

# GOLDEN FETTERS AND THE CAUSAL EFFECTS OF COUNTERCYCLICAL MONETARY POLICY

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# THIS PAPER

- ▶ Sample Period: 1870-1913
  - ▶ Time of “free trade”
  - ▶ Commitment to fixed exchange rate (Gold / Gold Exchange Standard)
- ▶ 17 advanced economies (US, UK, France, Germany,...)
- ▶ 13 developing economies (Argentina, China, India, Mexico, ...)
- ▶ Annual percentage change in real principal-export price
- ▶ Trilemma instrument - unpredictable changes in UK short term interest rate

# TWO DEMAND SHOCKS: THIS PAPER

## *Monetary Policy Shocks*

- ▶ Construct *Trilemma instrument* (Obstfeld, Shambaugh & Taylor) for 30 advanced and developing countries (1870-1913)

150 basis points  $\uparrow$   $\rightarrow$  5% lower real GDP per capita, three years later  
4% lower price level, three years later

## *Export Commodity Price Shocks*

- ▶ Observed changes in commodity prices recorded in UK

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## Novelty:

- ▶ Extend Trilemma instrument to developing countries
- ▶ Export Price Shocks during period of “free trade”
- ▶ Effect of Export Price shock  $\times$  Monetary Policy Stance

# INTERACTION OF TWO DEMAND SHOCKS

## Why some times are different?

- ▶ Stabilization of shocks depends on the level of monetary and fiscal policy space (Romer & Romer 2017)
- ▶ Norway pre crisis had 10% nominal policy rate, and negative net debt. Put together an aggressive response
- ▶ Greece, Italy - interest rates at ZLB, not enough fiscal response

## INTERACTION OF TWO DEMAND SHOCKS

- ▶ Active Taylor rule makes it hard to learn about stance of monetary policy
- ▶ There is an endogenous response of interest rates to changes in output and inflation
- ▶ Trilemma instrument “exogenizes” the monetary policy rate
- ▶ Export price shocks help identify exogenous “cycles”

Preliminary results align with Romer & Romer (1994, 2017)

- ▶ “Strong” countercyclical monetary policy can tame the export price shock
- ▶ Can we extrapolate these lessons to developed countries today?

# TRILEMMA AND DEVELOPING COUNTRIES

## Outline for Comments

- ▶ In the absence of central bank, what interest rate to use may matter?
- ▶ Exogeneity of instrument?
- ▶ Is the transmission mechanism similar across advanced and developing countries?

# TRILEMMA INSTRUMENT

Exogenous base country interest rate movements spill into local interest rates for open pegs

(Obstfeld, Shambaugh & Taylor 2004, Shambaugh 2004)



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Construct instrument: unpredictable movements in base country interest rates

**Table 3:** First-stage relationship between change in short-rates for pegs and the trilemma instrument

Dependent variable: $\Delta r_{i,t}$	No controls			With controls		
	(1) All years	(2) Pre-WW2	(3) Post-WW2	(4) All years	(5) Pre-WW2	(6) Post-WW2
<b>Pegs: <math>q = 1</math></b>						
$z_{i,t}$ (instrument)	0.58*** (0.09)	0.40*** (0.09)	0.67*** (0.10)	0.52*** (0.06)	0.35* (0.17)	0.56*** (0.06)
<i>t</i> -statistic	[6.58]	[4.32]	[6.46]	[8.62]	[2.05]	[8.97]
Observations	1059	438	621	672	148	524

Notes: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Standard errors in parentheses. Full sample: 1870–2013 excluding 1914–1919 and 1939–1947. Pre-WW2 sample: 1870–1938 (excluding 1914–1919). Post-WW2 sample: 1948–2013. Country fixed effects included in the regressions for columns 4–6. These regressions also include up to two lags of the first difference in log real GDP, log real consumption, investment to GDP ratio, credit to GDP, short and long-term government rates, log real house prices, log real stock prices, and CPI inflation. In addition we include world GDP growth to capture global cycles. See text.

Source: Jorda, Schularick & Taylor (2018)

## TRILEMMA INSTRUMENT: IDENTIFICATION

Fixed exchange rates and free capital mobility, with no-arbitrage, implies that the correlation between the instrument and the policy variable can be used to calculate a *local* impulse response in the sense of the *local average treatment effect*

$$y_{i,t+h} = \alpha_{i,h} + \mathbf{x}_{i,t}\gamma_h + \widehat{\Delta r}_{i,t}\beta_h + v_{i,t+h}; \quad \text{for } h = 0, \dots, H - 1$$

$$\mathcal{R}_{LATE} = E(\mathbf{y}_1 - \mathbf{y}_0 | \Delta r, \mathbf{x}, z; q = 1) = \boldsymbol{\beta} = (\beta_0, \dots, \beta_{H-1})'$$

gives impulse response, assuming *relevance*, *exogeneity* and *monotonicity*

$\Delta r$  change in domestic interest rate,  $\mathbf{x}$  vector of controls,  $z$  instrument,  $\widehat{\Delta r}$  is instrumented change in domestic interest rate

# TRILEMMA INSTRUMENT

Jorda et al ('18) sample plus developing countries,

	No controls	Country Fixed Effects	Country Fixed Effects + controls
Constant	-0.031 (0.055)	-0.031*** (0.002)	1.792*** (0.093)
Instrument	0.319*** (0.066)	0.324*** (0.065)	0.285*** (0.071)
Observations	687	687	670
Adjusted R-squared	0.0202	0.0222	0.490
Number of countries	29	29	29

Controls are country specific time-trends and two lags for international financial crisis dummy, domestic financial crisis dummy, international war, intra-national war, central bank dummy, stock market dummy. Robust SEs (country clustered). Only countries adhering to the gold standard.

Source: Mitchener & Pina (2018)

Approx 10 basis points less passthrough

## DELVING DEEPER

Assumption of **open** pegs - free movement of capital

With advanced countries (Jorda et al), *monotonicity*

$$\frac{\partial E(\Delta r|\mathbf{x})}{\partial z} \geq 0$$

With developing countries,

$$\frac{\partial E(\Delta r|\mathbf{x})}{\partial z} > 0 ?$$

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Why?

- ▶ lack of capital mobility

## THE CHAPTER YOU MAY NOT OMIT

*MISS PRISM: ...Cecily, you will read your Political Economy in my absence. The chapter on the Fall of the Rupee you may omit. It is somewhat too sensational. Even these metallic problems have their melodramatic side.*

— Oscar Wilde, *The Importance of Being Earnest*, Act 2

## FINANCES OF THE RAJ: AT WHAT RATE?

The (small) formal banking structure in British India:

- ▶ Exchange banks - (foreign trade financing)
- ▶ Three **Presidency banks** (later consolidated into State Bank of India)
- ▶ Indian joint-stock banks (eg Punjab National Bank)
- ▶ Cooperative Credit Societies

Europeans would go to Presidency banks with rupee denominated *Council Bills* to arbitrage away interest rate differences.  
Reserve Bank of India established in 1935.

Source: Tirthankar Roy, Economic History of India 2011

# SEASONAL FLUCTUATIONS IN DISCOUNT RATE

Let us examine the annual fluctuations of the rate in recent years in more detail:—

	Bengal Rate per Cent.			Bengal Rate per Cent.	
	Max. rate in February.	Min. rate in August.		Max. rate in February.	Min. rate in August.
1900	8	3	1907	9	3
1901	8	3	1908	9	3
1902	8	3	1909	8	3
1903	8	3	1910	6	3
1904	7	3	1911	8	3
1905	7	3	1912	8	3
1906	9	3	1913	8	

GBR	
1899	3.18
1900	3.66
1901	3.16
1902	2.97
1903	3.41
1904	2.68
1905	2.56
1906	3.99
1907	4.47
1908	2.32
1909	2.29
1910	3.16
1911	2.91
1912	3.62
1913	4.37

Source: J. M. Keynes, "Indian Currency and Finance" (1913, Ch VIII)

Right table: Jorda Schularick & Taylor "Macro-history database"



## KEYNES (1913) ASSESSMENT

Why were seasonal fluctuations not arbitrated away?

*If there is so regular an expectation of obtaining 7 or 8 per cent in India on excellent security, why is it not worth some one's while to transfer funds to India in the busy season on an ampler scale than is the case at present, and thus secure the advantage of so wide a discrepancy between the English and the Indian rates*

- ▶ large transport costs of gold to arbitrage away differences
- ▶ lack of financial instruments within India → need a central bank

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- ▶ lack of financial instruments within India → need a central bank

Similar concerns might apply to the trilemma instrument.

- ▶ Unclear as to what interest rate to use for developing countries without a central bank
- ▶ This might have implications for monotonicity condition (might explain why the passthrough is 10 bp lower than JST)

## 'RELEVANCE' & EXOGENEITY

Is it the 'relevant' interest rate for output fluctuations?

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- ▶ Despite instrument relevance, exogeneity may be threatened (Conley, Hansen & Rossi 2011)

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*Spillovers* / Exclusion Restriction

$$\Delta r = z b + \eta,$$

$$y = \hat{\Delta} r \beta + z\phi + \nu$$

Assume:  $\phi = 0$ . If not:

$$\hat{\beta}_{IV} \rightarrow \beta + \frac{\phi}{b}$$

$b$  - strength of instrument. Despite controlling for global factors through global GDP, base rates proxy for factors common to all countries.

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Suggestion 1: zero-first-stage test (Bound and Jaeger, 2000)

Suggestion 2: Exploit the population of floats/ silver-standard to show robustness of exclusion restriction (Plausibly exogeneous)

# FISCAL/MONETARY POLICY SHOCK

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Why do the British love tea? because tea leaves.

Old answer: because they could afford to.



Government of India in Session 1875 (Tirthankar Roy)



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- ▶ Annual average of 15 million sterling remitted by India, often through borrowing in the London market
- ▶ Interest rate shocks likely affect government borrowings in sterling
- ▶ The transmission mechanism likely fiscal in developing economies (Fiscal theory of Price level)

# SUMMARY

- ▶ Brings new data to think about developing country monetary policy during the original Brexit movement
- ▶ Has the potential to convincingly address the question of importance of policy space during recessions
- ▶ Comment 1: provide some evidence of instrument exogeneity
- ▶ Comment 2: address the issue of monetary-fiscal interaction in colonies

Thanks!