NIPA Consistent FIM Check

Manuel Alcalá Kovalski

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```
source('src/packages.R')
```

Contributions to Percent Change in Real Gross Domestic Product (NIPA)

First, we want to load Table 1.1.2. "Contributions to Percent Change in Real Gross Domestic Product" from BEA for quarterly data between 2018 and 2020.

```
library(bea.R)
beaKey <- '6937C372-8AEE-4BFD-B991-1A469B942C41'

beaSpecs <- list(
    'UserID' = beaKey ,
    'Method' = 'GetData',
    'datasetname' = 'NIPA',
    'TableName' = 'T10102',
    'Frequency' = 'Q',
    'Year' = '2018, 2019, 2020'
)

nipa_contributions <-
  beaGet(beaSpecs,  asTable = TRUE, asWide = FALSE) %>%
  as_tibble()
library(kableExtra)
paged_table(nipa_contributions)
```

TableName	SeriesCode	LineNumber	LineDescription	TimePeriod	M
T10102	A191RL	1	Gross domestic product	2018Q1	F
T10102	A191RL	1	Gross domestic product	2018Q2	F
T10102	A191RL	1	Gross domestic product	2018Q3	F
T10102	A191RL	1	Gross domestic product	2018Q4	F
T10102	A191RL	1	Gross domestic product	2019Q1	F
T10102	A191RL	1	Gross domestic product	2019Q2	F
T10102	A191RL	1	Gross domestic product	2019Q3	F
T10102	A191RL	1	Gross domestic product	2019Q4	F
T10102	A191RL	1	Gross domestic product	2020Q1	F
T10102	A191RL	1	Gross domestic product	2020Q2	F
T10102	A191RL	1	Gross domestic product	2020Q3	F
T10102	A009RY	10	Structures	2018Q1	Q
T10102	A009RY	10	Structures	2018Q2	Q
T10102	A009RY	10	Structures	2018Q3	Q
T10102	A009RY	10	Structures	2018Q4	Q
T10102	A009RY	10	Structures	2019Q1	Q
T10102	A009RY	10	Structures	2019Q2	Q
T10102	A009RY	10	Structures	2019Q3	Q
T10102	A009RY	10	Structures	2019Q4	Q
T10102	A009RY	10	Structures	2020Q1	Q
T10102	A009RY	10	Structures	2020Q2	Q
T10102	A009RY	10	Structures	2020Q3	Q
T10102	Y033RY	11	Equipment	2018Q1	Q
T10102	Y033RY	11	Equipment	2018Q2	Q
T10102	Y033RY	11	Equipment	2018Q3	Q
T10102	Y033RY	11	Equipment	2018Q4	Q
T10102	Y033RY	11	Equipment	2019Q1	Q
T10102	Y033RY	11	Equipment	2019Q2	Q
T10102	Y033RY	11	Equipment	2019Q3	Q
T10102	Y033RY	11	Equipment	2019Q4	Q
T10102	Y033RY	11	Equipment	2020Q1	Q
T10102	Y033RY	11	Equipment	2020Q2	Q
T10102	Y033RY	11	Equipment	2020Q3	Q
T10102	Y001RY	12	Intellectual property products	2018Q1	Q
T10102	Y001RY	12	Intellectual property products	2018Q2	Q
T10102	Y001RY	12	Intellectual property products	2018Q3	Q
T10102	Y001RY	12	Intellectual property products	2018Q4	Q
T10102	Y001RY	12	Intellectual property products	2019Q1	Q
T10102	Y001RY	12	Intellectual property products	2019Q2	Q
T10102	Y001RY	12	Intellectual property products	2019Q3	Q
T10102	Y001RY	12	Intellectual property products	2019Q4	Q
T10102	Y001RY	12	Intellectual property products	2020Q1	Q
T10102	Y001RY	12	Intellectual property products	2020Q2	Q
T10102	Y001RY	12	Intellectual property products	2020Q3	Q
T10102	A011RY	13	Residential	2018Q1	Q
T10102	A011RY	13	Residential	2018Q2	Q
T10102	A011RY	13	Residential	2018Q3	Q
T10102	A011RY	13	Residential	2018Q4	Q
T10102	A011RY	13	Residential	2019Q1	Q
T10102	A011RY	13	Residential	2019Q2	Q
T10102	A011RY	13	Residential	2019Q3	Q
T10102	A011RY	13	Residential	2019Q4	Q
T10102	A011RY	13	Residential	2020Q1	Q
T10102	A011RY	13	Residential	2020Q2	Q
T10102	A011RY	13	Residential	2020Q3	Q
T10102	A014RY	14	Change in private inventories	2018Q1	Q
T10102	A014RY	14	Change in private inventories	2018Q2	Q

In order to compare our methodology to the BEA's, we need to look at "Government consumption expenditures and gross investment" (Line item 22) and its subcomponents: Federal (Line item 23) and State and local (Line item 26).

```
nipa_contributions %<>%
  select(TimePeriod, LineDescription, DataValue) %>%
  filter(LineDescription %in% c('Government consumption expenditures and gross investment', 'Federal',
  ) %>%
  mutate(TimePeriod = as.yearqtr(TimePeriod)) %>%
  pivot_wider(names_from = LineDescription, values_from = DataValue)

paged_table(nipa_contributions)
```

TimePeriod	Government consumption expenditures and gross investment	Federal	State and local
2018 Q1	0.26	0.12	0.13
2018 Q2	0.50	0.23	0.27
2018 Q3	0.44	0.29	0.15
2018 Q4	-0.16	0.12	-0.28
2019 Q1	0.43	0.09	0.34
2019 Q2	0.86	0.58	0.28
2019 Q3	0.37	0.31	0.06
2019 Q4	0.42	0.26	0.16
2020 Q1	0.22	0.10	0.12
2020 Q2	0.77	1.17	-0.40
2020 Q3	-0.76	-0.38	-0.38

```
fim %>%
  mutate(date = as.yearqtr(date)) %>%
  filter(date >= '2018 Q1' & date <= '2020 Q3') %>%
  select(date, fim_bars, federal_cont, state_local_cont) %>%
  paged_table()
```

date	fim_bars	federal_cont	state_local_cont
2018 Q1	0.2940449	0.0877420	0.1651340
2018 Q2	0.7133847	0.4297577	0.0722578
2018 Q3	0.4609231	0.2109925	0.2262143
2018 Q4	-0.1287625	0.2371229	-0.3937263
2019 Q1	0.5095737	-0.1472996	0.5780487
2019 Q2	0.9103006	0.3571801	0.5028837
2019 Q3	0.6941990	0.3494500	0.0242558
2019 Q4	0.7733289	0.2127036	0.2037446
2020 Q1	0.3747326	-0.0679152	0.2893119
2020 Q2	14.5885686	7.4179723	-6.9774431
2020 Q3	3.7710863	-0.6167607	-0.3627439

```
fim %>%
  mutate(yq = as.yearqtr(date, format = '%Y-%q' )) %>%
  select(yq)
```

yq
1970 Q1
1970 Q2
1970 Q3
1970 Q4
1971 Q1
1971 Q2
1971 Q3
1971 Q4
1972 Q1
1972 Q2
1972 Q3
1972 Q4
1973 Q1
1973 Q2
1973 Q3
1973 Q4
1974 Q1
1974 Q2
1974 Q3
1974 Q4
1975 Q1
1975 Q2
1975 Q3
1975 Q4
1976 Q1
1976 Q2
1976 Q3
1976 Q4
1977 Q1
1977 Q2
1977 Q3
1977 Q4
1978 Q1
1978 Q2
1978 Q3
1978 Q4
1979 Q1
1979 Q2
1979 Q3
1979 Q4
1980 Q1
1980 Q2
1980 Q3
1980 Q4
1981 Q1
1981 Q2
1981 Q3
1981 Q4
1982 Q1
1982 Q2
1982 Q3
1982 Q4
1983 Q1
1983 Q2
1983 Q3
1983 Q4
1984 Q1

```r
fim_reduced <-
  fim %>%
  mutate(yq = as.yearqtr(date, format = '%Y-%q' )) %>%
  select(yq)
library('arsenal')
summary(comparedf(fim_reduced, nipa_contributions,
                tol.vars = c(fim_bars = 'Government consumption expenditures and gross investment',
                             federal_cont = "Federal",
                             state_local_cont = "State and local")
))
```

```
## Warning in tweakcolnames(by.x, by.y, colnames(x), colnames(y), control):
## Variable tolerance 'fim_bars' not found in colnames of x

## Warning in tweakcolnames(by.x, by.y, colnames(x), colnames(y), control):
## Variable tolerance 'federal_cont' not found in colnames of x

## Warning in tweakcolnames(by.x, by.y, colnames(x), colnames(y), control):
## Variable tolerance 'state_local_cont' not found in colnames of x

##
##
## Table: Summary of data.frames
##
## version   arg                  ncol   nrow
## --------  -------------------  -----  -----
## x         fim_reduced              1    211
## y         nipa_contributions       4     11
##
##
##
## Table: Summary of overall comparison
##
## statistic                                                  value
## ---------------------------------------------------------  ------
## Number of by-variables                                         0
## Number of non-by variables in common                           0
## Number of variables compared                                   0
## Number of variables in x but not y                             1
## Number of variables in y but not x                             4
## Number of variables compared with some values unequal          0
## Number of variables compared with all values equal             0
## Number of observations in common                              11
## Number of observations in x but not y                        200
## Number of observations in y but not x                          0
## Number of observations with some compared variables unequal    0
## Number of observations with all compared variables equal      11
## Number of values unequal                                       0
##
##
##
## Table: Variables not shared
##
```

```
## version   variable                                                  position  class
## --------  --------------------------------------------------------  --------  --------
## x         yq                                                               1  yearqtr
## y         TimePeriod                                                       1  yearqtr
## y         Government consumption expenditures and gross investment         2  numeric
## y         Federal                                                          3  numeric
## y         State and local                                                  4  numeric
##
##
##
## Table: Other variables not compared
##
## |                               |
## |:------------------------------|
## |No other variables not compared |
##
##
##
## Table: Observations not shared
##
## version    ..row.names..   observation
## --------  --------------  ------------
## x                     12            12
## x                     13            13
## x                     14            14
## x                     15            15
## x                     16            16
## x                     17            17
## x                     18            18
## x                     19            19
## x                     20            20
## x                     21            21
## x                     22            22
## x                     23            23
## x                     24            24
## x                     25            25
## x                     26            26
## x                     27            27
## x                     28            28
## x                     29            29
## x                     30            30
## x                     31            31
## x                     32            32
## x                     33            33
## x                     34            34
## x                     35            35
## x                     36            36
## x                     37            37
## x                     38            38
## x                     39            39
## x                     40            40
## x                     41            41
## x                     42            42
## x                     43            43
```

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## x                    44              44
## x                    45              45
## x                    46              46
## x                    47              47
## x                    48              48
## x                    49              49
## x                    50              50
## x                    51              51
## x                    52              52
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## x                    67              67
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## x                    92              92
## x                    93              93
## x                    94              94
## x                    95              95
## x                    96              96
## x                    97              97
```

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## x                98              98
## x                99              99
## x               100             100
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## x                199             199
## x                200             200
## x                201             201
## x                202             202
## x                203             203
## x                204             204
## x                205             205
```

```
## x                    206           206
## x                    207           207
## x                    208           208
## x                    209           209
## x                    210           210
## x                    211           211
##
##
##
## Table: Differences detected by variable
##
## |                                    |
## |:-----------------------------------|
## |No differences detected by variable |
##
##
##
## Table: Differences detected
##
## |                         |
## |:------------------------|
## |No differences detected |
##
##
##
## Table: Non-identical attributes
##
## |                             |
## |:----------------------------|
## |No non-identical attributes |
```