# Case Study: *statbanker package* Automating Processes at the Central Bank

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# Tasks at the Central Bank

- Macro-modelling Team
- Large scale econometric models
  - Main input: data from CSO StatBank
  - Roughly 50-60 different px files / StatBank tables

# Tasks at the Central Bank

Other tasks that involve use of CSO data are:

- Forecasting
- Research
- Internal Briefing Notes
- Publications - Quarterly Bulletin
- Reporting to the ECB

# Data Retrieval

**Central Bank of Ireland**
Programmatic Approach
R package: *statbanker*
Workhorse function: `getStatBankData()`

**Bank of Italy**
R package: *RJSDMX*
Workhorse function: `getTimeSeries()`

Example

```
NQQ24 <- getStatBankData("NQQ24")
```

# Our perspective

If we know the following:

1. Data Location (URL)
2. Data Structure (PC-Axis)

We can pipe data and metadata into our:

1. Models
2. Documents
3. Databases
4. Data visualization tools

This is:

1. Efficient
2. Clean
3. Transparent
4. Replicable

# Loading statbanker

- The statbanker package depends on two other packages; pxR and reshape.

```
# library(pxR)      # Dependency
# library(reshape)  # Dependency
library(statbanker)
```

- The pxR package provides tools for parsing PC-Axis files.
- The reshape package is used when transforming px objects.

# Retrieving Data

- Standard Approach

```
NQQ27 <- getStatBankData("NQQ27") # Quarterly National Accounts
N1406 <- getStatBankData("N1406") # Annual National Accounts
NAH09 <- getStatBankData("NAH09") # Historical National Accounts
BPQ15 <- getStatBankData("BPQ15") # Quarterly Balance of Payments
FIM08 <- getStatBankData("FIM08") # Interest Rates (ECB, 10 Year Bond)
RSM03 <- getStatBankData("RSM03") # Monthly Retail Sales
CPM02 <- getStatBankData("CPM02") # Consumer Price Index
HPM01 <- getStatBankData("HPM01") # Residential Property Prices
MUM01 <- getStatBankData("MUM01") # Monthly Unemployment Rate
PEA01 <- getStatBankData("PEA01") # Population
```

- Alternative Approach

```
TableNames <- c("NQQ27","NQQ25","CPM01","LRM02","QNQ19")
AllTables  <- sapply(TableNames,function(x)getStatBankData(x))
```

# Functionality

- By default: Data is returned as a px object and metadata is printed on screen.

```
NQQ27 <- getStatBankData("NQQ27")
```

```
*** METADATA ***
CSO Table =  NQQ27
TITLE =  Expenditure on Gross National Product (chain linked annually and" "referenced to 2013) by Sector,
Quarter and Statistic
UNITS =  Euro Million
SOURCE =  Central Statistics Office, Ireland
DATABASE =  CSO Databank
CREATION DATE =  20150918 15:49
LAST UPDATED =  20150909 14:43
FILE ADDRESS =  http://cso.ie/px/pxeirestat/Database/eirestat/National%20Accounts%20Quarterly/NQQ27.px
```

```
class(NQQ27)
```

```
[1] "px"
```

# Functionality

- Metadata: Printing metadata on screen can be turned off.

```
NQQ27 <- getStatBankData("NQQ27",metadata=FALSE)
```

- Object Types: Three types of objects can be retrieved.

```
NQQ27 <- getStatBankData("NQQ27",metadata=FALSE,type="px")
class(NQQ27)
```

```
[1] "px"
```

```
NQQ27 <- getStatBankData("NQQ27",metadata=FALSE,type="col")
class(NQQ27)
```

```
[1] "cast_df"    "data.frame"
```

```
NQQ27 <- getStatBankData("NQQ27",metadata=FALSE,type="ts")
class(NQQ27)
```

```
[1] "mts"    "ts"     "matrix"
```

# Helper Functions

- Helper functions are provided for transforming data after it has been retrieved.

```
# Retrieve data as a px object
NQQ27 <- getStatBankData("NQQ27",metadata=FALSE,type="px")
class(NQQ27)
```

```
[1] "px"
```

```
# Convert px object to a column-orientated dataframe
NQQ27.col <- px2col(NQQ27)
class(NQQ27.col)
```

```
[1] "cast_df"    "data.frame"
```

```
# Convert dataframe object to a ts object
NQQ27.ts <- col2ts(NQQ27.col)
class(NQQ27.ts)
```

```
[1] "mts"    "ts"     "matrix"
```

# Exploring Data

```
# Retrieve the data
NQQ27 <- getStatBankData("NQQ27",metadata=FALSE,type="ts")

# Explore the variables
head(colnames(NQQ27))
```

```
[1] "Quarter"
[2] "Expenditure on GNP at Current Market Prices (Euro Million)_Personal Expenditure on Consumer Goods and
Services"
[3] "Expenditure on GNP at Current Market Prices (Euro Million)_Net Expenditure by Central and Local Govt.
on Current Goods and Services"
[4] "Expenditure on GNP at Current Market Prices (Euro Million)_Gross Domestic Fixed Capital Formation"
[5] "Expenditure on GNP at Current Market Prices (Euro Million)_Value of Physical Changes in Stocks"
[6] "Expenditure on GNP at Current Market Prices (Euro Million)_Exports of Goods and Services (excluding
Factor Income Flows)"
```

# Selecting Data

```
NQQ27[,"Expenditure on GNP at Current Market Prices (Euro Million)_Personal Expenditure on Consumer Goods and Services"]
```

```
      Qtr1  Qtr2  Qtr3  Qtr4
1997  8264  8636  8826 10185
1998  9367  9844 10032 11132
1999 10608 10758 11532 12546
2000 12377 12876 13029 14445
2001 13654 14095 14146 15809
2002 15033 15336 15665 17161
2003 16413 16631 16545 18097
2004 17341 17469 17592 19163
2005 18692 18862 19437 20986
2006 20510 20807 20957 23052
2007 22545 22835 23184 25236
2008 24027 23336 23498 24793
2009 21381 20776 20560 22236
2010 20499 20422 20627 22117
2011 20777 20713 20493 22634
2012 20365 20417 20892 22905
2013 20642 20612 21224 23247
2014 21343 21473 21839 24304
2015 22261 22256
```

Questions or Comments?