

Testing the Effects of Several Variables on Turkey's Exchange Rates, 1987-2017

Fetching the GDP Growth data

```
WDIsearch(string = "GDP Growth",  
          field = "name",  
          short = TRUE)
```

##	indicator	name
## 712	5.51.01.10.gdp	Per capita GDP growth
## 715	6.0.GDP_growth	GDP growth (annual %)
## 11219	NV.AGR.TOTL.ZG	Real agricultural GDP growth rates (%)
## 11418	NY.GDP.MKTP.KD.ZG	GDP growth (annual %)
## 11421	NY.GDP.MKTP.KN.87.ZG	GDP growth (annual %)

```
Gdp_Growth <- data.frame(  
  WDI(country = "TR",  
       indicator = "NY.GDP.MKTP.KD.ZG",  
       start = 1987,  
       end = 2017,  
       extra = FALSE))
```

Fetching the Inflation data

```
WDIsearch(string = "Inflation",  
          field = "name",  
          short = FALSE)
```

##	indicator	name
## 7442	FP.CPI.TOTL.ZG	Inflation, consumer prices (annual %)
## 7444	FP.FPI.TOTL.ZG	Inflation, food prices (annual %)
## 7446	FP.WPI.TOTL.ZG	Inflation, wholesale prices (annual %)
## 11393	NY.GDP.DEFL.87.ZG	Inflation, GDP deflator (annual %)
## 11394	NY.GDP.DEFL.KD.ZG	Inflation, GDP deflator (annual %)
## 11395	NY.GDP.DEFL.KD.ZG.AD	Inflation, GDP deflator: linked series (annual %)

description
7442
Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket

of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.

```
## 7444
```

```
## 7446
```

```
## 11393
```

```
## 11394
```

Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.

11395 Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. This series has been linked to produce a consistent time series to counteract breaks in series over time due to changes in base years, source data and methodologies. Thus, it may not be comparable with other national accounts series in the database for historical years.

```
##           sourceDatabase
```

```
## 7442 World Development Indicators
```

```
## 7444 WDI Database Archives
```

```
## 7446 WDI Database Archives
```

```
## 11393 WDI Database Archives
```

```
## 11394 World Development Indicators
```

```
## 11395 World Development Indicators
```

```
##
```

```
sourceOrganization
```

```
## 7442 International  
Monetary Fund, International Financial Statistics and data files.
```

```
## 7444
```

```
## 7446
```

```
## 11393
```

```
## 11394 World Bank  
national accounts data, and OECD National Accounts data files.
```

```
## 11395 World Bank staff estimates based on World Bank national accounts  
data archives, OECD National Accounts, and the IMF WEO database.
```

```
GDP_deflator <- data.frame(  
  WDI(country = "TR",  
    indicator = "NY.GDP.DEFL.KD.ZG",  
    start = 1987,  
    end = 2017,  
    extra = TRUE))
```

Fetching the Interest Rate data

```
WDIsearch(string = "Interest Rate",  
  field = "name",  
  short = TRUE)
```

```
##           indicator
```

```
## 6320 FB.FCP.INST.CB.PD.ER
```

```
## 6404 FB.INC.INST.CB.LN.AL
```

```

## 6405 FB.INC.INST.CB.LN.NL
## 6406 FB.INC.INST.CB.LN.SL
## 6407 FB.INC.INST.CB.LN.WL
## 6419 FB.INC.INST.FC.LN.AL
## 6420 FB.INC.INST.FC.LN.NL
## 6421 FB.INC.INST.FC.LN.SL
## 6422 FB.INC.INST.FC.LN.WL
## 6442 FB.INC.INST.MC.LN.AL
## 6443 FB.INC.INST.MC.LN.NL
## 6444 FB.INC.INST.MC.LN.SL
## 6445 FB.INC.INST.MC.LN.WL
## 6459 FB.INC.INST.OB.LN.AL
## 6460 FB.INC.INST.OB.LN.NL
## 6461 FB.INC.INST.OB.LN.SL
## 6462 FB.INC.INST.OB.LN.WL
## 6474 FB.INC.INST.OD.LN.AL
## 6475 FB.INC.INST.OD.LN.NL
## 6476 FB.INC.INST.OD.LN.SL
## 6477 FB.INC.INST.OD.LN.WL
## 7447 FR.INR.DPST
## 7448 FR.INR.DPST.DP
## 7449 FR.INR.GBND
## 7450 FR.INR.IMPL
## 7451 FR.INR.LEND
## 7452 FR.INR.LEND.DPST.DF
## 7453 FR.INR.LEND.LIBOR3.DF
## 7454 FR.INR.LNDP
## 7455 FR.INR.LNLB
## 7457 FR.INR.RINR
## 7459 FR.INR.TDPT
##
name
## 6320 459_Are commercial banks required to disclose
effective interest rate at the shopping and/or pre-contractual
stage?_#VHAA_00
## 6404 168_For
commercial banks, is all lending subject to interest rate caps or pricing
limits?
## 6405
169_For commercial banks, are there no interest rate caps or pricing limits?
## 6406 170_For commercial banks, are there some
interest rate caps or pricing limits that apply to certain products or
segments?
## 6407 171_For commercial banks, is all,
some, or no lending subject to interest rate caps or pricing limits?_#VGIA_00
## 6419 176_For financial
cooperatives, is all lending subject to interest rate caps or pricing limits?
## 6420
177_For financial cooperatives, are there no interest rate caps or pricing
limits?

```

6421 178_For financial cooperatives, are there some interest rate caps or pricing limits that apply to certain products or segments?

6422 179_For financial cooperatives, is all, some, or no lending subject to interest rate caps or pricing limits?_#VGIA_02

6442 184_For microcredit institutions (MCIs), is all lending subject to interest rate caps or pricing limits?

6443 185_For microcredit institutions (MCIs), are there no interest rate caps or pricing limits?

6444 186_For microcredit institutions (MCIs), are there some interest rate caps or pricing limits that apply to certain products or segments?

6445 187_For microcredit institutions (MCIs), is all, some, or no lending subject to interest rate caps or pricing limits?_#VGIA_04

6459 172_For other banks, is all lending subject to interest rate caps or pricing limits?

6460 173_For other banks, are there no interest rate caps or pricing limits?

6461 174_For other banks, are there some interest rate caps or pricing limits that apply to certain products or segments?

6462 175_For other banks, is all, some, or no lending subject to interest rate caps or pricing limits?_#VGIA_01

6474 180_For other deposit taking institutions (ODTIs), is all lending subject to interest rate caps or pricing limits?

6475 181_For other deposit taking institutions (ODTIs), are there no interest rate caps or pricing limits?

6476 182_For other deposit taking institutions (ODTIs), are there some interest rate caps or pricing limits that apply to certain products or segments?

6477 183_For other deposit taking institutions (ODTIs), is all, some, or no lending subject to interest rate caps or pricing limits?_#VGIA_03

7447 Deposit interest rate (%)

7448 Real deposit interest rate (%)

7449 Bond interest rate (%)

7450 International interest rate, implicit (%)

7451 Lending interest rate (%)

7452 Interest rate spread (lending rate minus deposit)

7453 Interest rate spread (lending rate minus LIBOR)

```

## 7454
Interest rate spread (lending rate minus deposit rate, %)
## 7455
Interest rate spread (lending rate minus LIBOR, %)
## 7457
Real interest rate (%)
## 7459
Time deposits interest rate (%)

Interest_rates <- data.frame(
  WDI(country = "TR",
      indicator = "FR.INR.DPST",
      start = 1987,
      end = 2017,
      extra = TRUE))

```

Fetching the Exchange Rate data

```

WDIsearch(string = "exchange rate",
  field = "name",
  short = FALSE)

##                indicator
## 3122                DPANUSLCU
## 3123                DPANUSSPB
## 3124                DPANUSSPF
## 3648      DT.DOD.DECT.CD.AR.EX.US
## 3659      DT.DOD.DECT.CD.CB.AR.EX.US
## 3708      DT.DOD.DECT.CD.GG.AR.EX.US
## 3722      DT.DOD.DECT.CD.IL.AR.EX.US
## 3736      DT.DOD.DECT.CD.MA.AR.EX.US
## 3751      DT.DOD.DECT.CD.OT.AR.EX.US
## 3796      DT.DOD.DIDI.CD.IL.EX.US
## 3813      DT.DOD.DIFE.CD.IL.EX.US
## 3830      DT.DOD.DIIE.CD.IL.EX.US
## 3845      DT.DOD.DLBN.CD.CB.AR.EX.US
## 3855      DT.DOD.DLBN.CD.GG.AR.EX.US
## 3866      DT.DOD.DLBN.CD.MA.AR.EX.US
## 3878      DT.DOD.DLBN.CD.OT.AR.EX.US
## 3888      DT.DOD.DLCD.CD.CB.AR.EX.US
## 3898      DT.DOD.DLCD.CD.GG.AR.EX.US
## 3909      DT.DOD.DLCD.CD.MA.AR.EX.US
## 3921      DT.DOD.DLCD.CD.OT.AR.EX.US
## 3932      DT.DOD.DLTL.CD.CB.AR.EX.US
## 3942      DT.DOD.DLTL.CD.GG.AR.EX.US
## 3953      DT.DOD.DLTL.CD.MA.AR.EX.US
## 3965      DT.DOD.DLTL.CD.OT.AR.EX.US
## 3975      DT.DOD.DLTO.CD.CB.AR.EX.US
## 3985      DT.DOD.DLTO.CD.GG.AR.EX.US
## 3996      DT.DOD.DLTO.CD.MA.AR.EX.US
## 4008      DT.DOD.DLTO.CD.OT.AR.EX.US

```

```

## 4018      DT.DOD.DLTS.CD.GG.EX.US
## 4028      DT.DOD.DLTS.CD.MA.AR.EX.US
## 4038      DT.DOD.DLTT.CD.CB.AR.EX.US
## 4048      DT.DOD.DLTT.CD.GG.AR.EX.US
## 4059      DT.DOD.DLTT.CD.MA.AR.EX.US
## 4071      DT.DOD.DLTT.CD.OT.AR.EX.US
## 4082      DT.DOD.DLXF.CD.CB.AR.EX.US
## 4120      DT.DOD.DLXF.CD.GG.AR.EX.US
## 4134      DT.DOD.DLXF.CD.MA.AR.EX.US
## 4149      DT.DOD.DLXF.CD.OT.AR.EX.US
## 4180      DT.DOD.DSCD.CD.CB.AR.EX.US
## 4190      DT.DOD.DSCD.CD.GG.AR.EX.US
## 4201      DT.DOD.DSCD.CD.MA.AR.EX.US
## 4213      DT.DOD.DSCD.CD.OT.AR.EX.US
## 4224      DT.DOD.DS00.CD.CB.AR.EX.US
## 4234      DT.DOD.DS00.CD.GG.AR.EX.US
## 4244      DT.DOD.DS00.CD.MA.AR.EX.US
## 4254      DT.DOD.DS00.CD.OT.AR.EX.US
## 4265      DT.DOD.DSTC.CD.CB.AR.EX.US
## 4303      DT.DOD.DSTC.CD.GG.AR.EX.US
## 4317      DT.DOD.DSTC.CD.MA.AR.EX.US
## 4332      DT.DOD.DSTC.CD.OT.AR.EX.US
## 4348      DT.DOD.DSTL.CD.CB.AR.EX.US
## 4358      DT.DOD.DSTL.CD.GG.AR.EX.US
## 4369      DT.DOD.DSTL.CD.MA.AR.EX.US
## 4381      DT.DOD.DSTL.CD.OT.AR.EX.US
## 4391      DT.DOD.DSTM.CD.CB.AR.EX.US
## 4401      DT.DOD.DSTM.CD.GG.AR.EX.US
## 4412      DT.DOD.DSTM.CD.MA.AR.EX.US
## 4424      DT.DOD.DSTM.CD.OT.AR.EX.US
## 4437      DT.DOD.DSTT.CD.CB.AR.EX.US
## 4447      DT.DOD.DSTT.CD.GG.AR.EX.US
## 4458      DT.DOD.DSTT.CD.MA.AR.EX.US
## 4470      DT.DOD.DSTT.CD.OT.AR.EX.US
## 11187      NEER
## 11562      PA.NUS.FCRF
## 11563      PA.NUS.FCRF.XR
## 11566      PA.NUS.PPPC.RF
## 11607      PE.NUS.FCAE
## 14798      PX.REC.REER
## 14799      PX.REX.REER
## 14872      REER
## 17330      SP.EXCHG.RATE.ICP
##

```

name

3122

Official exchange rate, LCU per USD, period average

3123

rate, new LCU per USD extended backward, period average

3124

Exchange

Exchange

rate, old LCU per USD extended forward, period average

3648 Gross Ext. Debt Pos., All Sectors,
All maturities, All instruments, Exchange rate chg, USD

3659 Gross Ext. Debt Pos., Deposit-Taking Corp., exc. CB,
All maturities, All instruments, Exchange rate chg, USD

3708 Gross Ext. Debt Pos., General Government,
All maturities, All instruments, Exchange rate chg, USD

3722 Gross Ext. Debt Pos., DI: Intercom Lending,
All maturities, All instruments, Exchange rate chg, USD

3736 Gross Ext. Debt Pos., Central Bank,
All maturities, All instruments, Exchange rate chg, USD

3751 Gross Ext. Debt Pos., Other Sectors,
All maturities, All instruments, Exchange rate chg, USD

3796 Gross Ext. Debt Pos., DI: Intercom Lending, All maturities, Debt
liab. of DI ent. to dir. investors, Exchange rate chg, USD

3813 Gross Ext. Debt Pos., DI: Intercom Lending, All
maturities, Debt liab. to fellow ent., Exchange rate chg, USD

3830 Gross Ext. Debt Pos., DI: Intercom Lending, All maturities, Debt
liab. of dir. investors to DI ent., Exchange rate chg, USD

3845 Gross Ext. Debt Pos., Deposit-Taking Corp., exc.
CB, Long-term, Debt securities, Exchange rate chg, USD

3855 Gross Ext. Debt Pos., General
Government, Long-term, Debt securities, Exchange rate chg, USD

3866 Gross Ext. Debt Pos., Central
Bank, Long-term, Debt securities, Exchange rate chg, USD

3878 Gross Ext. Debt Pos., Other
Sectors, Long-term, Debt securities, Exchange rate chg, USD

3888 Gross Ext. Debt Pos., Deposit-Taking Corp., exc. CB,
Long-term, Currency and deposits, Exchange rate chg, USD

3898 Gross Ext. Debt Pos., General Government,
Long-term, Currency and deposits, Exchange rate chg, USD

3909 Gross Ext. Debt Pos., Central Bank,
Long-term, Currency and deposits, Exchange rate chg, USD

3921 Gross Ext. Debt Pos., Other Sectors,
Long-term, Currency and deposits, Exchange rate chg, USD

3932 Gross Ext. Debt Pos., Deposit-Taking
Corp., exc. CB, Long-term, Loans, Exchange rate chg, USD

3942 Gross Ext. Debt Pos.,
General Government, Long-term, Loans, Exchange rate chg, USD

3953 Gross Ext. Debt Pos.,
Central Bank, Long-term, Loans, Exchange rate chg, USD

3965 Gross Ext. Debt Pos.,
Other Sectors, Long-term, Loans, Exchange rate chg, USD

3975 Gross Ext. Debt Pos., Deposit-Taking Corp., exc. CB,
Long-term, Other debt liabilities, Exchange rate chg, USD

3985 Gross Ext. Debt Pos., General Government,
Long-term, Other debt liabilities, Exchange rate chg, USD

3996 Gross Ext. Debt Pos., Central Bank,
Long-term, Other debt liabilities, Exchange rate chg, USD

4008 Gross Ext. Debt Pos., Other Sectors,

Long-term, Other debt liabilities, Exchange rate chg, USD
 ## 4018 Gross Ext. Debt Pos., General Government, Long-term,
 Special drawing rights (allocations), Exchange rate chg, USD
 ## 4028 Gross Ext. Debt Pos., Central Bank, Long-term,
 Special drawing rights (allocations), Exchange rate chg, USD
 ## 4038 Gross Ext. Debt Pos., Deposit-Taking Corp., exc. CB, Long-
 term, Trade credit and advances, Exchange rate chg, USD
 ## 4048 Gross Ext. Debt Pos., General Government, Long-
 term, Trade credit and advances, Exchange rate chg, USD
 ## 4059 Gross Ext. Debt Pos., Central Bank, Long-
 term, Trade credit and advances, Exchange rate chg, USD
 ## 4071 Gross Ext. Debt Pos., Other Sectors, Long-
 term, Trade credit and advances, Exchange rate chg, USD
 ## 4082 Gross Ext. Debt Pos., Deposit-Taking Corp., exc.
 CB, Long-term, All instruments, Exchange rate chg, USD
 ## 4120 Gross Ext. Debt Pos., General
 Government, Long-term, All instruments, Exchange rate chg, USD
 ## 4134 Gross Ext. Debt Pos., Central
 Bank, Long-term, All instruments, Exchange rate chg, USD
 ## 4149 Gross Ext. Debt Pos., Other
 Sectors, Long-term, All instruments, Exchange rate chg, USD
 ## 4180 Gross Ext. Debt Pos., Deposit-Taking Corp., exc. CB,
 Short-term, Currency and deposits, Exchange rate chg, USD
 ## 4190 Gross Ext. Debt Pos., General Government,
 Short-term, Currency and deposits, Exchange rate chg, USD
 ## 4201 Gross Ext. Debt Pos., Central Bank,
 Short-term, Currency and deposits, Exchange rate chg, USD
 ## 4213 Gross Ext. Debt Pos., Other Sectors,
 Short-term, Currency and deposits, Exchange rate chg, USD
 ## 4224 Gross Ext. Debt Pos., Deposit-Taking Corp., exc. CB,
 Short-term, Other debt liabilities, Exchange rate chg, USD
 ## 4234 Gross Ext. Debt Pos., General Government,
 Short-term, Other debt liabilities, Exchange rate chg, USD
 ## 4244 Gross Ext. Debt Pos., Central Bank,
 Short-term, Other debt liabilities, Exchange rate chg, USD
 ## 4254 Gross Ext. Debt Pos., Other Sectors,
 Short-term, Other debt liabilities, Exchange rate chg, USD
 ## 4265 Gross Ext. Debt Pos., Deposit-Taking Corp., exc.
 CB, Short-term, All instruments, Exchange rate chg, USD
 ## 4303 Gross Ext. Debt Pos., General
 Government, Short-term, All instruments, Exchange rate chg, USD
 ## 4317 Gross Ext. Debt Pos., Central
 Bank, Short-term, All instruments, Exchange rate chg, USD
 ## 4332 Gross Ext. Debt Pos., Other
 Sectors, Short-term, All instruments, Exchange rate chg, USD
 ## 4348 Gross Ext. Debt Pos., Deposit-Taking
 Corp., exc. CB, Short-term, Loans, Exchange rate chg, USD
 ## 4358 Gross Ext. Debt Pos.,
 General Government, Short-term, Loans, Exchange rate chg, USD
 ## 4369 Gross Ext. Debt Pos.,

Central Bank, Short-term, Loans, Exchange rate chg, USD
 ## 4381 Gross Ext. Debt Pos.,
 Other Sectors, Short-term, Loans, Exchange rate chg, USD
 ## 4391 Gross Ext. Debt Pos., Deposit-Taking Corp., exc.
 CB, Short-term, Debt securities, Exchange rate chg, USD
 ## 4401 Gross Ext. Debt Pos., General
 Government, Short-term, Debt securities, Exchange rate chg, USD
 ## 4412 Gross Ext. Debt Pos., Central
 Bank, Short-term, Debt securities, Exchange rate chg, USD
 ## 4424 Gross Ext. Debt Pos., Other
 Sectors, Short-term, Debt securities, Exchange rate chg, USD
 ## 4437 Gross Ext. Debt Pos., Deposit-Taking Corp., exc. CB, Short-
 term, Trade credit and advances, Exchange rate chg, USD
 ## 4447 Gross Ext. Debt Pos., General Government, Short-
 term, Trade credit and advances, Exchange rate chg, USD
 ## 4458 Gross Ext. Debt Pos., Central Bank, Short-
 term, Trade credit and advances, Exchange rate chg, USD
 ## 4470 Gross Ext. Debt Pos., Other Sectors, Short-
 term, Trade credit and advances, Exchange rate chg, USD
 ## 11187
 Nominal Effective Exchange Rate
 ## 11562
 Official exchange rate (LCU per US\$, period average)
 ## 11563
 Official exchange rate to parallel exchange rate ratio
 ## 11566 Price level ratio
 of PPP conversion factor (GDP) to market exchange rate
 ## 11607
 Official exchange rate (LCU per US\$, end period)
 ## 14798
 Real effective exchange rate index (line rec, 2005 = 100)
 ## 14799
 Real effective exchange rate index (2010 = 100)
 ## 14872
 Real Effective Exchange Rate
 ## 17330
 SP.EXCHG.RATE.ICP:Exchange Rate Value
 ##
 description
 ## 3122
 Official exchange rate refers to the exchange rate determined by national
 authorities or to the rate determined in the legally sanctioned exchange
 market. It is calculated as an annual average based on monthly averages
 (local currency units relative to the U.S. dollar).
 ## 3123
 Local currency units (LCU) per U.S. dollar, with values prior to the
 currency's introduction presented in the new currency's terms
 ## 3124
 Local currency units (LCU) per U.S. dollar, with values after a new
 currency's introduction presented in the old currency's terms

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4008
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11187

A measure of the value of a currency against a weighted average of several foreign currencies

11562

Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar).

11563

11566 Price level ratio is the ratio of a purchasing power parity (PPP) conversion factor to an exchange rate. It provides a measure of the differences in price levels between countries by indicating the number of units of the common currency needed to buy the same volume of the aggregation level in each country. At the level of GDP, they provide a measure of the differences in the general price levels of countries.

11607

Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. This series shows the end period value of local currency units relative to the U.S. dollar.

14798

Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs. This indicator corresponds to the IFS's line rec, and is based on a nominal rate adjusted for relative changes in consumer prices.

14799

Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.

14872

Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.

17330

sourceDatabase

3122 Global Economic Monitor

3123 Global Economic Monitor

3124 Global Economic Monitor

3648 Quarterly External Debt Statistics SDDS

3659 Quarterly External Debt Statistics SDDS

[illegible]

```

## 4401 Quarterly External Debt Statistics SDDS
## 4412 Quarterly External Debt Statistics SDDS
## 4424 Quarterly External Debt Statistics SDDS
## 4437 Quarterly External Debt Statistics SDDS
## 4447 Quarterly External Debt Statistics SDDS
## 4458 Quarterly External Debt Statistics SDDS
## 4470 Quarterly External Debt Statistics SDDS
## 11187 Global Economic Monitor
## 11562 World Development Indicators
## 11563 WDI Database Archives
## 11566 World Development Indicators
## 11607 Africa Development Indicators
## 14798 Africa Development Indicators
## 14799 World Development Indicators
## 14872 Global Economic Monitor
## 17330 ICP 2017
##
sourceOrganization
## 3122 World Bank staff calculations based
on Datastream and IMF International Finance Statistics data.
## 3123 World Bank staff calculations based
on Datastream and IMF International Finance Statistics data.
## 3124 World Bank staff calculations based
on Datastream and IMF International Finance Statistics data.
## 3648
## 3659
## 3708
## 3722
## 3736
## 3751
## 3796
## 3813
## 3830
## 3845
## 3855
## 3866
## 3878
## 3888
## 3898
## 3909
## 3921
## 3932
## 3942
## 3953
## 3965
## 3975
## 3985
## 3996
## 4008
## 4018

```

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4348
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4391
4401
4412
4424
4437
4447
4458
4470
11187 World Bank staff calculations based
on Datastream and IMF International Finance Statistics data.
11562
International Monetary Fund, International Financial Statistics.
11563
11566 International Comparison Program, World Bank | World Development
Indicators database, World Bank | Eurostat-OECD PPP Programme.
11607
International Monetary Fund, International Financial Statistics.
14798
International Monetary Fund, International Financial Statistics.
14799
International Monetary Fund, International Financial Statistics.
14872 World Bank staff calculations based
on Datastream and IMF International Finance Statistics data.
17330

```

Exchange_rate_dataset <- get_datasets()
search_dataset("Exchange Rate", data = Exchange_rate_dataset)

## # A tibble: 2 x 2
##   id          title
##   <chr>       <chr>
## 1 SNA_TABLE4    4. PPPs and exchange rates
## 2 REFSERIES_MSIT Exchange rates

Exchange_rate <- get_dataset("SNA_TABLE4",
                             filter = list("TUR", "EXC"),
                             start_time = 1987,
                             end_time = 2017)

```

Creating the data frame

```

df <- data.frame(Exchange_rate$Time, Exchange_rate$ObsValue,
GDP_deflator$NY.GDP.DEFL.KD.ZG, Gdp_Growth$NY.GDP.MKTP.KD.ZG,
Interest_rates$FR.INR.DPST)
df$GDP_deflator.NY.GDP.DEFL.KD.ZG <- rev(df$GDP_deflator.NY.GDP.DEFL.KD.ZG)
df$Gdp_Growth.NY.GDP.MKTP.KD.ZG <- rev(df$Gdp_Growth.NY.GDP.MKTP.KD.ZG)
df$Interest_rates.FR.INR.DPST <- rev(df$Interest_rates.FR.INR.DPST)
df$Exchange_rate.ObsValue <- as.numeric(df$Exchange_rate.ObsValue)

```

Checking the variables together with Multiple Linear Regression

```

lm.df <- lm(df$Exchange_rate.ObsValue ~ df$GDP_deflator.NY.GDP.DEFL.KD.ZG +
df$Gdp_Growth.NY.GDP.MKTP.KD.ZG + df$Interest_rates.FR.INR.DPST, data = df)
summary(lm.df)

##
## Call:
## lm(formula = df$Exchange_rate.ObsValue ~ df$GDP_deflator.NY.GDP.DEFL.KD.ZG +
+
##     df$Gdp_Growth.NY.GDP.MKTP.KD.ZG + df$Interest_rates.FR.INR.DPST,
##     data = df)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.13073 -0.38936 -0.07422  0.27046  1.84751
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.454398   0.339469   7.230 8.92e-08
## ***
## df$GDP_deflator.NY.GDP.DEFL.KD.ZG -0.007662   0.008020  -0.955   0.348
## df$Gdp_Growth.NY.GDP.MKTP.KD.ZG -0.031055   0.028097  -1.105   0.279
## df$Interest_rates.FR.INR.DPST    -0.022020   0.011538  -1.909   0.067 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##

```



```
## df$Gdp_Growth.NY.GDP.MKTP.KD.ZG  0.03033    0.04038    0.751  0.45874
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.015 on 29 degrees of freedom
## Multiple R-squared:  0.01907,    Adjusted R-squared:  -0.01475
## F-statistic: 0.5639 on 1 and 29 DF,  p-value: 0.4587

lm.df3 <- lm(df$Exchange_rate.ObsValue ~ df$Interest_rates.FR.INR.DPST, data
= df)
summary(lm.df3)

##
## Call:
## lm(formula = df$Exchange_rate.ObsValue ~ df$Interest_rates.FR.INR.DPST,
##     data = df)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.2858 -0.3627 -0.1809  0.3159  1.7746
##
## Coefficients:
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   2.328693   0.230527  10.102 5.24e-11 ***
## df$Interest_rates.FR.INR.DPST -0.029773   0.004625  -6.437 4.84e-07 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6574 on 29 degrees of freedom
## Multiple R-squared:  0.5883, Adjusted R-squared:  0.5741
## F-statistic: 41.43 on 1 and 29 DF,  p-value: 4.842e-07
```

After testing the variables one by one, we can observe that GDP growth is irrelevant to exchange rates. Also we know that inflation and interest rates are correlated as we can see in the next regression:

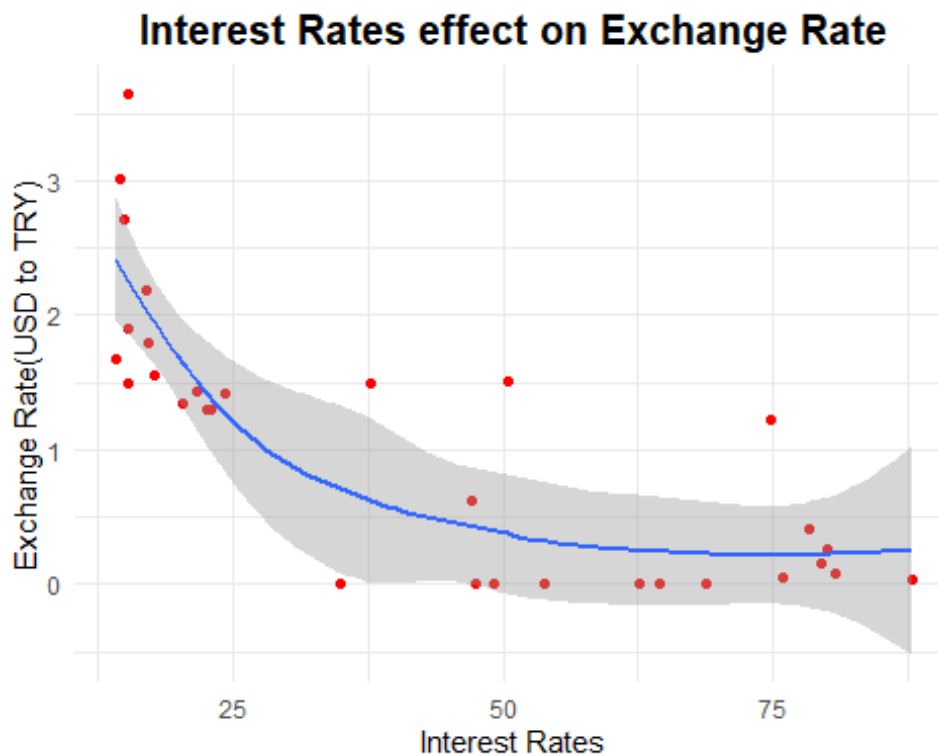
```
lm.df4 <- lm(df$Exchange_rate.ObsValue ~ df$GDP_deflator.NY.GDP.DEFL.KD.ZG +
df$Interest_rates.FR.INR.DPST, data = df)
summary(lm.df4)

##
## Call:
## lm(formula = df$Exchange_rate.ObsValue ~ df$GDP_deflator.NY.GDP.DEFL.KD.ZG +
##     df$Interest_rates.FR.INR.DPST, data = df)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.2588 -0.3832 -0.1968  0.2802  1.8230
##
## Coefficients:
```

```
##                                Estimate Std. Error t value Pr(>|t|)
## (Intercept)                   2.205145   0.254738   8.657   2.1e-09
***
## df$GDP_deflator.NY.GDP.DEFL.KD.ZG -0.008914   0.007971  -1.118   0.273
## df$Interest_rates.FR.INR.DPST     -0.018452   0.011121  -1.659   0.108
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6546 on 28 degrees of freedom
## Multiple R-squared:  0.6059, Adjusted R-squared:  0.5777
## F-statistic: 21.52 on 2 and 28 DF,  p-value: 2.183e-06
```

So we can interpret the simple linear regressions 1 and 3 to look at the effects of inflation and interest rates on the exchange rates:

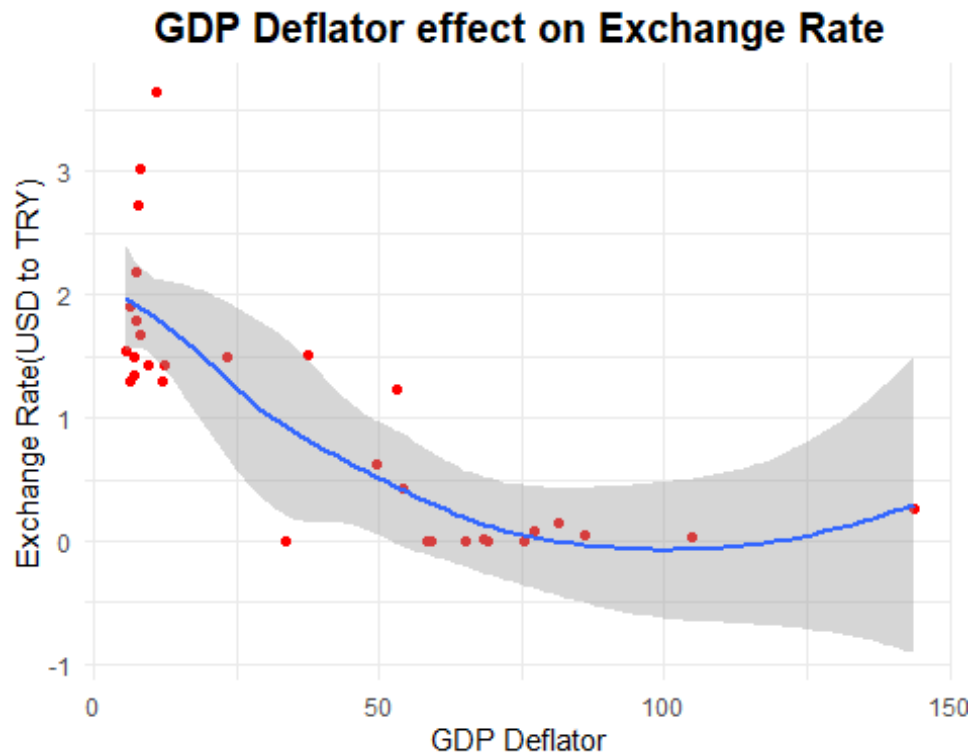
```
ggplot(df,aes(Interest_rates.FR.INR.DPST, Exchange_rate.ObsValue)) +
  geom_point(color="red") +
  geom_smooth() +
  theme_minimal() +
  labs(x='Interest Rates', y='Exchange Rate(USD to TRY)', title='Interest
Rates effect on Exchange Rate') +
  theme(plot.title = element_text(hjust=0.5, size=15, face='bold'))
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```



```
ggplot(df,aes(GDP_deflator.NY.GDP.DEFL.KD.ZG, Exchange_rate.ObsValue)) +
  geom_point(color="red") +
```

```
geom_smooth() +
theme_minimal() +
labs(x='GDP Deflator', y='Exchange Rate(USD to TRY)', title='GDP Deflator
effect on Exchange Rate') +
theme(plot.title = element_text(hjust=0.5, size=15, face='bold'))

## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```



We observe that dots are mainly inside of the confident interval, so we can say that interest rates and inflation were affecting the exchange rates between 1987 and 2017.