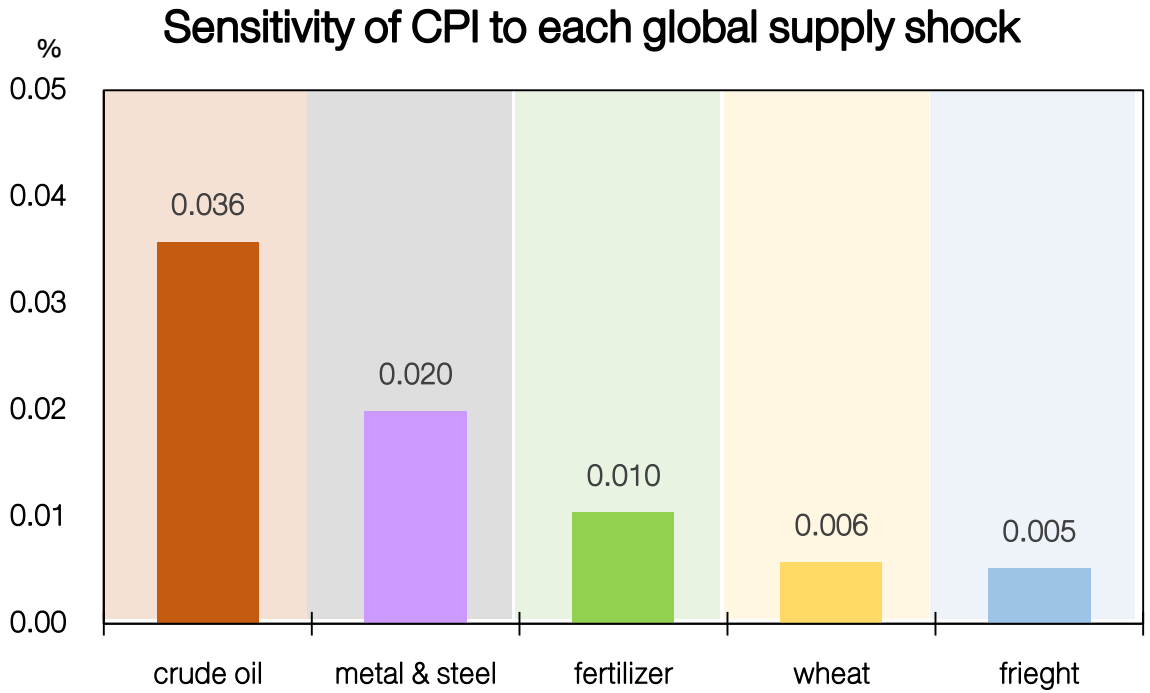
Global oil, metal , fertilizer, wheat, and freight prices shocks have direct effects in five key sectors which have strong linkages to others.



Source: Thailand's Input-Output Table 2015, Authors' calculation

Note: Total Linkage represents the value of each element in Leontief Inverse Matrix



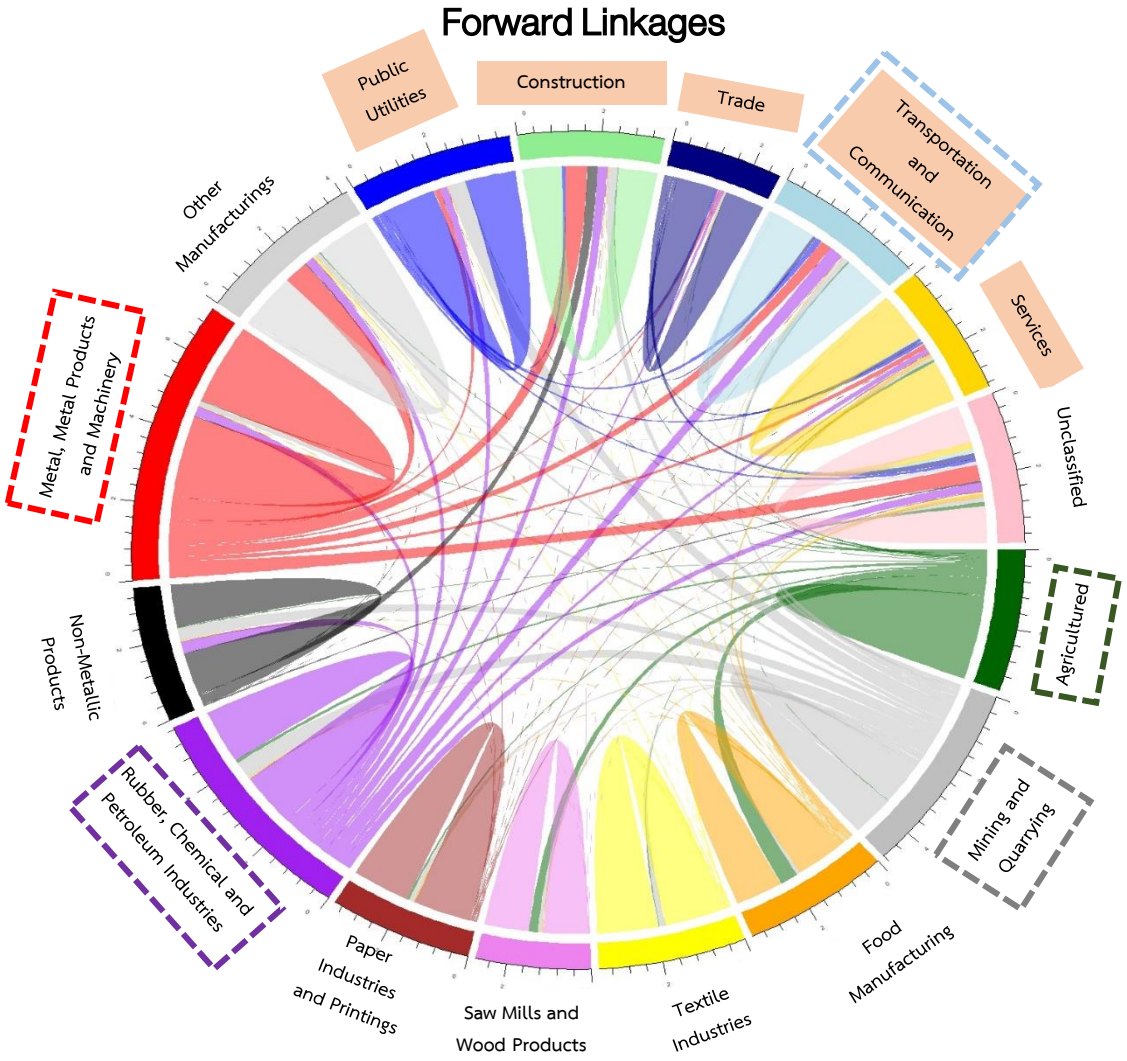


Source: Authors' calculation

Note: Size of the CPI passthrough depends on production cost structure and sectoral linkages based on Thailand's Input-Output Table 2015

III. Cost passthrough to consumer prices: when, and by how much?

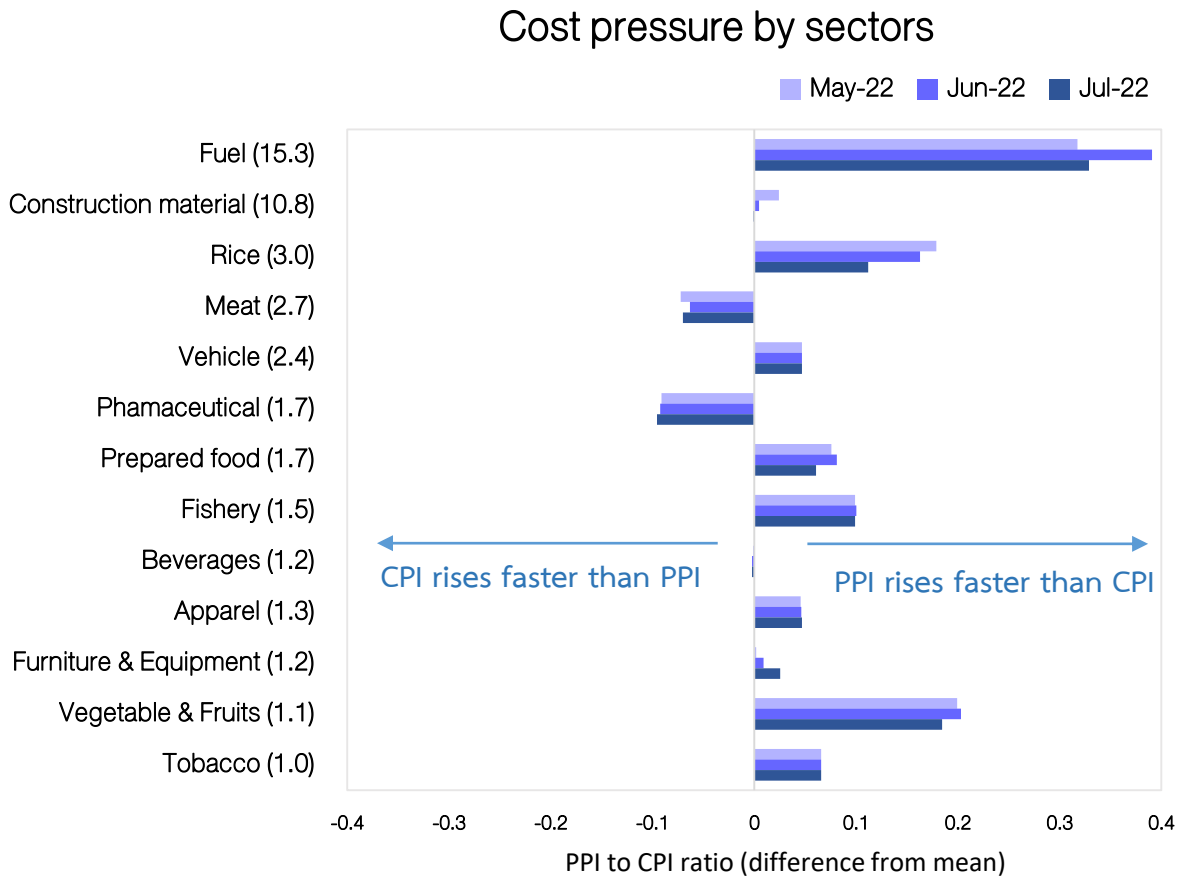
Businesses in service, trade, and construction sectors are particularly hard hit because they rely heavily on inputs from the key sectors



Source: Thailand's Input-Output Table 2015, Authors' calculation

Note: Forward linkage value is calculated by the horizontal sum within Leontief Inverse Matrix

The recent PPI-CPI ratio indicates rising cost pressure in some highly forward-linkage sectors



Note: (x) forward-linkage value

high value => strong fwd-linkage sector

Source: Authors' calculation, Thailand's Input-Output Table 2015

Factors affecting the entrepreneur's decision to adjust price

Pricing power

custormer's purchasing power: entrepreneurs tend to raise their prices during a recovery.

Degree of competition in industries: Entrepreneur are reluctant to be the first-mover to raise prices in highly competitive industries.

Ability to adjust their prices: Government's price control policy / prices of goods move according to the global market prices

The needs for price adjustments

Are the costs of production continue to rise? or Are the affected cost has large share in cost structure ?

Profit and Loss reflect firm's ability to absorb increasing cost.

The ability of businesses to adjust to rising costs

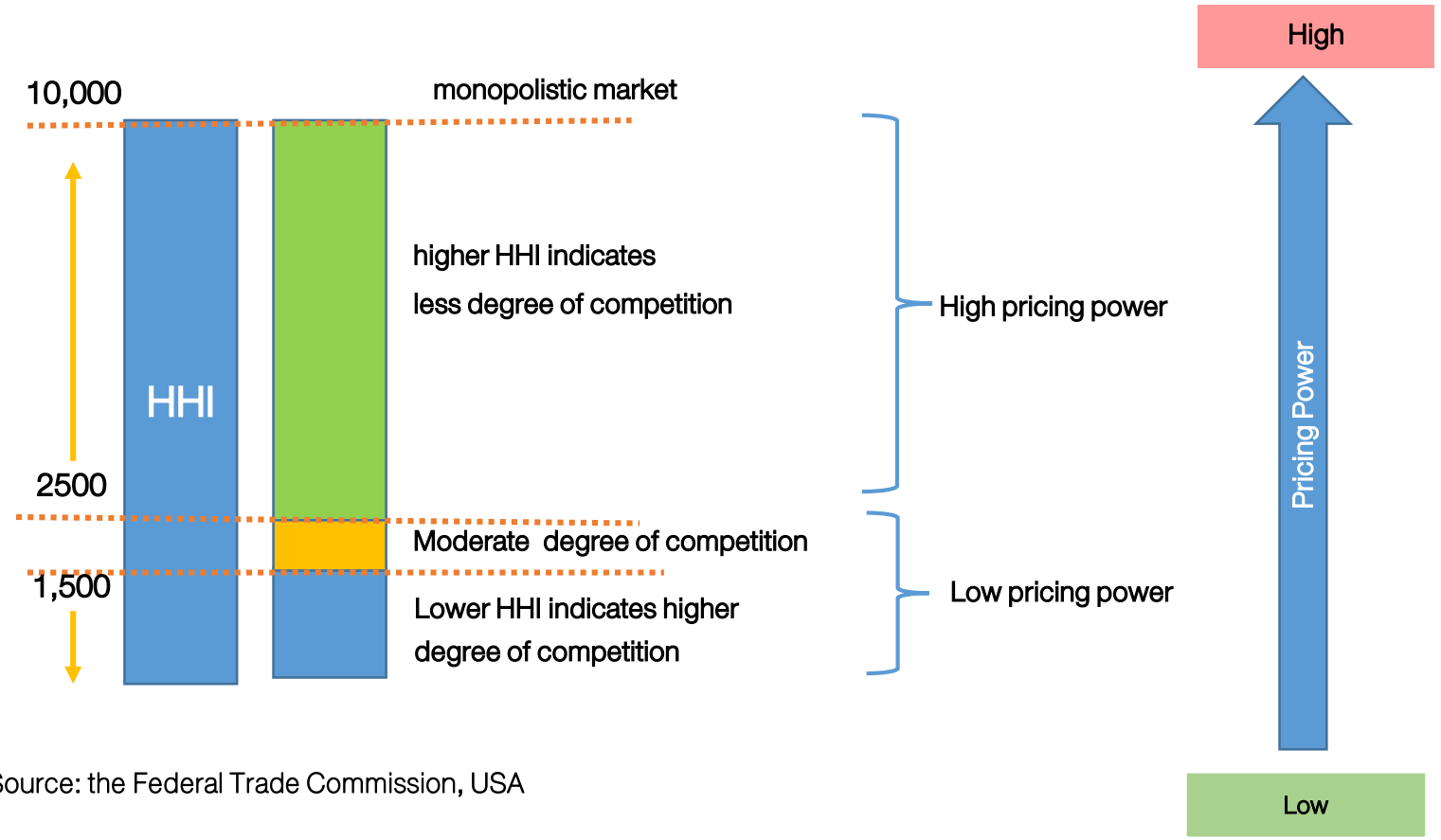
Source: survey on price setting behaviour of entrepreneur in 2018 by the Bank of Thailand

Degree of Market Competition

Herfindhal-Hirschman Index (HHI) is a common measure of market concentration of an industry

$$HHI = S^2_1 + S^2_2 + S^2_3 + S^2_4 + \ldots + S^2_n$$

S = market share of each firm in the industry



Source: the Federal Trade Commission, USA

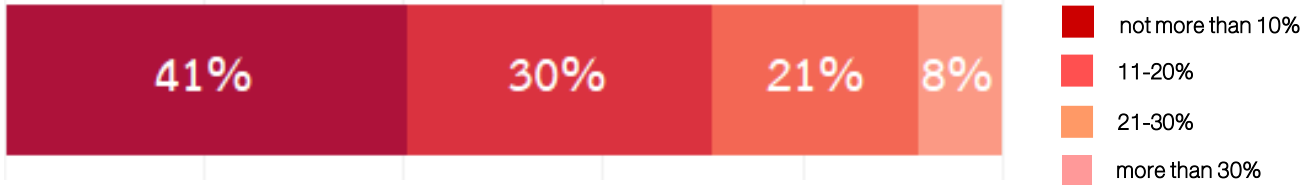
Degree of Market Competition

Sector	HHI
Passenger transport	5045
Hotel	4138
Petroleum	2971
IC and Semiconductor	2888
Food and Beverages	2859
Rubber and Plastic	2066
Construction materials	2037
Petrochemical	1713
Construction	1547
Transportation	1415
Trade	1348
Steel and Metal fabrication	1084
Textile and Apparel	912
Real estate	540
Restaurant	152

Source: SETSMART, compiled and calculated by authors

Price Setting Power

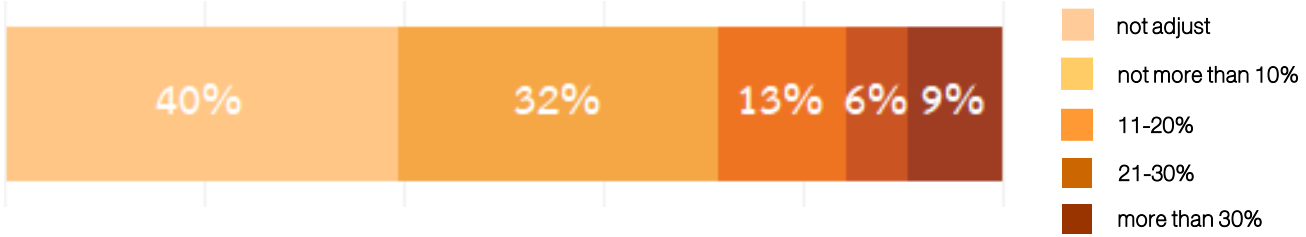
How much additional costs can the company bear before raising prices?



Almost half of the rising-cost entrepreneurs **will raise prices if costs rise no further than 10%.**

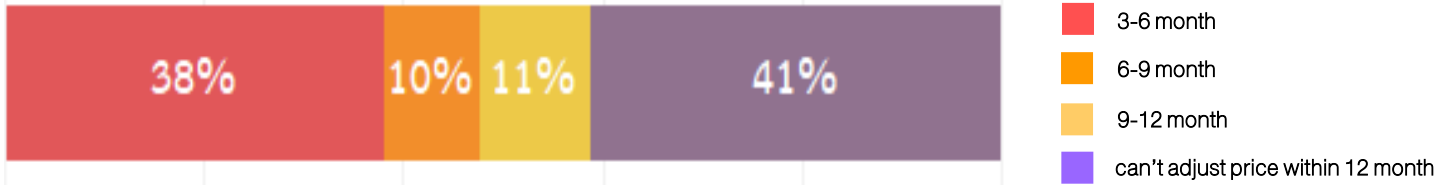
Most of them are in trading, construction, and real estate sectors.

How much will the price increase within the next 3 months (% of rising cost)?



In the next three months, 60% of enterpreneurs will raise prices no less than 10%.

In case no price increase within 3 months,
how long will the company bear further rising cost?



Most manufacturing businesses could bear further cost increases by **less than 3-6 months.**

Service businesses are unlikely to raise prices **within a year,** so they consider other strategies e.g. cutting promotion & cost

Source: The Bank of Thailand's business survey of 327 large companies and SMEs (April 2022)

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One of the reasons why operators must adjust prices is the direct cost structure involved in the production of goods and services.

Sector	Percent of Direct Cost to each Global Commodity Shock				
	Crude Oil	Metal & Steels	Fertilizer	Wheat	Freight
Construction	0	15.3	0	0.2	12.8
Construction materials	4.5	4.7	0	0	5.5
Food and beverage	0	0	0	20.9	11.1
Hotel	0	0	0	0.2	0.7
IC and Semiconductor	0	3	0	0	1.1
Passenger transport	0	0	0	0	10.5
Petrochemical	2.2	0	10.3	1.1	7.6
Petroleum	74.4	0	0	0	1.2
Real estate	0	0	0	0	0.5
Restaurant	0	0	0	0.2	0.7
Rubber and Plastic	0	0.3	0	0	4
Steel and Metal fabrication	0.1	92	0	0	2.3
Textile and Apparel	0	0	0	0	1.9
Trade	0	0	0	0	1.1
Transportation	0	0	0	0	10.5

Source: Thailand's Input-Output Table 2015, Authors' calculation

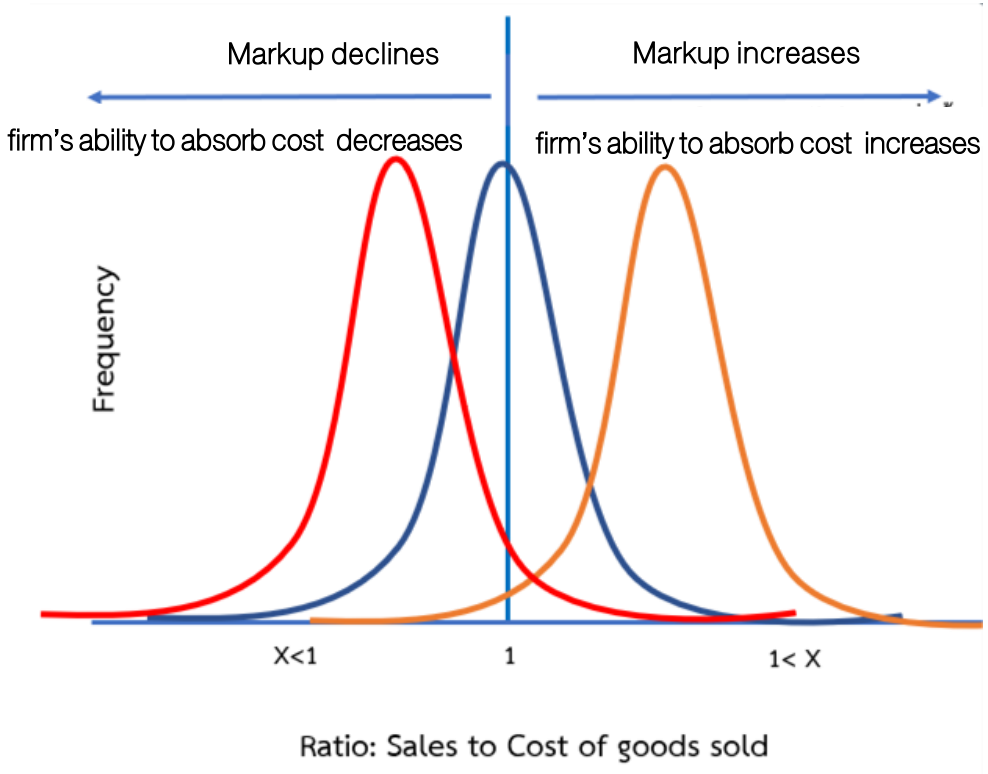
The needs to raise the prices to maintain a profit margin

Distribution of markups of listed companies in SET are used to mesure impacts from shock on firms financial position

markup = sales / cost of goods sold)

(1) Is markup declining continuously over the last 4 quarters?

- **Mode moves to the left :** most businesses in the sector have reduced profit
- **Mode moves to the right:** most businesses in the sector have reduced profit

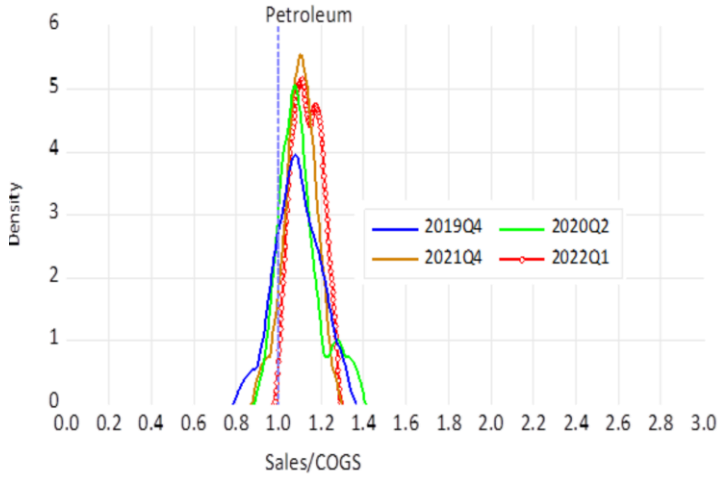


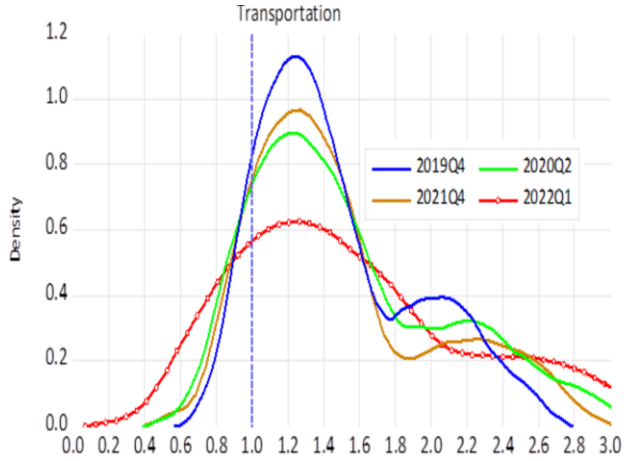
(2) Number of firm in ithe sector that experience losses in the last one year

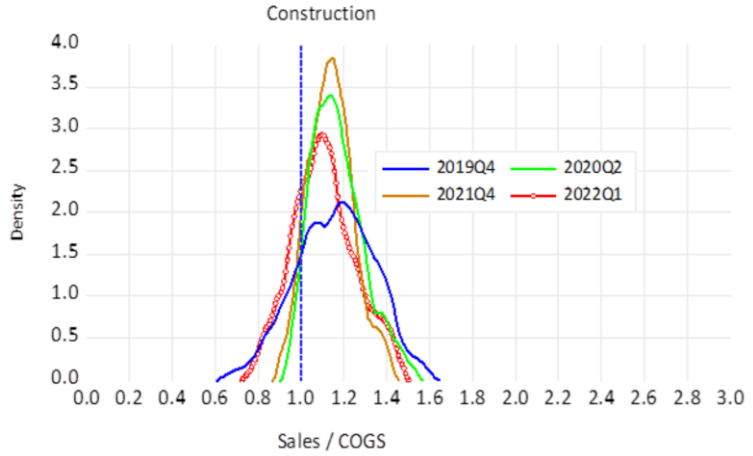
- **Left area:** firms absorbed some of the cost changes and still have not passed on higher costs to their customers
- **Right area business:** firms passed on higher costs to customers / are able reduce their production costs

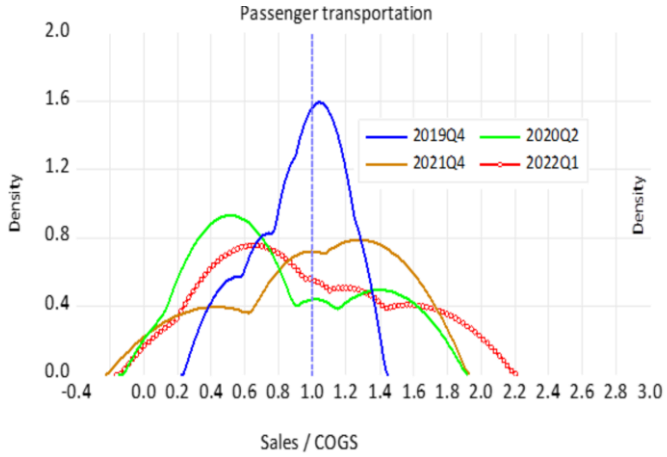
Group of firms that needs to pass on higher costs to customers

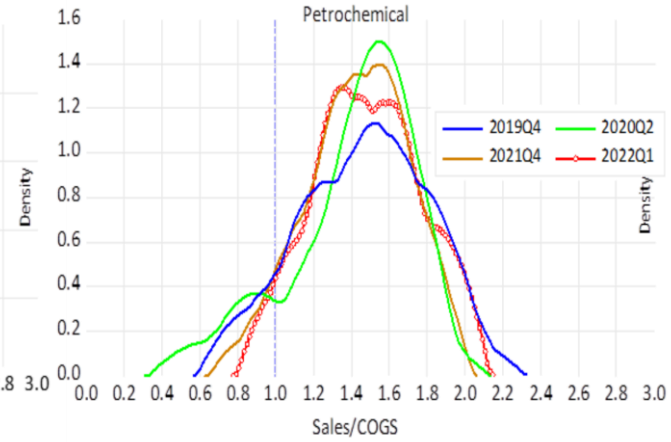
Speed of cost passthrough to CPI depends on how firms could squeeze their profit margin to the threshold

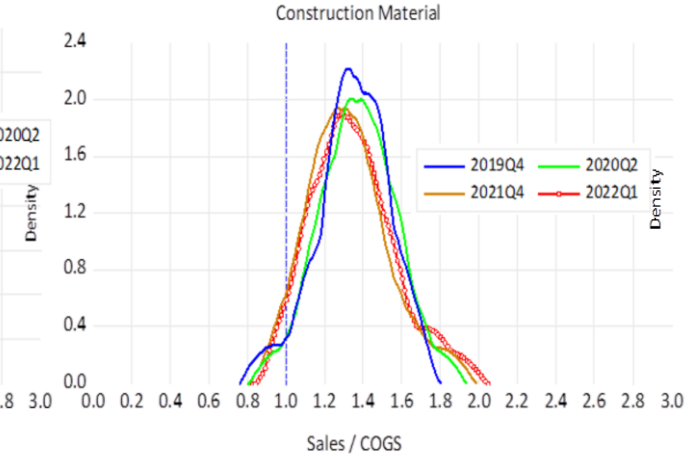


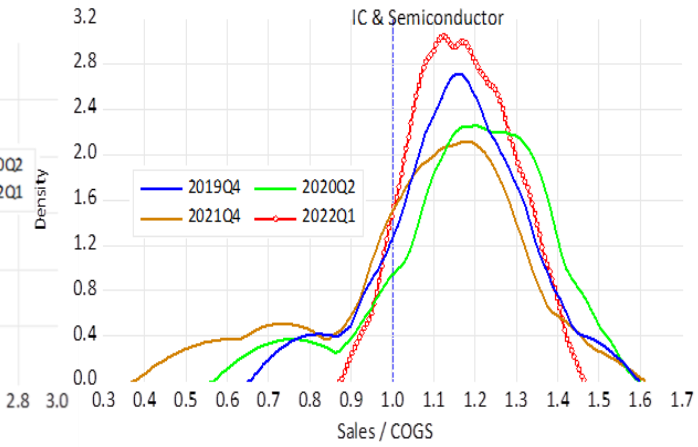








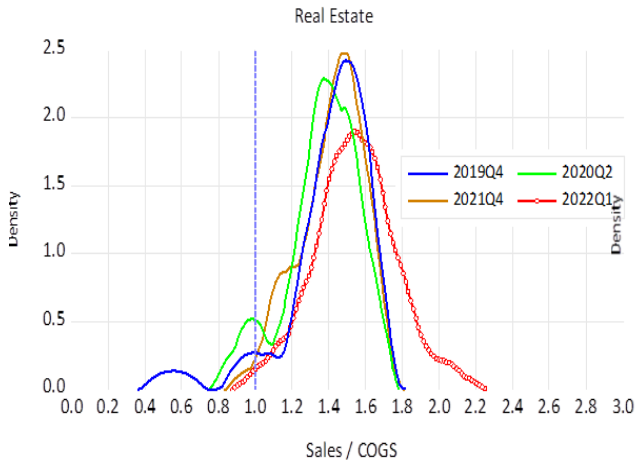


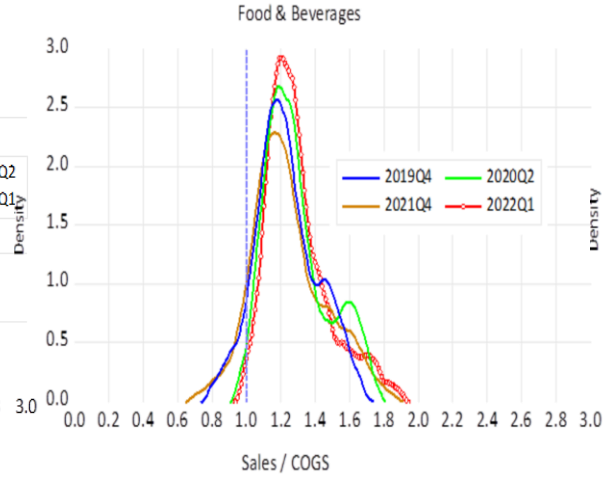


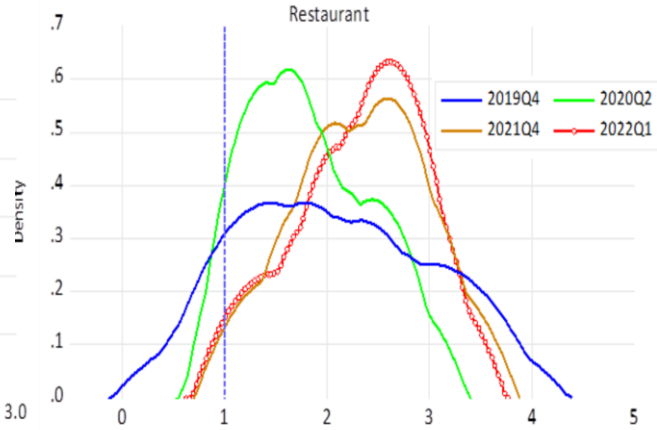
Source: SETSMART, compiled and calculated by authors

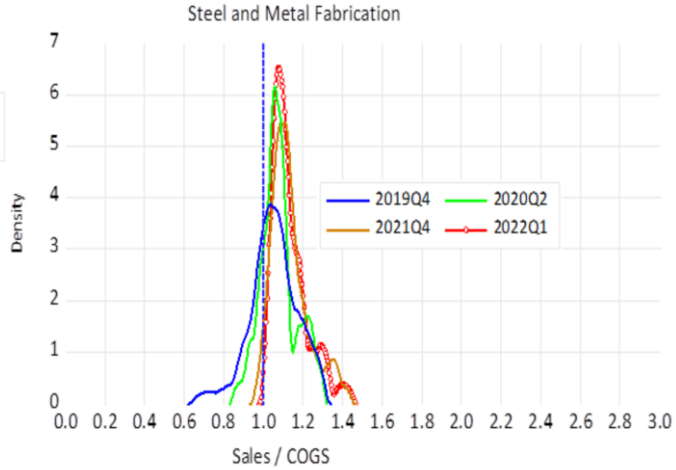
Group of business that still have ability to absorb higher cost or have reduced cost during the past 1-2 years.

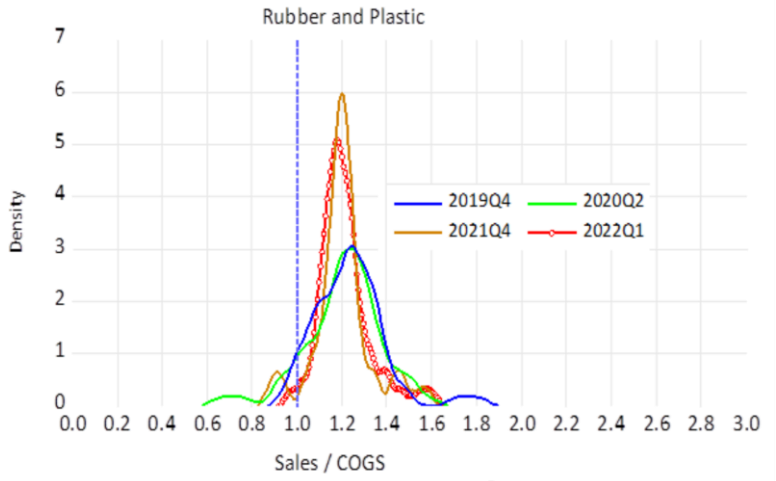
Speed of cost passthrough to CPI depends on how firms could squeeze their profit margin to the threshold

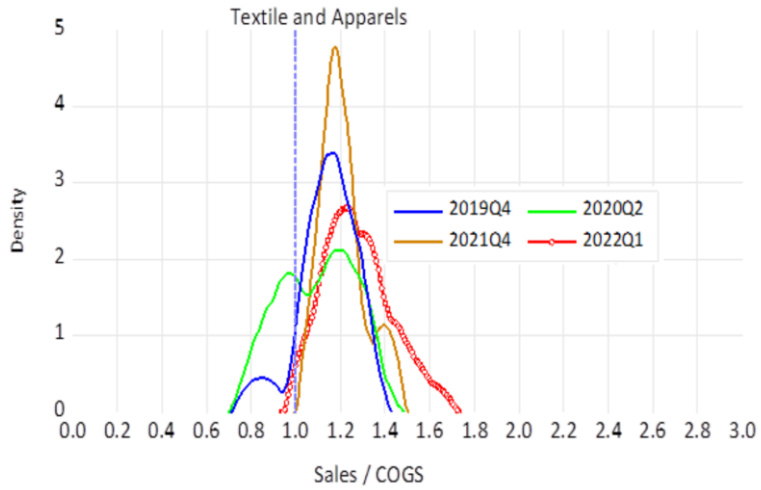


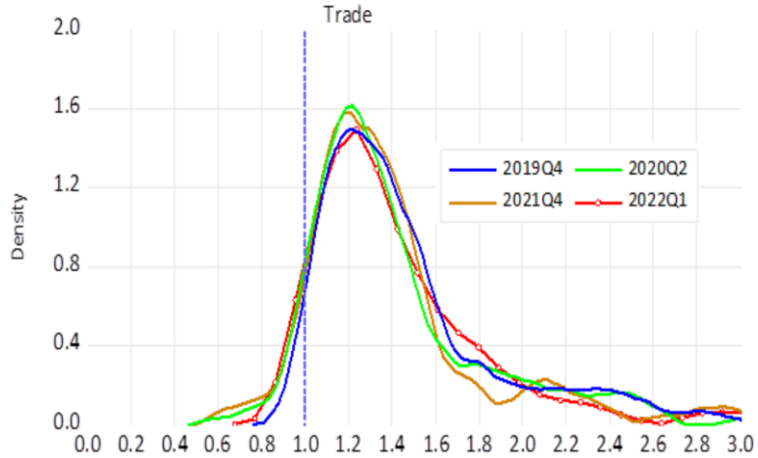












Source: SETSMART, compiled and calculated by authors

Scoring: decision of thai entrepreneur on price adjustment

	ability to adjust price	the needs to adjust price						Total score for entrepreneur's decision on price adjustment
	HHI	% firms have markup less than 1	# number of quarter that markup has decreased since 2021	proportion of costs affected by shock				
				Case 1 (oil)	Case 2 (metal)	Case 3 (fertilizer)	Case 4 (wheat)	Case 5 (freight)
Construction	1	1	3	0	2	0	1	2	9
Construction materials	2	0	2	1	1	0	0	1	5
Food and beverage	2	1	3	0	0	0	2	2	8
Hotel	2	3	2	0	0	0	1	1	7
IC and Semiconductor	2	1	3	0	1	0	0	1	6
Passenger transport	2	4	4	0	0	0	0	2	10
Petrochemical	1	1	3	1	0	2	1	1	9
Petroleum	2	2	3	3	0	0	0	1	9
Real estate	0	1	2	0	0	0	0	1	4
Restaurant	0	0	1	0	0	0	1	1	3
Rubber and Plastic	1	1	4	0	1	0	0	1	7
Steel and Metal fabrication	0	0	3	1	3	0	0	1	8
Textile and Apparel	0	0	2	0	0	0	0	1	3
Trade	0	1	1	0	0	0	0	1	3
Transportation	0	1	2	0	0	0	0	2	5
Scoring	score range 0-2	score range 0-5	score range 0-5	score range 0-3					
	1-1500 =0	0% = 0	1 quarter = 1	0% = 0					
	1500-2500 = 1	1-20% =1	2 quarters = 2	1-10% =1					
	2501-10000 = 2	21-40% =2	3 quarters = 3	11-50% = 2					
		41-60% =3	4 quarters = 4	50% up = 3					
		61-80% =4	5 quarters = 5						
		81-100% =5							

Source: SETSMART, compiled and calculated by authors

Going forward, many entrepreneurs tend to raise the prices of goods and services

Tendency of price adjustment of Thai entrepreneur going forward

Ability to adjust prices	the needs to raise price: Lowest	Low	Medium	Medium-high	High
High			(1) Construction materials (2) IC and Semiconductor	(1) Food and beverage (2) Hotel (3) Petroleum (4) Petrochemical (5) Rubber and Plastic	(1) Passenger transport
Medium					(1) Construction (2) Steel and Metal fabrication
Low	(1) Restaurant	(1) Textile and Apparel (2) Trade	(1) Real estate	(1) Transportation	

Low possibility to pass on costs

Medium possibility to pass on costs

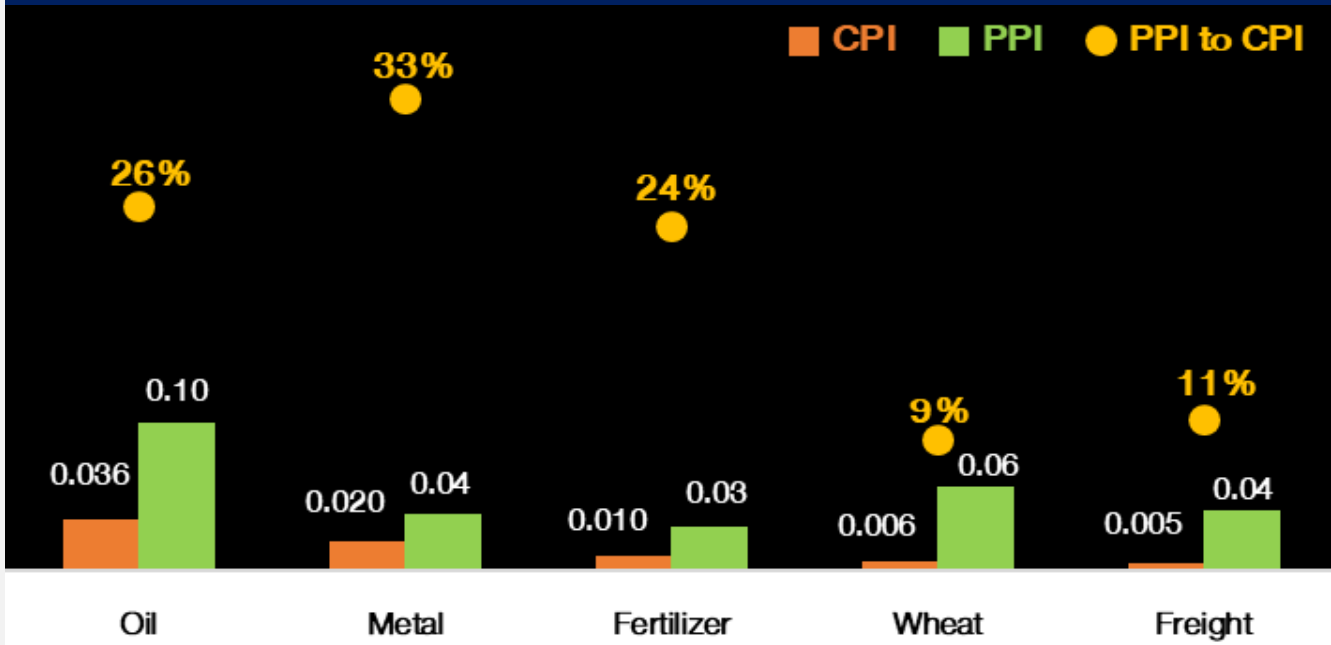
High possibility to pass on costs

ที่มา: SETSmart, Business Sentiment Index survey during the period of COVID as of 19 ถ April 2022, calculated by authors

Global cost shock pass-through to domestic prices in Thailand: sectoral perspectives

- **The role of sectoral linkages & dynamic cost passthrough**
- **More pronounced passthrough effects**
  with VA linkages and a series of global supply shocks
- **PPI passthrough (mostly high fwd-linkage sectors)**
  transport & comm, services, construction, trade , public utilities
- **CPI passthrough (yet to come)**
  - passenger transport, hotel, construction
  - F&B, petroleum & petrochemical, rubber & plastic, steel & metal fabricaion

Global cost shocks pass through domestic prices in Thailand



*1yr-cumulative effects after +1% shocks


Q&A