Quarterly GDP Estimates for the United Kingdom, 1938-55

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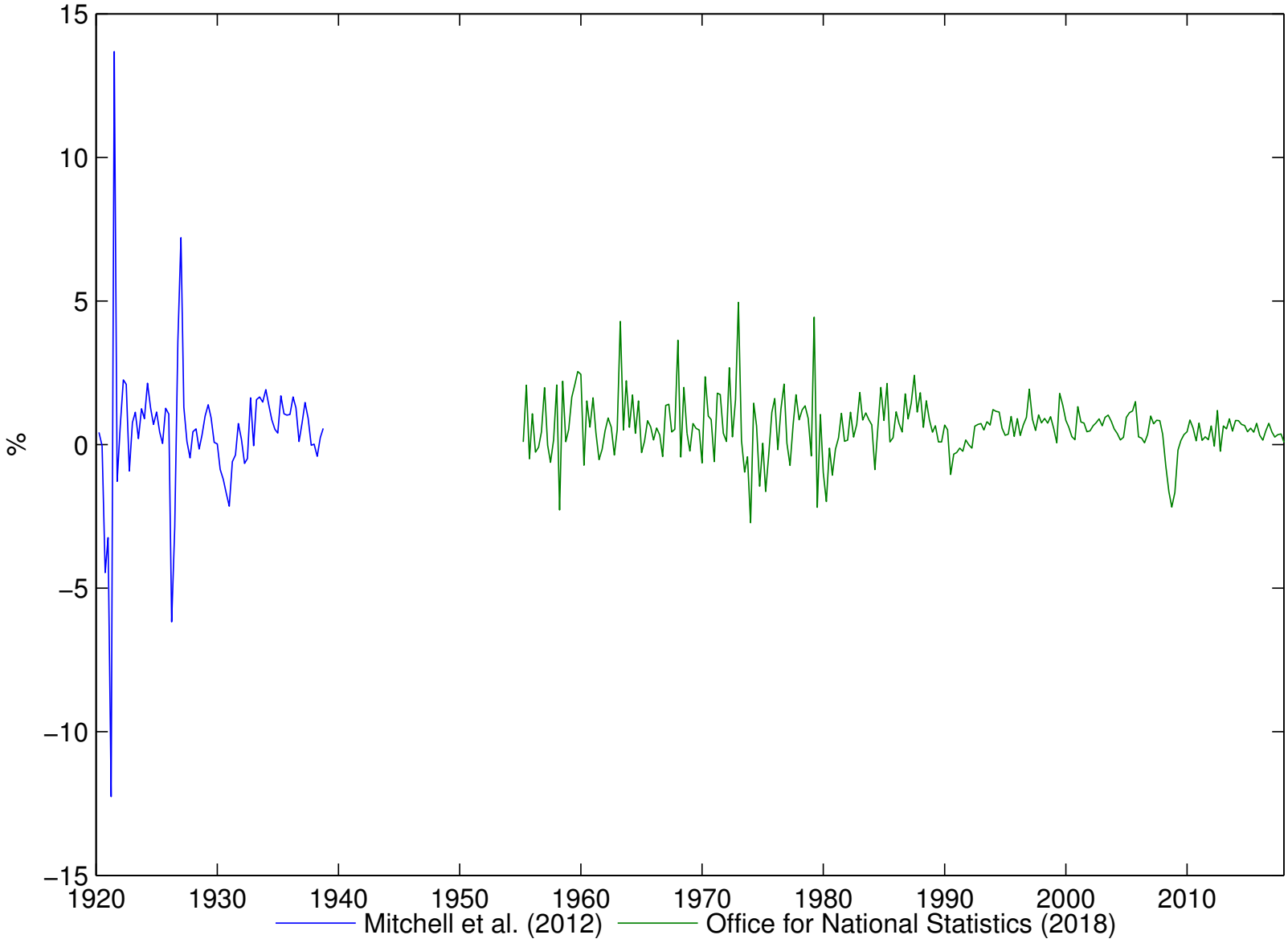
Introduction

- We construct the first quarterly estimates of real GDP at factor cost and at market prices for the United Kingdom between 1938 and 1955
- Based on annual estimates of real GDP and a rich set of quarterly indicators of economic activity
- This research is part of 'Project 1.1EXT: Dating Historical Business Cycles, 1700-2000' for ESCoE

Motivation


15
10
5
0
−5
−10
−15
%
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
Mitchell et al. (2012)
Office for National Statistics (2018)

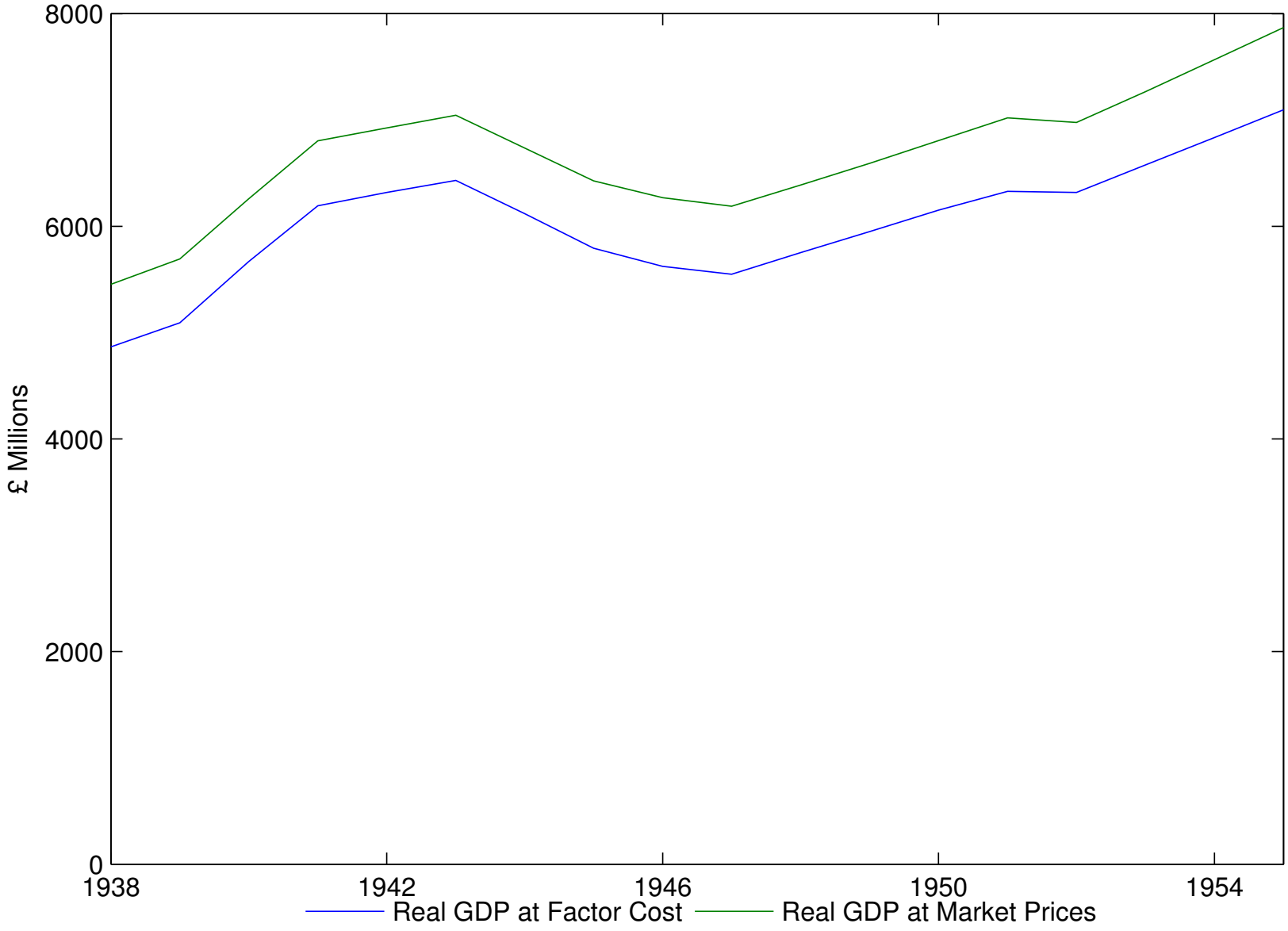
Why is High-Frequency Data Useful?

- Greater resolution
  - Short phases of contraction or expansion may be concealed in annual data but emerge at higher frequencies
  - Turning points in economic activity can be more precisely located at higher frequencies
- Increases the sample sizes available for econometric analysis, resulting in more precise estimates
  - For example, high-frequency GDP estimates for the UK have been used in the analysis of government spending multipliers (Crafts and Mills, 2013, 2015), tax multipliers (Cloyne, 2013; Cloyne et al., 2018) and uncertainty (Lennard, 2018)

Previous Literature

Paper	Sample	Method
Balke and Gordon (1986)	US, 1875-1946	Chow and Lin (1971)
Gordon and Krenn (2010)	US, 1919-51	Chow and Lin (1971)
Edvinsson and Hegelund (2016)	Sweden, 1913-2014	Denton (1971)
Albers (2018)	28 countries, 1925-36	Normalized PC
Hayes and Turner (2007)	UK, 1920-38	Chow and Lin (1971)
Mitchell et al. (2012)	UK, 1920-38	DF

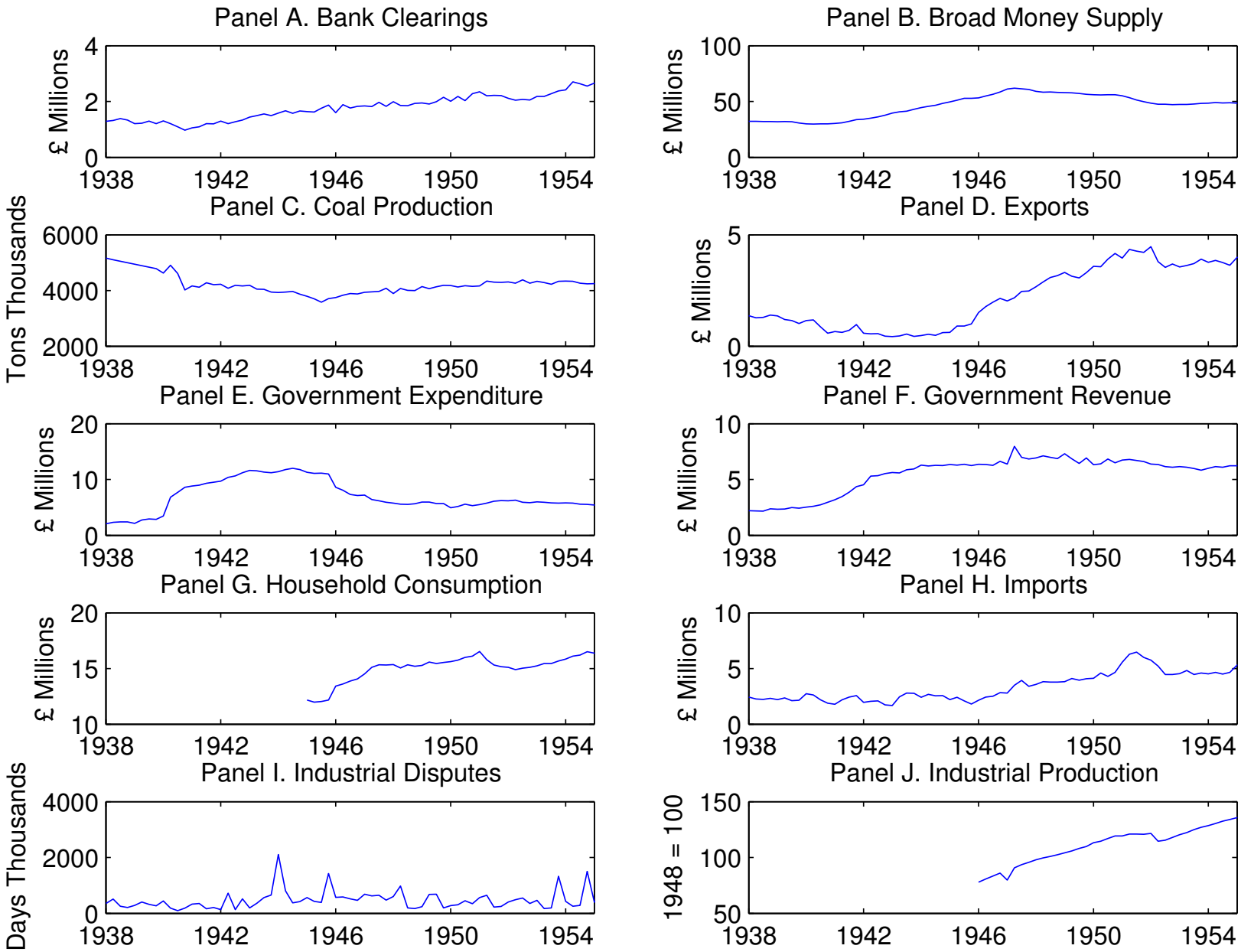
Data: Annual


8000
6000
4000
2000
0
£ Millions
1938
1942
1946
1950
1954
Real GDP at Factor Cost
Real GDP at Market Prices

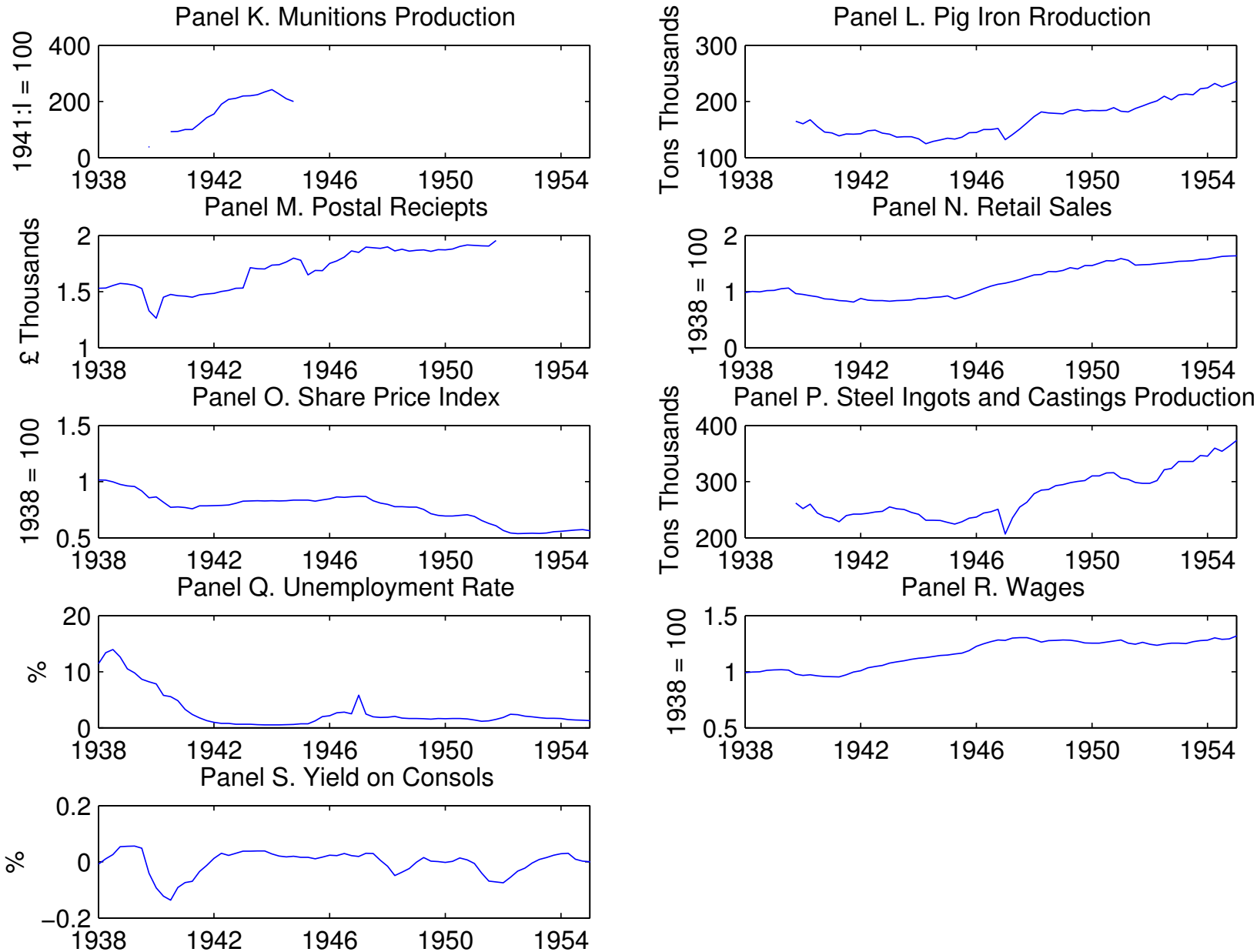
Data: Quarterly

- 19 series included that are either components or correlates of GDP
- Of which 13 series were collected from primary sources, such as the *Accounts Relating to Trade and Navigation of the United Kingdom*, Bank of England's *Statistical Summary*, *Board of Trade Journal*, *Economist*, *Ministry of Labour Gazette* and *Monthly Digest of Statistics*, and 6 were collected from secondary sources

Data: Quarterly



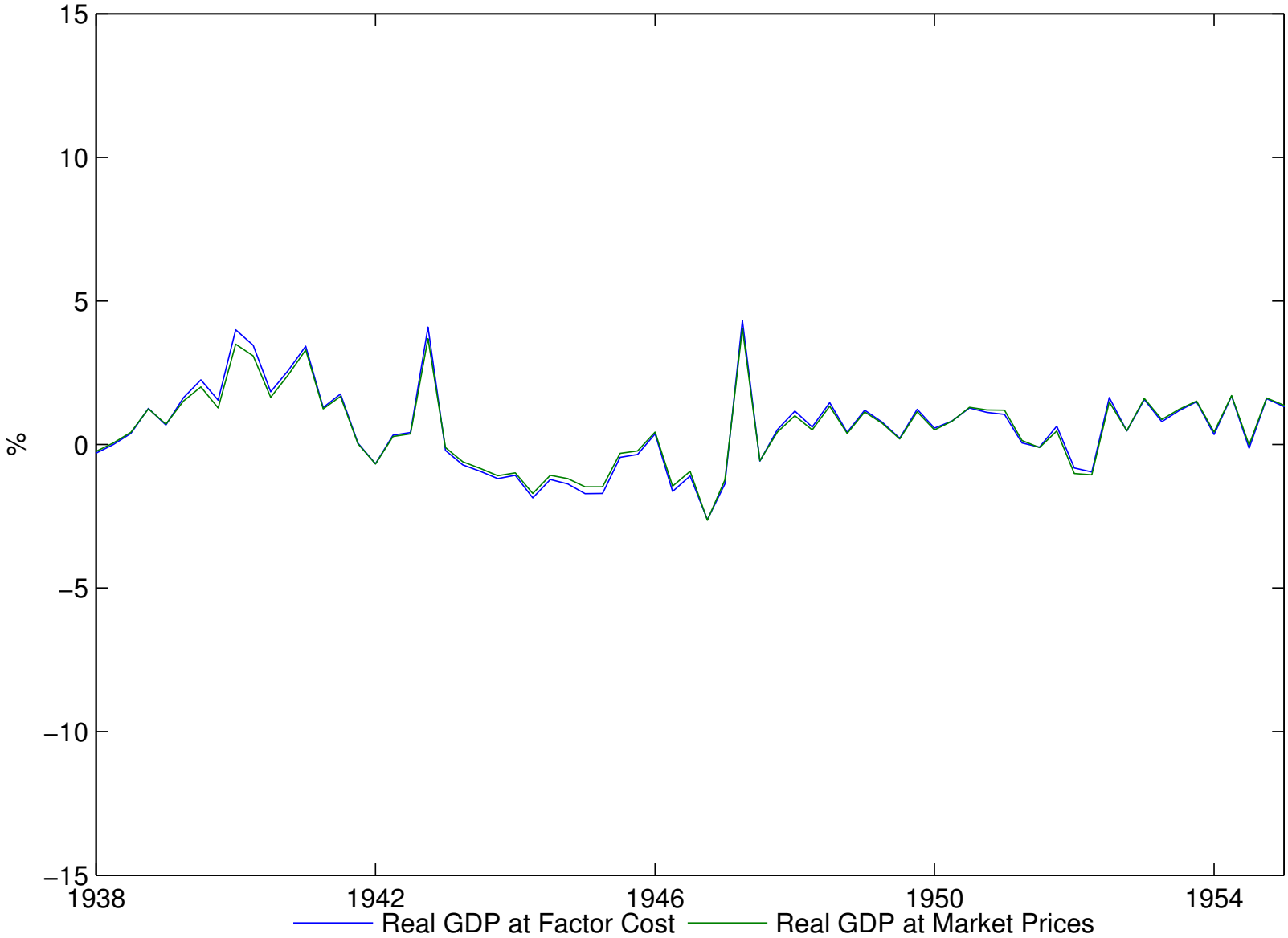
Data: Quarterly



Methodology

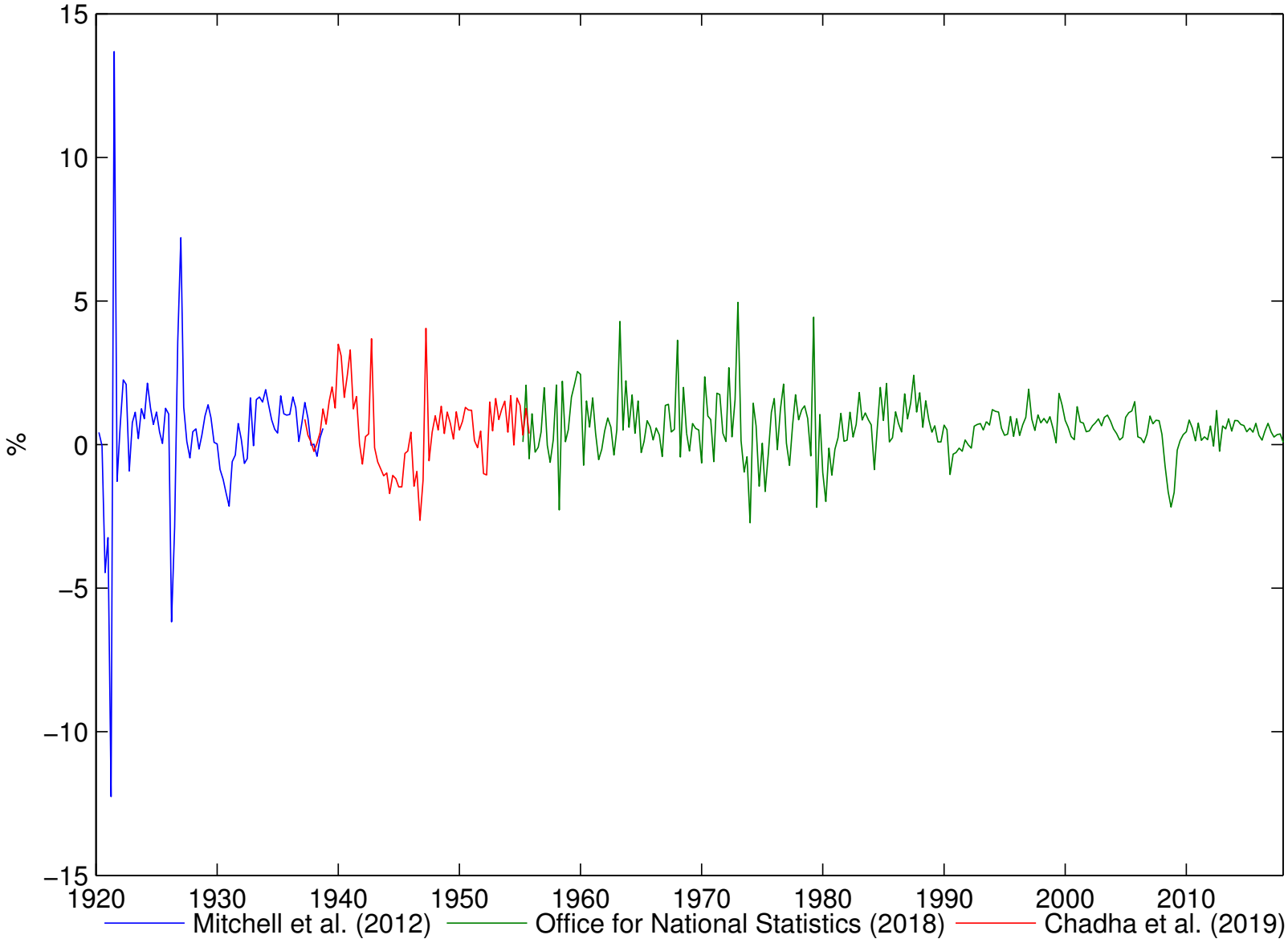
1. Deflate nominal variables using the retail price index
2. Seasonally adjust variables with significant seasonality using TRAMO-SEATS
3. Impute variables with missing values using the Cuevas and Quilis (2012) algorithm
   - 3.1 Estimate a principal components (PC) model for the variables that cover the full sample
   - 3.2 Regress the variables with missing values on the PC and use the estimated parameters to calculate the missing values
4. Estimate a PC model for all variables over the full sample
5. Use the Chow and Lin (1971) approach with either real GDP at factor cost or at market prices as the dependent variable and the PC as the explanatory variable

Results: Quarterly GDP Growth, 1938-55

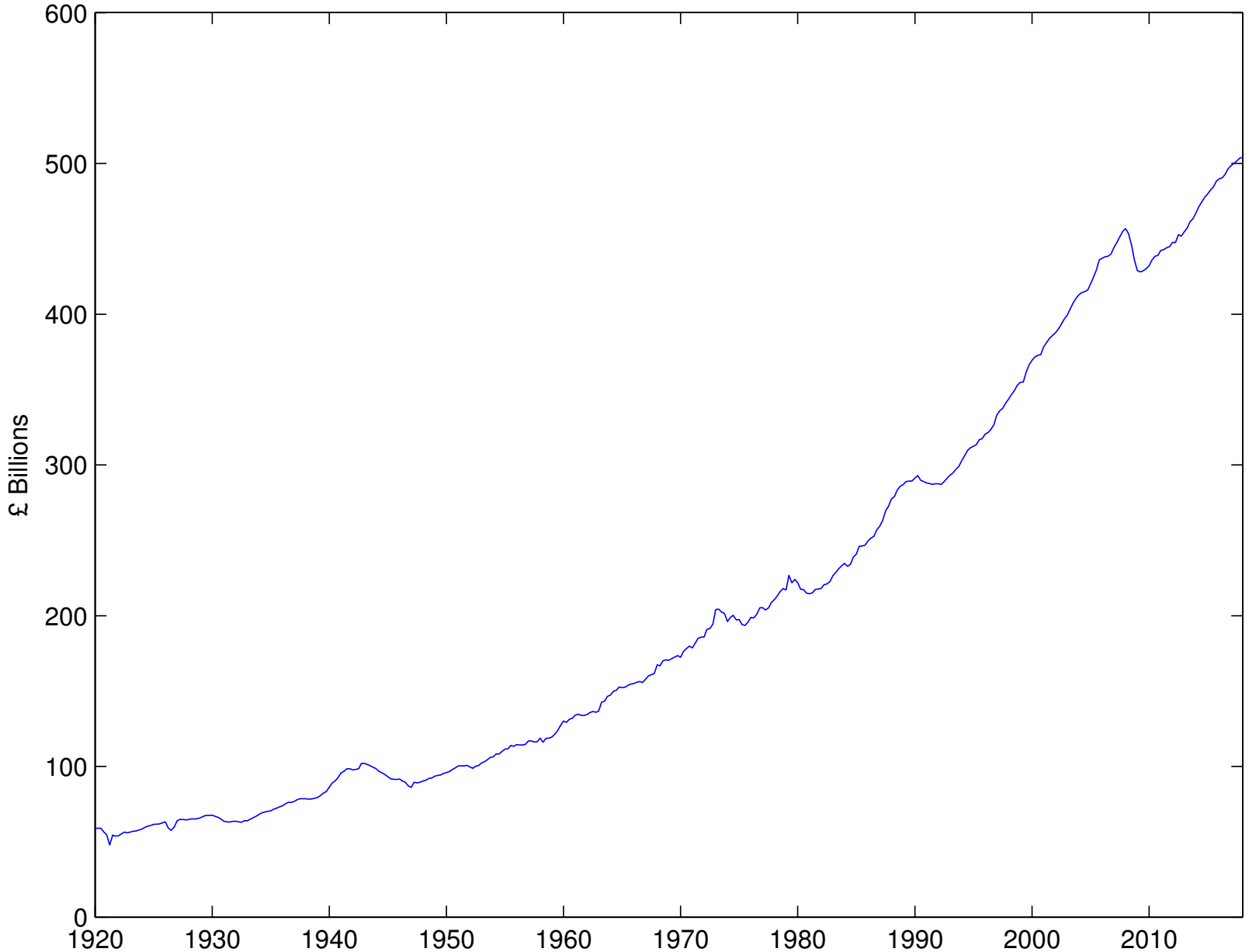


Results: Quarterly GDP, 1938-55

Results: Quarterly GDP Growth, 1920-2018



Results: Quarterly GDP, 1920-2018



Conclusions

- This paper constructs the first high-frequency estimates of GDP for the period surrounding WWII
- The new series bridges existing estimates for the interwar and post-war periods, leading to an unbroken long-run time series between 1920 and the present
- This data will be valuable not only to economic historians but also to applied economists constrained by the small sample size and relative tranquillity of the post-war period
- Next steps:
  - To estimate a dynamic factor model (Proietti and Moauro, 2006; Mitchell et al., 2012)
  - To develop a chronology of historical business cycles