

Mobile phone data and the "Travel" item in the Balance of Payments: the Bank of Italy's experience

Andrea Carboni, Claudio Doria, **Valeria Valletta – Bank of Italy**
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Before and after MPD introduction

1996-2020: Survey on International Tourism

1.200.000 counting op.

estimation of the size of the reference universe

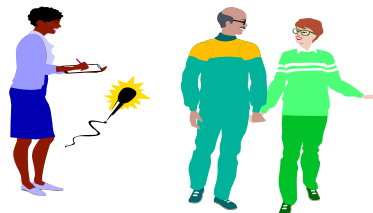
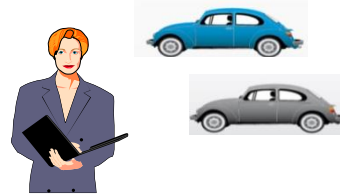
state of residence / state visited.

Administrative data

great precision on the overall number of travelers
no information on their residence or destination.

110.000 interviews

information on expenses, characteristics of the traveler, characteristics of the trip, etc...



After 2020: MPD replaced most of the counting op.

427.000 counting op.

Checking purposes, information on overlapping borders.

Mobile phone data

Country of residence (proxied by the company issuing the SIM) and number of travelers

MPD from Vodafone:

- 21,7% market share (2023), covers almost 99% of the Italian territory, good spatial and time resolution, data are compliant with Italian privacy legislation

Similar structure of MPD and datasets from counting operations – loss of secondary information

Administrative data

110.000 interviews

How MPD can improve the survey

Reduction of the total cost

MPD replaced a large part of the counting operations, that are very expensive.

Resilience to wide shocks

Due to Covid-19 movement restrictions, the survey had to be interrupted for several months. MPD were not affected by the pandemic.

Better estimation of universe size and residency distribution

Road: mountainous areas, lack of checkpoints, no administrative data. MPD monitor all crossings simultaneously in the continuous.

Seaports: access restrictions to boarding and disembarkation areas. MPD monitor seaports without entering restricted areas. Only a minority of ports provide administrative data.

Airports: airports usually have good administrative data, MPD helps refine estimates of travellers' residency distribution, especially in large, complex airports with many distant gates.

From telephony terminology to tourism's definitions

Italian resident travelling abroad = SIM card issued in Italy disappearing from the network near a border.

Destination country (or countries) → Welcome message.

Non-resident entering Italy = SIM card issued by a foreign operator appearing on the network near a border.

Origin country → the residence of the SIM card issuer is used as a proxy.



Foreigners resident in Italy who use a SIM card issued in their home country.

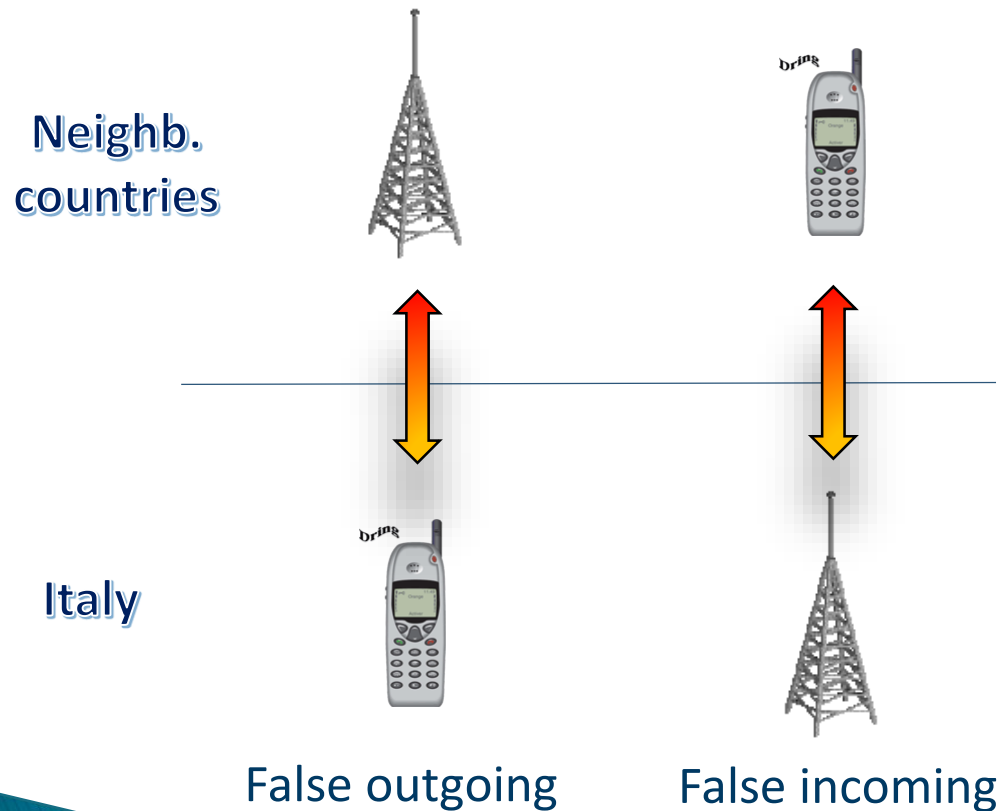
FALSE POSITIVE

if a SIM card issued abroad is detected on the Italian network for at least nine out of the twelve months preceding the month under examination, then the SIM card is associated with a resident in Italy.

From telephony terminology to tourism's definitions: roaming problem

Problem

In areas close to land borders a SIM could connect to a Network abroad without crossing the border.



Solution

Time: a minimum amount of time (30 mins) is required to identify a SIM that has crossed the border:

- Non Italian SIMs: must be detected on the Vodafone network for at least 30 mins
- Italian SIMs: must disappear from Vodafone network for at least 30 mins.

Frequency: if a SIM connects and disconnects a large nb. of times in a single day, it is considered a false positive.

Corridors: if a foreign SIM connects to adjacent cells progressively more distant from the borders it is considered a true positive (conversely for Italians going abroad).

From telephony terminology to tourism's definitions



Arrivals and departures at airports

Departing SIM: the SIM must be detected while approaching the airport area; then it has to disappear from the mobile network;

It has not to reconnect within a few hours in another Italian area

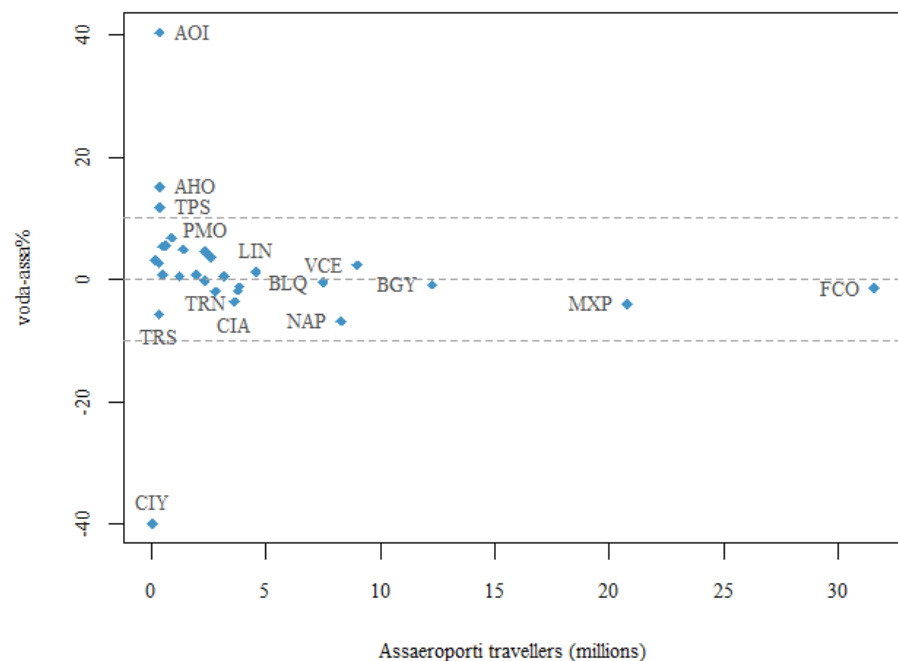
Arriving SIM: the SIM must not be present on the mobile network and must appear in an airport;

- If the SIM moves in areas in the proximity of the airport → arrival
- If the SIM disappears again without leaving the airport → transit

Do MPD match with administrative data?

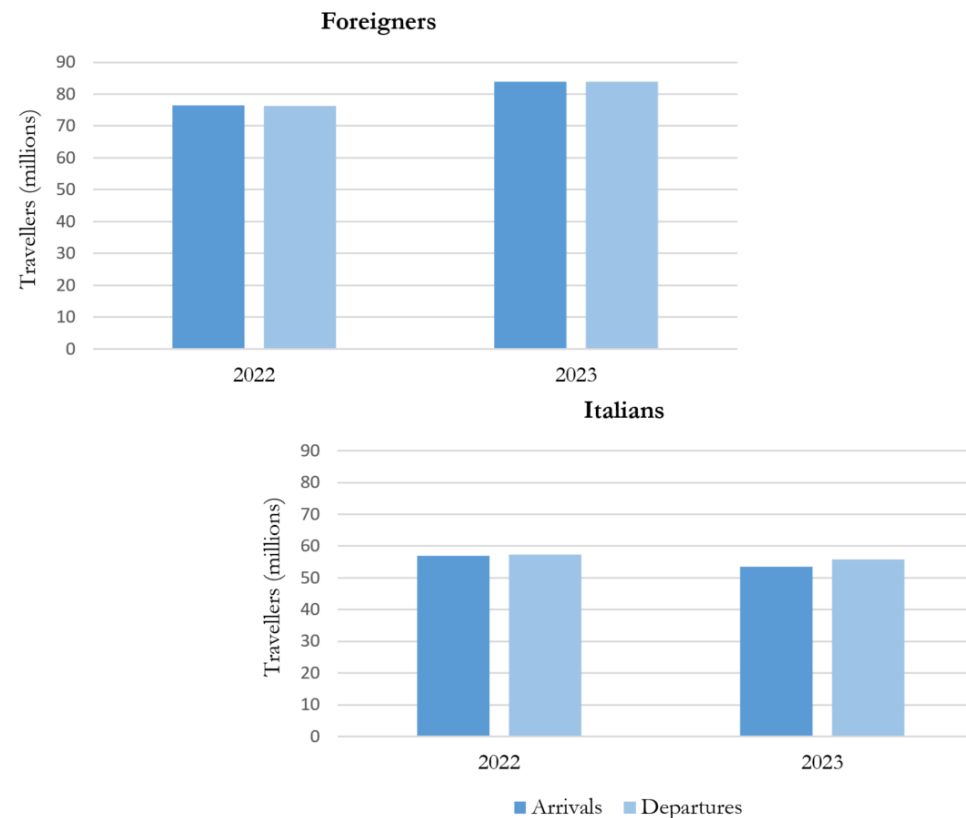
Differences between MPD and administrative data

Airports - 2023



International arrivals and departures (millions)

All crossings (2022, 2023)



Source: Assaeroporti, MPD

Thank you!

valeria.valletta@bancaditalia.it