

# Inflation Targeting: Vaccine or Placebo?

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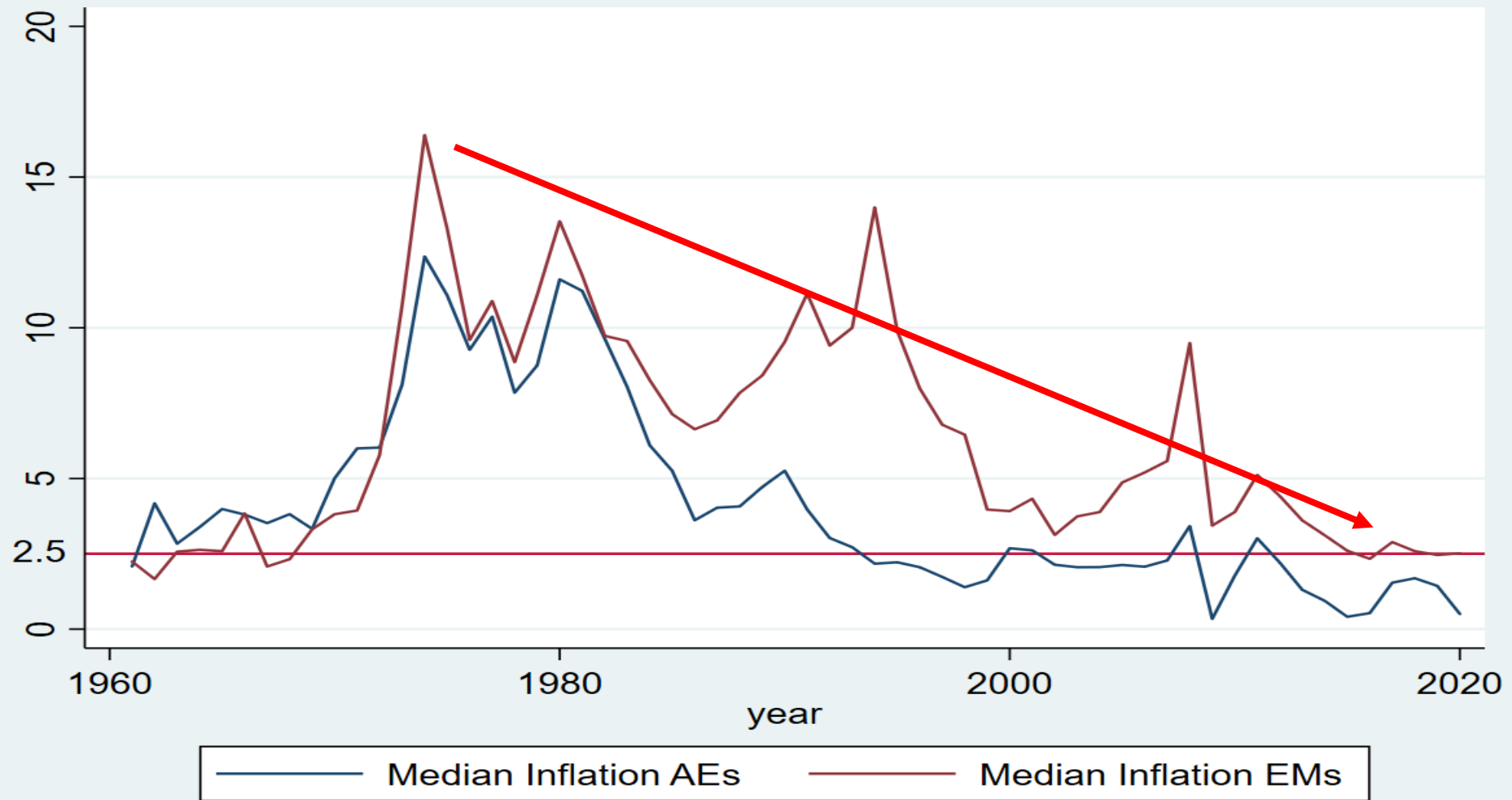
*We are grateful to Sriram Balasubramanian for his work with us at the initial phase of this project.*

# Bhalla, Bhasin, Loungani: Triptych



- 1) Inflation Targeting (IT): Vaccine or Placebo?
  - Today's seminar at EGROW
- 2) Inflation Targeting in India: Benefits and Costs
  - ORF webinar by Surjit Bhalla, March 2021, with Ila Patnaik as discussant
- 3) Understanding the Great Inflation Moderation
  - IEO webinar by Surjit Bhalla, with Paul Krugman, Larry Ball, Sonali Das as panelists

Until the recent upsurge, inflation had been declining in advanced economies (AEs) and emerging market economies (EMs)



## Two broad classes of explanations for the decline

- Central bankers claim credit (“better monetary management”)
  - Spread of best practices, particularly inflation targeting (IT)
  - Anchored expectations, in part due to spread of IT
  - Fewer policy mistakes

- Structural factors may also be at play
  - Demographics
  - Globalization (Rogoff, 2003)
    - Unlimited supplies of skilled labor (Bhalla)
    - Unfettered mobility of capital (Loungani)

### **Take-aways from our triptych:**

- 1) If you ‘follow the science,’ it’s difficult to make the case that *formal adoption* of IT is responsible for decline in inflation.
- 2) The structural view offers a convincing narrative for the decline in inflation

# Formal Adoption of IT: Vaccine or Placebo

# Formal Adoption of Inflation Targeting

Many countries had declines in inflation after adopting IT (indicated in red below)

1989-1999 (11 adopters; all saw decline in 3-year average inflation post-IT)

- New Zealand, Canada, UK, Australia, Sweden, Czech Republic, Israel, Poland, Brazil, Chile, Colombia

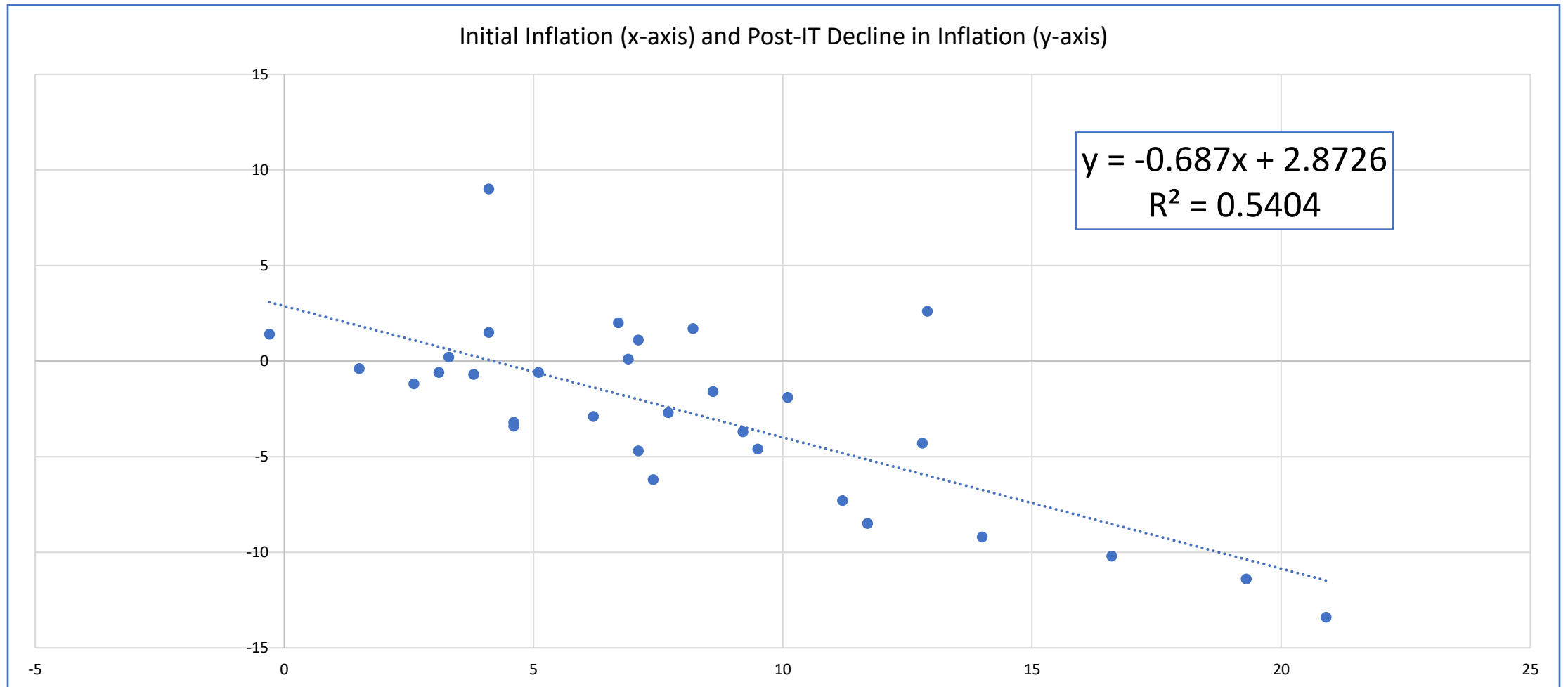
2000-2009 (15 adopters; 60% of countries saw decline)

- S. Africa, Thailand, Iceland, Mexico, Norway, Peru, Philippines, Guatemala, Indonesia, Romania, Armenia, Turkey, Ghana, Georgia, Serbia

2010-2019 (7; 30% of countries saw decline)

- U.S., Japan, Russia, Kazakhstan, Ukraine, Argentina, India
- Plus: ECB is generally regarded as an inflation targeter (2% inflation target)

# Countries with higher inflation rates at time of IT adoption saw larger declines in inflation rates post-adoption



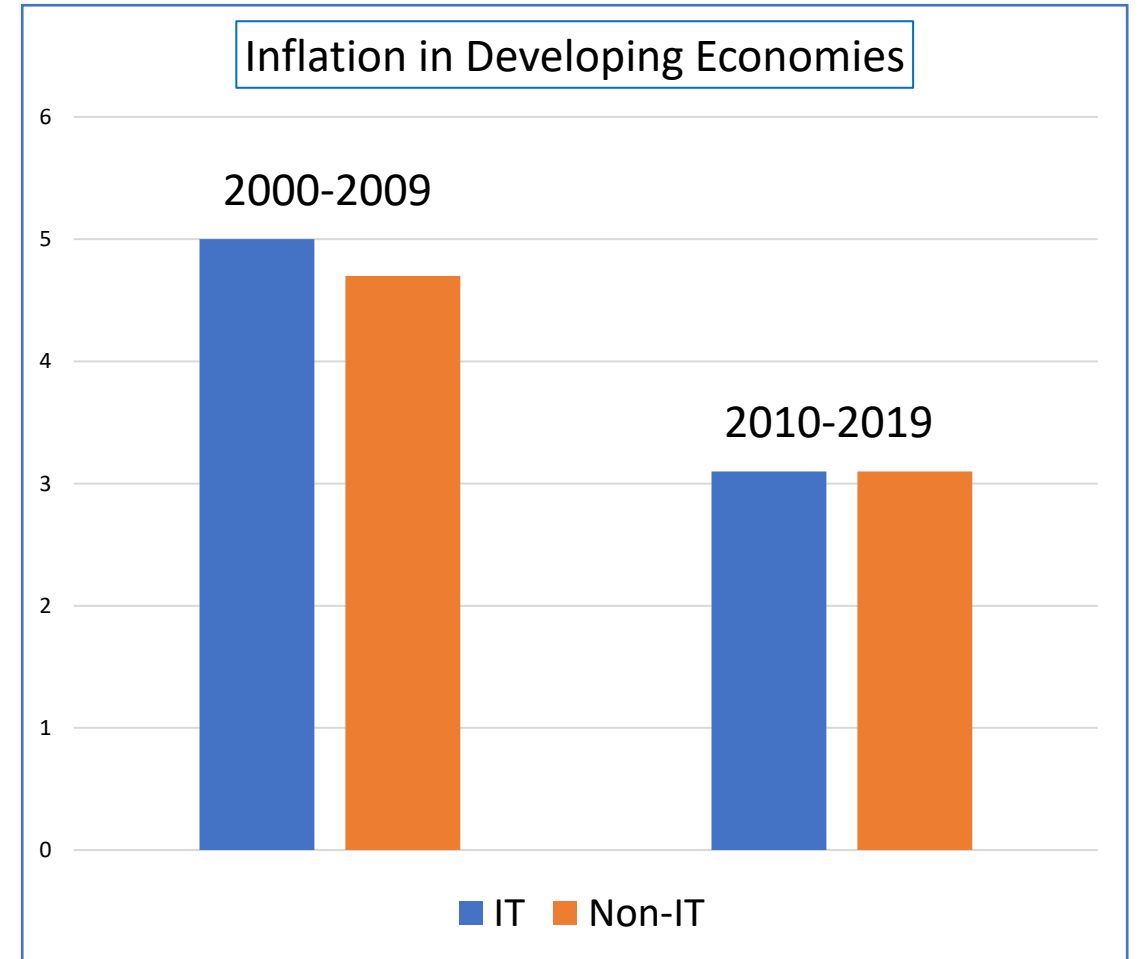
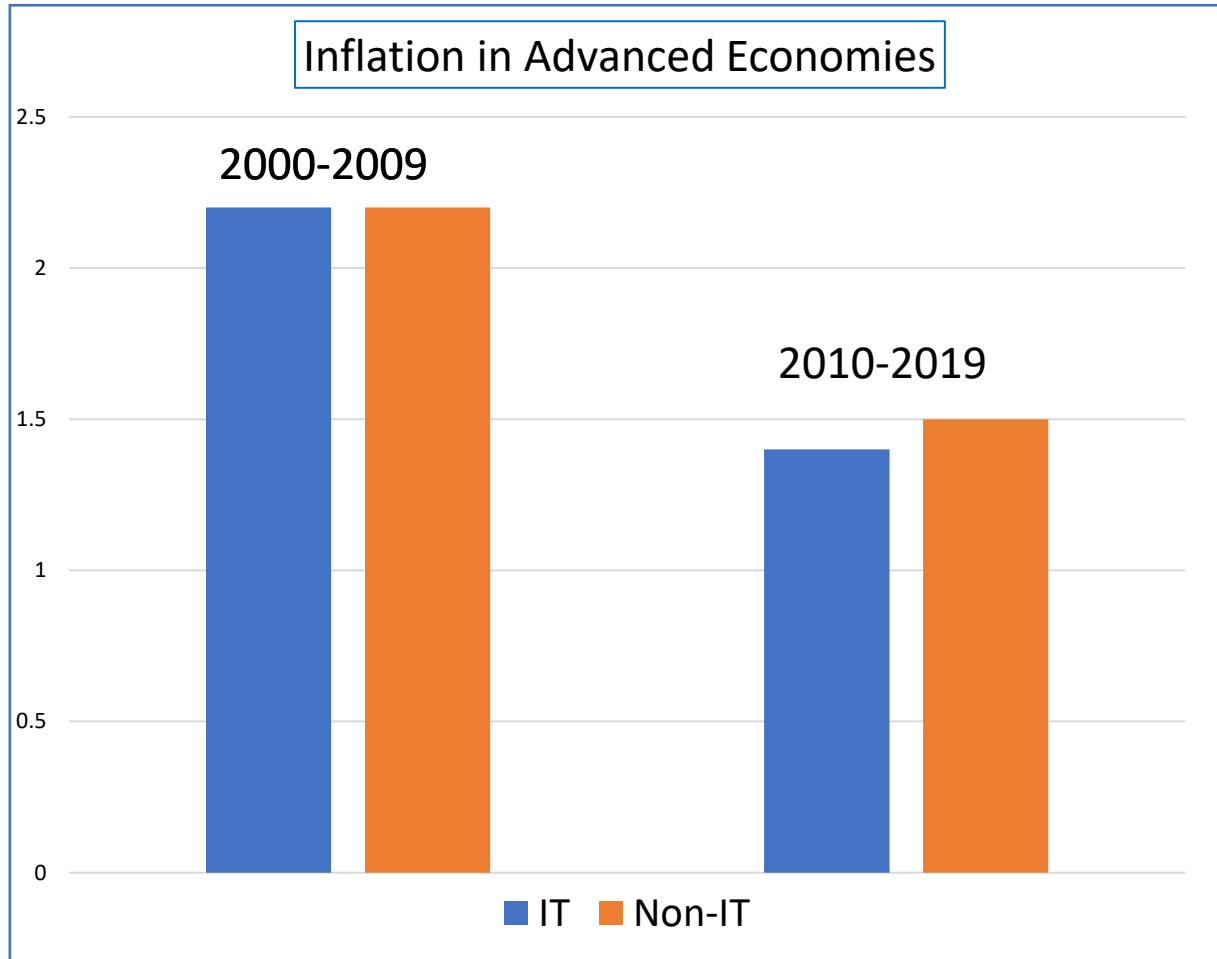
# IT-Adopters vs. Others: Summary Statistics



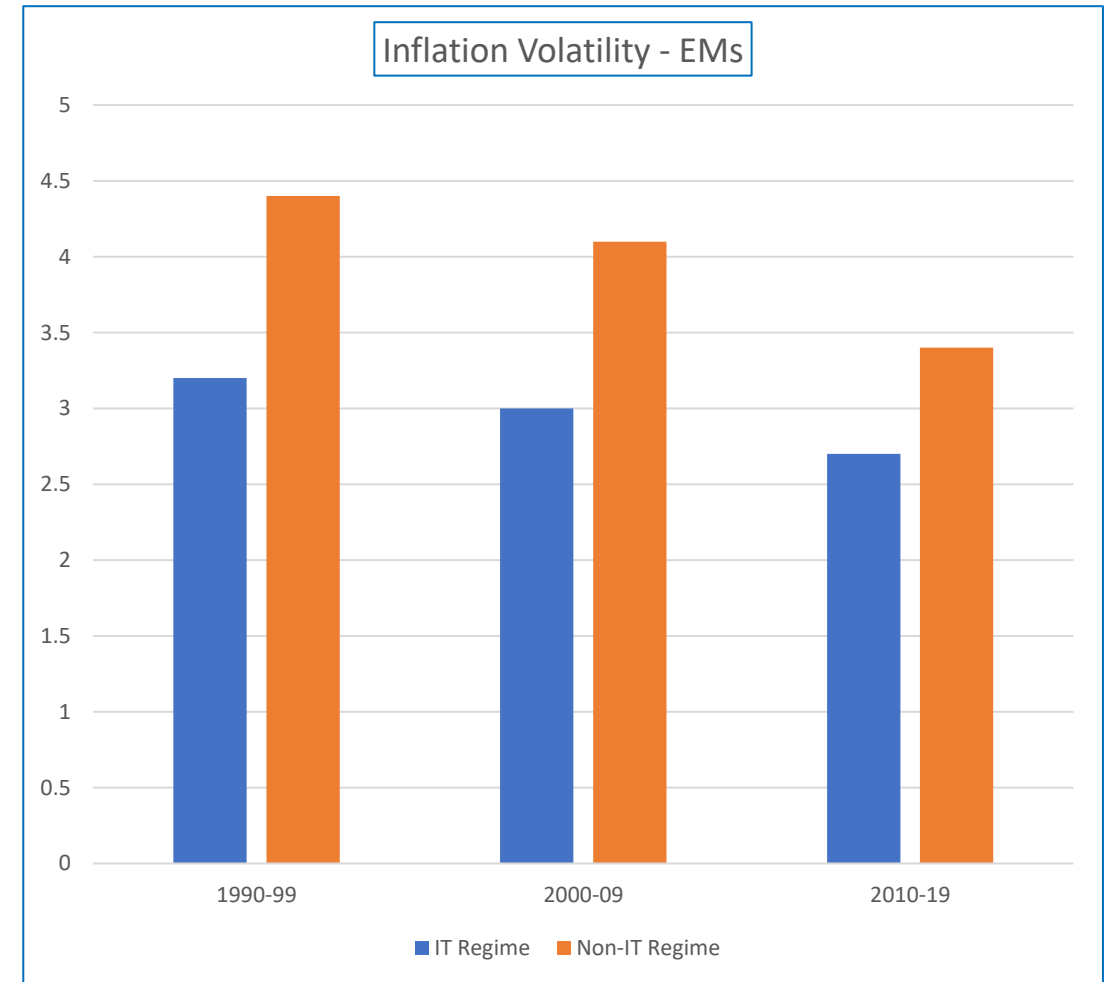
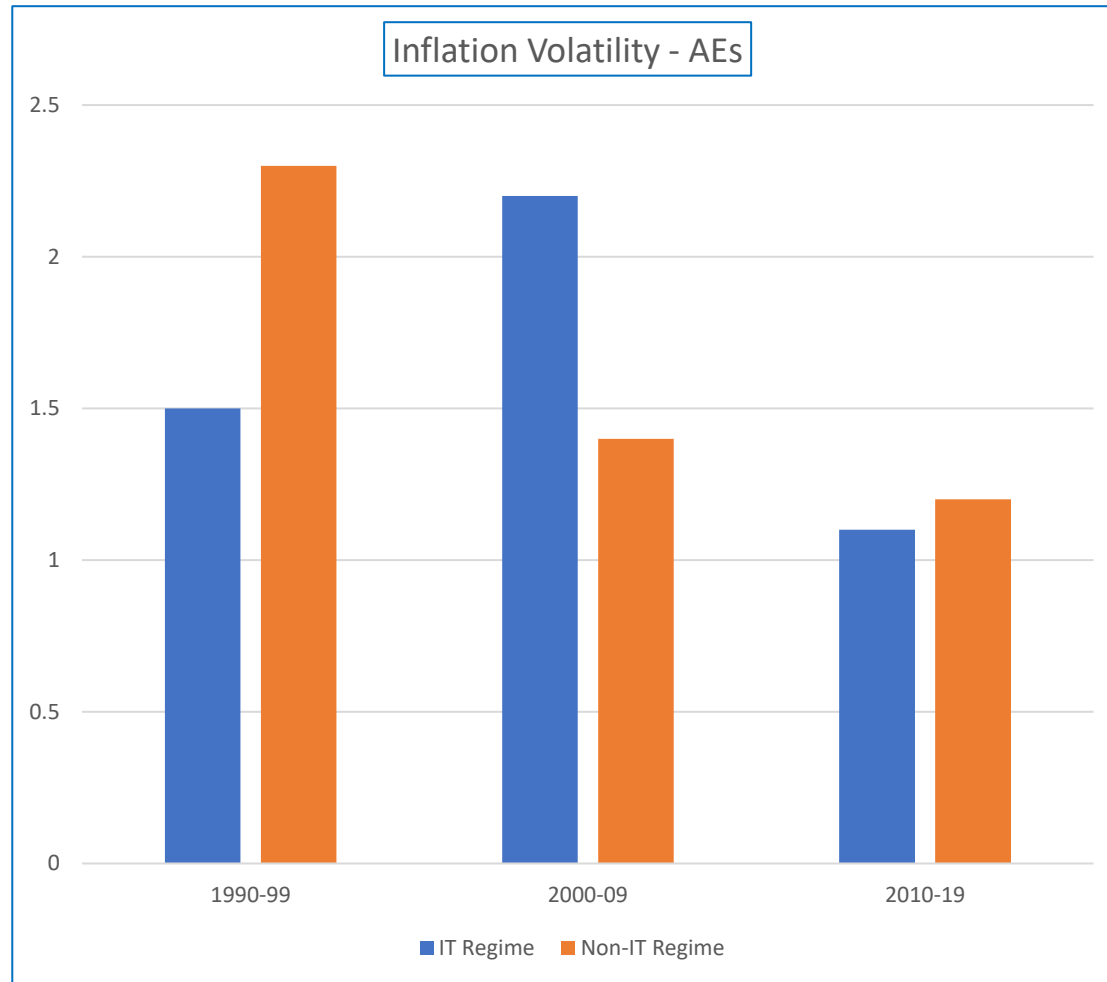
- No difference between median inflation between the two groups
- Small differences in inflation volatility
- No difference in inflation expectations
- No significant difference in anchoring of inflation expectations



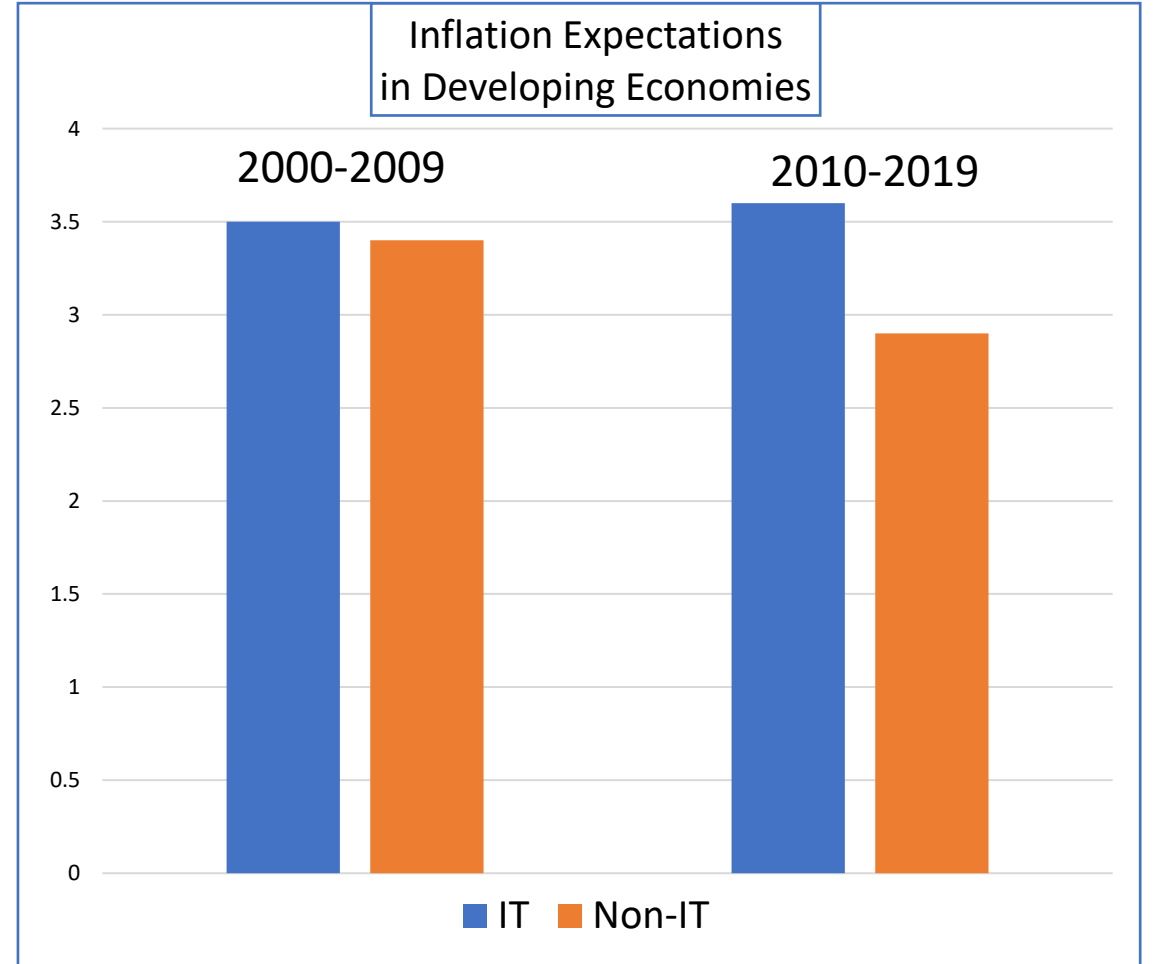
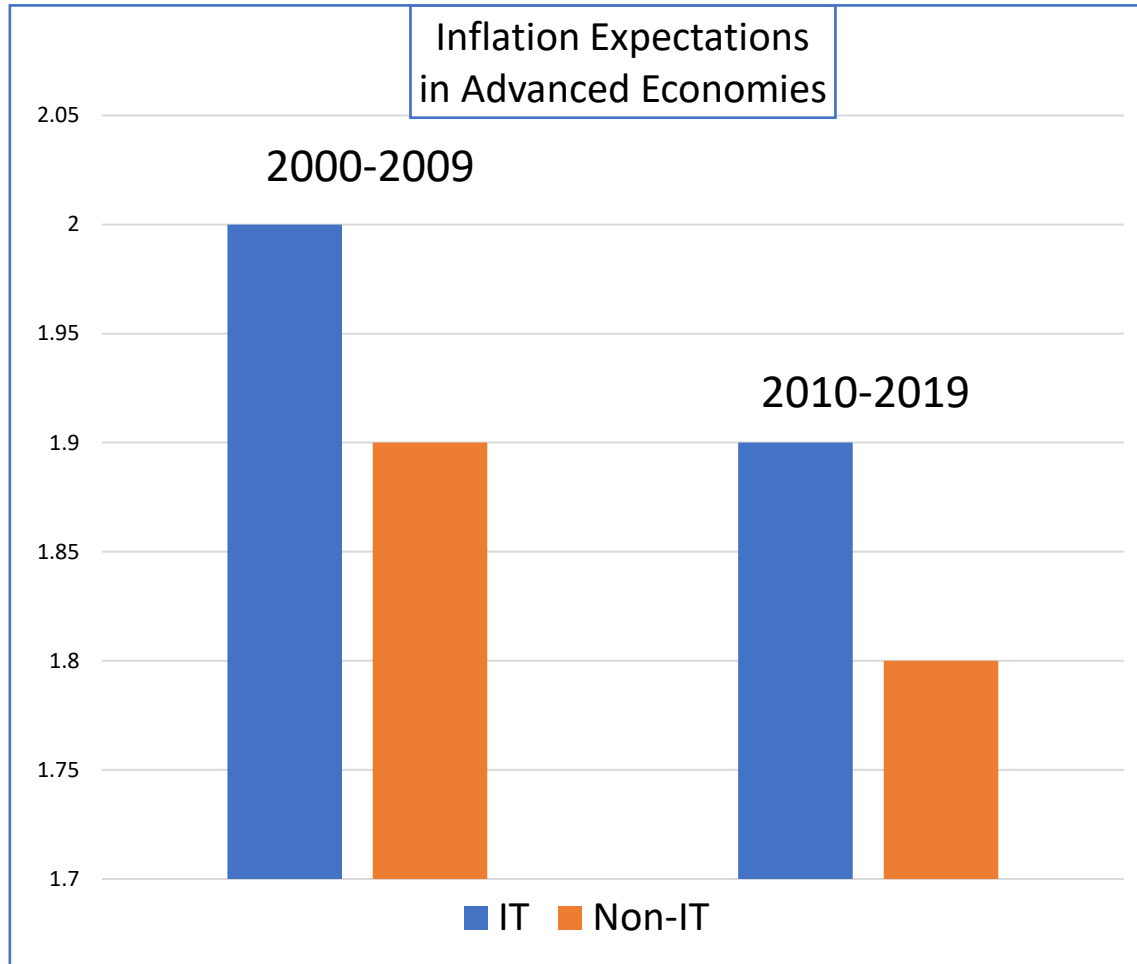
# Similar inflation developments in IT and non-IT countries



# Inflation Volatility – somewhat higher in non-IT EMs



# Similar inflation expectations in IT and non-IT countries



# Test for Anchoring of Inflation Expectations

- Levin, Natalucci & Piger (2004) and Choi et al (2018) use the following test for ‘anchoring’ of inflation expectations.

$$\Delta\pi_{j,t+n}^e = \alpha + \theta_j + \delta_t + \beta_1 \pi \textit{ Surprise} + \beta_2 \textit{ Median } \pi + \varepsilon_t$$

- $\Delta\pi_{j,t+n}^e$  is change in inflation expectations for time  $t + n$  at time  $t$  for country  $j$ . We try  $n = 3, 5, 10$  (i.e., change in 3-year ahead inflation expectations, etc.)
- Inflation Surprise ( $\pi \textit{ Surprise}$ ) is the deviation in current inflation from the 3-period moving average.
- **Test of anchoring:  $\beta_1 = 0$ .** Inflation blips don’t change inflation expectations.
- By this test, we find expectations to be anchored for both IT and non-IT countries.
- There is some evidence for better anchoring of inflation expectations in high-inflation EMs.

# Anchoring of Inflation Expectations

	Advanced Economies		Emerging Economies	
	IT	Non-IT	IT	Non-IT
Inflation Surprise	<b>0.00</b> <b>(0.01)</b>	<b>0.00</b> <b>(0.00)</b>	<b>0.11</b> <b>(0.07)</b>	<b>0.00</b> <b>(0.00)</b>
Median CPI Inflation	0.054 (0.03)	0.12*** (0.02)	0.05 (0.04)	0.06* (0.02)
Constant	-0.12 (0.05)	-0.33*** (0.04)	-0.33 (0.14)	-0.35* (0.11)
R-Squared	0.033	0.089	0.13	0.02

\* p<0.05, \*\* p<0.01, \*\*\*p<0.001

Inflation Surprise is defined as the deviation in current inflation from the 3-period moving average.

The dependent variable is the change in inflation expectations for time t + 3 at time t. Similar results hold for 5-year ahead and 10-year ahead inflation expectations.

# Anchoring of Inflation Expectations in High Inflation EMs

	3 Year Ahead Inflation Expectations		5 Year Ahead Inflation Expectations	
	IT	Non-IT	IT	Non-IT
Inflation Surprise	<b>0.03</b> <b>(0.02)</b>	<b>0.11</b> <b>(0.07)</b>	<b>0.01</b> <b>(0.02)</b>	<b>0.10</b> <b>(0.07)</b>
Median CPI Inflation	0.03 (0.02)	0.02 (0.43)	0.03* (0.01)	-0.42 (0.65)
Constant	-0.08 (0.06)	1.26 (1.68)	-0.15** (0.04)	4.03 (2.55)
R-Squared	0.01	0.00	0.01	0.00

\* p<0.05, \*\* p<0.01, \*\*\*p<0.001

Inflation Surprise is defined as the deviation in current inflation from the 3-period moving average.

The dependent variable is the change in inflation expectations for time  $t + n$  at time  $t$ .

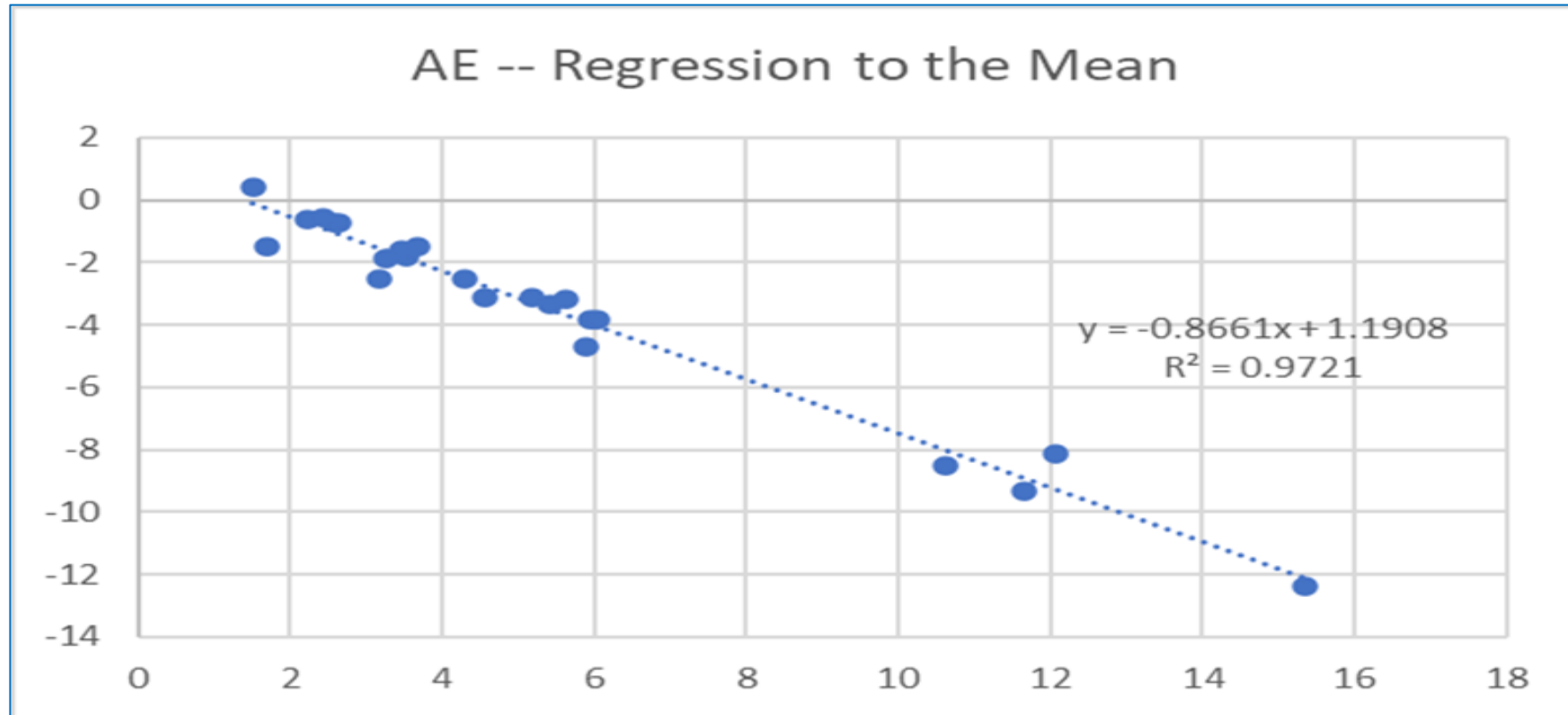
# IT Adoption and Inflation: Regression to the Mean

- Ball & Sheridan (2003) suggested that ‘regression to the mean’ rather than IT adoption explained inflation decline in advanced economies.
- Ball & Sheridan analogy: suppose a batsman is going through a bad patch and is advised to sleep with the cricket ball next to him. His form recovers (regression to the mean), and he attributes this to the ‘good advice’ to sleep with the ball next to him.



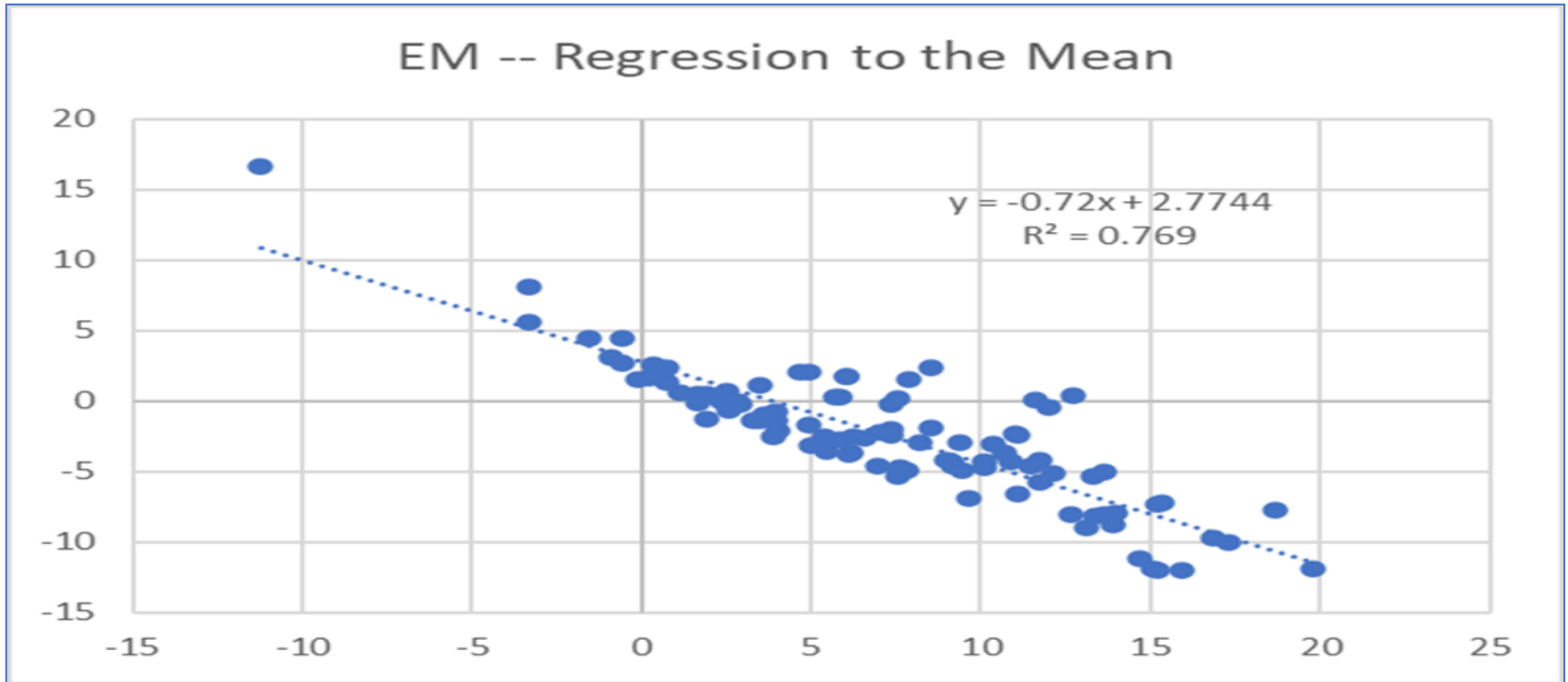
# Advanced Economies: Regression to the Mean

- There is a strong inverse relationship between the initial inflation rate (x-axis) and the change in the inflation rate over a subsequent period (y-axis)
- Countries with high initial levels of inflation typically do better in subsequent period than those with low initial levels of inflation





# Emerging Markets: Regression to the Mean



## IT Adoption and Inflation: Regression to the Mean

- Difference in differences (DID) specification to control for regression to the mean:

$$\pi_{\text{post}} - \pi_{\text{pre}} = \alpha_0 + a_1 D + a_2 \pi_{\text{pre}}$$

- $\pi_{\text{post}}$  = inflation in post-targeting period
- $\pi_{\text{pre}}$  = inflation in pre-targeting period
- $D = (0,1)$  dummy; 1 for IT-adopters, 0 for non-adopters
- How does the inclusion of  $\pi_{\text{pre}}$  affect the estimate of  $a_1$  (impact of inflation targeting)?

# Inflation: Regression to the Mean

	Change in Inflation			
	Advanced Economies	Advanced Economies	EMs	EMs
IT Dummy	<b>-1.02</b> <b>(1.30)</b>	<b>0.00</b> <b>(0.27)</b>	<b>-4.75***</b> <b>(1.28)</b>	<b>-0.78</b> <b>(0.79)</b>
Initial Inflation		-0.87*** (0.04)		-0.70*** (0.05)
Constant	-3.04** (0.97)	1.19*** (0.23)	-1.74*** (0.45)	2.76*** (0.41)
R-Square	0.03	0.97	0.12	0.77
No. of countries	23	23	101	101
p<0.05, ** p<0.01,***p<0.001				

# Growth: Regression to the Mean

	Change in Growth			
	AE	AE	EM	EM
IT Dummy	0.79 (0.61)	0.49 (0.41)	-0.48 (0.91)	0.01 (0.43)
Initial Growth		-0.80** (0.22)		-1.01*** (0.05)
Constant	-0.88* (0.33)	1.44* (0.52)	0.17 (0.61)	4.09*** (0.31)
R-Square	0.08	0.51	0.00	0.86
Number of countries	23	23	95	95

p<0.05, \*\* p<0.01,\*\*\*p<0.001

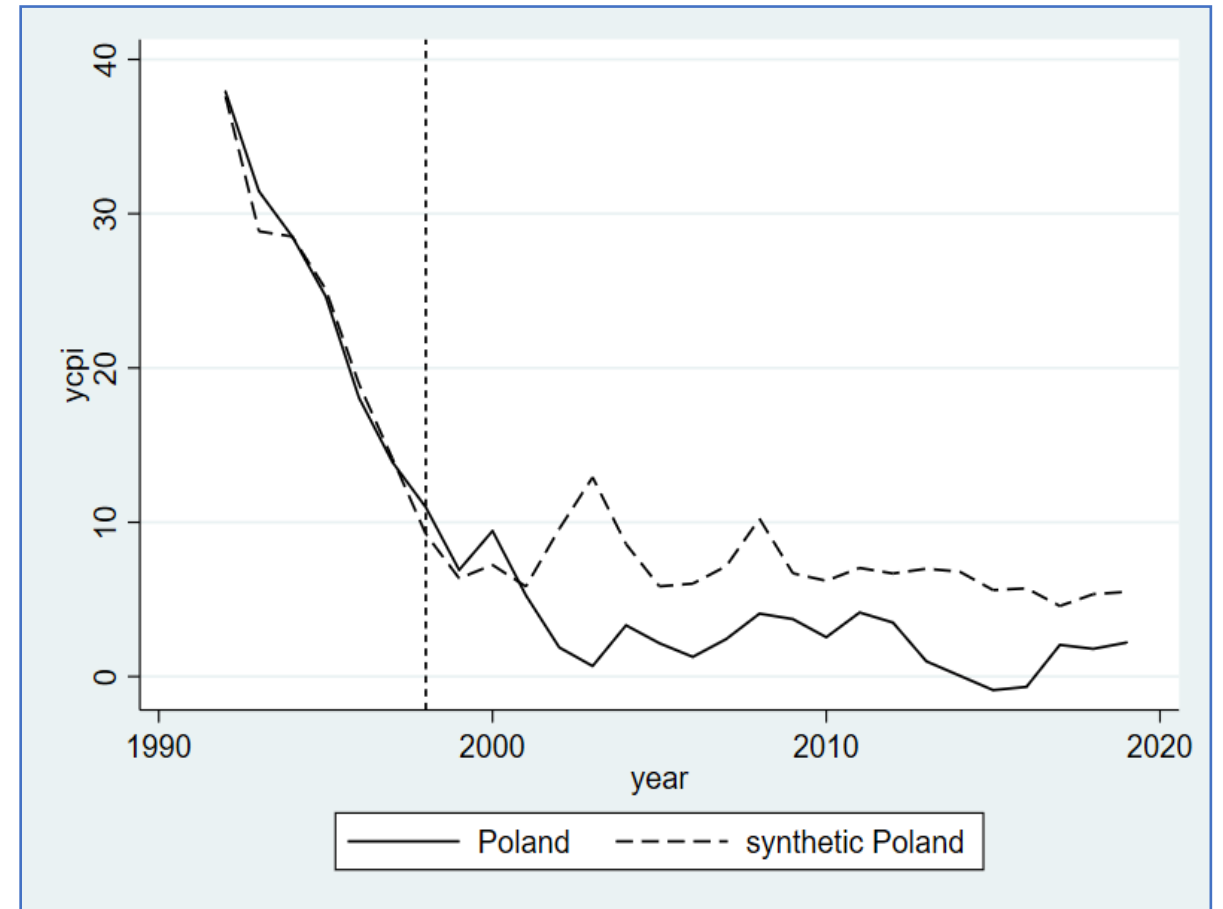
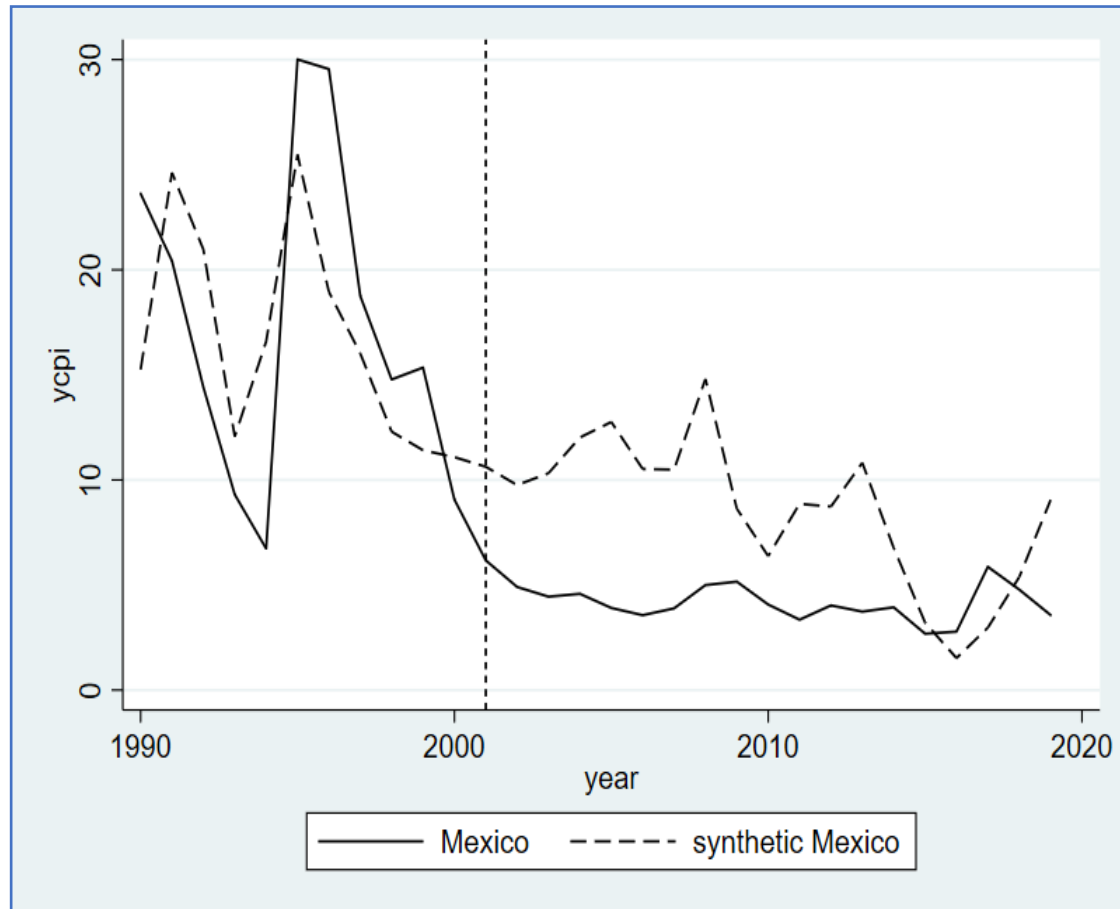
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# Synthetic Control Method (SCM)

- Another difference in differences (DID) estimation, done country by country
- ‘Treatment’ group: a country that adopted inflation targeting
- ‘Synthetic’ control: a weighted average of countries that had inflation outcomes similar to a country in the treatment group.
- Compare the difference in outcomes between the country in the treatment group and that of its synthetic cohort after the treatment (i.e. after adoption of inflation targeting).

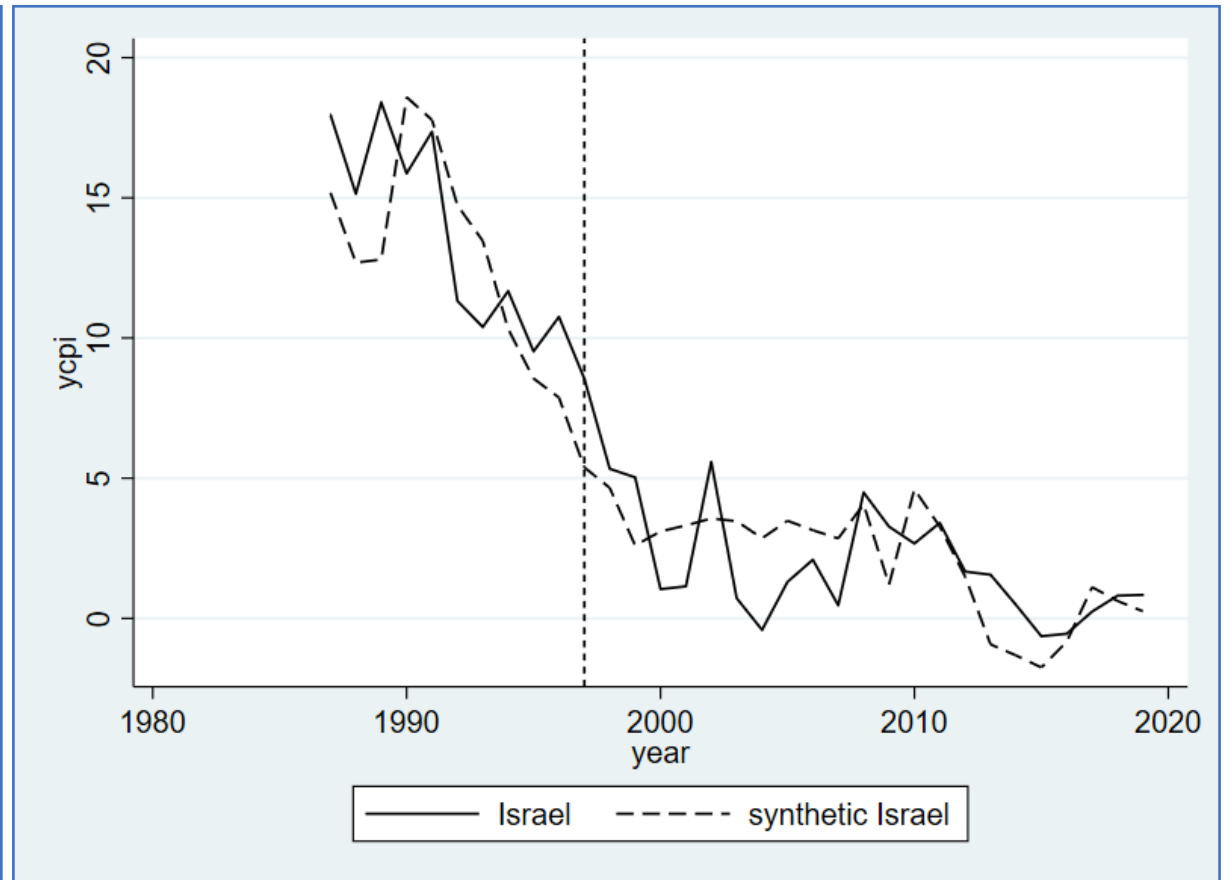
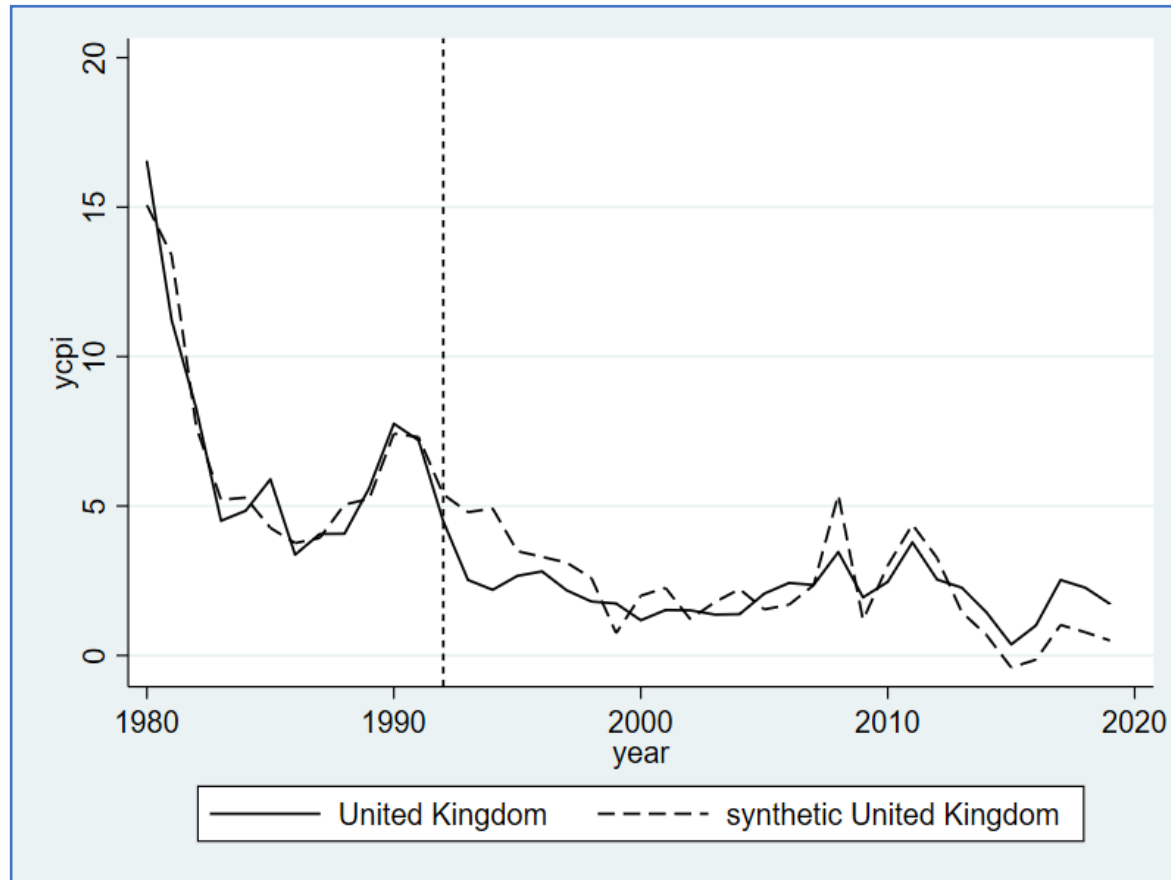
# SCM: some successful cases

Charts compare the evolution of inflation in a country relative to that in its synthetic control. The vertical line shows the year of adoption of inflation targeting

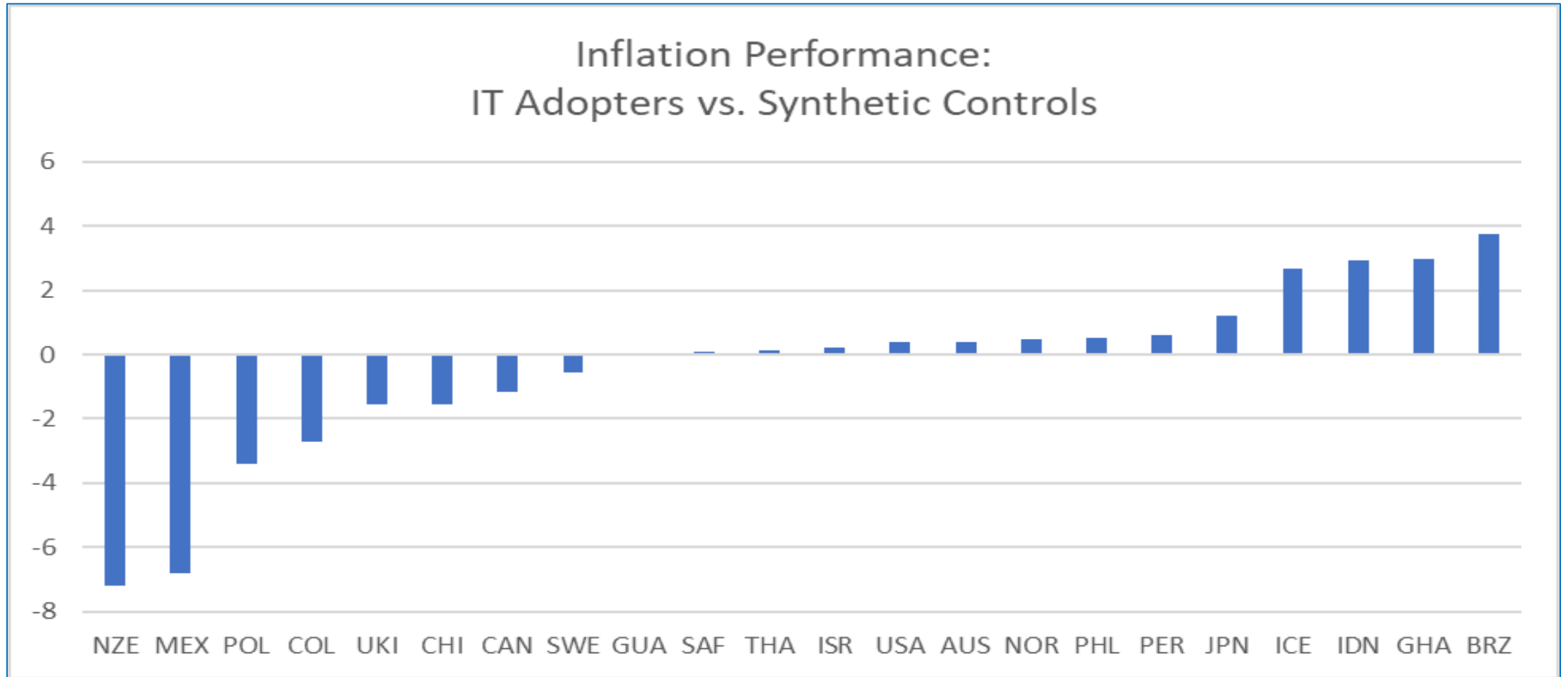


# SCM: 'no impact' cases

Charts compare the evolution of inflation in a country relative to that in its synthetic control. The vertical line shows the year of adoption of inflation targeting

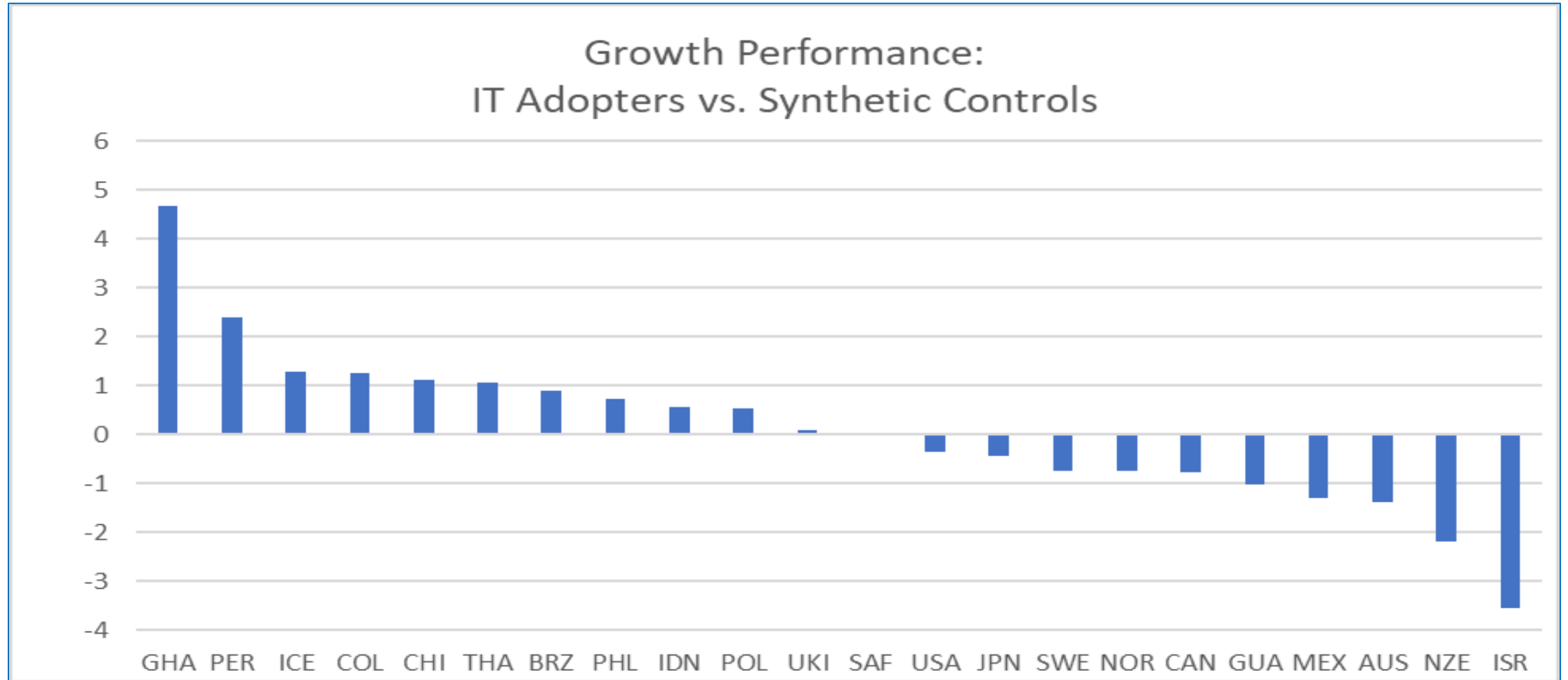


# Differences in Inflation Performance



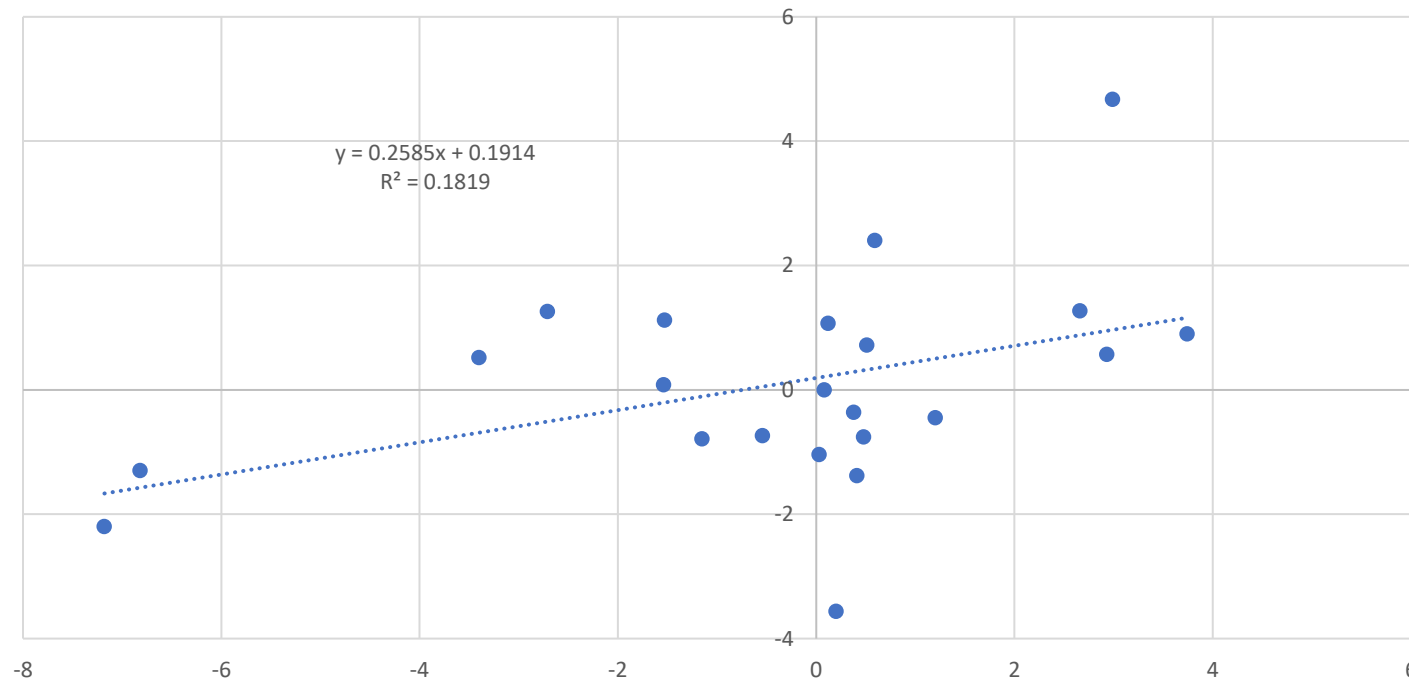


# Differences in Growth Performance



# Inflation vs. Growth Outcomes in IT Adopters

- Countries with better inflation outcomes than their synthetic cohort tended to somewhat worse growth outcomes
- There is a modest correlation between inflation outcomes after IT adoption (x-axis) and growth outcomes after IT adoption (y-axis)



# Conclusions & Implications

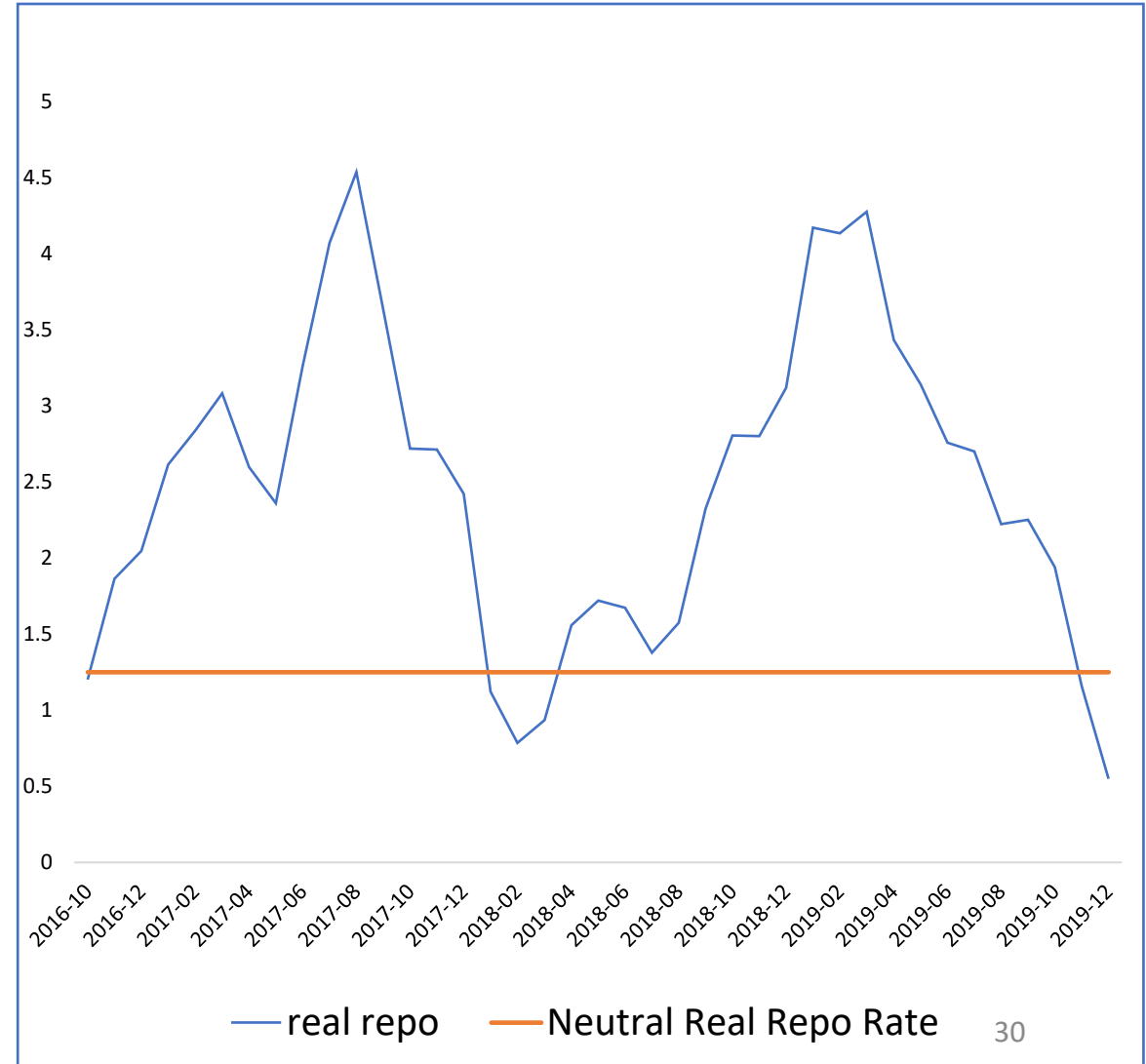
- Inflation moderation has been a near universal phenomenon over the last few decades. Two broad classes of explanations (not mutually exclusive):
  - Improved monetary management. Spread of inflation targeting (IT)
  - Structural (non-monetary) factors
- Our evidence: Formal adoption of IT is neither necessary nor sufficient for improved inflation or growth outcomes.
- Does our evidence rule out a role for improved monetary management? Not necessarily. Both IT-adopting and non-adopting central banks could have improved their management.
  - But if that is case, why does the central banking & IFI community advocate adoption of IT?
- Implications of our triptych:
  - ‘Follow the science’: claims about benefits of IT adoption should be established rather than asserted—IT might be placebo, not vaccine. And there can be costs to the adoption of IT.
  - Structural (non-monetary) factors can explain the decline in inflation and deserve serious consideration.

Thank you

# A Quick Glimpse of Other Papers in the Triptych

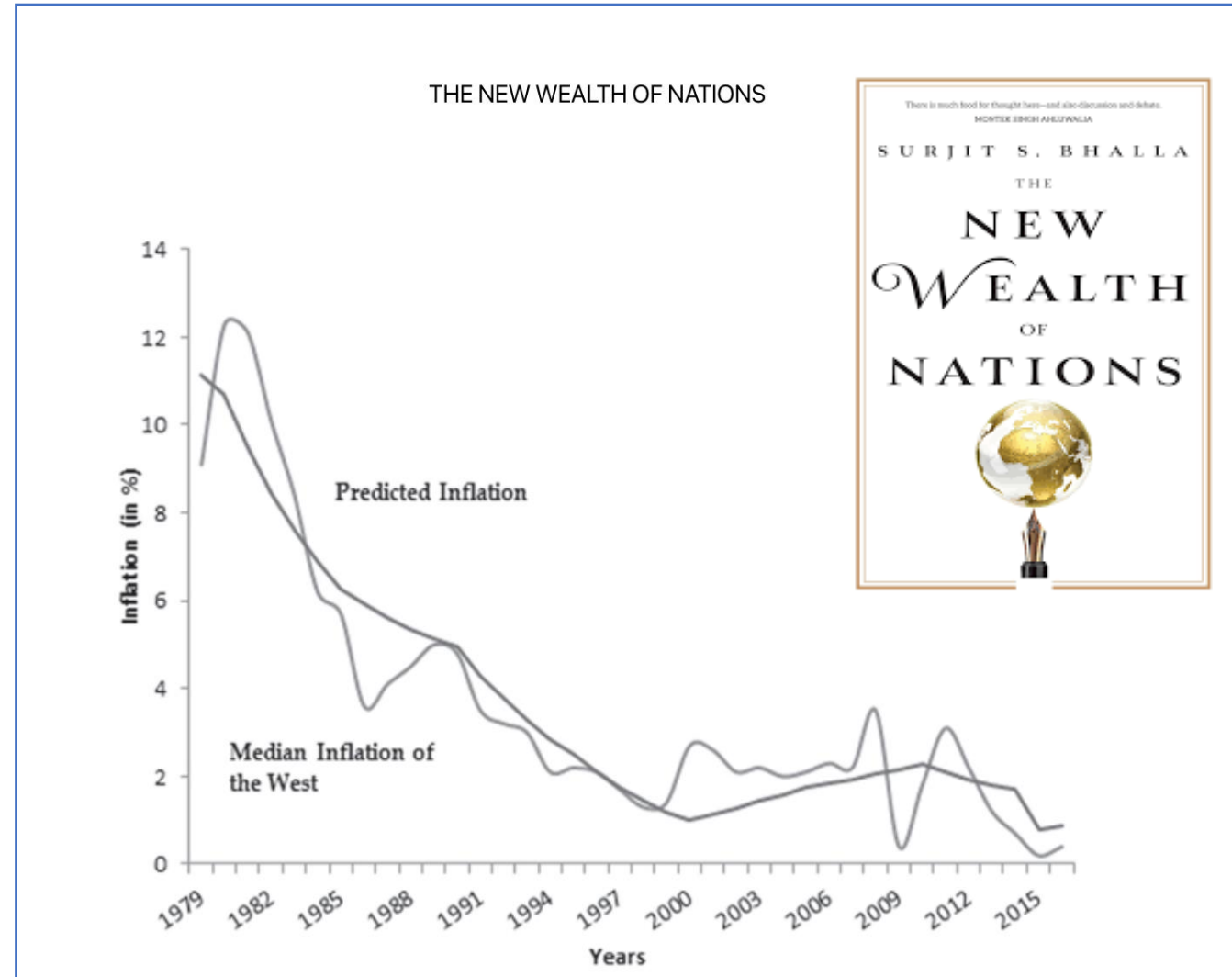
# Policy Mistakes?

- Single-minded attention to inflation can sometimes prove costly (Krugman, 2015, “rate hike fever”)
  - Greenspan’s Feb. 1995 rate hike based on concerns about inflation
  - ECB hiked rates in July 2008 worried about impact of oil prices on inflation
  - ECB hiked rates 50 basis points in July 2011
    - Roubini, 2011: ECB’s “biggest mistake ever, the rate hike that sharply worsened the Euro Zone crisis”
  - Swedish central bank raised rates in 2010, with unemployment still at 9% (Svensson, 2011)
- India: real policy interest rates in 2016-19 almost always higher than RBI’s ‘neutral’ real policy rate



# Unlimited Supply of ‘Skilled’ Labor

- Steady expansion of college-educated workers in developing world (the “Rest”)
- These workers have displaced those with less than a high school education in advanced economies (the “West”) and are now starting to threaten jobs of those with higher skills
- Consequence is low wage growth in advanced economies and low inflation
- The narrowing gap in skilled labor supplies between the Rest and the West can account for the decline in median inflation in the West



# Growth in College Premiums Declining in the 'West'

## Growth in College Premium in the US

