

Downloading Economic and Financial Market Data from the Internet

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1. INTRODUCTION

This Guide gives a short introduction to the implementation and usage of two R functions to download economic indicators and financial market data from the internet. The functions are part of the Rmetrics package `fBasics`. They provide the retrieval of historical economic indicators from *www.economagic.com* and historical financial market data from *www.yahoo.com*.

2. ECONOMIC INDICATORS

For the US economy and some European and Far-East economies economic and financial indicators are available for downloading from the Internet. *Economagic* is the provider of the “economic time series page” on the Internet site *www.economagic.com*. The site is a comprehensive source of easily available economic time series data useful for economic research. The site started in 1996 to give students easy access to large amounts of data. Today there are more than 100'000 time series available for which data and custom charts can be retrieved. The most frequently downloaded data files from *Economagic* for the US economy include the following time series:

Table: Frequently downloaded Indicators from Economagic:

Query:	DESCRIPTION:
var/leading-ind-long	Leading Economic Indic.
var/cpiu-long	Consumer Price Index
var/vel-gdp-per-m1	M1 Velocity
fedstl/pop	Total U.S. Population
fedstl/trsp500	S&P 500 Total Return
fedstl/gnp	Gross National Product
fedstl/gdpdef	GDP Impl. Price Deflator
fedstl/pi	Personal Income
feddal/ru	Unemployment Rate
fedstl/indpro	Total Indust. Production
fedstl/m1sl	M1 Money Supply
fedstl/exjpus+2	Yen USD FX Rate
fedstl/fedfunds+2	Federal Funds Rate
fedstl/mdiscrt+2	Discount Rate
fedstl/mprime+2	Bank Prime Loan Rate
fedbog/tcm30y+2	30-Year Treasury Rate
fedbog/cm+2	30-Year Home Mortgages

The R function `economagicImport()` allows to import economic indicators directly into a data frame which can be saved in a spreadsheet file. The usage of the function is shown in the following example which downloads the daily time series for the US Fed Funds:

Economagic Download Example:

```
# Usage of the R function economagicImport():

# Save the Downloaded Data to a File:
file = "fedfunds.csv"
# The Source of the Data [Default] and Query:
source = "http://www.economagic.com/em-cgi/data.exe/"
query = "fedstl/fedfunds+2"
# Download:
economagicImport(file, source, query)
```

The download report on the screen becomes

Download Report:

```
[1] "Starting Internet Download ..."
[1] "Data successfully downloaded ..."
  DATE      1      1      2
  1 195407  0.80      NA      NA
  2 195408  1.22  5.0400      NA
  . . . . .
 12 195506  1.64  2.5200      NA
 13 195507  1.68  0.4800  0.8800
  . . . . .
559 200011  5.98 -5.0400  0.5200
560 200012  5.49 -5.8800 -0.2400
```

and the data is saved in your personal working directory in the comma delimited CSV file “fedfunds.csv”.

3. FINANCIAL MARKET DATA

Historical daily financial market data for stock prices and indexes, foreign exchange rates, and interest rates is also available for downloading from the Internet. The Financial Service from Yahoo allows for downloading those

data. The URL and the [Query] string which contains the symbol of the requested instrument and date information is given by

How to build the Query String?

```
URL:      http://chart.yahoo.com/table.csv?[Query]
[Query]: s=SYMBOL&a=D&b=M&c=Y&q=q
SYMBOL:  symbol name e.g. IBM
D:       Starting Day, e.g. 1
M:       Starting Month, e.g. 1 for January
Y:       Starting Year, e.g. 1990, as CCYY
Example: s=IBM&a=1&b=1&c=1990&q=q
```

Thousands of financial instruments can be downloaded by the SYMBOL name. In the following we list some examples like blue chips stocks listed in the Dow Jones Index, like high technology stocks list in the NASDAQ 100 Index, and the most important US Indexes. Here is a list of selected Symbols:

Table of Some Selected Symbols:

```
BLUE CHIPS:
-----
Alcoa          AA      AT&T          T
American Express  AXP    Boeing        BA
Caterpillar    CAT    Citigroup     C
Coca-Cola      KO     DuPont        DD
Eastman Kodak  EK     Exxon Mobil   XOM
General Electric  GE    General Motors  GM
Home Depot     HD     Honeywell     HON
Hewlett Packard  HWP    IBM           IBM
Intel          INTC   Internat.Paper  IP
J.P. Morgan     JPM    Johnson&Johnson  JNJ
McDonald's     MCD    Merck         MRK
Microsoft      MSFT   Minnesota Mining  MMM
Philip Morris   MO     Procter&Gamble   PG
SBC Comm.       SBC    United Technol.  UTX
Wal-Mart Stores  WMT    Walt Disney     DIS
-----
```

NASDAQ 100 STOCKS:

```
-----
COMS  ADPT  ADCT  ADLAC  ADBE  ALTR  AMZN  APCC
AMGN  APOL  AAPL  AMAT  AMCC  ATHM  ATML  BBBY
BGEN  BMET  BMCS  BVSN  CHIR  CIEN  CTAS  CSCO
CTXS  CMGI  CNET  CMCSK  CPWR  CMVT  CEFT  CNXT
COST  DELL  DLTR  EBAY  DISH  ERTS  FISV  GMST
GENZ  GBLX  MLHR  ITWO  IMNX  INTC  INTU  JDSU
KLAC  LGTO  LVLT  LLTC  ERICY  LCOS  MXIM  WCOM
MCLD  MEDI  MFNX  MCHP  MSFT  MOLX  NTAP  NETA
NSOL  NXTL  NXLK  NWAC  NOVL  NTLI  ORCL  PCAR
PHSY  SPOT  PMTC  PAYX  PSFT  PMCS  QLGC  QCQM
QTRN  RNWK  RFMD  SANM  SDLI  SEBL  SIAL  SSCC
SPLS  SBUX  SUNW  SNPS  TLAB  USAI  VRTS  VISX
VTSS  VSTR  XLNX  YHOO
-----
```

US INEXES:

```
-----
30 DJ Industrials ^DJI  20 DJ Transport. ^DJT
15 DJ Utilities   ^DJU  65 DJ Composite  ^DJA
NYSE Volume in   ^TV.N  NYSE Composite   ^NYA
NASDAQ Composite ^IXIC  NASDAQ Volume    ^TV.O
Nasdaq 100       ^NDX  Major Market     ^XMI
SP500 Index      ^SPC  SP100 Index      ^OEX
PacEx Technology ^PSE  Phil Semiconduct ^SOXX
Russell 3000     ^RUA  TSC Internet     ^DOT
Value Line       ^VLIC  Wilshir 5000 TOT ^TMW
30-Year Bond     ^TYX  10-Year Note     ^TNX
5-Year Note      ^FVX  13-Week Bill    ^IRX
DJ Commodities   ^DJS  Phil Gold&Silver ^XAU
-----
```

In the following we present an example how to download six US Stock Market Indexes starting on January 1st, 1970.

Yahoo Download Example:

```
# Make List of Indexes:
indexes =
c("DJI", "SPC", "OEX", "IXIC", "NDX", "NYA" )
# Download US Stock Market Indexes:
for (index in indexes) {
symbol = paste("^", index, sep="")
file = paste(index, ".CSV", sep="")
source = "http://chart.yahoo.com/table.csv?"
query = paste("s=", symbol,
"&a=1&b=1&c=1970&g=d&q=q&y=0&z=",
symbol, "&x=.csv", sep="")
import.data.yahoo(file, source, query)
}
```

The download report on the screen becomes

Some lines from the Download Report:

```
[1] "Starting Internet Download ..."
[1] "Data successfully downloaded ..."
      Date      Open      High      Low      Close
1 19700102  18.225  18.2875  18.20    ...
2 19700105  18.30   18.4125  18.30    ...
3 19700106  18.4125  18.45    18.3125  ...
. ...      ...      ...      ...      ...
7888 20010320  91.60   92.03    88.10    ...
7889 20010321  88.45   91.60    87.75    ...
7890 20010322  89.12   91       87.65    ...
...
```

5. SOME REMARKS ON FUNCTIONS AND DATA

Both, `economagicImport()` and `yahooImport()`, retrieve the data from a formatted file provided by Economagic and Yahoo, respectively. This file is reformatted into a data frame with ISO8601 formatted dates as row names and automatically selected names for the instruments as column names. The success of the download depends on the format structure of the retrieved files. If Economagic or Yahoo change there format and data structure the download will most likely fail. Every time if format changes become true we have to adapt the download function. Please be aware of this! Both functions are working standalone, there are no calls to functions from contributed R packages or from other sources.

Note, that the usage of the *Rmetrics* data import functions and the information provided from *Economagic's* and *Yahoo's* Internet sites does not warrant the accuracy of the materials provided therein, either expressly or impliedly, for any particular purpose and expressly disclaims any warranties of merchantability or fitness for a particular purpose. The providers will not be responsible for any loss or damage that could result from interception by third parties of any information made available to you from the download sites.

REFERENCES

- www.rmetrics.com for Rmetrics's Internet site
- www.economagic.com for Economagic's Internet site
- charts.yahoo.com for Yahoo's Internet site