The Limits of Central Bank Independence for Inflation Performance

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Central bank governors and their independence

- What do these three besuited individuals have in common?
  - (Other than the obvious fact that they are all men with slightly pained looks on their faces)

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The importance of central bank independence in theory and practice

- Central bank independence is *the* lynchpin of academic belief in credible monetary policymaking
  - This argument is the hallmark of economists' pushback against recent threats to central bank governance
  - It has also been almost unambiguously been embraced by governments worldwide
- Independent monetary authorities also represent an inherent tension in democracies
  - They outsource a powerful policy instrument to unelected bureaucrats
  - But a transparent monetary commitment also complements democratic transparency

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The three-way relationship between inflation, independence, and democracy

- The natural way to examine these linkages is to condition one on the other
  - Multiple veto players in democracies can affect the effectiveness of central bank independence and its inflationary stance (Keefer & Stasavage 2002, 2003)
  - Independence is a transparent monetary commitment that can reinforce the transparency of democratic systems to produce low-inflation outcomes (Broz 2002)
  - Democracies that emphasize rule of law while allowing independent central banking offer the discipline and credibility necessary for low inflation (Bodea & Hicks 2015)

Exploiting the explanatory power of democracy to isolate independence effect

- Relying on interactions misses the way democracies decentralize societal decisionmaking
  - Decentralized policymaking applies to monetary policy too
  - Democracies exhibit an average independence score of 1.7 versus 1.5 for nondemocracies
  - Democracy positively correlated with independence
- Recognizing this relationship (and the absence of one with respect to inflation) unlocks the relevance of democracy as an instrument for independence

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Resolving the endogeneity of inflation and independence

- Apply an instrumental variables approach to identify causal effect of independence on inflation
- Rely on an expanded coverage that includes up to 182 countries (twice as many as Bodea & Hicks 2015!) over more than 40 years (four times longer than Cukierman, Webb & Neyapti 1992!)
- Expanded spatial-temporal coverage necessitates extra attention to parameter heterogeneity alongside endogeneity

Does central bank independence really matter?

- Revisit the question of central bank independence for inflation using a model that accommodates:
  - Unobserved heterogeneity (two-dimensional FEs, with multi-way SE clustering)
  - Reverse causality (panel GMM IV/2SLS)
  - Parameter heterogeneity (CCE and dynamic CCE, with IV)
- Secondary analyses that tease out the drivers of the main result
  - Subsamples by income level
  - Decompose central bank independence
  - Clarify transmission channels via interaction effects
  - Variability of inflation

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Central bank independence associated with lower inflation...

- Early papers stress negative independence-inflation relationship
  - Theoretical arguments stress importance of credibility to avoid time inconsistency in inflation-unemployment tradeoff (Kydland & Prescott 1977)
  - Credibility bought with rules (Barro & Gordon), delegation to inflation-averse central bank (Rogoff 1985), banker (Walsh 1995), committee (Faust 1996), or supranational institution (Giavazzi & Pagano 1988)
  - Empirical studies have offered support in developed economies (Cukierman 1992) or a limited sample of DMs and EMs (Cukierman, Webb & Neyapti 1995; Cukierman & Webb 1995)

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. . . but effects of independence on inflation may in fact be mixed I

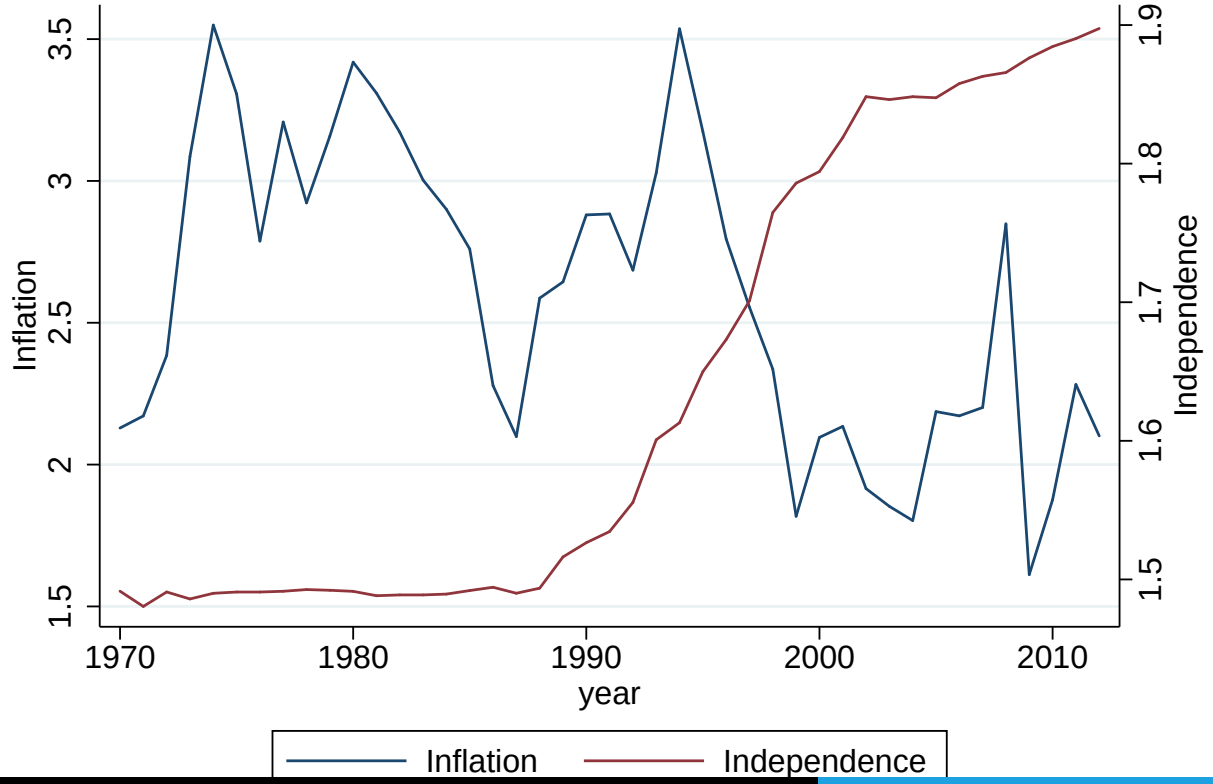
- Subsequent work has questioned the simple negative independence-inflation story
  - Theoretical papers now afford the possibility that multiple objectives may lead to Tinbergen Rule-type dilemmas
  - Political economy can complicate the picture via legislative coalition formation (Crowe 2008), rent seeking (Hillman & Ursprung 2016), or patronage politics (Acemoglu *et al.* 2008)
  - Inflation dynamics are also recognized to be a more complicated process that may be influenced by factors beyond policymakers' control, such as demographics (Bobeica *et al.* 2017) or input prices (Choi *et al.* 2018)

. . . but effects of independence on inflation may in fact be mixed II

- Empirical work has also moved toward finding weaker or no relationship (de Haan & Kooi 2000; Klomp & de Haan 2010)
- Special cases, such as hyperinflation, may still engender the negative effect (Bernholz 2013, 2015)

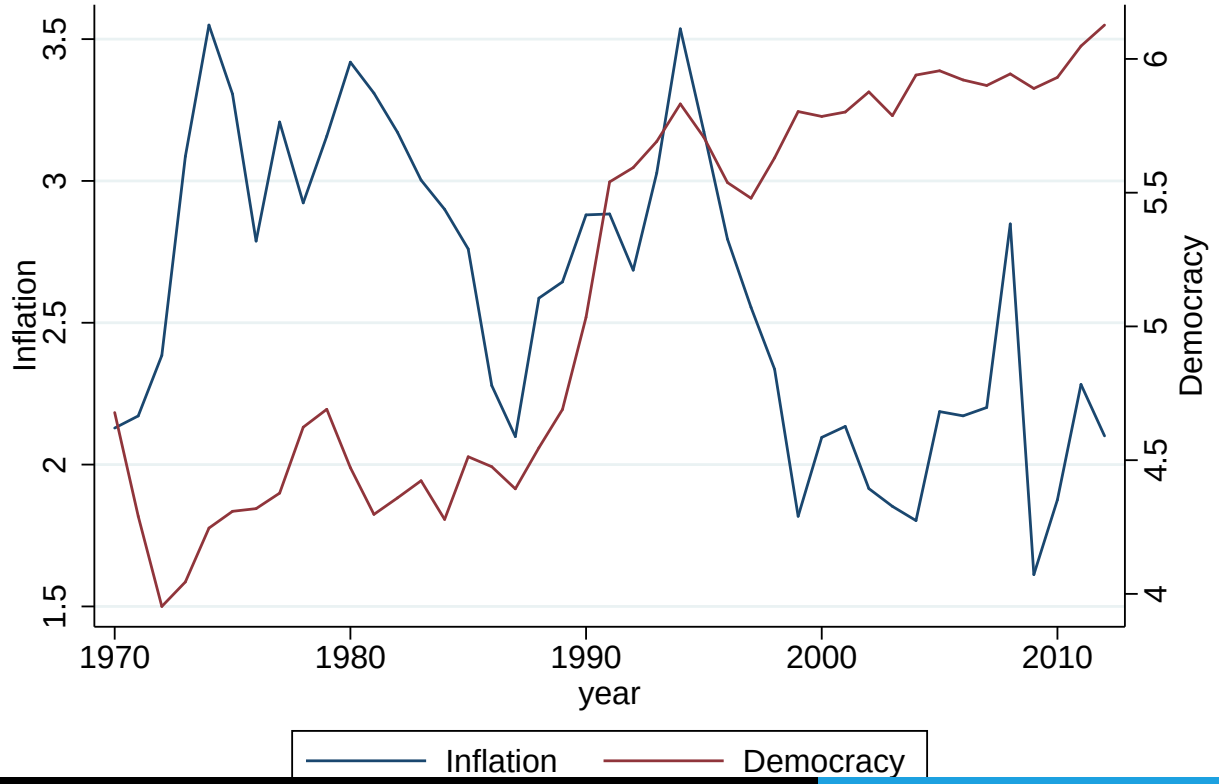
Trends in independence, democracy, and inflation

- Macroeconomic trends in inflation and independence suggest a negative relationship on average



Trends in independence, democracy, and inflation

- But a similar negative trend characterizes the relationship vis-à-vis democracy



Strong independence need not result in low inflation I

- History has yielded cases where formally independent central banks either chose not to exercise control over rampant price rises, or failed to do so
  - McChesney Martin defined Fed actions as "*within* the government, not independent *of* it" (Meltzer 2005, p. 153), and acquiesced to financing any budget approved by Congress in the interest of "policy coordination"
  - BoJ charter requires the institution to "buy and sell foreign exchange. . . upon approval of the Minister of Finance" (Art. 40, Sec. 2–3), and this routine sterilization has interfered with the conduct of monetary policy proper

Strong independence need not result in low inflation II

- Even when central banks do not face conflicted targets, independence has been insufficient to control inflation in settings with weak democratic norms
  - After separating the functions of the *Banco Central do Brasil* from Brazil's National Treasury, inflation remained sticky for 7 years, ending only with the *Plano Real*
  - Latvia's *Latvijas Banka* governor Ilmars Rimsevics dismissed on corruption charges, and high independence may ironically have enabled such political side payments

Estimation and methodology

- Two-dimensional FE with multiway clustering

$$\pi_{it} = \phi_F \pi_{i,t-1} + \beta_F CBI_{it} + \delta_F DEMOC_{it} + \kappa_F CBI_{it} \times DEMOC_{it} + \mathbf{X}'_{i,t-1}\boldsymbol{\Gamma_F} + \alpha_i + \alpha_t + \epsilon_{it}$$

- Panel GMM IV

$$\pi_{it} = \beta_I \widehat{CBI}_{it} + \mathbf{X}'_{i,t-1}\boldsymbol{\Gamma_I} + \alpha_i + \alpha_t + \epsilon_{it}$$

$$\widehat{CBI}_{it} = \delta_I DEMOC_{it} + \mathbf{Y}'_{it}\boldsymbol{\Psi}_{I,i} + \varepsilon_{it}$$

- CCE and dynamic CCE with IV

$$\pi_{it} = \phi_C \pi_{i,t-1} + \beta_{c,i} CBI_{it} + \delta_C DEMOC_{it} + \mathbf{X}'_{i,t-1}\boldsymbol{\Gamma_C} + \mathbf{W}_t \alpha'_{c,i} + \upsilon_{it}$$

$$\upsilon_{it} = \mathbf{V}'_t \lambda_{c,i} + \xi_{it}$$

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Identification considerations

- Three potential sources of endogeneity
  - Absence of inflationary pressures could induce governments to confer independence to their central banks (reverse causality)
  - Societies with high degrees of inflation aversion may invest their central banks with greater independence in the belief that this can combat inflation (simultaneity bias)
  - Since inflation is multifaceted there is little guarantee that independence matters at the margin (unobserved heterogeneity)
- Implication: Clear endogeneity problem that has to be resolved for appropriate inference (Brumm 2011; Crowe & Meade 2008)

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Validity of the instrument

- **Relevance condition**
  - Positive significant correlation (ρ = 0.2, p = 0.00)
  - Further report first-stage regression and underidentification statistics
- **Exclusion restriction**
  - Unlike growth, little theoretical reason for any *direct* relationship between democracy and inflation
  - Volatility of alternation of parties in a democracy has "essentially zero effect on inflation" (Cukierman & Webb 1995, p. p. 411)
  - No clear relationship between political decentralization and inflation (Treisman 2000)
  - Correlation between democracy and inflation nonexistent ($\rho = -0.03, p = 0.06$)

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Threats to the exclusion restriction I

- There could be an *indirect* effect of democracy on inflation
  - Changes in partisan orientation of government could alter inflation outcomes
  - E.g. Left-leaning government may favor loose monetary policy but might be voted out by an inflation-averse electorate (or *vice versa* for right-leaning government)
  - Robustness check that includes democracy alongside an alternative index of partisanship, and using this expanded specification for the first stage

Threats to the exclusion restriction II

- Hyperinflation may strengthen inflation-independence link
  - Such partisan changes do not imply changes in the degree of democratic adherence (and is therefore uncorrelated with the error term)
  - Robustness checks that exclude interregna and high-inflation episodes

Threats to the exclusion restriction III

- Other unobserved channels could affect inflation other than via independence
  - Panel specification includes either fixed effects or multifactor error structure to absorb additional unobserved heterogeneity
  - Robustness check includes level of development as additional control in first stage (higher per capita incomes operate through wide range of channels)

Data and sources

- Cross-country macroeconomic indicators from standard sources
  - World Development Indicators
  - International Financial Statistics
  - World Bank Commodity Database
- Main dependent: CPI inflation
- Main independent: *De jure* central bank independence (Garriga 2016)
- Main instrument: Democracy index from Polity IV

Replicating the fixed effect benchmark

	(F1)	(F2)	(F3)	(F4)	(F5)	(F6)	(F7)	(F8)
Independence	-1.017	-0.818	-1.012	-0.793	-0.170	-0.054	-0.457	-0.432
	(0.280)***	(0.276)***	(0.215)***	(0.317)**	(0.456)	(0.436)	(0.136)***	(0.158)***
Democracy	0.040	0.042	0.043	0.043	0.086	0.080	0.023	0.020
	(0.016)**	(0.016)***	(0.015)**	(0.012)**	(0.026)***	(0.022)***	(0.012)**	(0.010)**
Independence × Democracy					-0.115	-0.100		
					(0.050)**	(0.050)**		
Lagged dep?	No	No	No	No	No	No	Yes	Yes
Controls?	No	Yes	No	Yes	No	No	No	Yes
Fixed effects:								
Time?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- Verify negative independence-inflation relationship, even after controlling for democracy
- When interacted, conditional effect of independence on inflation is likewise negative
- Dynamics via a lagged dependent do not alter qualitative conclusions

Addressing endogeneity with instrumental variables

	(I1)	(I2)	(I3)	(I4)	(I5)	(I6)
			Second stage			
Independence	3.831	9.597	3.831	9.597	4.304	10.867
	(1.185)***	(3.647)***	(1.505)**	(4.481)**	(3.261)	(11.032)
			First stage			
Democracy	0.008	0.004	0.008	0.004	0.008	0.004
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.004)**	(0.003)**
Lagged dep?	No	No	No	No	No	No
Controls?	No	Yes	No	Yes	No	Yes
Fixed effects:						
Time?	Yes	Yes	Yes	Yes	Yes	Yes
Country?	Yes	Yes	Yes	Yes	Yes	Yes

- Instrumenting with democracy leads to a *positive* independence-inflation relationship
- Effect is economically and frequently statistically significant
- Standard IV diagnostics are generally satisfied

Allowing for parameter heterogeneity with CCE

	(C1)	(C2)	(C3)	(C4)	(C5)	(C6)
Independence	0.300	0.404	1.074	3.821	73.458	1.756
	(0.196)	(0.200)**	(2.103)	(2.800)	(47.156)	(8.464)
Lagged dep?	No	No	Yes	Yes	Yes	Yes
Controls?	No	Yes	No	Yes	No	Yes
Goodness-of-fit	2.356	11.790	0.233	0.385	-0.246	-1.188
Estimation	CCE-MG	CCE-MG	DCCE-MG	DCCE-MG	DCCE-IV	DCCE-IV
Errors	Multifactor	Multifactor	Multifactor	Multifactor	Multifactor	Multifactor

- Coefficient on independence remains positive, but estimates are noisy
- Results underscore importance of capturing cross-country variations in independence effect

Robustness checks

1. Additional variables motivated by theory
   - Unemployment (à la Phillips Curve)
   - Interest rate (à la Taylor-type rule)
   - Public debt (à la fiscal theory of price level)
   - Global commodity prices
2. Alternative measures for key dependent/independent
   - Polity2 or Polcon instead of democracy
   - Unweighted instead of weighted CBI
   - GDP deflator or WPI instead of CPI
3. Sample restrictions
   - Exclude for years before/after interregna
   - Exclude high-inflation (> 50 percent) episodes
   - 5-year averages with system GMM
4. Additional instruments for first stage
   - Political constraints
   - Human capital proxy (enrollment rate)

Do high-income countries drive the *status quo* relationship?

	(S1)	(S2)	(S3)	(S4)	(S5)	(S6)	(S7)	(S8)
		High income				*Developing*		
Independence	-0.195	-0.982	-12.335	-1.078	5.671	24.197	2.691	0.078
	(0.138)	(3.001)	(26.121)	(0.208)***	(2.563)**	(76.994)	(1.258)**	(17.812)
Democracy	-0.004			0.045				
	(0.016)			(0.013)**				
Lagged dep?	No	No	No	No	No	No	No	No
Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects:								
Time?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Subsample	HIC	HIC	OECD	DEV	DEV	UMC	LMC	LIC

- Coefficient on independence reverts to negative for high-income subsample
- Effect remains positive for developing economies, but diminish with falling income level
- No evidence of U-shaped inflation-independence relationship

Breaking down central bank independence

	(D1) *CEO*	(D2) *Obj.*	(D3) *Policy*	(D4) *Lend.*
Independence	9.539	8.764	-78.189	7.355
	(3.582)**	(4.227)**	(287.147)	(3.265)**

- Positive and significant effect operates on the CEO, objective, and lending (but not policy) channels
- Granting central banker the legal authority to define, formulate, and execute monetary policy is key
- But policy currently receives the lowest weight (0.15) in aggregates of central bank independence

Candidate transmission channels

- Consider three candidate channels
  1. Tinbergen rule violations due to multiple targets (*substitute* inflation with growth rate)
  2. Independence in opaque environment enables deviation from inflation objective (*interact* with transparency)
  3. Gap between *de jure* and *de facto* independence (*interact* with turnover)

Political economy channel most likely

	(C1)	(C2)	(C3)	(C4)	(C5)	(C6)
	Mult. obj.		*Pol. econ.*		*Op. indep.*	
Independence	5.294	3.908	0.683	2.668	-175.653	-41.009
	(4.481)	(4.008)	(3.144)	(3.091)	(18274.573)	(602.154)
Transparency	-0.004		0.518	0.579		
	(0.016)		(0.207)**	(0.165)***		
Transparency × independence			-0.815	-0.950		
			(0.304)**	(0.247)***		
Turnover					166.433	17.280
					(17,122.588)	(235.925)
Turnover × independence					-373.002	-38.698
					(38,400.483)	(530.856)

- Conditional on transparency, independence effect on inflation is negative
- No statistically significant effect for multiple objective or operational independence channels
- Consistent with political dynamics shaping central bank behavior

Independence and the variability of inflation

	(V1)	(V2)	(V3)	(V4)	(V5)	(V6)
Independence	1.679	1.508	-15.672	-8.754	0.997	-9.183
	(0.705)**	(0.731)**	(11.154)	(4.712)*	(3.596)	(5.515)*
Democracy	-0.097	-0.103				
	(0.031)***	(0.037)***				

- Collapse panel into cross section and examine volatility of inflation over period
- Weak evidence that greater independence *reduces* inflation volatility (negative relationship)

Takeaways

- In contrast to existing literature, central bank independence exerts a *positive* effect on inflation when endogeneity and heterogeneity is accounted for
- Effects are driven by developing countries, operate via policy, and are conditional on transparency
- Implication: Political economy matters! Granting independence to monetary authorities in settings where overall institutional governance is weak may yield counterproductive outcomes

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