

Special Feature A

Invoicing Currency in Singapore's Merchandise Imports

In contrast with the standard assumption that goods exports are always priced in the home currency of the producing firm, empirical research has shown that they are often priced in the destination country's currency or a third country's currency instead. Based on a large, transaction-level dataset of invoices for imports into Singapore, this Special Feature presents five stylised facts on the currency pricing strategies adopted by exporters of goods to Singapore. First, on a value basis, nearly two-thirds of Singapore's goods imports are invoiced in a vehicle currency, with the US\$ being the dominant choice. Second, based on a frequency count of transactions, currency choice is evenly distributed between the three pricing schemes. Third, US\$-vehicle pricing is more prevalent among certain types of goods such as primary commodities and electronics. Fourth, a sizeable share of imported consumer goods by value is denominated in local currency. Fifth, producer currency pricing appears to be less prevalent among exporters in Asia ex-Japan. Overall, the choice of currency invoicing strategy is largely driven by the product type of the imported good and region of origin.

1 Introduction

The standard assumption in international macroeconomics is that producers price or invoice their goods for export in terms of the home country's currency, termed Producer Currency Pricing (PCP). The literature has also long recognised that firms may price their exports in the currency of destination countries instead, i.e., adopt Local Currency Pricing (LCP). However, more recent empirical research has emphasised that firms in many countries invoice their exports in terms of a third country's currency, thereby eschewing the currencies of the countries directly involved in the bilateral trade. This has been characterised as Vehicle Currency Pricing (VCP). Notably, the key empirical finding that the US\$ is the dominant vehicle currency for international trade globally, accounting for nearly 40% of global goods exports, has led some to describe this as a Dominant Currency Pricing paradigm (Gopinath *et al.* 2020; Boz *et al.* 2020).

The currency pricing strategy of an exporting firm may significantly affect the extent and speed of exchange rate pass-through to import prices. A firm's decision to choose PCP, LCP or VCP¹ may thus matter for the short-run impact of the exchange rate on inflation and the trade balance. This Special Feature seeks to establish a set of stylised facts on the pricing practices of exporters to Singapore using a database of importers' invoices. The invoices cover 12.9 million product-level transactions in 2019, amounting to a total import value of S\$296.7 billion, or around 60% of the value of Singapore's merchandise imports.

¹ That exporters (sellers) rather than importers (buyers) choose the invoicing (pricing) currency is a key assumption, although there is empirical support for this (Amiti, Itskhoki and Konings, 2020).

The rest of the Feature is organised as follows. The next section briefly surveys the literature on currency invoicing and summarises the implications of PCP, LCP and VCP for exchange rate transmission to import prices. Thereafter, key findings on the currency pricing regimes for Singapore's imports are presented, followed by international comparisons and a simple regression analysis to better understand the drivers of the pricing scheme chosen. The paper concludes with some areas for further research, notably Singapore's exporters' currency pricing practices.

2 Why Currency Pricing Choices Matter

Motivations for Currency Pricing Strategies

The canonical open economy models in Obstfeld and Rogoff (1995) assume that producers adopt their home currencies when setting prices in either domestic or international markets. A key implication of PCP is that exchange rate pass-through to import prices is immediate and complete. For instance, assuming that goods imported from Australia are invoiced in Australian dollars, a 1% appreciation of the S\$ against the Australian Dollar would lead to an immediate 1% decline in the S\$ cost of the goods.

However, Paul Krugman (1987) in a seminal work noted that even after adjusting for exchange rates, import prices of the same good could differ vastly across countries. The postulated explanation for this phenomenon is that profit-maximising firms operating in less than fully competitive conditions could choose to adopt LCP instead of PCP. Even after accounting for exchange rate fluctuations, exporters could optimally set different prices in segmented markets when market imperfections and trade frictions hinder the flow of goods between countries. Exporters might also prefer to keep their prices in overseas markets stable even at the expense of short-run fluctuations in markups (when exchange rates change) as this could better preserve market share. Betts and Devereux (2000) have found that LCP is more prevalent in the face of competitive pressures from domestic firms and for differentiated goods.²

In line with the empirical findings mentioned earlier, recent research has sought to better understand the reasons for implementing VCP. One strand of research shows that VCP is more likely to be used by exporters that are part of global value chains, with a high degree of dependence on imported intermediate inputs in production. The choice to adopt VCP is due in part to imported inputs themselves being invoiced in the vehicle currency, therefore automatically hedging exchange rate risk (Amiti, Itskhoki and Konings, 2020). In addition, adopting a common pricing currency for inputs and outputs could also minimise an exporter's price variation relative to its foreign competitors. This is akin to the strategic complementarities between exporters and local competitors under LCP, which Goldberg and Tille (2008) call a "coalescing effect". Finally, the status of the US\$ as the most common vehicle currency in both trade and international finance suggests that firms prefer to receive export revenues in that currency because financing is typically undertaken in the same currency. In turn, US\$ financing is often cheaper and more widely available than most other currencies (Gopinath and Stein, 2018).

² Knetter (1993) argued that "local currency price stability" could be an optimal pricing strategy if exporters face strong competition from local producers in the destination market (known as strategic complementarities).

Exchange Rate Transmission under Different Pricing Schemes

In the short run, the macroeconomic implications of LCP and VCP may differ from that of PCP. Specifically, assuming that exporters set prices *ex-ante* in the destination currency under LCP, an appreciation of the S\$ has no immediate effect on Singapore's import prices. Hence, there is no exchange rate pass-through, which obviates the expenditure-switching role of flexible exchange rates (Devereux and Engel, 2003). Critically, however, zero exchange rate pass-through only holds in the presence of nominal price rigidities when the exporting firm does not adjust its local currency prices immediately to take into account currency movements.

Under VCP, the short-run impact on import prices is similar to that under PCP. A S\$ appreciation *vis-à-vis* the vehicle currency will lower Singapore's import prices. This induces the same expenditure-switching and import compression effects as with PCP. However, bilateral exchange rate changes between the home currency of the exporting firm and the S\$ would not affect import prices.

Table 1 summarises the short-run macroeconomic effects of a S\$ appreciation under the three pricing paradigms on the assumption of homogenous firms and symmetry across import and export pricing schemes—that is, Singapore's exporters adopt the same pricing schemes as firms exporting to Singapore. This reinforces shifts in the external balance under PCP, but offsets external rebalancing under VCP.³

Table 1 Effects of a S\$ appreciation under symmetric pricing schemes

		PCP	LCP	VCP
Prices	Price of imports into Singapore (S\$ terms)	Decrease	No change	Decrease
	Price of exports from Singapore (foreign currency terms)	Increase	No change	No change
Output	Demand for imports into Singapore	Increase	No change	Increase
	Demand for Singapore's exports	Decrease	No change	No change
	Trade balance	Worsen	No change	Worsen, but less than under PCP

Note: The assumption of pricing symmetry does not always hold. For example, the US' exports are usually invoiced in PCP but imports to the US are in LCP (Gopinath and Rigobon, 2006).

The key underlying assumption driving the different consequences of exchange rate changes in the three pricing schemes is that firms do not change prices in the short run (i.e., nominal price rigidity). However, under LCP or VCP, firms may respond to changes in exchange rates by adjusting their prices, especially in subsequent periods. Such adjustments allow producers to unwind persistent changes to their profit margins caused by exchange rate movements. Moreover, in the longer term, firms could enter or exit the market in response to significant changes in profit margins. Thus, assuming free entry and sufficient competitive

³ If Singapore's exporters adopt VCP as well, the external rebalancing is smaller relative to the PCP case. A weaker S\$ does not affect the price of Singapore's exports as they are priced in the vehicle (foreign) currency. Hence, Singapore's exports do not increase with the S\$ depreciation even as imports fall.

pressures, changes in the S\$ should eventually pass through fully to prices, regardless of the choice of pricing currency.

3 An Overview of the Data

The data for this study is derived from goods import declarations made by traders and declaring agents in 2019. For each import declaration or invoice, there are multiple transactions, each tied to an invoicing currency, product type (denominated by an 8-digit HS code), country of origin⁴, and value in S\$ terms⁵. Invoices without a declared invoicing currency or other recording errors, as well as those for re-imports (products originating from Singapore) were discarded. The discarded data amounted to about 38% of the raw transactions. The final database comprises 12.9 million transactions, representing 2.9 million invoices from 43,181 firms, which imported from 233 origin countries across a total of 9,075 HS product types. The dataset broadly matches with the composition of overall merchandise imports by product type and region of origin, indicating that it can be taken as representative of goods imports into Singapore.

Despite the large number of origin countries, only 38 different currencies were found to be used for invoicing goods imports. In addition, importers in Singapore seem to fall into two distinct categories, simply termed as 'small' and 'big' following Corsetti *et al.* (2020). The 'small' category refers to firms that import goods from five countries or fewer. These firms make up 83.1% of all firms in the sample, but their share of total import value is only 12.7%, (the sum of the numbers in the bottom two rows of **Charts 1a and 1b**). In contrast, the 'big' category contains only 16.9% of sampled firms but accounted for 87.3% of total import value (the sum of the numbers in the top row of **Charts 1a and 1b**). Thus, 'big' firms imported goods both from a more diverse group of countries and of larger value.

Chart 1a Joint distribution of origin country and currency (by share of unique importers in %)

No. of origin countries	5+	1.0	12.2	3.7
	2-5	9.2	26.4	0.1
	1	42.0	5.5	0.0
		1	2-5	5+
		No. of invoicing currencies		

Source: EPG, MAS estimates

Note: Figures may not sum to 100% due to rounding.

Chart 1b Joint distribution of origin country and currency (by share of import value in %)

No. of origin countries	5+	6.3	36.4	44.6
	2-5	4.9	5.1	0.0
	1	1.7	0.8	0.0
		1	2-5	5+
		No. of invoicing currencies		

Source: EPG, MAS estimates

Note: Figures may not sum to 100% due to rounding.

⁴ Country of origin refers to the country that the good was produced in for tariff purposes i.e., it is determined by the contribution of processing to a good's value-added content and not where the good was last physically shipped to Singapore from, which is known as the port of loading.

⁵ This is on a cost including freight and insurance (CIF) basis, that is, the value of goods at the frontier of the exporting country plus the cost of insurance, freight and any other charges when sold for export to Singapore.

Table 2 presents the top ten invoicing currencies used for Singapore's imports by value and transaction count. By value of transactions, the US\$ dominates with a share of 72.9%. However, by count, the US\$ is used only in slightly more than one-third of transactions, implying that large-value transactions are a reason for its dominance in value terms. The share of S\$-invoicing in value terms is notable (12.5%) and rises significantly to nearly a third of all transactions on a count basis. The Euro, renminbi and yen are the other three major invoicing currencies, although they lag far behind the US\$ and S\$.

In comparing trade flows and currencies used, the disparity between the invoicing currency and country of origin is most stark for China and Malaysia. In the dataset, Singapore's largest import source is China (15.4%), while imports from Malaysia (10.7%) rank fourth. However, the use of renminbi (0.9%) or ringgit (0.5%) as the invoicing currency is considerably lower. Conversely, the overall share of Singapore's goods imports from all source countries that is invoiced in US\$ (72.9%) is 6.2 times the proportion of US imports (11.7%) (**Chart 2**).⁶

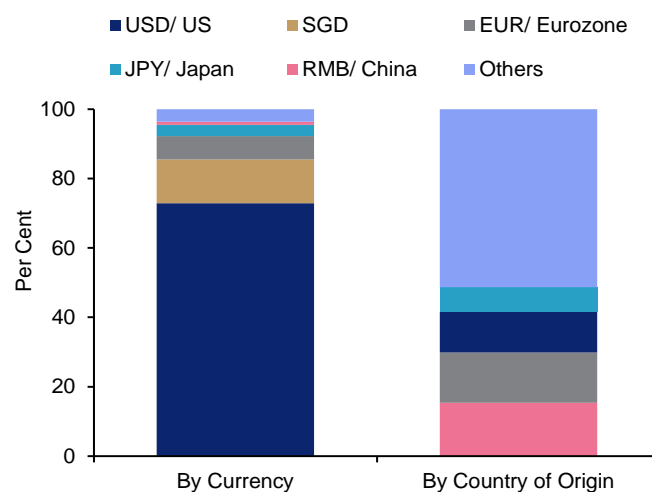
Table 2 Top ten invoicing currencies

	Share of Import Transactions by Value (%)	Share of Import Transactions by Count (%)
USD	72.9	36.4
SGD	12.5	32.3
EUR	6.8	11.3
JPY	3.2	4.8
RMB	0.9	6.0
CHF	0.8	0.5
GBP	0.8	3.5
MYR	0.5	1.8
AUD	0.5	1.7
HKD	0.3	0.3

Source: EPG, MAS estimates

Note: The ranking is done based on the shares by value and would be slightly different based on shares by count.

⁶ Using a comprehensive dataset that covers 75% of global exports, Boz *et al.* (2020) estimate that the US\$ dollar share as an invoicing currency is roughly four times the share of exports to the US, and 2.3 times when commodities are excluded.

Chart 2 Share of imports by currency and country of origin

Source: EPG, MAS estimates

Note: Eurozone only includes countries that use the Euro as their national currency. The remaining EU countries fall within "Others".

4 Stylised Facts on Pricing Strategies

This section documents five key stylised facts on the pricing strategies of exporters to Singapore, which are derived by matching the invoicing currency of goods imports to their country of origin.

Fact 1: On an import value basis, nearly two-thirds of Singapore's goods imports are invoiced in a vehicle currency, with the US\$ being the dominant choice. In line with the literature, 62.1% of Singapore's imports by value are invoiced using the US\$ as a vehicle currency (**Table 3**). The Euro, Japanese yen and Swiss franc also serve as vehicle currencies, but their shares of import transactions are far lower.⁷ As may be expected, the Euro and yen are primarily used to invoice imports originating from the Eurozone and Japan respectively, i.e., they are examples of PCP. However, PCP has a relatively low share of total import value overall, as in addition to VCP, LCP is also a non-negligible share of imports by value.

⁷ In the dataset, the Euro is used as a vehicle currency mainly for imports from Malaysia, China, US and South Korea, while the yen is a vehicle currency mostly for imports from China, Indonesia, Malaysia and Thailand.

Table 3 Share of imports by pricing scheme

	Share of Import Transactions by Value (%)	Share of Import Transactions by Count (%)
Producer Currency Pricing (PCP)	21.3	31.2
Local Currency Pricing (LCP)	12.5	32.3
Vehicle Currency Pricing (VCP)	66.1	36.5
VCP (USD)	62.1	28.9
VCP (EUR)	2.1	3.4
VCP (JPY)	0.5	0.9
VCP (CHF)	0.3	0.3
VCP (Others)	1.2	3.0

Source: EPG, MAS estimates

Fact 2: Based on a frequency count of transactions, VCP continues to have the largest share (36.5%) although the shares of PCP and LCP are only slightly lower at 31.2% and 32.3%, respectively. The large differences between the shares by value and by count reflect the fact that the average transaction amount under VCP (S\$41,759) is more than four times that of LCP (S\$8,949) and more than two times that of PCP (S\$15,709).

Fact 3: VCP is more prevalent among certain types of imports such as primary commodities and electronics. At the SITC 2-digit level, relatively homogenous imported products are almost entirely invoiced under VCP using the US\$. Such products include petroleum and natural gas, animal and vegetable oils and fats, base metals and non-monetary gold.⁸ Nevertheless, if these were omitted, the invoicing share of the US\$ is still a sizeable 68.6%, 5.1 times the proportion of non-commodity imports from the US (13.4%). **Table 4** further reveals that besides commodities (SITC 3 and 9), electrical machinery, office machines and telecommunications equipment (SITC 7) are also predominantly priced using VCP (in US\$). Singapore imports most of these goods from Taiwan, China, Malaysia, South Korea and Japan which, like Singapore, are key nodes in the global electronics supply chain. Nevertheless, even for the other SITC categories, VCP has the largest share of import transactions with the exception of Beverages & Tobacco (SITC 1).⁹

⁸ Since commodity prices are fully flexible and determined in global markets, commodity trade is not subject to the transmission mechanisms that arise under the different pricing schemes owing to price rigidities.

⁹ The differences in the currency pricing choice for homogeneous goods versus differentiated goods are also consistent with the literature. Goldberg and Tille (2005) show that, in industries producing goods with high price elasticities, such as homogeneous goods, producers aim to keep their prices in line with competitors and are more likely to display herding behaviour in their choice of currency.

Table 4 Import pricing schemes by SITC sections

SITC 1-digit Section	Share of Import Transactions by Value (%)	Share of Currency Invoicing Schemes by Value (%)		
		PCP	LCP	VCP
7 Machinery & Transport Equipment	53.9	21.9	9.6	68.5
8 Miscellaneous Manufactured Articles	11.5	24.0	34.5	41.4
5 Chemicals & Chemical Products	9.8	30.3	19.6	50.0
3 Mineral Fuels, Lubricants & Related Materials	8.8	2.9	0.9	96.2
6 Manufactured Goods	5.9	17.3	10.7	72.0
9 Commodities and Transactions Not Classified Elsewhere	5.5	12.7	2.1	85.3
0 Food & Live Animals	2.4	37.1	15.4	47.5
1 Beverages & Tobacco	1.4	47.5	11.9	40.6
2 Crude Materials (Excl. Fuels)	0.6	29.5	23.9	46.6
4 Animal & Vegetable Oils, Fats & Waxes	0.3	26.1	1.1	72.8

Source: EPG, MAS estimates

Fact 4: Categorising Singapore's imports by their end use or Broad Economic Categories (BEC) shows that a sizeable share of consumption goods (including food) by value is invoiced using PCP or LCP (**Table 5**). This could be due to the fact that firms exporting consumption goods may prefer either stable markups (PCP) or stable prices for importers (LCP). VCP is dominant for imported capital and intermediate goods, which are mostly machinery and transport equipment and likely to involve firms plugged into global value chains as noted above, as well as being large value transactions. In contrast, the import value of consumption goods is relatively small, although the number of transactions is large.

Table 5 Import pricing schemes by BEC classification

BEC Categories	Share of Import Transactions by Value (%)	Share of Currency Invoicing Schemes by Value (%)		
		PCP	LCP	VCP
Capital	14.5	26.6	9.8	63.6
Intermediate	46.4	24.4	9.5	66.1
Consumption	14.4	29.0	33.7	37.3
Multiple	18.4	3.9	1.3	94.9
Unclassified	6.3	19.9	25.8	54.3

Source: EPG, MAS estimates

Note: HS codes that can be mapped to more than one BEC categories are classified as "Multiple".

Fact 5: PCP appears to be less prevalent among exporters from Asia ex-Japan. Firms from China, Malaysia, Taiwan, Indonesia and South Korea overwhelmingly adopt VCP when exporting to Singapore (**Table 6**). In comparison, VCP is not as dominant among exporters from the UK, Japan, Eurozone and Switzerland. Exporters in Europe (i.e., the Eurozone, Switzerland and the UK) appear to have a notable preference for LCP. These countries tend to mainly export consumer goods such as vehicles, watches, jewellery and handbags to Singapore. Meanwhile, the usage of PCP among exporters from Asia ex-Japan is very low. While this may reflect the composition of goods exported to Singapore, such as electronics and commodities, that are mostly invoiced in a vehicle currency, it is also possible that

exporters in these countries prefer receiving revenues in a liquid currency like the S\$ compared to their home currencies.

Table 6 Import pricing schemes for top 10 exporting countries/regions

Country/Region	Share of Import Transactions by Value (%)	Share of Currency Invoicing Schemes by Value (%)		
		PCP	LCP	VCP
China	15.4	5.7	8.8	85.5
Eurozone	14.5	32.2	29.6	38.1
US	11.7	91.6	4.6	3.8
Malaysia	10.7	3.9	7.5	88.7
Taiwan	7.5	0.5	1.1	98.4
Japan	7.1	39.0	7.8	53.2
Indonesia	5.1	2.4	9.5	88.2
South Korea	3.8	0.8	3.9	95.2
Switzerland	3.3	16.9	56.0	27.1
United Kingdom	2.8	18.1	19.9	62.0

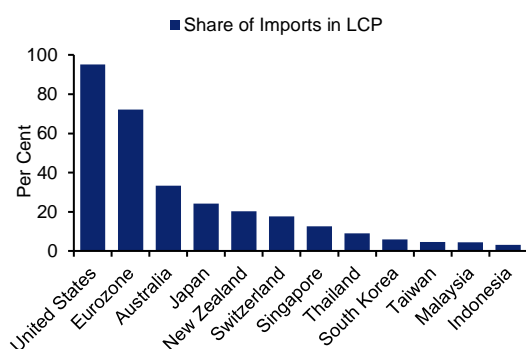
Source: EPG, MAS estimates

Note: Eurozone only includes countries that use the Euro as their national currency.

5 Discussion and Regression Analysis

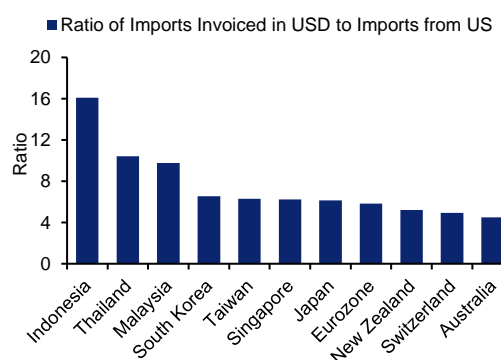
The key findings above are broadly consistent with expectations given the structure of the Singapore economy. Drawing from results in the literature, two points are apparent when the share of LCP invoicing and the prevalence of US\$-VCP pricing of Singapore's imports is compared with that of other economies. First, a larger share of Singapore's imports is invoiced using LCP compared to other ASEAN economies. Singapore's share of LCP imports is closer to that of other small open advanced economies such as Switzerland and New Zealand (**Chart 3**). Second, the share of VCP invoicing using the US\$ is smaller compared to most ASEAN imports, but is comparable to that of Taiwan and South Korea, which are important electronics producers (**Chart 4**).

Chart 3 Cross-country comparison of LCP share in imports invoicing



Source: Boz *et al.* (2020), UN Comtrade and EPG, MAS estimates

Chart 4 Cross-country comparison of US\$ share in imports invoicing



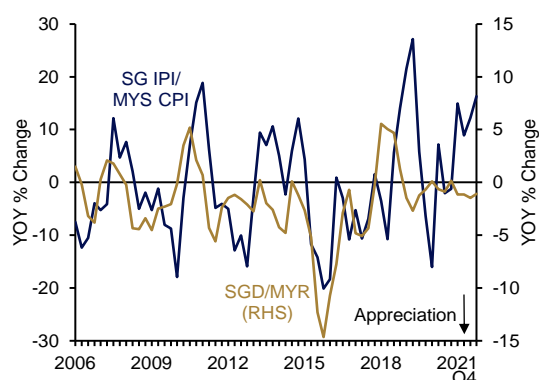
Source: Boz *et al.* (2020), UN Comtrade and EPG, MAS estimates

The fairly sizeable share of LCP in Singapore's imports, especially for consumption goods, implies that the exchange rate pass-through to prices may occur with longer lags compared to that under standard PCP pricing (**Table 1**). However, there is also evidence to suggest that for some consumer goods imports under LCP, such as food, import prices can change relatively quickly in response to variations in foreign exporters' markups. As noted above, under LCP, exporters' markups in their home currencies will fluctuate with movements in the exchange rate (and the production cost of goods). Exporters can therefore adjust their prices in S\$ to stabilise profit margins.

Indeed, changes in the S\$-Ringgit bilateral exchange rate for example appear to be correlated with movements in the local price of eggs after controlling for their cost in ringgit terms. This implies that Malaysian egg exporters respond to exchange rate changes by resetting S\$ prices regularly (**Chart 5**).¹⁰ For imported food as a whole, changes in S\$ prices after taking into account global and regional food prices exhibit a clear negative relationship with the S\$NEER (**Chart 6**).¹¹ Hence, there is significant and rapid pass-through of exchange rate changes to import prices even under LCP.

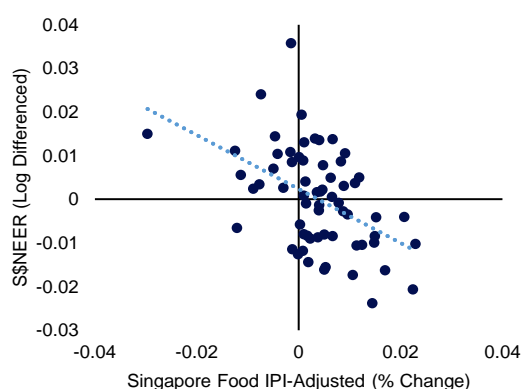
The frequent price changes in some of Singapore's imports suggest that some exporters to Singapore are not necessarily choosing LCP because of strategic complementarities. They may simply prefer to receive revenue in S\$ terms, given the liquidity of the currency relative to their own.

Chart 5 S\$/Ringgit exchange rate and Singapore's IPI for eggs (scaled by Malaysia's CPI for eggs)



Source: DOS, Haver Analytics and EPG, MAS estimates

Chart 6 Change in S\$NEER against change in Singapore food prices (IPI-adjusted)



Source: EPG, MAS estimates

Note: Singapore's food prices (IPI-adjusted) is the residual of the regression of Singapore's IPI for food & live animals against global and regional food price indicators. Holding these prices constant, a 1% increase in S\$NEER implies that import prices of food & live animals in S\$ decline by 0.6% in the short term.

To better understand the "underlying drivers" of currency pricing schemes, a multinomial logistic regression (MNL) was estimated using the following explanatory variables: (i) region of origin; (ii) exporter's industry (proxied by SITC 1-digit product category); and (iii) type of

¹⁰ Singapore imports most of its eggs from Malaysia, which are mainly invoiced under LCP or VCP.

¹¹ While a slight majority of non-cooked food imports are invoiced under VCP and PCP, there is a sizeable share of imports priced in LCP, as shown in Table 4.

importer ('big' or 'small'). This type of regression is used for dependent variables that have categorical outcomes (in this case, whether an import transaction uses PCP, LCP or VCP). It therefore captures the drivers of currency choice based on the count of transactions, rather than by value. The coefficients of the independent variables represent their respective impact in terms of raising (or lowering) the probability that another pricing scheme will be chosen, relative to the base.¹²

All three explanatory variables are statistically significant in determining currency invoicing choice. However, based on likelihood-ratio tests, the region of origin and industry (product type) have much greater explanatory power for the pricing strategy chosen than the type of importing firm in Singapore. The relative weakness of this last variable is congruent with theoretical and empirical evidence that exporting firms, rather than importers, mostly determine the pricing currency.

Table 7 reports the predicted probability of each pricing outcome for imports from different regions, industries and type of importing firm. Holding other things constant, goods originating from the Americas or Europe are associated with a noticeably higher probability that PCP is adopted (relative to the roughly equal split by count in **Table 3**). Asian exporters are the most likely to choose VCP, although those from Northeast Asia still use PCP to a large extent (37.9%), mainly reflecting Japanese firms. In contrast, firms from the rest of Asia have a strong preference for LCP-pricing in S\$ (39.7%) and a much lower probability of using their home currencies (9.4%). This preference remains even after controlling for industry and could be due to the liquidity of the US\$ and S\$ relative to their home currencies. This may also explain why African exporters are very unlikely to price in their home currencies. However, exporters in Oceania (mostly Australia) are most likely to price in S\$ (84.1%), which could be attributed to price competition or strategic complementarity concerns rather than the volatility of their home currencies.

¹² The MNL model is estimated using PCP as the base outcome. As region, industry and type of importer are categorical variables, they are also compared to a base outcome. The base for region is "Americas" while for industry, it is SITC 5 and for type of importer it is 'small'.

Table 7 Predicted outcome probabilities from MNL regression

	Predicted Outcome Probabilities (%)		
	PCP	LCP	VCP
Region			
Northeast Asia (NEA)	37.9	10.8	51.3
Asia ex-NEA	9.4	39.7	51.0
Americas	74.1	12.6	13.3
Europe	44.1	31.5	24.4
Oceania	8.3	84.1	7.6
Africa	1.4	55.3	43.3
Industry (SITC 1-digit)			
7 Machinery & Transport Equipment	23.5	28.6	47.9
8 Miscellaneous Manufactured Articles	24.9	37.3	37.8
5 Chemicals & Chemical Products	24.6	33.0	42.4
3 Mineral Fuels, Lubricants & Related Materials	25.7	26.7	47.6
6 Manufactured Goods	31.2	30.5	38.3
9 Commodities and Transactions Not Classified Elsewhere	42.7	21.5	35.7
0 Food & Live Animals	55.5	34.0	10.4
1 Beverages & Tobacco	49.2	18.2	32.6
2 Crude Materials (Excl. Fuels)	58.6	32.9	8.5
4 Animal & Vegetable Oils, Fats & Waxes	49.7	23.6	26.7
Importer Type			
Small importer	38.1	43.9	18.0
Big importer	29.8	28.6	41.6

Note: These figures are the estimated predicted probabilities for the different explanatory variables generated from the underlying multinomial logistic regression. Each column shows the predicted probability of a particular currency invoicing outcome if the explanatory variable takes on that categorical value. For instance, the probability that imports from NEA are invoiced in PCP is 37.9%.

All estimated coefficients are significant at the 1% level.

Industries plugged into the global electronics value chain (SITC 7) and commodities (SITC 3) are most likely to price using VCP. However, for exporters of manufactured goods and articles (SITC 6 and 8), the likelihood of choosing any of the three pricing schemes is more even, suggesting a smaller degree of coalescing around the US\$ for products that include a significant share of consumer goods. Exports of food & live animals (SITC 0) are highly likely to be priced in S\$, partly reflecting stiffer price competition for consumer goods and the practice of pricing to market.

Finally, the probability of an import transaction being invoiced in PCP is slightly lower for 'big' importers (29.8%) compared to the overall sample and significantly lower compared to 'small' importers (38.1%). Devereux *et al.* (2017) find that large importers have higher price elasticity of demand and thus are more sensitive to import price fluctuations. Exporters selling to big importers (who also have many import sources) may therefore prefer to keep prices stable and thus choose to price in PCP less often.

6 Conclusion

In contrast to the standard assumption of producer currency pricing, this study finds that local pricing in S\$ and vehicle currency pricing in US\$ are important for Singapore's goods imports. The choice of pricing strategy is partly driven by the type of goods imported as well as the source region. While the data is confined to imports, the literature notes that there is usually a positive correlation between the currency in which a firm's intermediate imports are priced and its export currency choice. Given the dominance of the US\$ in VCP pricing for capital and intermediate goods imports, it is plausible that goods exporters in Singapore have a high cost exposure in US\$ terms and may therefore adopt this currency for export pricing. This will be the subject of a future study by EPG, MAS.

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