What Types of Assets can Provide Effective Protection Against Inflation for Chinese Citizens?

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Introduction

- Inflation is a measure of the overall changes in the price of goods and services that erodes the purchasing power of consumers.
- There is a clear gap in the exploration of inflation-hedging assets specifically tailored to the dynamics of the Chinese market.
- This project examines the qualities of a variety of assets as hedges in fighting against the inflation risk in the realm of China.

Content

1.1 Data

- The data utilized in our research is spanning the interval from 2010 to 2020.
- The Rate of Inflation from World Bank Inflation Database.
- Asset-related Data.
  Housing price [WIND database],
  Gold price [Shanghai Gold Exchange],
  Fixed deposit rate [People's Bank of China],
  Shanghai Stock Exchange [Shanghai Stock Exchange],
  Short-term (6-month), mid-term (5-year), and long-term(10-year) government bond [Chinese National Financial Regulatory Administration]

Descriptive Statistics for Asset-related Data

	Mean	SD	Min	Max
House_price	15028.977	5971.002	6399.000	23006.000
Gold_price	291.587	47.019	222.990	402.640
Fixed_deposit_rate	3.653	0.719	3.000	5.000
Shanghai_stock_index	2812.791	517.082	1979.206	4277.222
government_bond_sixm	2.679	0.629	1.414	4.174
government_bond_fivey	3.139	0.499	2.337	4.458
government_bond_teny	3.421	0.457	2.590	4.552

1.2 Methodology

- we employ the following model:

$$\beta_i = \alpha_0 + \alpha_1 ln\_inflation + \alpha_{-i}\beta_{-i} + \epsilon$$

  β_i represents the return rate of a specific asset i; *ln_inflation* is the logarithm form of the core inflation; β_{-i} indicates the prices of other assets apart from β_i; ϵ is the error term.
- Correlation check among assets
- Excluding assets with insignificant p-values and those exhibiting minimal multicollinearity(0-0.19), and rerun the regression above.

2.1 Results

- the coefficient on all assets is insignificant, indicating that there is no statistically significant relation between the inflation rate and the assets' return.
- After multicollinearity test, we obtain similar results.

Regression Model after Correlation Check (Continued)

	Dependent variable:			
	House_Change	Gold_Change	Fixed_deposit_rate	Shanghai_stock_Change
	house	gold	fixed	stock
	(1)	(2)	(3)	(4)
log1p(core_inflation)	9.556	0.555	-0.225	2.028
	(7.896)	(8.652)	(0.738)	(15.261)
Shanghai_stock_Change		-0.103		
		(0.086)		
House_Change			0.010	
			(0.015)	
government_bond_yield_sixm	-0.543	-7.113**	0.392	
	(2.755)	(3.022)	(0.253)	
government_bond_yield_fivey	-3.840	3.559	-1.644***	
	(5.543)	(6.105)	(0.512)	
government_bond_yield_teny	0.919	-0.835	2.084***	
	(4.794)	(5.311)	(0.440)	
Gold_Change				-0.360
				(0.253)
Constant	10.475	12.205	0.673	0.319
	(7.450)	(8.163)	(0.701)	(5.341)
Observations	44	44	44	44
R^2	0.103	0.251	0.443	0.049
Adjusted R^2	0.011	0.153	0.370	0.002
Residual Std. Error	6.216 (df = 39)	6.809 (df = 38)	0.571 (df = 38)	12.240 (df = 41)
F Statistic	1.123 (df = 4; 39)	2.552** (df = 5; 38)	6.049*** (df = 5; 38)	1.045 (df = 2; 41)
Note:				*p<0.1; **p<0.05; ***p<0.01

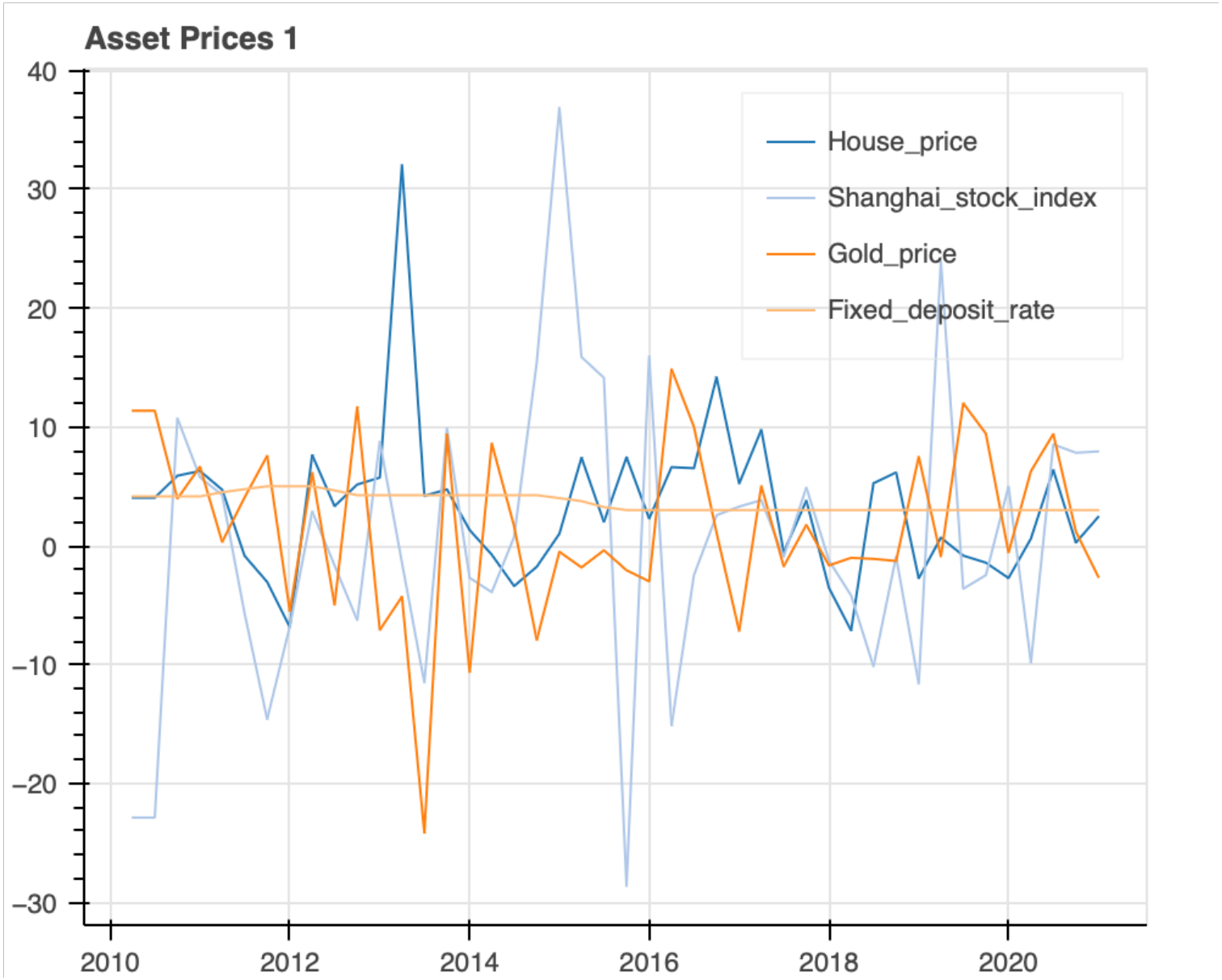
Regression Model after Correlation Check

	Dependent variable:		
	government_bond_yield_sixm sixm (1)	government_bond_yield_fivey fivey (2)	government_bond_yield_teny teny (3)
log1p(core_inflation)	0.354 (0.429)	-0.065 (0.210)	0.104 (0.218)
House_Change	-0.006 (0.009)	-0.001 (0.004)	-0.001 (0.004)
Gold_Change	-0.018** (0.007)	0.002 (0.004)	-0.001 (0.004)
Fixed_deposit_rate	0.145 (0.092)	-0.130*** (0.041)	0.178*** (0.038)
government_bond_yield_fivey	1.288*** (0.265)		0.869*** (0.095)
government_bond_yield_sixm		0.303*** (0.062)	-0.131 (0.080)
government_bond_yield_teny	-0.511 (0.314)	0.800*** (0.087)	
Constant	-0.214 (0.426)	0.091 (0.207)	0.362* (0.208)
Observations	44	44	44
R^2	0.757	0.909	0.883
Adjusted R^2	0.718	0.895	0.863
Residual Std. Error (df = 37)	0.334	0.162	0.169
F Statistic (df = 6; 37)	19.262***	61.790***	46.325***
Note:			*p<0.1; **p<0.05; ***p<0.01

2.2 Visualization

- First Order Value Trend Overtime
- Second Order Percentage Change in All Assets And Inflation Indicators
- Proportion of Assets vs. Inflation Indicators Over Time

2.2 Visualization - First Order Value Trend Overtime



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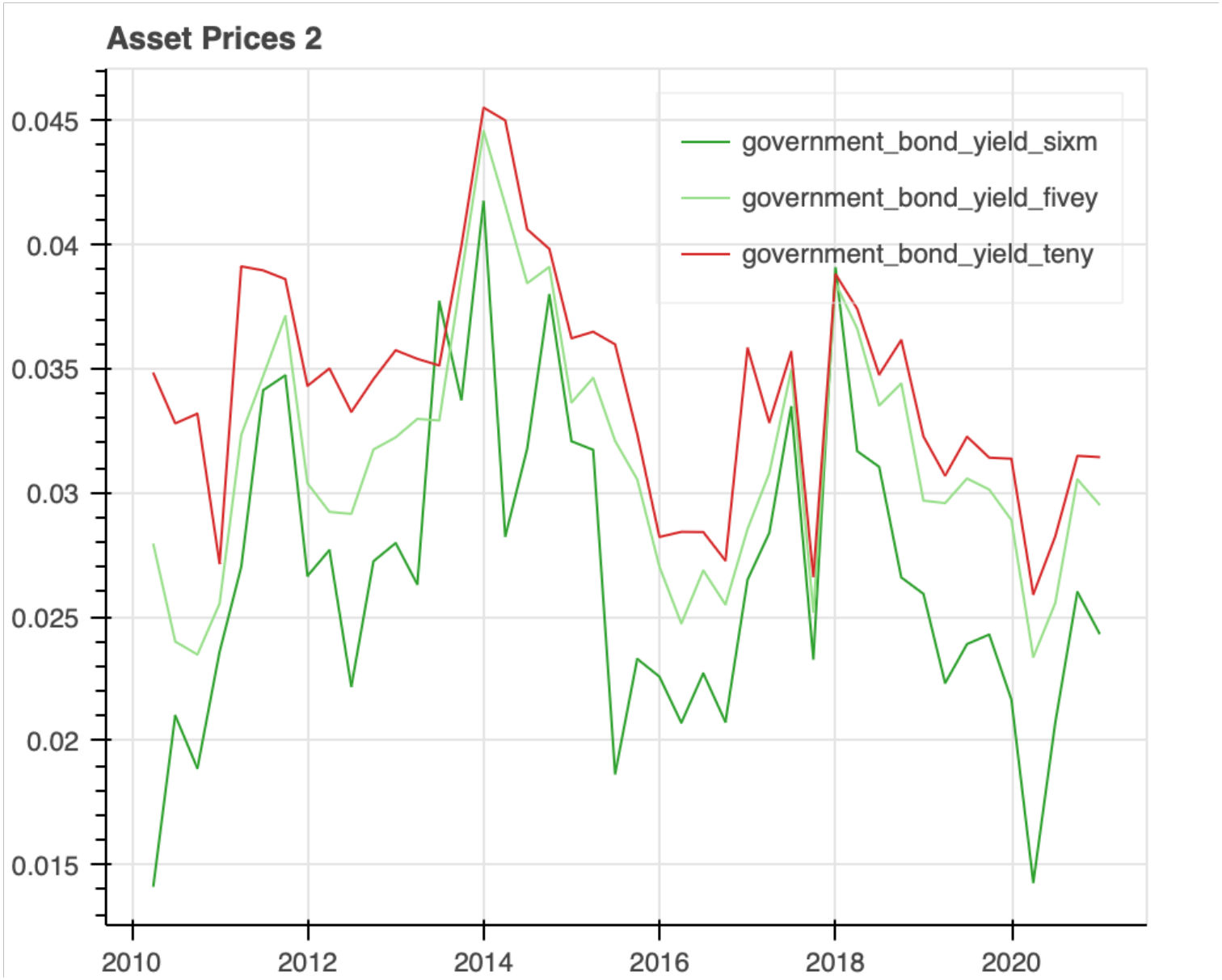

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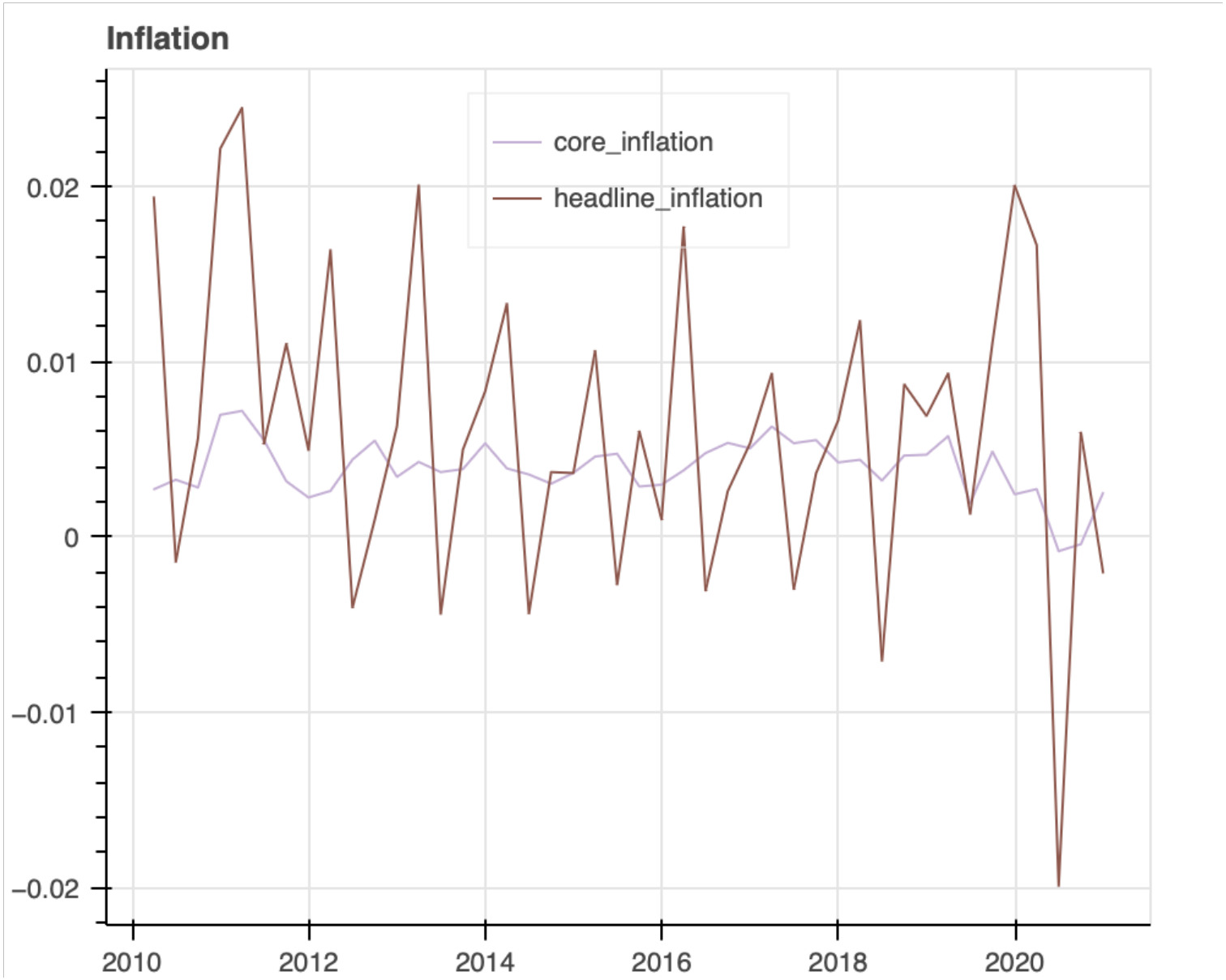

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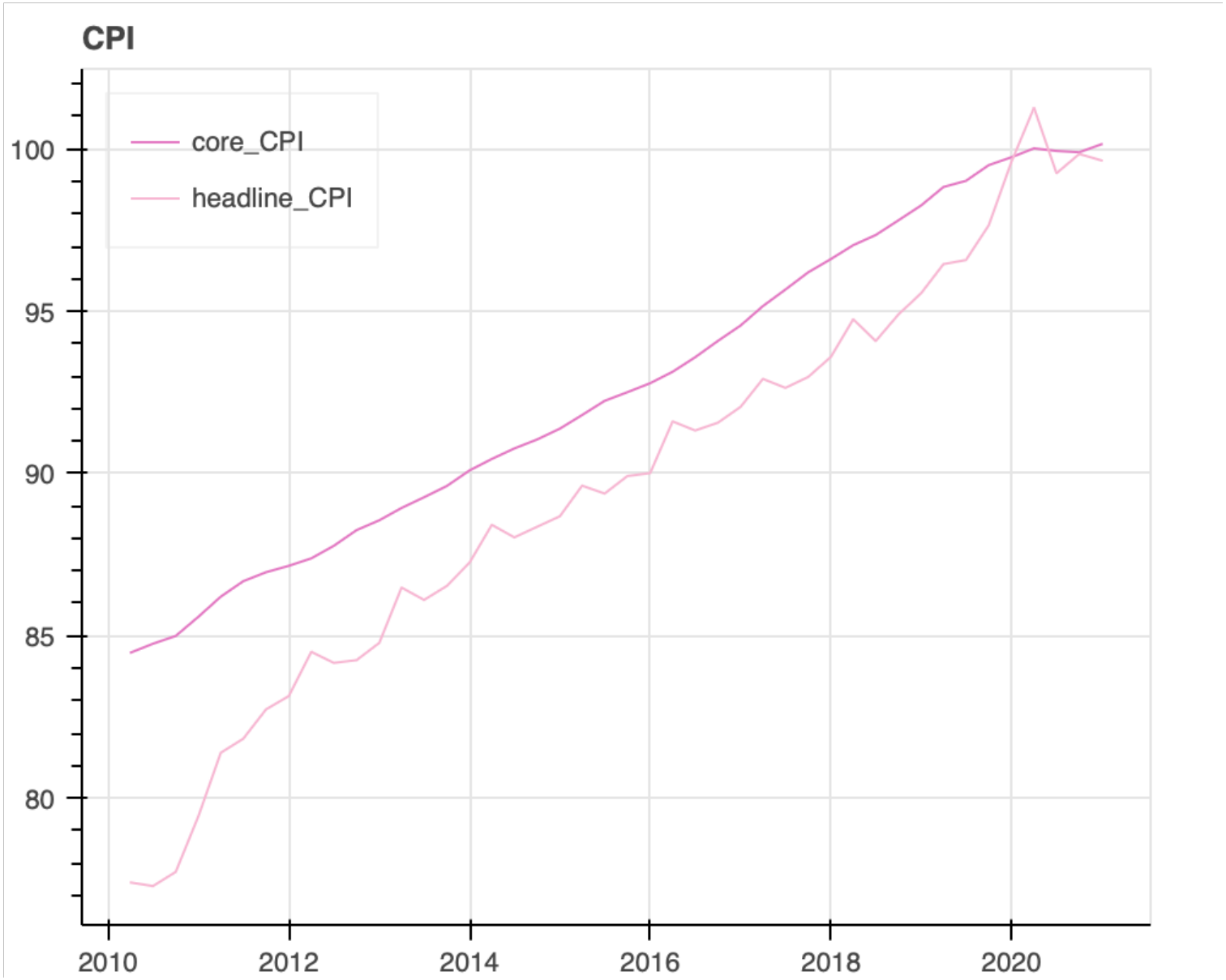
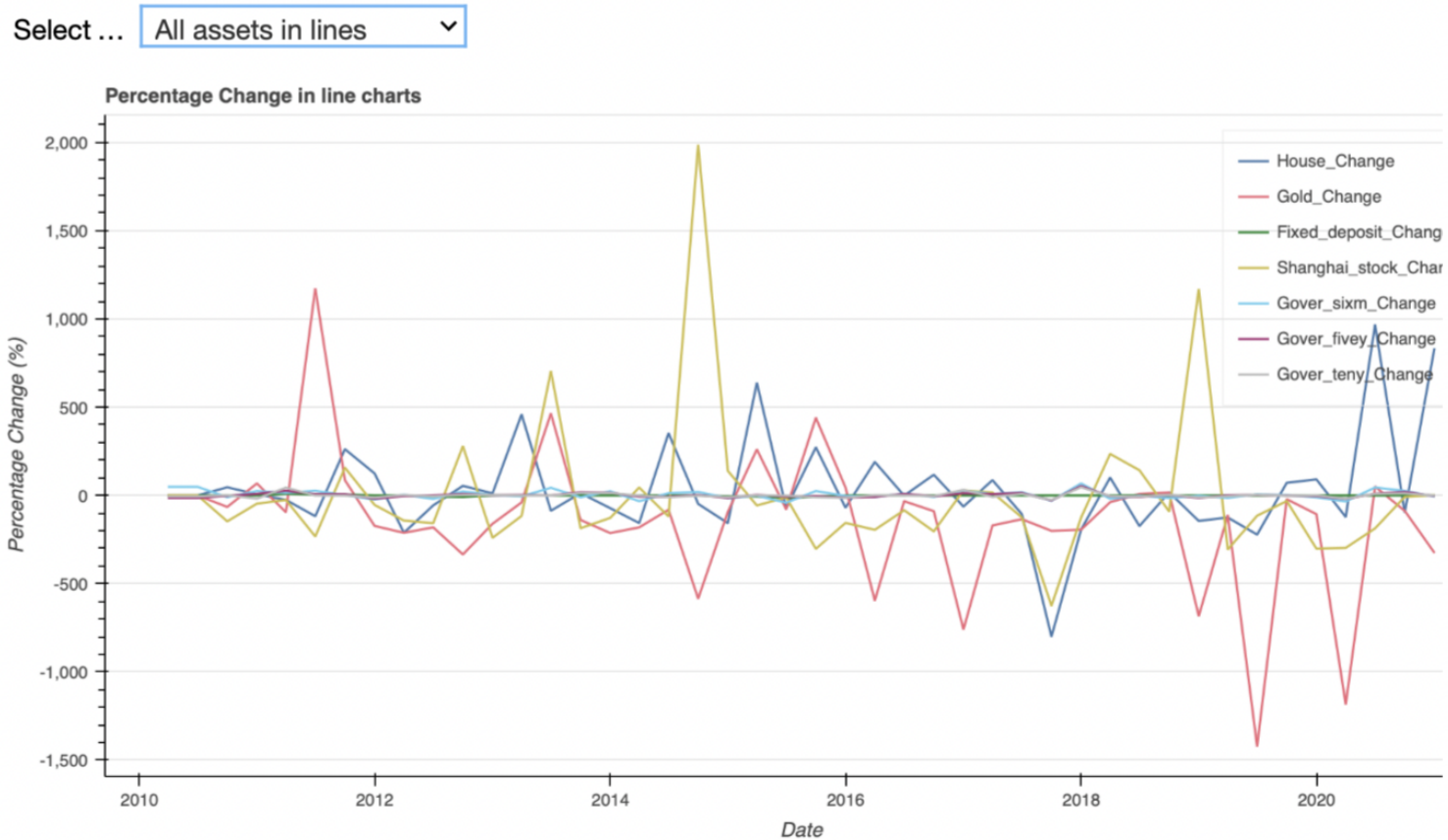


2.2 Visualization - Second Order Percentage Change in All Assets And Inflation Indicators



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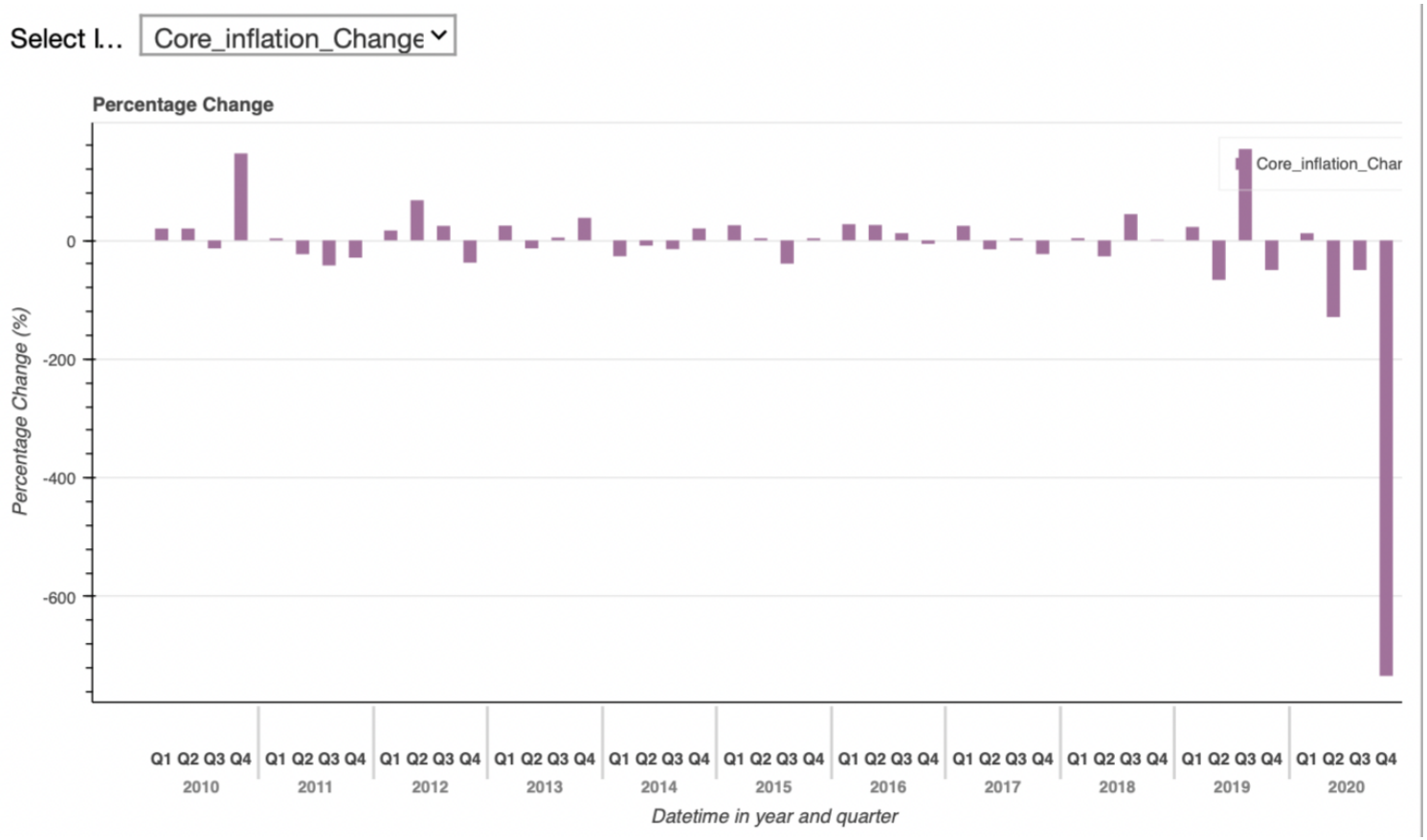


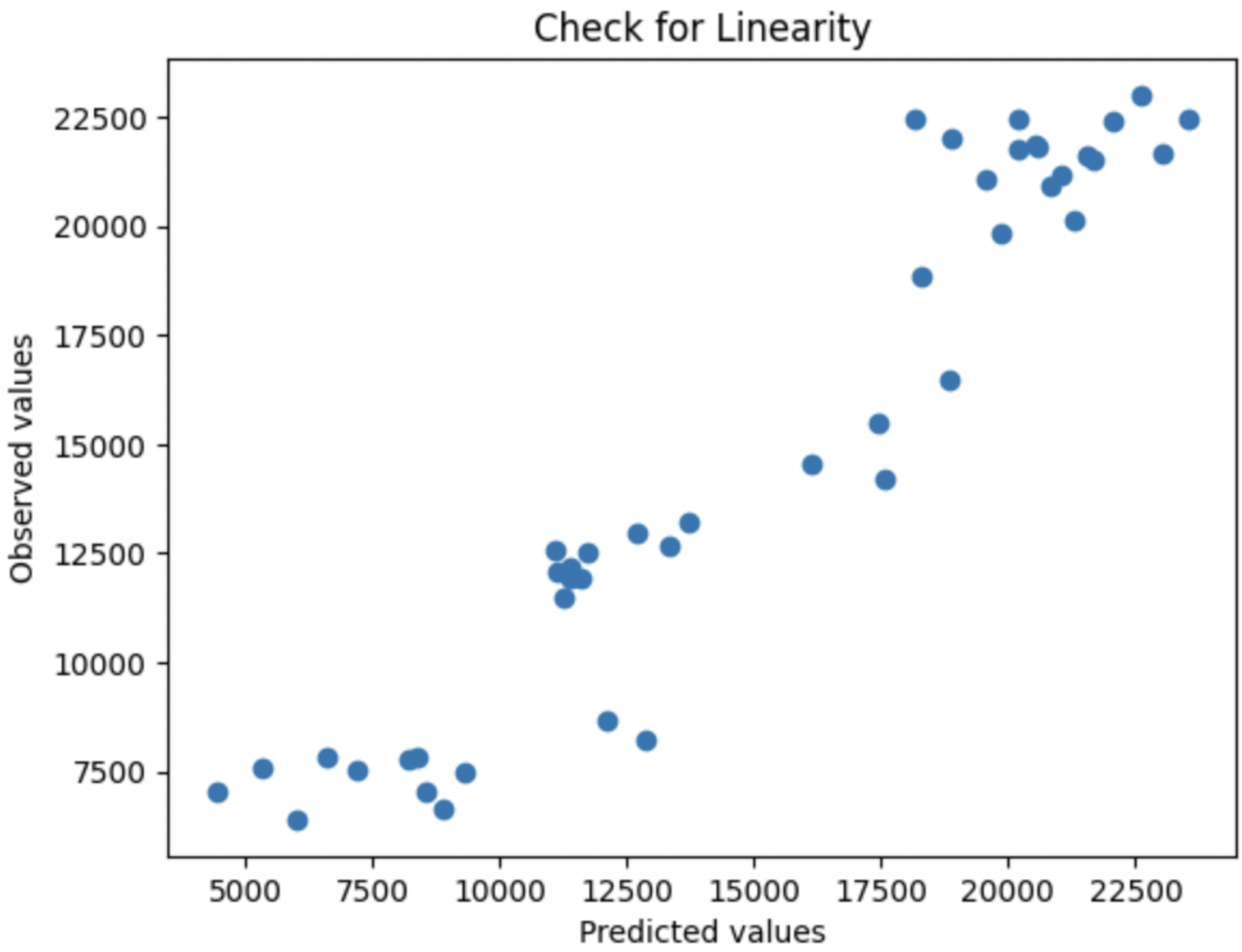
2.3 Visualization - Proportion of Assets vs. Inflation Indicators Over Time

3.1 Robustness Tests - Linearity

- We conduct the robustness check by including the Ordinary Least Squares (OLS) model assumption testing.
- By plotting the observed values against the predicted values of the OLS model, we can observe whether the observed values and the predicted values are aligned along a straight line.

3.1 Robustness Tests - Linearity

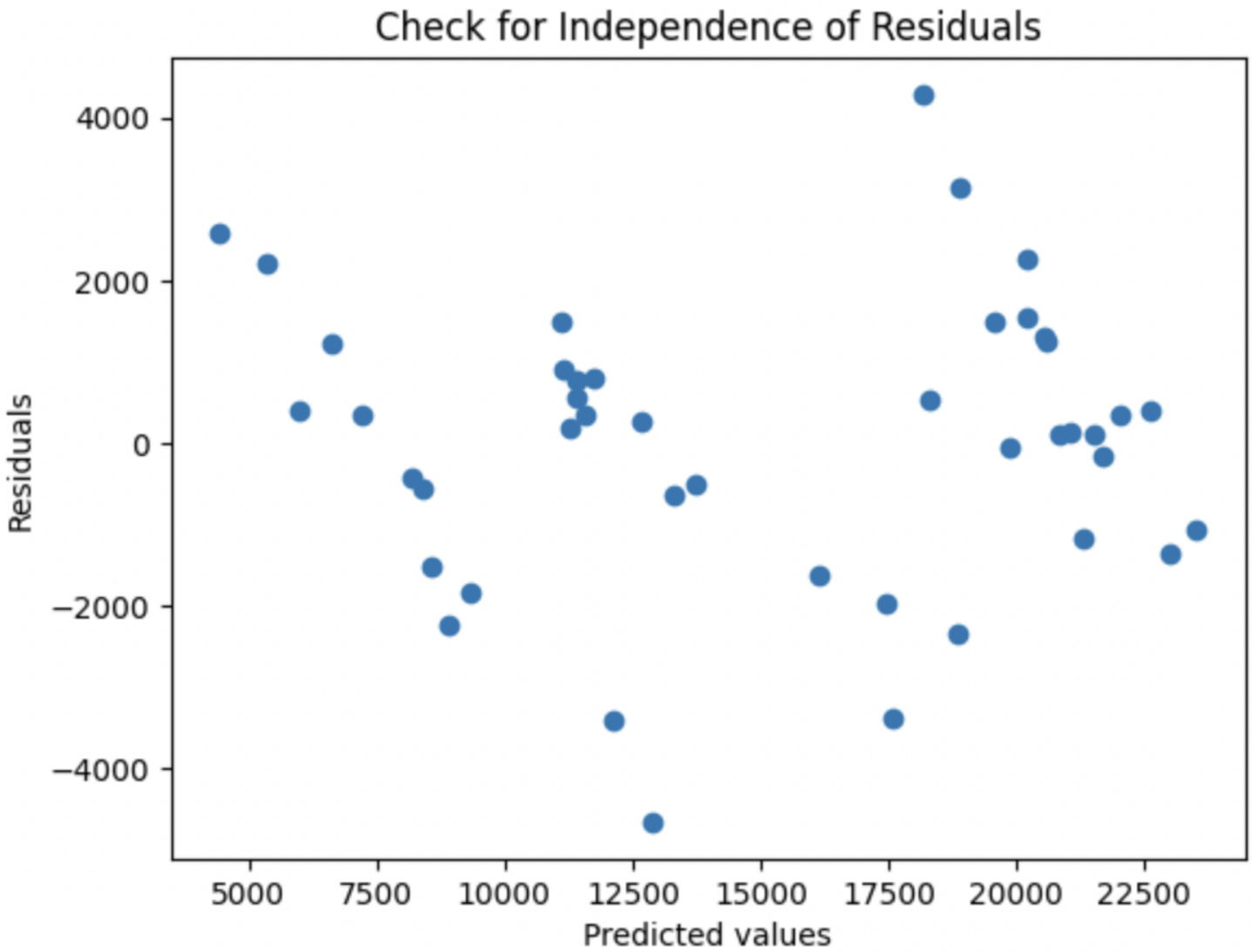
Assumption checks for house model



3.1 Robustness Tests - Independence of Residuals

- Create a scatter plot of the residuals against the fitted values (predicted values). If there is no pattern or structure in the plot, it suggests independence.

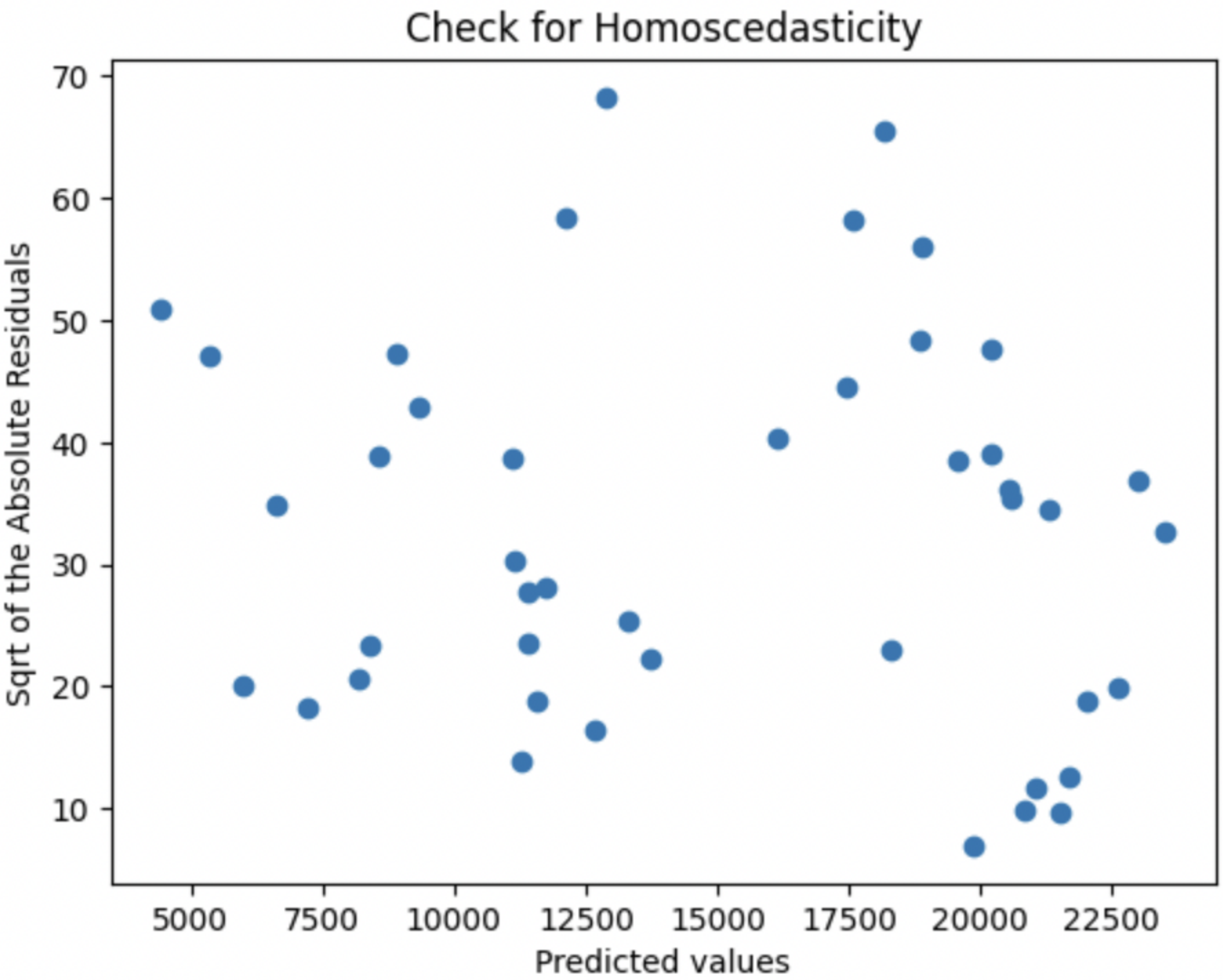
3.1 Robustness Tests - Independence of Residuals



3.1 Robustness Tests - Homoscadesticity

- Similar to testing for independence, a scatter plot of the residuals against the fitted values can help visually inspect whether there is a consistent spread of residuals across all levels of the independent variable(s).

3.1 Robustness Tests - Homoscadesticity



Conclusion

- We employed Ordinary Least Squares (OLS) regression models to investigate the impact of the core inflation rate on the returns of real estate, gold, securities, and short, medium,and long-term government bond in the Chinese market.
- Statistically speaking, there are no assets in the Chinese market that exhibit significant hedging capabilities against inflation.

Thanks

Thank You!