Macroeconomics in Action:

How Theory Is Affecting Policy

V. V. Chari

University of Minnesota
and
Federal Reserve Bank of Minneapolis

Academe and Policy: Engineering versus Architecture

- Day to Day Policy Advice: Engineering
  - Essential in getting things done
  - Relatively unimportant in long-run

- Designing Institutions: Architecture
  - Useless in short-run
  - Remote, abstract, model-based
  - Essential in long-run

Main Arguments Today

- Much progress in architecture
- Not a great deal in engineering
- Other countries have reformed institutions
- U.S. institutions somewhat better but not much better
- Need to improve U.S. institutions

Developments in Macroeconomic Theory

- Lucas Critique
- Kydland-Prescott Critique
- Quantitative Business Cycle Modeling

Lucas Critique

- Private behavior depends on beliefs about how future policies will be set as the state of the economy changes
- Must think about policy as a rule describing how policy will be set as state of the economy changes
- Must think about policy as comparison between alternative rules
- Must get away from “What do we do right now”

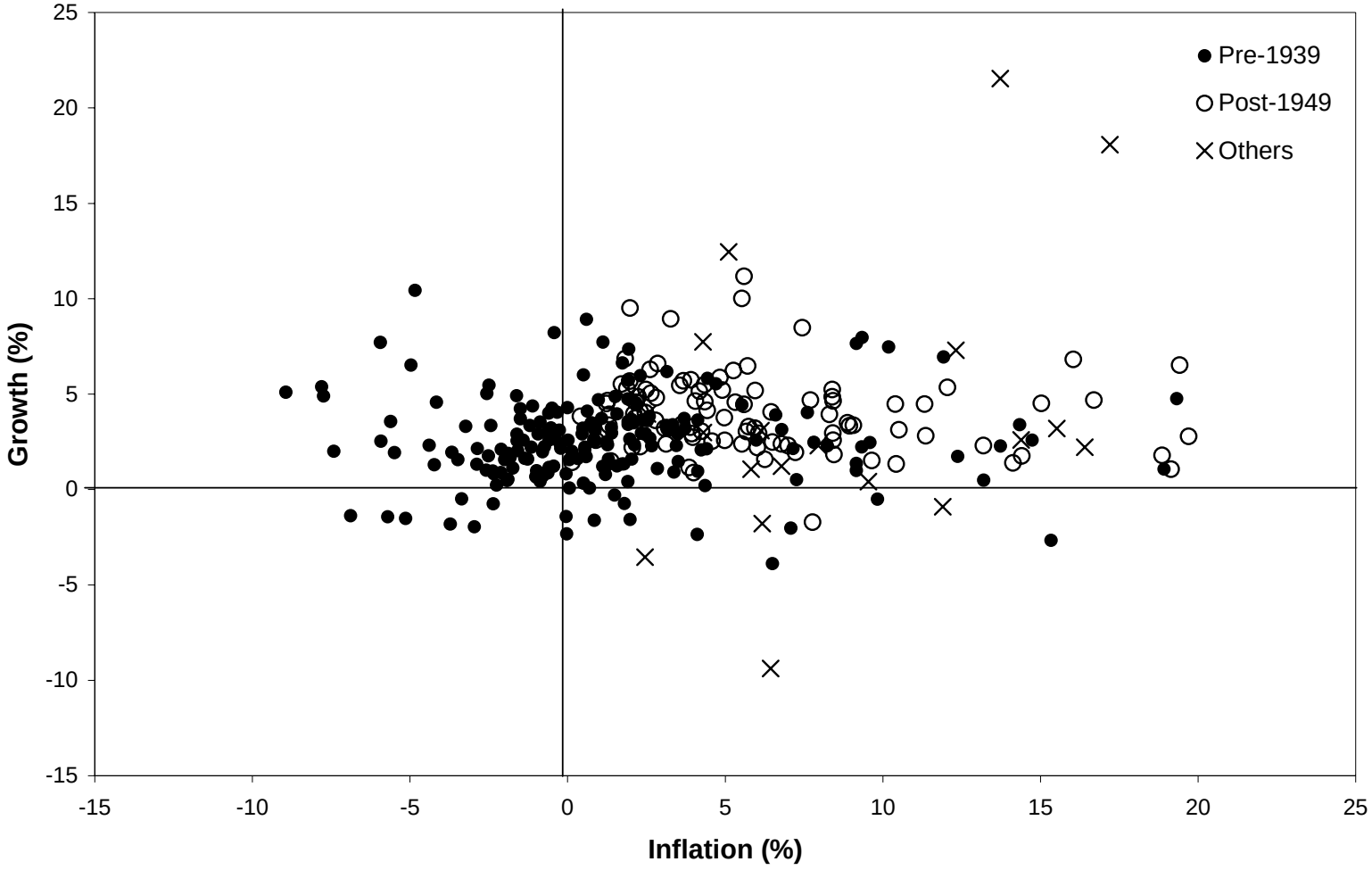
Kydland-Prescott Critique

- Policy rules set under commitment better than choosing policies in a discretionary manner
- Must design institutions which make rules difficult to change
- "What should we do now" terrible way to make policy

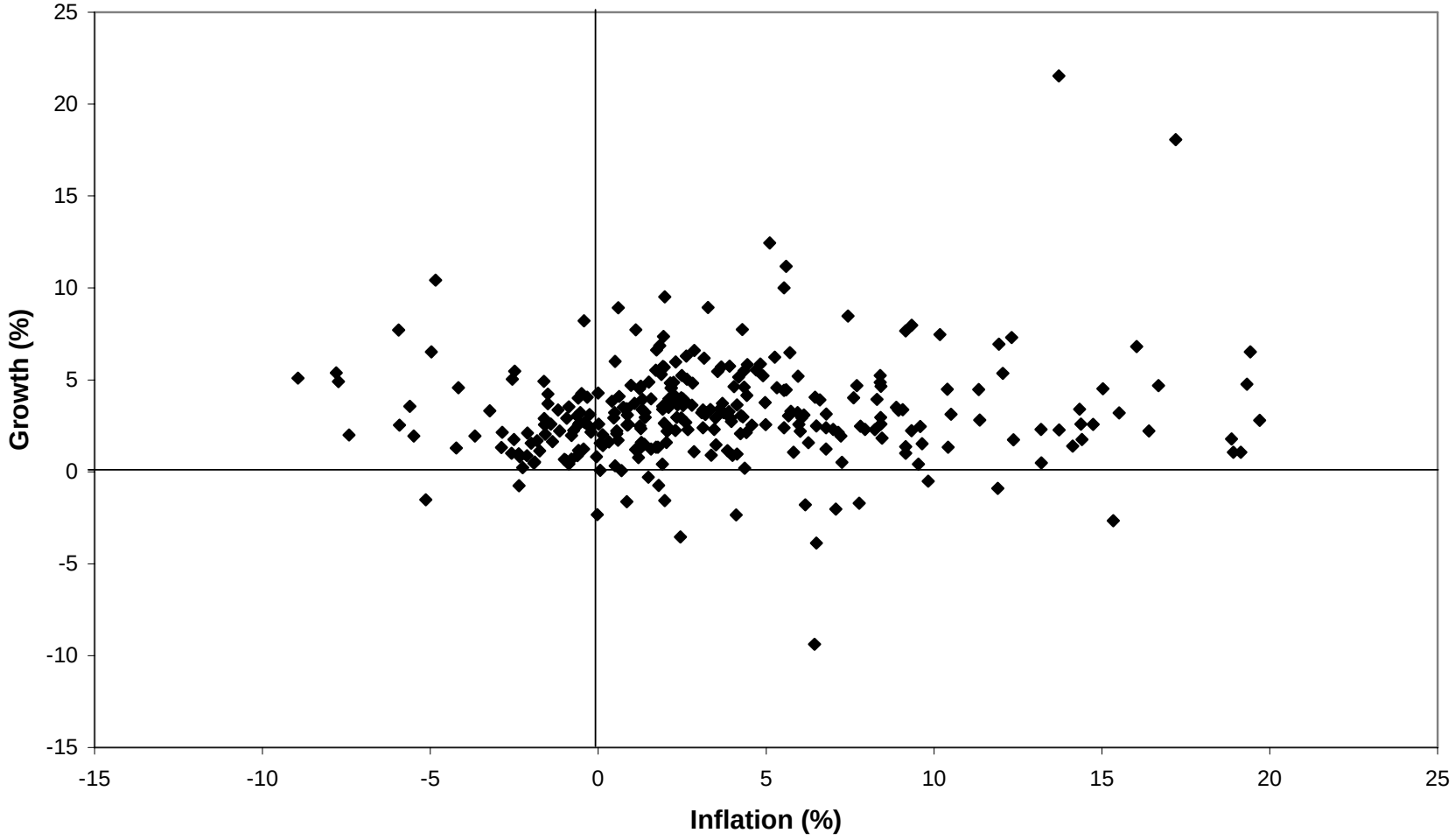
Implications for Monetary Policy

- Optimal Monetary Policy keeps interest rates and average inflation rates low
- Under discretion, policymakers have incentives to choose policies with short-run gains and long-run costs
- Design institutions to minimize such discretionary policymaking

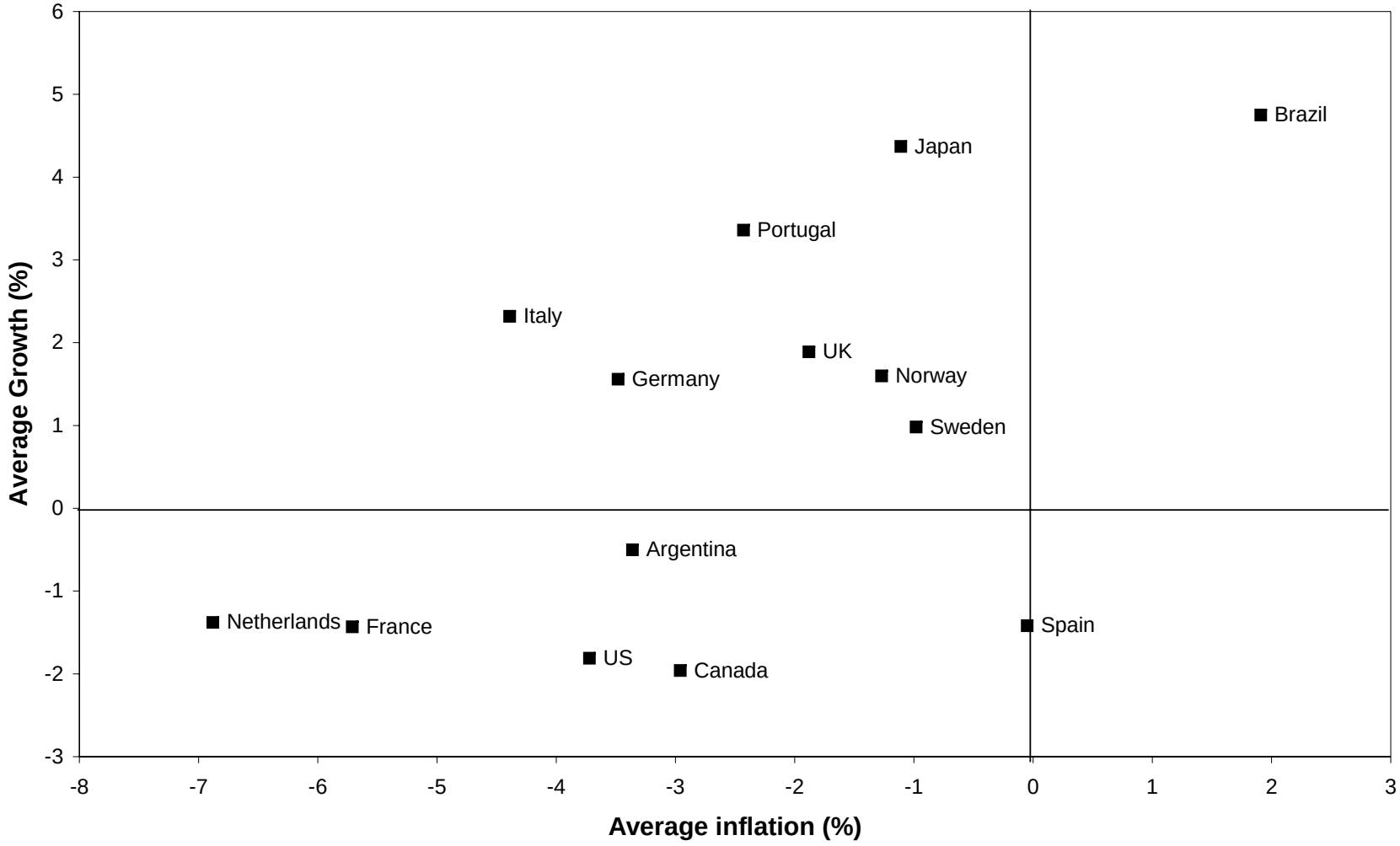
Average Inflation and Real Output Growth in 15 countries in All 5-year Periods, 1820-2000



Avg. Inflation and Real Output Growth in 15 Countries in All 5-year Periods Except 1929-34



Average Inflation and Real Output Growth in 14 Countries in 1929-34



The Evolution of Monetary Policy

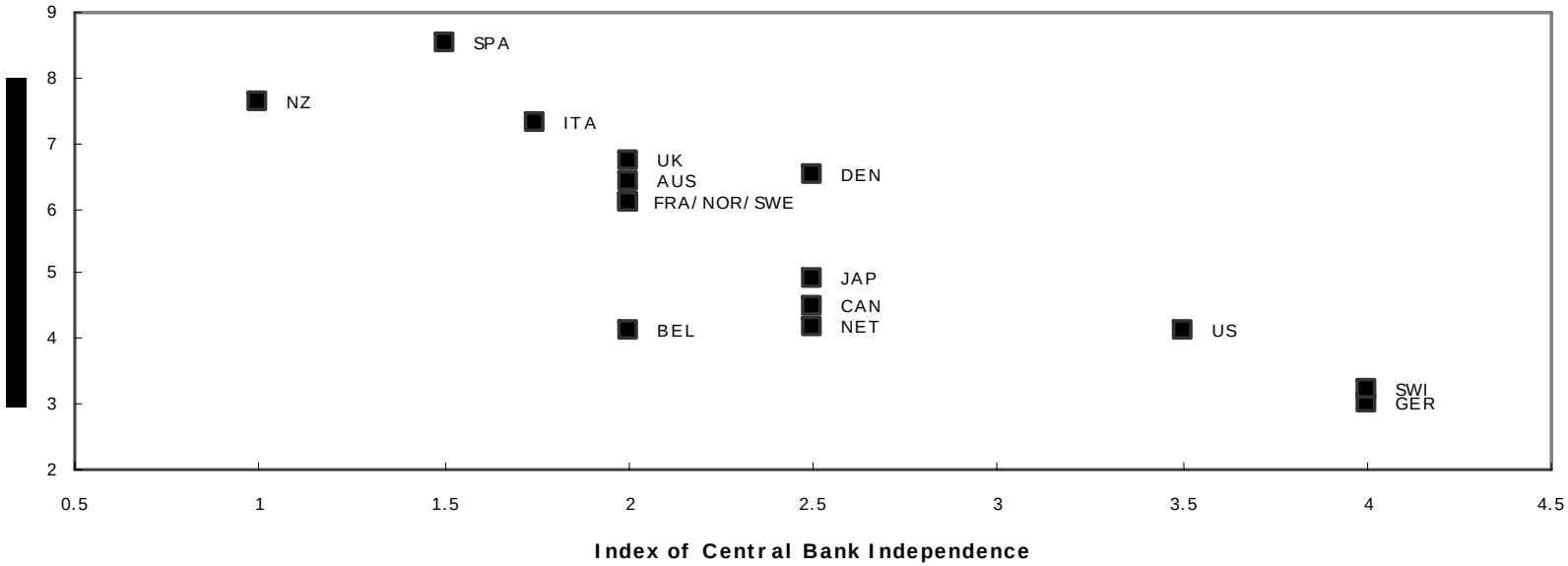
- European Central Bank
  - Commitment to price-stability
  - Restriction on fiscal policies of member countries
  - Independence of central bank core value
- Inflation targeting: 22 countries have adopted inflation targeting since 1989

  All developed countries except U.S., Japan, Switzerland

  Some developing countries

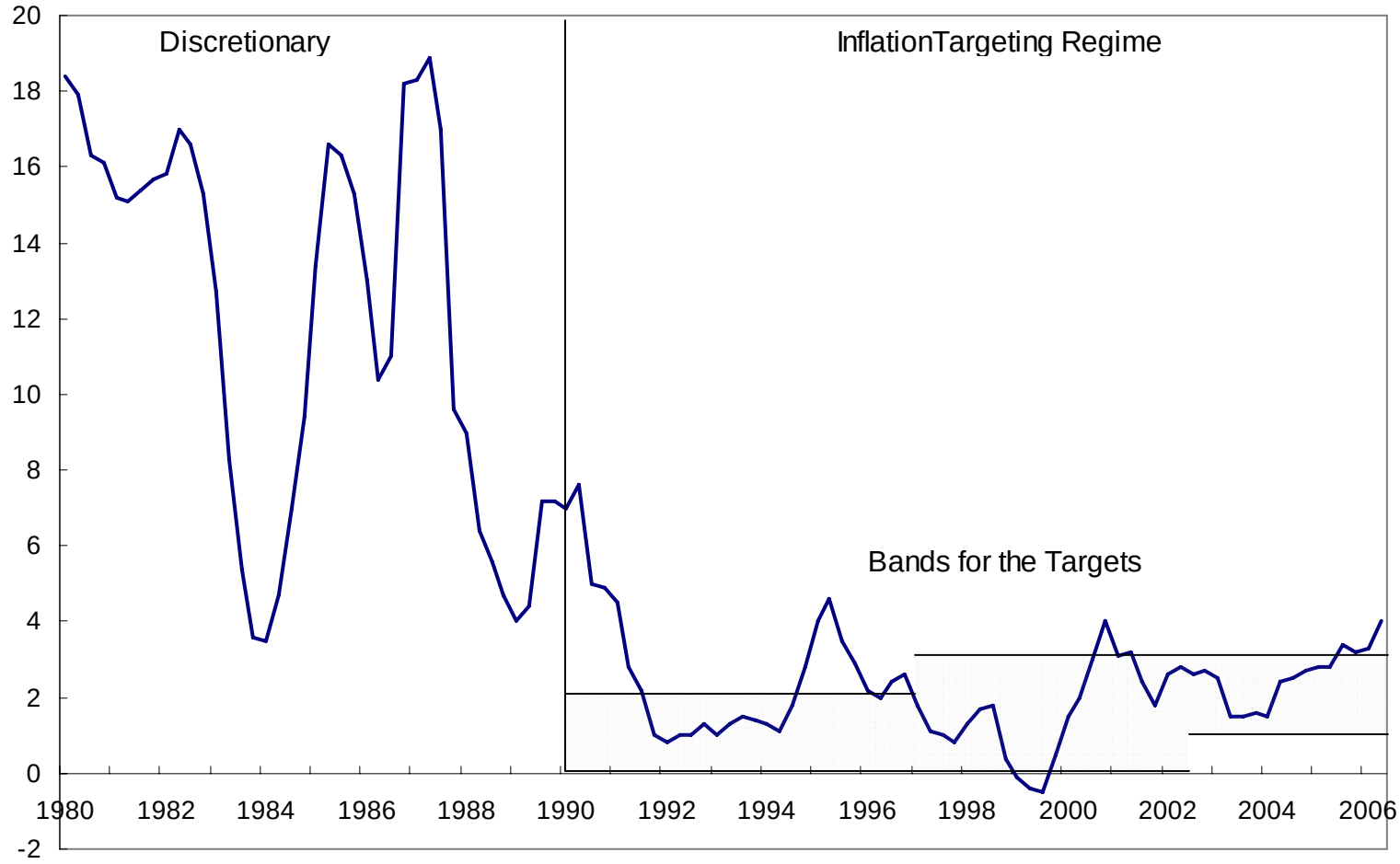
Figure 1
Central Bank Independence vs. Inflation

Measures of Central Bank Independence vs. Average Rates of Inflation in 16 Countries, 1973–88



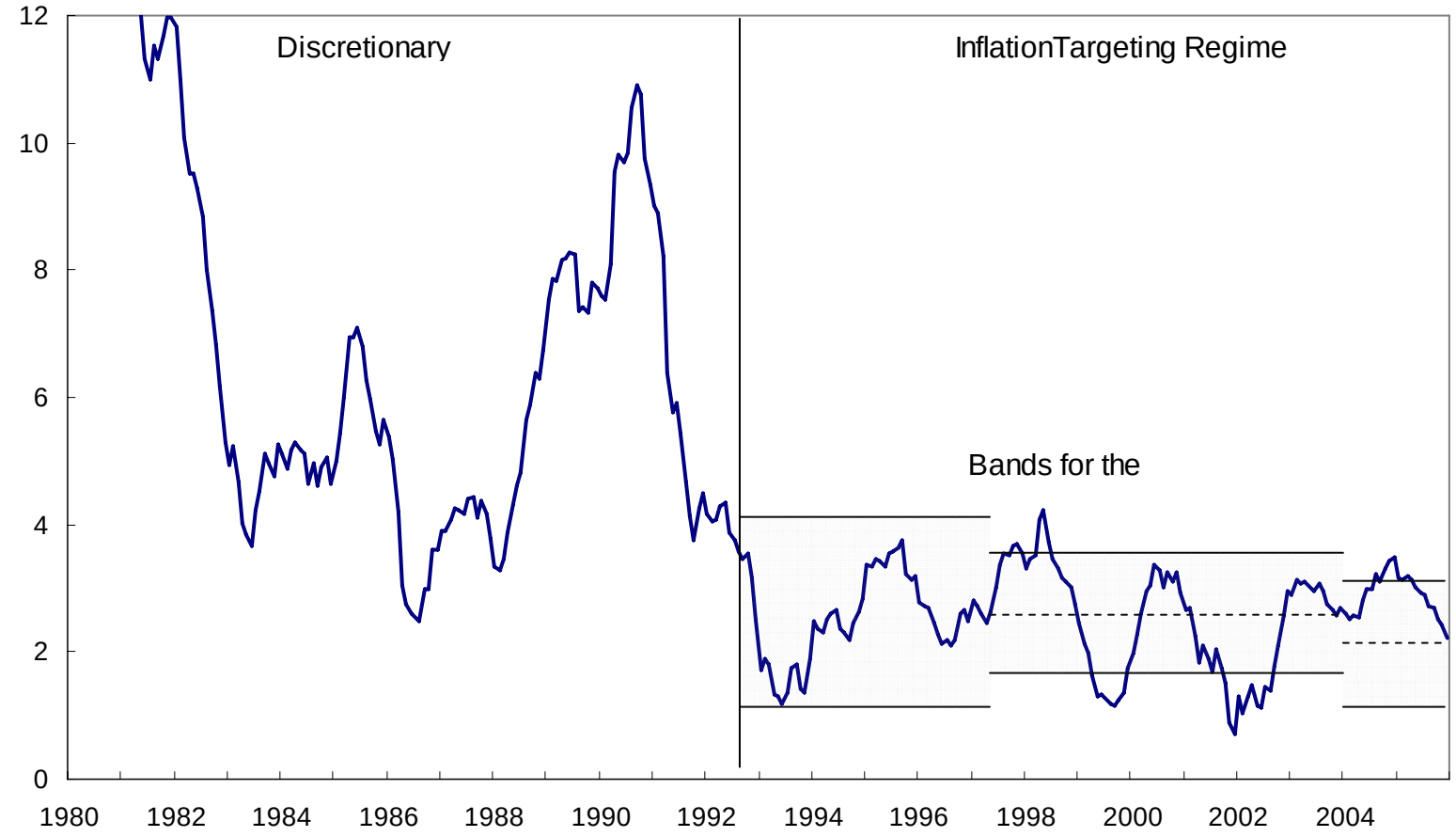
Source: Alesina and Summers (1993)

Inflation in Discretionary and Targeting Regimes – NZ



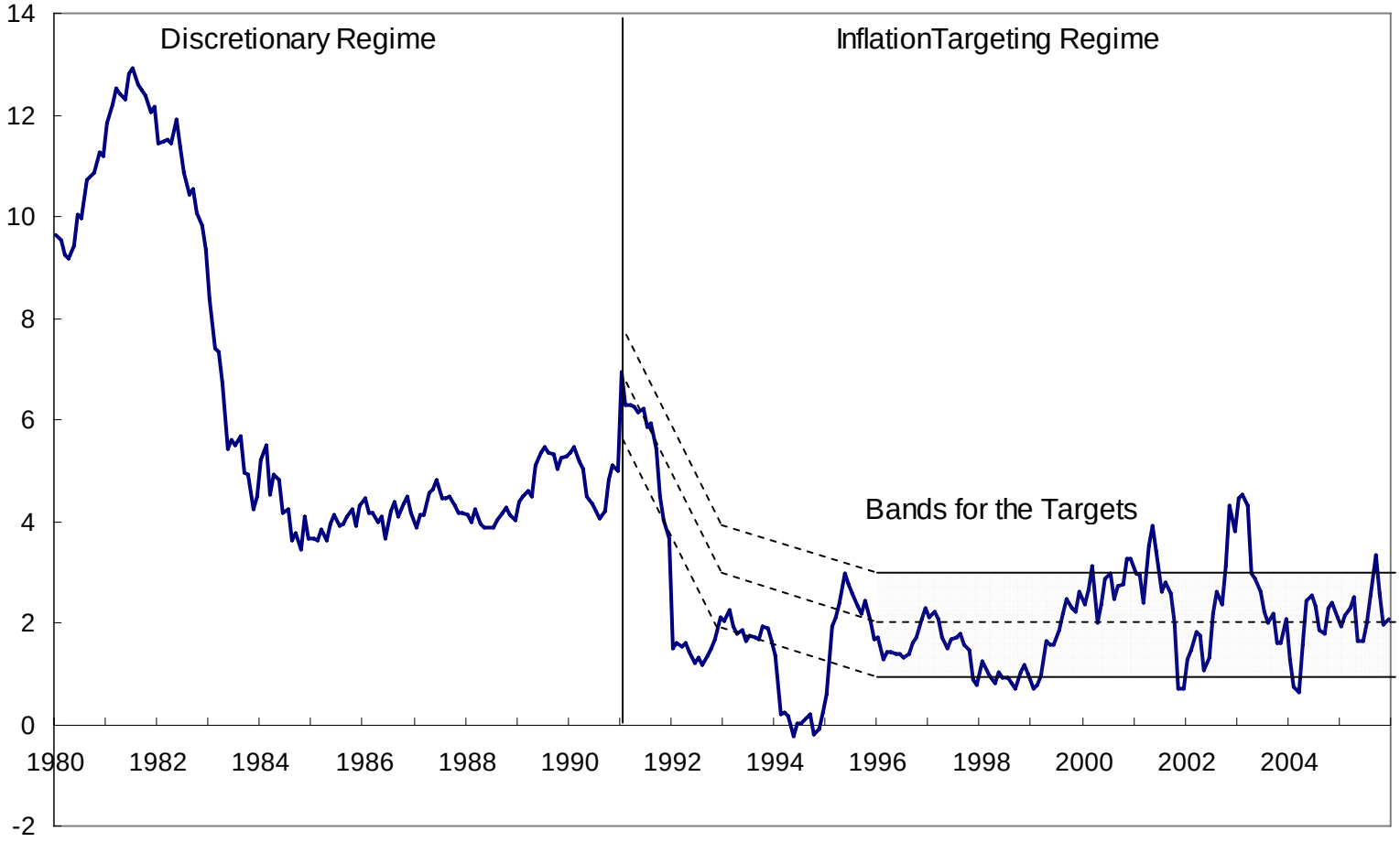
Source: The Reserve Bank of New Zealand

Inflation in Discretionary and Targeting Regimes – UK



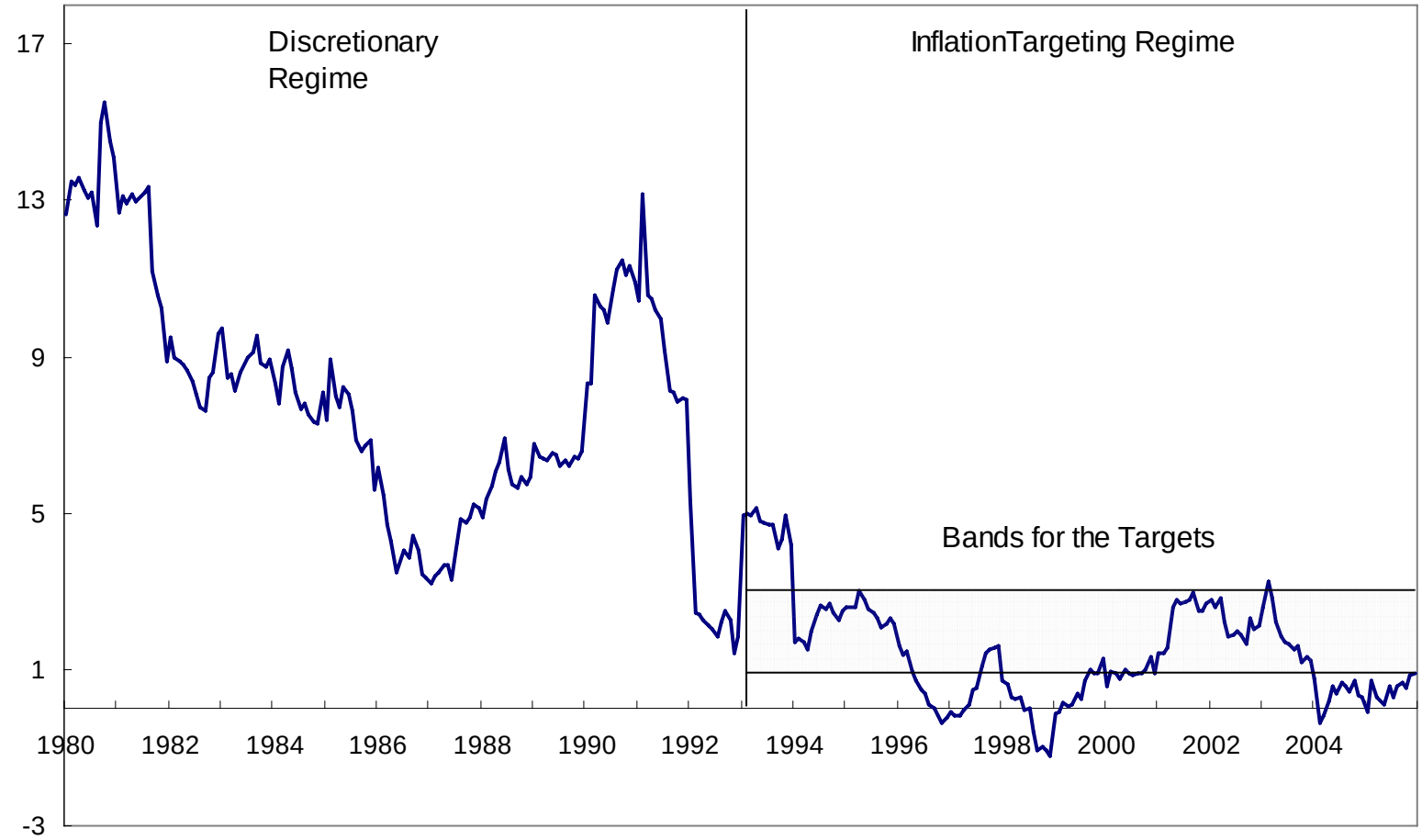
Source: IMF-IFS, Bank of England

Inflation in Discretionary and Targeting Regimes – Canada



Source: OECD, Bank of Canada

Inflation in Discretionary and Targeting Regimes – Sweden



Source: OECD, Bank of Sweden

Inflation Targeting in 22 Countries: 1989-2002

Country	Date of adoption	Average inflation 5 years before	Inflation in the year of adoption	Average inflation 5 years after
Australia	June-93	5.25	1.81	2.05
Brazil	June-99	433.81	4.86	8.73
Canada	February-91	4.46	5.61	1.46
Chile	September-90	20.33	26.04	13.92
	September-99	7.66	3.34	2.75
Colombia	October-99	20.44	10.87	7.31
Czech Republic	December-97	9.31	8.54	4.63
Finland	February-93	4.91	2.10	1.06
Hungary	June-01	15.18	9.22	5.06
Iceland	March-01	2.83	6.39	3.55
Israel	December-91	24.31	19.02	11.31
	June-97	11.31	9.00	3.70
Korea	April-98	4.97	7.51	2.68
Mexico	January-95	16.30	35.01	19.40
	January-01	19.40	6.36	4.57
New Zealand	December-89	11.38	7.50	2.41
Norway	March-01	2.30	3.02	1.44
Peru	January-02	5.00	0.19	2.51
Philippines	January-02	6.31	3.00	5.69
Poland	September-98	26.62	11.73	5.10
South Africa	February-00	7.34	5.34	5.10
Spain	January-95	5.57	4.68	2.62
Sweden	January-93	6.89	4.73	1.10
Thailand	May-00	5.12	1.56	2.27
United Kingdom	October-92	6.44	3.74	2.61

Inflation Targeting in 22 Countries: 1989-2002

	5 Years Before Targeting Date	5 Years After Targeting Date
Mean Inflation	27.34	4.92
Median Inflation	7.34	3.55
Mean GDP growth	3.85	3.84
Median GDP growth	3.61	3.76

Inflation Targeting in 22 Countries

Country	Date of adoption	Average inflation 5 years before	Average inflation 5 years after	Median of never-targeting countries		Difference	
				Average inflation 5 years before	Average inflation 5 years after	Before	After
Australia	June-93	5.25	2.05	10.14	5.57	-4.88	-3.52
Brazil	June-99	433.81	8.73	5.57	3.66	428.24	5.07
Canada	February-91	4.46	1.46	8.51	7.88	-4.05	-6.43
Chile	September-90	20.33	13.92	6.86	9.70	13.47	4.22
	September-99	7.66	2.75	5.57	3.66	2.09	-0.91
Colombia	October-99	20.44	7.31	5.57	3.66	14.87	3.65
Czech Republic	December-97	9.31	4.63	7.88	3.67	1.43	0.96
Finland	February-93	4.91	1.06	10.14	5.57	-5.23	-4.51
Hungary	June-01	15.18	5.06	3.75	3.46	11.43	1.60
Iceland	March-01	2.83	3.55	3.75	3.46	-0.92	0.09
Israel	December-91	24.31	11.31	8.51	7.88	15.80	3.42
	June-97	11.31	3.70	7.88	3.67	3.42	0.03
Korea	April-98	4.97	2.68	5.78	3.66	-0.81	-0.98
Mexico	January-95	16.30	19.40	9.62	3.75	6.69	15.65
	January-01	19.40	4.57	3.75	3.46	15.65	1.11
New Zealand	December-89	11.38	2.41	7.67	9.62	3.72	-7.21
Norway	March-01	2.30	1.44	3.75	3.46	-1.44	-2.02
Peru	January-02	5.00	2.51	3.54	3.61	1.46	-1.09
Philippines	January-02	6.31	5.69	3.54	3.61	2.77	2.08
Poland	September-98	26.62	5.10	5.78	3.66	20.83	1.44
South Africa	February-00	7.34	5.10	4.50	3.33	2.84	1.77
Spain	January-95	5.57	2.62	9.62	3.75	-4.04	-1.13
Sweden	January-93	6.89	1.10	10.14	5.57	-3.24	-4.47
Thailand	May-00	5.12	2.27	4.50	3.33	0.63	-1.05
United Kingdom	October-92	6.44	2.61	9.54	5.78	-3.10	-3.18

Inflation and GDP Growth Relative to Nontargeting Countries

Inflation

All Countries		Before	After
Median inflation	Targeting	7.34	3.55
	Never-targeting	5.78	3.66
Median of differences		2.09	0.03

GDP Growth

All Countries		Before	After
Median	Targeting	3.61	3.76
	Never-targeting	3.24	2.47
Median of differences		0.37	0.85

Inflation Targeting in OECD Countries

Country	Date of adoption	Average inflation 5 years before	Average inflation 5 years after	Median of never-targeting OECD countries: Average inflation 5 years before	Median of never-targeting OECD countries: Average inflation 5 years after	Difference: Before	Difference: After
Australia	June-93	5.25	2.05	3.23	2.07	2.02	-0.02
Canada	February-91	4.46	1.46	3.19	2.56	1.27	-1.10
Czech Republic	December-97	9.31	4.63	2.56	2.30	6.75	2.34
Finland	February-93	4.91	1.06	3.23	2.07	1.68	-1.02
Hungary	June-01	15.18	5.06	2.30	2.14	12.89	2.92
Iceland	March-01	2.83	3.55	2.30	2.14	0.53	1.41
Korea	April-98	4.97	2.68	2.37	2.44	2.60	0.24
Mexico	January-95	16.30	19.40	3.51	2.30	12.79	17.10
	January-01	19.40	4.57	2.30	2.14	17.10	2.43
New Zealand	December-89	11.38	2.41	3.95	3.51	7.43	-1.11
Norway	March-01	2.30	1.44	2.30	2.14	0.01	-0.70
Poland	September-98	26.62	5.10	2.37	2.44	24.25	2.66
Spain	January-95	5.57	2.62	3.51	2.30	2.06	0.32
Sweden	January-93	6.89	1.10	3.23	2.07	3.66	-0.97
United Kingdom	October-92	6.44	2.61	3.38	2.37	3.05	0.24

Inflation and GDP Growth
Relative to Nontargeting Countries

Inflation

OECD Countries		Before	After
Median inflation	Targeting	6.44	2.62
	Never-targeting	3.19	2.30
Median of differences		3.05	0.24

GDP Growth

OECD Countries		Before	After
Median	Targeting	3.72	3.03
	Never-targeting	3.01	2.22
Median of differences		1.00	0.95

Inflation Targeting in Latin American Countries

Country	Date of adoption	Average inflation 5 years before	Average inflation 5 years after	Median of never-targeting Latin-American countries		Difference	
				Average inflation 5 years before	Average inflation 5 years after	Before	After
Brazil	June-99	433.81	8.73	11.38	8.95	422.43	-0.22
Chile	September-90	20.33	13.92	31.60	31.01	-11.28	-17.09
	September-99	7.66	2.75	11.38	8.95	-3.73	-6.20
Colombia	October-99	20.44	7.31	11.38	8.95	9.05	-1.64
Mexico	January-95	16.30	19.40	32.07	10.07	-15.76	9.33
	January-01	19.40	4.57	10.07	10.27	9.33	-5.71
Peru	January-02	5.00	2.51	8.09	8.81	-3.09	-6.29

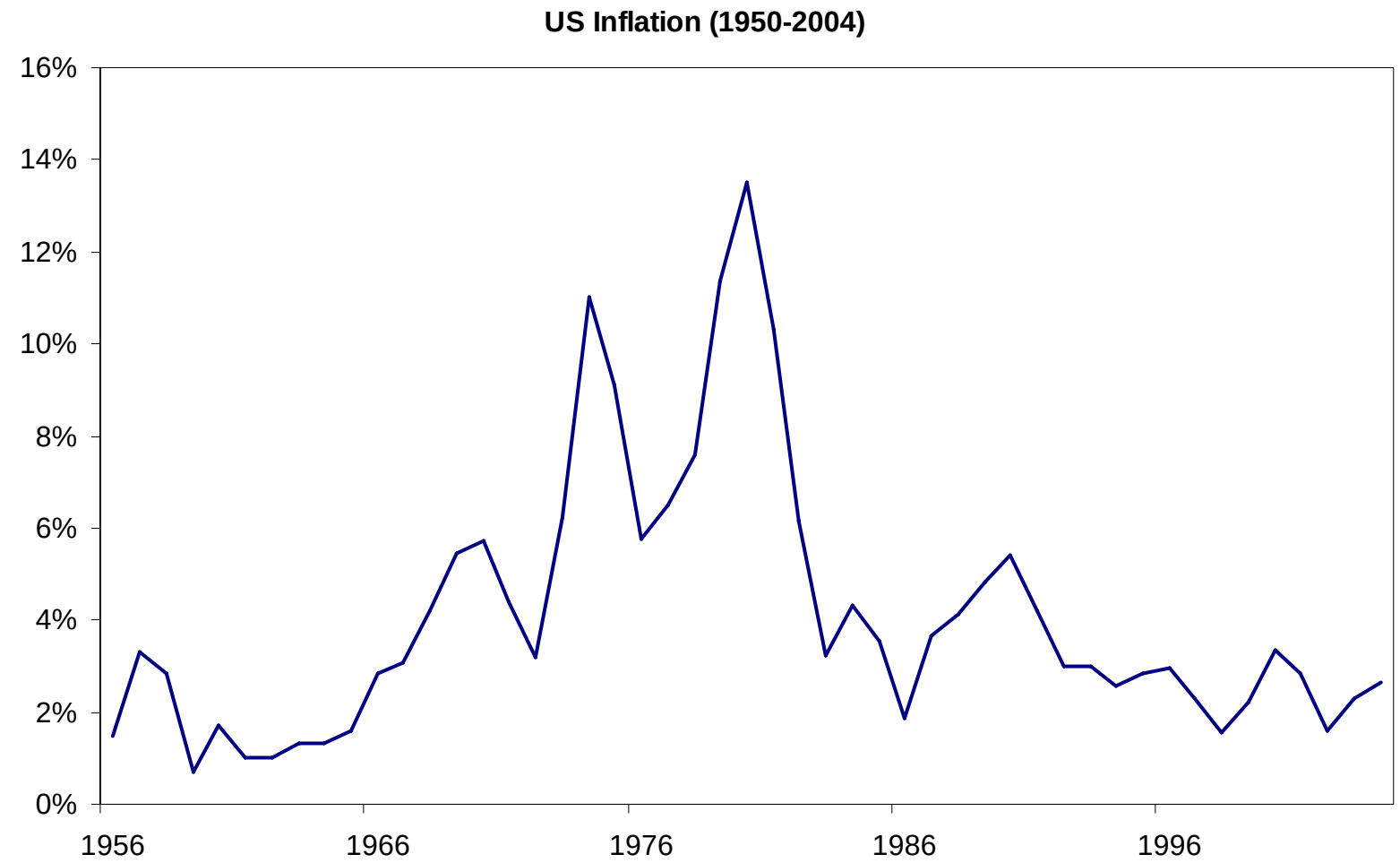
Inflation and GDP Growth
Relative to Nontargeting Countries

Inflation

Latin-American Countries		Before	After
Median inflation	Targeting	19.40	7.31
	Never-targeting	11.38	8.95
Median of differences		-3.09	-5.71

GDP Growth

Latin-American Countries		Before	After
Median	Targeting	3.86	3.97
	Never-targeting	3.61	2.14
Median of differences		0.35	0.94



Source: Bureau of Labor Statistics

Hypotheses About Great Inflation in U.S.

- Poor institutions
- Bad luck
- Stupid policymakers

My View

- Poor institutions
- Discretionary policymaking
- No commitment to rules
- Inflation targeting will help but does not fundamentally change institutions

A Proposal

- Every 3 years, FOMC sets policy rule for next 3 years

- Deviations from rule requires supermajority

Advantages

- Overcomes discretion problems
- Provides some room for “unexpected” events
- Shifts focus from “What should we do now” to thinking strategically about contingent plans

Fiscal Policy

- Two main distortions

- Static Distortion

  MRS between consumption and leisure ≠ MRT between labor and output

  - Labor or Consumption Taxes

- Intertemporal Distortion

  MRS between consumption today and tomorrow ≠ MRT between saving today and output tomorrow

  - Capital Taxes

Optimal Fiscal Policy

- Eliminate intertemporal distortions
- Keep static distortions constant over the business cycle
- Use state-contingent taxes and debt to balance budget
- High initial tax on capital: Time Inconsistency Problem

Table 1
Effective U.S. Marginal Tax Rates on Capital Income, 1953–2003

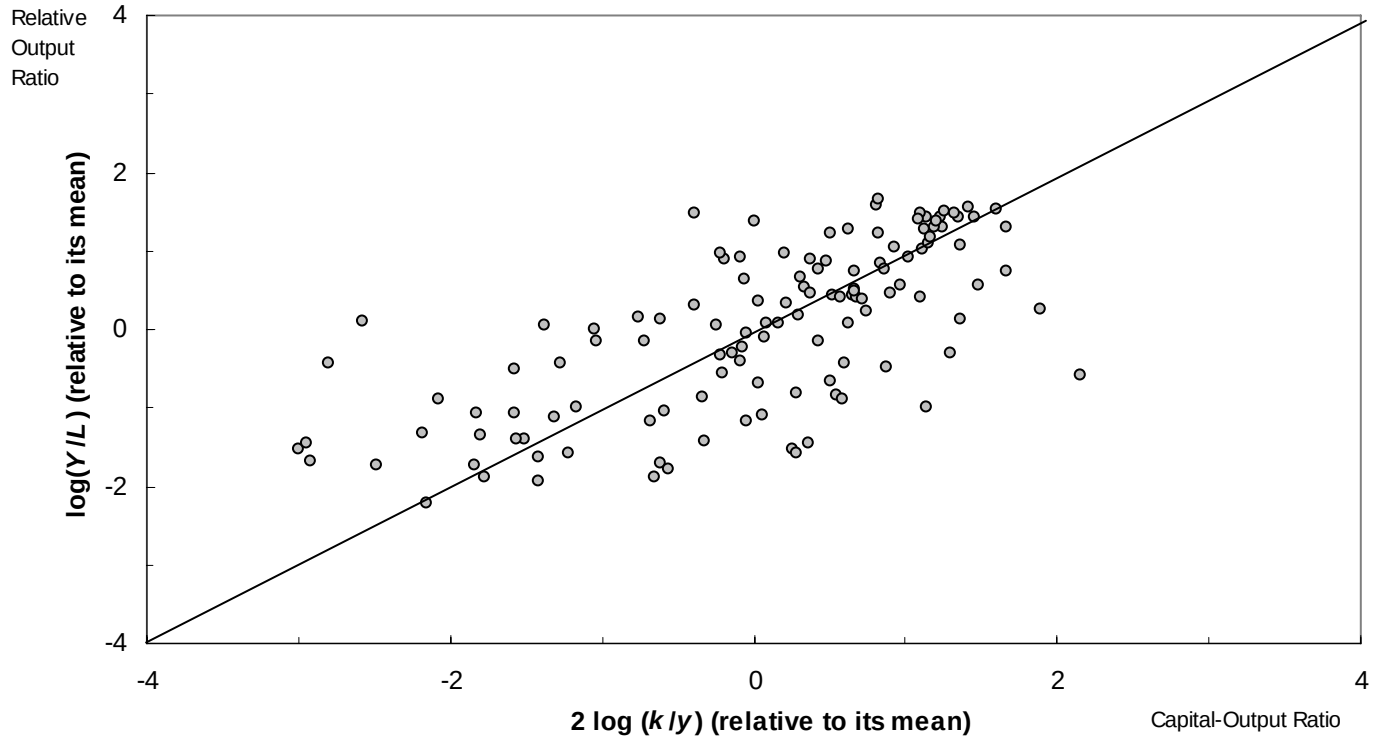
Time Period	%
1953–59	47.3
1960s	35.8
1970s	41.3
1980s	35.3
1990s	30.5
2000–03	28.3

Source: Gravelle (2004)

Thinking of Distortions More Generally

- Can help account for poverty of nations
- Can help account for very different employment experiences across U.S. and Europe

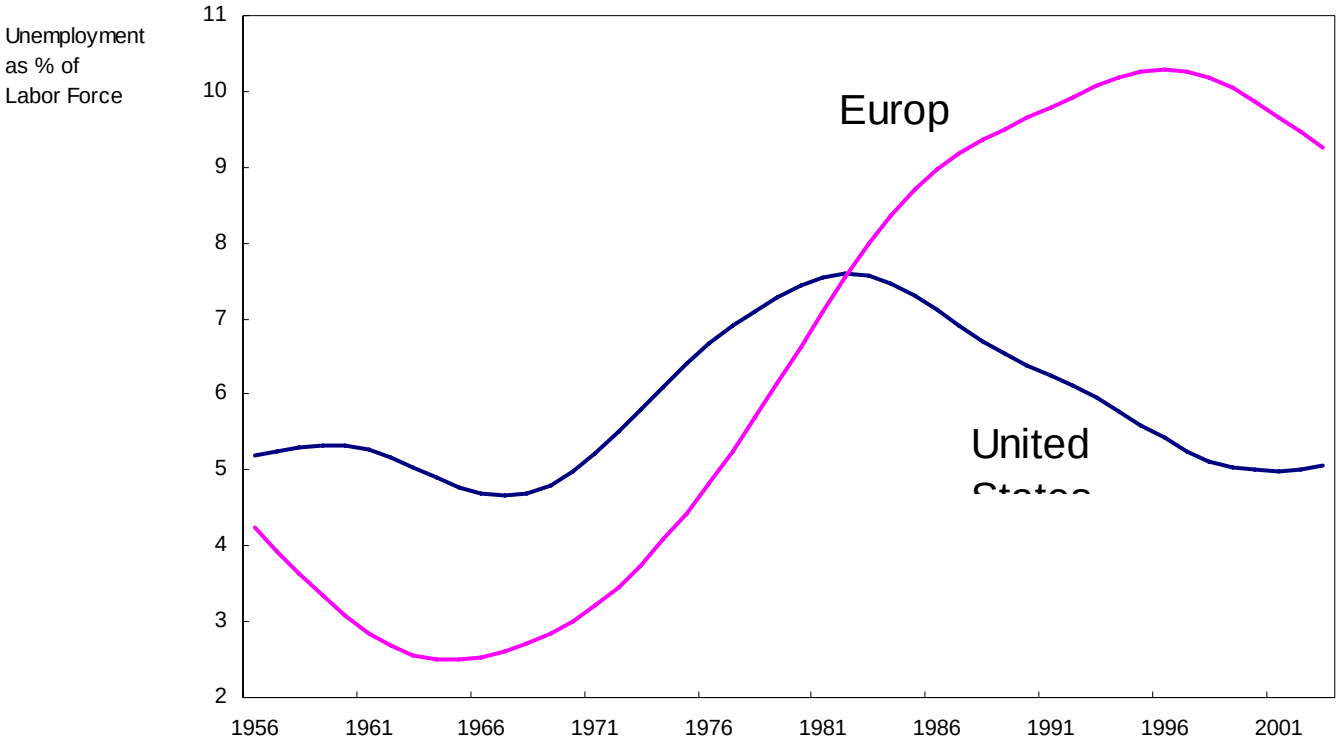
Figure 3
The Relationship Between Capital-Output Ratios and Relative Income Levels in 125 Countries During the Period 1950–85



Source: Chari, Kehoe, and McGrattan (1997)

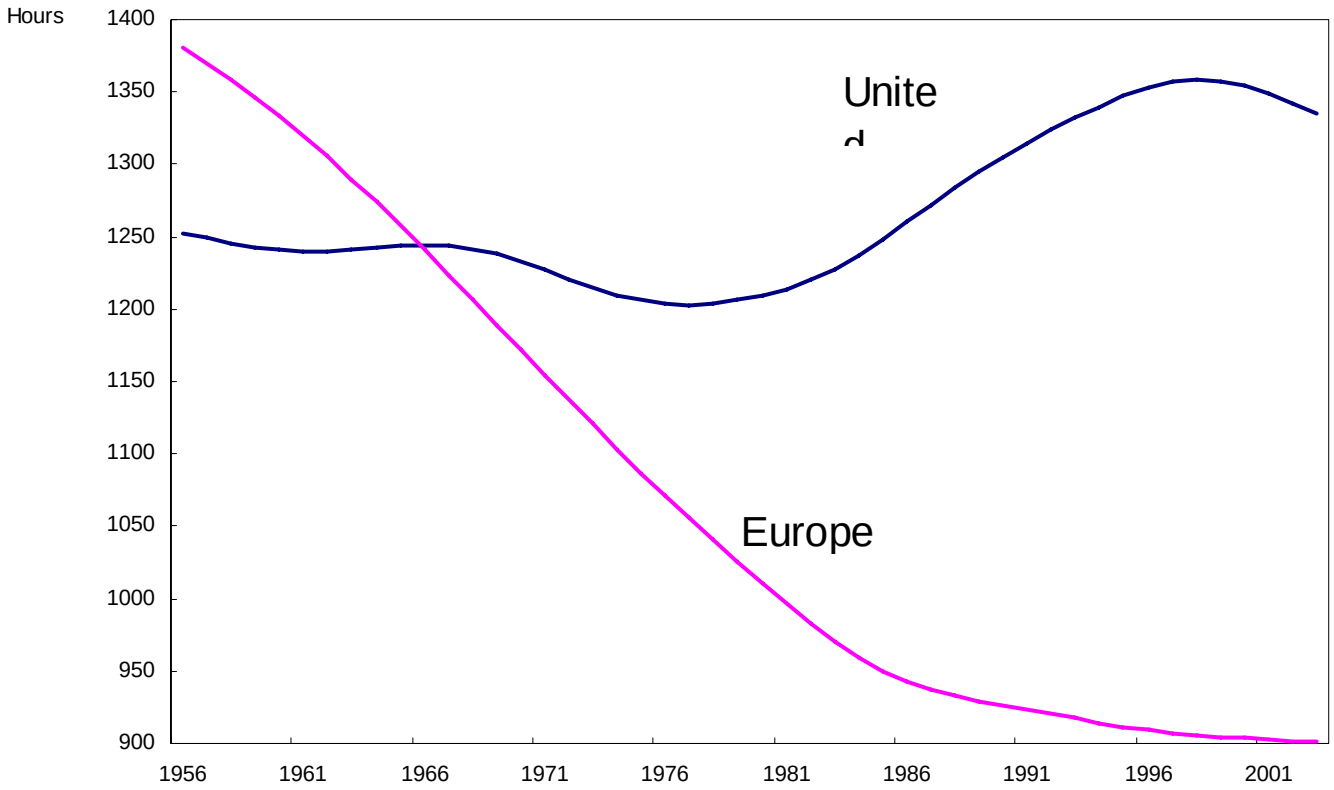
Figures 4–5
Unemployment and Employment in Europe and the United States, 1956–2003

Figure 4
Unemployment Rates



Source: Rogerson (2005)

Figure 5
Average Annual Hours Worked



Source: Rogerson (2005)

Table 2
G-7 Countries' Predicted and Actual Labor Supply Employment*

Country	Tax rate τ	Consumption-Output Ratio *c/y*	Labor Supply in 1970–74	
			Actual	Predicted
Germany	.52	.66	24.6	24.6
France	.49	.66	24.4	25.4
Italy	.41	.66	19.2	28.3
Canada	.44	.72	22.2	25.6
United Kingdom	.45	.77	25.9	24.0
Japan	.25	.60	29.8	35.8
United States	.40	.74	23.5	26.4

Source: Prescott (2002)
*Hours worked per week per person aged 15–64

Bottom Line for Fiscal Policy

- Intertemporal distortions may be due to time inconsistency problem
- Must find ways to mitigate this problem
- Need creative ways to set up markets in state-contingent debt. Moral Hazard is a problem here.