Splitting into periods...

Analyzing period: 1996-1999

Number of quarters: 16

Explained variance ratios:

PC1: 0.6235 (62.35%) - Cumulative: 62.35%

PC2: 0.1471 (14.71%) - Cumulative: 77.06%

PC3: 0.1174 (11.74%) - Cumulative: 88.81%

PC4: 0.0425 (4.25%) - Cumulative: 93.06%

PC5: 0.0364 (3.64%) - Cumulative: 96.70%

PC6: 0.0168 (1.68%) - Cumulative: 98.38%

PC7: 0.0095 (0.95%) - Cumulative: 99.33%

PC8: 0.0035 (0.35%) - Cumulative: 99.68%

PC9: 0.0023 (0.23%) - Cumulative: 99.91%

PC10: 0.0006 (0.06%) - Cumulative: 99.97%

PC11: 0.0003 (0.03%) - Cumulative: 100.00%

PC12: 0.0000 (0.00%) - Cumulative: 100.00%

PC13: 0.0000 (0.00%) - Cumulative: 100.00%

Top contributing factors for first 3 components:

PC1 loadings (absolute values):

gdp 0.348677

population 0.348186

investment 0.347692

housing\_prices 0.341632

income 0.341246

PC2 loadings (absolute values):

mortgage\_rates 0.606867

pct\_change\_y 0.499980

pct\_change\_x 0.469447

construction\_prices 0.219820

pct\_change 0.208563

PC3 loadings (absolute values):

pct\_change 0.736759

pct\_change\_y 0.496158

housing\_starts 0.264011

construction\_prices 0.232677

cpi 0.217777

Analyzing period: 2000-2003

Number of quarters: 16

Explained variance ratios:

PC1: 0.6956 (69.56%) - Cumulative: 69.56%

PC2: 0.1461 (14.61%) - Cumulative: 84.17%

PC3: 0.0683 (6.83%) - Cumulative: 91.01%

PC4: 0.0371 (3.71%) - Cumulative: 94.72%

PC5: 0.0185 (1.85%) - Cumulative: 96.57%

PC6: 0.0166 (1.66%) - Cumulative: 98.23%

PC7: 0.0089 (0.89%) - Cumulative: 99.12%

PC8: 0.0045 (0.45%) - Cumulative: 99.57%

PC9: 0.0023 (0.23%) - Cumulative: 99.80%

PC10: 0.0015 (0.15%) - Cumulative: 99.95%

PC11: 0.0004 (0.04%) - Cumulative: 99.99%

PC12: 0.0001 (0.01%) - Cumulative: 100.00%

PC13: 0.0000 (0.00%) - Cumulative: 100.00%

Top contributing factors for first 3 components:

PC1 loadings (absolute values):

population 0.326845

investment 0.325016

gdp 0.324917

housing\_prices 0.313495

housing\_starts 0.310260

PC2 loadings (absolute values):

pct\_change\_y 0.636216

construction\_prices 0.480476

pct\_change 0.352944

income 0.291258

mortgage\_rates 0.235599

PC3 loadings (absolute values):

cpi 0.489803

construction\_prices 0.488518

pct\_change\_y 0.407675

income 0.306919

unemployment 0.267743

Analyzing period: 2004-2007

Number of quarters: 16

Explained variance ratios:

PC1: 0.6187 (61.87%) - Cumulative: 61.87%

PC2: 0.1979 (19.79%) - Cumulative: 81.66%

PC3: 0.0818 (8.18%) - Cumulative: 89.84%

PC4: 0.0502 (5.02%) - Cumulative: 94.86%

PC5: 0.0253 (2.53%) - Cumulative: 97.39%

PC6: 0.0151 (1.51%) - Cumulative: 98.90%

PC7: 0.0064 (0.64%) - Cumulative: 99.54%

PC8: 0.0027 (0.27%) - Cumulative: 99.81%

PC9: 0.0012 (0.12%) - Cumulative: 99.92%

PC10: 0.0006 (0.06%) - Cumulative: 99.98%

PC11: 0.0002 (0.02%) - Cumulative: 100.00%

PC12: 0.0000 (0.00%) - Cumulative: 100.00%

PC13: 0.0000 (0.00%) - Cumulative: 100.00%

Top contributing factors for first 3 components:

PC1 loadings (absolute values):

construction\_prices 0.347955

gdp 0.347417

population 0.346487

pct\_change 0.331552

unemployment 0.328593

PC2 loadings (absolute values):

investment 0.573356

pct\_change\_x 0.433600

housing\_starts 0.365695

pct\_change\_y 0.318057

housing\_prices 0.284538

PC3 loadings (absolute values):

pct\_change\_y 0.809559

mortgage\_rates 0.375335

pct\_change\_x 0.245789

income 0.232983

unemployment 0.161723

Analyzing period: 2008-2011

Number of quarters: 16

Explained variance ratios:

PC1: 0.5092 (50.92%) - Cumulative: 50.92%

PC2: 0.2287 (22.87%) - Cumulative: 73.80%

PC3: 0.1321 (13.21%) - Cumulative: 87.01%

PC4: 0.0582 (5.82%) - Cumulative: 92.83%

PC5: 0.0365 (3.65%) - Cumulative: 96.48%

PC6: 0.0209 (2.09%) - Cumulative: 98.58%

PC7: 0.0057 (0.57%) - Cumulative: 99.15%

PC8: 0.0049 (0.49%) - Cumulative: 99.64%

PC9: 0.0019 (0.19%) - Cumulative: 99.84%

PC10: 0.0011 (0.11%) - Cumulative: 99.95%

PC11: 0.0003 (0.03%) - Cumulative: 99.98%

PC12: 0.0001 (0.01%) - Cumulative: 99.99%

PC13: 0.0001 (0.01%) - Cumulative: 100.00%

Top contributing factors for first 3 components:

PC1 loadings (absolute values):

population 0.376449

income 0.364022

mortgage\_rates 0.360807

investment 0.349619

unemployment 0.325160

PC2 loadings (absolute values):

cpi 0.442823

gdp 0.425850

housing\_prices 0.406845

construction\_prices 0.358623

pct\_change\_x 0.331975

PC3 loadings (absolute values):

pct\_change\_y 0.604902

pct\_change\_x 0.425193

pct\_change 0.418634

housing\_starts 0.304988

housing\_prices 0.285424

Analyzing period: 2012-2015

Number of quarters: 16

Explained variance ratios:

PC1: 0.5439 (54.39%) - Cumulative: 54.39%

PC2: 0.1747 (17.47%) - Cumulative: 71.86%

PC3: 0.0924 (9.24%) - Cumulative: 81.09%

PC4: 0.0782 (7.82%) - Cumulative: 88.91%

PC5: 0.0636 (6.36%) - Cumulative: 95.28%

PC6: 0.0219 (2.19%) - Cumulative: 97.47%

PC7: 0.0176 (1.76%) - Cumulative: 99.22%

PC8: 0.0052 (0.52%) - Cumulative: 99.74%

PC9: 0.0022 (0.22%) - Cumulative: 99.96%

PC10: 0.0002 (0.02%) - Cumulative: 99.98%

PC11: 0.0001 (0.01%) - Cumulative: 99.99%

PC12: 0.0001 (0.01%) - Cumulative: 100.00%

PC13: 0.0000 (0.00%) - Cumulative: 100.00%

Top contributing factors for first 3 components:

PC1 loadings (absolute values):

population 0.374813

gdp 0.374568

unemployment 0.372921

investment 0.372591

housing\_prices 0.366586

PC2 loadings (absolute values):

mortgage\_rates 0.570399

pct\_change\_x 0.480868

pct\_change\_y 0.417163

pct\_change 0.311411

construction\_prices 0.310054

PC3 loadings (absolute values):

pct\_change\_y 0.480300

construction\_prices 0.467938

pct\_change 0.403579

cpi 0.366099

pct\_change\_x 0.360159

Analyzing period: 2016-2019

Number of quarters: 16

Explained variance ratios:

PC1: 0.5691 (56.91%) - Cumulative: 56.91%

PC2: 0.1621 (16.21%) - Cumulative: 73.12%

PC3: 0.1186 (11.86%) - Cumulative: 84.98%

PC4: 0.0641 (6.41%) - Cumulative: 91.40%

PC5: 0.0443 (4.43%) - Cumulative: 95.83%

PC6: 0.0214 (2.14%) - Cumulative: 97.97%

PC7: 0.0118 (1.18%) - Cumulative: 99.15%

PC8: 0.0044 (0.44%) - Cumulative: 99.59%

PC9: 0.0028 (0.28%) - Cumulative: 99.86%

PC10: 0.0010 (0.10%) - Cumulative: 99.96%

PC11: 0.0003 (0.03%) - Cumulative: 100.00%

PC12: 0.0000 (0.00%) - Cumulative: 100.00%

PC13: 0.0000 (0.00%) - Cumulative: 100.00%

Top contributing factors for first 3 components:

PC1 loadings (absolute values):

unemployment 0.363890

population 0.360586

investment 0.359773

construction\_prices 0.358993

gdp 0.356792

PC2 loadings (absolute values):

pct\_change\_x 0.628009

mortgage\_rates 0.525041

pct\_change 0.364105

pct\_change\_y 0.309627

housing\_starts 0.209124

PC3 loadings (absolute values):

pct\_change\_y 0.571179

cpi 0.451556

housing\_prices 0.404694

housing\_starts 0.335814

income 0.284659

Analyzing period: 2020-2022

Number of quarters: 12

Explained variance ratios:

PC1: 0.6195 (61.95%) - Cumulative: 61.95%

PC2: 0.2289 (22.89%) - Cumulative: 84.84%

PC3: 0.0639 (6.39%) - Cumulative: 91.23%

PC4: 0.0361 (3.61%) - Cumulative: 94.83%

PC5: 0.0236 (2.36%) - Cumulative: 97.20%

PC6: 0.0171 (1.71%) - Cumulative: 98.90%

PC7: 0.0069 (0.69%) - Cumulative: 99.59%

PC8: 0.0026 (0.26%) - Cumulative: 99.85%

PC9: 0.0010 (0.10%) - Cumulative: 99.96%

PC10: 0.0003 (0.03%) - Cumulative: 99.99%

PC11: 0.0001 (0.01%) - Cumulative: 100.00%

PC12: 0.0000 (0.00%) - Cumulative: 100.00%

Top contributing factors for first 3 components:

PC1 loadings (absolute values):

construction\_prices 0.348864

housing\_prices 0.346922

gdp 0.344362

cpi 0.335151

population 0.333384

PC2 loadings (absolute values):

housing\_starts 0.550132

income 0.441799

pct\_change\_x 0.353934

pct\_change 0.348909

mortgage\_rates 0.323020

PC3 loadings (absolute values):

pct\_change 0.628773

income 0.496438

pct\_change\_x 0.355766

unemployment 0.313917

housing\_starts 0.230735

Performing regression validation...

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

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/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=12 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

Printing results...

Regression Analysis Validation of PCA Findings

================================================================================

Period: 1996-1999

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

R-squared: 1.000

Adjusted R-squared: 1.000

Variable Impacts:

Strong Impacts:

- const: 2.1993264328366635

Moderate Impacts:

Weak Impacts:

- housing\_prices: 0.1125167771277229

Model Summary:

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

=======================================================================================

coef std err t P>|t| [0.025 0.975]

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

const 2.1993 0.000 1.12e+04 0.000 2.199 2.200

housing\_starts -0.0008 0.001 -0.798 0.461 -0.003 0.002

population 0.0208 0.012 1.807 0.131 -0.009 0.050

housing\_prices 0.1125 0.001 96.377 0.000 0.110 0.116

construction\_prices -0.0026 0.002 -1.627 0.165 -0.007 0.002

gdp -0.0134 0.008 -1.603 0.170 -0.035 0.008

unemployment 0.0069 0.002 3.055 0.028 0.001 0.013

income -0.0527 0.003 -15.413 0.000 -0.062 -0.044

mortgage\_rates 0.0027 0.001 2.666 0.045 9.56e-05 0.005

cpi -0.0002 0.000 -0.529 0.619 -0.001 0.001

investment -0.0059 0.002 -3.197 0.024 -0.011 -0.001

=======================================================================================

================================================================================

Period: 2000-2003

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

R-squared: 1.000

Adjusted R-squared: 1.000

Variable Impacts:

Strong Impacts:

- const: 2.6160551724484744

Moderate Impacts:

Weak Impacts:

- housing\_prices: 0.15508815259851316

Model Summary:

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

=======================================================================================

coef std err t P>|t| [0.025 0.975]

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

const 2.6161 7.43e-05 3.52e+04 0.000 2.616 2.616

housing\_starts 0.0013 0.001 2.329 0.067 -0.000 0.003

population -0.0014 0.003 -0.555 0.603 -0.008 0.005

housing\_prices 0.1551 0.000 531.737 0.000 0.154 0.156

construction\_prices -0.0001 0.000 -0.552 0.604 -0.001 0.001

gdp 0.0006 0.001 0.455 0.668 -0.003 0.004

unemployment 0.0013 0.001 2.457 0.057 -6.13e-05 0.003

income -0.0191 0.001 -35.357 0.000 -0.020 -0.018

mortgage\_rates 0.0004 0.001 0.669 0.533 -0.001 0.002

cpi -0.0004 0.000 -1.946 0.109 -0.001 0.000

investment -0.0005 0.002 -0.261 0.804 -0.005 0.004

=======================================================================================

================================================================================

Period: 2004-2007

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

R-squared: 1.000

Adjusted R-squared: 1.000

Variable Impacts:

Strong Impacts:

- const: 3.3793796456454412

Moderate Impacts:

Weak Impacts:

- housing\_prices: 0.17166063477681304

Model Summary:

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

=======================================================================================

coef std err t P>|t| [0.025 0.975]

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

const 3.3794 0.000 1.04e+04 0.000 3.379 3.380

housing\_starts -0.0049 0.004 -1.198 0.285 -0.015 0.006

population -0.0166 0.018 -0.940 0.390 -0.062 0.029

housing\_prices 0.1717 0.002 89.854 0.000 0.167 0.177

construction\_prices -0.0019 0.010 -0.191 0.856 -0.028 0.024

gdp 0.0248 0.024 1.029 0.351 -0.037 0.087

unemployment 0.0065 0.003 1.869 0.121 -0.002 0.015

income -0.0387 0.003 -14.298 0.000 -0.046 -0.032

mortgage\_rates -0.0005 0.001 -0.400 0.706 -0.004 0.003

cpi -0.0004 0.000 -0.955 0.383 -0.002 0.001

investment 0.0058 0.003 2.019 0.099 -0.002 0.013

=======================================================================================

================================================================================

Period: 2008-2011

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

R-squared: 1.000

Adjusted R-squared: 1.000

Variable Impacts:

Strong Impacts:

- const: 3.326526654326595

Moderate Impacts:

Weak Impacts:

Model Summary:

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

=======================================================================================

coef std err t P>|t| [0.025 0.975]

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

const 3.3265 0.000 1.53e+04 0.000 3.326 3.327

housing\_starts -0.0007 0.001 -0.551 0.605 -0.004 0.003

population -0.0026 0.005 -0.564 0.597 -0.015 0.009

housing\_prices 0.0940 0.001 146.593 0.000 0.092 0.096

construction\_prices 0.0010 0.002 0.577 0.589 -0.004 0.006

gdp -0.0019 0.002 -0.959 0.382 -0.007 0.003

unemployment -0.0027 0.002 -1.454 0.206 -0.008 0.002

income -0.0613 0.003 -23.132 0.000 -0.068 -0.054

mortgage\_rates -0.0003 0.001 -0.237 0.822 -0.004 0.003

cpi 0.0007 0.001 1.280 0.257 -0.001 0.002

investment -0.0017 0.003 -0.640 0.550 -0.009 0.005

=======================================================================================

================================================================================

Period: 2012-2015

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

R-squared: 1.000

Adjusted R-squared: 1.000

Variable Impacts:

Strong Impacts:

- const: 3.9581139717982152

Moderate Impacts:

Weak Impacts:

- housing\_prices: 0.2931332241377005

- income: -0.137856759560683

Model Summary:

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

=======================================================================================

coef std err t P>|t| [0.025 0.975]

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

const 3.9581 0.001 5046.354 0.000 3.956 3.960

housing\_starts 0.0006 0.003 0.193 0.854 -0.008 0.009

population 0.0176 0.017 1.045 0.344 -0.026 0.061

housing\_prices 0.2931 0.005 57.289 0.000 0.280 0.306

construction\_prices 0.0020 0.002 1.151 0.302 -0.002 0.006

gdp 0.0059 0.015 0.397 0.708 -0.032 0.044

unemployment 0.0199 0.014 1.451 0.206 -0.015 0.055

income -0.1379 0.010 -14.462 0.000 -0.162 -0.113

mortgage\_rates -0.0044 0.002 -1.856 0.123 -0.010 0.002

cpi -0.0002 0.001 -0.274 0.795 -0.002 0.002

investment 0.0164 0.014 1.196 0.285 -0.019 0.052

=======================================================================================

================================================================================

Period: 2016-2019

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

R-squared: 1.000

Adjusted R-squared: 0.999

Variable Impacts:

Strong Impacts:

- const: 4.141819106449367

Moderate Impacts:

Weak Impacts:

- housing\_prices: 0.1341147296295796

- income: -0.1336610892135317

Model Summary:

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=16 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

=======================================================================================

coef std err t P>|t| [0.025 0.975]

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

const 4.1418 0.001 4772.731 0.000 4.140 4.144

housing\_starts 0.0062 0.004 1.408 0.218 -0.005 0.017

population 0.0322 0.024 1.353 0.234 -0.029 0.093

housing\_prices 0.1341 0.002 62.926 0.000 0.129 0.140

construction\_prices 0.0003 0.007 0.051 0.961 -0.016 0.017

gdp -0.0414 0.020 -2.110 0.089 -0.092 0.009

unemployment -0.0092 0.011 -0.829 0.445 -0.038 0.019

income -0.1337 0.008 -16.508 0.000 -0.154 -0.113

mortgage\_rates -0.0025 0.002 -1.165 0.297 -0.008 0.003

cpi 0.0027 0.001 1.875 0.120 -0.001 0.007

investment -0.0132 0.018 -0.748 0.488 -0.059 0.032

=======================================================================================

================================================================================

Period: 2020-2022

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

R-squared: 1.000

Adjusted R-squared: 1.000

Variable Impacts:

Strong Impacts:

- const: 4.83514723354063

- housing\_prices: 0.5702190437551202

Moderate Impacts:

Weak Impacts:

Model Summary:

/Users/appleowner/Downloads/Thesis/Data/PC Analysis /venv/lib/python3.13/site-packages/scipy/stats/\_axis\_nan\_policy.py:430: UserWarning: `kurtosistest` p-value may be inaccurate with fewer than 20 observations; only n=12 observations were given.

return hypotest\_fun\_in(\*args, \*\*kwds)

=======================================================================================

coef std err t P>|t| [0.025 0.975]

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

const 4.8351 0.000 2.48e+04 0.000 4.833 4.838

housing\_starts -0.0015 0.002 -0.856 0.549 -0.024 0.021

population 0.0036 0.003 1.402 0.394 -0.029 0.036

housing\_prices 0.5702 0.003 197.695 0.003 0.534 0.607

construction\_prices -0.0122 0.005 -2.313 0.260 -0.079 0.055

gdp -0.0104 0.004 -2.460 0.246 -0.064 0.043

unemployment -0.0021 0.001 -1.899 0.309 -0.016 0.012

income -0.0468 0.002 -28.516 0.022 -0.068 -0.026

mortgage\_rates 0.0065 0.003 2.458 0.246 -0.027 0.040

cpi 0.0067 0.001 4.533 0.138 -0.012 0.025

investment 0.0106 0.004 2.525 0.240 -0.043 0.064

=======================================================================================

================================================================================

Comparing PCA and regression results...

Period: 1996-1999

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

PCA Explained Variance (first 3 components):

PC1: 0.6235 (62.35%)

PC2: 0.1471 (14.71%)

PC3: 0.1174 (11.74%)

Top contributing factors (absolute loadings) for first 3 PCs:

PC1:

gdp 0.348677

population 0.348186

investment 0.347692

housing\_prices 0.341632

income 0.341246

PC2:

mortgage\_rates 0.606867

pct\_change\_y 0.499980

pct\_change\_x 0.469447

construction\_prices 0.219820

pct\_change 0.208563

PC3:

pct\_change 0.736759

pct\_change\_y 0.496158

housing\_starts 0.264011

construction\_prices 0.232677

cpi 0.217777

Regression Results:

R-squared: 0.9999

Adjusted R-squared: 0.9998

Significant features (p < 0.05):

const: p=0.0000, coef=2.1993

housing\_prices: p=0.0000, coef=0.1125

unemployment: p=0.0283, coef=0.0069

income: p=0.0000, coef=-0.0527

mortgage\_rates: p=0.0446, coef=0.0027

investment: p=0.0241, coef=-0.0059

Period: 2000-2003

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

PCA Explained Variance (first 3 components):

PC1: 0.6956 (69.56%)

PC2: 0.1461 (14.61%)

PC3: 0.0683 (6.83%)

Top contributing factors (absolute loadings) for first 3 PCs:

PC1:

population 0.326845

investment 0.325016

gdp 0.324917

housing\_prices 0.313495

housing\_starts 0.310260

PC2:

pct\_change\_y 0.636216

construction\_prices 0.480476

pct\_change 0.352944

income 0.291258

mortgage\_rates 0.235599

PC3:

cpi 0.489803

construction\_prices 0.488518

pct\_change\_y 0.407675

income 0.306919

unemployment 0.267743

Regression Results:

R-squared: 1.0000

Adjusted R-squared: 1.0000

Significant features (p < 0.05):

const: p=0.0000, coef=2.6161

housing\_prices: p=0.0000, coef=0.1551

income: p=0.0000, coef=-0.0191

Period: 2004-2007

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

PCA Explained Variance (first 3 components):

PC1: 0.6187 (61.87%)

PC2: 0.1979 (19.79%)

PC3: 0.0818 (8.18%)

Top contributing factors (absolute loadings) for first 3 PCs:

PC1:

construction\_prices 0.347955

gdp 0.347417

population 0.346487

pct\_change 0.331552

unemployment 0.328593

PC2:

investment 0.573356

pct\_change\_x 0.433600

housing\_starts 0.365695

pct\_change\_y 0.318057

housing\_prices 0.284538

PC3:

pct\_change\_y 0.809559

mortgage\_rates 0.375335

pct\_change\_x 0.245789

income 0.232983

unemployment 0.161723

Regression Results:

R-squared: 1.0000

Adjusted R-squared: 0.9999

Significant features (p < 0.05):

const: p=0.0000, coef=3.3794

housing\_prices: p=0.0000, coef=0.1717

income: p=0.0000, coef=-0.0387

Period: 2008-2011

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

PCA Explained Variance (first 3 components):

PC1: 0.5092 (50.92%)

PC2: 0.2287 (22.87%)

PC3: 0.1321 (13.21%)

Top contributing factors (absolute loadings) for first 3 PCs:

PC1:

population 0.376449

income 0.364022

mortgage\_rates 0.360807

investment 0.349619

unemployment 0.325160

PC2:

cpi 0.442823

gdp 0.425850

housing\_prices 0.406845

construction\_prices 0.358623

pct\_change\_x 0.331975

PC3:

pct\_change\_y 0.604902

pct\_change\_x 0.425193

pct\_change 0.418634

housing\_starts 0.304988

housing\_prices 0.285424

Regression Results:

R-squared: 1.0000

Adjusted R-squared: 0.9999

Significant features (p < 0.05):

const: p=0.0000, coef=3.3265

housing\_prices: p=0.0000, coef=0.0940

income: p=0.0000, coef=-0.0613

Period: 2012-2015

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

PCA Explained Variance (first 3 components):

PC1: 0.5439 (54.39%)

PC2: 0.1747 (17.47%)

PC3: 0.0924 (9.24%)

Top contributing factors (absolute loadings) for first 3 PCs:

PC1:

population 0.374813

gdp 0.374568

unemployment 0.372921

investment 0.372591

housing\_prices 0.366586

PC2:

mortgage\_rates 0.570399

pct\_change\_x 0.480868

pct\_change\_y 0.417163

pct\_change 0.311411

construction\_prices 0.310054

PC3:

pct\_change\_y 0.480300

construction\_prices 0.467938

pct\_change 0.403579

cpi 0.366099

pct\_change\_x 0.360159

Regression Results:

R-squared: 0.9999

Adjusted R-squared: 0.9998

Significant features (p < 0.05):

const: p=0.0000, coef=3.9581

housing\_prices: p=0.0000, coef=0.2931

income: p=0.0000, coef=-0.1379

Period: 2016-2019

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

PCA Explained Variance (first 3 components):

PC1: 0.5691 (56.91%)

PC2: 0.1621 (16.21%)

PC3: 0.1186 (11.86%)

Top contributing factors (absolute loadings) for first 3 PCs:

PC1:

unemployment 0.363890

population 0.360586

investment 0.359773

construction\_prices 0.358993

gdp 0.356792

PC2:

pct\_change\_x 0.628009

mortgage\_rates 0.525041

pct\_change 0.364105

pct\_change\_y 0.309627

housing\_starts 0.209124

PC3:

pct\_change\_y 0.571179

cpi 0.451556

housing\_prices 0.404694

housing\_starts 0.335814

income 0.284659

Regression Results:

R-squared: 0.9998

Adjusted R-squared: 0.9995

Significant features (p < 0.05):

const: p=0.0000, coef=4.1418

housing\_prices: p=0.0000, coef=0.1341

income: p=0.0000, coef=-0.1337

Period: 2020-2022

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

PCA Explained Variance (first 3 components):

PC1: 0.6195 (61.95%)

PC2: 0.2289 (22.89%)

PC3: 0.0639 (6.39%)

Top contributing factors (absolute loadings) for first 3 PCs:

PC1:

construction\_prices 0.348864

housing\_prices 0.346922

gdp 0.344362

cpi 0.335151

population 0.333384

PC2:

housing\_starts 0.550132

income 0.441799

pct\_change\_x 0.353934

pct\_change 0.348909

mortgage\_rates 0.323020

PC3:

pct\_change 0.628773

income 0.496438

pct\_change\_x 0.355766

unemployment 0.313917

housing\_starts 0.230735

Regression Results:

R-squared: 1.0000

Adjusted R-squared: 1.0000

Significant features (p < 0.05):

const: p=0.0000, coef=4.8351

housing\_prices: p=0.0032, coef=0.5702

income: p=0.0223, coef=-0.0468

venv(base) appleowner@MacBook-Pro PC Analysis %