Micro-data for financial assets' statistics

BANCO DE PORTUGAL
EUROSYSTEM

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CEMLA - Financial Information Forum

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AGENDA

I A new paradigm for data collection

II Enhancing the value chain of statistics

III Applying micro-data integration: an example

IV Concluding remarks

A new paradigm for data collection

For many years the data acquisition model for statistical purposes was supported by traditional **aggregated reporting schemes**:

- Forms designed to answer pre-defined requirements
- Zero flexibility
- Lengthy preparation time
- Heavy transformation rules imposed to respondents
- Some classifications were “black boxes”
- Hard to perform a reliable data quality control

Statisticians have been facing a changing world

Challenges

- Increasingly more complex reality
- Massive requests for new data
- Need to reduce response burden
- Better communication

Ingredients

- Knowledgeable people
- Micro-data
- Statistical date warehouses
- Powerful IT tools

Efficient solutions

- Data governance
- Concern with context costs
- Institutional cooperation
- Integrated management of information
- Initiative, persistence and flexibility

Introducing changes in the data collection processes

Over the last 15 years significant changes were introduced in the statistical compilation processes at BdP:

- **Item-by-item** reporting
- Approaching the granularity of the internal and external data at the respondents' level
- **Multi-purpose** reporting: "*data reported only once*"
- Use of administrative data
- Micro-databases
- **Integration** of data based on **BI solutions**
- Modern IT tools for exploring data

Statisticians can do a better job with micro-data

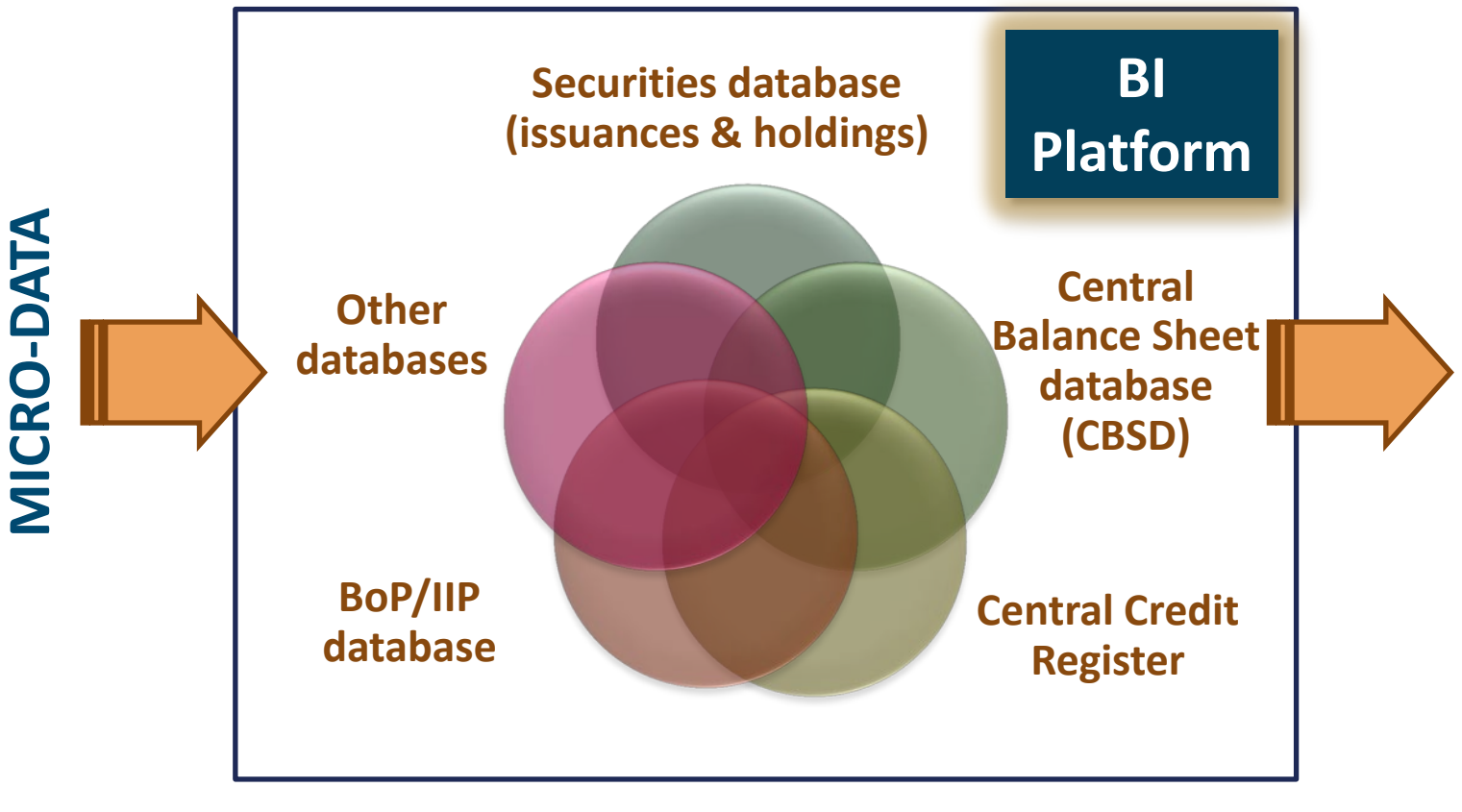
A new paradigm

Integrated management of micro-databases

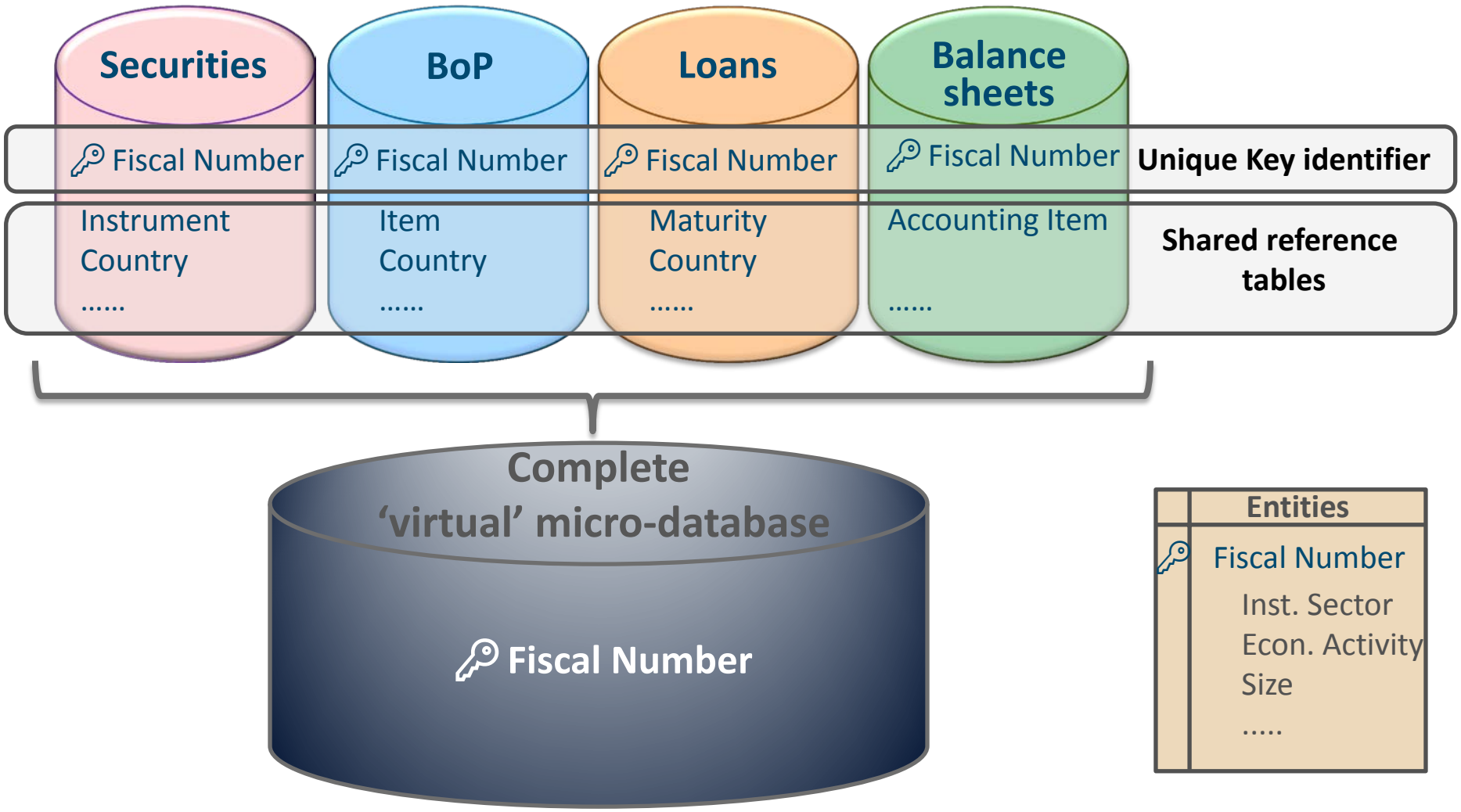
Enhancing the value chain of statistics

Is micro-data enough?

- But having micro-data is just part of the game…
- The possibility to **integrate** data from different domains makes all the difference

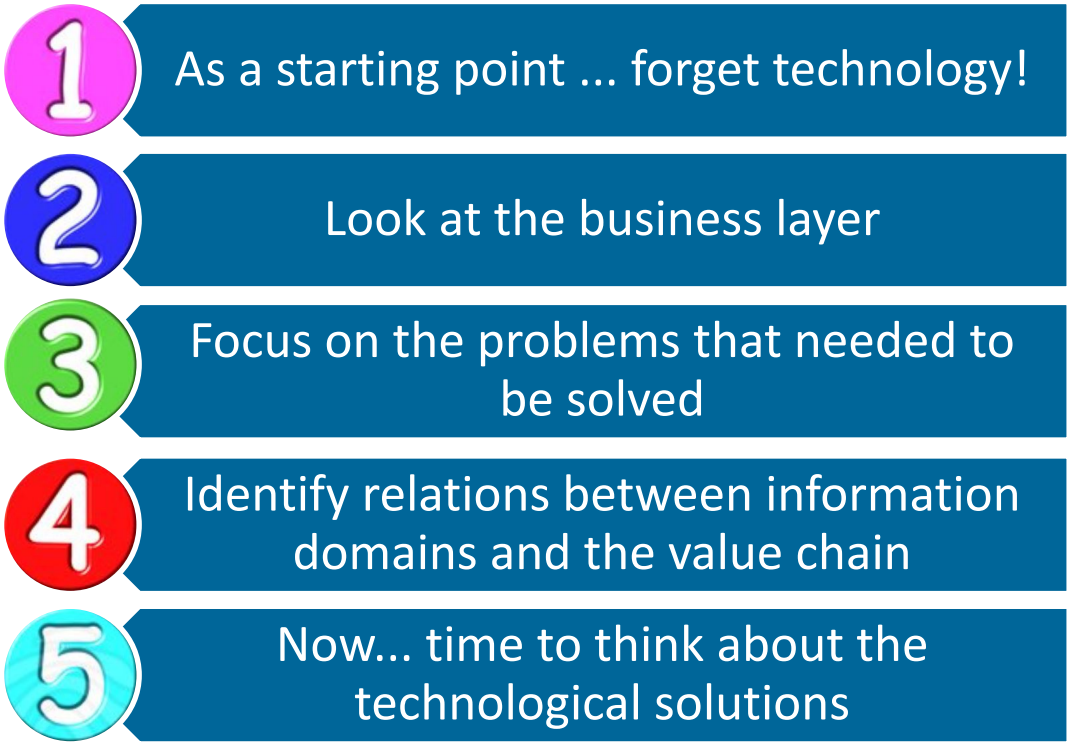


Pre-requisites for data integration



Two keywords: micro-data & integration

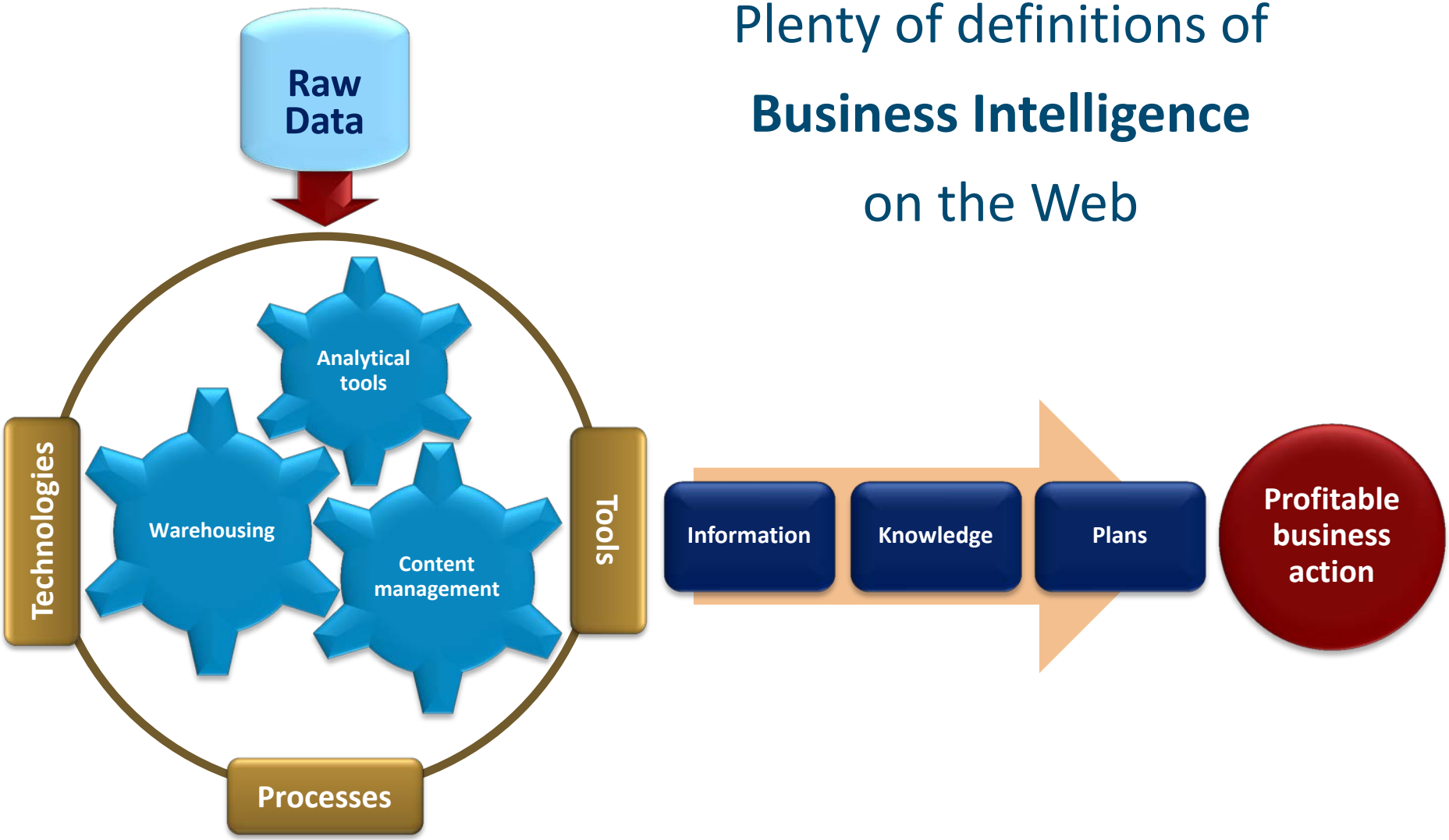
- To "cook these two ingredients" the Statistics Dep. and the IT Dep. worked together to define a **Business Intelligence (BI) architecture** for statistics. It was a business-driven process.



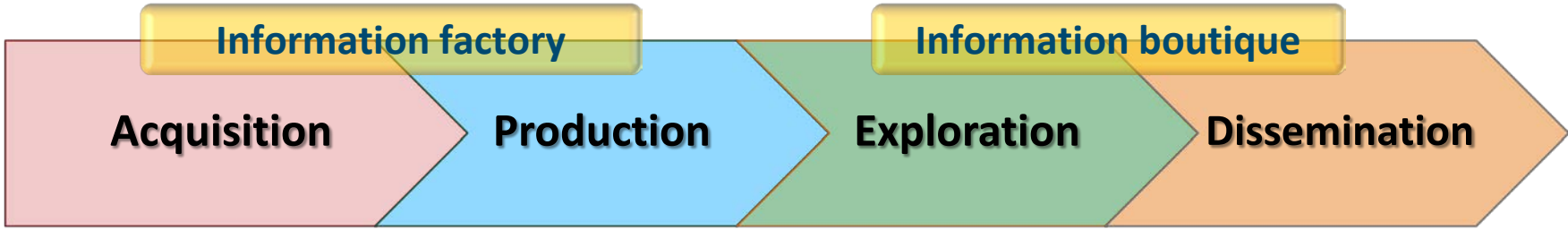
Plenty of definitions of

Business Intelligence

on the Web



The information model

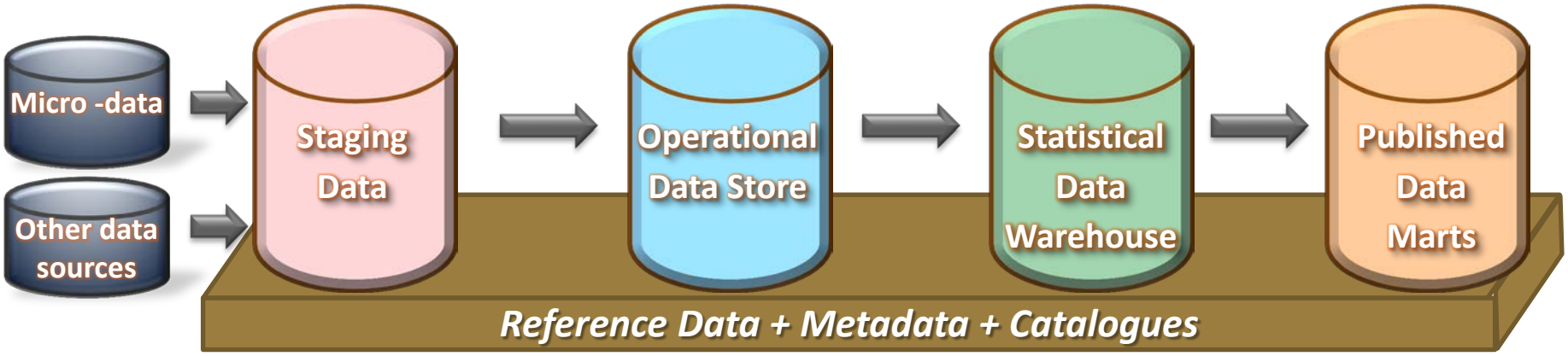


- Data collection from external sources
- Integration of internal sources
- Data transformation
- 1st level of quality control

- 2nd level of quality control
- Quantitative analysis
- Estimates
- Calculated metrics

- Multidimensional analysis
- *Ad hoc* reports
- Context: **Internal**

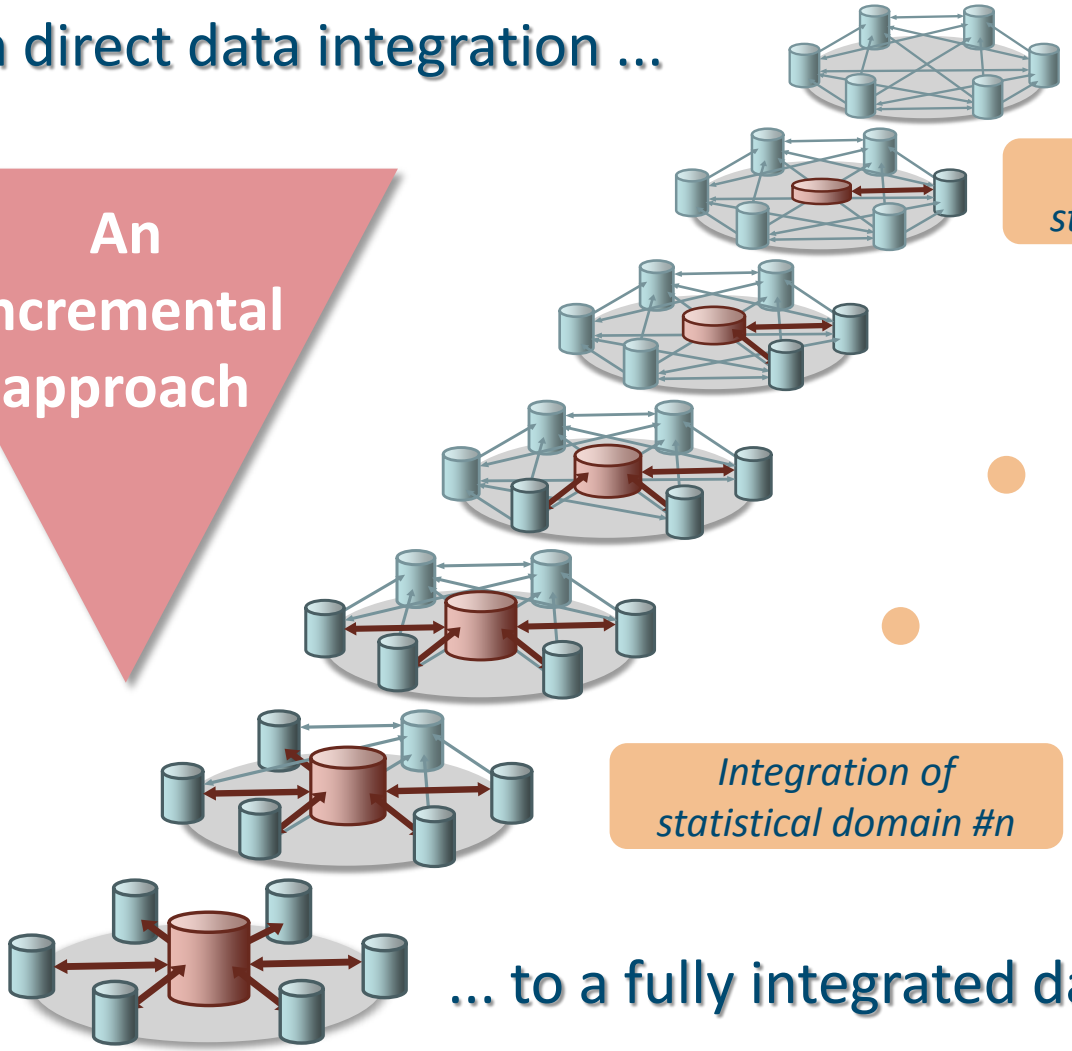
- Publication
- Reporting
- Context: **Public**



Implementing the BI architecture

From direct data integration ...

An incremental approach



Integration of statistical domain #1

Integration of statistical domain #n

... to a fully integrated data warehouse

A word about technology

Microsoft® SQL Server®

Database and OLAP cubes

sas

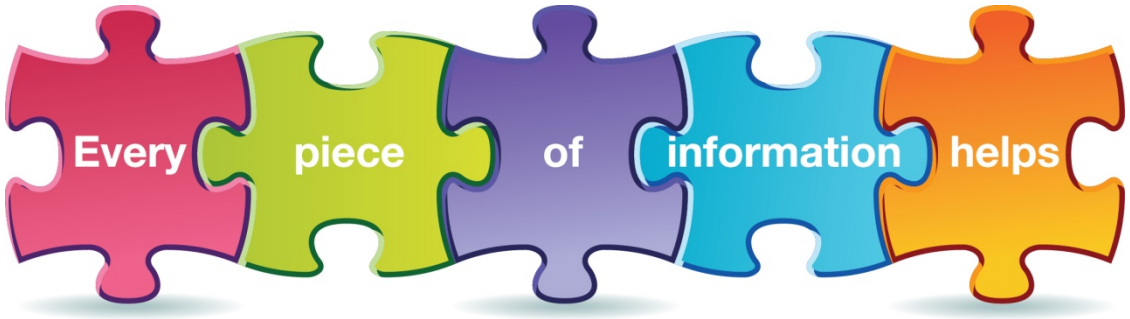
Statistical production

Advanced analytics
(self-service BI)

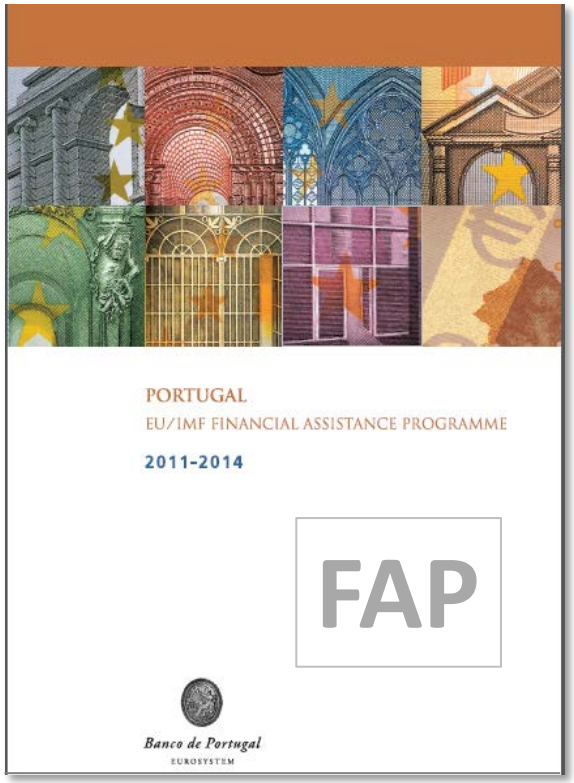
- **Self-service BI** is a shift in business intelligence
- Before, traditional BI was handled just by the IT staff

- With self-service BI:
  - Everyone can be an analyst
  - Less need for IT support
  - Results are quickly delivered
  - No bottlenecks caused by a busy IT department
  - Analysis can happen on the spot
  - Reporting is simplified and easy to distribute
  - Both business and IT professionals may focus on their expertise

Applying micro-data integration: an example



2011 – EU/IMF Financial Assistance Programme



- BdP was challenged to dramatically increase the level of detail of its statistics, on a regular and *ad hoc* basis, regarding in particular:
  - The financial sector
  - The public sector
  - The financing and the indebtedness of the economy with a particular focus on the non-financial sector
- The micro-databases managed by the Statistics Department were vital to address these new requirements

Let's see how ...

Getting inspired by the demands

- Monitoring of credit developments in Portugal has been an ongoing concern during the term of the FAP (2011-2014), in particular the level of indebtedness of the non-financial sector (GG + NFC + Households)
- Inspired by a set of partial requests from the institutions involved in the FAP, the Statistics Dep. has designed a new product called **Non-Financial Sector Indebtedness** which began to be disclosed monthly from February 2012
- It was an innovative initiative at worldwide level

Let's see why...

Which debt concept to consider ?

- The indebtedness of a sector does not result only from bank loans obtained by the entities of that sector
- Thus, a more broad concept of debt was adopted to measure the level of indebtedness
- In addition to **domestic loans** (bank and intra-company), **external loans**, **debt securities issued** and **trade credits** were also taken into account
- An **unconsolidated** approach was followed, *i.e.* not excluding the debt of a sector *vis-à-vis* the entities of that sector

Which breakdowns ?

- Multiple dimensions of analysis were combined

Debtor and creditor sector (From-whom-to-whom table)

Type of financial instrument

Economic activity

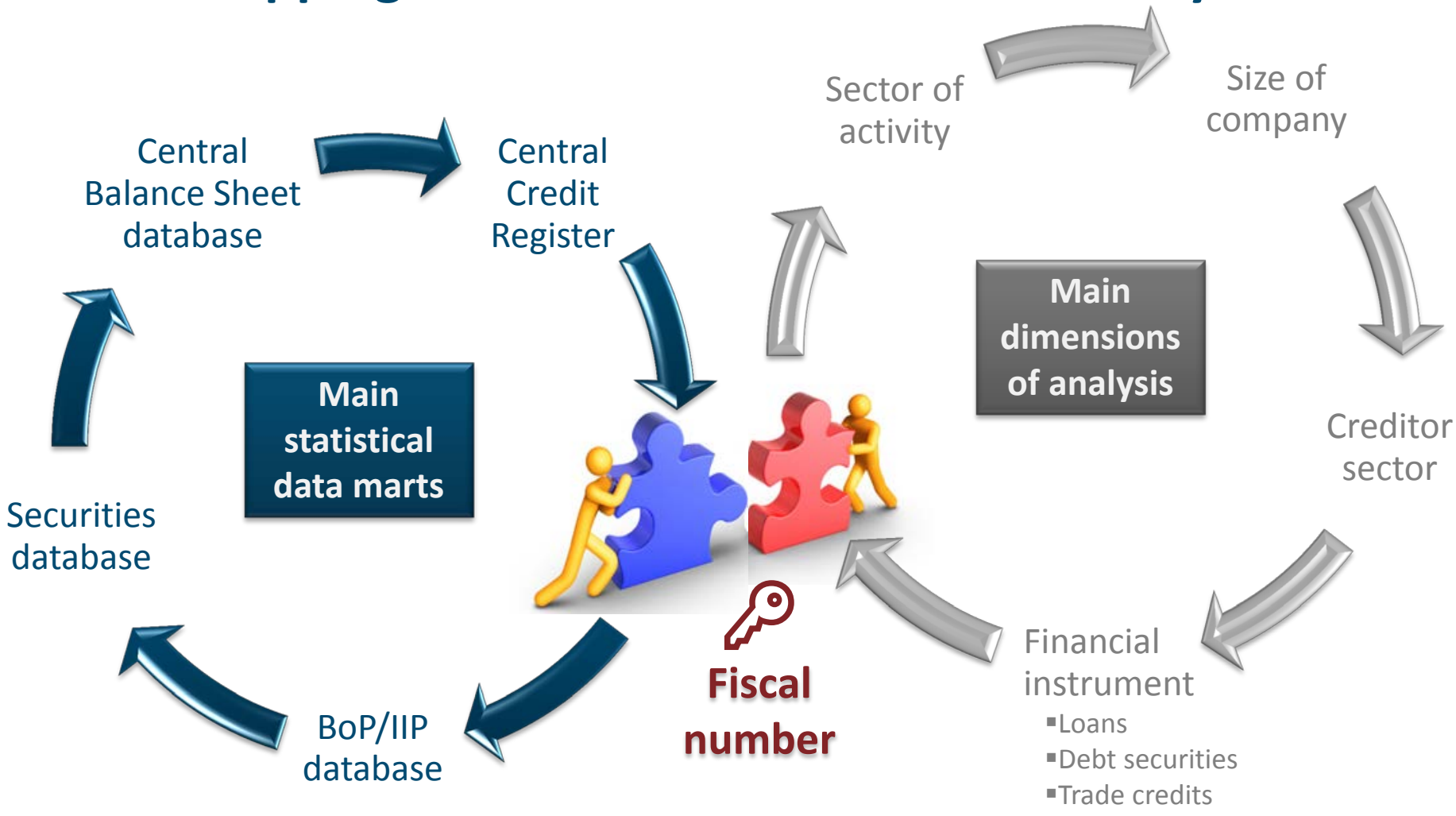
Size of companies

Maturity

Purpose of the loans

- 19 tables published monthly at *t+45 days*
- A new chapter in the Statistical Bulletin→ **K**

Mapping sources and dimensions of analysis



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Integrating data from the relevant sources

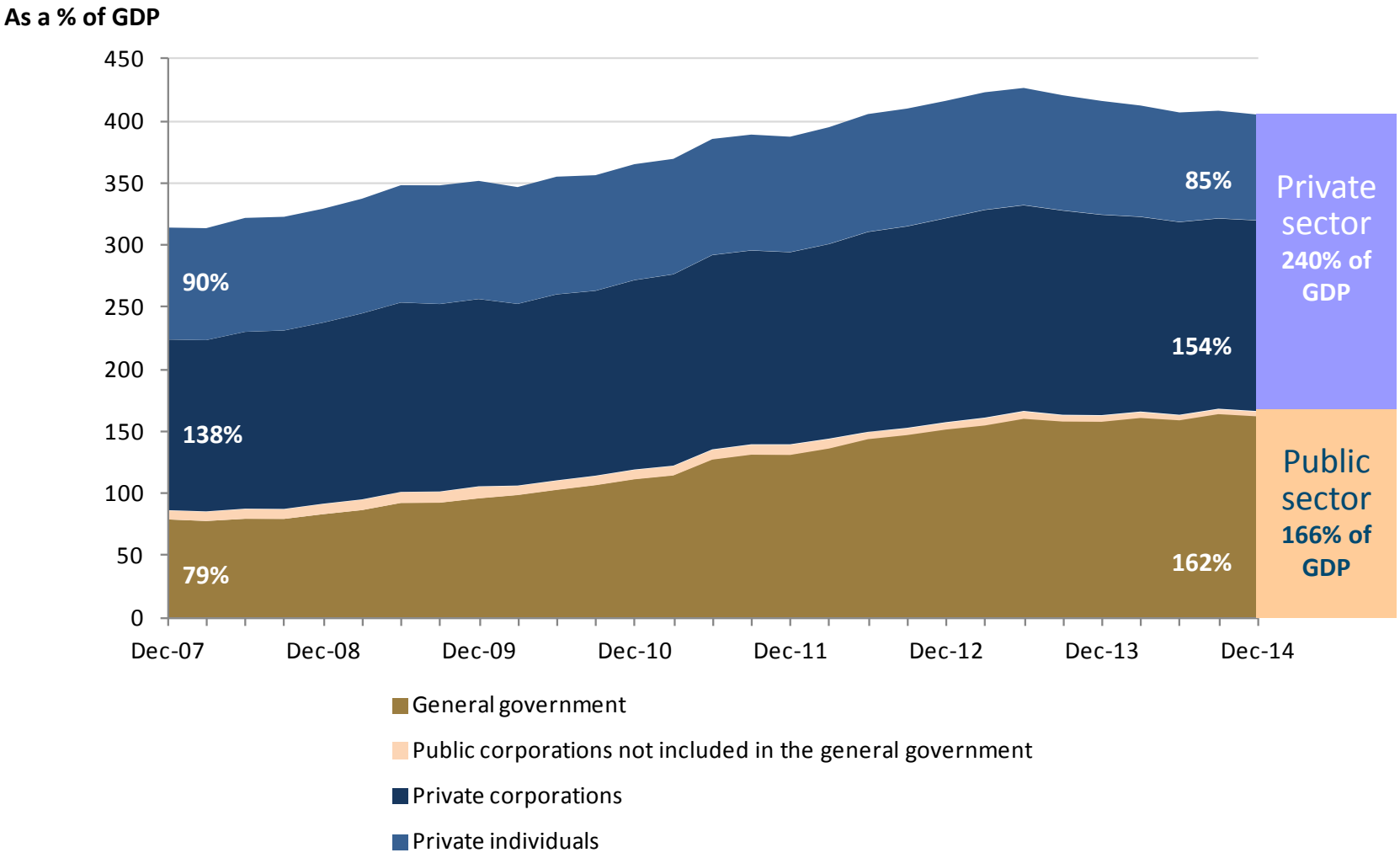
	GG	NFC	HH*
Internal loans	CCR	CCR+CBSD	CCR+CBSD
External loans	BoP	BoP	BoP
Debt securities held by residents	SEC	SEC	SEC
Debt securities held by non-residents	SEC	SEC	SEC
Trade credit granted by residents	DG Budget	CBSD	CBSD
Trade credit granted by non-residents	DG Budget	BoP	CBSD
Other GG liabilities	PDMA		

CCR → Central Credit Register
BoP → Balance of Payments
CBSD → Central Balance Sheet Database
SEC → Securities Database
PDMA → **P**ortuguese **D**ebt **M**anagement **A**gency

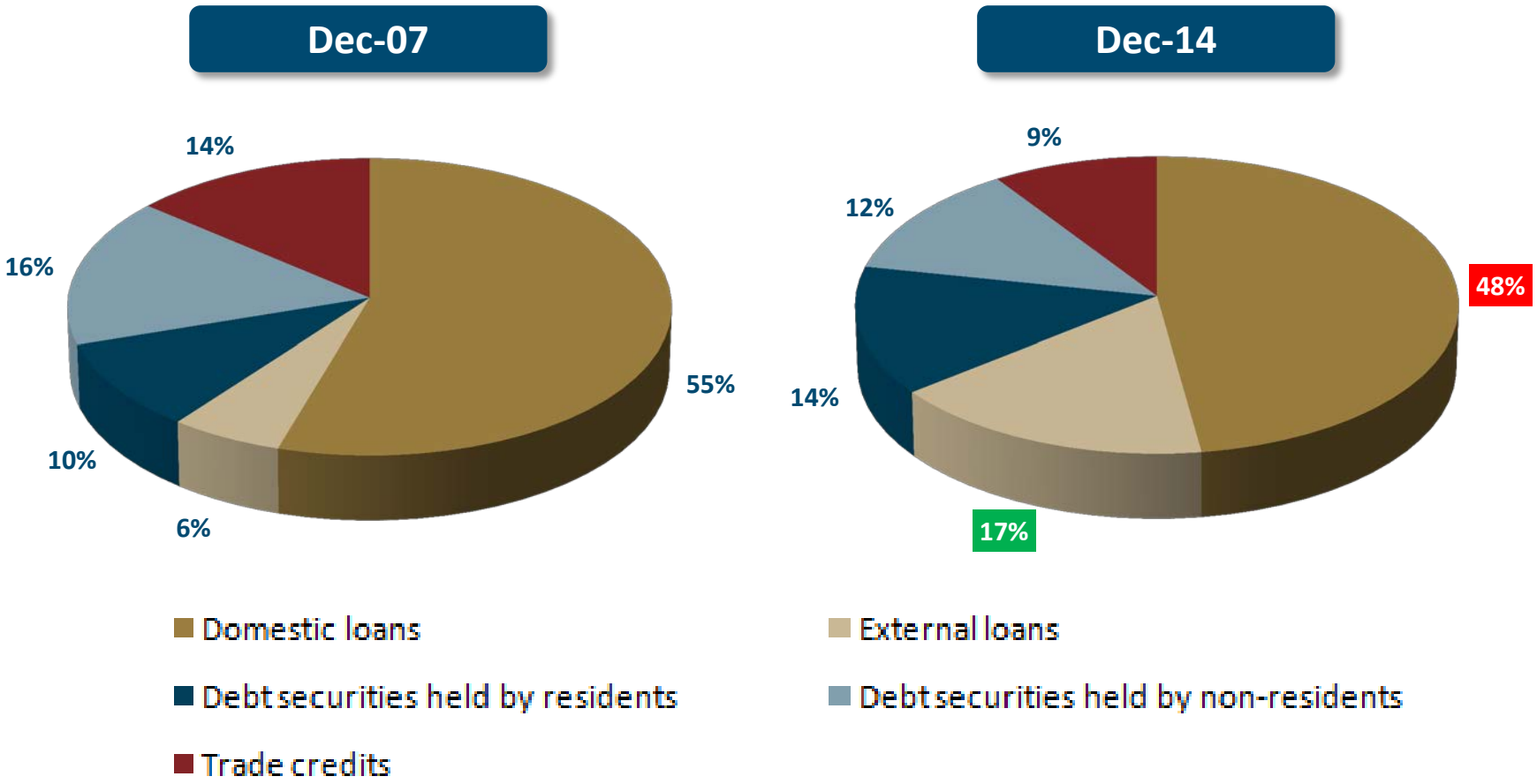
NFC Breakdowns by economic activity and size class using the CBSD

HH* Households
Sole proprietors
NPISH

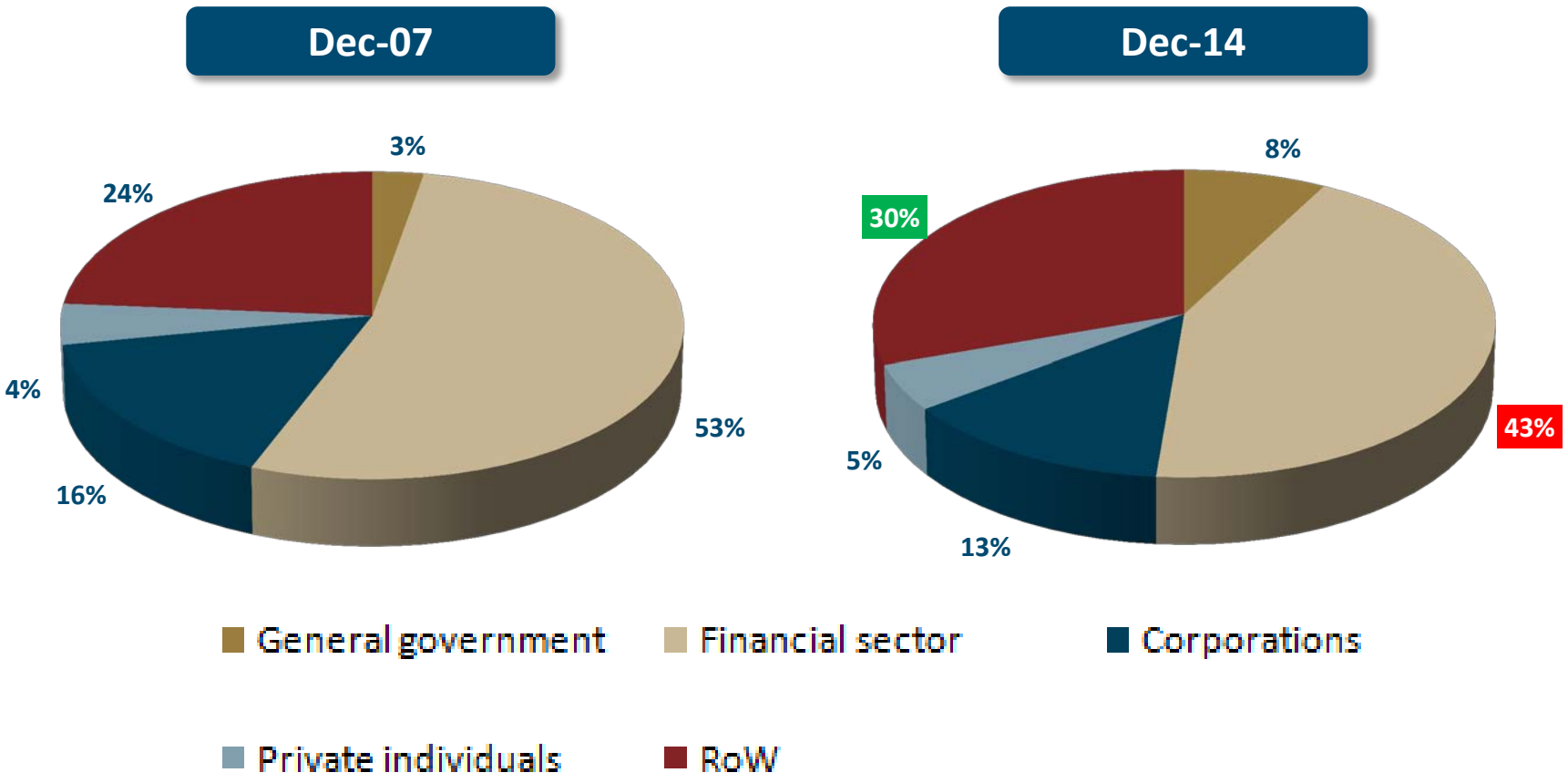
Indebtedness ratios



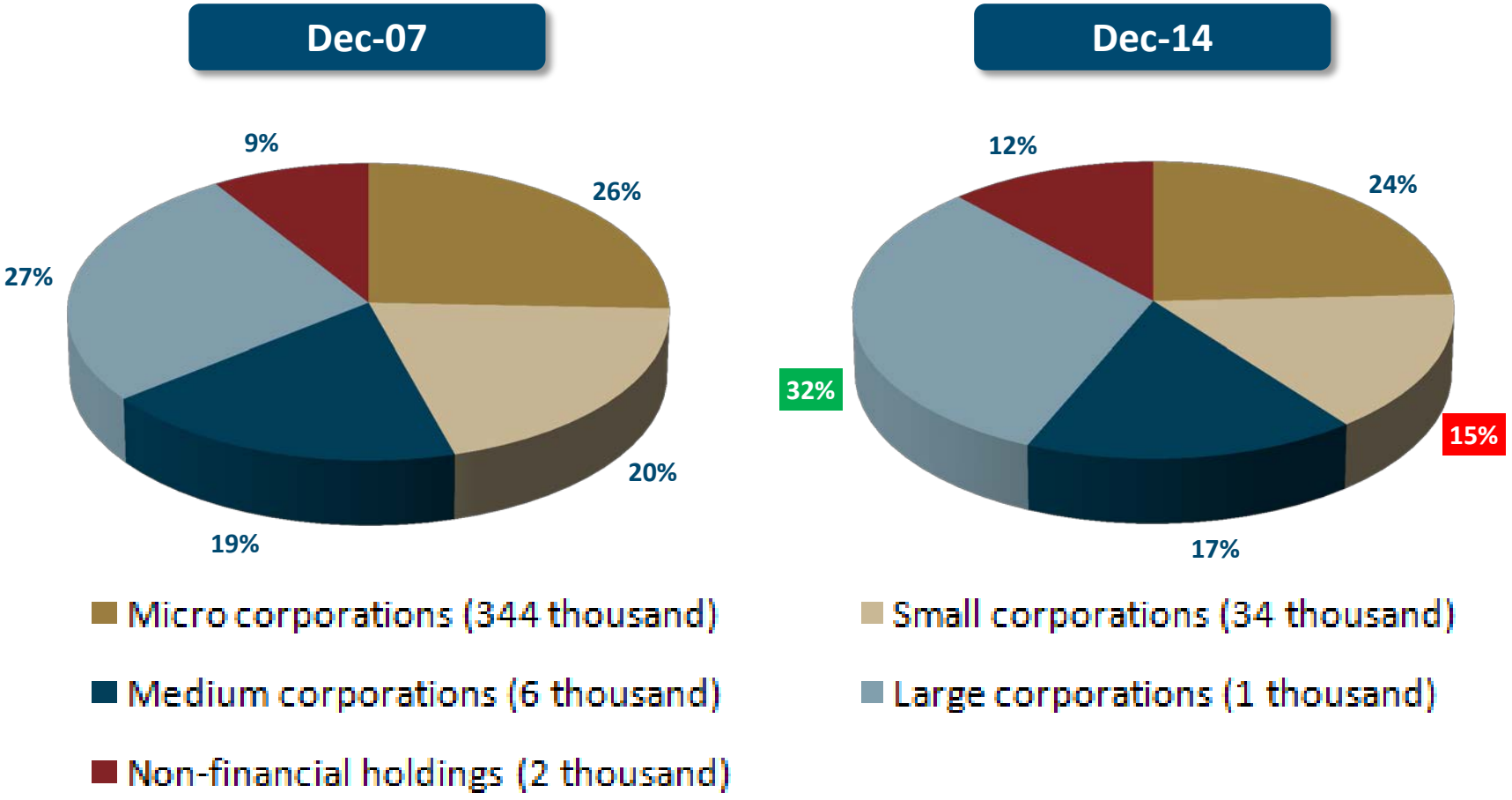
Non-financial sector's debt by financial instrument



Non-financial sector's debt by financing sector

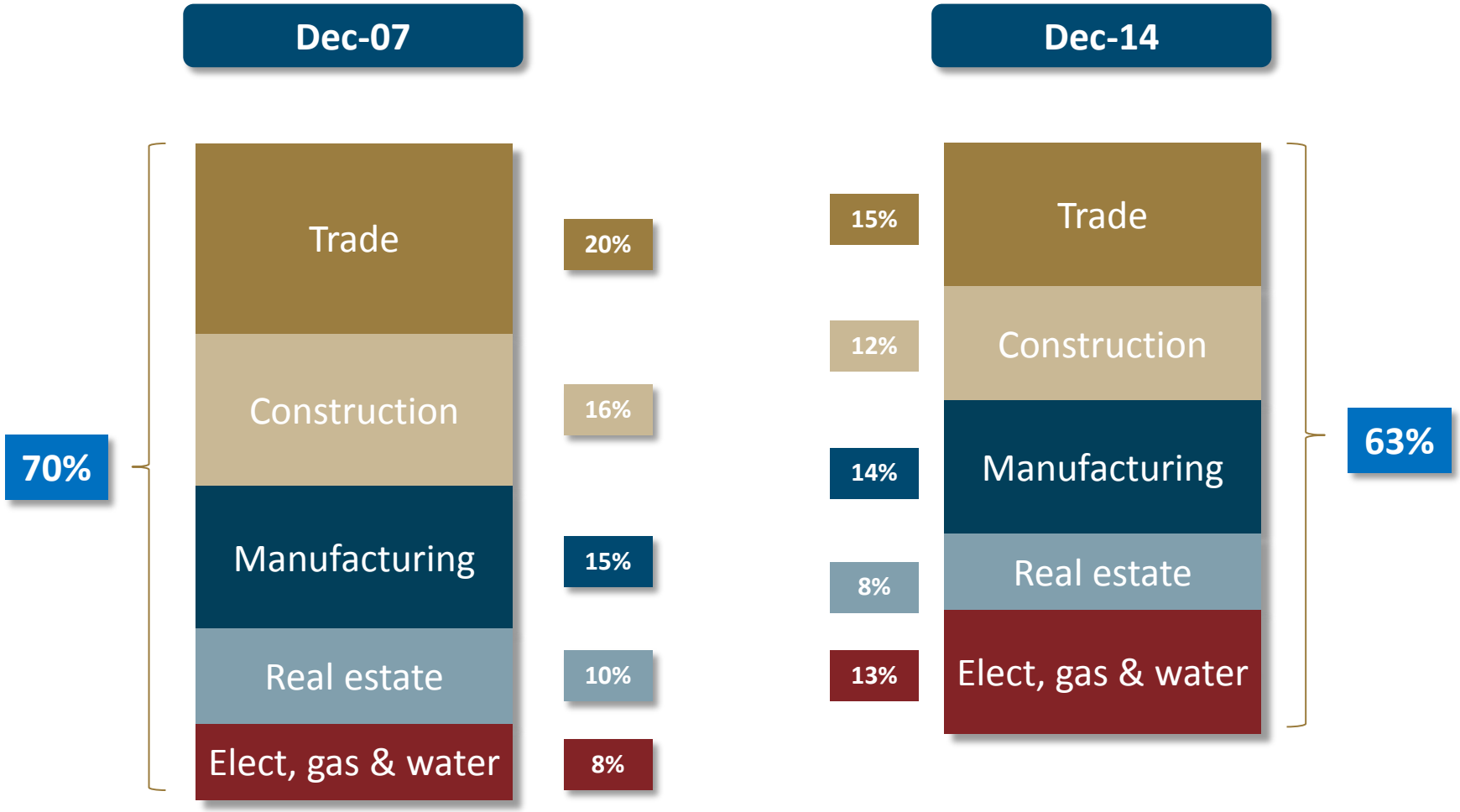


Private corporations' debt by size

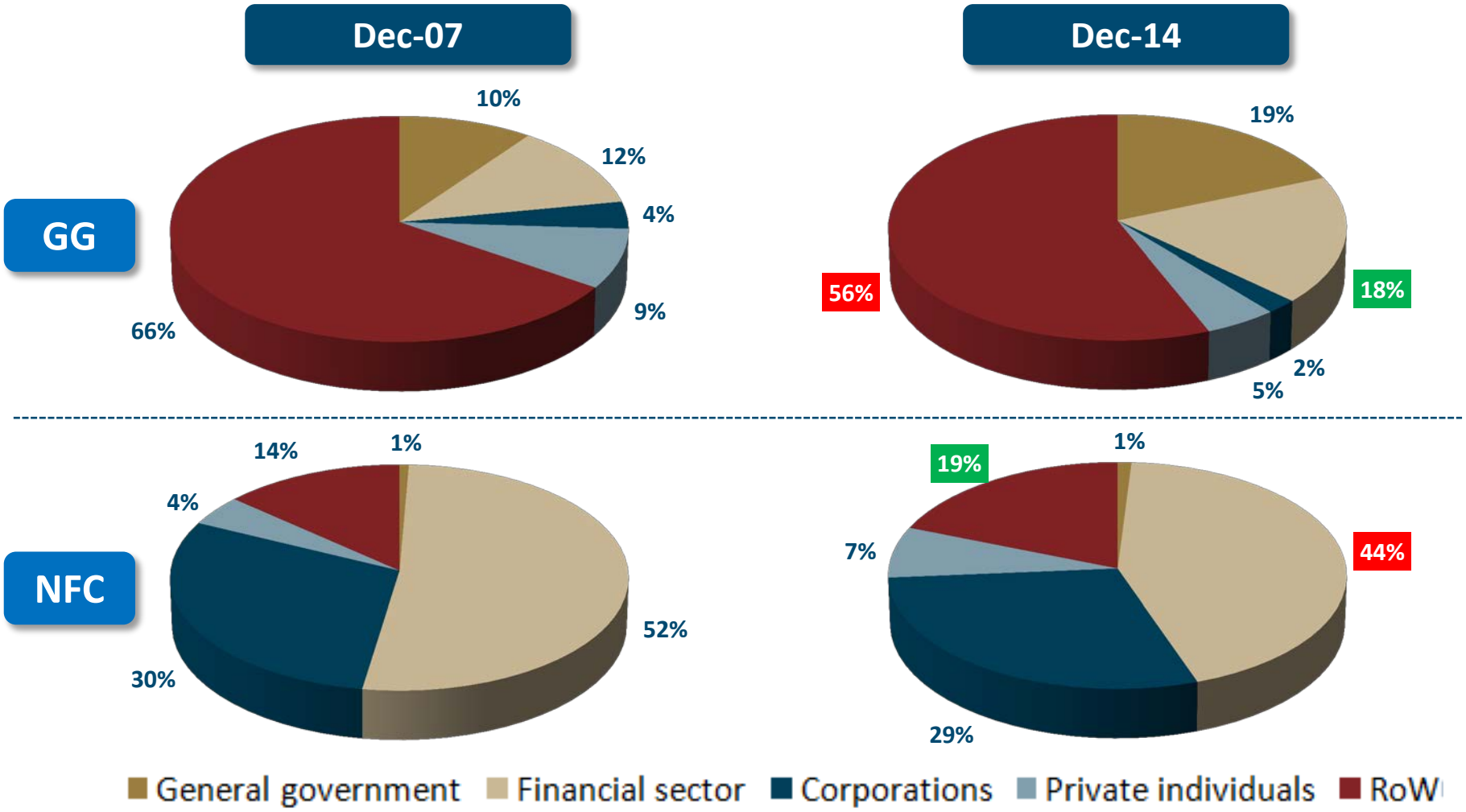


TOP 5 by economic activity

As a % of total debt of private corporations



Whom finances whom



Looking into the future

Apart from its high relevant informational value, this new statistical product proved the feasibility of a full revamping of the way BdP currently compiles the **Financial Accounts**:

- Compilation based almost **exclusively on micro-data**
- **Monthly** frequency
- Availability at **t+50**

Substantial reduction of time-to-market

Current situation:

- Quarterly frequency
- Provisional figures reported to the ECB at t+85
- Final figures published and reported to the ECB at t+100

Concluding remarks

Advantages of collecting micro-data

- Increases the flexibility do deal with the ever-changing statistical requirements
- Facilitates the implementation of reporting changes
- Prevents redundancy
- Paves the way for more efficient data quality management
- Boosts the responsiveness to *ad hoc* requests

Integration allows jumping to another level

Technology is only a facilitator for integration

The key for integration relies on information models designed to address that *desideratum*

The information models should be grounded on common reference data

Catalogues of data and metadata are indispensable

Self-service BI tools provide statisticians with great flexibility and autonomy to explore the data

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THANK YOU FOR YOUR INVITATION

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