```
E:\documentos que si importan\Microeconometria\trabajo2

  2. cap which `ado´
  3. if _rc!=0 ssc install `ado´, all
  4. }
checking scheme-burd consistency and verifying not already installed...
all files already exist and are up to date.




(Tobacco Sales in 39 US States)

       panel variable:  state (strongly balanced)
        time variable:  year, 1970 to 2000
                delta:  1 unit




------------------------------------------------------------------------------
Synthetic Control Method for Comparative Case Studies
------------------------------------------------------------------------------

First Step: Data Setup
------------------------------------------------------------------------------
control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

------------------------------------------------------------------------------
Data Setup successful
------------------------------------------------------------------------------
                Treated Unit: California
               Control Units: Alabama, Arkansas, Colorado, Connecticut,
                              Delaware, Georgia, Idaho, Illinois, Indiana,
                              Iowa, Kansas, Kentucky, Louisiana, Maine,
                              Minnesota, Mississippi, Missouri, Montana,
                              Nebraska, Nevada, New Hampshire, New Mexico,
                              North Carolina, North Dakota, Ohio, Oklahoma,
                              Pennsylvania, Rhode Island, South Carolina, South
                              Dakota, Tennessee, Texas, Utah, Vermont,
                              Virginia, West Virginia, Wisconsin, Wyoming
------------------------------------------------------------------------------
           Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
```

2000

Predictors: beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)

Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	1.943233

Unit Weights:

Co_No	Unit_Weight
Alabama	0
Arkansas	0
Colorado	.285
Connecticut	.101
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	.245
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	.369
Vermont	0

Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	24.28	23.22596
lnincome	10.03176	9.867266
retprice	66.63684	65.40743
age15to24	.1786624	.1825559
cigsale(1988)	90.1	92.6063
cigsale(1980)	120.2	120.3907
cigsale(1975)	127.1	126.7094

Estimating the treatment effects
Estimating the possible placebo effects (one set for each of the 1 treatment pe

```
|                                  | Total: 38
..................................| 22.00s elapsed.
```

Conducting inference: 5 steps, and 38 placebo averages
Step 1... Finished
Step 2... Finished
Step 3... Finished
Step 4... Finished
Step 5... Finished

Post-treatment results: Effects, p-values, standardized p-values

	estimates	pvals	pvals_std
c1	-7.887098	.1315789	0
c2	-9.693599	.1842105	0
c3	-13.8027	.2105263	0
c4	-13.344	.1315789	0
c5	-17.0624	.1052632	0
c6	-20.8943	.0789474	0
c7	-19.8568	.1315789	.0263158
c8	-21.0405	.1578947	0
c9	-21.4914	.1052632	.0263158
c10	-19.1642	.1842105	.0263158
c11	-24.554	.1052632	0
c12	-24.2687	.1052632	.0263158

file effect.pdf saved
file tc.pdf saved

```
  2. synth cigsale beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988)

  3.

------------------------------------------------------------------------------
Synthetic Control Method for Comparative Case Studies
------------------------------------------------------------------------------

First Step: Data Setup
------------------------------------------------------------------------------
control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

------------------------------------------------------------------------------
Data Setup successful
------------------------------------------------------------------------------
               Treated Unit: Alabama
             Control Units: Arkansas, California, Colorado, Connecticut,
                            Delaware, Georgia, Idaho, Illinois, Indiana,
                            Iowa, Kansas, Kentucky, Louisiana, Maine,
                            Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Tennessee, Texas, Utah, Vermont,
                            Virginia, West Virginia, Wisconsin, Wyoming
------------------------------------------------------------------------------
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                            1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                            2000
------------------------------------------------------------------------------
                Predictors: beer(1984(1)1988) lnincome retprice age15to24
                            cigsale(1988) cigsale(1980) cigsale(1975)
------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
------------------------------------------------------------------------------

Second Step: Run Optimization
------------------------------------------------------------------------------
------------------------------------------------------------------------------

Optimization done
------------------------------------------------------------------------------

Third Step: Obtain Results
------------------------------------------------------------------------------

Loss: Root Mean Squared Prediction Error
-------------+----------------
```

RMSPE	2.782483

Unit Weights:

Co_No	Unit_Weight
Arkansas	.381
California	0
Colorado	0
Connecticut	.037
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	.149
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	.265
Texas	0
Utah	.112
Vermont	0
Virginia	0
West Virginia	.055
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	18.96	19.00866
lnincome	9.632306	9.631108
retprice	66.99474	66.41953
age15to24	.1794635	.1762747
cigsale(1988)	112.1	111.7751
cigsale(1980)	123.2	123.1649
cigsale(1975)	111.7	111.596

```
Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

               Treated Unit: Arkansas
              Control Units: Alabama, California, Colorado, Connecticut,
                             Delaware, Georgia, Idaho, Illinois, Indiana,
                             Iowa, Kansas, Kentucky, Louisiana, Maine,
                             Minnesota, Mississippi, Missouri, Montana,
                             Nebraska, Nevada, New Hampshire, New Mexico,
                             North Carolina, North Dakota, Ohio, Oklahoma,
                             Pennsylvania, Rhode Island, South Carolina, South
                             Dakota, Tennessee, Texas, Utah, Vermont,
                             Virginia, West Virginia, Wisconsin, Wyoming

          Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000

                 Predictors: beer(1984(1)1988) lnincome retprice age15to24
                             cigsale(1988) cigsale(1980) cigsale(1975)

Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization


Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

   RMSPE | 2.472617

Unit Weights:

         Co_No | Unit_Weight
---------------+------------
       Alabama |        .088
```

California	0
Colorado	0
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	.838
Texas	.074
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	18.52	21.02944
lnincome	9.606481	9.694917
retprice	67.68947	65.26561
age15to24	.1691679	.1773153
cigsale(1988)	121.5	122.0072
cigsale(1980)	131.8	129.7146
cigsale(1975)	114.8	116.7948

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

```
treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period
```

Data Setup successful

```
               Treated Unit: Colorado
             Control Units: Alabama, Arkansas, California, Connecticut,
                            Delaware, Georgia, Idaho, Illinois, Indiana,
                            Iowa, Kansas, Kentucky, Louisiana, Maine,
                            Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Tennessee, Texas, Utah, Vermont,
                            Virginia, West Virginia, Wisconsin, Wyoming
```

```
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
```

```
                 Predictors: beer(1984(1)1988) lnincome retprice age15to24
                             cigsale(1988) cigsale(1980) cigsale(1975)
```

```
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
```

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	7.384361

Unit Weights:

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	.2
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0

Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	.084
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	.34
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	.056
Vermont	0
Virginia	.045
West Virginia	0
Wisconsin	0
Wyoming	.276

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	25.08	23.86444
lnincome	9.929731	9.869053
retprice	60.39474	63.21764
age15to24	.1844323	.1830876
cigsale(1988)	94.6	95.4047
cigsale(1980)	131	130.8709
cigsale(1975)	131	131.3663

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

```
                Treated Unit: Connecticut
               Control Units: Alabama, Arkansas, California, Colorado,
                              Delaware, Georgia, Idaho, Illinois, Indiana,
                              Iowa, Kansas, Kentucky, Louisiana, Maine,
                              Minnesota, Mississippi, Missouri, Montana,
                              Nebraska, Nevada, New Hampshire, New Mexico,
                              North Carolina, North Dakota, Ohio, Oklahoma,
                              Pennsylvania, Rhode Island, South Carolina, South
                              Dakota, Tennessee, Texas, Utah, Vermont,
                              Virginia, West Virginia, Wisconsin, Wyoming
------------------------------------------------------------------------------
           Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
------------------------------------------------------------------------------
                  Predictors: beer(1984(1)1988) lnincome retprice age15to24
                              cigsale(1988) cigsale(1980) cigsale(1975)
------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
------------------------------------------------------------------------------
Second Step: Run Optimization
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Optimization done
------------------------------------------------------------------------------
Third Step: Obtain Results
------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error
------------------------------------------------------------------------------
```

RMSPE	5.313993

```
------------------------------------------------------------------------------
Unit Weights:
```

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	.331
Mississippi	0
Missouri	0

Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	.608
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	.061
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	20.7	23.7151
lnincome	10.10563	9.876479
retprice	77.36842	69.00488
age15to24	.1673609	.1730643
cigsale(1988)	104.8	99.9229
cigsale(1980)	118	118.9135
cigsale(1975)	110.2	111.2071

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

```
      Treated Unit: Delaware
    Control Units: Alabama, Arkansas, California, Colorado,
                   Connecticut, Georgia, Idaho, Illinois, Indiana,
                   Iowa, Kansas, Kentucky, Louisiana, Maine,
                   Minnesota, Mississippi, Missouri, Montana,
                   Nebraska, Nevada, New Hampshire, New Mexico,
                   North Carolina, North Dakota, Ohio, Oklahoma,
                   Pennsylvania, Rhode Island, South Carolina, South
```

```
                            Dakota, Tennessee, Texas, Utah, Vermont,
                            Virginia, West Virginia, Wisconsin, Wyoming
------------------------------------------------------------------------------
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
------------------------------------------------------------------------------
                 Predictors: beer(1984(1)1988) lnincome retprice age15to24
                             cigsale(1988) cigsale(1980) cigsale(1975)
------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
------------------------------------------------------------------------------
Second Step: Run Optimization
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Optimization done
------------------------------------------------------------------------------
Third Step: Obtain Results
------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------
   RMSPE | 9.732523
------------------

------------------------------------------------------------------------------
Unit Weights:

-----------------------
        Co_No | Unit_Weight
--------------+--------------
      Alabama |           0
     Arkansas |           0
   California |           0
     Colorado |           0
  Connecticut |        .037
      Georgia |           0
        Idaho |           0
     Illinois |           0
      Indiana |           0
         Iowa |           0
       Kansas |           0
     Kentucky |           0
    Louisiana |           0
        Maine |           0
    Minnesota |           0
  Mississippi |           0
     Missouri |           0
      Montana |           0
     Nebraska |           0
       Nevada |           0
 New Hampshire |        .099
    New Mexico |           0
North Carolina |           0
 North Dakota |           0
         Ohio |        .334
-----------------------
```

Oklahoma	0
Pennsylvania	0
Rhode Island	.389
South Carolina	0
South Dakota	0
Tennessee	.14
Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	26.08	25.06588
lnincome	9.950567	9.843681
retprice	67.9	65.46919
age15to24	.1816541	.1769446
cigsale(1988)	137.1	133.8428
cigsale(1980)	150.5	149.8209
cigsale(1975)	147.6	148.2476

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

```
               Treated Unit: Georgia
             Control Units: Alabama, Arkansas, California, Colorado,
                            Connecticut, Delaware, Idaho, Illinois, Indiana,
                            Iowa, Kansas, Kentucky, Louisiana, Maine,
                            Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Tennessee, Texas, Utah, Vermont,
                            Virginia, West Virginia, Wisconsin, Wyoming
```

```
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
```

```
                                1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                                2000
-------------------------------------------------------------------------------
                     Predictors: beer(1984(1)1988) lnincome retprice age15to24
                                 cigsale(1988) cigsale(1980) cigsale(1975)
-------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                                1980 1981 1982 1983 1984 1985 1986 1987 1988
-------------------------------------------------------------------------------
Second Step: Run Optimization
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Optimization done
-------------------------------------------------------------------------------
Third Step: Obtain Results
-------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------------
   RMSPE | 1.379995
------------------------
-------------------------------------------------------------------------------
Unit Weights:

-----------------------------
         Co_No | Unit_Weight
-----------------------------
       Alabama |           0
      Arkansas |           0
    California |           0
      Colorado |           0
   Connecticut |        .022
      Delaware |        .047
         Idaho |           0
      Illinois |           0
       Indiana |           0
          Iowa |           0
        Kansas |           0
      Kentucky |        .002
     Louisiana |        .043
         Maine |           0
     Minnesota |           0
   Mississippi |           0
      Missouri |           0
       Montana |           0
      Nebraska |           0
        Nevada |           0
 New Hampshire |           0
    New Mexico |           0
North Carolina |           0
  North Dakota |           0
          Ohio |        .233
      Oklahoma |           0
  Pennsylvania |           0
  Rhode Island |           0
South Carolina |         .17
  South Dakota |           0
     Tennessee |        .483
         Texas |           0
          Utah |           0
```

Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	21.76	22.17568
lnincome	9.75286	9.740246
retprice	63.59474	63.61226
age15to24	.1834677	.1794795
cigsale(1988)	124.1	124.0515
cigsale(1980)	134	133.8832
cigsale(1975)	122.9	122.9841

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	Idaho
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)

Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979

```
                                1980 1981 1982 1983 1984 1985 1986 1987 1988
-------------------------------------------------------------------------------
Second Step: Run Optimization
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Optimization done
-------------------------------------------------------------------------------
Third Step: Obtain Results
-------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error
------------------------
   RMSPE |     2.72764
------------------------
-------------------------------------------------------------------------------
Unit Weights:
-------------------------------
         Co_No | Unit_Weight
-------------------------------
       Alabama |           0
      Arkansas |           0
    California |           0
      Colorado |           0
   Connecticut |           0
      Delaware |           0
       Georgia |           0
      Illinois |           0
       Indiana |           0
          Iowa |           0
        Kansas |           0
      Kentucky |           0
     Louisiana |           0
         Maine |           0
     Minnesota |           0
   Mississippi |           0
      Missouri |           0
       Montana |        .445
      Nebraska |           0
        Nevada |        .064
 New Hampshire |           0
    New Mexico |           0
North Carolina |        .116
  North Dakota |           0
          Ohio |           0
      Oklahoma |           0
  Pennsylvania |           0
  Rhode Island |           0
South Carolina |           0
  South Dakota |           0
     Tennessee |           0
         Texas |           0
          Utah |        .374
       Vermont |           0
      Virginia |           0
 West Virginia |           0
     Wisconsin |           0
       Wyoming |           0
-------------------------------
-------------------------------------------------------------------------------
Predictor Balance:
```

	Treated	Synthetic
beer(1984(1)1988)	22.22	22.07448
lnincome	9.716291	9.718539
retprice	62.38947	62.53615
age15to24	.1609521	.1829221
cigsale(1988)	84.5	85.3471
cigsale(1980)	115.2	115.4228
cigsale(1975)	123.3	122.7445

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	Illinois
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)
Unless period is specified predictors are averaged over:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	3.161682

Unit Weights:

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	.345
Connecticut	.309
Delaware	0
Georgia	0
Idaho	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	.062
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	.058
Oklahoma	0
Pennsylvania	.129
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	.034
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	.063

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	24.74	24.39036
lnincome	9.988937	9.968289
retprice	66.86842	67.15379
age15to24	.1733468	.1755212
cigsale(1988)	107.6	107.6665
cigsale(1980)	135.2	135.1297

```
                  cigsale(1975) |      131.8   131.8875
```

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

---

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

---

Data Setup successful

```
               Treated Unit: Indiana
             Control Units: Alabama, Arkansas, California, Colorado,
                            Connecticut, Delaware, Georgia, Idaho, Illinois,
                            Iowa, Kansas, Kentucky, Louisiana, Maine,
                            Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Tennessee, Texas, Utah, Vermont,
                            Virginia, West Virginia, Wisconsin, Wyoming
```

```
          Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
```

```
                 Predictors: beer(1984(1)1988) lnincome retprice age15to24
                             cigsale(1988) cigsale(1980) cigsale(1975)
```

```
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
```

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

```
   RMSPE | 5.887033
```

Unit Weights:

```
                 |
```

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	0
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	.226
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	.539
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	.117
Vermont	0
Virginia	.117
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	21.98	22.51976
lnincome	9.816424	9.798015
retprice	58.47368	61.71466
age15to24	.1792884	.1843928
cigsale(1988)	134	128.9645
cigsale(1980)	146.9	149.0884
cigsale(1975)	162.4	161.1938

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

```
control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period
```

Data Setup successful

Treated Unit:	Iowa
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming

---

Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)

Unless period is specified predictors are averaged over:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	4.175417

Unit Weights:

Co_No	Unit_Weight
Alabama	.009
Arkansas	.018
California	.01
Colorado	.012
Connecticut	.118
Delaware	.006

Georgia	.008
Idaho	.177
Illinois	.035
Indiana	.004
Kansas	.014
Kentucky	.005
Louisiana	.004
Maine	.009
Minnesota	.013
Mississippi	.007
Missouri	.031
Montana	.014
Nebraska	.015
Nevada	0
New Hampshire	.008
New Mexico	.009
North Carolina	.002
North Dakota	.009
Ohio	.02
Oklahoma	.037
Pennsylvania	.114
Rhode Island	.004
South Carolina	.006
South Dakota	.009
Tennessee	.011
Texas	.156
Utah	.057
Vermont	.005
Virginia	.008
West Virginia	.009
Wisconsin	.009
Wyoming	.014

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	23.24	23.13422
lnincome	9.832202	9.792975
retprice	66.98421	66.71757
age15to24	.1740632	.173351
cigsale(1988)	100.2	99.7442
cigsale(1980)	124.6	124.0458
cigsale(1975)	120.5	119.9671

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

```
Data Setup successful

              Treated Unit: Kansas
            Control Units: Alabama, Arkansas, California, Colorado,
                           Connecticut, Delaware, Georgia, Idaho, Illinois,
                           Indiana, Iowa, Kentucky, Louisiana, Maine,
                           Minnesota, Mississippi, Missouri, Montana,
                           Nebraska, Nevada, New Hampshire, New Mexico,
                           North Carolina, North Dakota, Ohio, Oklahoma,
                           Pennsylvania, Rhode Island, South Carolina, South
                           Dakota, Tennessee, Texas, Utah, Vermont,
                           Virginia, West Virginia, Wisconsin, Wyoming

         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                           1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                           1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                           1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                           2000

               Predictors: beer(1984(1)1988) lnincome retprice age15to24
                           cigsale(1988) cigsale(1980) cigsale(1975)

Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                           1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization


Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

  RMSPE | 3.999044

Unit Weights:

        Co_No | Unit_Weight
--------------+------------
      Alabama |           0
     Arkansas |           0
   California |           0
     Colorado |        .092
  Connecticut |        .208
     Delaware |           0
      Georgia |           0
        Idaho |           0
     Illinois |           0
      Indiana |           0
         Iowa |           0
     Kentucky |           0
    Louisiana |           0
        Maine |           0
```

Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	.073
Oklahoma	.255
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	.145
Vermont	0
Virginia	.227
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	19.94	20.14742
lnincome	9.878165	9.870962
retprice	64.54211	64.73952
age15to24	.1782438	.1793744
cigsale(1988)	103.2	103.2263
cigsale(1980)	127.1	127.0958
cigsale(1975)	123.4	123.4595

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

```
Treated Unit: Kentucky
Control Units: Alabama, Arkansas, California, Colorado,
               Connecticut, Delaware, Georgia, Idaho, Illinois,
               Indiana, Iowa, Kansas, Louisiana, Maine,
               Minnesota, Mississippi, Missouri, Montana,
```

```
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Tennessee, Texas, Utah, Vermont,
                            Virginia, West Virginia, Wisconsin, Wyoming
-------------------------------------------------------------------------------
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
-------------------------------------------------------------------------------
                 Predictors: beer(1984(1)1988) lnincome retprice age15to24
                             cigsale(1988) cigsale(1980) cigsale(1975)
-------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
-------------------------------------------------------------------------------
Second Step: Run Optimization
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Optimization done
-------------------------------------------------------------------------------
Third Step: Obtain Results
-------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------
   RMSPE | 25.99098
------------------

-------------------------------------------------------------------------------
Unit Weights:

-----------------------
         Co_No | Unit_Weight
---------------+-------------
       Alabama |           0
      Arkansas |           0
    California |           0
      Colorado |           0
   Connecticut |           0
      Delaware |           0
       Georgia |           0
         Idaho |           0
      Illinois |           0
       Indiana |           0
          Iowa |           0
        Kansas |           0
     Louisiana |           0
         Maine |           0
     Minnesota |           0
   Mississippi |           0
      Missouri |           0
       Montana |           0
      Nebraska |           0
        Nevada |           0
 New Hampshire |        .695
    New Mexico |           0
```

North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	.185
South Dakota	0
Tennessee	.119
Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	18.94	30.98272
lnincome	9.663799	9.815748
retprice	51.86842	60.62383
age15to24	.1808541	.1775578
cigsale(1988)	173.2	163.3027
cigsale(1980)	215.3	213.3241
cigsale(1975)	223	225.1376

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

```
               Treated Unit: Louisiana
             Control Units: Alabama, Arkansas, California, Colorado,
                            Connecticut, Delaware, Georgia, Idaho, Illinois,
                            Indiana, Iowa, Kansas, Kentucky, Maine,
                            Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Tennessee, Texas, Utah, Vermont,
                            Virginia, West Virginia, Wisconsin, Wyoming
```

```
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
```

```
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
------------------------------------------------------------------------------
                  Predictors: beer(1984(1)1988) lnincome retprice age15to24
                              cigsale(1988) cigsale(1980) cigsale(1975)
------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
------------------------------------------------------------------------------
Second Step: Run Optimization
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Optimization done
------------------------------------------------------------------------------
Third Step: Obtain Results
------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error
------------------------------------------------------------------------------
```

RMSPE	2.185672

```
------------------------------------------------------------------------------
Unit Weights:
```

Co_No	Unit_Weight
Alabama	0
Arkansas	.014
California	0
Colorado	0
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	.144
Maine	0
Minnesota	0
Mississippi	.2
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	.144
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0

Tennessee	0
Texas	.497
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	23.88	24.03106
lnincome	9.692214	9.724859
retprice	66.22632	65.89812
age15to24	.1874313	.1817693
cigsale(1988)	110.9	111.3207
cigsale(1980)	143.8	143.0997
cigsale(1975)	133.6	133.8688

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	Maine
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)

```
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization


Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

   RMSPE | 4.219438

Unit Weights:

         Co_No | Unit_Weight
---------------+------------
       Alabama |           0
      Arkansas |        .303
    California |           0
      Colorado |           0
   Connecticut |        .023
      Delaware |           0
       Georgia |           0
         Idaho |           0
      Illinois |           0
       Indiana |           0
          Iowa |           0
        Kansas |           0
      Kentucky |        .021
     Louisiana |           0
     Minnesota |           0
   Mississippi |           0
      Missouri |           0
       Montana |           0
      Nebraska |           0
        Nevada |        .097
 New Hampshire |        .029
    New Mexico |           0
North Carolina |           0
  North Dakota |           0
          Ohio |           0
      Oklahoma |           0
  Pennsylvania |           0
  Rhode Island |        .193
South Carolina |           0
  South Dakota |           0
     Tennessee |           0
         Texas |           0
          Utah |           0
       Vermont |           0
      Virginia |           0
 West Virginia |        .335
     Wisconsin |           0
       Wyoming |           0
```

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	22.44	22.65046
lnincome	9.723929	9.736339
retprice	67.6421	67.50508
age15to24	.1705818	.1721591
cigsale(1988)	125	125.0405
cigsale(1980)	141.2	141.3792
cigsale(1975)	140.7	140.8394

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	Minnesota
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)
Unless period is specified predictors are averaged over:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	4.192796

Unit Weights:

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	0
Connecticut	.357
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	.045
New Hampshire	0
New Mexico	.061
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	.043
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	.325
Utah	.16
Vermont	0
Virginia	0
West Virginia	.009
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	23.12	23.1428
lnincome	9.89587	9.898243

retprice	71.42105	71.27176
age15to24	.1784081	.1783191
cigsale(1988)	94.1	94.138
cigsale(1980)	117.7	117.6972
cigsale(1975)	111.5	111.516

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	Mississippi
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)
Unless period is specified predictors are averaged over:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	2.427172

Unit Weights:

Co_No	Unit_Weight
Alabama	0
Arkansas	.424
California	0
Colorado	0
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	.007
Louisiana	.164
Maine	0
Minnesota	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	.132
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	.19
South Dakota	0
Tennessee	0
Texas	0
Utah	.084
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	21.14	21.0663
lnincome	9.512577	9.647601
retprice	65.17895	64.84224
age15to24	.1852971	.1809744
cigsale(1988)	109	109.4284
cigsale(1980)	127	127.0901
cigsale(1975)	116.8	116.918

```
Synthetic Control Method for Comparative Case Studies
-------------------------------------------------------------------------------

First Step: Data Setup
-------------------------------------------------------------------------------
control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

-------------------------------------------------------------------------------
Data Setup successful
-------------------------------------------------------------------------------
               Treated Unit: Missouri
             Control Units: Alabama, Arkansas, California, Colorado,
                            Connecticut, Delaware, Georgia, Idaho, Illinois,
                            Indiana, Iowa, Kansas, Kentucky, Louisiana,
                            Maine, Minnesota, Mississippi, Montana, Nebraska,
                            Nevada, New Hampshire, New Mexico, North
                            Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Tennessee, Texas, Utah, Vermont,
                            Virginia, West Virginia, Wisconsin, Wyoming
-------------------------------------------------------------------------------
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                            1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                            2000
-------------------------------------------------------------------------------
                Predictors: beer(1984(1)1988) lnincome retprice age15to24
                            cigsale(1988) cigsale(1980) cigsale(1975)
-------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
-------------------------------------------------------------------------------

Second Step: Run Optimization
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Optimization done
-------------------------------------------------------------------------------

Third Step: Obtain Results
-------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------
   RMSPE | 1.914362
------------------

-------------------------------------------------------------------------------
Unit Weights:

-------------------------
        Co_No | Unit_Weight
-------------------------
      Alabama |           0
     Arkansas |           0
```

California	0
Colorado	0
Connecticut	0
Delaware	0
Georgia	0
Idaho	.024
Illinois	0
Indiana	.059
Iowa	0
Kansas	0
Kentucky	.09
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Montana	0
Nebraska	0
Nevada	.021
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	.776
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	.029
Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	23.88	23.54804
lnincome	9.832367	9.826953
retprice	62.24211	62.48344
age15to24	.1710479	.1749603
cigsale(1988)	127.4	127.118
cigsale(1980)	142.1	141.9182
cigsale(1975)	135.6	135.3846

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

```
treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

------------------------------------------------------------------------------
Data Setup successful
------------------------------------------------------------------------------
                Treated Unit: Montana
              Control Units: Alabama, Arkansas, California, Colorado,
                             Connecticut, Delaware, Georgia, Idaho, Illinois,
                             Indiana, Iowa, Kansas, Kentucky, Louisiana,
                             Maine, Minnesota, Mississippi, Missouri,
                             Nebraska, Nevada, New Hampshire, New Mexico,
                             North Carolina, North Dakota, Ohio, Oklahoma,
                             Pennsylvania, Rhode Island, South Carolina, South
                             Dakota, Tennessee, Texas, Utah, Vermont,
                             Virginia, West Virginia, Wisconsin, Wyoming
------------------------------------------------------------------------------
          Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                             1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                             1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                             1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                             2000
------------------------------------------------------------------------------
                 Predictors: beer(1984(1)1988) lnincome retprice age15to24
                             cigsale(1988) cigsale(1980) cigsale(1975)
------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                             1980 1981 1982 1983 1984 1985 1986 1987 1988
------------------------------------------------------------------------------
Second Step: Run Optimization
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Optimization done
------------------------------------------------------------------------------
Third Step: Obtain Results
------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error
------------------------
   RMSPE | 2.308369
------------------------
------------------------------------------------------------------------------
Unit Weights:
-----------------------
         Co_No | Unit_Weight
---------------+-------------
       Alabama |           0
      Arkansas |           0
    California |           0
      Colorado |        .166
   Connecticut |           0
      Delaware |           0
       Georgia |           0
         Idaho |        .213
      Illinois |           0
       Indiana |           0
```

Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Nebraska	0
Nevada	0
New Hampshire	.054
New Mexico	.388
North Carolina	0
North Dakota	.178
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	27.88	25.82322
lnincome	9.751127	9.74585
retprice	63.36842	63.87093
age15to24	.1740634	.1785446
cigsale(1988)	87.1	89.0951
cigsale(1980)	122	121.531
cigsale(1975)	123.7	123.5293

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit: Nebraska

```
                Control Units: Alabama, Arkansas, California, Colorado,
                               Connecticut, Delaware, Georgia, Idaho, Illinois,
                               Indiana, Iowa, Kansas, Kentucky, Louisiana,
                               Maine, Minnesota, Mississippi, Missouri, Montana,
                               Nevada, New Hampshire, New Mexico, North
                               Carolina, North Dakota, Ohio, Oklahoma,
                               Pennsylvania, Rhode Island, South Carolina, South
                               Dakota, Tennessee, Texas, Utah, Vermont,
                               Virginia, West Virginia, Wisconsin, Wyoming
------------------------------------------------------------------------------
            Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
------------------------------------------------------------------------------
                  Predictors: beer(1984(1)1988) lnincome retprice age15to24
                              cigsale(1988) cigsale(1980) cigsale(1975)
------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
------------------------------------------------------------------------------

Second Step: Run Optimization
------------------------------------------------------------------------------

------------------------------------------------------------------------------

Optimization done
------------------------------------------------------------------------------

Third Step: Obtain Results
------------------------------------------------------------------------------

Loss: Root Mean Squared Prediction Error

------------------
   RMSPE | 2.716292
------------------

------------------------------------------------------------------------------

Unit Weights:

-------------------------
        Co_No | Unit_Weight
--------------+----------
      Alabama |           0
     Arkansas |           0
   California |        .054
     Colorado |         .15
  Connecticut |           0
     Delaware |           0
      Georgia |           0
        Idaho |        .132
     Illinois |           0
      Indiana |           0
         Iowa |           0
       Kansas |           0
     Kentucky |           0
    Louisiana |           0
        Maine |           0
    Minnesota |           0
  Mississippi |           0
     Missouri |           0
```

Montana	0
Nevada	0
New Hampshire	0
New Mexico	.142
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	.369
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	.079
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	.075
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	24.72	24.6907
lnincome	9.830106	9.837883
retprice	65.62105	65.75009
age15to24	.1748023	.1753535
cigsale(1988)	92.9	92.9872
cigsale(1980)	116.3	116.4158
cigsale(1975)	114.1	114.2173

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit: Nevada
Control Units: Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont,

```
                              Virginia, West Virginia, Wisconsin, Wyoming
-------------------------------------------------------------------------------
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
-------------------------------------------------------------------------------
                 Predictors: beer(1984(1)1988) lnincome retprice age15to24
                              cigsale(1988) cigsale(1980) cigsale(1975)
-------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
-------------------------------------------------------------------------------
Second Step: Run Optimization
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Optimization done
-------------------------------------------------------------------------------
Third Step: Obtain Results
-------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------
   RMSPE | 7.601449
------------------

-------------------------------------------------------------------------------
Unit Weights:

-----------------------
         Co_No | Unit_Weight
-----------------------
       Alabama |           0
      Arkansas |           0
    California |        .179
      Colorado |           0
   Connecticut |           0
      Delaware |           0
       Georgia |           0
         Idaho |           0
      Illinois |           0
       Indiana |           0
          Iowa |           0
        Kansas |           0
      Kentucky |           0
     Louisiana |           0
         Maine |           0
     Minnesota |           0
   Mississippi |           0
      Missouri |           0
       Montana |           0
      Nebraska |           0
 New Hampshire |        .253
    New Mexico |           0
North Carolina |        .394
  North Dakota |           0
          Ohio |           0
      Oklahoma |           0
```

Pennsylvania	0
Rhode Island	.067
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	.106
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	37	26.1469
lnincome	10.00415	9.827893
retprice	68.1579	59.57038
age15to24	.167457	.1808283
cigsale(1988)	141.9	139.4147
cigsale(1980)	177.7	180.6711
cigsale(1975)	205.2	202.2731

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

```
               Treated Unit: New Hampshire
             Control Units: Alabama, Arkansas, California, Colorado,
                            Connecticut, Delaware, Georgia, Idaho, Illinois,
                            Indiana, Iowa, Kansas, Kentucky, Louisiana,
                            Maine, Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Mexico, North Carolina,
                            North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode
                            Island, South Carolina, South Dakota, Tennessee,
                            Texas, Utah, Vermont, Virginia, West Virginia,
                            Wisconsin, Wyoming
```

```
        Dependent Variable: cigsale
 MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                             1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                             1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                             1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
```

```
                                2000
-------------------------------------------------------------------------------
                  Predictors: beer(1984(1)1988) lnincome retprice age15to24
                              cigsale(1988) cigsale(1980) cigsale(1975)
-------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
-------------------------------------------------------------------------------
Second Step: Run Optimization
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Optimization done
-------------------------------------------------------------------------------
Third Step: Obtain Results
-------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------------
   RMSPE |     59.03776
------------------------
-------------------------------------------------------------------------------
Unit Weights:

-----------------------------
         Co_No | Unit_Weight
-----------------------------
       Alabama |           0
      Arkansas |           0
    California |           0
      Colorado |           0
   Connecticut |           0
      Delaware |           0
       Georgia |           0
         Idaho |           0
      Illinois |           0
       Indiana |           0
          Iowa |           0
        Kansas |           0
      Kentucky |           1
     Louisiana |           0
         Maine |           0
     Minnesota |           0
   Mississippi |           0
      Missouri |           0
       Montana |           0
      Nebraska |           0
        Nevada |           0
    New Mexico |           0
North Carolina |           0
  North Dakota |           0
          Ohio |           0
      Oklahoma |           0
  Pennsylvania |           0
  Rhode Island |           0
South Carolina |           0
  South Dakota |           0
     Tennessee |           0
         Texas |           0
          Utah |           0
       Vermont |           0
```

Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	34.96	18.94
lnincome	9.902217	9.663799
retprice	61.03158	51.86842
age15to24	.1738192	.1808541
cigsale(1988)	180.4	173.2
cigsale(1980)	247.8	215.3
cigsale(1975)	269.1	223

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	New Mexico
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)
Unless period is specified predictors are averaged over:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	2.40565

Unit Weights:

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	0
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	.377
Nebraska	0
Nevada	0
New Hampshire	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	.381
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	.242
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	27.98	23.34698
lnincome	9.672215	9.741928
retprice	66.12631	65.25278
age15to24	.1827938	.1834139
cigsale(1988)	77.7	78.6209
cigsale(1980)	102.7	102.952
cigsale(1975)	103.1	102.9817

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	North Carolina
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)
Unless period is specified predictors are averaged over:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	10.80942

Unit Weights:

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	0
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	.102
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	.624
New Hampshire	.274
New Mexico	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	19.92	34.909
lnincome	9.699141	9.957075
retprice	51.48421	65.21749
age15to24	.1871368	.170407
cigsale(1988)	146	151.6432
cigsale(1980)	187.8	193.7658
cigsale(1975)	226	218.343

```
Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

               Treated Unit: North Dakota
             Control Units: Alabama, Arkansas, California, Colorado,
                            Connecticut, Delaware, Georgia, Idaho, Illinois,
                            Indiana, Iowa, Kansas, Kentucky, Louisiana,
                            Maine, Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, Ohio, Oklahoma, Pennsylvania,
                            Rhode Island, South Carolina, South Dakota,
                            Tennessee, Texas, Utah, Vermont, Virginia, West
                            Virginia, Wisconsin, Wyoming

         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                            1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                            2000

                Predictors: beer(1984(1)1988) lnincome retprice age15to24
                            cigsale(1988) cigsale(1980) cigsale(1975)

Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization


Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

   RMSPE | 5.120409

Unit Weights:

        Co_No | Unit_Weight
```

Alabama	0
Arkansas	0
California	0
Colorado	.143
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	.235
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
Ohio	0
Oklahoma	.224
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	.258
Utah	.14
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	23.5	23.44284
lnincome	9.777563	9.790438
retprice	65.18947	65.48449
age15to24	.1872797	.1810792
cigsale(1988)	87.1	89.7997
cigsale(1980)	123.7	123.056
cigsale(1975)	117.9	118.1121

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

```
control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

------------------------------------------------------------------------------
Data Setup successful
------------------------------------------------------------------------------
                Treated Unit: Ohio
              Control Units: Alabama, Arkansas, California, Colorado,
                             Connecticut, Delaware, Georgia, Idaho, Illinois,
                             Indiana, Iowa, Kansas, Kentucky, Louisiana,
                             Maine, Minnesota, Mississippi, Missouri, Montana,
                             Nebraska, Nevada, New Hampshire, New Mexico,
                             North Carolina, North Dakota, Oklahoma,
                             Pennsylvania, Rhode Island, South Carolina, South
                             Dakota, Tennessee, Texas, Utah, Vermont,
                             Virginia, West Virginia, Wisconsin, Wyoming
------------------------------------------------------------------------------
           Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
------------------------------------------------------------------------------
                  Predictors: beer(1984(1)1988) lnincome retprice age15to24
                              cigsale(1988) cigsale(1980) cigsale(1975)
------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
------------------------------------------------------------------------------
Second Step: Run Optimization
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Optimization done
------------------------------------------------------------------------------
Third Step: Obtain Results
------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------
   RMSPE | 3.598554
------------------

------------------------------------------------------------------------------
Unit Weights:

-------------------------
         Co_No | Unit_Weight
-------------------------
       Alabama |           0
      Arkansas |           0
    California |           0
      Colorado |           0
   Connecticut |           0
      Delaware |        .047
       Georgia |         .42
```

Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	.141
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Oklahoma	0
Pennsylvania	.22
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	.172
Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	24.02	22.7894
lnincome	9.86313	9.791932
retprice	63.86842	64.79478
age15to24	.1747499	.1770231
cigsale(1988)	122.4	121.7527
cigsale(1980)	133.5	133.0984
cigsale(1975)	122.5	123.0796

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

```
Data Setup successful
```

Treated Unit:	Oklahoma
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)
Unless period is specified predictors are averaged over:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

```
Second Step: Run Optimization


Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error
```

RMSPE	3.154511

```
Unit Weights:
```

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	0
Connecticut	.022
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	.075
Louisiana	.502
Maine	0

Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	.402
Ohio	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	18.14	23.31066
lnincome	9.766885	9.743181
retprice	66.32632	65.04402
age15to24	.1747937	.186623
cigsale(1988)	103.6	105.9816
cigsale(1980)	141.6	140.6585
cigsale(1975)	132.9	133.6124

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit: Pennsylvania
Control Units: Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico,

```
                              North Carolina, North Dakota, Ohio, Oklahoma,
                              Rhode Island, South Carolina, South Dakota,
                              Tennessee, Texas, Utah, Vermont, Virginia, West
                              Virginia, Wisconsin, Wyoming
-------------------------------------------------------------------------------
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
-------------------------------------------------------------------------------
                 Predictors: beer(1984(1)1988) lnincome retprice age15to24
                              cigsale(1988) cigsale(1980) cigsale(1975)
-------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
-------------------------------------------------------------------------------
Second Step: Run Optimization
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Optimization done
-------------------------------------------------------------------------------
Third Step: Obtain Results
-------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------------
   RMSPE |     2.763698
------------------------

-------------------------------------------------------------------------------
Unit Weights:

-----------------------------
         Co_No | Unit_Weight
-----------------------------
       Alabama |           0
      Arkansas |        .053
    California |           0
      Colorado |           0
   Connecticut |        .213
      Delaware |           0
       Georgia |           0
         Idaho |           0
      Illinois |           0
       Indiana |           0
          Iowa |           0
        Kansas |           0
      Kentucky |           0
     Louisiana |           0
         Maine |           0
     Minnesota |           0
   Mississippi |           0
      Missouri |           0
       Montana |           0
      Nebraska |           0
        Nevada |           0
 New Hampshire |           0
    New Mexico |        .068
```

North Carolina	0
North Dakota	0
Ohio	.38
Oklahoma	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	.14
Utah	.03
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	.116
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	25.08	24.53894
lnincome	9.887352	9.877483
retprice	68.17368	68.69441
age15to24	.1679251	.175774
cigsale(1988)	107.6	107.6191
cigsale(1980)	124	123.8766
cigsale(1975)	114.6	114.7978

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	Rhode Island
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

```
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
------------------------------------------------------------------------------
                  Predictors: beer(1984(1)1988) lnincome retprice age15to24
                              cigsale(1988) cigsale(1980) cigsale(1975)
------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
------------------------------------------------------------------------------
Second Step: Run Optimization
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Optimization done
------------------------------------------------------------------------------
Third Step: Obtain Results
------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error
------------------------------------------------------------------------------
```

RMSPE	12.82115

Unit Weights:

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	0
Connecticut	0
Delaware	.619
Georgia	0
Idaho	0
Illinois	0
Indiana	.322
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	.042
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
South Carolina	0
South Dakota	0
Tennessee	0

Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	.017
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	25.54	25.11168
lnincome	9.868217	9.904277
retprice	67.30526	64.87601
age15to24	.1811306	.1801011
cigsale(1988)	138	135.8274
cigsale(1980)	149.3	150.0038
cigsale(1975)	154.7	154.37

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	South Carolina
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)

```
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
```

```
Second Step: Run Optimization
```

```
Optimization done
```

```
Third Step: Obtain Results
```

```
Loss: Root Mean Squared Prediction Error
```

RMSPE	1.732157

```
Unit Weights:
```

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	0
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	.039
Louisiana	0
Maine	0
Minnesota	0
Mississippi	.28
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Dakota	0
Tennessee	.405
Texas	0
Utah	0
Vermont	0
Virginia	.276
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	22.9	21.34076
lnincome	9.625621	9.692483
retprice	56.83158	61.2996
age15to24	.1932072	.1814462
cigsale(1988)	124.4	123.7633
cigsale(1980)	138.3	137.8651
cigsale(1975)	130.5	131.0932

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	South Dakota
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)
Unless period is specified predictors are averaged over:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	3.097704

Unit Weights:

Co_No	Unit_Weight
Alabama	.016
Arkansas	.07
California	.009
Colorado	.008
Connecticut	.008
Delaware	.007
Georgia	.007
Idaho	.11
Illinois	.009
Indiana	.008
Iowa	.012
Kansas	.009
Kentucky	.006
Louisiana	.013
Maine	.015
Minnesota	.011
Mississippi	.081
Missouri	.008
Montana	.018
Nebraska	.011
Nevada	.009
New Hampshire	.013
New Mexico	.149
North Carolina	.007
North Dakota	.012
Ohio	.007
Oklahoma	.015
Pennsylvania	.01
Rhode Island	.008
South Carolina	.007
Tennessee	.009
Texas	.012
Utah	.234
Vermont	.01
Virginia	.007
West Virginia	.038
Wisconsin	.008
Wyoming	.008

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	21.26	21.23608
lnincome	9.704052	9.693982
retprice	64.97368	64.90751

```
                    age15to24 |   .1805639   .1803958
                cigsale(1988) |       91.9    91.7872
                cigsale(1980) |       114.7   114.5661
                cigsale(1975) |       113.5   113.3711
------------------------------+---------------------------------------------------

------------------------------------------------------------------------------
Synthetic Control Method for Comparative Case Studies
------------------------------------------------------------------------------
First Step: Data Setup
------------------------------------------------------------------------------
control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

------------------------------------------------------------------------------
Data Setup successful
------------------------------------------------------------------------------
               Treated Unit: Tennessee
             Control Units: Alabama, Arkansas, California, Colorado,
                            Connecticut, Delaware, Georgia, Idaho, Illinois,
                            Indiana, Iowa, Kansas, Kentucky, Louisiana,
                            Maine, Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Texas, Utah, Vermont, Virginia, West
                            Virginia, Wisconsin, Wyoming
------------------------------------------------------------------------------
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                            1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                            2000
------------------------------------------------------------------------------
                Predictors: beer(1984(1)1988) lnincome retprice age15to24
                            cigsale(1988) cigsale(1980) cigsale(1975)
------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
------------------------------------------------------------------------------
Second Step: Run Optimization
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Optimization done
------------------------------------------------------------------------------
Third Step: Obtain Results
------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------+-----------
      RMSPE |  2.658021
------------+-----------
```

Unit Weights:

Co_No	Unit_Weight
Alabama	.136
Arkansas	.426
California	0
Colorado	0
Connecticut	0
Delaware	0
Georgia	.435
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Texas	0
Utah	.003
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	20.58	19.9737
lnincome	9.688795	9.673837
retprice	64.64737	65.80325
age15to24	.1765562	.1768669
cigsale(1988)	125.3	121.1531
cigsale(1980)	130.4	131.4164
cigsale(1975)	117.4	117.7849

Synthetic Control Method for Comparative Case Studies

```
First Step: Data Setup
control units: for 38 of out 38 units missing obs for predictor lnincome in per
control units: for 38 of out 38 units missing obs for predictor lnincome in per
treated unit: for 1 of out 1 units missing obs for predictor lnincome in period
treated unit: for 1 of out 1 units missing obs for predictor lnincome in period
Data Setup successful
               Treated Unit: Texas
             Control Units: Alabama, Arkansas, California, Colorado,
                            Connecticut, Delaware, Georgia, Idaho, Illinois,
                            Indiana, Iowa, Kansas, Kentucky, Louisiana,
                            Maine, Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Tennessee, Utah, Vermont, Virginia, West
                            Virginia, Wisconsin, Wyoming
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                            1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                            2000
               Predictors: beer(1984(1)1988) lnincome retprice age15to24
                            cigsale(1988) cigsale(1980) cigsale(1975)
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
Second Step: Run Optimization
Optimization done
Third Step: Obtain Results
Loss: Root Mean Squared Prediction Error
```

RMSPE	2.774958

Unit Weights:

Co_No	Unit_Weight
Alabama	0
Arkansas	.107
California	0

Colorado	0
Connecticut	.121
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	.157
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	.498
Ohio	0
Oklahoma	0
Pennsylvania	.118
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	28.58	22.89794
lnincome	9.838702	9.808286
retprice	70.21053	67.51074
age15to24	.1833567	.1808588
cigsale(1988)	96.5	99.1652
cigsale(1980)	129.7	127.1918
cigsale(1975)	116	118.83

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

```
treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

-------------------------------------------------------------------------------
Data Setup successful
-------------------------------------------------------------------------------
               Treated Unit: Utah
             Control Units: Alabama, Arkansas, California, Colorado,
                            Connecticut, Delaware, Georgia, Idaho, Illinois,
                            Indiana, Iowa, Kansas, Kentucky, Louisiana,
                            Maine, Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Tennessee, Texas, Vermont, Virginia, West
                            Virginia, Wisconsin, Wyoming
-------------------------------------------------------------------------------
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                            1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                            2000
-------------------------------------------------------------------------------
                Predictors: beer(1984(1)1988) lnincome retprice age15to24
                            cigsale(1988) cigsale(1980) cigsale(1975)
-------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
-------------------------------------------------------------------------------
Second Step: Run Optimization
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Optimization done
-------------------------------------------------------------------------------
Third Step: Obtain Results
-------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------------
   RMSPE | 24.36728
------------------------

-------------------------------------------------------------------------------
Unit Weights:

-----------------------------
        Co_No | Unit_Weight
--------------+--------------
      Alabama |           0
     Arkansas |           0
   California |           0
     Colorado |           0
  Connecticut |           0
     Delaware |           0
      Georgia |           0
        Idaho |           0
     Illinois |           0
      Indiana |           0
         Iowa |           0
```

Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	1
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	13.34	27.98
lnincome	9.662891	9.672215
retprice	64.17895	66.12631
age15to24	.1952908	.1827938
cigsale(1988)	55	77.7
cigsale(1980)	74.8	102.7
cigsale(1975)	75.8	103.1

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit: Vermont
Control Units: Alabama, Arkansas, California, Colorado,

```
                            Connecticut, Delaware, Georgia, Idaho, Illinois,
                            Indiana, Iowa, Kansas, Kentucky, Louisiana,
                            Maine, Minnesota, Mississippi, Missouri, Montana,
                            Nebraska, Nevada, New Hampshire, New Mexico,
                            North Carolina, North Dakota, Ohio, Oklahoma,
                            Pennsylvania, Rhode Island, South Carolina, South
                            Dakota, Tennessee, Texas, Utah, Virginia, West
                            Virginia, Wisconsin, Wyoming
-------------------------------------------------------------------------------
         Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                            1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                            2000
-------------------------------------------------------------------------------
                Predictors: beer(1984(1)1988) lnincome retprice age15to24
                            cigsale(1988) cigsale(1980) cigsale(1975)
-------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                            1980 1981 1982 1983 1984 1985 1986 1987 1988
-------------------------------------------------------------------------------
Second Step: Run Optimization
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Optimization done
-------------------------------------------------------------------------------
Third Step: Obtain Results
-------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------
   RMSPE | 8.397676
------------------

-------------------------------------------------------------------------------
Unit Weights:

-------------------------
         Co_No | Unit_Weight
-------------------------
       Alabama |           0
      Arkansas |        .273
    California |           0
      Colorado |           0
   Connecticut |           0
      Delaware |           0
       Georgia |           0
         Idaho |           0
      Illinois |           0
       Indiana |           0
          Iowa |           0
        Kansas |           0
      Kentucky |         .06
     Louisiana |           0
         Maine |           0
     Minnesota |           0
   Mississippi |           0
      Missouri |           0
       Montana |           0
```

Nebraska	0
Nevada	0
New Hampshire	.211
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	0
Pennsylvania	0
Rhode Island	0
South Carolina	.099
South Dakota	0
Tennessee	0
Texas	.356
Utah	0
Virginia	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	27.06	26.0105
lnincome	9.760267	9.747279
retprice	64.93158	65.09027
age15to24	.1823932	.1781124
cigsale(1988)	128.7	128.2955
cigsale(1980)	161.6	161.0501
cigsale(1975)	155.5	155.716

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit: Virginia
Control Units: Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, West Virginia, Wisconsin, Wyoming

```
          Dependent Variable: cigsale
  MSPE minimized for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988 1989
                              1990 1991 1992 1993 1994 1995 1996 1997 1998 1999
                              2000
-------------------------------------------------------------------------------
                  Predictors: beer(1984(1)1988) lnincome retprice age15to24
                              cigsale(1988) cigsale(1980) cigsale(1975)
-------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
-------------------------------------------------------------------------------
Second Step: Run Optimization
-------------------------------------------------------------------------------

-------------------------------------------------------------------------------
Optimization done
-------------------------------------------------------------------------------
Third Step: Obtain Results
-------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error
```

RMSPE	2.288592

```
-------------------------------------------------------------------------------
Unit Weights:
```

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	.157
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	.389
Iowa	0
Kansas	0
Kentucky	.114
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	.076
Oklahoma	0

Pennsylvania	0
Rhode Island	0
South Carolina	.266
South Dakota	0
Tennessee	0
Texas	0
Utah	0
Vermont	0
West Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	23	22.56386
lnincome	9.884459	9.789243
retprice	53.78421	58.11244
age15to24	.1847988	.1839905
cigsale(1988)	129.5	129.1158
cigsale(1980)	148.9	149.1891
cigsale(1975)	152.7	153.1856

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	West Virginia
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Wisconsin, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000

```
                  Predictors: beer(1984(1)1988) lnincome retprice age15to24
                              cigsale(1988) cigsale(1980) cigsale(1975)
------------------------------------------------------------------------------
Unless period is specified
predictors are averaged over: 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979
                              1980 1981 1982 1983 1984 1985 1986 1987 1988
------------------------------------------------------------------------------
Second Step: Run Optimization
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Optimization done
------------------------------------------------------------------------------
Third Step: Obtain Results
------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error

------------------
   RMSPE | 3.348149
------------------

------------------------------------------------------------------------------
Unit Weights:

----------------------
         Co_No | Unit_Weight
---------------+------------
       Alabama |        .145
      Arkansas |          0
    California |          0
      Colorado |          0
   Connecticut |          0
      Delaware |          0
       Georgia |          0
         Idaho |          0
      Illinois |          0
       Indiana |        .067
          Iowa |          0
        Kansas |          0
      Kentucky |          0
     Louisiana |          0
         Maine |        .494
     Minnesota |          0
   Mississippi |          0
      Missouri |          0
       Montana |          0
      Nebraska |          0
        Nevada |          0
 New Hampshire |          0
    New Mexico |          0
North Carolina |          0
  North Dakota |          0
          Ohio |          0
      Oklahoma |          0
  Pennsylvania |          0
  Rhode Island |         .05
South Carolina |          0
  South Dakota |          0
     Tennessee |          0
         Texas |          0
          Utah |        .244
       Vermont |          0
```

Virginia	0
Wisconsin	0
Wyoming	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	19.8	19.83918
lnincome	9.636039	9.709162
retprice	67.92632	66.0721
age15to24	.1701841	.1790094
cigsale(1988)	109.1	107.3025
cigsale(1980)	122.3	123.1753
cigsale(1975)	123.2	122.8133

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	Wisconsin
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wyoming
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)
Unless period is specified predictors are averaged over:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

```
Second Step: Run Optimization
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Optimization done
------------------------------------------------------------------------------
Third Step: Obtain Results
------------------------------------------------------------------------------
Loss: Root Mean Squared Prediction Error
------------------------------------------------------------------------------
```

RMSPE	2.816959

```
------------------------------------------------------------------------------
Unit Weights:
```

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	0
Connecticut	.158
Delaware	.116
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	0
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	0
New Mexico	.375
North Carolina	0
North Dakota	0
Ohio	.013
Oklahoma	0
Pennsylvania	.323
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	.016
Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wyoming	0

```
------------------------------------------------------------------------------
Predictor Balance:
```

	Treated	Synthetic

beer(1984(1)1988)	32.04	25.53076
lnincome	9.852031	9.854892
retprice	69.87895	68.78273
age15to24	.1792819	.175399
cigsale(1988)	102.6	99.9503
cigsale(1980)	117.6	118.4884
cigsale(1975)	113.5	113.6824

Synthetic Control Method for Comparative Case Studies

First Step: Data Setup

control units: for 38 of out 38 units missing obs for predictor lnincome in per

control units: for 38 of out 38 units missing obs for predictor lnincome in per

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

treated unit: for 1 of out 1 units missing obs for predictor lnincome in period

Data Setup successful

Treated Unit:	Wyoming
Control Units:	Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin
Dependent Variable:	cigsale
MSPE minimized for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988
Results obtained for periods:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Predictors:	beer(1984(1)1988) lnincome retprice age15to24 cigsale(1988) cigsale(1980) cigsale(1975)
Unless period is specified predictors are averaged over:	1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988

Second Step: Run Optimization

Optimization done

Third Step: Obtain Results

Loss: Root Mean Squared Prediction Error

RMSPE	12.03828

Unit Weights:

Co_No	Unit_Weight
Alabama	0
Arkansas	0
California	0
Colorado	.652
Connecticut	0
Delaware	0
Georgia	0
Idaho	0
Illinois	0
Indiana	0
Iowa	0
Kansas	0
Kentucky	.066
Louisiana	0
Maine	0
Minnesota	0
Mississippi	0
Missouri	0
Montana	0
Nebraska	0
Nevada	0
New Hampshire	.171
New Mexico	0
North Carolina	0
North Dakota	0
Ohio	0
Oklahoma	.111
Pennsylvania	0
Rhode Island	0
South Carolina	0
South Dakota	0
Tennessee	0
Texas	0
Utah	0
Vermont	0
Virginia	0
West Virginia	0
Wisconsin	0

Predictor Balance:

	Treated	Synthetic
beer(1984(1)1988)	24.98	25.5939
lnincome	9.903308	9.889398
retprice	59.37895	60.59931
age15to24	.1804583	.1813114
cigsale(1988)	114.3	115.4584
cigsale(1980)	158.1	157.7132
cigsale(1975)	160.7	160.898

```
Estimating the treatment effects
Estimating the possible placebo effects (one set for each of the 1 treatment pe

|                                  | Total: 38
.....................................| 20.00s elapsed.
Conducting inference: 5 steps, and 38 placebo averages
Step 1... Finished
Step 2... Finished
Step 3... Finished
Step 4... Finished
Step 5... Finished
Post-treatment results: Effects, p-values, standardized p-values
```

	estimates	pvals	pvals_std
c1	-7.887098	.1315789	0
c2	-9.693599	.1842105	0
c3	-13.8027	.2105263	0
c4	-13.344	.1315789	0
c5	-17.0624	.1052632	0
c6	-20.8943	.0789474	0
c7	-19.8568	.1315789	.0263158
c8	-21.0405	.1578947	0
c9	-21.4914	.1052632	.0263158
c10	-19.1642	.1842105	.0263158
c11	-24.554	.1052632	0
c12	-24.2687	.1052632	.0263158

```
(13 real changes made)
(3 real changes made)

(13 real changes made)
```

Source	SS	df	MS	Number of obs	=	1,209
				F(69, 1139)	=	118.23
Model	1138129.08	69	16494.6243	Prob > F	=	0.0000
Residual	158903.874	1,139	139.511742	R-squared	=	0.8775
				Adj R-squared	=	0.8701
Total	1297032.95	1,208	1073.70277	Root MSE	=	11.812

cigsale	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interva
tratados	-26.48595	4.355307	-6.08	0.000	-35.03128	-17.940

state						
Arkansas	7.100001	3.000126	2.37	0.018	1.213607	12.98
California	-3.780083	3.512345	-1.08	0.282	-10.67148	3.1113
Colorado	-.1580638	3.000126	-0.05	0.958	-6.044458	5.7283
Connecticut	-8.687096	3.000126	-2.90	0.004	-14.57349	-2.8007
Delaware	32.26774	3.000126	10.76	0.000	26.38135	38.154
Georgia	8.064517	3.000126	2.69	0.007	2.178123	13.950
Idaho	-9.567742	3.000126	-3.19	0.001	-15.45414	-3.6813
Illinois	1.858064	3.000126	0.62	0.536	-4.02833	7.7444
Indiana	31.71936	3.000126	10.57	0.000	25.83296	37.605
Iowa	-2.587097	3.000126	-0.86	0.389	-8.473491	3.2992
Kansas	-1.822581	3.000126	-0.61	0.544	-7.708975	4.0638
Kentucky	78.46452	3.000126	26.15	0.000	72.57812	84.350
Louisiana	11.17419	3.000126	3.72	0.000	5.2878	17.060
Maine	13.95161	3.000126	4.65	0.000	8.065218	19.838
Minnesota	-8.590322	3.000126	-2.86	0.004	-14.47672	-2.7039
Mississippi	2.645163	3.000126	0.88	0.378	-3.241232	8.5315
Missouri	19.25161	3.000126	6.42	0.000	13.36522	25.138
Montana	-5.864516	3.000126	-1.95	0.051	-11.75091	.02187
Nebraska	-8.035484	3.000126	-2.68	0.008	-13.92188	-2.1490
Nevada	40.55484	3.000126	13.52	0.000	34.66844	46.441
New Hampshire	103.5903	3.000126	34.53	0.000	97.70393	109.47
New Mexico	-25.21613	3.000126	-8.41	0.000	-31.10252	-19.329
North Carolina	54.8129	3.000126	18.27	0.000	48.92651	60.69
North Dakota	-10.71613	3.000126	-3.57	0.000	-16.60252	-4.8297
Ohio	10.60645	3.000126	3.54	0.000	4.720057	16.492
Oklahoma	9.041937	3.000126	3.01	0.003	3.155542	14.928
Pennsylvania	-1.190322	3.000126	-0.40	0.692	-7.076716	4.6960
Rhode Island	13.3129	3.000126	4.44	0.000	7.426509	19.19
South Carolina	13.88387	3.000126	4.63	0.000	7.997477	19.770

South Dakota	-9.28387	3.000126	-3.09	0.002	-15.17026	-3.3974
Tennessee	11.62581	3.000126	3.88	0.000	5.739412	17.51
Texas	-7.593548	3.000126	-2.53	0.012	-13.47994	-1.7071
Utah	-45.63871	3.000126	-15.21	0.000	-51.5251	-39.752
Vermont	24.55484	3.000126	8.18	0.000	18.66845	30.441
Virginia	19.98387	3.000126	6.66	0.000	14.09748	25.870
West Virginia	4.948387	3.000126	1.65	0.099	-.9380074	10.834
Wisconsin	-6.006451	3.000126	-2.00	0.046	-11.89285	-.12005
Wyoming	19.77419	3.000126	6.59	0.000	13.8878	25.660
year						
1971	3.630768	2.67478	1.36	0.175	-1.617281	8.8788
1972	8.874359	2.67478	3.32	0.001	3.626309	14.122
1973	11.19743	2.67478	4.19	0.000	5.949385	16.445
1974	14.30513	2.67478	5.35	0.000	9.057077	19.553
1975	16.52051	2.67478	6.18	0.000	11.27246	21.768
1976	20.76154	2.67478	7.76	0.000	15.51349	26.009
1977	20.55384	2.67478	7.68	0.000	15.30579	25.801
1978	19.94615	2.67478	7.46	0.000	14.6981	25.19
1979	17.51282	2.67478	6.55	0.000	12.26477	22.760
1980	17.47179	2.67478	6.53	0.000	12.22374	22.719
1981	17.33077	2.67478	6.48	0.000	12.08272	22.578
1982	15.6	2.67478	5.83	0.000	10.35195	20.848
1983	10.56667	2.67478	3.95	0.000	5.318617	15.814
1984	4.228204	2.67478	1.58	0.114	-1.019845	9.4762
1985	2.435896	2.67478	0.91	0.363	-2.812153	7.6839
1986	-.100001	2.67478	-0.04	0.970	-5.34805	5.1480
1987	-3.08718	2.67478	-1.15	0.249	-8.335229	2.1608
1988	-6.264464	2.67711	-2.34	0.019	-11.51709	-1.0118
1989	-10.51575	2.67711	-3.93	0.000	-15.76837	-5.2631
1990	-14.52857	2.67711	-5.43	0.000	-19.78119	-9.2759
1991	-16.05164	2.67711	-6.00	0.000	-21.30427	-10.799

```
        1992 |  -17.00549   2.67711    -6.35   0.000    -22.25811   -11.752
        1993 |  -17.79267   2.67711    -6.65   0.000    -23.04529   -12.540
        1994 |  -18.47728   2.67711    -6.90   0.000    -23.72991   -13.224
        1995 |  -17.52087   2.67711    -6.54   0.000     -22.7735   -12.268
        1996 |  -19.49267   2.67711    -7.28   0.000    -24.74529   -14.240
        1997 |  -18.92087   2.67711    -7.07   0.000     -24.1735   -13.668
        1998 |  -19.76959   2.67711    -7.38   0.000    -25.02221   -14.516
        1999 |  -23.17728   2.67711    -8.66   0.000    -28.42991   -17.924
        2000 |  -28.64139   2.67711   -10.70   0.000    -33.89401   -23.388
             |
       _cons |   110.4552   2.822127    39.14   0.000      104.918    115.99
-------------+----------------------------------------------------------------
__
(est1 stored)

Linear regression                               Number of obs     =      1,209
                                                F(29, 38)         =          .
                                                Prob > F          =          .
                                                R-squared         =     0.8775
                                                Root MSE          =     11.812
                                   (Std. Err. adjusted for 39 clusters in stat
-------------+----------------------------------------------------------------
__
             |               Robust
     cigsale |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interva
-------------+----------------------------------------------------------------
__
    tratados |  -26.48595   2.883034    -9.19   0.000    -32.32235   -20.649
             |
       state |
    Arkansas |   7.100001   1.59e-13  4.5e+13   0.000     7.100001    7.1000
  California |  -3.780083   1.209014    -3.13   0.003    -6.227605   -1.3325
    Colorado |  -.1580638   1.58e-13 -1.0e+12   0.000    -.1580638   -.15806
 Connecticut |  -8.687096   1.59e-13 -5.5e+13   0.000    -8.687096   -8.6870
    Delaware |   32.26774   1.59e-13  2.0e+14   0.000     32.26774    32.267
     Georgia |   8.064517   1.58e-13  5.1e+13   0.000     8.064517    8.0645
       Idaho |  -9.567742   1.59e-13 -6.0e+13   0.000    -9.567742   -9.5677
    Illinois |   1.858064   1.59e-13  1.2e+13   0.000     1.858064    1.8580
```

Indiana	31.71936	1.58e-13	2.0e+14	0.000	31.71936	31.719
Iowa	-2.587097	1.58e-13	-1.6e+13	0.000	-2.587097	-2.5870
Kansas	-1.822581	1.59e-13	-1.1e+13	0.000	-1.822581	-1.8225
Kentucky	78.46452	1.61e-13	4.9e+14	0.000	78.46452	78.464
Louisiana	11.17419	1.59e-13	7.0e+13	0.000	11.17419	11.174
Maine	13.95161	1.60e-13	8.7e+13	0.000	13.95161	13.951
Minnesota	-8.590322	1.58e-13	-5.4e+13	0.000	-8.590322	-8.5903
Mississippi	2.645163	1.58e-13	1.7e+13	0.000	2.645163	2.6451
Missouri	19.25161	1.59e-13	1.2e+14	0.000	19.25161	19.251
Montana	-5.864516	1.58e-13	-3.7e+13	0.000	-5.864516	-5.8645
Nebraska	-8.035484	1.59e-13	-5.1e+13	0.000	-8.035484	-8.0354
Nevada	40.55484	1.60e-13	2.5e+14	0.000	40.55484	40.554
New Hampshire	103.5903	1.58e-13	6.6e+14	0.000	103.5903	103.59
New Mexico	-25.21613	1.58e-13	-1.6e+14	0.000	-25.21613	-25.216
North Carolina	54.8129	1.61e-13	3.4e+14	0.000	54.8129	54.81
North Dakota	-10.71613	1.58e-13	-6.8e+13	0.000	-10.71613	-10.716
Ohio	10.60645	1.58e-13	6.7e+13	0.000	10.60645	10.606
Oklahoma	9.041937	1.58e-13	5.7e+13	0.000	9.041937	9.0419
Pennsylvania	-1.190322	1.59e-13	-7.5e+12	0.000	-1.190322	-1.1903
Rhode Island	13.3129	1.60e-13	8.3e+13	0.000	13.3129	13.31
South Carolina	13.88387	1.60e-13	8.7e+13	0.000	13.88387	13.883
South Dakota	-9.28387	1.58e-13	-5.9e+13	0.000	-9.28387	-9.283
Tennessee	11.62581	1.58e-13	7.4e+13	0.000	11.62581	11.625
Texas	-7.593548	1.58e-13	-4.8e+13	0.000	-7.593548	-7.5935
Utah	-45.63871	1.59e-13	-2.9e+14	0.000	-45.63871	-45.638
Vermont	24.55484	1.58e-13	1.6e+14	0.000	24.55484	24.554
Virginia	19.98387	1.60e-13	1.2e+14	0.000	19.98387	19.983
West Virginia	4.948387	1.58e-13	3.1e+13	0.000	4.948387	4.9483
Wisconsin	-6.006451	1.58e-13	-3.8e+13	0.000	-6.006451	-6.0064
Wyoming	19.77419	1.59e-13	1.2e+14	0.000	19.77419	19.774

year						
1971	3.630768	.822686	4.41	0.000	1.965328	5.2962
1972	8.874359	1.610961	5.51	0.000	5.613139	12.135
1973	11.19743	1.983752	5.64	0.000	7.181539	15.213
1974	14.30513	2.12649	6.73	0.000	10.00027	18.609
1975	16.52051	2.372277	6.96	0.000	11.71809	21.322
1976	20.76154	2.527252	8.22	0.000	15.64538	25.877
1977	20.55384	2.395317	8.58	0.000	15.70478	25.402
1978	19.94615	2.242244	8.90	0.000	15.40697	24.485
1979	17.51282	2.278509	7.69	0.000	12.90022	22.125
1980	17.47179	2.432774	7.18	0.000	12.5469	22.396
1981	17.33077	2.473682	7.01	0.000	12.32306	22.338
1982	15.6	2.663059	5.86	0.000	10.20892	20.991
1983	10.56667	2.622081	4.03	0.000	5.258541	15.874
1984	4.228204	2.85296	1.48	0.147	-1.547311	10.003
1985	2.435896	3.005523	0.81	0.423	-3.648466	8.5202
1986	-.100001	3.138568	-0.03	0.975	-6.4537	6.2536
1987	-3.08718	3.100351	-1.00	0.326	-9.363512	3.1891
1988	-6.264464	3.427683	-1.83	0.075	-13.20344	.67451
1989	-10.51575	3.50032	-3.00	0.005	-17.60177	-3.4297
1990	-14.52857	3.958415	-3.67	0.001	-22.54196	-6.5151
1991	-16.05164	4.252216	-3.77	0.001	-24.65981	-7.4434
1992	-17.00549	4.379888	-3.88	0.000	-25.87211	-8.138
1993	-17.79267	4.241171	-4.20	0.000	-26.37847	-9.2068
1994	-18.47728	4.314989	-4.28	0.000	-27.21252	-9.7420
1995	-17.52087	4.375557	-4.00	0.000	-26.37873	-8.6630
1996	-19.49267	4.331935	-4.50	0.000	-28.26221	-10.723
1997	-18.92087	4.35058	-4.35	0.000	-27.72816	-10.113
1998	-19.76959	4.201526	-4.71	0.000	-28.27514	-11.264
1999	-23.17728	4.113602	-5.63	0.000	-31.50484	-14.849
2000	-28.64139	4.40603	-6.50	0.000	-37.56093	-19.721

```
       _cons |   110.4552   2.601578    42.46   0.000     105.1885    115.72
------------------------------------------------------------------------------
(est2 stored)

      Source |       SS           df       MS      Number of obs   =     1,209
-------------+----------------------------------   F(69, 1139)     =    118.23
       Model |  1138129.08         69  16494.6243   Prob > F        =    0.0000
    Residual |  158903.874      1,139  139.511742   R-squared       =    0.8775
-------------+----------------------------------   Adj R-squared   =    0.8701
       Total |  1297032.95      1,208  1073.70277   Root MSE        =    11.812

------------------------------------------------------------------------------
      cigsale |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interva
--------------+---------------------------------------------------------------
     tratados |  -26.48595   4.355307    -6.08   0.000    -35.03128   -17.940

        state |
     Arkansas |   7.100001   3.000126     2.37   0.018     1.213607     12.98
   California |  -3.780083   3.512345    -1.08   0.282    -10.67148    3.1113
     Colorado |  -.1580638   3.000126    -0.05   0.958    -6.044458    5.7283
  Connecticut |  -8.687096   3.000126    -2.90   0.004    -14.57349   -2.8007
     Delaware |   32.26774   3.000126    10.76   0.000     26.38135    38.154
      Georgia |   8.064517   3.000126     2.69   0.007     2.178123    13.950
        Idaho |  -9.567742   3.000126    -3.19   0.001    -15.45414   -3.6813
     Illinois |   1.858064   3.000126     0.62   0.536     -4.02833    7.7444
      Indiana |   31.71936   3.000126    10.57   0.000     25.83296    37.605
         Iowa |  -2.587097   3.000126    -0.86   0.389    -8.473491    3.2992
       Kansas |  -1.822581   3.000126    -0.61   0.544    -7.708975    4.0638
     Kentucky |   78.46452   3.000126    26.15   0.000     72.57812    84.350
    Louisiana |   11.17419   3.000126     3.72   0.000       5.2878    17.060
        Maine |   13.95161   3.000126     4.65   0.000     8.065218    19.838
    Minnesota |  -8.590322   3.000126    -2.86   0.004    -14.47672   -2.7039
  Mississippi |   2.645163   3.000126     0.88   0.378    -3.241232    8.5315
     Missouri |   19.25161   3.000126     6.42   0.000     13.36522    25.138
      Montana |  -5.864516   3.000126    -1.95   0.051    -11.75091    .02187
```

Nebraska	-8.035484	3.000126	-2.68	0.008	-13.92188	-2.1490
Nevada	40.55484	3.000126	13.52	0.000	34.66844	46.441
New Hampshire	103.5903	3.000126	34.53	0.000	97.70393	109.47
New Mexico	-25.21613	3.000126	-8.41	0.000	-31.10252	-19.329
North Carolina	54.8129	3.000126	18.27	0.000	48.92651	60.69
North Dakota	-10.71613	3.000126	-3.57	0.000	-16.60252	-4.8297
Ohio	10.60645	3.000126	3.54	0.000	4.720057	16.492
Oklahoma	9.041937	3.000126	3.01	0.003	3.155542	14.928
Pennsylvania	-1.190322	3.000126	-0.40	0.692	-7.076716	4.6960
Rhode Island	13.3129	3.000126	4.44	0.000	7.426509	19.19
South Carolina	13.88387	3.000126	4.63	0.000	7.997477	19.770
South Dakota	-9.28387	3.000126	-3.09	0.002	-15.17026	-3.3974
Tennessee	11.62581	3.000126	3.88	0.000	5.739412	17.51
Texas	-7.593548	3.000126	-2.53	0.012	-13.47994	-1.7071
Utah	-45.63871	3.000126	-15.21	0.000	-51.5251	-39.752
Vermont	24.55484	3.000126	8.18	0.000	18.66845	30.441
Virginia	19.98387	3.000126	6.66	0.000	14.09748	25.870
West Virginia	4.948387	3.000126	1.65	0.099	-.9380074	10.834
Wisconsin	-6.006451	3.000126	-2.00	0.046	-11.89285	-.12005
Wyoming	19.77419	3.000126	6.59	0.000	13.8878	25.660
year						
1971	3.630768	2.67478	1.36	0.175	-1.617281	8.8788
1972	8.874359	2.67478	3.32	0.001	3.626309	14.122
1973	11.19743	2.67478	4.19	0.000	5.949385	16.445
1974	14.30513	2.67478	5.35	0.000	9.057077	19.553
1975	16.52051	2.67478	6.18	0.000	11.27246	21.768
1976	20.76154	2.67478	7.76	0.000	15.51349	26.009
1977	20.55384	2.67478	7.68	0.000	15.30579	25.801
1978	19.94615	2.67478	7.46	0.000	14.6981	25.19
1979	17.51282	2.67478	6.55	0.000	12.26477	22.760
1980	17.47179	2.67478	6.53	0.000	12.22374	22.719

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        1981 |   17.33077    2.67478     6.48   0.000     12.08272    22.578
        1982 |       15.6    2.67478     5.83   0.000     10.35195    20.848
        1983 |   10.56667    2.67478     3.95   0.000     5.318617    15.814
        1984 |   4.228204    2.67478     1.58   0.114    -1.019845    9.4762
        1985 |   2.435896    2.67478     0.91   0.363    -2.812153    7.6839
        1986 |   -.100001    2.67478    -0.04   0.970     -5.34805    5.1480
        1987 |   -3.08718    2.67478    -1.15   0.249    -8.335229    2.1608
        1988 |  -6.264464    2.67711    -2.34   0.019    -11.51709   -1.0118
        1989 |  -10.51575    2.67711    -3.93   0.000    -15.76837   -5.2631
        1990 |  -14.52857    2.67711    -5.43   0.000    -19.78119   -9.2759
        1991 |  -16.05164    2.67711    -6.00   0.000    -21.30427   -10.799
        1992 |  -17.00549    2.67711    -6.35   0.000    -22.25811   -11.752
        1993 |  -17.79267    2.67711    -6.65   0.000    -23.04529   -12.540
        1994 |  -18.47728    2.67711    -6.90   0.000    -23.72991   -13.224
        1995 |  -17.52087    2.67711    -6.54   0.000     -22.7735   -12.268
        1996 |  -19.49267    2.67711    -7.28   0.000    -24.74529   -14.240
        1997 |  -18.92087    2.67711    -7.07   0.000     -24.1735   -13.668
        1998 |  -19.76959    2.67711    -7.38   0.000    -25.02221   -14.516
        1999 |  -23.17728    2.67711    -8.66   0.000    -28.42991   -17.924
        2000 |  -28.64139    2.67711   -10.70   0.000    -33.89401   -23.388
             |
       _cons |   110.4552   2.822127    39.14   0.000      104.918    115.99
------------------------------------------------------------------------------
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(est3 stored)
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#hola mundo

$$theta$$

[Figure 1: efectos de cigarro Note: This is a footnote just below the figure's caption.][my_img]

[my_img]:https://github.com/adam-p/markdown-here/raw/master/src/common/images/icon48.png {wi