

Cross cutting issue Bundling of Products

30th Voorburg Group Meeting
September 2015

Session Leader: Mary Beth Garneau, Statistics Canada

Bundling Panel

- John Murphy, US Census Bureau
- Joseph Keating, Central Statistics Office, Ireland
- Mike Prestwood, Office for National Statistics, UK
- Mary Beth Garneau, Statistics Canada

Special thanks to the contribution of those unable to attend the meeting:

- Aki Ono, Bank of Japan
- Erik Hillström, Statistics Sweden

Session Format

- Background
- What is bundling?
- Industries where bundling is prevalent
- Classification
- Turnover/Output
- SPPIs
- National Accounts

Background

- VG first touched on bundling in 1997
 - Simple service
 - Composite service
 - Bundled service
- Issue was not resolved and continued to be raised in various industry presentations
- At the Dublin Meeting last year, added as a cross cutting topic for Sydney

Product

- CPC – “a product is a good or service that is the result of production in any economy”
- NAPCS – “[products] are created and transacted (sold or transferred) by the reporting units to economic entities outside of the reporting unit”
- Combined – two necessary conditions for products: production and transaction

More about Products

- Product vs. characteristic
 - Hotel with maid service
 - Automobile with sport interior
 - Telecom – wireline phone with caller ID
- Must define the core product properly
 - Case prices for paper
 - Access to a network vs. phone, video, internet access

Bundling of services and services

- Composite services
 - Primary service and secondary service / Core service and characteristics
 - Secondary service is only available with purchase of primary service
 - e.g. Hotel service with linen supply service, or
Fixed telephone service with call forwarding service
- Price bundling
 - A combination of independent services
 - Services are available separately
 - e.g. Office space rental and parking space rental
Building cleaning services and security services

Bundling of services and goods

- Services and goods are bundled and sold together as well
- One example is copy machines and maintenance services. Another example is electric generators in a power plant and plant maintenance services. On the whole, some businesses ship goods at a low price, focusing on earning revenue from subsequent relevant services
- Goods and services are provided at different periods, so unbundled prices are easy to follow.

Eurostat/OECD manual on bundling

- *Where one product is sold in combination with another as a requirement of the sale*
 - Example: telecommunications (phone, SMS, data TV, Internet)
 - Lots of combinations:
 - Number and percentage of products
 - Mix of classification industries across bundle products
 - Difficulty in distinguishing product prices within a bundle
 - Simultaneous processes versus end-to-end processes

Mentions of ‘bundle’ or ‘bundling’ by industry in the manual

[Eurostat- OECD Methodological guide for developing producer price indices for services –Second edition 2014.](#)

Industry	Mentions
Telecommunications	8
Freight Transport by Road, Accommodation and Food Services	4
Warehousing and Storage	3
Software Publishing, Financial and Insurance, Engineering	2
Wholesale and Retail, Water Transport, Cargo Handling, Courier and Postal, Real Estate, Management Consultancy, Advertising, Cleaning Services	1

Why does bundling happen?

Businesses offering bundled products focus on the advantages of the practice to the consumer, as the following quotes from Irish company websites show:

- *We offer an extensive range of facility services and we understand that because all businesses are different their facility services needs can also be different. That's why we offer customers the option to select either a single or a bundled service.*
- *We offer a 'one stop shop' for all your transport and logistics requirements*
- *We're known for providing end-to-end supply chain management solutions to quick service restaurants*

Industries with bundling - Ireland

- Ireland currently redeveloping the price indices for:
 - Freight Transport by Road
 - Industrial Cleaning.
- Bundling is very important in both these industries in Ireland
- Many Irish Freight Transport businesses offer a complete logistics solution, including
 - Storage and Warehousing
 - Freight Forwarding
 - Other modes of transport
- Many Irish businesses in Industrial Cleaning also offer
 - Landscape Services
 - Security Services
 - Complete facilities management service

Industries with bundling – UK (1)

Telecommunications

- Phone calls
- Line Rental
- Short Message Service (SMS)
- Internet
- Data Transfer
- Television
 - ❖ Repair
 - ❖ Maintenance
 - ❖ Insurance

Industries with bundling – UK (2)

‘end-to-end’ process

Engineering

- Plans/Groundwork
- Engineering service work
- Testing

Freight business

- Freight movement
- Cargo handling
- Storage

Industries with bundling – UK (3)

Computer Services

- PC and printer support
- Network support/maintenance
- Software installation

Hotel accommodation

- Overnight stay
- Breakfast
- Sometimes bar/room service

Examples of activities with bundles (Canada)

- **Accounting**
Bookkeeping, payroll, compilation, tax preparation
- **Advertising**
Creation/design, ad space/ air time, media planning, etc.
- **Architecture**
Design, construction documents, consulting, etc.
- **Assisted daily living services**
Rental of room, meals, assistance with daily living, monitoring, medical services, entertainment, etc.
- **Financial Services**
Chequing, account statements, ATM transactions, non-deposit services, etc.
- **Maintenance and Repair**
Sales of parts bundled with maintenance and repair services
- **Rental and Leasing**
Delivery, insurance, maintenance and repair
- **Retail Trade**
Delivery, assembly, installation, warranty, etc.
Cellular phones with a telecommunications plan
- **Tour packages**
Transportation, accommodation, admission to attractions, guided visits, commentary, entertainment, meals, etc.

Industries where bundling is prevalent

Are there other industries, not noted by the panel, where bundling is prevalent in your country?

Impact for classifications

- Presence of bundles as separately identified products causes problems for mutual exclusivity?
- Incorrect identification of core product impacts both output and price programs?
- Poor match conceptually results in statistics that are not as useful or reflective of the economy as possible

Bundling in Product Classifications

- Bundles are groups of existing products
 - Can lead to double counting
 - Different permutations are possible
 - Bundles change over time

Bundling and Industry Classifications

- Bundle may cross firms and industries
 - Cell phones and telecommunication plans bundled in Canada
 - Customers “purchase” discounted or free phone and sign onto a service contract at retail store
 - Retail outlets (establishment level) of telecommunications service providers are classified as retail trade
- Can be challenging when activities in a bundle are key activities of different industries in the portion of each service changes through time
 - E.g. in Canada, establishments in the Software publishing, Computer systems design, Data processing industries all provide software publishing, computer system design services, data processing and hosting services

Bundling in Product and Industry Classifications

Are there other classification issues related to bundling?

Do you have bundling examples in classifications used by your country?

Output Collection

- Relatively straight forward regardless of the product composition if records available
 - Does not matter if there are products and/or bundles
 - Output is normally collected at nominal values – quality adjustment is not an issue
 - Short answer – outputs are outputs

Eurostat output regulations

- A fundamental (unspoken) assumption of Eurostat output regulations, is that output can be broken down into detailed industry and product codes.
- Bundling of products is in conflict with this assumption.
- Irish businesses can generally supply output figures broken down to the detail the regulations require, even for bundled products.
- To what extent is this breaking down of a bundled products output arbitrary? Does it tell us anything meaningful?

Bundling in the Canadian Telecommunications Sector

- Telecommunications in Canada is regulated by the Canadian Radio-television and Telecommunications Commission (CRTC) which has legal mandate to collect information from telecom service providers
- To reduce government burden on businesses, Statistics Canada and CRTC collect data in partnership
- Wireless Code imposed on service providers
 - Whenever there is bundling of a device with a telecommunication service, the service provider must disclose the undiscounted retail price of the phone in the contract

Annual Survey of Telecommunications

Form 281

Form 281 - Wireless devices and contract durations	
Filed under the authority of the <i>Telecommunications Act and the Statistics Act</i>	
Filed in Confidence	
Part A - Wireless Devices	
Wireless devices with service contracts	
	Total
1 Number of wireless devices activated with a service contract (post-paid and pre-paid), between January 1 and December 31 of the reporting year	0
2 Total value (in dollars) for devices in question 1 at the lesser of the two following amounts: the manufacturer's suggested retail price or the price set when the device is purchased without a contract	0
Cancellation Fee	
	Total
3 Total early cancellation fee amounts received from post-paid contracts (exclude write-offs)	0
Inventory in Dollars	
	Total
4 Opening inventory of wireless devices as of January 1 of the reporting year (exclude write-offs and overhead)	0
5 Total purchases of wireless devices	0
6 Closing inventory of wireless devices as of December 31 of the reporting year (exclude write-offs and overhead)	0
7 Total cost of goods sold (sum of questions 1 and 2 minus 3 above)	0

Annual Survey of Telecommunications

Form 296

Form 296 - Residential bundled telecommunications services					
Filed under the authority of the <i>Telecommunications Act</i> and the <i>Statistics Act</i>					
Filed in Confidence					
	Bundled services	2 Services	3 Services	4 Services	Total
1	Number of residential customers	0	0	0	0
2	Revenues	\$0	\$0	\$0	\$0
3	Total number of residential customers (with and without bundles)				\$0

Bundling in turnover/output statistics

Are there other turnover issues you have encountered in your country?

How do you deal with bundling in turnover statistics?

SPPIs (or prices in general)

- No impact at industry level
- Commodity or product level indices are more problematic
 - Phone, video, internet access separate and bundled
 - Incomplete commodity price information for individual products (services), undefined mixture of services included in bundles
- Records can be a problem

Composite services in SPPIs

- The primary service (A) should be followed in the price. The secondary service (B) is regarded as a characteristic of the primary service

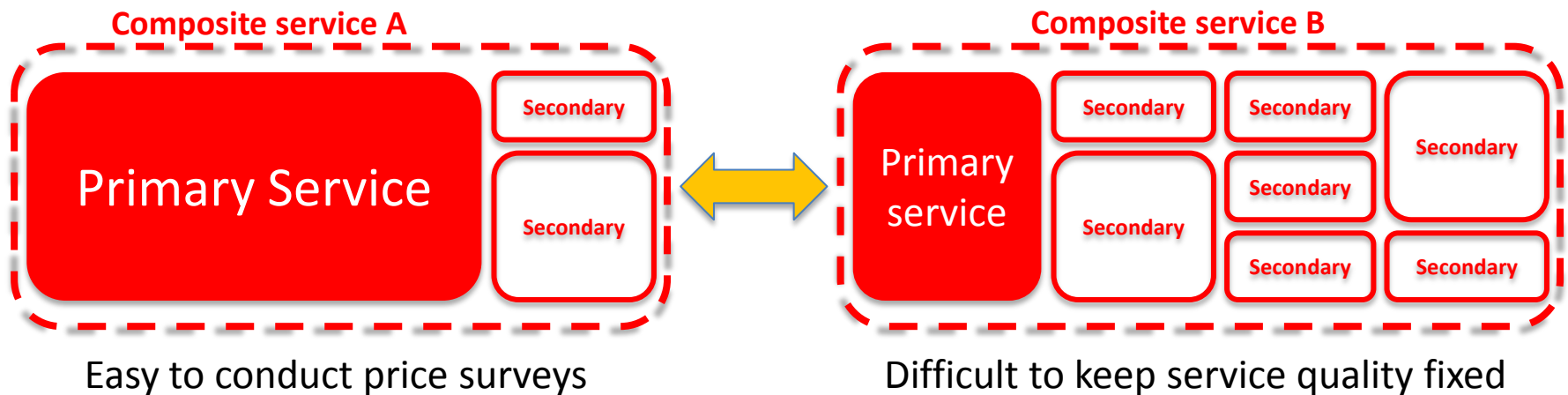
E.g. Hotel service (A) and Linen supply service (B)

The entire accommodation fee rises because of the increasing cost of linen supply service due to oil price hike, while the charge for lodging remains unchanged.

- In this case, the price increase should be reflected for the index of “Hotel service” (=primary service)

Difficulties with composite services in SPPIs

- When the corresponding relationship between primary service and secondary service is clear and defined, it is relatively easy to conduct price surveys.
- However, when secondary services are increasingly tied with primary service and, as a result, the variety and quality of secondary services become diverse, it is more difficult to survey prices in practice. In other words, it becomes more difficult to follow pure price changes with service quality fixed.



Difficulties with composite services in SPPIs (2)

Example – Japanese wholesale services

- Wholesalers resale goods to other businesses and act as an agent or broker in buying and selling
- Primary service is wholesaling
- Also provide secondary services such as warehousing, advertisement and marketing
 - Therefore, it is extremely difficult to survey prices of wholesale services with quality held constant
 - On a trial basis, Bank of Japan keeps track of margins to measure prices, in particular, margin per unit (the difference between sale price and purchase price of a product). However, the quality changes have not been adjusted in this method.

Price bundling in SPPIs (1)

- Unlike composite services, it is difficult to identify primary service
 - For price bundling, it is more complicated to survey prices.
1. Should the price reduction due to bundling be reflected in price indexes?
 - It should not be reflected because this reduction is a kind of quantity discount (= altered selling terms)?
 - If we regard it as a pure price change, how to reflect it? In practice, it is hard to know in what proportions customers buy the bundles or buy the single component.

Price bundling in SPPIs (2)

2. How can bundled prices be followed continuously?
- If all parts of the bundle are in the same product classification, all representative types of services should be surveyed (service A, B, A and B)
 - If bundled service is a combination of products across different classification, it would be more difficult to handle.
- We have not come to the conclusion whether the price change due to mixed bundles should be reflected in price indexes.
 - The Bank of Japan assumes the discount by bundling Service A and Service B results from the change in transaction terms (=quality change) and does not reflect it in price indexes.

Price bundling in SPPIs (3)

Example – Office space rental and Parking space rental. Assume that “Office space rental A” is replaced by “Office space rental A + Parking space rental B.” Single service is no longer available.

- Single price: Office A = \$3,000
Parking B = \$500
 - Bundled price: Office A + Parking B = \$3,300
- The Bank of Japan does not reflect the total discount because the price change is caused by purchasing multiple services, that is, the change in transaction term. In this case, the sample is reviewed or replaced by others.

How can bundled prices be followed

- When bundled services are in the same product category, the prices of simple and bundled services should be followed simultaneously.
E.g. In case of print newspaper and electronic newspaper, three types of services, “paper,” “electronic version,” and “paper and electronic version” should be covered.

How can bundled prices be followed (2)

When bundled services are a combination of products across different product classification, the Bank of Japan deals with it as follows :

1. Ask respondents to provide unbundled prices for the individual services

E.g. When Building cleaning services and Security services are provided as a group, respondents are asked to split the prices into constituent parts for each service, based on the cost estimation or detailed breakdowns (= using production cost approach)

2. (If 1 is impossible), exclude from price collection.

How can bundled prices be followed (3)

- If bundled transactions are prevalent and become more dominant in the industry, relevant product category should be reviewed and integrated.
 - In the integrated product category, simple and bundled services are tracked together from one period to the next.

Bundling of goods and services

- Goods and services are provided at different periods, so unbundled prices are easy to follow
- However, they have great influence on each other in price determination. So if goods and services are sold together as a group by a specific provider, it is desirable to survey these prices from the same one.
- The Bank of Japan selects samples taking this point into consideration.

Ex.) Company A discounts the price of copy machines, while raises maintenance fee with a view to maximizing its revenue.

- Ask Company A to report the prices of both “copy machines” and of “maintenance services for copy machines” and then reflect them to the indexes respectively.

Why is bundling an issue?

- Pricing index structures are based on defining homogeneous service products
- A bundle price, consisting of various products, does not provide the disaggregated components that are required
- Overcoming this is difficult:
 - Need NSIs to identify individual components
 - Service providers need to be able to provide separate component prices

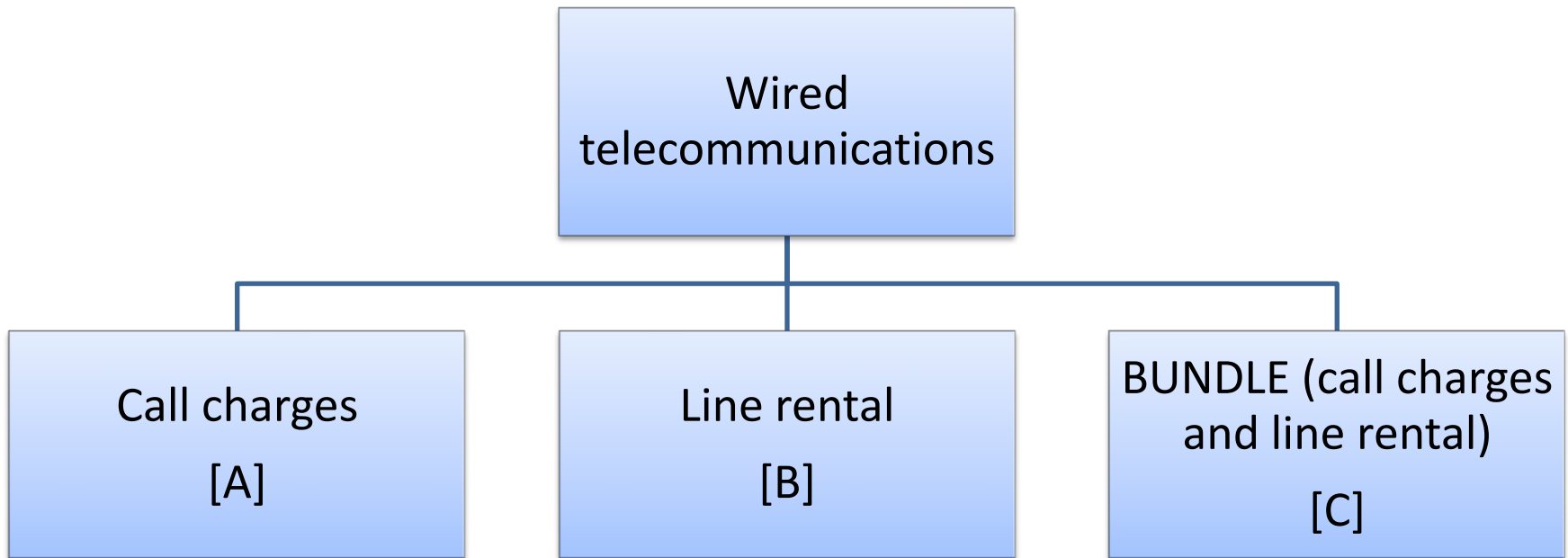
But, even if component prices can be provided...

- Are the components proportionately equal in price?
- Are some components at full price and others discounted?
- Does the level of discounting depend on the volume of each component purchased?
- Do bundle prices change if the component prices change, and vice versa; so if the components change price, is there an impact on the bundle?

Classification options for bundled services (UK)

1. 'Ignoring' them
2. Include bundling services as a separate product in the aggregation structure
3. Assume same price movement for each of the products included in the bundle
4. Calculate price for each bundle component

Classification - example



Classification

Service product	Weight	Price (July)	Price (August)	Price Relative
[A] Call charges (£/min)	25	0.05	0.06	1.2
[B] Line rental (£)	25	17	17.50	1.03
[C] BUNDLE – calls & line rental (£)	50	25	26	1.04

Classification

- Option 1: 'Ignoring' them

$$\text{Index} = \frac{(1.2*25) + (1.03*25)}{50} = 1.12$$

- Option 2: Include bundling services as a separate product in the aggregation structure

$$\text{Index} = \frac{(1.2*25) + (1.03*25) + (1.04*50)}{100} = 1.08$$

Classification

- Option 3: Assume same price movement for each of the products included in the bundle

$$\text{Index} = \frac{[(1.2*25) + (1.04*25)] + [(1.03*25) + (1.04*25)]}{100} = 1.08$$

- Option 4: Calculate price for each bundle component
 - Approach requires the business to estimate the price and weight of each component within the bundle
 - Businesses would need to provide prices when first recruited and be able to continually provide this
 - Experience has indicated that both these aspects are not always possible

SPPI

Looking at the bundling of services examples provided earlier, and the approaches for dealing with them in the UK:

- ‘Ignoring’ them –telecommunications
- Include bundling services as a separate product in the aggregation structure
 - Engineering
 - Freight business
 - Computer services
 - Hotel accommodation

SPPI An Irish example

- Two products that had previously been sold separately were combined to form a pure bundled product.
- Old prices were €49 for Product 1 and €72 for Product 2.
- New price is €79 for the bundle of Product 1 and Product 2.
They are no longer offered separately.
- What is the price change here?

First approach

- The products previously cost €49 and €72, a total of €121
- The bundled product now costs €79
- So we have a **price reduction of €42, or 35%**
- But many consumers may not want both products

Second approach

- Estimate that 80% of customers previously bought Product 1 only. This group are now paying $€79 - €49 = €30$ more
- Estimate that 10% of customers previously bought Product 2 only. This group are now paying $€79 - €72 = €7$ more
- Estimate that 10% of customers previously bought both products. This group are now paying $(€49 + €72) - €79 = €42$ less
- Weighting these changes gives a price change of €20.50, a **price increase of 35%** ($=20.5/(79-20.5)$)
- But consumers do place **some** value on the product they were not previously purchasing

Third approach

Customer Group	Share of Market	Old expenditure	Reserve price for other product
Product 1 only	80%	€49	€10
Product 2 only	10%	€72	€30
Both products	10%	€121	

- Previously buying Product 1:
Effective price increase = $€79 - (€49 + €10) = €20$
- Previously buying Product 2:
Effective price decrease = $(€72 + €30) - €79 = €23$
- Previously buying both products:
Price decrease = $(€49 + €72) - €79 = €42$
- Weighting these changes gives a price change of €9.50, a **price increase of 14%** ($=9.5/(79-9.5)$). This seems about right

Bundling in Telecoms

- **Irish Telecommunications Operators Monthly Prices 27/7/2015, callcosts.ie**

Operator	Telephone only, €'s	Broadband only, €'s	Telephone and Broadband combined, €'s
A	43.00	25.40	53.00
B	35.00	35.00	45.00
C	35.57	34.95	44.03
D	Not Available	Not Available	40.83

- Bundling complicates the picture in Telecoms
- But it's only one complication among many
 - How to weight the different providers
 - What range of assumptions do we make about usage?

Expenditure weights for bundled telecommunications

- Statistics Canada's Survey of Household Spending (used to calculate the CPI basket)
- Questions on bundling:
 - Whether the household pays for two or more bundled services (telephone, cell phone, cablevision, satellite TV, Internet or home security systems)
 - What services are included
 - Whether expenses can be broken down
 - Questions on payment (bundled and per service) and duration

Bundling in the Canadian Retail Services Price Index (RSPI) - 1

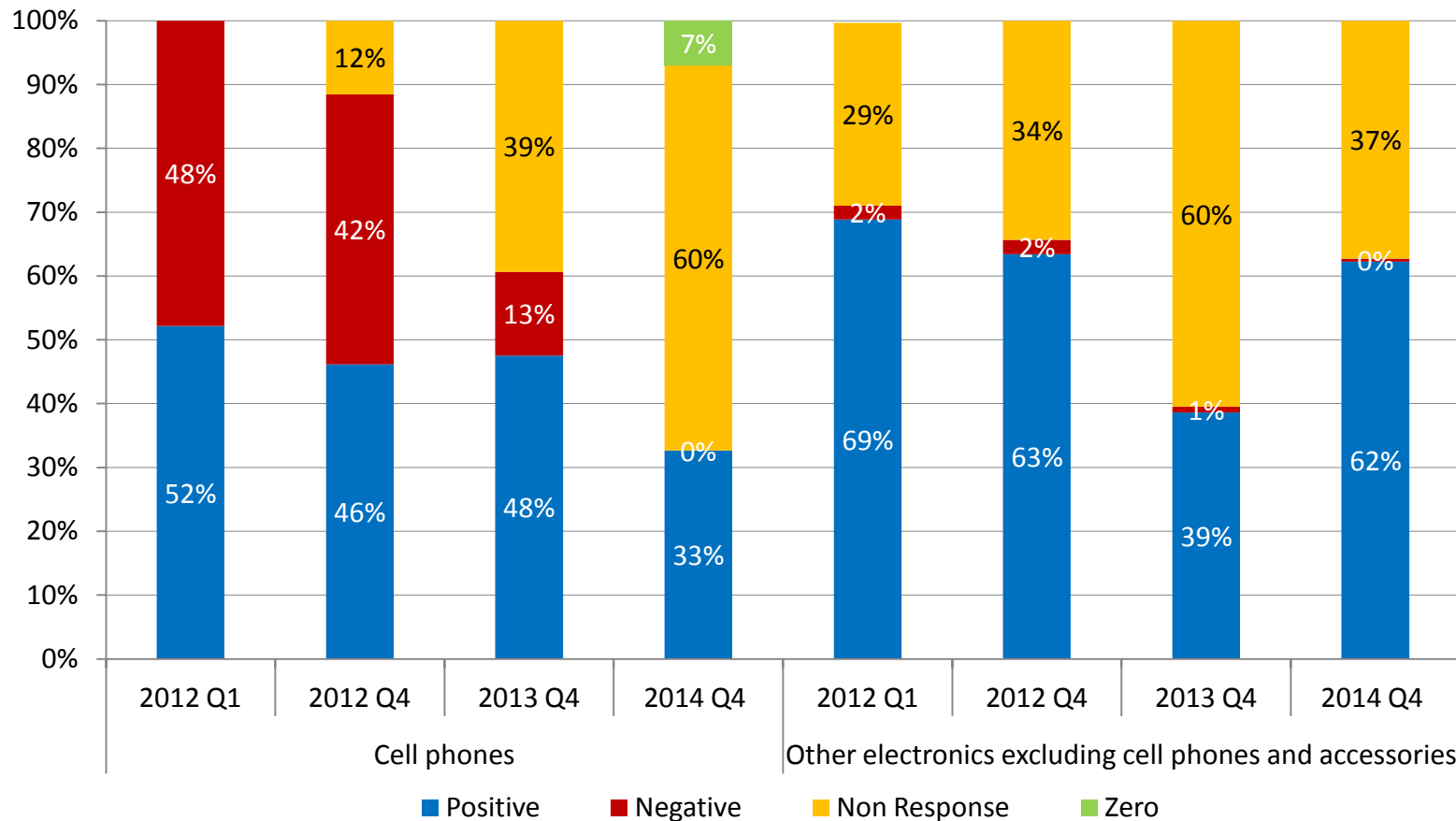
- Most cell phone “sales” include a service contract
- Customers can purchase unlocked cell phones but these are generally older generation phones near end of product life cycle – low volumes
- Retail stores of service providers serve as a direct market channel to consumers
- Increasingly, electronic retailers selling devices and plans on behalf of third party telecommunication firms

Bundling in the Canadian RSPI - 2

- Margins are calculated by subtracting the retailer's selling price from the vendor price (the price paid by the retailer)
- Tend to get negative margins for popular cell phones
 - Retailers most familiar with the store's listed price for phones
 - Respondents don't consider the commission received as part of the retail price
- Negative margins are unusable and excluded from index

Bundling in the Canadian RSPI - 3

Proportions of electronic products with positive or negative margins

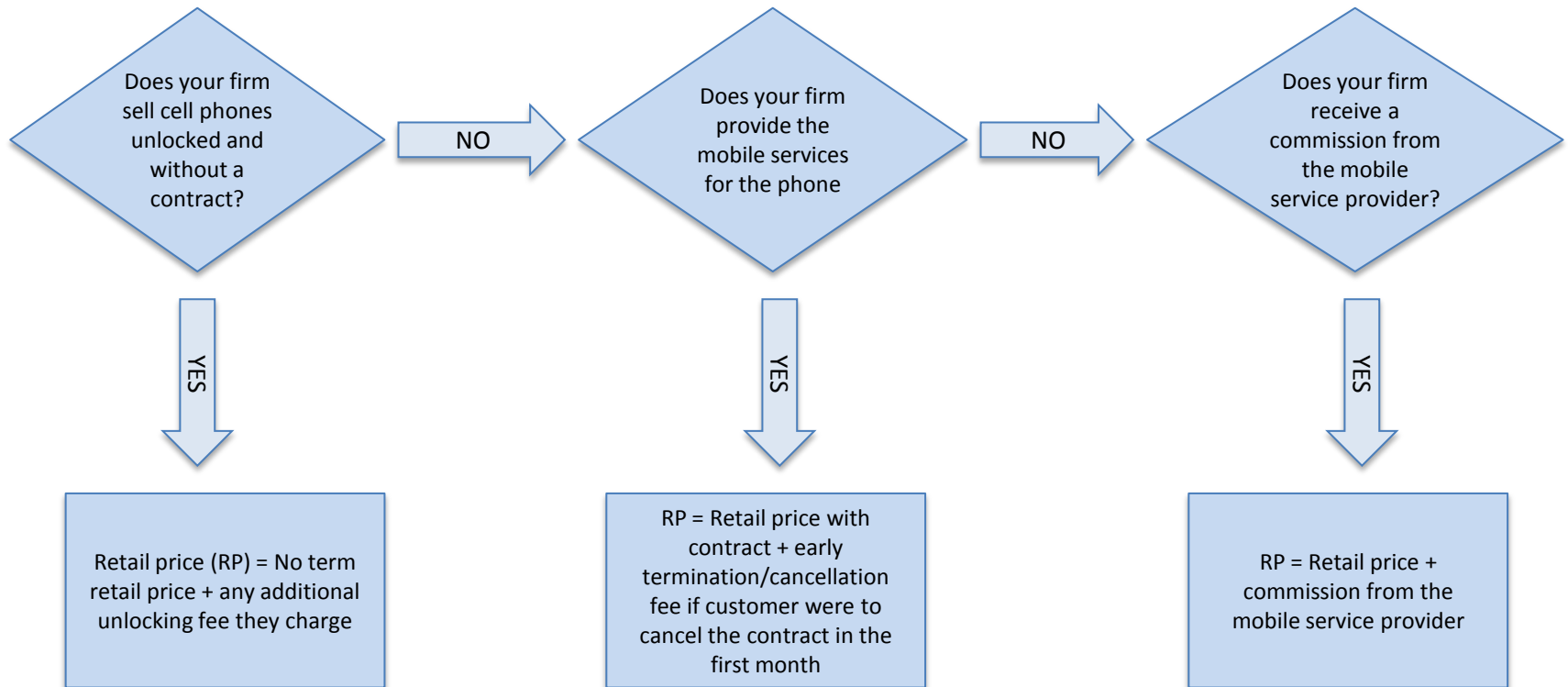


Negative margins in Canadian RSPI

Options:

1. Status quo –negative margins and high non-response
2. Treat cell phones and telecommunication services as one bundled product
3. Ask the respondent to include both the retail price and the sales commission received or early cancellation fee if the contract was cancelled in the first month

Respondent initialization flow chart for Canadian RSPI



Bundling in SPPIs

Are there other issues in the measure of SPPIs caused by bundling in your country?

How do you deal with bundling in SPPIs statistics?

Do you have any comments on the approaches mentioned?

Other Guidance

- SNA appears to suggest unbundling or partitioning in paragraphs 3.66 to 3.68
- BPM6 appears to suggest unbundling or partitioning in paragraph 3.17
- MSITIS 2010 notes that transactions can be bundles but is unclear on how to treat them

SNA Impact

- Implicitly UK does address the bundling of services in some areas
 - Say hotel fees, where some additional services are included as standard (overnight stay, breakfast, sometimes bar/room services), as against more chargeable services such as laundry, but
- Explicitly, difficulties are experienced with telecommunications, computer software, electrical goods (with insurance), IT hardware (with maintenance)
 - An associated issue is the provision of free services, such as newspapers, apps on mobile phones

SNA Impact

- National Accounts deflation is on a product basis, to allow for more clarity in the deflation process, but
- Increasingly prices are offered from one 'bundled' contract covering a range of products
- Therefore, how the turnover of a business is reported for NA becomes increasingly important as well as having good prices for products

SNA Impact

- Bundling causes noise in price quantity measurement
- Alignment of turnover data and price deflators
- Product detail
- With bundling, the volume index of output tends to be under-estimated while the price index is over-estimated

Bundling in SNA

Are there other ways that bundling impacts the SNA and volume measures of services output?

How does your country's SNA deal with bundling in services?

Proposals/Questions

Definitions:

- **Service product** – simple or composite service that is the result of production and is transacted to a separate consumer of the service
- **Price bundle** – a single transaction that includes more than one service product when the total change in the condition of the consumer is no greater than the sum of the individual service products
- Classifications should not identify price bundles?
- Price bundles are conceptually the same as quantity discounts and should be unbundled into separate products for measurement?

Discussion

Are there any further comments or suggestions?