Why so low for so long?
A long-term view of real interest rates

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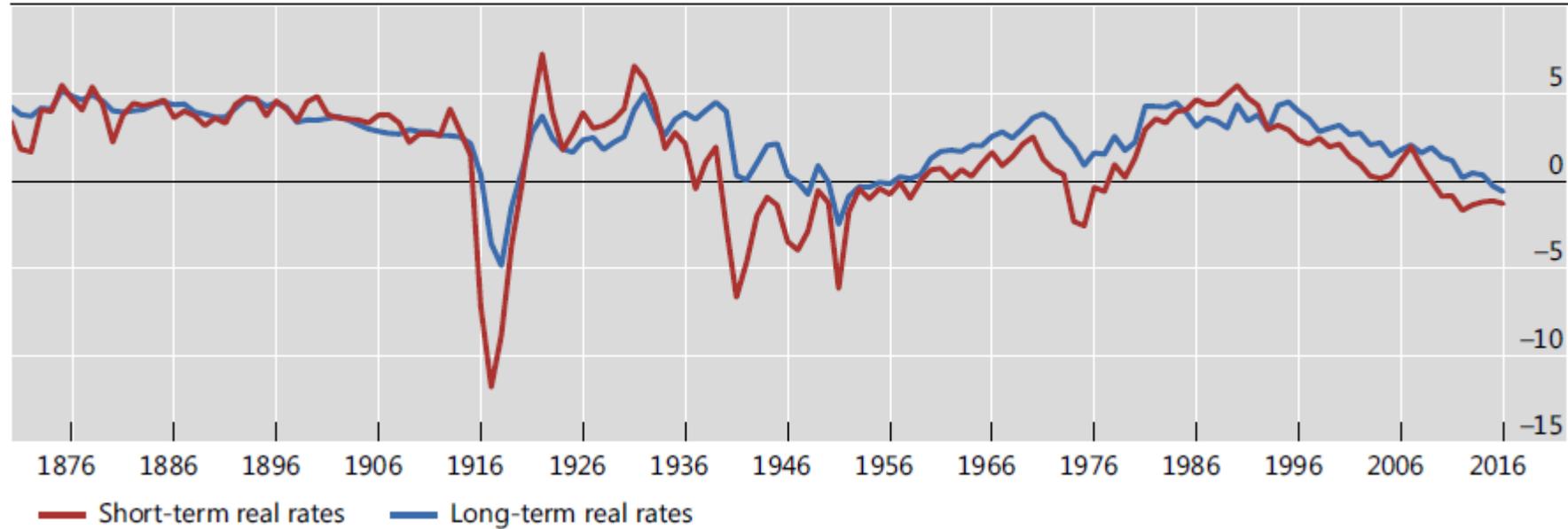
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Secular decline in real interest rate over last 30 years

Real interest rates

In per cent

Graph 1

Short-term real rates   Long-term real rates

Note: Median of 19 advanced economies

- R* has declined, due to higher saving and lower investment
- 'Usual suspects': lower productivity, demographic shifts, rising inequality etc.

Limitations

- Pivotal role of S-I factors a maintained hypothesis
  - Quantify the contributions of S&I factors with structural models
  - Estimate r* through filtering

- Underlying theory not tested
  - "Given that S-I factors explain the real rate, what are their relative contributions?" vs "Do S-I factors explain the real rate?"
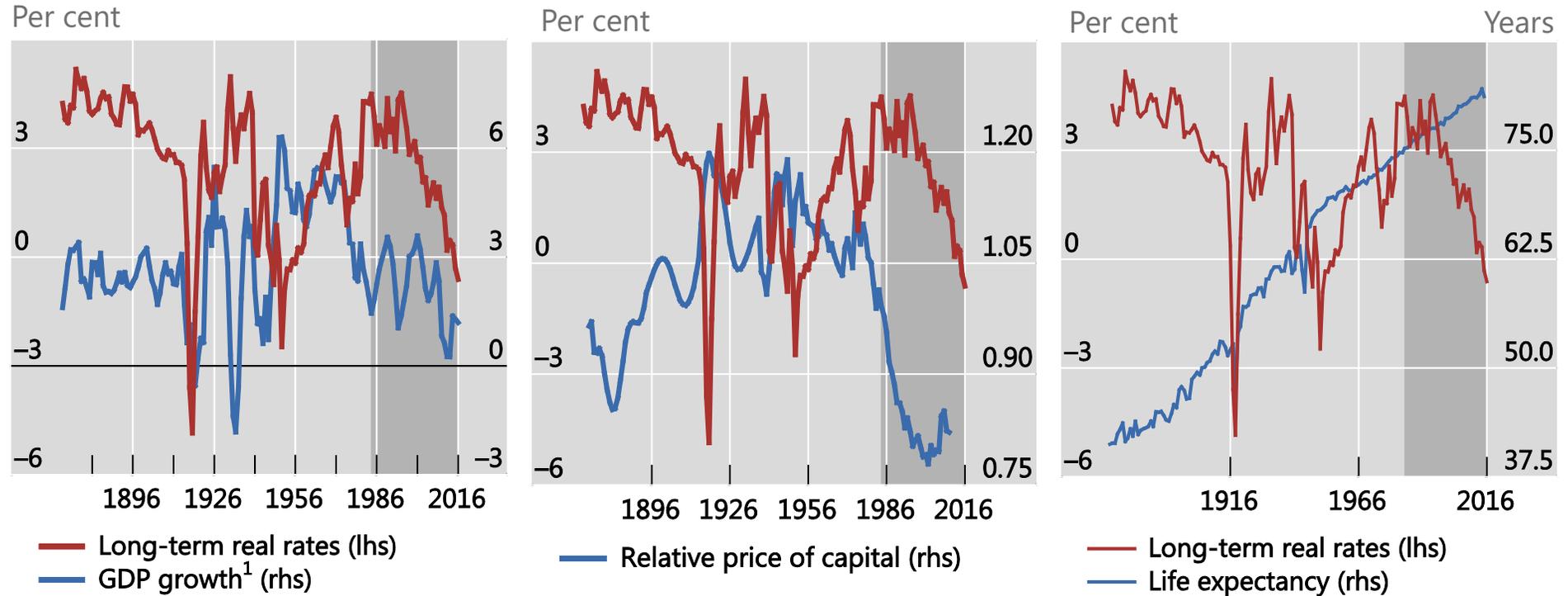
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Our work in a nutshell

- Is there a stable long-run relationship between real interest rates and the 'usual suspects'?
  - 19 advanced economies; 1870-2016 sample; various S&I factors
    - GDP/productivity
    - Demographics
    - Relative price of capital
    - Fiscal policy
    - Risk premium
    - Inequality
    - Marginal product of capital
  - None of these can systematically explain real rate in the long sample

- Monetary regimes potentially play a role, with a significant global component

Key literature

- Lunsford and West (2019)
  - Over 30 variables; from 1890 for the US
  - Only aggregate labour hours and dependency ratio works

- Hamilton et al (2016)
  - 1800s for 17 countries; focus on GDP growth
  - Only modest association and sample-specific

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Real interest rates and S-I factors

Correlation over last 30 years more of the exception than the rule

Per cent

Per cent

Per cent / Years

— Long-term real rates (lhs)
— GDP growth[1] (rhs)

— Long-term real rates (lhs)
— Relative price of capital (rhs)

— Long-term real rates (lhs)
— Life expectancy (rhs)

Note: Median values of 19 advanced countries

Bi-variate panel regressions confirm casual observations

	(1) Full sample	(2) Gold standard	(3) Interwar	(4) Postwar	(5) Pre-Volcker	(6) Post-Volcker
Marginal product of capital (+)	0.05	0.32***	–0.25	–0.33***	–0.57**	0.32
GDP growth (+)	–0.09**	0.01	–0.08**	–0.05	0.02	0.09*
TFP growth (+)	–0.08	–0.01	–0.04	–0.04	0.11	0.24***
Population growth (+/-)	–0.12	0.10	0.10**	–1.25***	–0.64***	–1.30**
Dependency ratio (+)	0.03***	–0.01	–0.12**	–0.04**	0.13**	0.03
Life expectancy (-)	–0.04***	–0.11***	0.43***	0.15***	0.33*	–0.35***
Relative price of capital (+)	0.00	0.05	–0.12	–0.02**	–0.07*	0.07***
Inequality (-)	0.03	–0.00	–0.46**	–0.28**	–0.61***	–0.33***

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Clearer still when all factors considered jointly

Multivariate fixed-effects panel regressions $r_{i,t} = \beta_0 + \beta_{0,i} + \beta_1 X_{i,t} + \varepsilon_{i,t}$
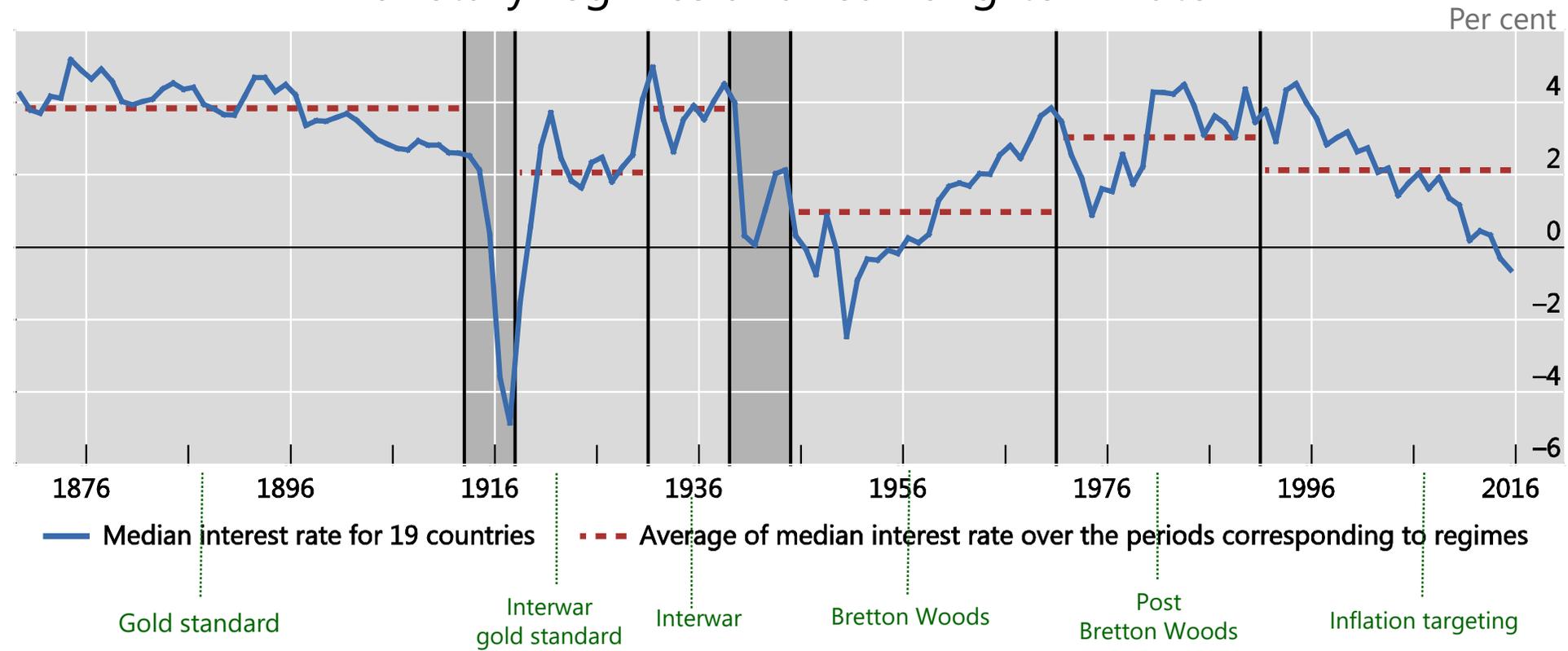
	(1) Full sample	(2) Gold standard	(3) Interwar	(4) Postwar	(5) Pre-Volcker	(6) Post-Volcker
GDP growth (+)	−0.13***	−0.00	−0.07	0.07	0.07	0.07
Population growth (+/−)	−0.98**	−0.60	0.48	−0.67**	0.10	−0.25
Dependency ratio (+)	0.00	0.02	−0.05	0.02	0.14***	−0.07
Life expectancy (−)	0.02	−0.18***	0.44	0.25***	0.59***	−0.33***
Relative price of capital (+)	0.01	0.10**	−0.09*	−0.00	−0.04	0.03
Income inequality (−)	0.09	0.03	0.04	−0.25***	0.03	−0.06
Public debt (+)	−0.86***	−3.19*	−2.51	−1.50***	−0.69	1.58*
Fiscal balance (-)	0.00	0.09	-0.09	-0.04	0.19**	-0.08
Constant	1.41	9.95*	-17.47	-14.61**	-52.15***	33.08***
Adjusted R-squared	0.10	0.58	0.23	0.24	0.38	0.35

Findings robust to numerous exercises

- Short-term real rates as the dependent variable

- Holston-Laubach-Williams r* as the dependent variable

- 5-year & 10-year non-overlapping averages of the data

- Forward-looking inflation expectations (GMM estimation)

- Alternative dependency ratio definitions

- TFP instead of GDP growth

- Adding proxies for risk premium

- Dynamic and global specifications

A role for monetary factors?

Monetary regimes and real long-term rate

Per cent

Legend:
- **Median interest rate for 19 countries**
- **Average of median interest rate over the periods corresponding to regimes**

Gold standard | Interwar gold standard | Interwar | Bretton Woods | Post Bretton Woods | Inflation targeting

Regime definitions

International monetary policy regimes

Table 9

Countries	1870s	1880s	1890s	1900s	1910s	1920s	1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s	2010s
Australia	1852														
Austria			1892												
Belgium	1878														
Canada	1854														
Denmark	1872														
Finland	1877														
France	1878														
Germany	1871														
Italy		1884													
Japan			1897												
Netherlands	1875														
New Zealand	1821														
Norway	1875														
Portugal	1854														
Spain															
Sweden	1873														
Switzerland	1878														
United Kingdom	1821														
United States	1879														

Legend:
- Gold standard/silver/bimetallic[1]
- No GS/paper
- Wars
- Interwar gold standard
- Interwar (between GS and BW)
- Bretton Woods (between BW and IT)
- Post-Bretton Woods (between BW and IT)
- Inflation targeting/de facto/price stability

[1] The table shows the year when a country joins the gold standard. In the empirical analysis, we do not distinguish between metallic standards. In the text, we use "gold standard" to refer to metallic standards.
Sources: Benati (2008); Meissner (2005); BIS; authors' calculations.

Monetary regimes matter

	Regimes & base	Regimes & base & time
Paper	**5.80***	**4.25***
Interwar gold standard	**−7.34***	**−4.40***
Interwar non-GS	**1.90****	0.29
Bretton Woods	**−3.74***	**−1.55***
Post-Bretton Woods	**1.83***	**6.03***
Inflation targeting	**−1.25***	−0.80
GDP growth	**−0.07***	**−0.06***
Population growth	−0.23	0.02
Dependency ratio	**0.05***	**0.03****
Life expectancy	**0.15***	0.06
Relative capital price	0.00	0.02
Income inequality	0.07	0.11
Adjusted R-squared	0.19	0.45
Country fixed effects	yes	yes
Time fixed effects	no	Yes

Global specification

$$r_{i,t} = \beta_0 + \beta_{0,i} + \beta_1^G X_t^G + \beta_1^C \left(X_{i,t} - X_t^G \right) + \varepsilon_{i,t}$$

	Dependent variable: individual countries' real long-term interest rates			
	Full sample	Gold standard	Pre-WWII	Post-WWII
Global monetary policy	0.29***	−0.08	0.39**	0.30***
G: GDP growth	0.01	−0.05	−0.11**	0.04
G: pop. growth	−1.60**	−2.03	−1.38	0.72
G: dependency r.	0.03	0.21	−0.12	0.03
G: life exp.	−0.13*	−0.12	0.04	0.21*
G: capital price	−0.10***	−0.07	−0.10	−0.16***
G: inequality	−0.19*	0.22	0.33	−1.07***
Number of observations	889	159	324	556
Adjusted R-squared	0.21	0.79	0.21	0.48

Conclusions

- We find little support for the 'usual suspects' in explaining real interest rate movements consistently over the long sample

- Monetary policy regimes and conduct may have more persistent effects on real interest rates than commonly assumed
  - If so, question the usefulness of r* as policy anchor

- Is there really an equilibrium real rate that evolves independently of policy?