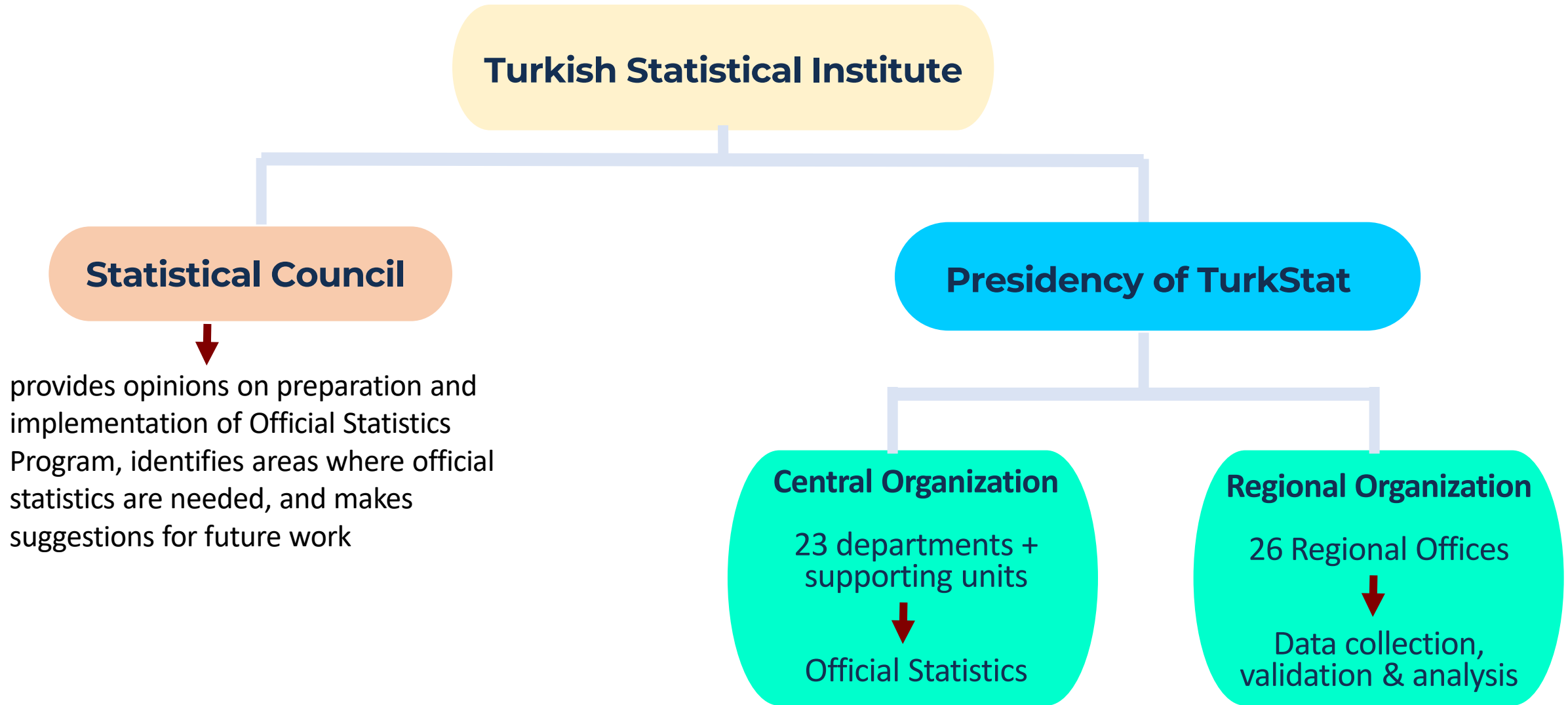


40th Voorburg Group Meeting



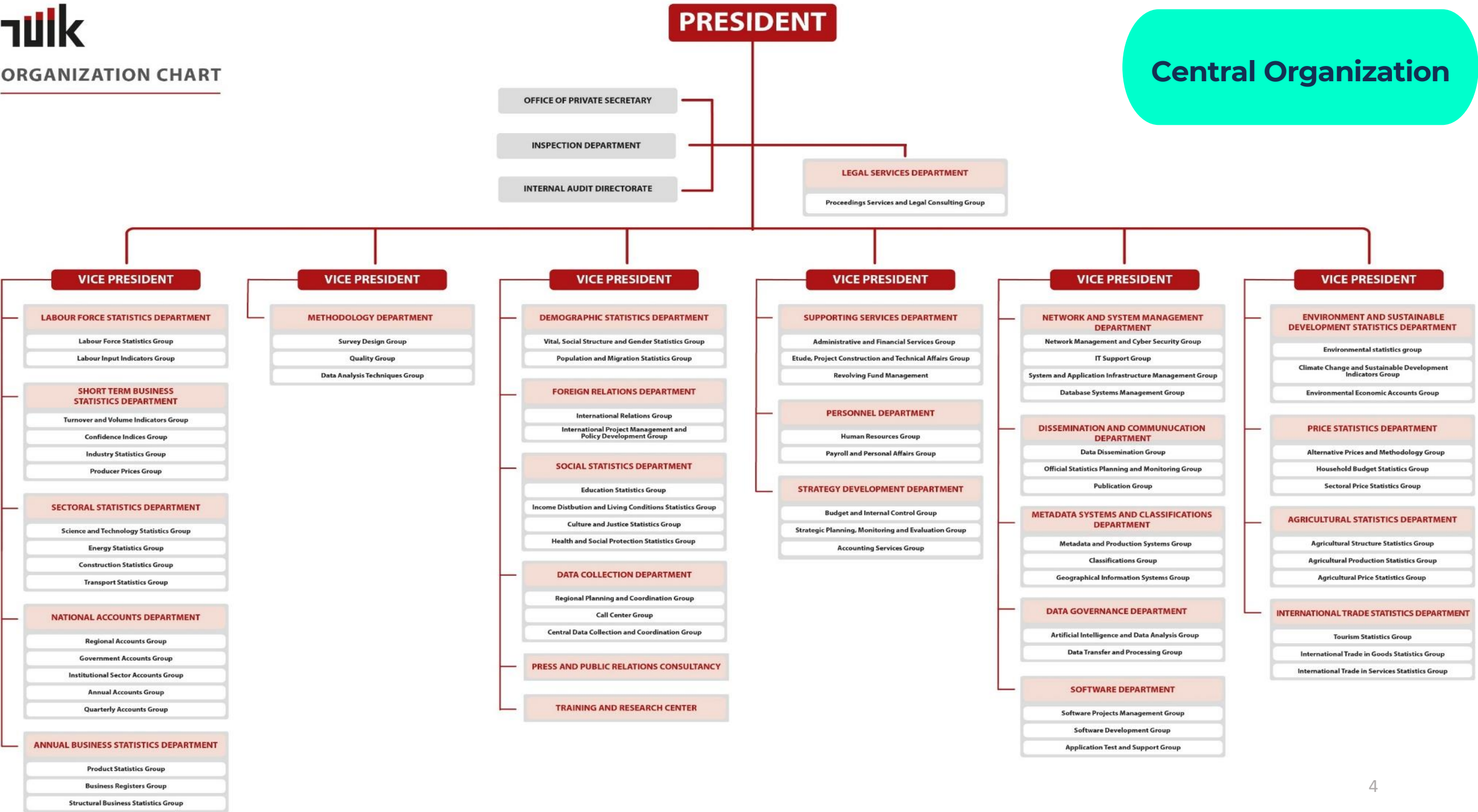
Usage of hourly-rate method for SPPI in labor intensive sectors and quality adjustment considerations

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TurkStat



Regional Organization





Services

- Services has the biggest share of GDP in the whole world.
- In Turkish economy, the share of services in GDP has arised to almost 60% (including the wholesale and retail trade) in recent years.
- Services represent a large and growing share of modern economies, but measuring their price development is challenging.
- **SPPI answers the question:**
“How are the prices of services produced by businesses changing over time?”
- What does SPPI measure?
- Service output → Price received by producer → Price change over time



SPPI

SPPI measures the change over time in the prices received by domestic service producers for their output.

SPPI provides an essential price indicator for:

- **National Accounts** → Deflation of current-price service output
- **Economic Analysis** → Monitoring inflationary pressures in the business sector
- **Business & Market Analysis** → Tracking changes in service prices, for pricing and contract decisions
- **Policy & Decision Making** → Evidence for economic policy and sectoral analysis



FRIBS

The **FRIBS**- Framework Regulation Integrating Business Statistics- brings many new works to SPPI as all other short-term business statistics.

Under FRIBS, national statistical institutes are expected to:

- maintain representative service specifications,
- replace disappearing services using internationally accepted replacement methods,
- apply explicit quality adjustment where service characteristics change,
- use weights based on current turnover,
- compile chain-linked Laspeyres-type indices,
- publish seasonally adjusted series where appropriate,
- document revisions and methodological changes transparently.



FRIBS

For a statistical office modernizing its SPPI under FRIBS, the main priorities are:

Priority	Current FRIBS expectation
Target price concept	Business-to-All (B2All) transaction prices
Industry coverage	Broader industry coverage using NACE/CPA classifications
Base year	2025 = 100
Classification	CPA 2.1 for products and NACE-based activities during the current transition period
Frequency	Quarterly (with some optional monthly domains)
Transmission	T + 3 months
Price basis	Actual transaction prices excluding VAT
Data sources	Survey data supplemented by administrative and digital sources
Quality adjustment	Mandatory where service characteristics change

TurkStat SPPI Methodology

- Classification: CPA Rev 2.1
- Sampling: Firms with turnovers greater than 70% (top-down),
- Weight Sources: Services turnover survey for CPA product groups (6-digit),
National Accounts for 3-digit and upper levels,
- At firm-level: Short-term service statistics and administrative data,
- Items under firms: Administrative data for very big firms, others equal share,
- Data collection: From the web with a form designed separately for each pricing method,
- Period: Monthly,
- Index formula: Laspeyres (chain-linked)

TurkStat SPPI Methodology

- Base year: 2021=100,
- Number of items: 9553,
- Number of firms: 3065,
- Number of product groups, by CPA 2.1: 306,
- Coverage: Turkey, H-I-J-L-M-N sectors of STS,
- No seasonal adjustment,
- No revisions,
- Dissemination in turkey: t+30, H-I-J-L-M-N sectors and 2-digit levels.

Why is measuring service prices difficult?

- Unlike many manufactured products, services are often **intangible, heterogeneous and customized**.

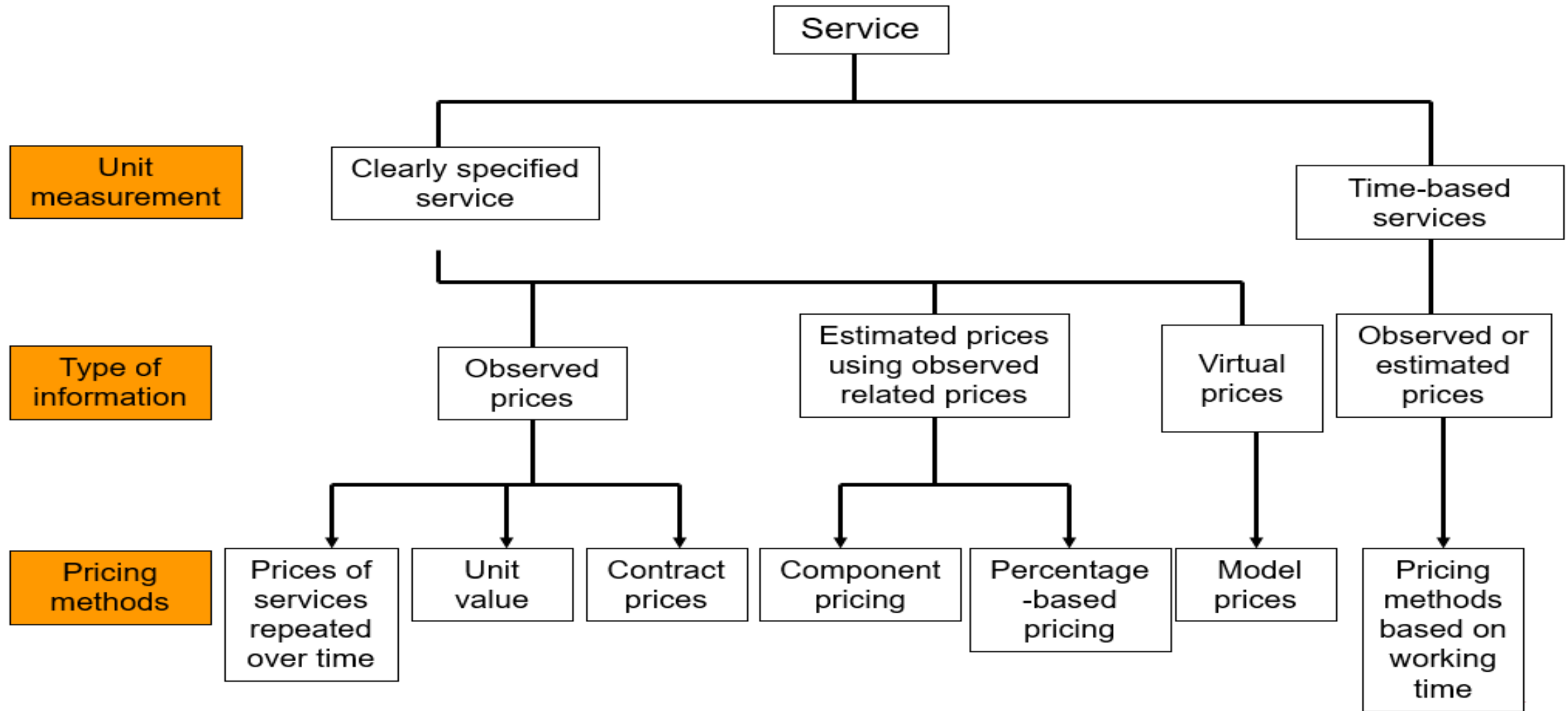
Goods

- Often physically observable
- Relatively standardized
- Easier to identify a unit of output
- Prices can often be directly observed
- Product changes may be visible

Services

- Often intangible
- Frequently customized
- Output unit may be difficult to define
- Prices may depend on contracts, time, quality and scope
- Quality changes can be difficult to identify

- How can we measure a **“pure” price change** when the service itself may change?
→ This is where different SPPI pricing methods become important.



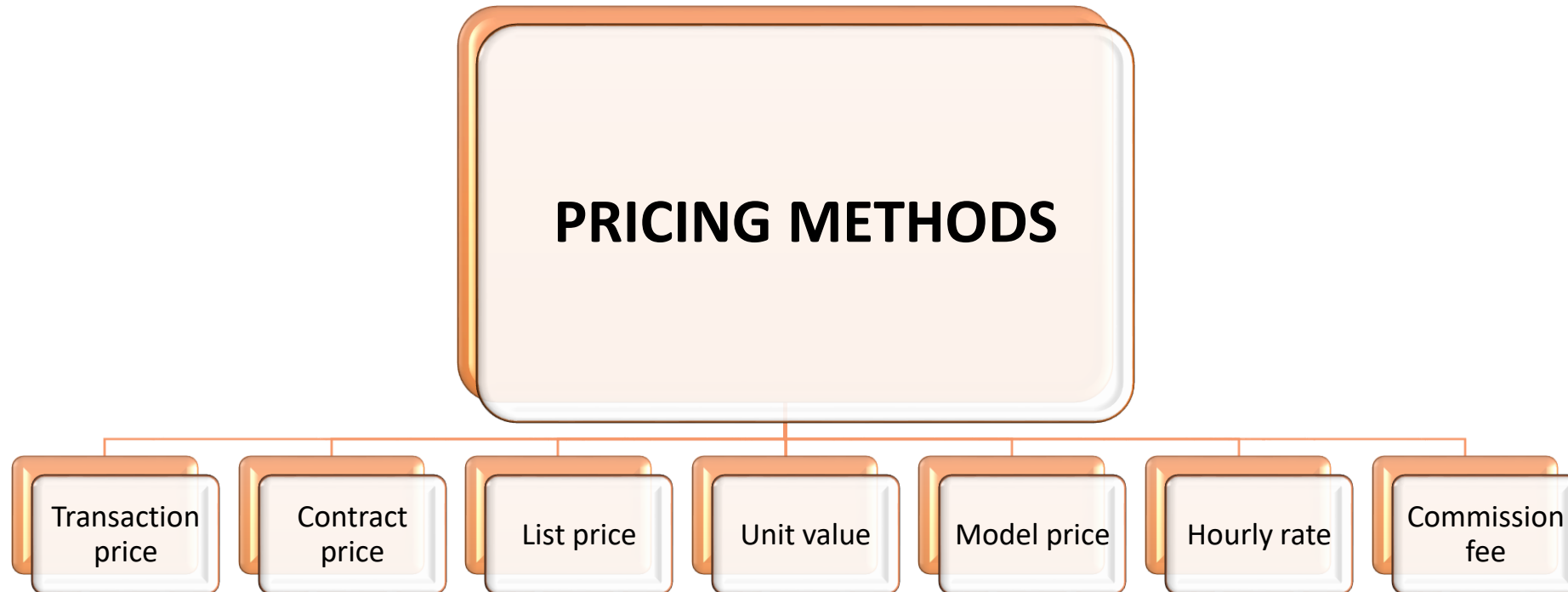
- **Observed prices**

- **Prices of services repeated over time:** Prices are collected from actual transactions or price lists.
- **Unit value:** When services are homogeneous, the total billing value of service can be divided by the quantity of the service performed.
- **Contract prices:** Service providers select one or more specific service contracts that are recurring over time.

- **Estimated prices**

- **Component pricing:** The service is divided into a number of key components and each is priced separately.
- **Percentage-based pricing:** The price is estimated by multiplying the percentage charged by the value of the service to which the percentage is applied.

- **Virtual prices**
 - **Model prices:** The price of a fictitious service or model agreed upon by the statistical office and the company is collected.
- **Observed or estimated prices, when the service can not be clearly specified:**
 - **Prices based on hourly costs:** The price of a standard amount of work (e.g., one hour) for different labour categories within the company is collected.



The Hourly-Rate Method

The **hourly rate method** (or hourly charge-out rate method) in the **Services Producer Price Index (SPPI)** is a pricing technique that measures service price changes based on the time-based fee charged for a specific category of labor or expertise.

An SPPI is intended to measure changes in the prices received by producers for their service output. It is therefore not equivalent to:

- a wage index;
- a labour-cost index;
- an employment-cost index; or
- an index of hours worked.

The Hourly-Rate Method

Suppose that a law firm charges €100 per hour for a senior lawyer. The €100 is not the lawyer's wage. It is the amount charged to the customer for an hour of service provided by that category of professional.

The difference may cover overheads, capital costs, administrative costs, profit margins and other components.

Hourly charge-out rate $\neq$ Hourly labour cost

The statistical office must focus on the price paid or charged for the service rather than on the cost of producing it.

How does the hourly-rate method work?

An example

If an engineering company reports:

September 2025

Hourly charge-out rate:

TRY 1,000

September 2026

Hourly charge-out rate:

TRY 1,200

Then:

$$I = 1,200 / 1,000 \times 100 = 120$$

Price change

+20%

The price charged for one hour of the specified service increased by 20%.

But does one hour represent the same quantity and quality of service in both periods?

How does the hourly-rate method work?

September 2025

100 hours × TRY 1,000
= **TRY 100,000**

September 2026

70 hours × TRY 1,200
= **TRY 84,000**

Hourly rate
+20%

Project price
-16%

Why?
Productivity increased.

This is the fundamental **productivity-bias problem** with time-based pricing.

How does the hourly-rate method work?

The service can change even if the hourly rate does not.

☐ Human capital

- Experience and qualifications
- Seniority
- Specialization

☐ Technology

- Software
- Automation
- AI tools and digital platforms

☐ Service characteristics

- Complexity and scope
- Deliverables
- Response time

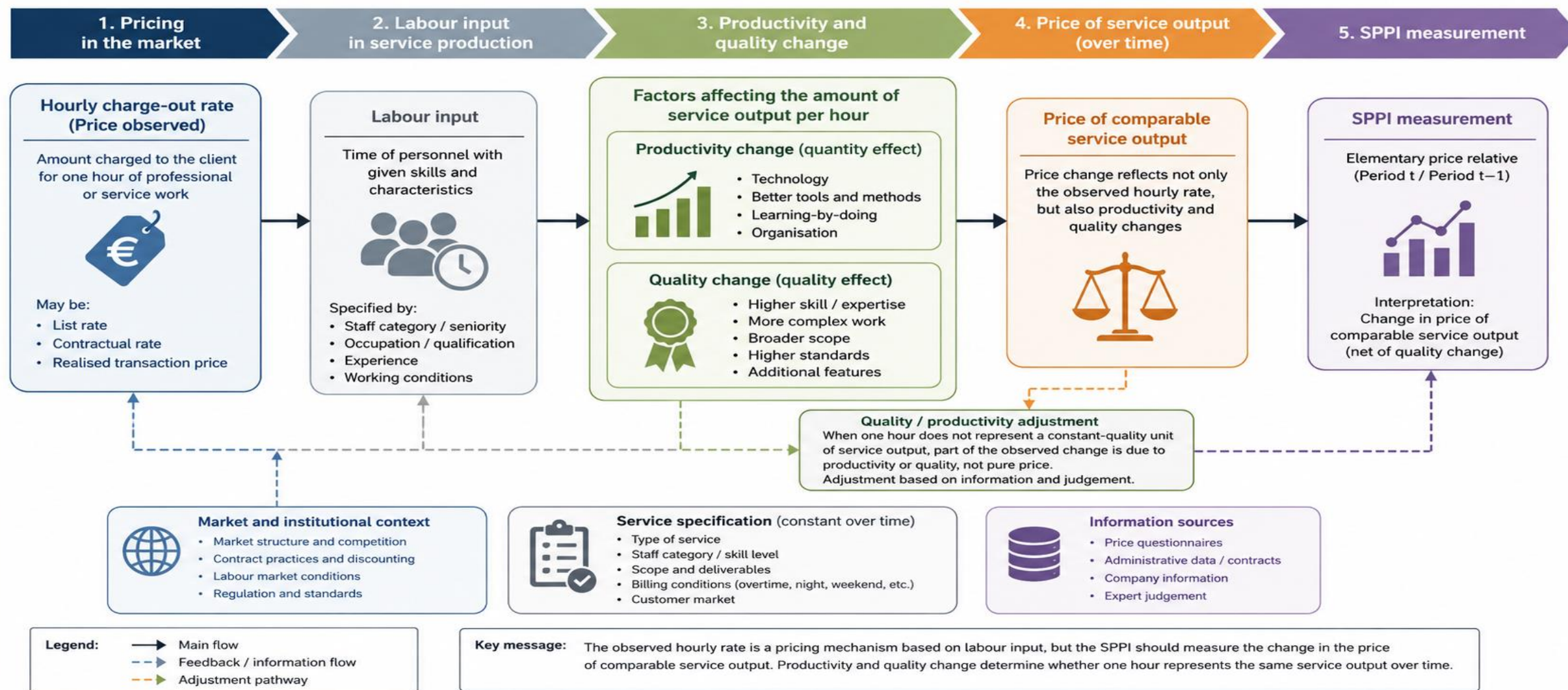
Where hourly-rate pricing is appropriate?

- The hourly-rate method is particularly suitable for professional and labour-intensive sectors.

The ideal situation is where we have 4 factors:

- ☐ A clearly defined service,
 - ☐ A clearly defined staff category,
 - ☐ An observable hourly-rate,
 - ☐ A relatively stable billing mechanism.
- However the method becomes weaker when the customer is actually buying an outcome rather than time. In such a case, hourly-rate may not represent the price of final output very well.
 - Method selection should follow the actual pricing mechanism in the market, rather than applying the same method automatically across all services.

The hourly-rate method: from pricing mechanism to SPPI measurement



Turkish Experience

Prices based on hourly-rate method: The price of a standard amount of work (e.g., one hour) for these labour categories are collected in Turkey.



Activities mostly using hourly-rate:

- 62 Computer programming, consultancy and related services,
- 69 Legal and accounting services,
- 71 Architectural and engineering services; technical testing and analysis services,
- 78 Employment services,
- 80 Security and investigation services,
- 81 Services to buildings and landscape

NACE 62 - Computer programming, consultancy and related services

This sector includes software development, programming, IT consultancy, system design etc.

- Highly labour-intensive
- Customized projects
- Professional staff
- Difficult to identify identical transactions
- Hourly charging is common

e.g. The hourly rate for a senior software consultant

Main quality risks: Technology + productivity + skill composition

This is probably one of the sectors where the productivity-bias issue is most visible.

NACE 69 - Legal and accounting services

This sector includes legal advisory and representation services concerning criminal law, business law, labor law etc. Especially for 69.1 legal services, the hourly-rate is used.

Professional services are frequently priced by:

- Partner/senior professional
- Specialist
- Associate
- Assistant

Main quality dimensions

- Expertise
- Complexity
- Responsibility
- Specialization, experience

e.g. The hourly rate of a junior lawyer

Key risk: Changes in staff composition can appear as price changes.

NACE 71 - Architectural and engineering services; technical testing and analysis services

This sector includes architectural & engineering and technical testing firms.

- Project-based
- Customized
- Technically complex
- Often unique
- Difficult to repeat identically

Pricing options: **Hourly rate** versus **Model pricing** versus **Contract/project price**

e.g. The hourly rate of a senior civil engineering consultant

Quality risks

- Project complexity
- Technology and productivity
- Scope
- Professional expertise

NACE 78 - Employment services

This sector includes

- Temporary employment
- Personnel placement
- Recruitment
- Workforce supply

Special characteristic

The service itself involves supplying labour to another business.

e.g. The hourly rate of a temporary worker

Worker's wage $\neq$ Agency's charge to customer

Customer price = Labour cost + Agency margin + Other costs

The wage pass-through is a pure price change, however worker composition is about quality change.

NACE 80 - Security and investigation services

This sector includes security guards, monitoring, investigation and specialized security services.

Typical pricing structure

Personnel × hours × charge-out rate

e.g. The hourly-rate for a standard security guard

Quality dimensions

- Qualification
- Risk level
- Number of personnel
- Response time (day or night)
- Equipment
- Specialized training

Main concern

Is one security hour always the same service?

NACE 81 - Services to buildings and landscape

This sector includes general cleaning, industrial cleaning, building and landscape maintenance.

Why hourly rates?

Simple + observable + labour-intensive

e.g. The hourly-rate for a commercial cleaning service

Quality dimensions

- Frequency
- Surface type
- Special equipment and additional tasks
- Required standards

Key risk: Cleaning technology causes a potential productivity-bias.

What has to be considered?

Quality assurance indicators

☐ **Price data**

- Movements of time series
- Persistent unusual changes

☐ **Labour information**

- Staff categories and their skill levels
- Employment structure

☐ **Service information**

- Scope and complexity
- Contract type
- Customer type

☐ **External information**

- Technology
- Productivity
- Market conditions

Turkish Experience

In general , some basic problems of the hourly-rate method are similar for each of these sectors.

- In Turkey, firms are sometimes unwilling to agree to share the transaction prices, because of discontinuity of same-quality service products. When the firm experts can not determine a real price, their response will be hourly-rate method.
- Hourly-rate method includes many quality problems, since the firms respond that they could not separate some complex works.
- The off days of the employees on especially the holiday seasons form the root reason of the volatility. The working hours are affected by the national and regional holidays, significantly. Our regional holidays' periods are changing every year. (annual rates affected) The revenues don't change, whereas the working hours fluctuate.

Turkish Experience

- In some law firms (69) they can not match the specifications of certain employees to certain revenue of cases and the hourly-rates can not be separated according to their seniority. This creates a quality problem.
- In some engineering firms (72), there may not be a clear contract so that the hourly-rate of a specialized engineer had not been determined, before the service is provided.
- For 80 and 81, there are circulations of workers such that firms can not overcome the calculations of working hours.

Quality Control and Data Processing

☐ Data cleaning in the Collection Unit

- Change in specification of items,
- Control of missing prices,
- Appearance and disappearance of sub-groups.

☐ Data cleaning in the Promoting Unit

- Controlling the change rates at item levels considering the explanations of firms and the collecting unit,
- Analyzing time series and historical checks,
- Analyzing the contribution rates to upper-level indices,
- Consistency with other sources (administrative data),
- Knowledge of industrial sectors and economic conditions.

Treatment of quality changes

Causes of price change

- 1 Changes in exchange rates
- 2 Seasonality
- 3 Change in costs
- 4 Firm policy
- 5 Campaigns and discounts
- 6 Change in the specifications of the item
- 7 Change in quality
- 8 No sales in current month
- 9 Production and sales have stopped for this CPA level

Quality Adjustments

- Implicit quality adjustments:
 - Overlapping method (when prices are available at same periods)
 - Imputation method (if prices are not available at same periods, then computation made by assumption)
 - a - In firm with the product group (CPA) change
 - b - In firm with the product group (CPA) change, excluding outlier
 - c - by the product group (CPA) change
 - d - by the product group (CPA) change, excluding outlier

Quality Adjustments

- Explicit quality adjustments:
 - Information provided by experts
 - This is implemented when there are some updates mentioned by the firm, for the past periods,
 - Some calculations made by the experts, comparing the current prices with the base prices (p_0) which are the December prices of the last year.

Hourly-rate method: strengths and weaknesses

Strengths

- Relatively easy for respondents
- Regularly observable
- Suitable for labor-intensive services
- Stable price observations
- Useful where transaction prices are difficult to identify
- Practical for customized professional services

Weaknesses

- Potential productivity bias / May overstate price increases when productivity rises
- Sensitive to staff composition
- May mix wage and margin developments
- Difficult to maintain constant quality
- Can fail to capture technological improvements

Conclusions and Discussion

- Hourly-rate pricing is practical and valuable for labour-intensive services.
- The main methodological challenge is not calculation - it is constant quality.
- Productivity and technological change must be considered when interpreting price movements.

Final questions

- How can we make hourly-rate method more representative for service prices?
- How are staff-composition effects controlled?
- Can administrative data help?
- If possible, when is model pricing preferable?

Conclusions and Discussion

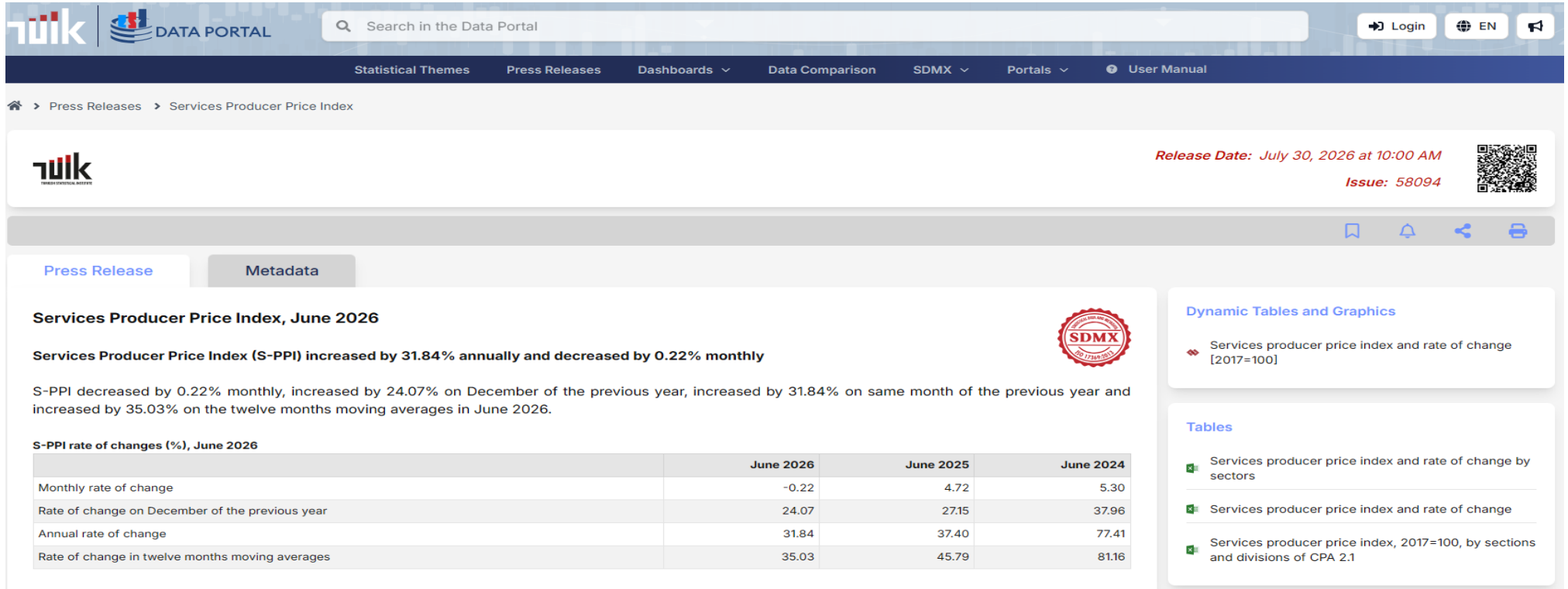
The hourly-rate method is most effective when the statistical specification includes; not only who performs the service and how much an hour costs; but also what service is delivered during that hour and whether the characteristics of that service have changed over time.

Upcoming short-term and long-term plans

- Adapting to NACE Rev. 2.1
- Base year change as 2025=100
- Development of administrative data usage for SPPI, increasing controls from e-invoices, VAT, etc.
- Increasing the use of transaction prices by consulting with sector associations

Dissemination and results

- Press Release and the results of SPPI
[\(https://veriportali.tuik.gov.tr/en/press/](https://veriportali.tuik.gov.tr/en/press/) → Press Release)
<https://veriportali.tuik.gov.tr/en/press/metadata> → Metadata



Services Producer Price Index, June 2026

Services Producer Price Index (S-PPI) increased by 31.84% annually and decreased by 0.22% monthly

S-PPI decreased by 0.22% monthly, increased by 24.07% on December of the previous year, increased by 31.84% on same month of the previous year and increased by 35.03% on the twelve months moving averages in June 2026.

S-PPI rate of changes (%), June 2026

	June 2026	June 2025	June 2024
Monthly rate of change	-0.22	4.72	5.30
Rate of change on December of the previous year	24.07	27.15	37.96
Annual rate of change	31.84	37.40	77.41
Rate of change in twelve months moving averages	35.03	45.79	81.16

Dynamic Tables and Graphics

- Services producer price index and rate of change [2017=100]

Tables

- Services producer price index and rate of change by sectors
- Services producer price index and rate of change
- Services producer price index, 2017=100, by sections and divisions of CPA 2.1

THANKS

