

Reusing CPI Price Data to Compile an Experimental Health Services PPI: Singapore's Experience

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OBJECTIVE

Constructing an Experimental Health SPPI Using Existing CPI Price Data for Deflation and Analyses of Healthcare Provider Price Trends

Why a Health SPPI?

CONSUMER PAYS

price after subsidies
(Health CPI)

What it measures
Changes in prices paid by consumers for healthcare services

More relevant for
measuring inflation experienced by households

PRODUCER RECEIVES

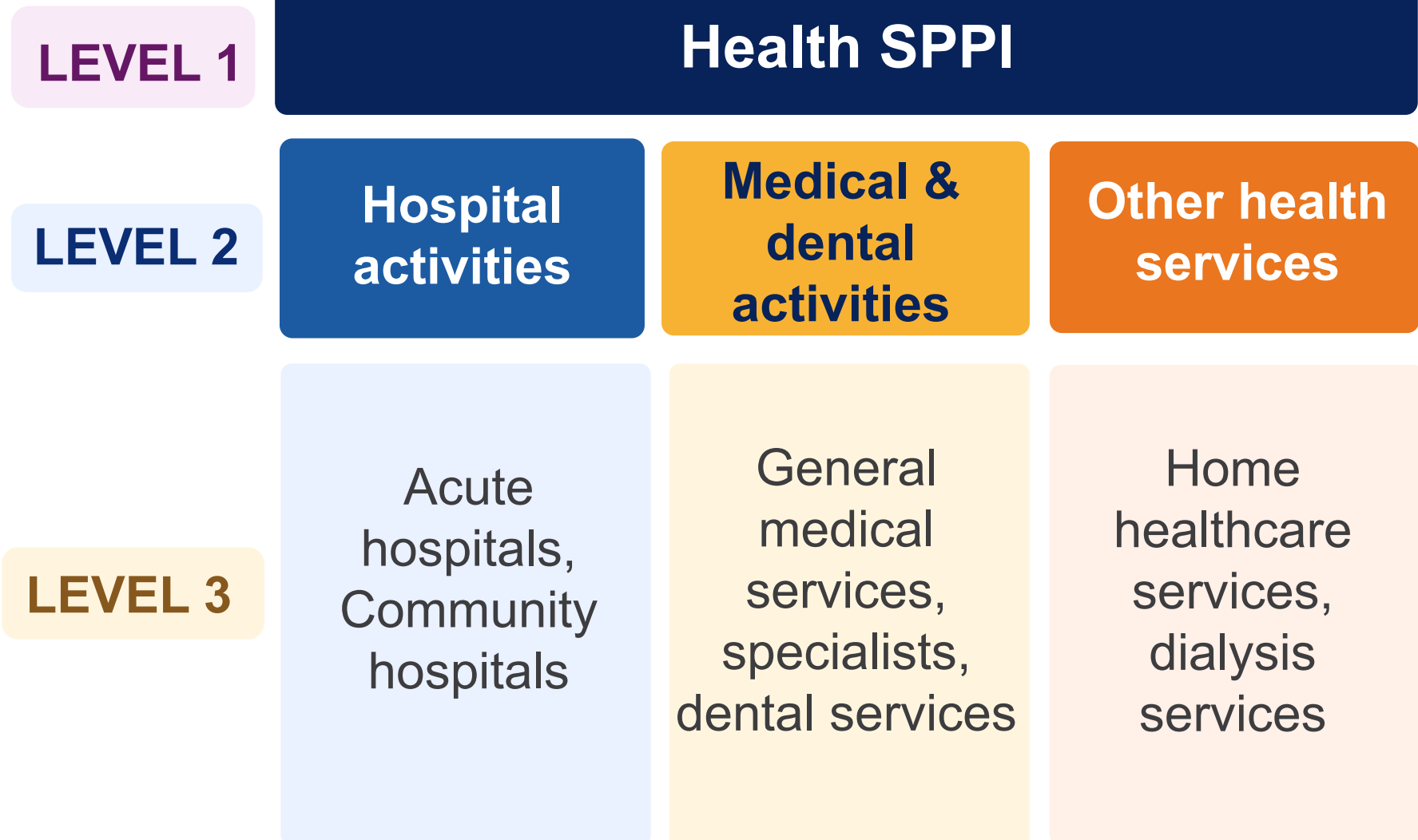
price before subsidies
(Health SPPI)

What it measures
Changes in prices received by healthcare providers for their services

More relevant for
deflating health sector output and measuring real output in the national accounts

DIFFERENCE

Index structure

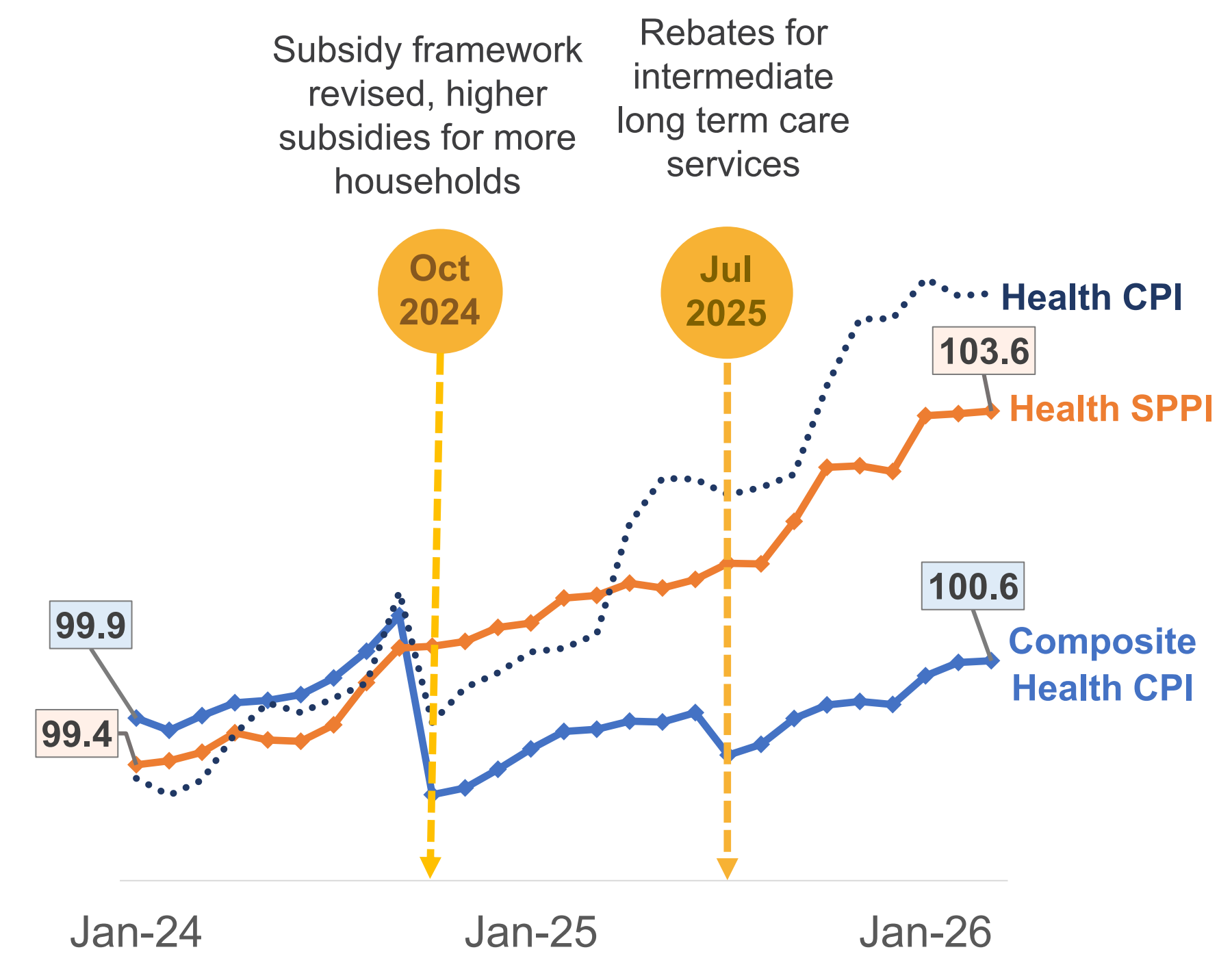


Results

Health CPI = medicines/health products + health insurance + outpatient, inpatient and other health services

The Composite Health CPI **excludes medicines/health products and health insurance** for better comparability with the Health SPPI.

Health SPPI 103.6 ↑ 4.3% since Jan 2024	Composite Health CPI 100.6 ↑ 0.7% since Jan 2024
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The Health SPPI rose more than the Composite Health CPI, largely because government subsidies reduces prices paid by consumers, which led to lower Composite Health CPI.

The dips seen in Composite Health CPI are explained by subsidy events, with SPPI unaffected

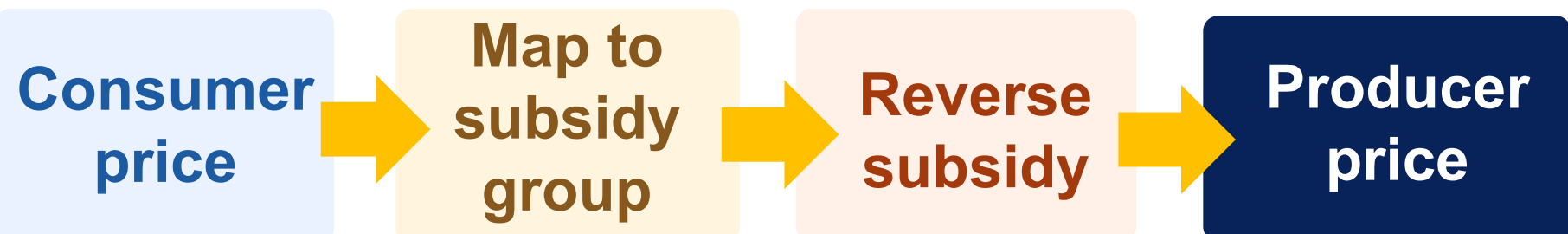
Conceptual Differences: Health CPI vs. SPPI

	Health CPI	Health SPPI
Valuation	Consumer price paid; point-of-sale subsidy lowers price captured.	Producer revenue received; subsidy added back to price paid by consumer
Classification	S-COICOP, includes: - Medicines & Health Products - Outpatient Services - Inpatient Services - Other Health Services - Health Insurance	SSIC 86* (Human Health Services) Excludes: - Medicines & Health Products, - Health Insurance - Residential Care Services
Weighting	Household expenditure	Producer revenue
Scope	Business-to-consumer (B2C)	B2B / B2All Focus on B2C for experimental index

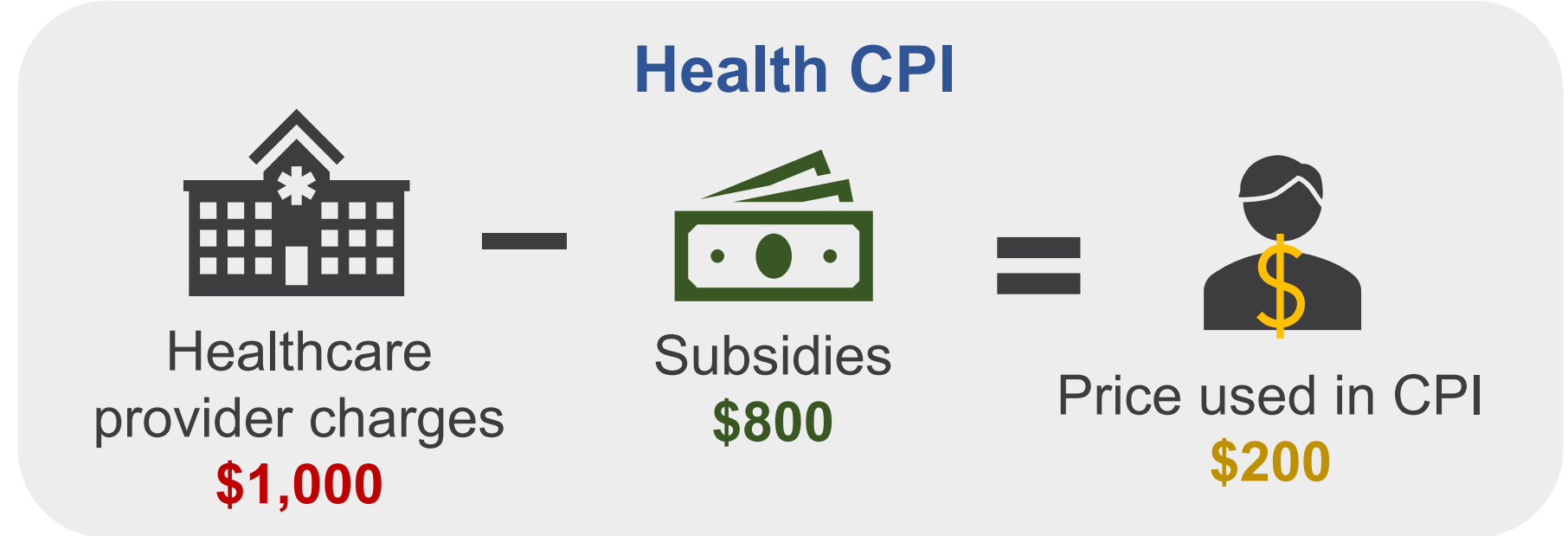
*Equivalent to NAICS 621 and 622 or ISIC 86

From consumer price to producer price

Process of conversion is as follows:



Illustrative example

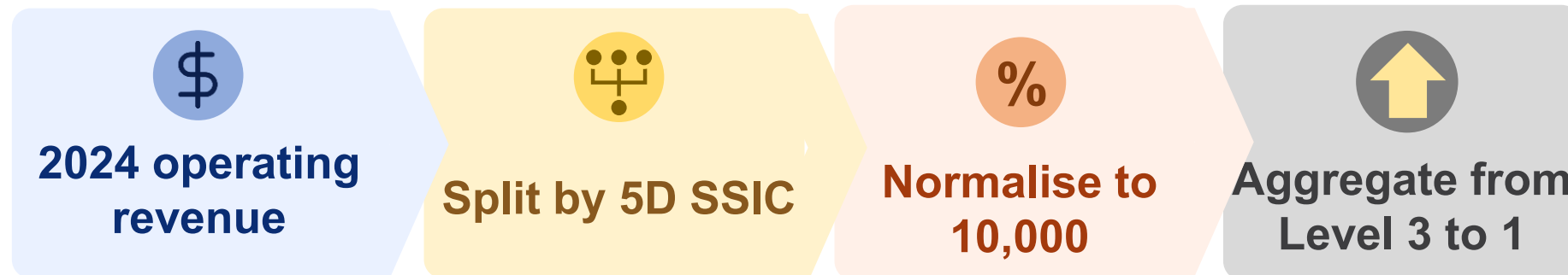


Notes:

- Subsidies include government subsidies and targeted in-house assistance from non-profit organisations.
- Insurance payouts and payments from personal medical savings accounts are out of scope in the CPI and PPI.

Weights and index compilation

LEVEL 1-3 WEIGHTS



INDIVIDUAL ITEM WEIGHTS

In the absence of a separate PPI survey, CPI household expenditure share was used to proxy each item's share of producer revenue before subsidy.

INDEX COMPILATION

Index compiled using the weighted arithmetic mean Laspeyres Formula with weight and price reference year of 2024:

$$I_t = \sum_i w_i \left(\frac{P_{i,t}}{P_{i,0}} \right)$$

Where:

I_t is the price index at time t , $P_{i,t}$ = price of item i at time t , $P_{i,0}$ = price of item i in 2024, w_i = weight of item i fixed in 2024

Five step development approach

- Determine structure & coverage**
Items underlying each firm are aggregated through 3 levels based on the firm's characteristics: 5-digit SSIC → 3-digit SSIC → overall Health SPPI (SSIC 86)
- Map CPI items to SPPI categories**
Assign every priced CPI item to its firm and its corresponding Health SPPI category. More than 5,800 CPI health services were mapped to the Health SPPI
- Derive firm and item weights**
Firm-level weights are derived from 2024 operating revenue from DOS's business data, while item-level weights within each firm are proxied using CPI weights.
- Convert consumer to producer prices**
Each priced item's applicable subsidy is reversed at the time it took effect to derive producer prices. Subsidies' type and quantum vary by health service, age and income.
- Compile Health SPPI**
Item-level price relatives and weights are aggregated via weighted arithmetic mean Laspeyres (2024 as base) to form the overall Health SPPI.

Limitations

- Currently, item-level weights are proxied using CPI household expenditure weights, which reflect post-subsidy household spending rather than producer revenue which is more aligned to SPPI methodology.
- However, the impact to the Health SPPI should not be significant as we noticed that prices move in tandem for similar services with different subsidy types.
- The Health SPPI currently covers only B2C transactions, excluding B2B segments which may exhibit different pricing behaviour.
- However, the B2C segment represents a more substantial share of Singapore's healthcare activity, and future work could explore incorporating B2B to broaden the index's coverage.

Next steps

- Extend methodology to SSIC 87 Residential Care
- Explore the potential use of 'InvoiceNow', Singapore's national e-invoicing network, when implemented, and assess whether the information captured can be used to expand the coverage of health services including B2B and more B2C transactions.

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