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The Contribution of Electronic Invoicing Data to the survey of Turnover in Services

Focus on selected service sectors

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Italy

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Context

- The use of administrative data, originally collected for fiscal or other purposes, is becoming increasingly important for National Statistical Institutes
- The use of administrative data makes it possible to integrate information from direct surveys
- The integration of administrative data with survey data, also recommended by the European legislation on official statistics, makes it possible to develop a robust system of economic statistics:
 - Timely statistics
 - Lower burden on enterprises

Electronic Invoicing and Economic Statistics

The introduction of electronic invoicing in Italy has created new opportunities for compiling official economic statistics

Data acquired from the Revenue Agency could represent one of the main sources of administrative quantitative information on economic variables of enterprises

The **focus** is to evaluate the feasibility of using administrative data from Electronic Invoicing (EI) from the Revenue Agency to integrate data from the short-term statistics of turnover in services within the production of official statistics

Since 2019, electronic invoicing has been mandatory for both B2B and B2C transactions in Italy, operating through the Revenue Agency's Exchange System. This system increases fiscal transparency, reduces VAT evasion, and simplifies accounting and document storage. It also allows for the creation of a continuous data flow and a comprehensive database, which can be used by public administrations while respecting confidentiality

Presently the data flow can be received on a systematic basis

The Italian Survey of Turnover in Services

The Italian Survey of Turnover in Services (FAS), is a well-established monthly survey that produces high-quality economic indicators according to the EU Regulation 2019/2152. The produced indicators provide intra-annual trends in value and volume of services.

The survey produces unadjusted, seasonally adjusted, and calendar-adjusted, turnover indices at the NACE Rev. 2 division and group level. It covers around 25,000 enterprises across Sections G, H, I, J, L, M (excluding Group M70.1 and Divisions M72 and M75) and N. The enterprises involved provide their data via an electronic questionnaire.

In order to construct the FAS sample the reference population is given from all enterprises recorded in the Statistical Business Register (ASIA). The enterprises are identified through the ASIA code, the unique key assigned to each enterprise in the register and the ATECO code which is the Italian version of NACE classification of economic activities.

For the services sector, estimation domains mostly correspond to groups of economic activity.

The Italian Survey of Turnover in Services

Due to the heterogeneity of structural characteristics across the sectors under examination it is necessary the adoption of various methods for selecting enterprises to participate in the survey. In particular:

➤ Cut-off method

- Sectors dominated by few large firms (e.g. air/water transport, postal services, telecoms, employment)
- Select largest units → cover $\geq 80\%$ of turnover

➤ Stratified random sampling

- Sectors with many homogeneous enterprises stratified by economic activity + enterprise size (employees or turnover)

➤ Random sampling with threshold

- Define subpopulation by employee threshold
- Draw random sample within it

Methodological approach

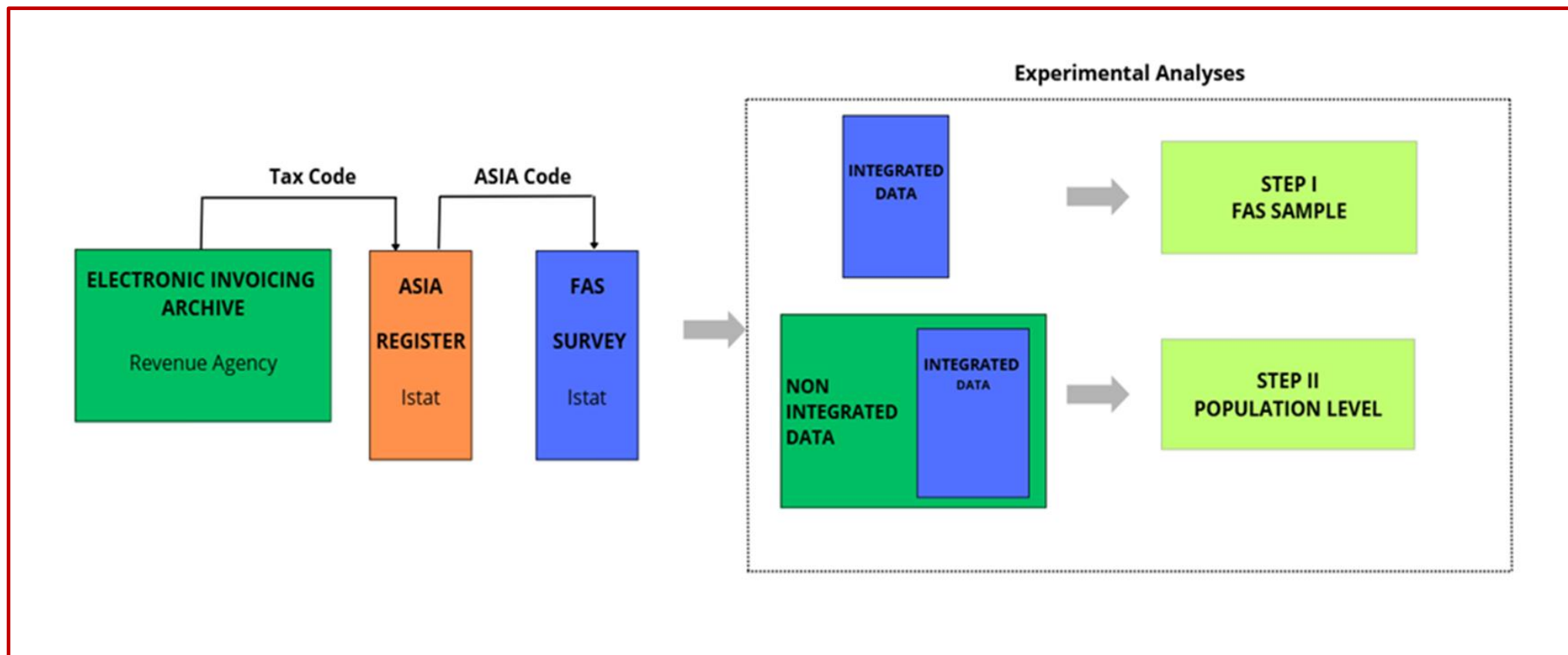
The analysis was conducted at the "stratum" level, defined by the combination of the employee and turnover classes to which the survey unit belongs

The simulation covers a thirteen-month period, from June 2024 to June 2025, with monthly observations

The main objective is to match the enterprises recorded in the Electronic Invoicing (EI) system with those included in the FAS samples, in order to integrate administrative and survey data into a single coherent framework.

Data integration approach

INTEGRATION SCHEME OF ADMINISTRATIVE AND SURVEY DATA



Data integration phases

The integration process is carried out in two successive steps:

1. Identification through Tax Code

Each enterprise in the EI database is identified by its Tax Code. The Tax Codes are linked to the 2023 ASIA register, obtaining the corresponding ASIA code. This step ensures the alignment of EI data with the official statistical business register

2. Linkage with FAS samples

Once matched to ASIA, EI enterprises are connected to the FAS 2024 and 2025 samples using the ASIA code as the common key

Analysis phases

The analysis is also divided into two steps:

➤ **Step I** of the analysis → AT SAMPLE LEVEL

- Integrated data are analysed at the FAS sample level, using the original survey strata, for each period between June 2024 and June 2025
- In total have been analysed 340,000 “enterprise-period” records from the FAS sample, of which 250,000 records were respondents within the reference period.
- FAS and e-invoicing totals have been aggregated according to the strata that characterise the survey

Analysis phases

➤ Step II of the analysis → AT THE POPULATION LEVEL

- The analysis is carried out on a set of enterprises (integrated and non-integrated) which, according to the 2023 ASIA register, fall within the scope of the FAS survey
- The simulation has been conducted on approximately 12.0 million “enterprise-period” records
- The EI turnover totals, at the level of the “enterprise-period” association, have been aggregated by strata — a combination of employment size classes and turnover classes — constructed according to the stratification criteria adopted in the FAS survey (possible inconsistency with Fas)

This is an experimental exercise aimed at assessing what would happen to the Services Turnover Index if the survey were to be replaced by the full universe of e-invoicing data.

It is only a simulation study, intended to provide findings into the potential implications of such a methodological shift

....in progress

Main results

The analysis results are available for each stratum identified by FAS:

227 strata for the "total record" aggregation

225 for the "national component only" record aggregation

Specifically:

- given the non-perfect stability of the fields related to amounts expressed in foreign currency, the accuracy measures were calculated not only on the “totals” but also on the subset of “national turnover” records
- the records were subjected to a preliminary procedure for the elimination of potential outliers
- the results are summarised at an aggregated level (by size and turnover class), while the full set of disaggregated results by stratum, remains available
- the results refer to four specific sectors: two because “virtuous”, due to the high degree of alignment between survey data and e-invoicing data, two sectors to highlight “particular” issues

Analytical results

Diagnostic tests, Coefficients, Accuracy Indicators

STRATA	2_454	1_781	1_55A	1_561
n. observation	254	23	102	119
% share of sales receipts	7,790	0,000	63,94	80,73
Totals level:				
Correlation	0,903	0,966	0,945	0,958
Test diff. between means = 0	-	*	*	*
Test $\beta = 1$	*	-	-	-
m-m variations level:				
Pearson correlation	0,990	0,990	0,920	0,95
Spearman correlation	0,990	0,910	1,000	1
ME	-1,81	-0,93	0,620	1,2
SD	5,04	5,51	7,78	3,04
MAE	3,3	3,5	6,30	2,3
RMAR	5,2	5,4	7,0	3,0
SC	91,7	91,7	100	100

Diagnostic tests significant at 5%-level
Reference period: June 2024-June 2025 for 2_454 and 1_781, January-June 2025 for 1_55A and 1_561
Differences refers to (FAS- EI)

Totals:

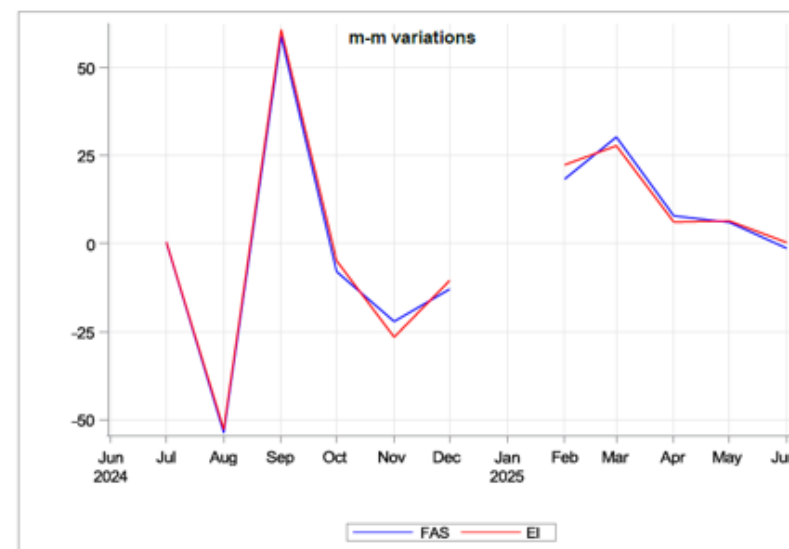
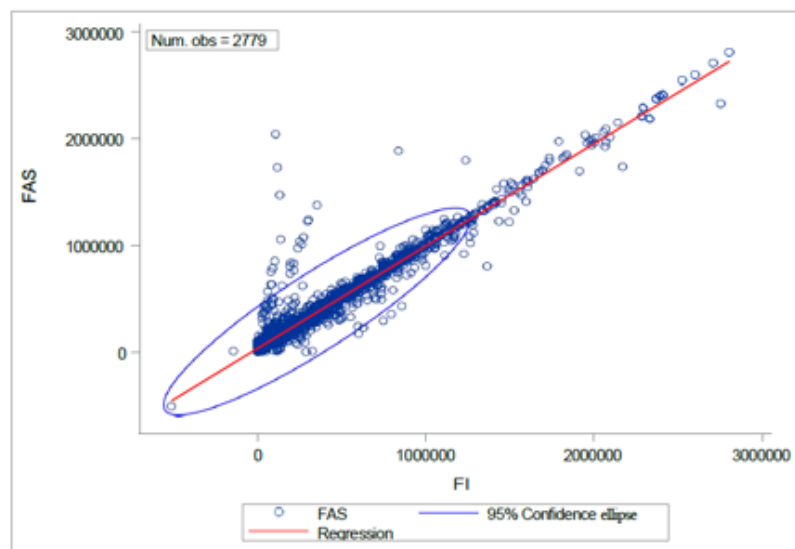
- Correlation coefficients for all strata are highly significant, over 90%
- Diagnostic tests confirm the assumptions underlying the linear relationships
- Equality tests for means are accepted for all sectors except for 2_454 stratum, indicating greater consistency between FAS and EI data in these sectors
- The test for the slope coefficient $\beta = 1$ —which implies proportionality between the variables—is accepted for sectors 2_454, reinforcing the hypothesis of regular and standardised invoicing practices

m-m:

- Small variability, high levels of precision and signs concordance, moderate deviations (from means)
- Evidence of absence of bias: overestimation of survey data compared to EI data for the sectors 1_55A e 1_561, and *vice versa* for sectors 2_464 and 1_781

Graphical results – virtuous sector

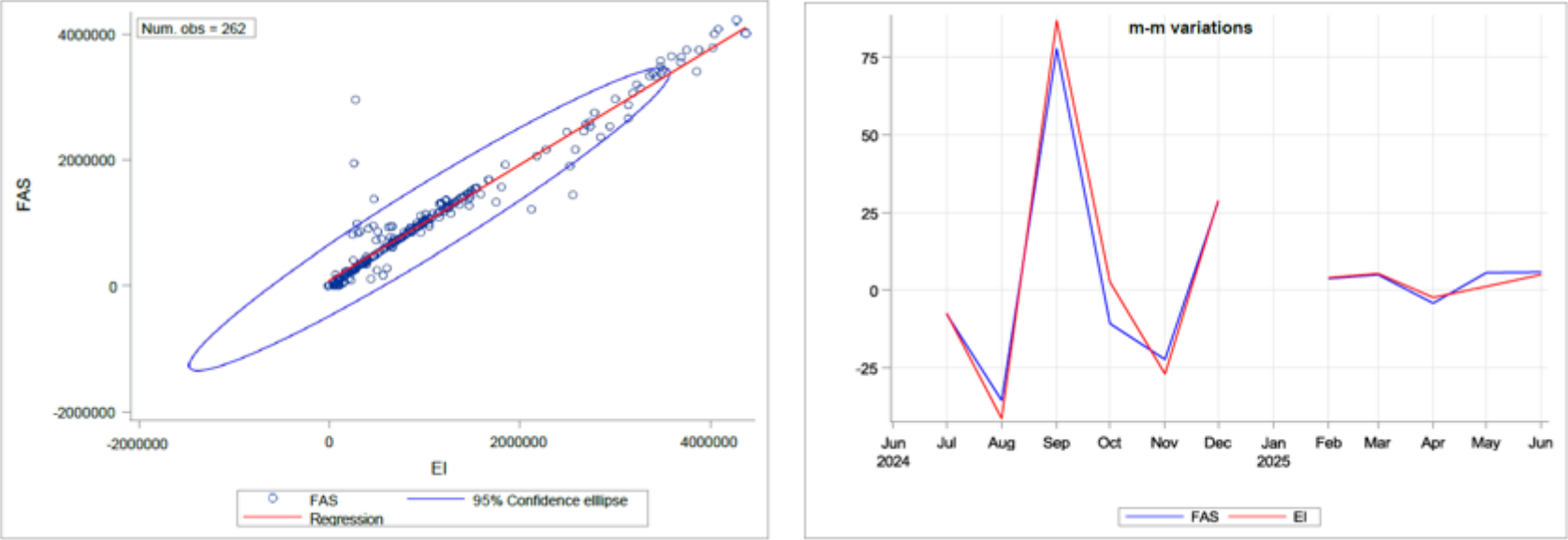
2_454 SALE, MINTENANCE AND REPAIR OF MOTORCYCLES AND RELATED PARTS OF ACCESSORIES



- Very strong correlation between the two variables (points closely aligned along the diagonal)
- Results likely due to the nature of the sector represented—more traditional and regulated—invoicing practices standardized and consistently applied

Graphical results – virtuous sector

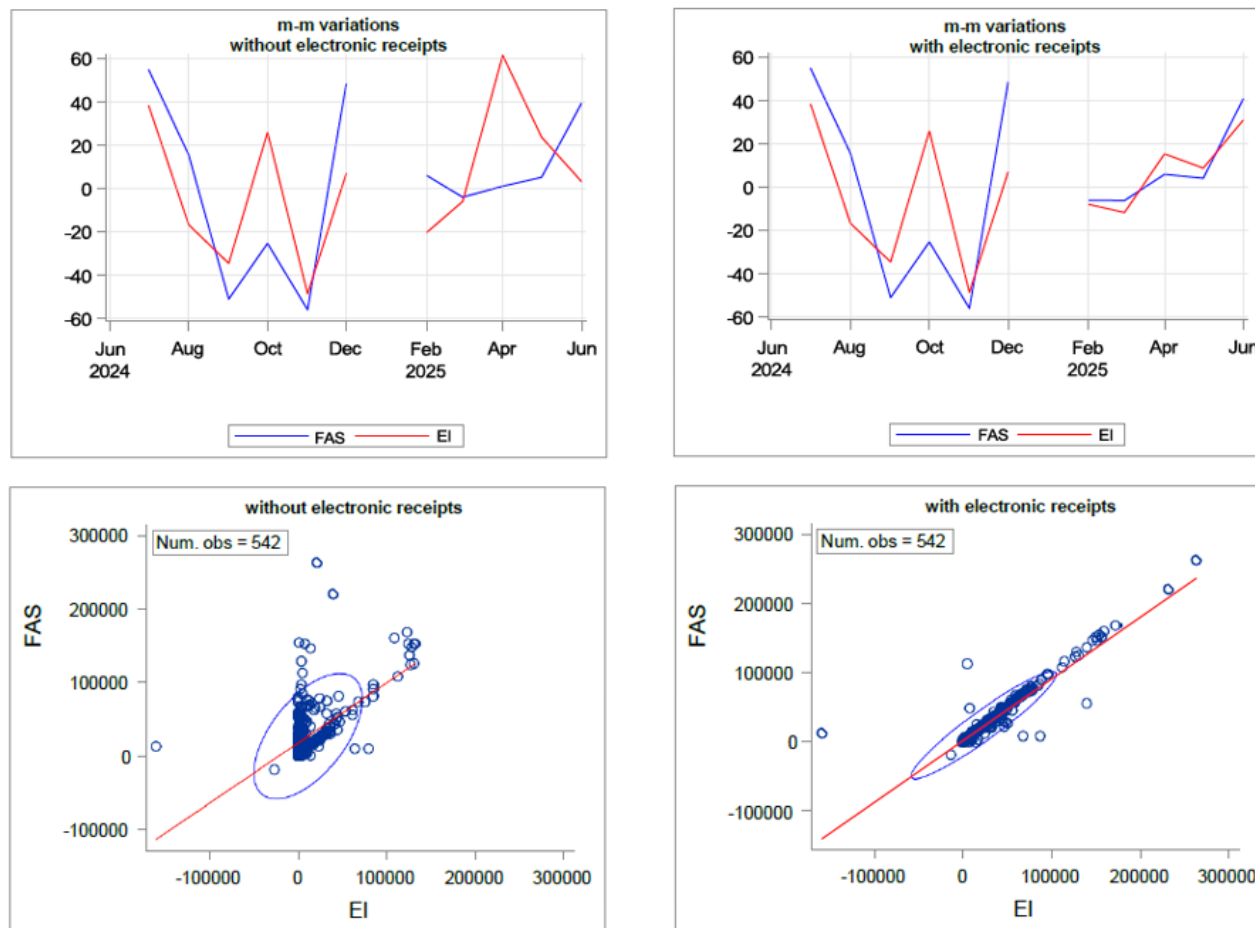
1_781 PLACEMENT AGENCY ACTIVITIES



Observed effect: near one-to-one match between FAS and EI (test $\beta_1 = 1$ significant)

Graphical results — the impact of ER

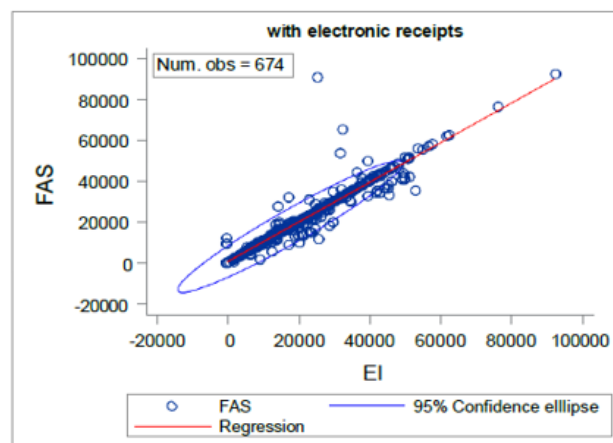
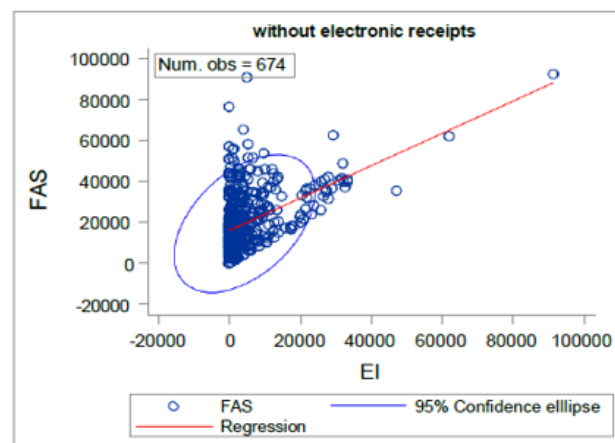
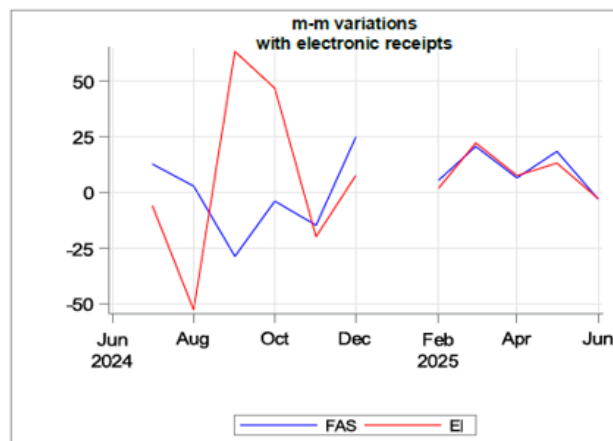
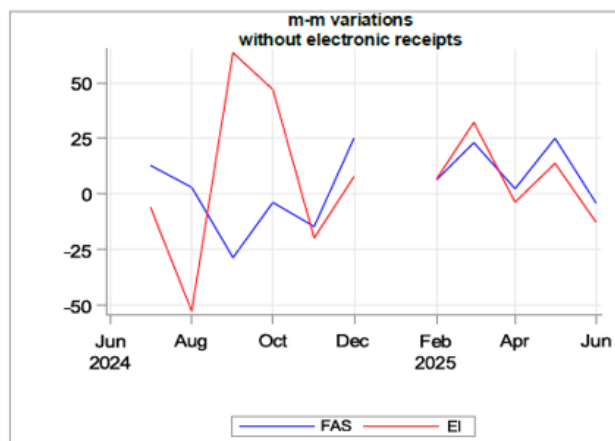
1_55A ACCOMMODATION



- Sectors 1_55A and 1_561 highlight a particular feature of data (EI)
- Both sectors are characterized by a high incidence of electronic receipts
- The fiscal receipts — transmitted electronically by enterprises to the Italian Revenue Agency — represent a new data source that Istat has begun acquiring in recent months, starting with data from January 2025
- Results are presented with reference to two datasets: month-on-month changes excluding electronic receipts and month-on-month changes including the ER

Graphical results — the impact of ER

1_551 RESTAURANT AND MOBILE FOOD SERVICE ACTIVITIES



- Scatter plots without ER exhibit a concentration of data points near the origin for EI → a substantial share of observations report lower values for EI compared with Fas
- Role of administrative factors: in these sectors, a substantial share of transactions is recorded via receipts, which are not included in the EI data transmitted to ISTAT
- Scatter plots with ER show an almost perfect alignment of the data along the diagonal. The introduction of the ER component reduces, in both sectors, the discrepancy between month-on-month variations calculated from survey data and those calculated from administrative data

Conclusions

- The consistency between FAS survey data and administrative e-invoicing data was investigated at both aggregated and disaggregated levels across 227 survey strata
- The results show strong alignment in many sectors, which opens the possibility of replacing survey data with administrative data in the short to medium term. Starting from January 2026, this replacement will begin for selected sectors, while for others, e-invoicing will serve as a validation and integration tool
- The use of e-invoicing brings multiple benefits:
 - greater timeliness and continuity
 - reduced burden on enterprises
 - lower costs
 - improved data quality due to its comprehensive coverage.
- There is potential for extending the approach to the full population. Once technically and methodologically feasible

Thank you for your kind attention

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