The Impact of Monetary Policy on Inequality in the UK. An Empirical Analysis

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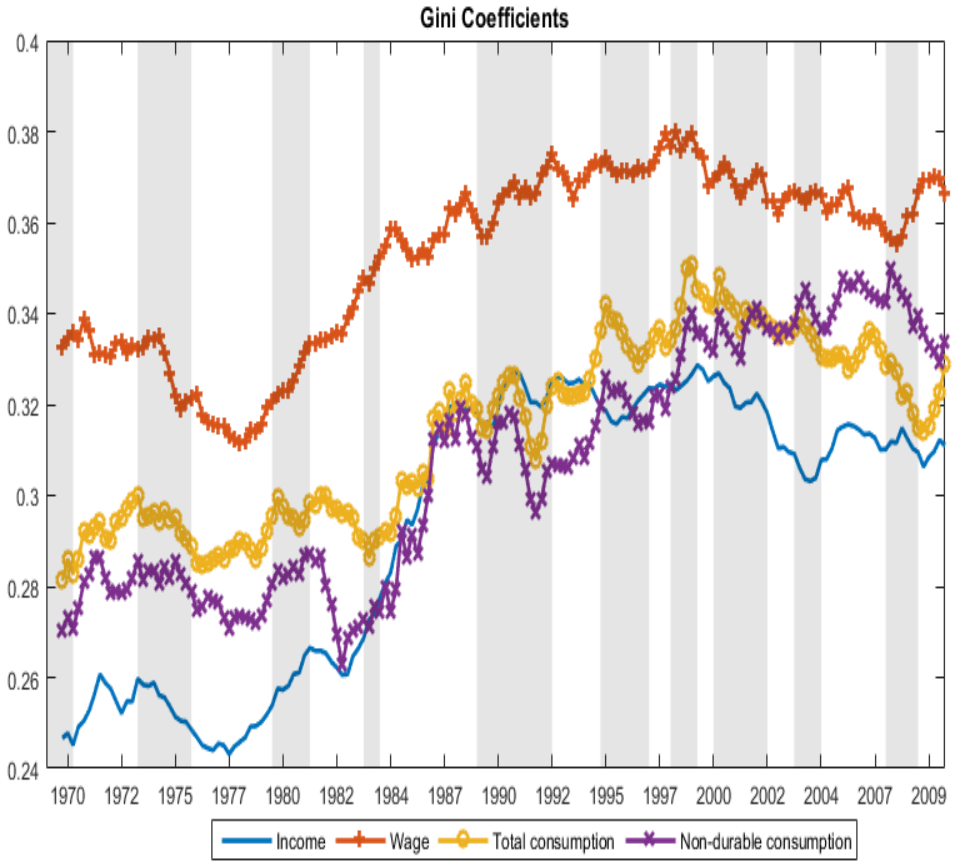
Introduction

- Inequality in wages, income and consumption high over the Great Moderation period.
- Complex reasons including technological change, changes in family structure, fiscal policy.
- Did monetary policy play a role?



Monetary Policy and inequality

Monetary Expansion may benefit

- Financial market participants.
- households whose maturing liabilities exceed their maturing assets.
- borrowers
- Households more exposed to unemployment

Monetary Expansion may harm

- Low income households vulnerable to inflation
- households with short-term assets.
- savers

Related Evidence

Country	Study	Shock	Inequality
USA	Coibion et.al (2016)	M -	+
EA	Guerello (2016)	M +	-
Ind.	Hubers and Stephen (2014)	M +	-
USA	Bivens (2015)	M +	-
Japan	Saiki and Frost (2014)	UMP +	+
Italy	Casiraghi et.al (2016)	UMP +	-
Ind. and dev	Furceri et.al (2016)	M -	+

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Related Evidence

- Cloyne et.al. (2016) show that policy shocks affect durable consumption of mortgagors more than home-owners.

Summary

- We build quarterly time-series for measures of income, earnings and consumption inequality 1969-2010.
- Using a battery of SVARs, we show that contractionary policy shocks associated with an increase in inequality.
- Policy shocks contribute about 10% to FEV of the Gini coefficient.
- Some evidence to suggest that QE was associated with an increase in income inequality.

Data and Inequality Measures

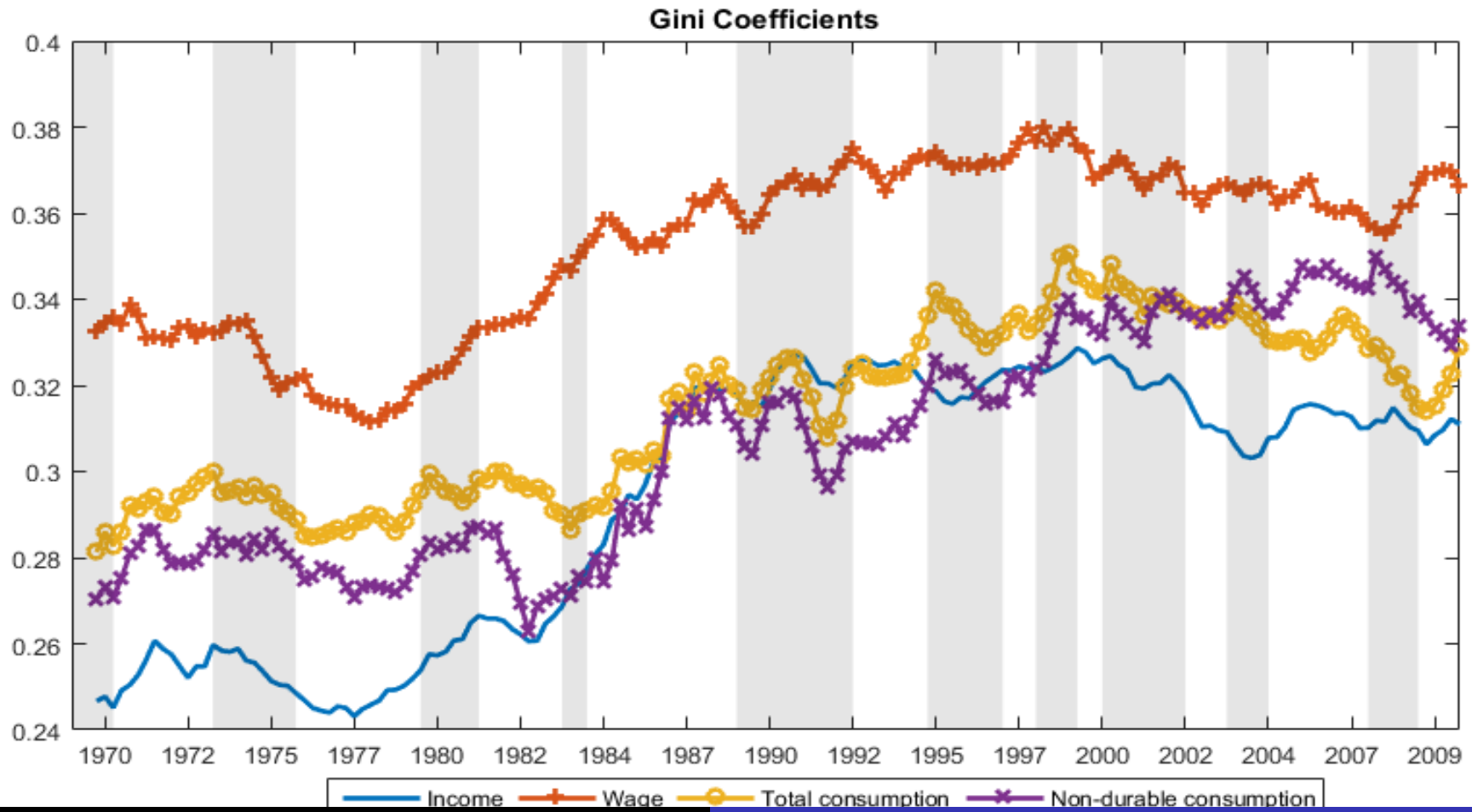
- We collect data for four variables: disposable income, total consumption, consumption of non durables and gross wage.
- 43 waves from UK Family Expenditure Survey (FES) (EFS, 2001 and LCFS, 2008)
- 7,000 households per year
- FES over represents mortgage holders, people living in the country and under represents people living in council flats
- Time Span : 1969-2012 Quarterly data
- Quarterly data are constructed by assigning households according to the date of their interview (Cloyne and Surico, 2016)
- We trim the distributions of all variables by removing the top and bottom 1%

▸ Appendix

Data and Inequality Measures

- Two widely used measures of Inequality:
  1. The Gini coefficient of levels which takes values between 0 (perfect equality) and 1 (perfect inequality).
  2. The cross sectional standard deviation of log levels
- The inequality measures are calculated using household level data for each quarter of interview.
- Disposable income is equivalised for the family size and composition by using the modified OECD scale.
- The measures for wage is on individual level and consumption is per capita.

Inequality Measures



The VAR model

- We estimate the following VAR model 1975Q1-2008Q4 (excluding Bretton Woods and the QE period)

$$Z_t = c + \sum_{j=1}^{P} B_j Z_{t-j} + A_0 \varepsilon_t$$

- where Z contains the growth of real GDP per capita, CPI, the three month treasury bill rate, the growth of nominal effective exchange rate and the measure of Inequality

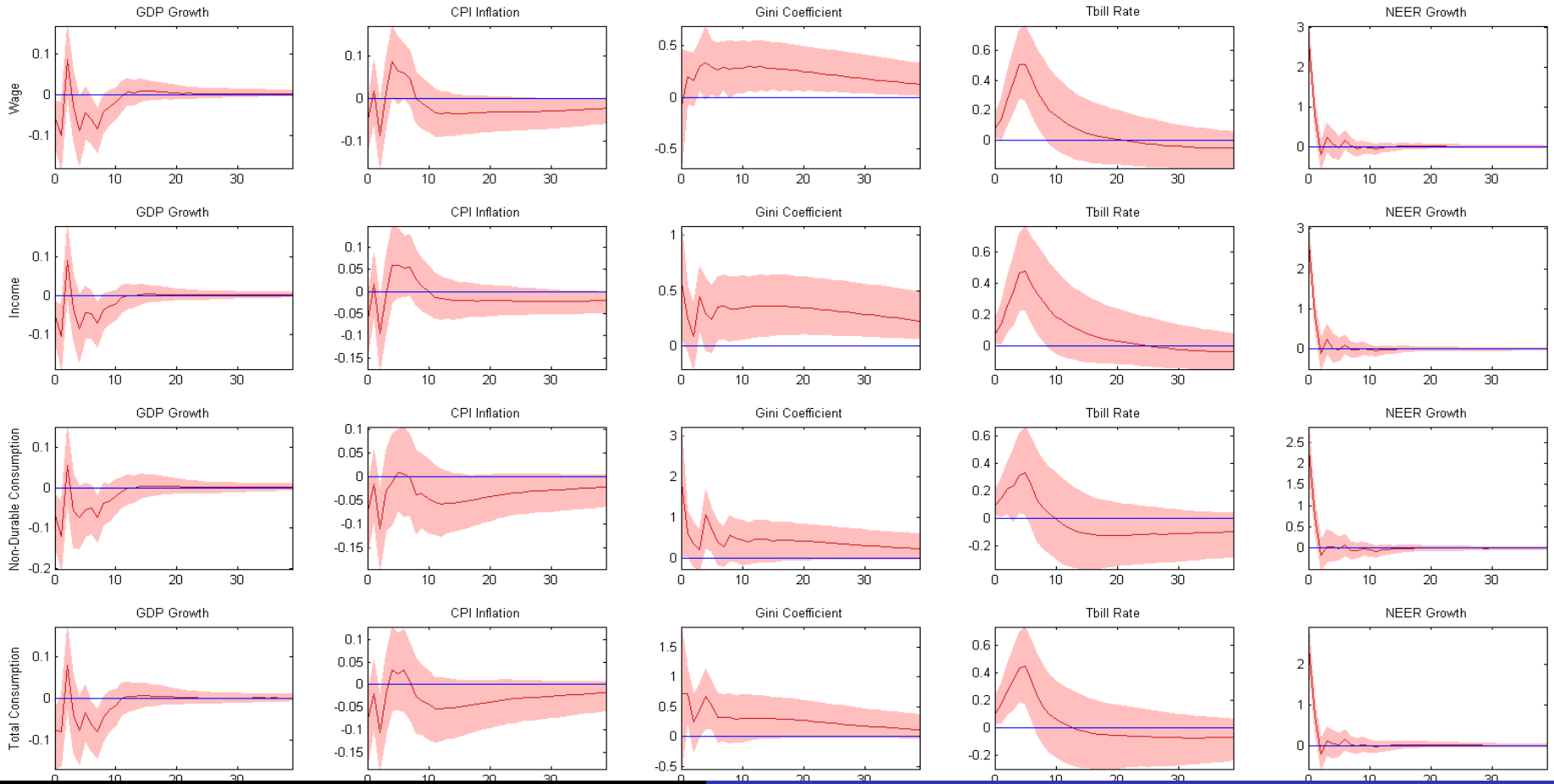
Identifying the policy shock

- Benchmark model uses sign restrictions

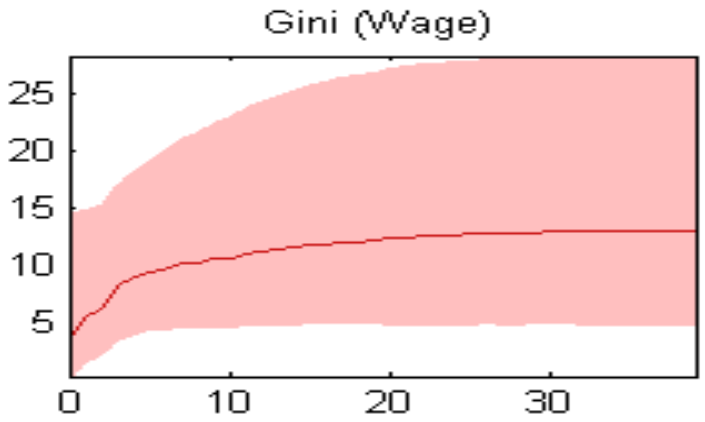
Var	GDP	CPI	Inequality	R	ER
Sign	$-$	$-$	$\times$	$+$	$+$

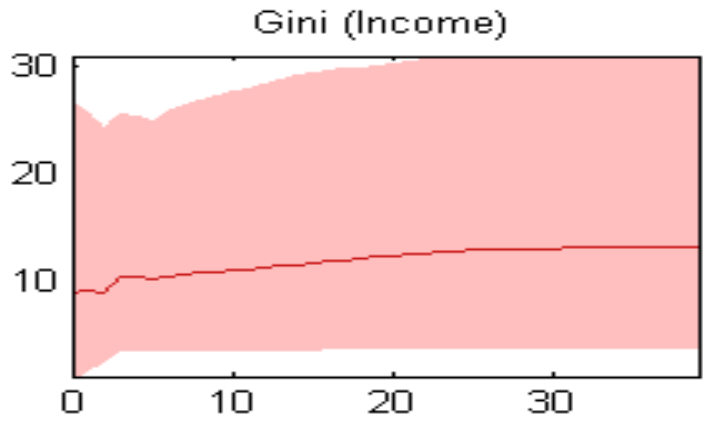
- Results robust to
  1. Recursive scheme
  2. Using a narrative measure of shocks (Cloyne and Huertgen (2014))
  3. Large data set (FAVAR)

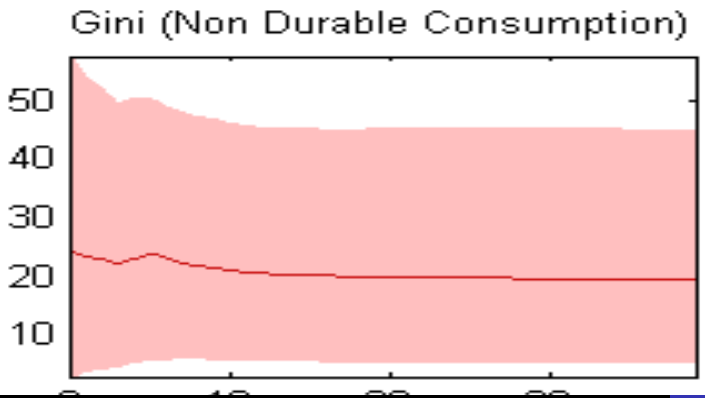
Impulse Responses

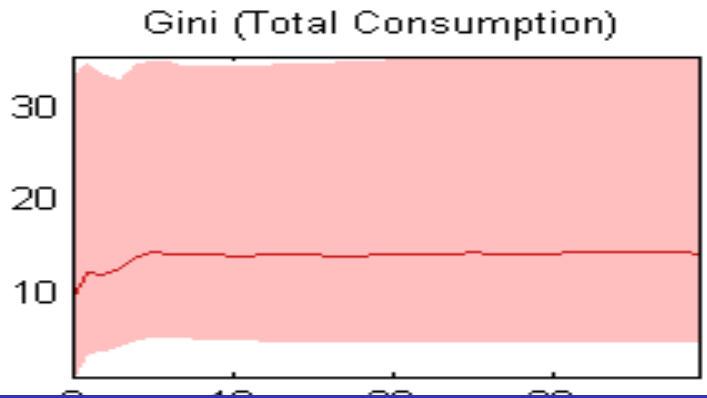


Contribution of monetary policy shocks to forecast error variance of Inequality





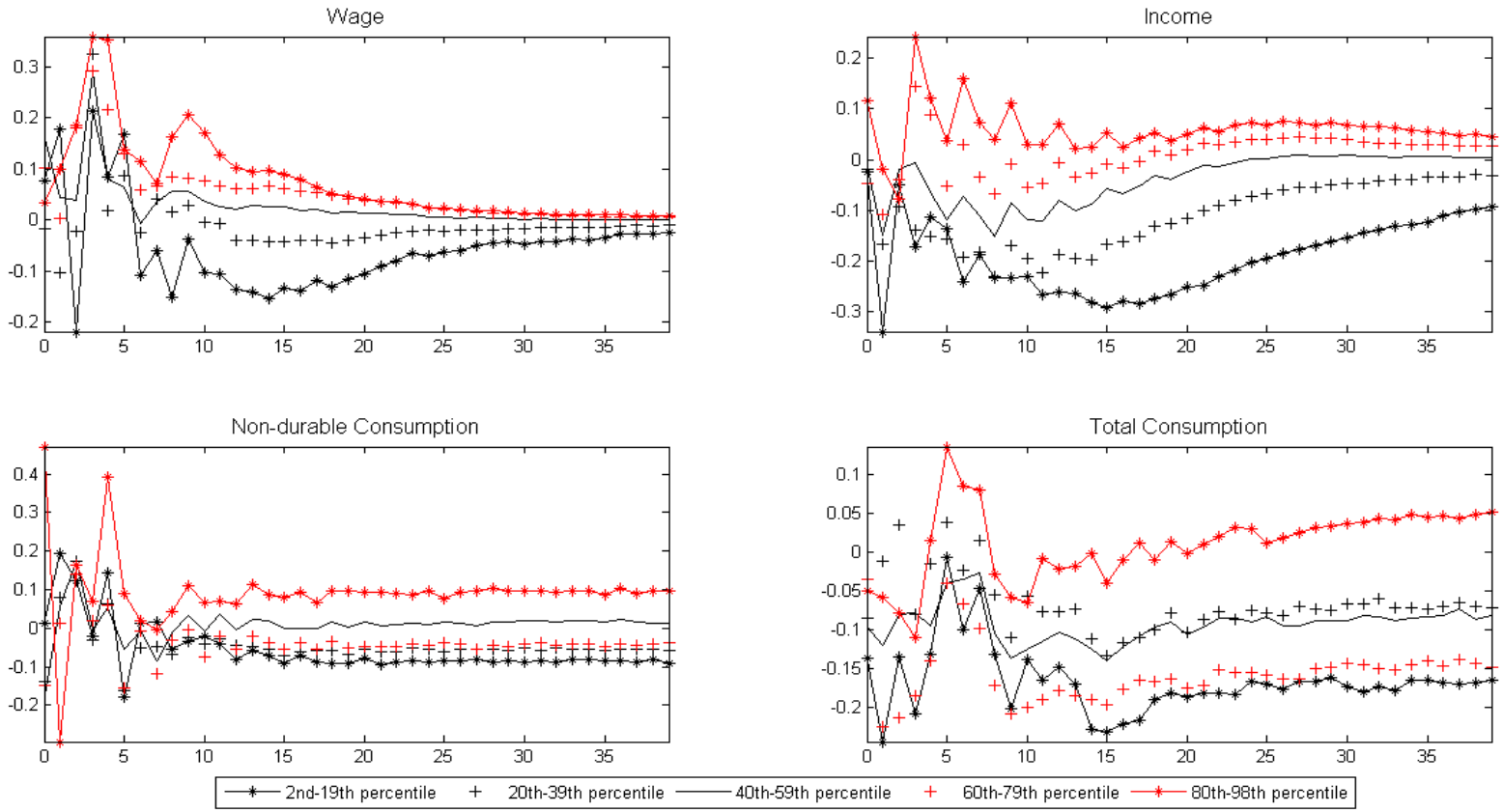




Heterogenous Impulse Responses

- Consider households and individuals that fall within the following percentiles in a given quarter: $P_1 = \left[2^{nd} : 19^{th}\right], P_2 = \left[20^{th} : 39^{th}\right], P_3 = [40^{th} : 59^{th}], P_4 = [60^{th} : 79^{th}], P_5 = [80^{th} : 98^{th}]$.
- We then construct measures of average real wage, real income and real per-capita consumption within these percentiles.
- These measures are then included in the SVAR along with four macroeconomic variables used above and their response to a monetary policy shock is examined.

Heterogenous Impulse Responses



Heterogenous Impulse Responses

- Income and Wages fall for groups P_1 to P_3
  - quick reversal (unemployment, social security)
- Rise in income for higher groups
  - Investments form a larger proportion of Gross income (5% compared to 1.5% for P_1)
  - Consistent with evidence for the US.
- Consumption declines for P_5 and rises for P_1
  - Consistent with P_1 substituting non-durable consumption for durables due to credit constraints.
- Expenditure does not decline as much for P_5
  - This group has high income
  - may spend more on durables and housing (interest sensitive)

Heterogenous Impulse Responses

- Savings re-distribution channel
  - increase in rates benefits savers and those receiving interest income
- Earnings heterogeneity channel
  - increase in interest rates hurts low income households who may become unemployed
- Financial segmentation channel
  - Less direct evidence visible

Impact of QE

- Post 2008 QE employed by the BOE
- Portfolio balance effect may trigger financial segmentation channel by stimulating asset prices.

We use two methods:

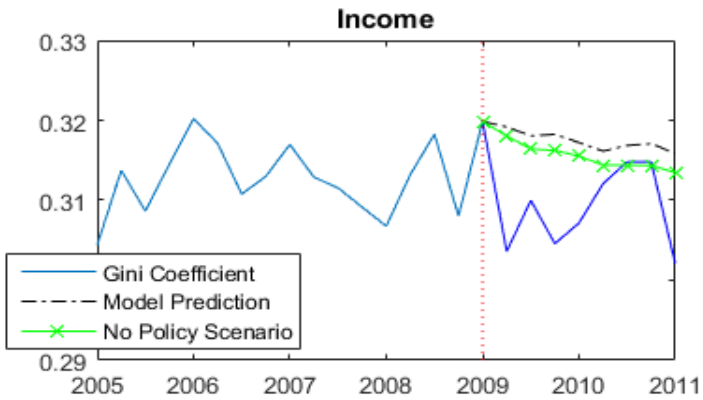
1. Kapetanios et al. (2012): Include bond spread in the VAR model and assume QE reduced spread by 100 basis points. Conduct two forecasts over 2009Q1-2010Q4:
   - Policy Scenario: Forecast of Gini coefficient assuming spread and policy rate equal realised values
   - No-policy scenario: As above but assume spread higher by 100 bp over horizon.

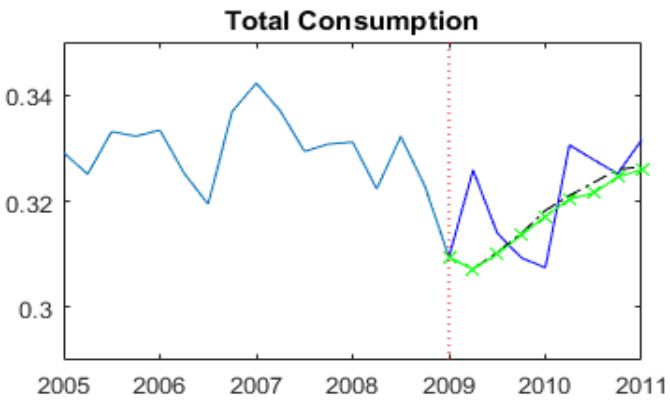
Impact of QE

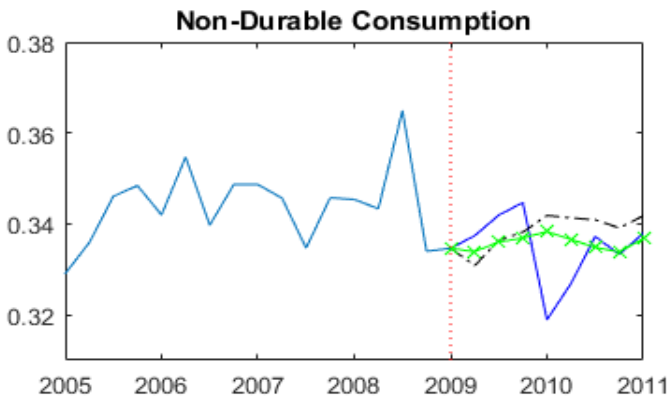
2. Baumeister and Benati (2013): Identify a QE shock in a TVP VAR. Contractionary spread shock$\longrightarrow$ spread $\uparrow$, Inflation $\downarrow$, Output growth $\downarrow$, policy rate unchanged.
    - Counterfactual simulation using spread shocks scaled to ensure spread is higher by 100 basis points over 2009Q1-2010Q4
    - Compare the counter-factual path of the Gini coefficient with the actual path.

Counterfactual scenarios approximating the absence of QE are associated with a peak impact of about -1% on GDP growth over the simulation period.

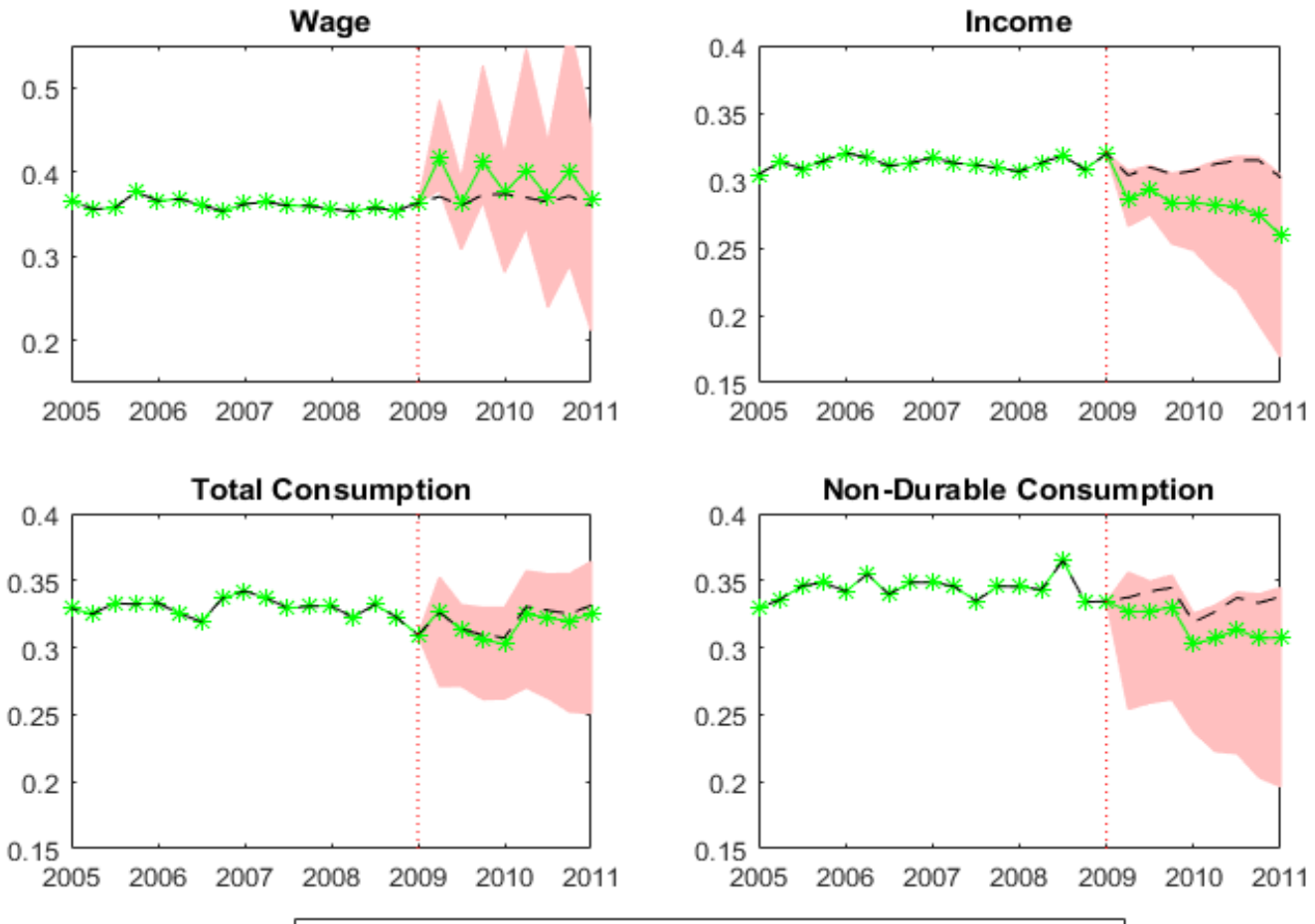
Results: Method 1







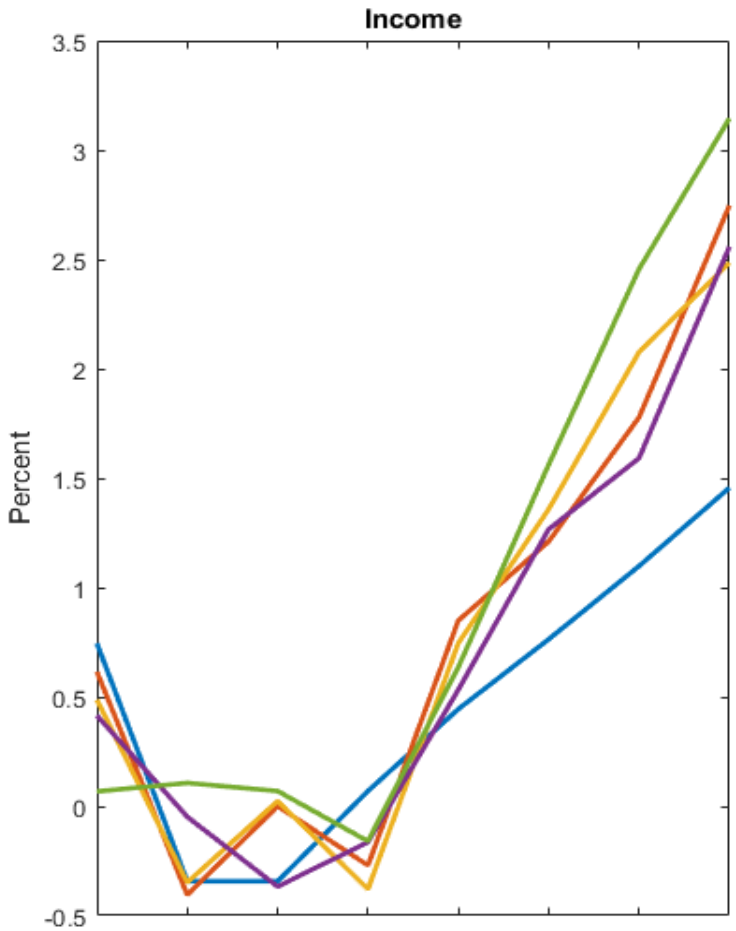
Results: Method 2

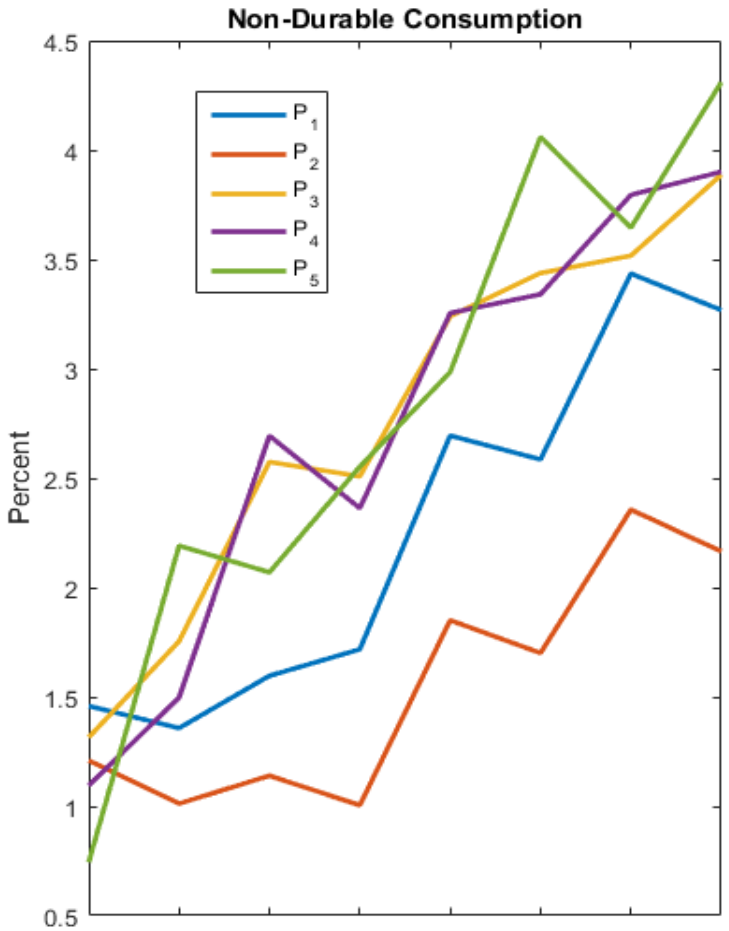


Impact of QE

- Evidence that wage and total consumption inequality was systematically different in the absence of QE appears to be limited.
- More evidence that QE worsened income and non-durable consumption inequality.
  - Re-run counterfactual forecast using income and consumption in groups P_1 to P_5
  - present difference in projected income/consumption under policy and no-policy scenarios.
  - positive values$\longrightarrow$ positive impact of QE

Impact of QE


Income
Percent
3.5
3
2.5
2
1.5
1
0.5
0
-0.5


Non-Durable Consumption
Percent
4.5
4
3.5
3
2.5
2
1.5
1
0.5
P1
P2
P3
P4
P5

Impact of QE

- QE may signal that rates are likely to remain low.
- Asset prices positively affected (Joyce et.al 2010)
  - Financial segmentation channel
- Investors willing to hold longer-term bonds
  - Lower unhedged interest rate exposure (Auclert 2016)
  - Derive benefit from low rates (Interest rate exposure channel)

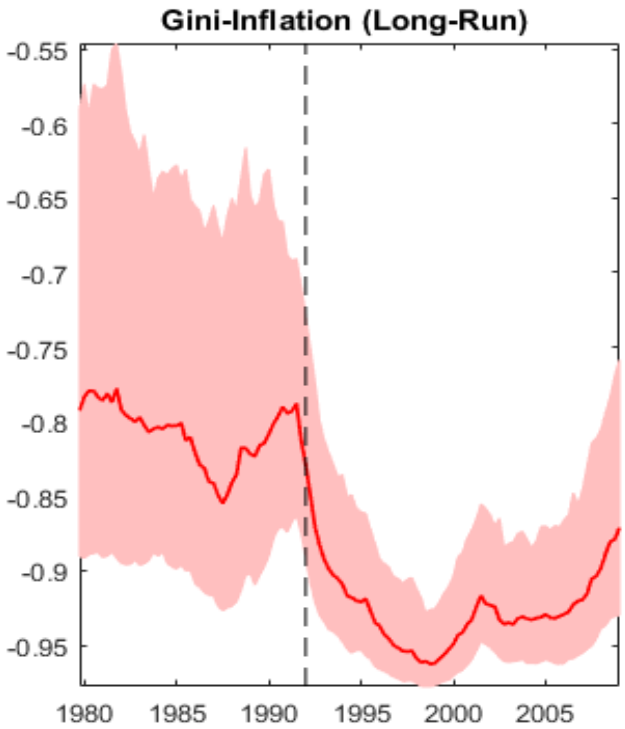
Summary

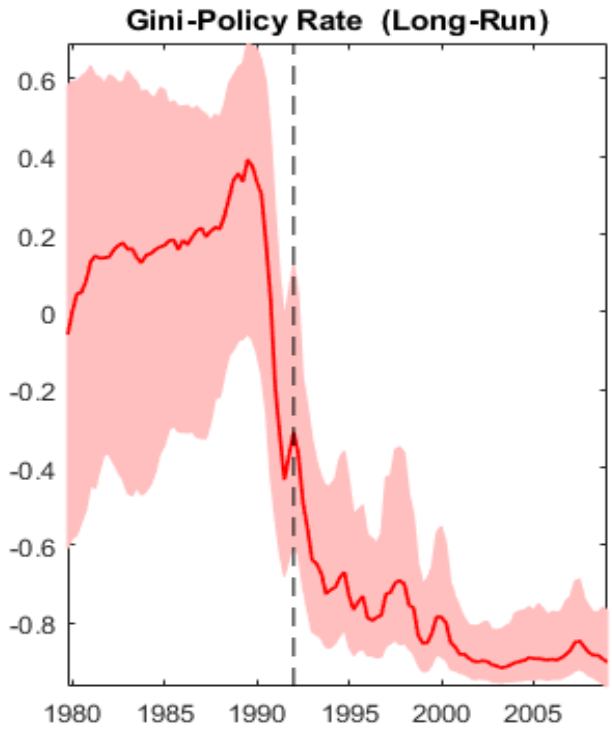
- Contractionary policy shocks associated with an increase in inequality
  - Saving re-distribution channel
  - Earnings heterogeneity channel
- QE associated with higher income and consumption inequality
  - Financial segmentation channel

Some issues of interest

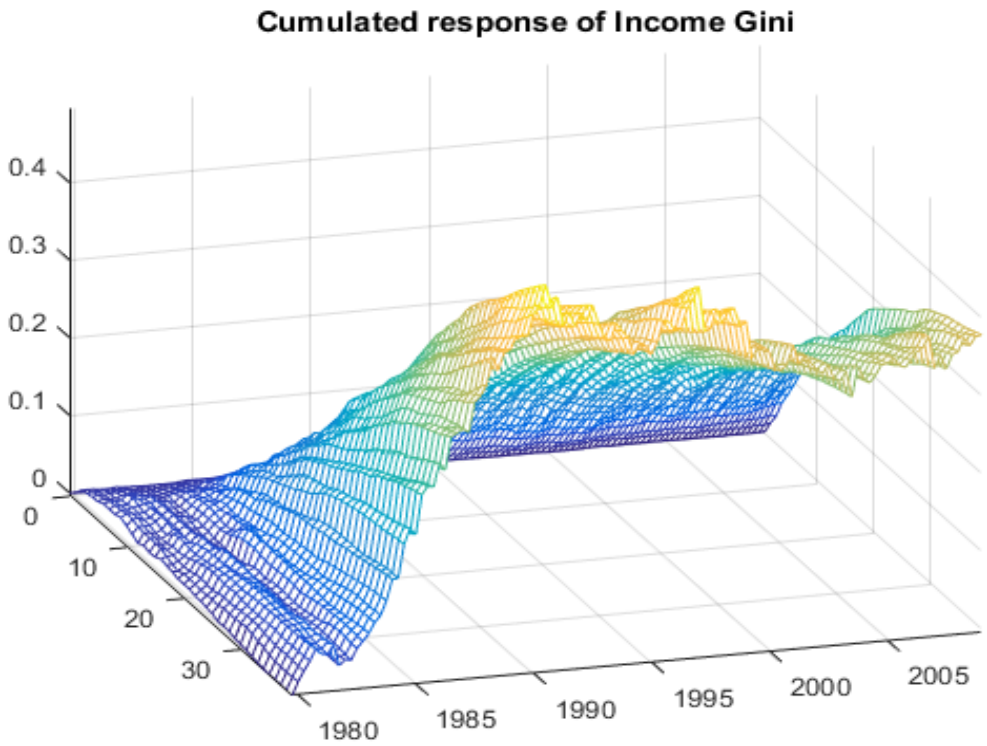
- Exploring the channels of transmission
- Role of wealth
- Permanent/systematic policy changes
  - Coibion et.al. report that decrease in target increases inequality

Long-run correlation





Time-Varying response of the Gini Coefficient



Data details

- Income: Weekly household income net of taxes and national insurance contributions
  - Equivalised using OECD scale
- Wage: normal gross wage from any type of occupation before taxes including national insurance contributions and other deductions and bonuses.
- Total Consumption: sum of housing, food, alcohol, tobacco, fuel, light and power, clothing and footwear,durable household goods, other goods, transport, vehicles and services.
- Non-durable consumption: excludes housing and durable household goods back