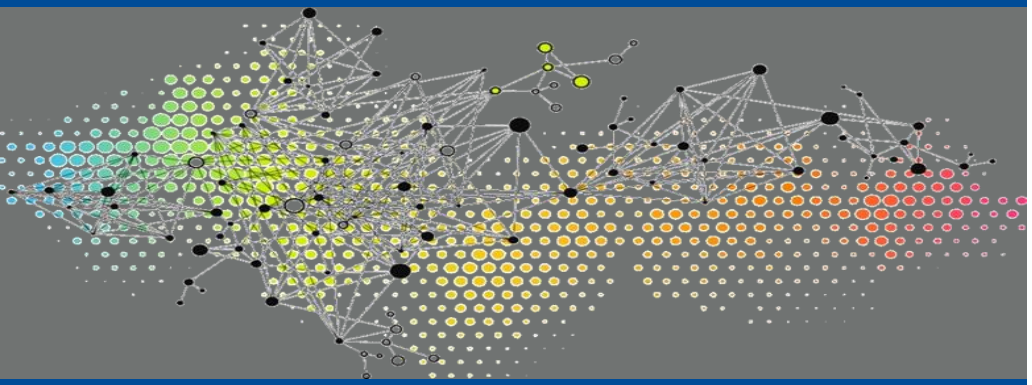


STATISTICS

Accommodations Research – Unit Values and Transaction Prices

SEPTEMBER 22, 2021

Andrew Baer
Real Sector Division, Statistics Department, IMF

Disclaimer

The views expressed herein are those of the author and should not be attributed to the IMF, its Executive Board, or its management.

The basics – matched models and unit values (1)

- General best practice for PPIs – matched models
  - Select a sample of well-specified goods and services, monitor their prices in future periods when they are sold under similar transaction terms.
  - Update sample periodically, perform QA when necessary.

- Alternative approach – unit values
  - Collect the price for a good or service as the total sales value generated from all transactions divided by the number of units (quantity) sold.
  - Subject to unit value bias – likely to be affected by changes in the mix of types of transactions that are included each period.
  - Advantage – low-cost method to increase number of sample observations

The basics – matched models and unit values (2)

- If data collection resources were unlimited and response burden unconstrained, we'd always advise matched model approach since it is not subject to unit value bias

- In real world, decision may be based on assessment of increased precision of larger sample weighed against loss of accuracy due to unit value basis
  - This is difficult to measure (any ideas?)
  - This study produces only anecdotal information about this tradeoff

STR historical data

- For this study, the IMF purchased historical monthly accommodations data for Canada, UK, and Japan from STR.
- STR maintains Census of all properties with 10 or more rooms in these countries
- 40-70% of these properties report supply of available rooms, room nights booked, and accommodation revenue each month. Price = revenue / room nights booked.
- Information for non-reporting properties is estimated based on reported data for similar properties (awaiting detailed documentation of methodology)
- No property-specific information is provided, only aggregations across all Census properties at the national level.

Benefits of increasing sample for accommodation services

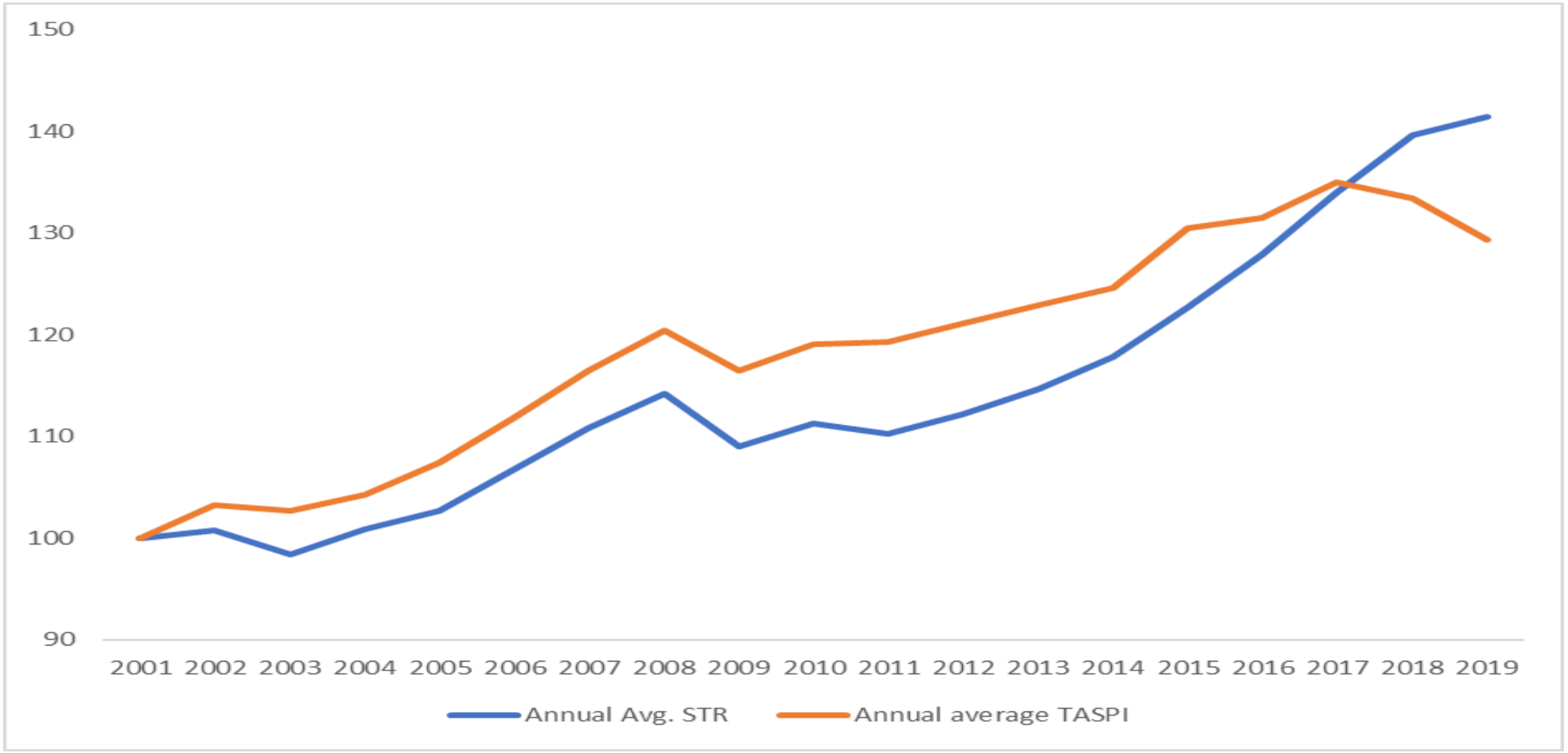
- STR has 6,000-7,000 Census properties for Canada, receives reports from 3,000+ properties each month. SPPI covered 482 properties.
- A large hotel with 1,000 rooms may make as many as 30,000 distinct room night transactions in a month
- NSOs typically collect only 2-6 accommodation transaction prices from a property
- Dynamic pricing compounds problem – algorithmic models that continually estimate profit-maximizing price for each room night based on evolving supply and demand signals
- Hotels may also discount through channel-shifting. When demand is low, offer rooms at lower price through OTAs (booking.com, etc.) while keeping website price the same. This price dynamic is missed with strict matched model pricing.

Cost of unit value bias for accommodation services

- Erroneous price changes shown:
  - if activity shifts across the value chain (luxury>full service>limited service)
  - within a property, if the occupancy rate of higher-quality suites changes differently than other lower-quality rooms

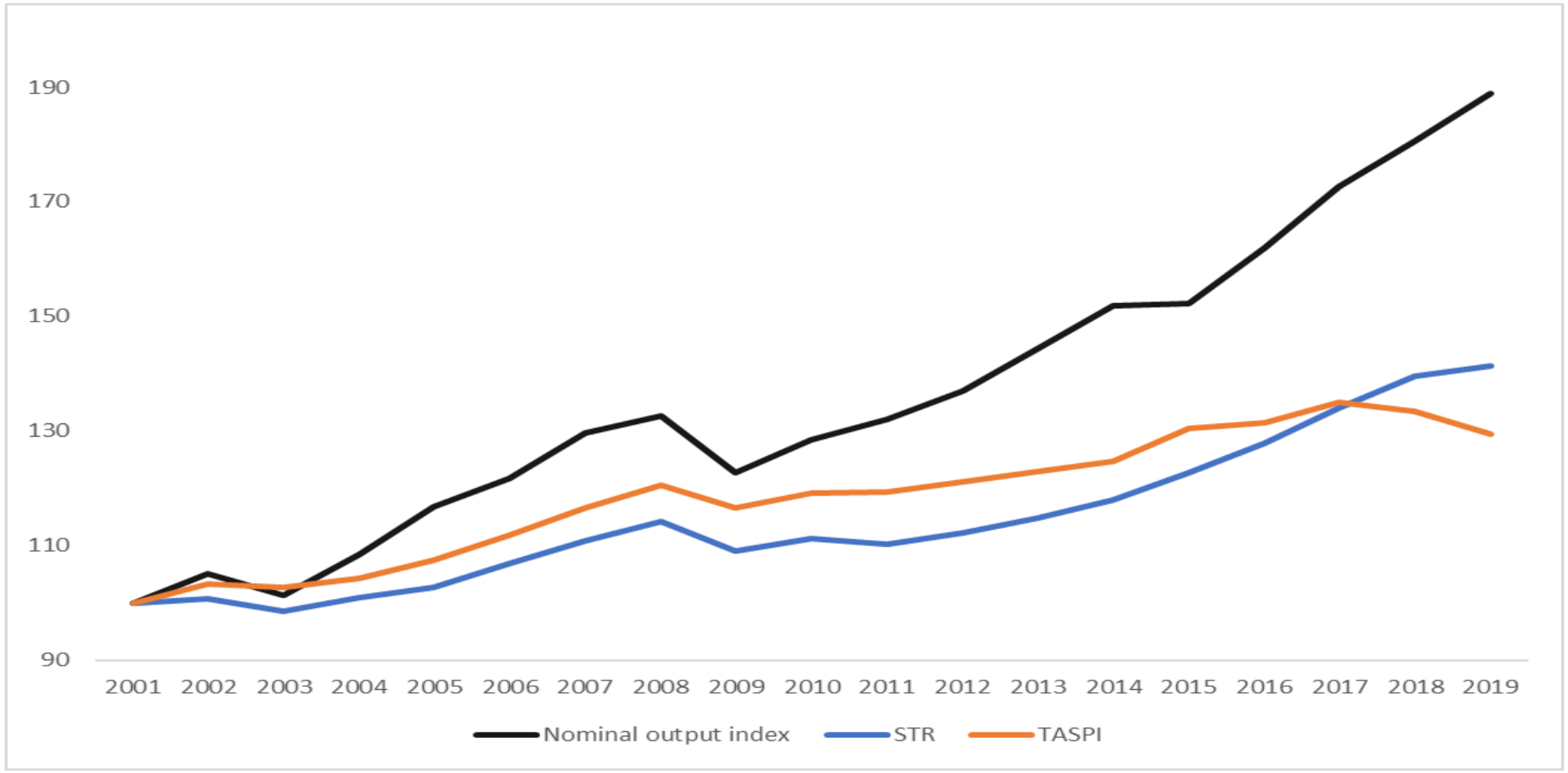
- Potential mitigating factors:
  - These problems are more impactful on seasonal changes than annual averages
    - Occupancy rates largely stable, Census room counts growing at stable rates through 2019
    - 2020 not included in this analysis

Canada Traveller Accommodation Services Price Index vs. STR



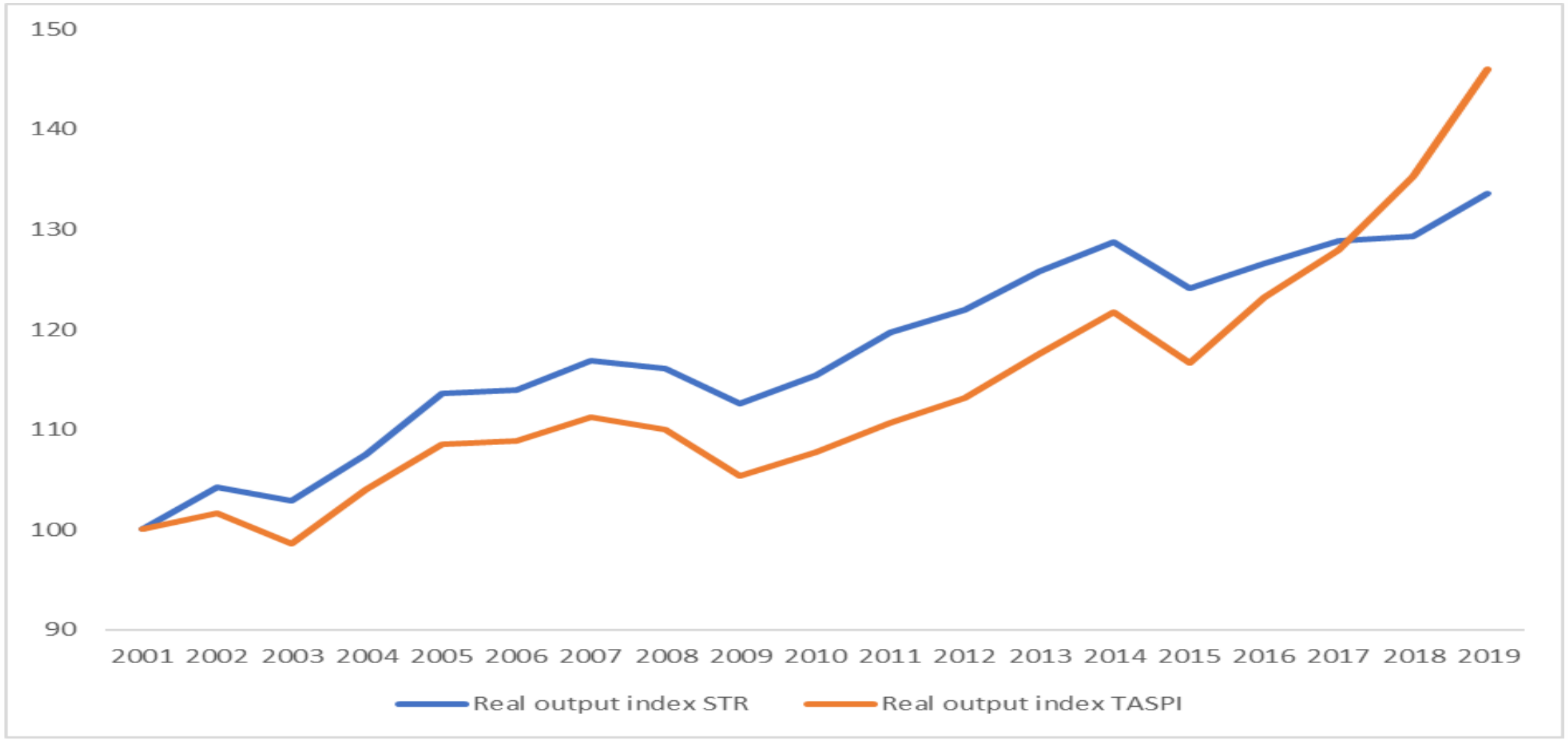
SOURCE STATISTICS CANADA, STR, LLC REPUBLICATION OR OTHER RE-USE OF THIS DATA WITHOUT THE EXPRESS WRITTEN PERMISSION OF STR IS STRICTLY PROHIBITED.

Annual output and the price indexes



SOURCE STATISTICS CANADA, STR, LLC REPUBLICATION OR OTHER RE-USE OF THIS DATA WITHOUT THE EXPRESS WRITTEN PERMISSION OF STR IS STRICTLY PROHIBITED.

Alternative volume measures



SOURCE STATISTICS CANADA, STR, LLC REPUBLICATION OR OTHER RE-USE OF THIS DATA WITHOUT THE EXPRESS WRITTEN PERMISSION OF STR IS STRICTLY PROHIBITED.

SPPI: Hotels and similar accommodation for the United Kingdom

Emelia D'Silva-Parker

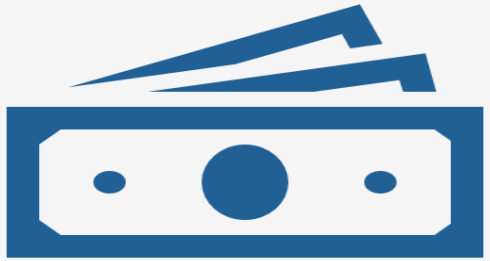
20th September 2021

Office for National Statistics

Introduction

- The United Kingdom follows the CPA 2.1 Structure and has recently moved to chain-linked PPI's and SPPI's.
- The UK SPPI is published quarterly
- Within the Classification of Product by Activity, section I is made up of division 55 which covers accommodation and division 56 which covers Food and beverage serving services.
- Within accommodation, the UK currently samples group 55.10- Hotels and similar accommodation services and 55.2 - Holiday and other short stay accommodation services.
- Hotels have an effective weight of approx. 2% into headline SPPI

Pricing



The pricing method currently being used is that of prices for repeated services

The indices reflect prices on or around the first month at the start of the quarter. For example for Q2, prices returned will reflect prices on or around the 1st of the month of April

Data collection

- Data collection for this product group is done via surveys dispatched each quarter where businesses can respond until the 2nd week of the next quarter.
- Respondents are chosen via stratified random sample from the Business Register which currently consists of approximately 124 businesses that provide us approximately 210 price quotes.
- The index is calculated using prices collected in Nine categories:

  London – Bedroom Accommodation (16.66%)

  London – Daily Delegate Rate (41.58%)

  London – 24 Hour Residential Rate (16.50%)

  London – Conference/Exhibition Room Hire (9.61%)

  Rest of UK – Bedroom Accommodation (10.15%)

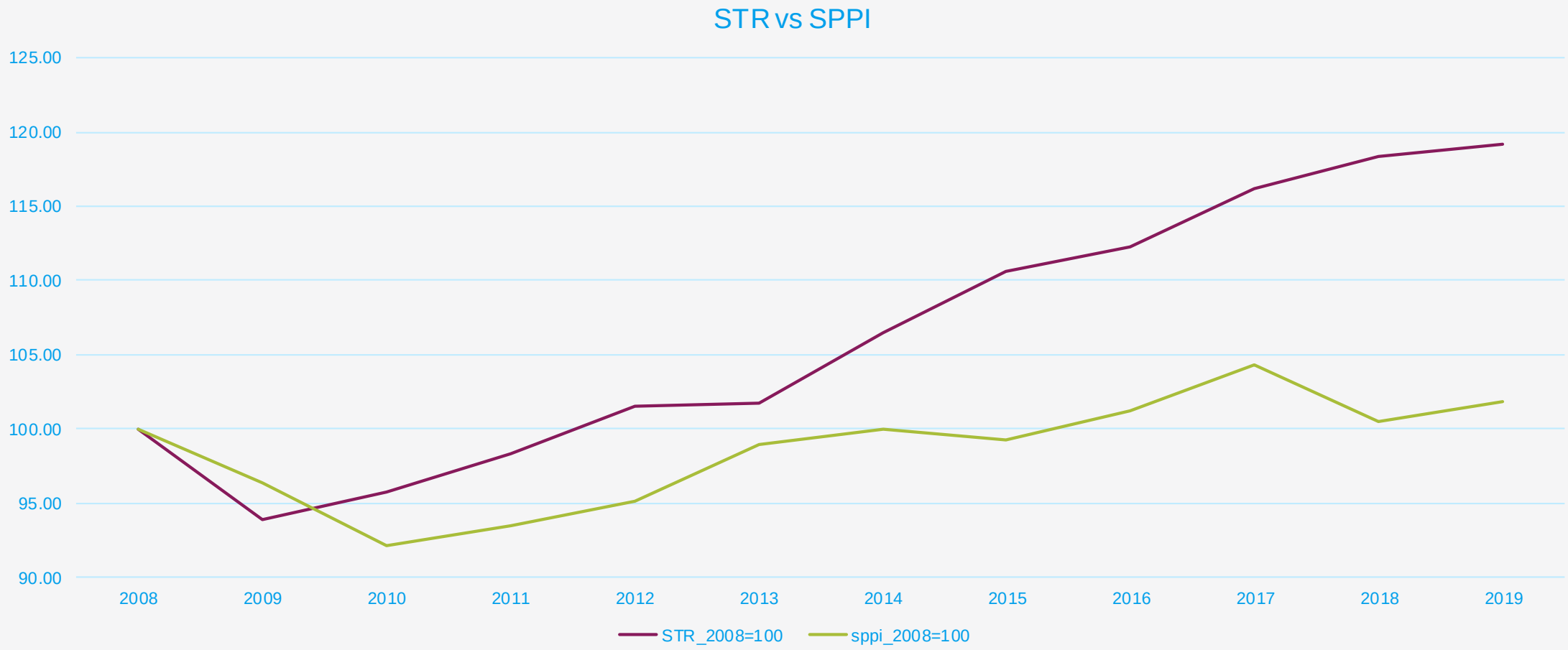
  Rest of UK – Daily Delegate Rate (1.67%)

  Rest of UK – 24 Hour Residential Rate (2.07%)

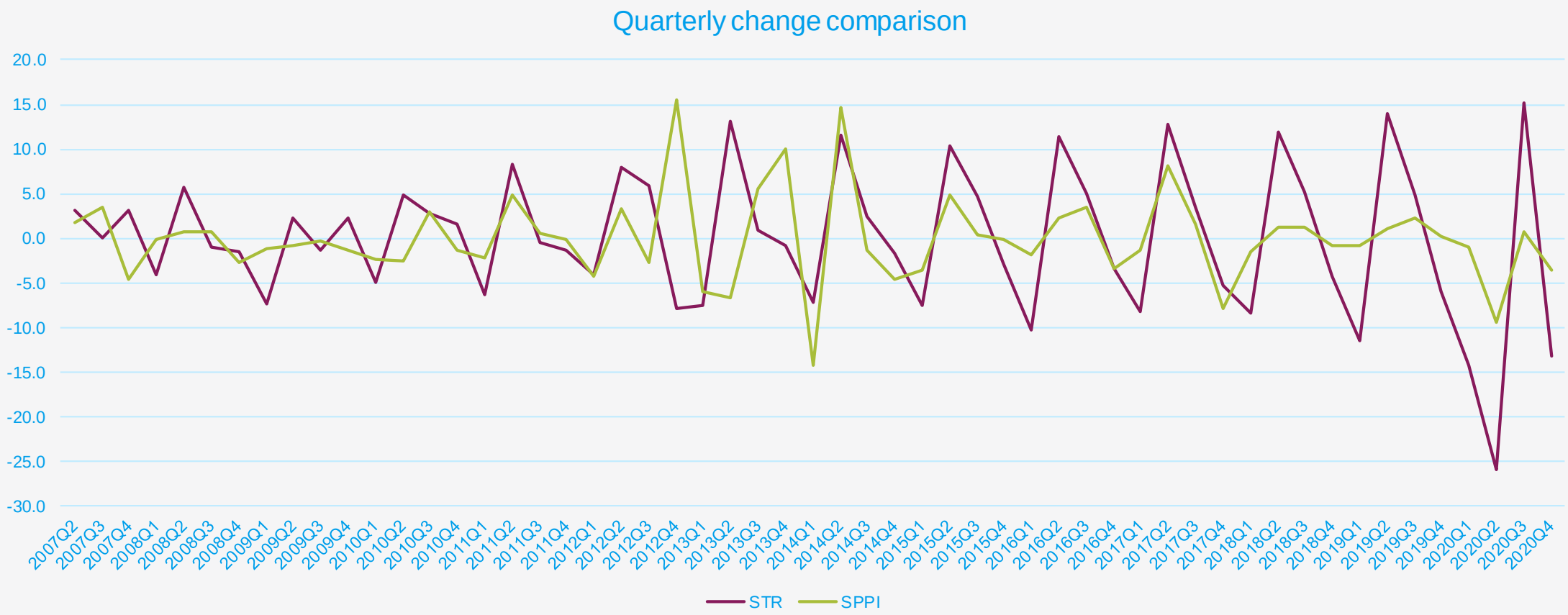
  Rest of UK – Conference/Exhibition Room Hire (1.76%)

- Since the pandemic, response rates have been affected with fewer business responding to the questionnaire, however pre-pandemic this industry saw a combined imputed weight of only 5.4%

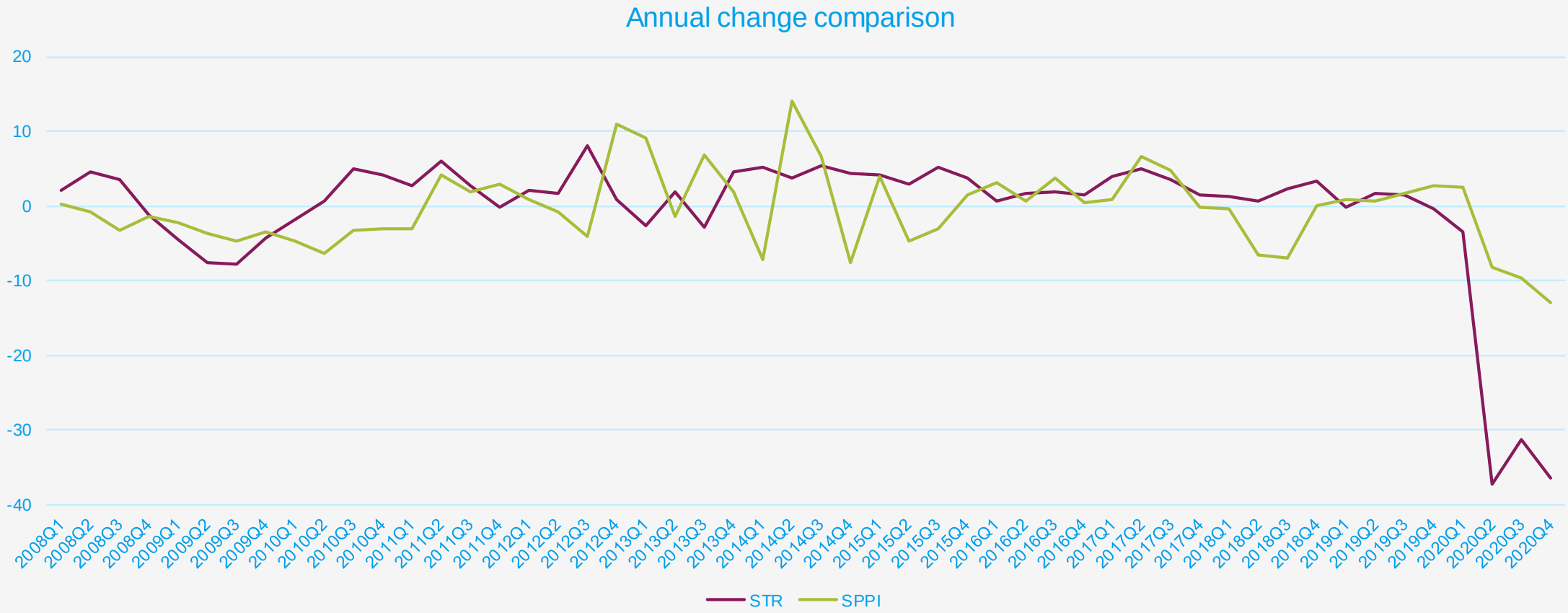
Index values comparison (2008=100)



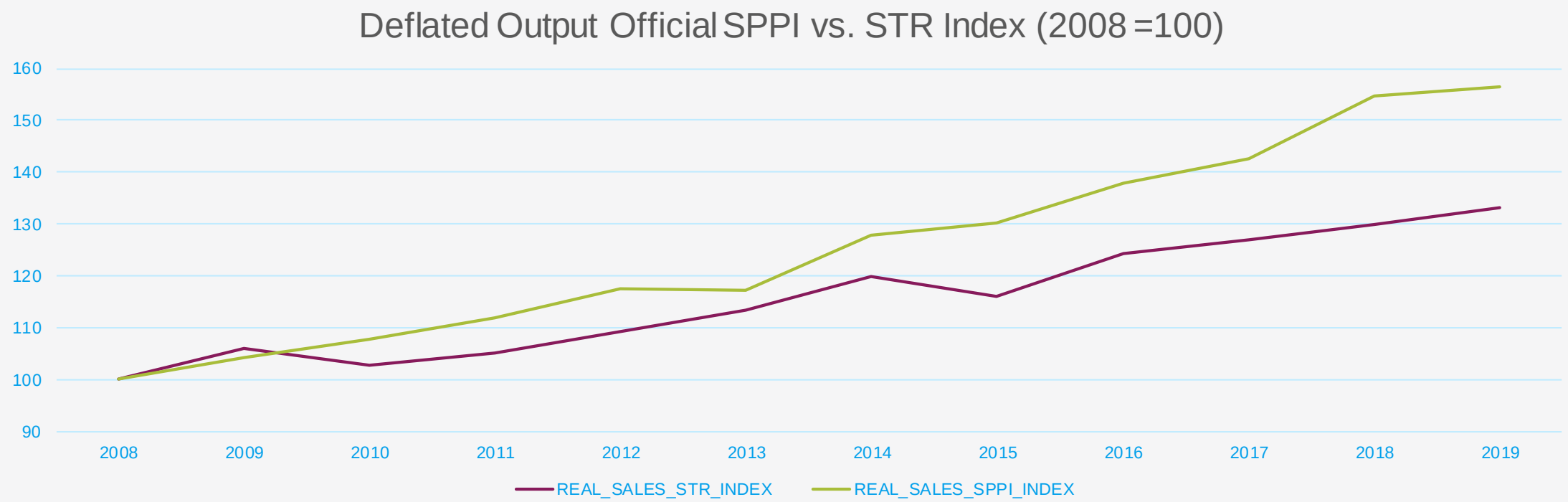
Quarter on quarter growth comparison



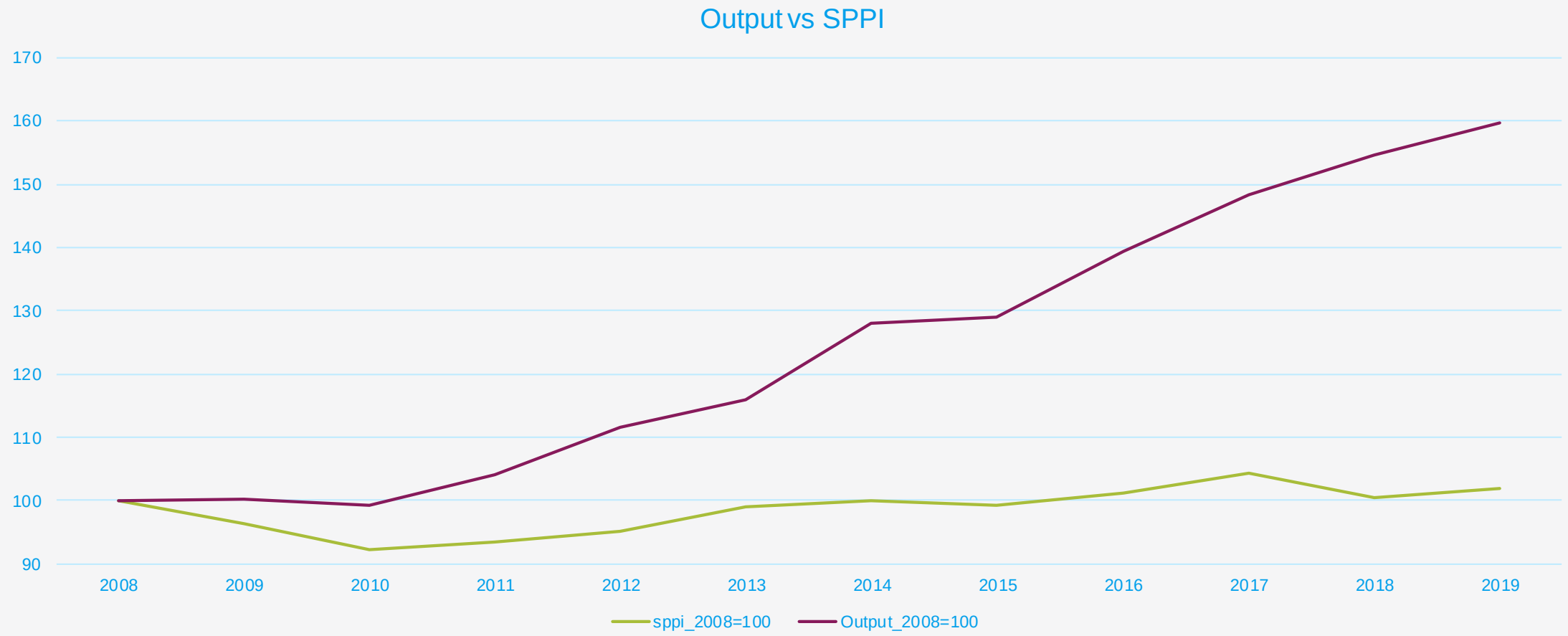
Year on year growth comparison



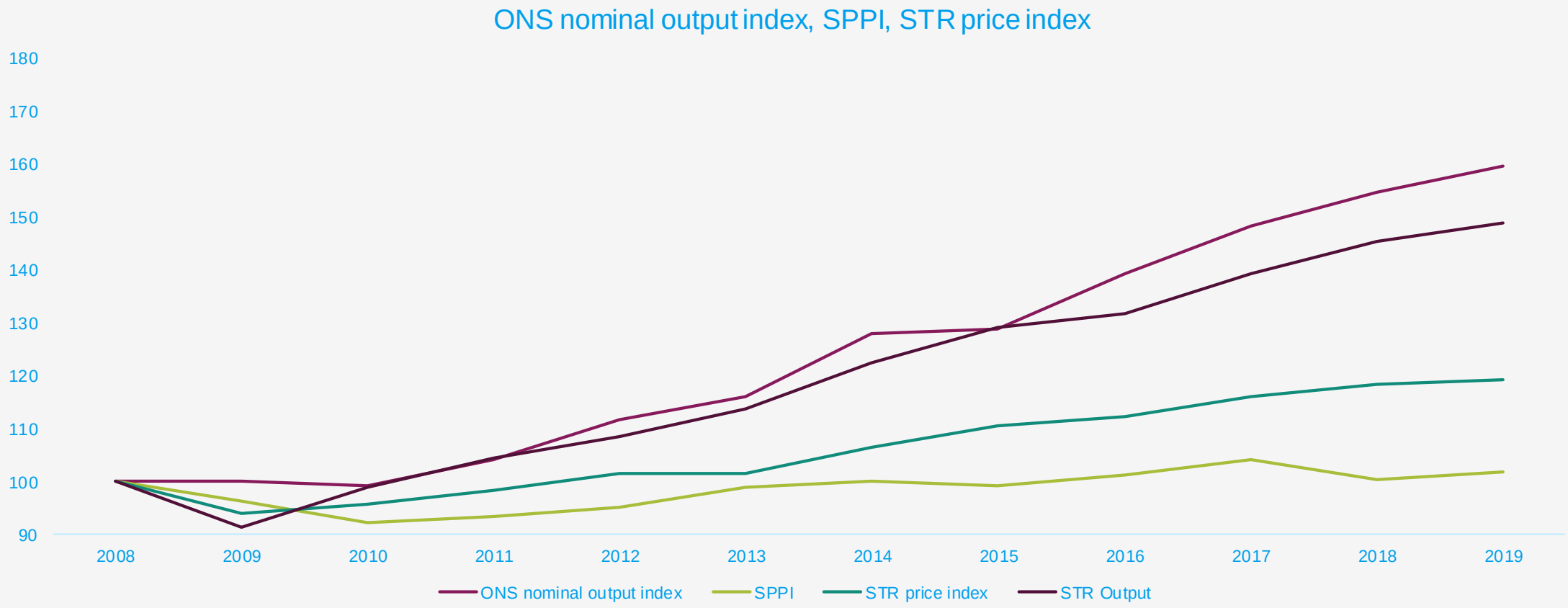
Deflated output SPPI vs. STR



Comparison of Nominal Output vs SPPI



Comparing nominal output, SPPI, STR price index and STR output



Final thoughts

- The STR data appears more volatile that SPPI. Reasons for why this may be the case are
  - Limited cut of the data – hotel classification needed
  - Bias in data collection methods- seasonality?
  - SPPI vs STR sample – location bias
- Both indices show the fall during the start of the pandemic
- Data sources for unit value are limited

IMF collaboration - Comparison of unit value and transaction pricing in Accommodation (Japan)

2021 Voorburg meeting

Moegi Inoue
The Bank of Japan

1. Description

✓Collection and Pricing methods are similar between STR and SPPI while STR has a much larger sample.

	STR	SPPI	CPI
Scope	B to All (excluding Ryokan, cheap lodging house)	B to B (mainly focusing on economy hotels)	B to C (including Ryokan)
Sample	About 1400	undisclosed	About 400
Collection Method	Directly reported from each hotel	Directly reported from each hotel	Web scraping
Pricing Method	- Average Dairy Rate(ADR) - ADR is calculated by dividing all revenues of samples by total number of occupied rooms.	- Average Dairy Rate (ADR) - Weighted-average of ADR of each hotel.	-Direct use of repeated transaction (specifying particular plan, e.g. 1 night at Japanese-style room with 2 meals)
Frequency	Dairy, Weekly, Monthly	Monthly	Monthly

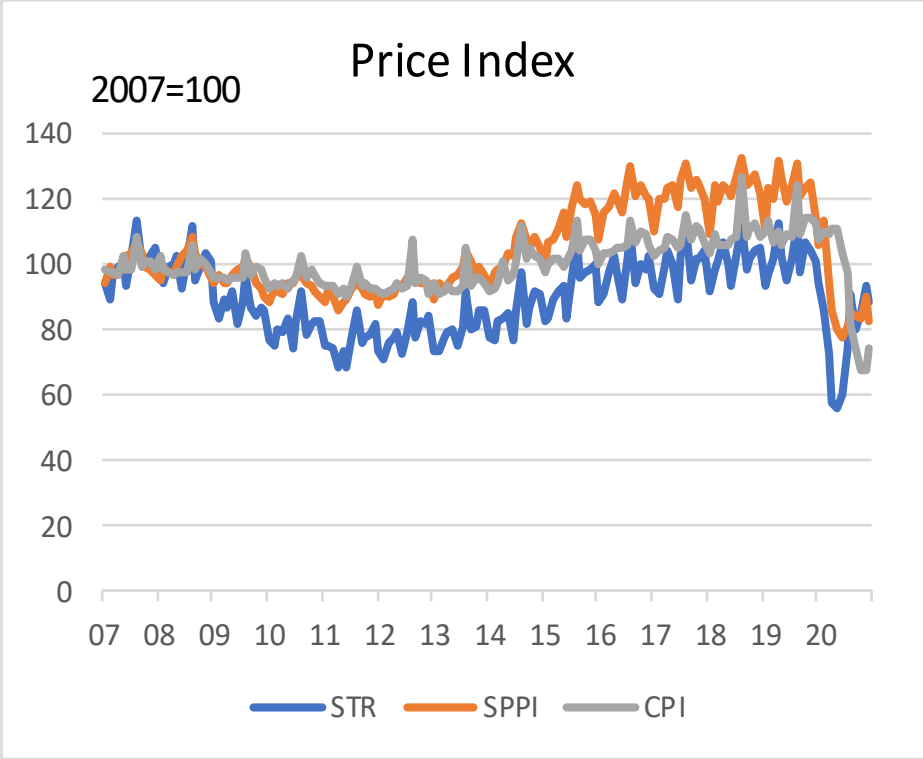
Note1： Ryokan is Japanese-style hotel.

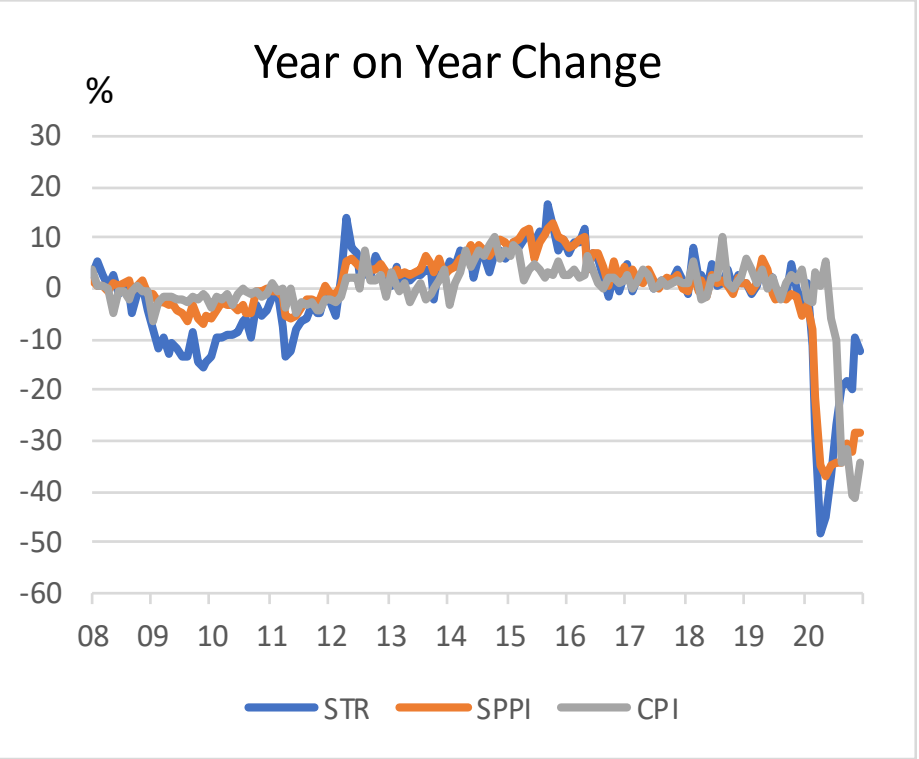
Note2： ADR= revenues /the number of occupied rooms.

2. Price index

✓STR index and SPPI follow similar trends.

- However, STR has downward trends in 2009 and in March to May 2020, which can be caused by the change in the composition ratio of samples (STR can move downward when cheaper hotels are more transacted because STR is calculated by dividing all revenues of samples by total number of occupied rooms, not aggregating each ADR of hotel like SPPI).

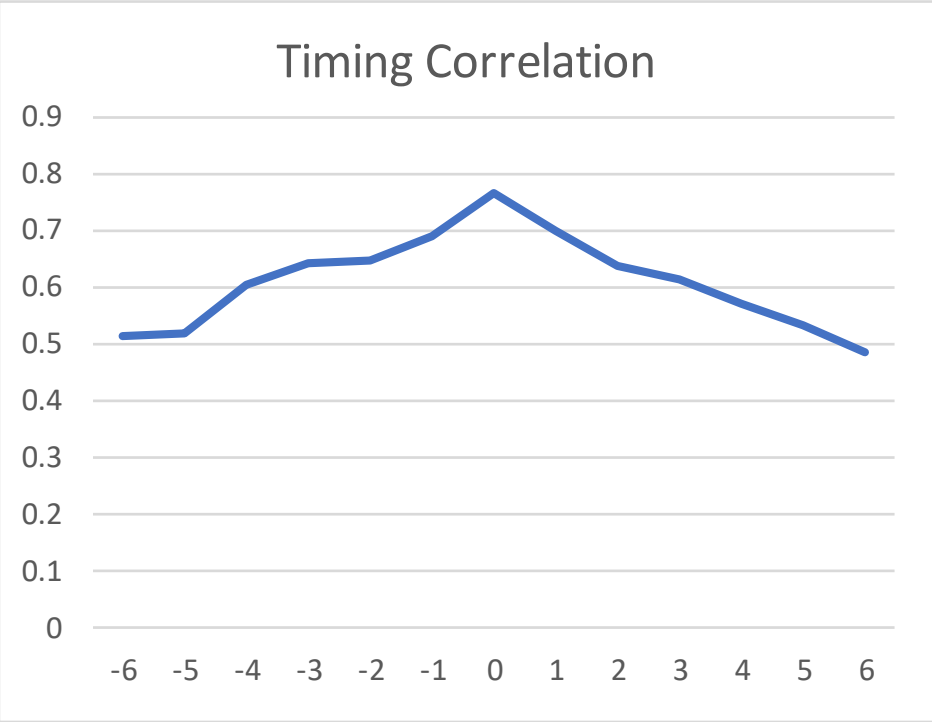


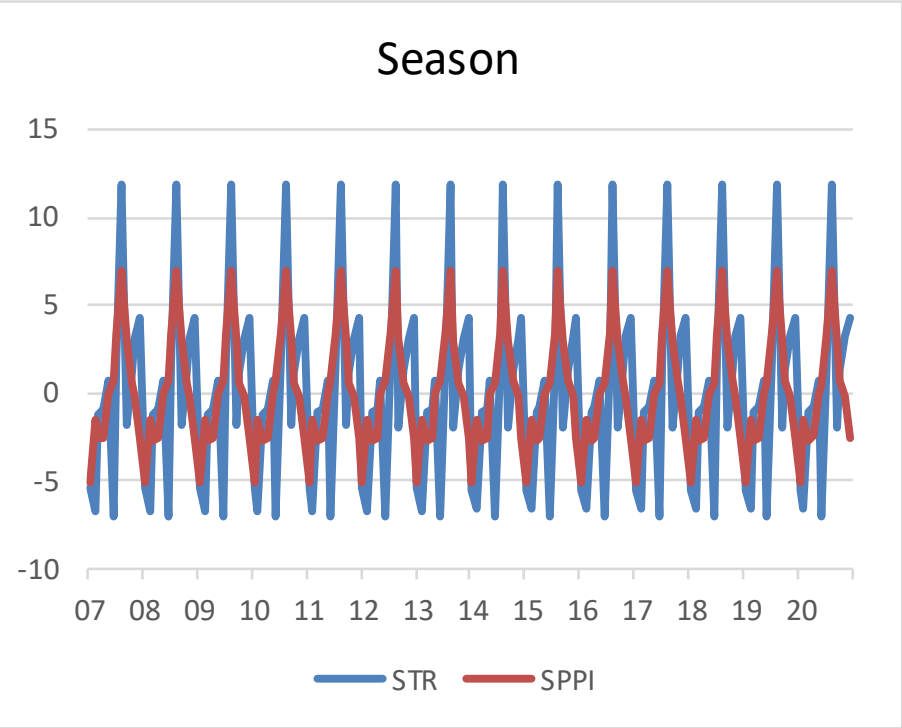


3. Seasonality

✓Although the seasonality is also similar as the time correlation shows (zero lag is the highest), STR seems to have the stronger seasonality.

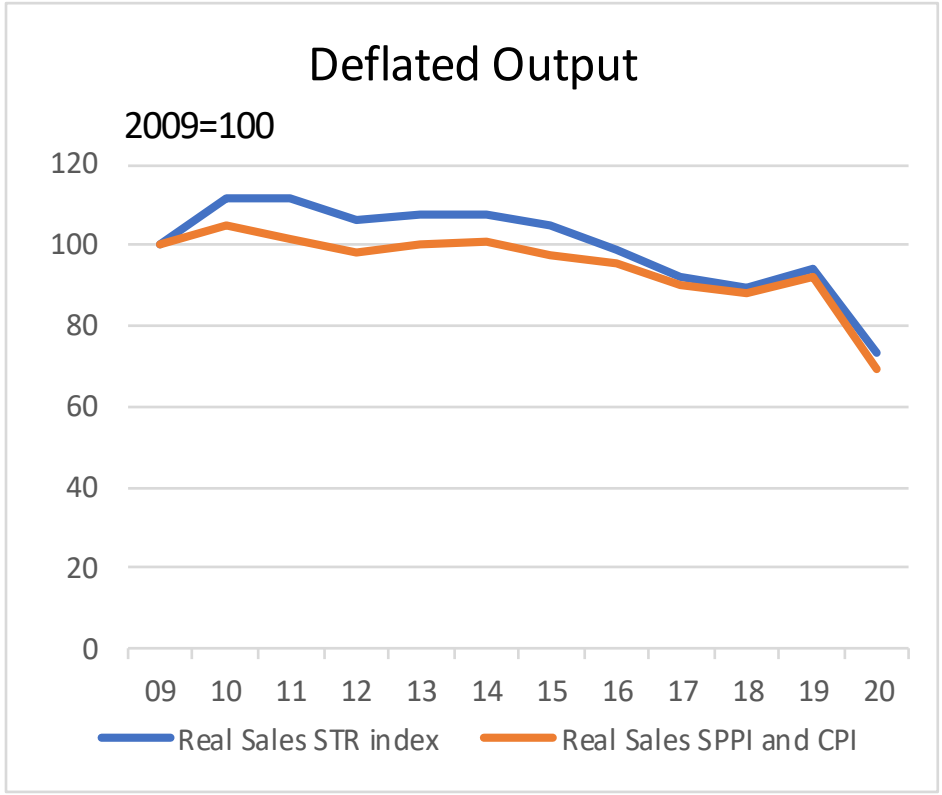
- STR index increases more than SPPI in August, decreases in June and increases at the end of the year. This could be because STR index is more affected by tourism demand (e.g. vacation, rainy season) while business demand is not so much affected as observed in SPPI.

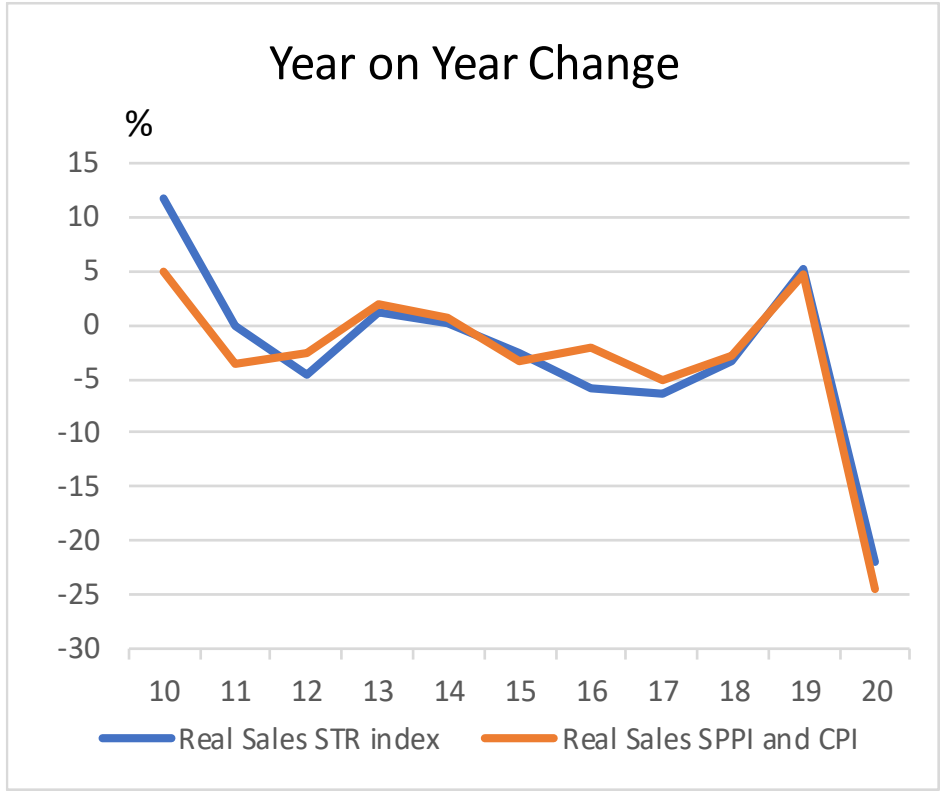




4. Deflator

✓From the perspective of the function as a deflator, the difference between two indexes seems to have little impact on the real output.





India's Price Index- Hotel Services (CPI vs STR)

Ms Rupa Dutta

Mr. Ram Singh

Office of the Economic Adviser

Department for Promotion of Industry and Internal Trade

Ministry of Commerce & Industry

Government of India

Hotel Industry in India

- Indian tourism and hospitality industry have emerged as one of the key drivers of growth among the services sector in India.

- As per World Travel Tourism Council (WTTC) Economic Impact 2019 report, India's Travel & Tourism GDP contribution grew by 4.9 percent.

- The industry is considered as a major job provider across the country. During 2014-2019, India had witnessed the strongest growth in the creation of jobs of about 6.36 million (WTTC report)

- The sector also attracts most FDI inflows for India.

Official CPI for Hotel lodging charges

- Currently, in India Consumer Price Index (CPI) with base 2012=100 including Hotel lodging charges is released by National Statistics Office (NSO), Ministry of Statistics and Programme Implementation on a monthly basis.

- **Hotel lodging charges** has been defined as *"the lodging charges paid by an individual for staying in a hotel (short term)"*

- Expenditure on hotel stay during official tours covered by travelling allowance paid by the employer is excluded. Lodging charges are considered for price collection only in urban sector.

- Item basket has been prepared state-wise using the data of Consumer Expenditure Survey conducted by the NSO during the year 2011-12.

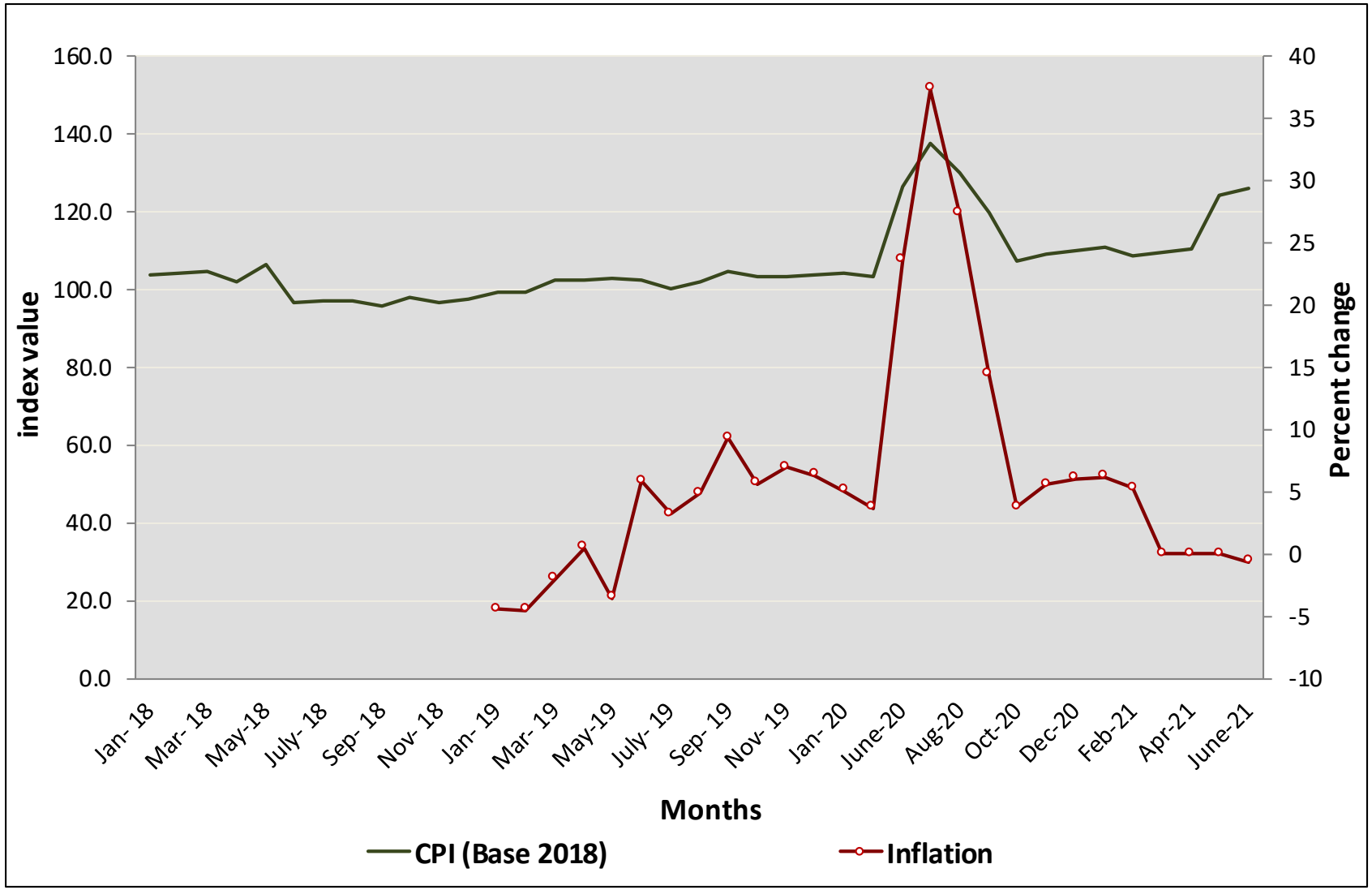
CPI- Hotel services

- **Base Year:** 2018 (Calendar year)
- **Data Source:** All India Item Combined Index (Base 2012) for hotel lodging charges, available from January, 2014 onwards.
- **Coverage:** Total of 167 hotels, lodges, guest houses spread across six States.
- **Weight:** Consumer Expenditure Survey -2011-12
- **Categories:** Executive/Deluxe, Economy, Standard (double/single).
- **CPI – hotel services:**

  *[Combined index value in a particular month/ Geomean (index value from Jan-Dec, 2018)] *100*
- **Inflation trend:**

  *[(Current CPI value- Previous CPI value)/Previous CPI value]*100*

CPI- Hotel services



STR - Hotel services

- **Base Year:** 2018 (Calendar year)

- **Data Source:** Average price data for India, UK and Japan from Smith Travel Research (STR) for the year 2018, 2019 and 2020 has been provided by International Monetary Fund (IMF).

- **Coverage:** 5,070 Indian hotels (average). Trailing 7-day average rates for the entire country for each week in a year.

- **Total rooms demanded:**

  = Sumif [Range (all weeks of the year), Criteria ("Month of the year"), Sum_ range (Rooms demand in the year)]

- **Total revenue:**

  = Sumif [Range (all weeks of the year), Criteria ("Month of the year"), Sum_ range (revenue in the year)]

STR - Hotel services

- **Average Daily Rate (ADR):**

  Total revenue in a month of the year/Total rooms demanded in the same month of the year

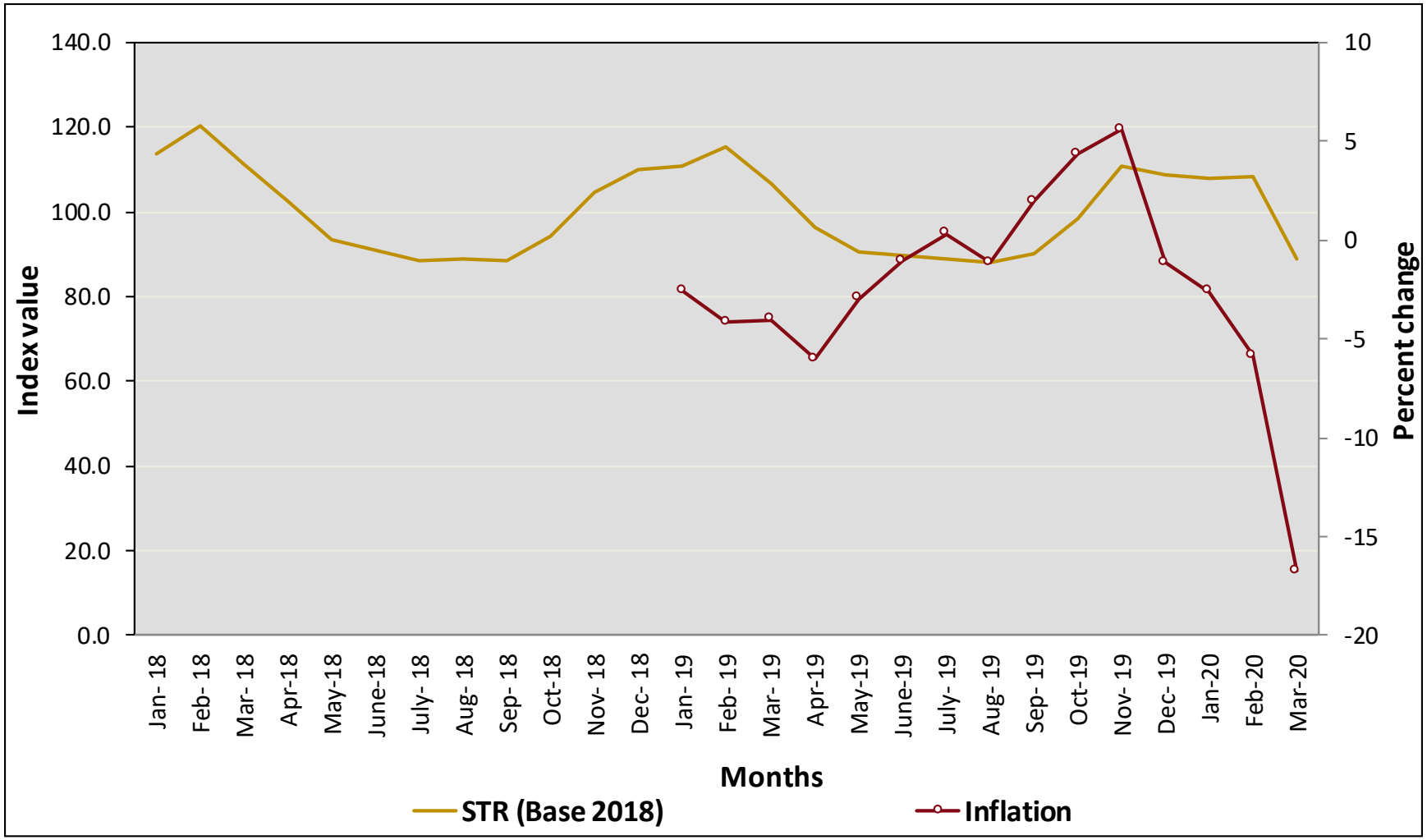
- **STR– hotel services:**

  *[ADR value in a month/ Geomean (ADR value from Jan-Dec, 2018)] *100*

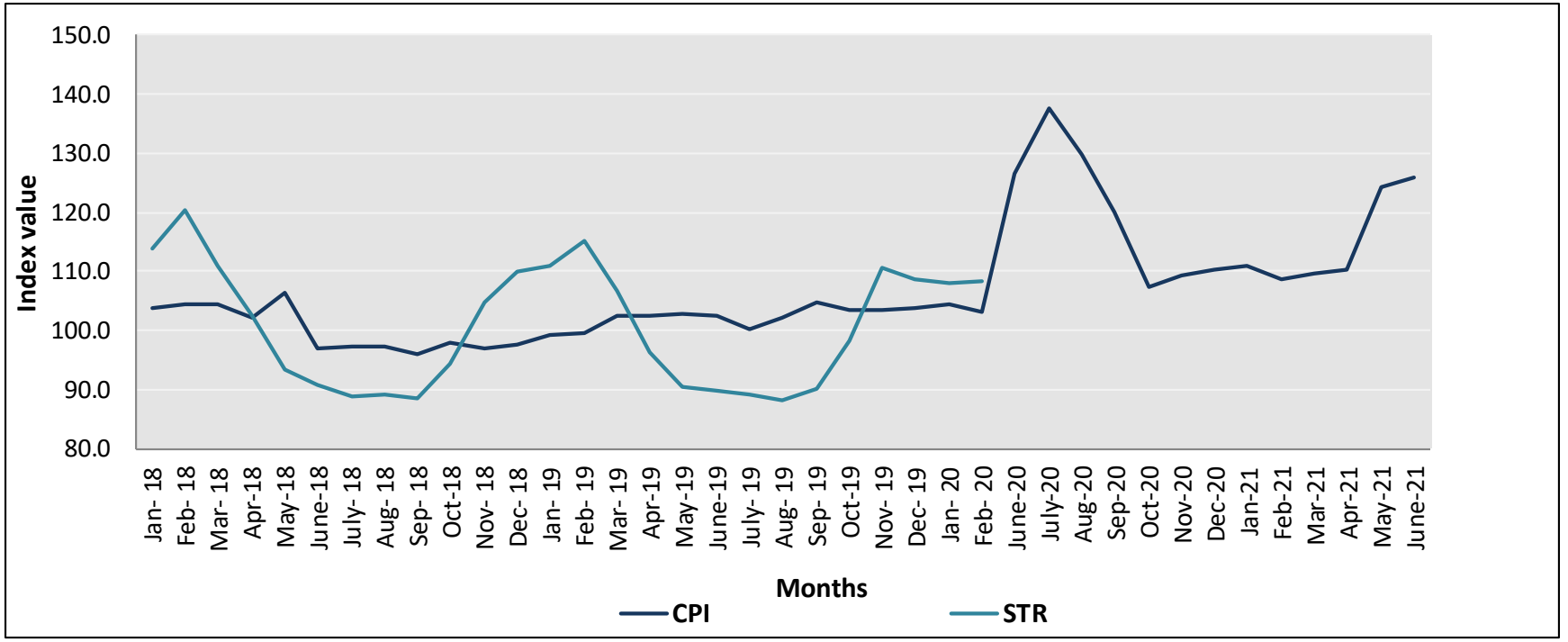
- **Inflation trend:**

  *[(Current STR value- Previous STR value)/Previous STR value]*100*

STR- Hotel services



Comparison: CPI vs STR



The trend pattern of India's CPI & STR is not similar, may be due to the fact that data sources and the methodology are different and difference in the coverage of hotels between these indices.