Rich internet applications for the visualisation of statistics

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Objectives of the development

Improve ECB communication with the public

Improve data visualisation in order to facilitate understanding of statistics

Leverage IT usage: new web technologies as well as users’ computers.
Phased approach

Three phase development approach:

1. Research and initial development
2. Gradual extension to the ECB website and the SDW
3. Possible development of ECB Dashboards, to be used by internal analysts, decision-making bodies or the public.

Currently in phase 2
Phase 1:
Research and initial developments
ECB applications using Adobe Flex

Currently, two applications on the ECB web site:

- Bilateral exchange rates (2007-04)
- Euro area yield curves (2007-07)

Using data published in SDMX-ML v2 Compact format
**Most popular section** on the ECB website. Improved both data accessibility and visualisation.

- More information (latest observation, growth rates)
- Hovering functionality that shows the value for each observation
- Possibility to view data for predefined periods
- Possibility to define own period (period slider)
- Possibility to switch base currency
Exchange rates (2): Further developments

- Change the frequency
- Compare currencies developments
- Add a data table and a calendar view
Euro area yield curves

Second Adobe Flex application in production since July 2007.
AAA-rated euro area central government bonds. Updated every TARGET business day at noon ECB time (CET/CEST)

A yield curve is a representation of the relationship between market remuneration rates and the remaining time to maturity of debt securities, also known as the term structure of interest rates. The ECB publishes several yield curves as shown below.

1 Feb 2008

Select curves: Spot rate  Instantaneous forward  Par yield
Compare with previous dates  Compare with all euro area central government bonds  See animation since
Select maturity range: All  0 to 5 years  5 to 10 years  10 to 15 years

15 years, 4 months: 1 Feb 2008: 4.335

Source: ECB. Underlying data provided by EuroMTS, ratings provided by Fitch Ratings.
Euro area yield curve

AAA-rated euro area central government bonds. Updated every TARGET business day at noon ECB time (CET/CEST)

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1 Feb 2008

Select curves: ○ Spot rate ○ Instantaneous forward ○ Par yield
○ Compare with previous dates
○ Compare with all euro area central government bonds
See animation since 11 Jan 2008 until 1 Feb 2008
Select maturity range: ○ All ○ 0 to 5 years ○ 5 to 10 years ○ 10 to 15 years

Source: ECB. Underlying data provided by EuroMts, ratings provided by Fitch Ratings.

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Conclusions of Phase 1

• Improved communication with the public (improved visualisation, accessibility and understanding of data).
• Very popular (rather high usage).

But "ad hoc" applications (structure of data is "hard coded" into the application). Inefficient, no reusability, scalability issue.

=> Need for a generic reusable visualisation framework
Phase 2: Consolidation and Generalisation
Based on the SDMX standard:

- ISO standard (ISO/TS 17369), sponsored by 7 international institutions (including the ECB)
- SDMX information model describes all artefacts needed
- Already in use in all layers of the ECB Statistical environment
- Offers various XML formats (SDMX-ML)
Consolidation: The SDMX visualisation framework (2)

Based on 3 layers:

1. The readers: Reads the Data Structure Definitions and the data files (SDMX-ML Structure and Compact formats)

2. The model: translation of the extracted data into artefacts of the SDMX Information Model

3. The views: visualisation of the objects of the SDMX information model
Generalisation: ECB website and SDW

- Extend the use of this technology to other sections of the ECB website (e.g.: Effective exchange rates, Eurosysten joint dissemination sections, etc.)
- Replace SDW fixed charts with similar visualisation tools
Possible phase 3:

ECB statistical dashboards
ECB dashboard: Key features

- Visual display of key ECB statistics
- Analytical dashboard, to support data analysis
- Offers context, history and compare functionalities
- Supports interaction (e.g.: data drill-down)
- Customisable
- Target groups: internal (Decision-making bodies, Economics, Research, Financial Stability, International and Statistics), external (press, academia and general public)
Prototype, using the HICP to demonstrate what a section of an ECB Dashboard could look like.
Zoom in, view table

Map linked to click on total

Time series on selected component

Chart linked to click on total
Conclusions

• Improved visual display
• Improved accessibility
• Data analysis easier and more efficient
• Improved understanding
• Improved communication with the public