

# **Multiple Hands on the Wheel: Partial Delegation and Shared Control of Monetary Policy in the Open and Institutionalized Economy**

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**ABSTRACT:** Previous work showed that, when partially autonomous central banks (CB's) and politically responsive governments share monetary policymaking control, the inflation rate that prevails is a convex combination of the rate that would have occurred if the government fully controlled monetary policy and that which would have occurred if, instead, the CB had full control. Thus, the anti-inflation effects of CB autonomy and conservatism (CBA) depend on *all* political-economic variables to which governments and CB's would respond differently and, *vice versa*, the degree of CBA mutes the inflation effects of all such variables. This paper extends that logic of shared policy-control to open political economies under differing exchange-rate regimes and degrees of international financial exposure. When domestic monetary authorities fully commit to fixed exchange-rates, they effectively delegate domestic inflation-control to foreign authorities. Similarly, in small, financially open economies, domestic policymakers must match domestic to foreign inflation to avoid large exchange-rate movements under any exchange regime. The implications extend intuitively from the closed-economy case. Broadly, the inflation effects of pegs and of financial exposure depend on each other and on many other institutional and structural characteristics of the domestic *and foreign* political economies, and, *vice versa*, the domestic-inflation effects of domestic and foreign political-economic variables depend on exchange-rate regimes and degrees of financial openness at home and abroad. The paper then shows how to model such complexly interactive hypotheses empirically compactly and substantively meaningfully and demonstrates that the postwar inflation records of 21 developed democracies decidedly favors that specification over less theoretically informed linear or linear-interactive alternatives. The conclusion illustrates several specific examples of this general result and discusses the broader applications of this approach to other instances of shared policy-control.

## Overview

- Start w/ inflation policy in non-exposed, flexible E.R. case (AJPS 43(3) 1999)

- Autonomy is a matter of degree  $\Rightarrow$

- $$\mathbf{p} = C \cdot \mathbf{p}_c(X_c) + (1 - C) \cdot \mathbf{p}_g(X_g) \quad (1)$$

- $\Rightarrow d\pi/dC=f(X_c, X_g)$ , not constant (as previously estimated)...

- $\Rightarrow$  all the converses:  $d\pi/dx=g(C, \cdot)$

- $\Rightarrow$  Anti-inflationary benefit of CBA varies; suggests movements to/from CBA

- $\Rightarrow$  Institutional impacts “contextual” (classic & modern C&IPE theme)

- Varying E.R. regimes & international financial exposure:

- $$\begin{aligned} \mathbf{p} = & P \cdot E \cdot C \cdot \mathbf{p}_1(X_1) + P \cdot E \cdot (1 - C) \cdot \mathbf{p}_2(X_2) \\ & + P \cdot (1 - E) \cdot C \cdot \mathbf{p}_3(X_3) + P \cdot (1 - E) \cdot (1 - C) \cdot \mathbf{p}_4(X_4) \\ & + (1 - P) \cdot E \cdot C \cdot \mathbf{p}_5(X_5) + (1 - P) \cdot E \cdot (1 - C) \cdot \mathbf{p}_6(X_6) \\ & + (1 - P) \cdot (1 - E) \cdot C \cdot \mathbf{p}_7(X_7) + (1 - P) \cdot (1 - E) \cdot (1 - C) \cdot \mathbf{p}_8(X_8) \end{aligned} \quad (2)$$

- Theory specifies  $\pi_i(X_i) \Rightarrow$  substantively & statistically informative est’s of proposition that domestic & foreign interests & institutions *all* interact to shape policies & outcomes

- Findings, Implications, Further Research, and New Directions

- Using theory to inform empirical exploration of interactive effects in C&IPE

- Gaining leverage on complex hypoth’s of classical & modern CP w/ available data

- Findings

- Insights for Endogenizing Institutions? *Reform* when least needed?

- Most P-A & other delegation situations should exhibit similar features

- Relative Weight of actors in shared policy control: Presidents, Ministerial Discretion...

- Direct empirical exploration of determinants of weights of multiple incentives

- Other instances where institutions & interests interact, w/ one factor moderating impact of several others similarly to determine policies and outcomes.

## **Two Hands on the Wheel:** “Partially Autonomous Central Banks, Politically Responsive Governments, and Inflation” (*AJP* 1999)

- Political scientists and economists generally agree:
  - CBA lowers inflation
  - Define CBA: *degree* of (conservative) CB autonomy from current political authority in monetary policymaking
  - From the political scientist’s view:
    - CB=bureaucratic institution, led by financial experts, generally inflation hawks, whether socialized to that view or coming from population w/ those interests.
    - Govts, esp. in democracies, more responsive to societal pressures that may emerge for inflation. Only most conservative of govts as anti-inflationary as its CB.
    - ⇒ Monetary authority delegation to conservative CB (=CBA) reduces inflation.
  - From the (neoclassical) economist’s view:
    - Monetary policy involves time-inconsistency problem
      - ⇒ discretionary-inflation bias (i.e., governments).
    - Credible delegation to autonomous, conservative CB
      - ⇒ commitment device circumventing time-inconsistency & therefore bias.
    - ⇒ CBA lowers inflation.
  - Some critics argue that CBA is epiphenomenal
    - Standard “institutions don’t matter” argument with standard weakness.
    - Evidence directly addressing this notion in this case soundly rejects it.
  - However derived, thesis that CBA lowers inflation...
    - ...incompletely understood,
    - ...misunderstanding translated into its empirical testing,
    - ...so many important theoretical & empirical implications of the argument missed.

## **The Theory of CBA & Inflation Reconsidered**

- CB autonomy from current govt in monetary policymaking matter of *degree*
  - Never full b/c CBA invariably derives from legal or constitutional provision
    - Political authorities can change either if CB policies ever sufficiently distasteful to justify expenditure of necessary political capital to change CB status.
    - Plus, (re-)appointment of CB authorities usually by government.
  - Govt cannot costlessly ensure CB conducts policy fully by its current will either.
    - CB expertise &/or informational advantage regarding monetary policy,
    - Opp. Costs: Time etc. even to monitor CB, more to conduct monetary policy itself.
  - ⇒ CBA must measure *how far* CB could stray from current govt's desires before govt would find political & economic costs of altering CB law or seizing monetary reins itself worth bearing (see, e.g., Lohmann 1992).
- ⇒ Monetary-policy *cum* inflation-control shared by CB & current govt
  - ...*if* domestic economy not so financially exposed that international considerations and inflation abroad would dominate either's concerns.
  - ...*if* domestic authorities not sacrificed policy autonomy for exchange-rate commitment
- Four substantive implications followed sequentially...

## Four substantive implications from Theory of CBA & Inflation

- Observed inflation = some convex combination of...
  - What it would be if conservative CB credibly, completely, & autonomously controlled monetary policy and
  - What it would be if instead current govt controlled monetary policy w/o any influence from CB
  - With weight on former (weakly) increasing in degree of CBA.

○ ***For Example:*** 
$$\mathbf{p} = C \cdot \mathbf{p}_c(X_c) + (1 - C) \cdot \mathbf{p}_g(X_g) \quad (3)$$

- Anti-inflationary impact of CBA not constant, as previously estimated, but rather varies depending on every political-economic factor to which CB's and govts would respond differently. And *vice versa*. In the example:

$$\begin{aligned} \frac{\mathbb{1}\mathbf{p}}{\mathbb{1}C} &= -[\mathbf{p}_g(X_g) - \mathbf{p}_c(X_c)] = f(X) \\ \frac{\mathbb{1}\mathbf{p}}{\mathbb{1}x} &= C \cdot \frac{\mathbb{1}\mathbf{p}_c}{\mathbb{1}x} + (1 - C) \cdot \frac{\mathbb{1}\mathbf{p}_d}{\mathbb{1}x} = g(C, X; ) \\ \frac{\mathbb{1}^2\mathbf{p}}{\mathbb{1}C\mathbb{1}x} &\equiv \frac{\mathbb{1}^2\mathbf{p}}{\mathbb{1}x\mathbb{1}C} = -\left[\frac{\mathbb{1}\mathbf{p}_g}{\mathbb{1}x} - \frac{\mathbb{1}\mathbf{p}_c}{\mathbb{1}x}\right] = h(\cdot) \end{aligned} \quad (4)$$

- *E.g.*, Anti-inflationary impact of CBA...
  - ...greater when left controls govt than when right
  - ...less in more trade-open economies, & those with larger financial sectors,
  - ...varies w/ labor- and goods-market institutions, *etc.*
- *E.g.*, converses:
  - difference b/w inflation under left and right govts and anti-inflationary impact of trade-openness, financial-sector size, etc. should be less the greater is CBA, etc.
- ⇒ Political-economic environments differ, so CBA will have more anti-inflationary bite in some country-times than others ⇒ some country-times more likely to see increases or decreases in CBA than others?
- ⇒ broader institutional C&IPE point: effect of institutions tend to be contextual; depend on configuration of other political, economic, structural, and institutional features of setting in which they *interact*.

## Deriving the Argument in the Familiar Neoclassical Model

- Can but need not be derived from std neoclassical model of CB-and-inflation:

$$V^m = -\left[\frac{A_g}{2}(N_g^* - N)^2 + \frac{1}{2}(\mathbf{p}_g^* - \mathbf{p})^2\right] \quad (5)$$

$$N = N_n + \mathbf{a}(\mathbf{p} - \mathbf{p}^e) \quad (6)$$

$$\mathbf{p}_d^* = \mathbf{p}_g^* + A_g \mathbf{a}(N_g^* - N_n) \quad (7)$$

$$\mathbf{p}_c^* = \mathbf{p}_b^* + A_b \mathbf{a}(N_b^* - N_n) \quad (8)$$

- If so, then predicted effects of CB and other factors can be specified:

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### First-Order Predictions of the Theory of CBA and Inflation

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The Inflation effect of...

...central bank autonomy .....  $\frac{\mathcal{I}\mathbf{p}}{\mathcal{I}C} = -[\mathbf{p}_d^* - \mathbf{p}_c^*] = -[\mathbf{p}_g^T - \mathbf{p}_c^T + A_g \mathbf{a}(N_g^T - N_n) - A_b \mathbf{a}(N_b^T - N_n)] < 0.$

...the government's inflation target .....  $\frac{\mathcal{I}\mathbf{p}}{\mathcal{I}\mathbf{p}_g^T} = 1 - C \geq 0.$

...the bank's inflation target .....  $\frac{\mathcal{I}\mathbf{p}}{\mathcal{I}\mathbf{p}_b^T} = C \geq 0.$

...the government's weight on employment relative to inflation .....  $\frac{\mathcal{I}\mathbf{p}}{\mathcal{I}A_g} = \mathbf{a}(1 - C)(N_g^T - N_n) \geq 0.$

...the bank's weight on employment relative to inflation .....  $\frac{\mathcal{I}\mathbf{p}}{\mathcal{I}A_b} = \mathbf{a}C(N_b^T - N_n) \geq 0.$

...the government's employment-rate target .....  $\frac{\mathcal{I}\mathbf{p}}{\mathcal{I}N_g^T} = \mathbf{a}(1 - C)A_g \geq 0.$

...the bank's employment-rate target .....  $\frac{\mathcal{I}\mathbf{p}}{\mathcal{I}N_b^T} = \mathbf{a}CA_b \geq 0.$

...the natural rate of employment .....  $\frac{\mathcal{I}\mathbf{p}}{\mathcal{I}N_n} = -\mathbf{a}[A_g - C(A_g - A_b)] \leq 0.$

...monetary real-efficacy (i.e., slope of the Phillips Curve) .....  $\frac{\mathcal{I}\mathbf{p}}{\mathcal{I}\mathbf{a}} = CA_b(N_b^T - N_n) + (1 - C)A_g(N_g^T - N_n) \geq 0.$

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## Second-Order (Interactive) Predictions of the Theory of CBA and Inflation

Statement	Converse	Formal Expression
The inflation effect of $C$ depends on the government's inflation-rate target.	The inflation effect of the government's inflation-rate target depends on $C$ .	$\frac{\partial \pi}{\partial C} \equiv \frac{\partial \pi}{\partial p_g^T} = -1$
The inflation effect of $C$ depends on the bank's inflation-rate target.	The inflation effect of the bank's inflation-rate target depends on $C$ .	$\frac{\partial \pi}{\partial C} \equiv \frac{\partial \pi}{\partial p_b^T} = 1$
The inflation effect of $C$ depends on the government's weight on employment.	The inflation effect of the government's weight on employment depends on $C$ .	$\frac{\partial \pi}{\partial A_g} \equiv \frac{\partial \pi}{\partial C} = -a(N_g^T - N_n) < 0$
The inflation effect of $C$ depends on the bank's weight on employment.	The inflation effect of the bank's weight on employment depends on $C$ .	$\frac{\partial \pi}{\partial A_b} \equiv \frac{\partial \pi}{\partial C} = a(N_b^T - N_n) \geq 0$
The inflation effect of $C$ depends on the government's employment-rate target.	The inflation effect of the government's employment-rate target depends on $C$ .	$\frac{\partial \pi}{\partial N_g^T} \equiv \frac{\partial \pi}{\partial C} = -A_g a < 0$
The effect of $C$ on inflation depends on the bank's employment-rate target.	The effect of the bank's employment-rate target on inflation depends on $C$ .	$\frac{\partial \pi}{\partial N_b^T} \equiv \frac{\partial \pi}{\partial C} = A_b a \geq 0$
The effect of $C$ on inflation depends on the natural rate of employment.	The effect of the natural rate of employment on inflation depends on $C$ .	$\frac{\partial \pi}{\partial N_n} \equiv \frac{\partial \pi}{\partial C} = a(A_g - A_b) > 0$
The effect of $C$ on inflation depends on the slope of the Phillips Curve.	The effect of the slope of the Phillips Curve on inflation depends on $C$ .	$\frac{\partial \pi}{\partial a} \equiv \frac{\partial \pi}{\partial C} = -[A_g(N_g - N_n) - A_b(N_b - N_n)] < 0$

○ Thus, neoclassical model implies that anything that increases...

- ...weight govt puts on employment relative to inflation ( $A_g$ ), or...
- ...real-effectiveness of surprise money, *i.e.* Phillips Curve slope ( $\alpha$ ), or...
- ...govt's desired employment and/or inflation levels ( $N_g^*$  and/or  $\pi_g^*$ )...

○ ...increases discretionary inflation while anything that increases...

- ...the natural rate of employment ( $N_n$ ) lowers discretionary inflation.

○ Contrarily, inflation w/ autonomous CB generally lower ( $\pi_c < \pi_d$ ) & usually assumed unaffected by these other considerations ( $A_b = 0$ ).

○ Thus, actual inflation,  $\pi$ , decreases proportionately from discretionary levels,  $\pi_d(X_d)$ , toward commitment levels,  $\pi_c(X_c)$  as CBA increases.

●  $\Rightarrow$  Inflation effect of CBA,  $\partial \pi / \partial C$ , more/less negative the higher/lower discretionary inflation *would have been* relative to commitment inflation *would have been*.

- Conclusions do ***NOT*** depend on neoclassical model.
  - Any model in which...
    - ...monetary policy matters,
    - ...CB can have at least some monetary-policy autonomy,
    - ...and CB & political authority would respond differently &/or to different factors,
  - $\Rightarrow$  some sort of convex-combinatorial prediction, which then implies the interactive effects &c, which have not generally been applied or fully realized.
- Point applies to many other situations: e.g., all P-A?
  - Abstractly, something like  $\mathbf{p} = C \cdot \mathbf{p}_c(X_c) + (1 - C) \cdot \mathbf{p}_g(X_g)$  should apply to all(?) PA situations (and many other situations of divided control over some outcome).
  - Principal-agent relations are problematic because...
    - given perfect latitude & capability, agent would act by some function,  $\mathbf{y}_1 = \mathbf{f}(\mathbf{X})$ ,
    - but principal, given same freedom, would act differently, say by  $\mathbf{y}_2 = \mathbf{g}(\mathbf{Z})$ .
  - Some institutional or other characteristics of environment then determine information, monitoring, enforcement, and other costs,  $\mathbf{c}$ , principal must incur to bring agent to act more according to  $\mathbf{g}(\mathbf{Z})$  and less according to  $\mathbf{f}(\mathbf{X})$ .
  - In any Principal-Agent situation, actually occurring  $\mathbf{y}$  likely then given by some:
    - $\mathbf{y} = \mathbf{k}(\mathbf{c}) \cdot \mathbf{f}(\mathbf{X}) + [\mathbf{1} - \mathbf{k}(\mathbf{c})] \cdot \mathbf{g}(\mathbf{Z})$  with  $\mathbf{0} \leq \mathbf{k}(\mathbf{c}) \leq \mathbf{1}$  and  $\mathbf{k}(\mathbf{c})$  weakly increasing?
    - So, effects of  $\mathbf{c}$  generally depend on  $\mathbf{X}$  and  $\mathbf{Z}$  and effect of each element of  $\mathbf{X}$  and  $\mathbf{Z}$  generally depend on  $\mathbf{c}$  and perhaps other elements of  $\mathbf{X}$  and  $\mathbf{Z}$ .
  - Empirical applications of principal-agent models seem frequently to have missed this

## Empirical Implementation in Simple, Closed-Economy Case

- In *A7PS* 43(3) identify 6 factors that should affect govt inflation policies and so whose inflationary impact degree of CBA would mitigate:

- **G**overnment **P**artisanship: left govts more inflationary than right (Higher  $A_g$ )
- **T**rade **E**xposure: more open economies inflation is more costly (Lower  $\alpha$ )
- Inflation Abroad ( $\pi_a$ ): ceteris paribus, inflation abroad generally imported
- **U**nion **P**ower: w/o coordination, leads to lack of wage restraint (Lower  $N_n$ )
- Wage/Price **B**argaining **C**oordination: wage/price restraint (Higher  $N_n$ )
- **F**inancial-Sector Employment-Share: most recent version of epiphenomenality
- **E**lection **Y**ear indicator: added in international extension below.

$$\blacksquare \Rightarrow \mathbf{p}_g(\mathbf{X}_g) = \mathbf{p}_g(GP, EY, UP, BC, AW, FS, TE, \mathbf{p}_a)$$

$$\blacksquare \Rightarrow \mathbf{p}_c(\mathbf{X}_c) = \bar{\mathbf{p}}_c$$

- $\Rightarrow$  3 Competing Empirical Models

- *Standard Linear-Additive Model* (most previous analyses some version of this):

$$E(\mathbf{p}) = \mathbf{B}_0 + \mathbf{b}_{gp} GP + \mathbf{b}_{ey} EY + \mathbf{b}_{up} UP + \mathbf{b}_{bc} BC + \mathbf{b}_{aw} AW + \mathbf{b}_{fs} FS + \mathbf{b}_{te} TE + \mathbf{b}_{pa} \mathbf{p}_a + \mathbf{b}_c C \quad (6)$$

- *Standard Linear-Interactive Model*: each PE factor operates differently on CB and Govt inflation policy:

$$E(\mathbf{p}) = \begin{cases} \mathbf{B}_0 + \mathbf{b}_{gp} GP + \mathbf{b}_{ey} EY + \mathbf{b}_{up} UP + \mathbf{b}_{bc} BC + \mathbf{b}_{aw} AW + \mathbf{b}_{fs} FS + \mathbf{b}_{te} TE + \mathbf{b}_{pa} \mathbf{p}_a + \mathbf{b}_{c2} C + \\ \mathbf{b}_{cgp} C \cdot GP + \mathbf{b}_{cey} C \cdot EY + \mathbf{b}_{cup} C \cdot UP + \mathbf{b}_{cbc} C \cdot BC + \mathbf{b}_{caw} C \cdot AW + \mathbf{b}_{cfs} C \cdot FS + \mathbf{b}_{cte} C \cdot TE + \mathbf{b}_{cpa} C \cdot \mathbf{p}_a \end{cases} \quad (8)$$

- *Theoretically Informed Nonlinear Model*: each PE influence operates only on Govt, not on (hypothetical) fully autonomous & conservative CB:

$$E(\mathbf{p}) = \mathbf{B}_0 + (\mathbf{b}_{gp} GP + \mathbf{b}_{ey} EY + \mathbf{b}_{up} UP + \mathbf{b}_{bc} BC + \mathbf{b}_{aw} AW + \mathbf{b}_{fs} FS + \mathbf{b}_{te} TE + \mathbf{b}_{pa} \mathbf{p}_a) \cdot (1 - \mathbf{b}_{c1} C) + \mathbf{b}_{c1} C \cdot \mathbf{b}_{c2} \quad (7)$$

- Notes regarding these three models:

- (7) and (8) encompass (6); each offers direct test of usual linear-additive
- (7) restricted version of (8); direct test of that set of restrictions exists also
- Many possibilities b/w (8) and (7) exist, other restrictions easily applied. None explored alter the substantive conclusions reached here.

- *A7PS* 1999 showed that (7) substantively and statistically dominates (6) or (8), and demonstrated the many interactive effects it implies.

## Extension: Varying Exchange Regimes & International Financial Exposure

$$\begin{aligned}
 \mathbf{p} = & P \cdot E \cdot C \cdot \mathbf{p}_1(X_1) + P \cdot E \cdot (1 - C) \cdot \mathbf{p}_2(X_2) \\
 & + P \cdot (1 - E) \cdot C \cdot \mathbf{p}_3(X_3) + P \cdot (1 - E) \cdot (1 - C) \cdot \mathbf{p}_4(X_4) \\
 & + (1 - P) \cdot E \cdot C \cdot \mathbf{p}_5(X_5) + (1 - P) \cdot E \cdot (1 - C) \cdot \mathbf{p}_6(X_6) \\
 & + (1 - P) \cdot (1 - E) \cdot C \cdot \mathbf{p}_7(X_7) + (1 - P) \cdot (1 - E) \cdot (1 - C) \cdot \mathbf{p}_8(X_8)
 \end{aligned} \tag{8}$$

- Set-up & Central Conclusion Completely Analogous to above:
  - Inflation effects of E.R. regimes & int'l financial (monetary) exposure generally depend on institutional & structural characteristics of domestic & foreign PE's...
  - & *v. v.*, inflation effects of foreign & domestic PE institutions & structures depend on E.R. regime & international monetary exposure.
- Analysis above assumes domestic authorities retain monetary-policy auton.:

$$\mathbf{p}_7 = \mathbf{p}_c(X_c) = \bar{\mathbf{p}}_c \tag{4}$$

$$\mathbf{p}_8 = \mathbf{p}_g(X_g) = \mathbf{p}_g(GP, EY, UP, BC, AW, FS, TE, \mathbf{p}_a) \tag{5}$$

- Theoretical-ideal of a fully financially exposed (& small) economy,  $E=1$ ,
  - $\Rightarrow$  domestic concerns swamped by international considerations  $\Rightarrow$

$$\begin{aligned}
 \mathbf{p}_1(X_1) = \mathbf{p}_2(X_2) = \mathbf{p}_5(X_5) = \mathbf{p}_6(X_6) = \mathbf{p}_a \\
 \Rightarrow \\
 \mathbf{p} = \begin{cases} E \cdot \mathbf{p}_a + P \cdot (1 - E) \cdot C \cdot \mathbf{p}_3(X_3) + P \cdot (1 - E) \cdot (1 - C) \cdot \mathbf{p}_4(X_4) \\ + (1 - P) \cdot (1 - E) \cdot C \cdot \bar{\mathbf{p}}_c + (1 - P) \cdot (1 - E) \cdot (1 - C) \cdot \mathbf{p}_g(X_g) \end{cases}
 \end{aligned} \tag{6}$$

- Fully effective fixed-exchange-rate regime  $\Leftrightarrow P=1$ ,
  - If pegged to single currency,  $SP=1$ , then  $\pi_p$  = inflation in that country.
  - If pegged to currency-basket,  $MP=1$ , then  $\pi_p$  = basket-wtd-average of inflation.

$$\begin{aligned}
 \mathbf{p}_3(X_3) = \mathbf{p}_4(X_4) = \mathbf{p}_p \\
 \Rightarrow \\
 \mathbf{p} = E \cdot \mathbf{p}_a + P \cdot (1 - E) \cdot \mathbf{p}_p + (1 - P) \cdot (1 - E) \cdot C \cdot \bar{\mathbf{p}}_c + (1 - P) \cdot (1 - E) \cdot (1 - C) \cdot \mathbf{p}_g(X_g)
 \end{aligned} \tag{7}$$

**Expressing these Theoretical Propositions  
in Estimable, Intuitive Reduced Form**

$$\begin{aligned}
 \mathbf{p} = & P \cdot E \cdot C \cdot \mathbf{p}_1(X_1) + P \cdot E \cdot (1 - C) \cdot \mathbf{p}_2(X_2) \\
 & + P \cdot (1 - E) \cdot C \cdot \mathbf{p}_3(X_3) + P \cdot (1 - E) \cdot (1 - C) \cdot \mathbf{p}_4(X_4) \\
 & + (1 - P) \cdot E \cdot C \cdot \mathbf{p}_5(X_5) + (1 - P) \cdot E \cdot (1 - C) \cdot \mathbf{p}_6(X_6) \\
 & + (1 - P) \cdot (1 - E) \cdot C \cdot \mathbf{p}_7(X_7) + (1 - P) \cdot (1 - E) \cdot (1 - C) \cdot \mathbf{p}_8(X_8)
 \end{aligned} \tag{8}$$

- Very simple (not too contentious?) contentions applied to **(16)**  $\Rightarrow$  much-reduced empirical form to estimate, yet gets all/most the substance:

$$\begin{aligned}
 \mathbf{p} = & E \cdot \mathbf{p}_a + (1 - E) \cdot \left\{ P \cdot \mathbf{p}_p + (1 - P) \cdot \left[ C \cdot \overline{\mathbf{p}_c} + (1 - C) \cdot \mathbf{p}_g(X_g) \right] \right\} \\
 \Rightarrow & \\
 \frac{\mathcal{I}\mathbf{p}}{\mathcal{I}E} = & \mathbf{p}_a(P^*, E^*, C^*, X^*, \mathbf{p}_a^*) - \left\{ P \cdot \mathbf{p}_p(P^*, E^*, C^*, X^*, \mathbf{p}_p^*) + (1 - P) \cdot \left[ C \cdot \overline{\mathbf{p}_c} + (1 - C) \cdot \mathbf{p}_g(X_g) \right] \right\} \\
 \frac{\mathcal{I}\mathbf{p}}{\mathcal{I}P} = & (1 - E) \cdot \left\{ \mathbf{p}_p(P^*, E^*, C^*, X^*, \mathbf{p}_p^*) - \left[ C \cdot \overline{\mathbf{p}_c} + (1 - C) \cdot \mathbf{p}_g(X_g) \right] \right\} \\
 \frac{\mathcal{I}\mathbf{p}}{\mathcal{I}C} = & (1 - E) \cdot \left\{ (1 - P) \cdot \left[ \overline{\mathbf{p}_c} - \mathbf{p}_g(X_g) \right] \right\} \\
 \frac{\mathcal{I}\mathbf{p}}{\mathcal{I}x} = & (1 - E) \cdot \left\{ (1 - P) \cdot \left[ (1 - C) \cdot \frac{\mathcal{I}\mathbf{p}_g}{\mathcal{I}x} \right] \right\} \\
 \frac{\mathcal{I}\mathbf{p}}{\mathcal{I}z^*} = & E \cdot \frac{\mathcal{I}\mathbf{p}_a}{\mathcal{I}z^*} + (1 - E) \cdot \left\{ P \cdot \frac{\mathcal{I}\mathbf{p}_p}{\mathcal{I}z^*} + (1 - P) \cdot \left[ (1 - C) \cdot \frac{\mathcal{I}\mathbf{p}_g}{\mathcal{I}\mathbf{p}_a} \cdot \frac{\mathcal{I}\mathbf{p}_a}{\mathcal{I}z^*} \right] \right\}
 \end{aligned} \tag{9}$$

- Note that (17) is implicitly recursive and highly interactive:
  - Domestic-inflation effect of domestic & foreign E.R. regimes, P & P\*, degrees of int'l exposure, E & E\*, and of CBA, C & C\*, and many other PE conditions, X<sub>g</sub> & X<sub>g</sub>\*, all generally depend on each others' levels.

## Alternative Empirical Models of Central Conclusion

- Domestic-inflation effect of P, E, C, and each element of X generally depends on P, E, C, and perhaps the other X at home and abroad.

Assume:  $\mathbf{p}_g = f(GP, EY, UP, BC, AW, FS, TE, \mathbf{p}_a) \equiv f(X_g)$  is linear.

- **Standard Linear-Additive Model:**

$$E(\mathbf{p}) = B_0 + \mathbf{b}_{gp} GP + \mathbf{b}_{ey} EY + \mathbf{b}_{up} UP + \mathbf{b}_{bc} BC + \mathbf{b}_{aw} AW + \mathbf{b}_{fs} FS + \mathbf{b}_e TE + \mathbf{b}_{pa} \mathbf{p}_a + \mathbf{b}_c C + \mathbf{b}_{sp} SP + \mathbf{b}_{mp} MP + \mathbf{b}_e E \quad (12)$$

- **Fully Interactive:** the effect of each factor depends on the configuration all the others  $\Rightarrow 2^k$  terms (coefficient-estimates) required! (2048 terms in this case!)
- **Pairwise Interactive:** the effect of each factor depends on each of the others but not the combinations of the others  
 $\Rightarrow N!/(2!(N-2)!)$  terms (coefficients) required! (55 terms in this case!)
- **Hybrid Based on (16):** the effect of each factor to which political authorities would respond,  $X_g$ , depends on the configuration of P, E, and C  
 $\Rightarrow 2 \cdot 2 \cdot 2 \cdot 8 = 64$  terms (coefficients) required!

$$E(\mathbf{p}) = B_0 + \left\{ \begin{array}{l} E \cdot P \cdot C \cdot [\mathbf{b}_{gp1} GP + \mathbf{b}_{ey1} EY + \mathbf{b}_{up1} UP + \mathbf{b}_{bc1} BC + \mathbf{b}_{aw1} AW + \mathbf{b}_{fs1} FS + \mathbf{b}_{te1} TE + \mathbf{b}_{pa1} \mathbf{p}_a] \\ E \cdot P \cdot (1-C) \cdot [\mathbf{b}_{gp2} GP + \mathbf{b}_{ey2} EY + \mathbf{b}_{up2} UP + \mathbf{b}_{bc2} BC + \mathbf{b}_{aw2} AW + \mathbf{b}_{fs2} FS + \mathbf{b}_{te2} TE + \mathbf{b}_{pa2} \mathbf{p}_a] \\ E \cdot (1-P) \cdot C \cdot [\mathbf{b}_{gp3} GP + \mathbf{b}_{ey3} EY + \mathbf{b}_{up3} UP + \mathbf{b}_{bc3} BC + \mathbf{b}_{aw3} AW + \mathbf{b}_{fs3} FS + \mathbf{b}_{te3} TE + \mathbf{b}_{pa3} \mathbf{p}_a] \\ (1-E) \cdot P \cdot C \cdot [\mathbf{b}_{gp4} GP + \mathbf{b}_{ey4} EY + \mathbf{b}_{up4} UP + \mathbf{b}_{bc4} BC + \mathbf{b}_{aw4} AW + \mathbf{b}_{fs4} FS + \mathbf{b}_{te4} TE + \mathbf{b}_{pa4} \mathbf{p}_a] \\ (1-E) \cdot (1-P) \cdot C \cdot [\mathbf{b}_{gp5} GP + \mathbf{b}_{ey5} EY + \mathbf{b}_{up5} UP + \mathbf{b}_{bc5} BC + \mathbf{b}_{aw5} AW + \mathbf{b}_{fs5} FS + \mathbf{b}_{te5} TE + \mathbf{b}_{pa5} \mathbf{p}_a] \\ (1-E) \cdot P \cdot (1-C) \cdot [\mathbf{b}_{gp6} GP + \mathbf{b}_{ey6} EY + \mathbf{b}_{up6} UP + \mathbf{b}_{bc6} BC + \mathbf{b}_{aw6} AW + \mathbf{b}_{fs6} FS + \mathbf{b}_{te6} TE + \mathbf{b}_{pa6} \mathbf{p}_a] \\ E \cdot (1-P) \cdot (1-C) \cdot [\mathbf{b}_{gp7} GP + \mathbf{b}_{ey7} EY + \mathbf{b}_{up7} UP + \mathbf{b}_{bc7} BC + \mathbf{b}_{aw7} AW + \mathbf{b}_{fs7} FS + \mathbf{b}_{te7} TE + \mathbf{b}_{pa7} \mathbf{p}_a] \\ (1-E) \cdot (1-P) \cdot (1-C) \cdot [\mathbf{b}_{gp8} GP + \mathbf{b}_{ey8} EY + \mathbf{b}_{up8} UP + \mathbf{b}_{bc8} BC + \mathbf{b}_{aw8} AW + \mathbf{b}_{fs8} FS + \mathbf{b}_{te8} TE + \mathbf{b}_{pa8} \mathbf{p}_a] \end{array} \right. \quad (13)$$

- In each case, ignoring SP/MP complication, excluding constants and time-serial controls (and their effects could vary too!).

- Model employing theoretically derived restrictions on (16) expressed in (17):

$$E(\mathbf{p}) = B_0 + \mathbf{b}_e E \cdot \mathbf{b}_a \cdot \mathbf{p}_a + (1 - \mathbf{b}_e E) \left\{ \begin{array}{l} \left[ \left( \mathbf{b}_{gp} GP + \mathbf{b}_{ey} EY + \mathbf{b}_{up} UP + \mathbf{b}_{bc} BC + \mathbf{b}_{aw} AW + \mathbf{b}_{fs} FS + \mathbf{b}_{te} TE + \mathbf{b}_{pg} \mathbf{p}_a \right) \right] \\ \cdot (1 - \mathbf{b}_{c1} C) + \mathbf{b}_{c1} C \cdot \mathbf{b}_{c2} \\ \cdot (1 - \mathbf{b}_{sp} SP - \mathbf{b}_{mp} MP) + \mathbf{b}_{sp} SP \cdot \mathbf{b}_a \cdot \mathbf{p}_{sp} + \mathbf{b}_{mp} MP \cdot \mathbf{b}_a \cdot \mathbf{p}_{mp} \end{array} \right\} \quad (14)$$

- Only 14 (!) Unique Coefficients (plus a constant and time-serial controls),
- Each with Intuitive Substantive Meaning
  - E.g.,  $\beta_{sp}$  and  $\beta_{mp}$  are the estimated degrees to which SP's and MP's bind.
  - $\beta_{c1}$  is the degree to which each unit increase in CB conservatism and autonomy mutes the inflation effects of variables to which domestic governments would have responded *when domestic authorities control inflation* (i.e., when  $P=E=0$ ).
  - $\beta_{e1}$  is degree to which international exposure constrains domestic authorities and/or their hopes for an exchange-rate peg from determining domestic inflation.
  - $[\beta_0 + \beta_{c2}] / (1 - \rho)$  is estimated constant inflation-target of (hypothetical) fully autonomous and conservative CB.
  - Other  $\beta_x$  simply reflect inflation response to  $x$  when domestic governments completely control domestic inflation-policies.

- Empirical Results:

**Table 1: Alternative Models of Inflation in 21 OECD Democracies, 1957-90**

Independent Variable	Linear-Additive Model (12)	Linear-Interactive Model (13)								Theory-Informed Model (14)	
		<i>P=1</i>	<i>P=0</i>	<i>P=1</i>	<i>P=0</i>	<i>P=1</i>	<i>P=0</i>	<i>P=1</i>	<i>P=0</i>		
		<i>E=1</i>	<i>E=1</i>	<i>E=0</i>	<i>E=0</i>	<i>E=1</i>	<i>E=1</i>	<i>E=0</i>	<i>E=0</i>		
		<i>C=1</i>	<i>C=1</i>	<i>C=1</i>	<i>C=1</i>	<i>C=0</i>	<i>C=0</i>	<i>C=0</i>	<i>C=0</i>		
Intercept	+0.80 (6.1)	+5.93 (8.40)								+0.53 (.30)	
$\pi_{t-1}$	<b>+0.65</b> (.05)	<b>+0.51</b> (.06)								+0.55 (.05)	
$\pi_{t-2}$	-0.03 (.04)	<b>-0.10</b> (.04)								-0.12 (.04)	
$X_g$ (The factors to which domestic governments respond)	GP	<b>-0.14</b> (.08)	+0.39 (.80)	-0.09 (1.29)	<b>-0.37</b> (1.31)	-1.37 (8.16)	-0.15 (.47)	-0.30 (.97)	<b>+1.82</b> (.74)	-0.39 (4.68)	<b>-0.60</b> (.30)
	EY	<b>+0.59</b> (.30)	+0.75 (.80)	-2.06 (2.31)	+0.50 (3.07)	-0.88 (14.67)	-2.31 (1.56)	<b>+6.03</b> (3.46)	+1.87 (1.81)	+3.81 (6.88)	<b>+2.60</b> (1.32)
	UP	<b>+2.19</b> (.74)	<b>-16.59</b> (6.43)	+9.51 (17.42)	-3.82 (13.91)	-2.46 (59.24)	<b>+33.95</b> (7.64)	+2.44 (15.92)	-11.88 (13.56)	-3.32 (37.49)	<b>+16.2</b> (4.61)
	BC	<b>-1.36</b> (.41)	+4.38 (3.50)	<b>+11.27</b> (5.33)	+6.02 (4.91)	-39.11 (30.32)	<b>-15.61</b> (3.97)	-11.69 (9.79)	+2.20 (3.86)	+9.27 (23.64)	<b>-10.7</b> (2.35)
	AW	+0.13 (.71)	-0.76 (1.15)	-2.37 (1.51)	+1.94 (1.43)	<b>+13.70</b> (5.37)	-0.56 (1.10)	-0.66 (1.38)	-2.24 (1.91)	-3.43 (2.35)	<b>+1.18</b> (.49)
	FS	<b>-0.15</b> (.10)	<b>-0.86</b> (.36)	<b>+2.00</b> (.96)	<b>+2.11</b> (.79)	<b>-11.13</b> (4.61)	+0.55 (.36)	-1.64 (1.26)	-1.00 (.71)	+4.63 (3.90)	<b>-1.09</b> (.30)
	TE	-0.04 (.99)	<b>+31.74</b> (14.33)	<b>-50.21</b> (25.31)	-54.49 (39.85)	+50.81 (176.99)	<b>-37.33</b> (14.87)	<b>+104.56</b> (30.40)	+48.70 (33.74)	-120.5 (103.79)	<b>-8.23</b> (4.92)
	$\pi_a$	<b>+0.39</b> (.07)	+0.24 (.14)	<b>+0.89</b> (.52)	-0.07 (.59)	-4.01 (3.94)	<b>+0.89</b> (.31)	+0.18 (.78)	<b>+0.98</b> (.33)	+2.65 (2.58)	<b>+0.64</b> (.24)
E	+0.29 (.75)	—								<b>+0.44</b> (.14)	
SP	-0.33 (.49)	—								<b>+1.04</b> (.05)	
MP	-0.37 (.38)	—								+0.22 (.12)	
$\pi_{sp}, \pi_{mp}, \pi_a$	—	—								+0.59 (.07)	
C	<b>-1.62</b> (.68)	—								<b>+1.03</b> (.11)	
$\bar{p}_c$	—	—								<b>-0.59</b> (1.18)	
Obs. ( <sup>o</sup> Free)	<b>660 (645)</b>	<b>660 (593)</b>								<b>660 (643)</b>	
$\bar{R}^2$ (S.E.R.)	<b>.72 (2.48)</b>	<b>.75 (2.31)</b>								<b>.76 (2.30)</b>	
D-W	<b>1.91</b>	<b>2.03</b>								<b>1.96</b>	

**NOTES:** Estimation by NLS or OLS with Newey-West robust variance-covariance matrix. Standard errors in parentheses. Coefficients significant at the .10 level or better in bold; coefficients of implausible sign or magnitude in italics.

- Model Results:

$$E(\mathbf{p}) \approx \left\{ \begin{array}{l} .53^{.30} + .55^{.05} \mathbf{p}_{t-1} - .12^{.04} \mathbf{p}_{t-2} + .44^{.14} E \cdot \mathbf{p}_a + \\ (1 - .44^{.14} E) \cdot \left\{ \begin{array}{l} 1.0^{.05} SP \cdot .59^{.07} \mathbf{p}_{sp} + .22^{.12} MP \cdot .59^{.07} \mathbf{p}_{mp} + \\ (1 - 1.0^{.05} SP - .22^{.12} MP) \cdot \left[ \begin{array}{l} 1.0^{.11} C \cdot (-.59^{1.2}) + \\ (1 - 1.0^{.11} C) \cdot \left( \begin{array}{l} -.60^{.30} GP + 2.6^{1.3} EY + 16^{4.6} UP - 11^{2.4} BC \\ + 1.2^{.49} AW - 1.1^{.30} FS - 8.2^{4.9} TE + .64^{.24} \mathbf{p}_a \end{array} \right) \end{array} \right] \end{array} \right\} \end{array} \right\} \quad (15)$$

- So, e.g., the evidence indicates that each extra .1 on Quinn index (rescaled 0-1) of international financial exposure reduce domestic inflation-autonomy  $4.4 \pm \%$ .
- Subject to that restraint, multi-country pegs constrain domestic authorities about 22% further, while single-country pegs seem remarkably effective, fully constraining domestic authorities from responding to domestic conditions (to the remaining degree that E has not already so constrained them).
- Central bank autonomy reduces political-economic influences on inflation at the rate of 10% for each .1 CBA. (e.g., US-Switz.-Germ. ascending  $+1 \pm$  series)
- Each of these imply a series of interactive effects.

⇒ Effect of peg generally depends on C, E,  $\pi_p$ , and all other elements of X. Through  $\pi_p$ , it also depends on peg-country values of all these factors.

- Examples:

- $E\left(\frac{d\mathbf{p}}{dx}\right) = (1 - .44E) \cdot \{(1 - SP - .22MP) \cdot [(1 - C) \cdot b_x]\}$
- $E\left(\frac{d\mathbf{p}}{dC}\right) = (1 - .44 \cdot E) \cdot \{(1 - b_p P) \cdot [(.6GP - 2.6EY - 16UP + 11BC - 1.2AW + 1.1FS + 8.2TE - .64\mathbf{p}_a) - .59]\}$
- $E\left(\frac{d\mathbf{p}}{dP}\right) = (1 - .44E) \cdot b_p \cdot \{.59\mathbf{p}_p - [(1 - C) \cdot (-.6GP + 2.6EY + 16UP - 11BC + 1.2AW - 1.1FS - 8.2TE + .64\mathbf{p}_a) - .59C]\}$
- $E\left(\frac{d\mathbf{p}}{dE}\right) = .44 \cdot (\mathbf{p}_a - \{b_p P \cdot .59\mathbf{p}_p + (1 - b_p P) \cdot [(1 - C) \cdot (-.6GP + 2.6EY + 16UP - 11BC + 1.2AW - 1.1FS - 8.2TE + .64\mathbf{p}_a) - .59C]\})$

- Further graphics and tables may also help:

**Table 3: Estimated Immediate Domestic-Inflation Effect of the Political-Economic Conditions to Which Government Respond, as a Function of CBA, E, and P**

		<i>E=0.40</i>			<i>E=0.65</i>			<i>E=0.90</i>		
		<i>SP=MP=0</i>	<i>MP=1</i>	<i>SP=1</i>	<i>SP=MP=0</i>	<i>MP=1</i>	<i>SP=1</i>	<i>SP=MP=0</i>	<i>MP=1</i>	<i>SP=1</i>
<b>Estimated Impact of 1-Unit Rightward Shift in Government Partisanship (<math>d\pi/dGP</math>)</b>										
<i>CBA =</i>	<i>0.26</i>	-0.359 <sup>.17</sup>	-0.281 <sup>.15</sup>	-0.000 <sup>.02</sup>	-0.311 <sup>.15</sup>	-0.243 <sup>.13</sup>	-0.000 <sup>.02</sup>	-0.262 <sup>.12</sup>	-0.206 <sup>.11</sup>	-0.000 <sup>.01</sup>
	<i>0.46</i>	-0.257 <sup>.12</sup>	-0.202 <sup>.10</sup>	-0.000 <sup>.01</sup>	-0.223 <sup>.10</sup>	-0.174 <sup>.09</sup>	-0.000 <sup>.01</sup>	-0.188 <sup>.09</sup>	-0.147 <sup>.08</sup>	-0.000 <sup>.01</sup>
	<i>0.66</i>	-0.156 <sup>.07</sup>	-0.122 <sup>.06</sup>	-0.000 <sup>.01</sup>	-0.135 <sup>.06</sup>	-0.106 <sup>.05</sup>	-0.000 <sup>.01</sup>	-0.114 <sup>.05</sup>	-0.089 <sup>.05</sup>	-0.000 <sup>.01</sup>
<b>Estimated Impact of a Post-Election Year (<math>d\pi/dEY</math>)</b>										
<i>CBA=</i>	<i>0.26</i>	+1.563 <sup>.79</sup>	+1.224 <sup>.61</sup>	+0.000 <sup>.09</sup>	+1.352 <sup>.69</sup>	+1.059 <sup>.53</sup>	+0.000 <sup>.07</sup>	+1.142 <sup>.60</sup>	+0.894 <sup>.47</sup>	+0.000 <sup>.06</sup>
	<i>0.46</i>	+1.120 <sup>.57</sup>	+0.877 <sup>.44</sup>	+0.000 <sup>.06</sup>	+0.970 <sup>.50</sup>	+0.759 <sup>.39</sup>	+0.000 <sup>.05</sup>	+0.819 <sup>.44</sup>	+0.641 <sup>.34</sup>	+0.000 <sup>.05</sup>
	<i>0.66</i>	+0.678 <sup>.37</sup>	+0.531 <sup>.29</sup>	+0.000 <sup>.04</sup>	+0.587 <sup>.32</sup>	+0.459 <sup>.25</sup>	+0.000 <sup>.03</sup>	+0.495 <sup>.28</sup>	+0.388 <sup>.22</sup>	+0.000 <sup>.03</sup>
<b>Estimated Impact of 10% Increase in Union Density (<math>0.1 \cdot d\pi/dUP</math>)</b>										
<i>CBA=</i>	<i>0.26</i>	+0.98 <sup>.25</sup>	+0.76 <sup>.18</sup>	+0.00 <sup>.05</sup>	+0.84 <sup>.21</sup>	+0.66 <sup>.16</sup>	+0.00 <sup>.04</sup>	+0.71 <sup>.19</sup>	+0.56 <sup>.14</sup>	+0.00 <sup>.04</sup>
	<i>0.46</i>	+0.70 <sup>.18</sup>	+0.55 <sup>.13</sup>	+0.00 <sup>.04</sup>	+0.61 <sup>.15</sup>	+0.47 <sup>.11</sup>	+0.00 <sup>.03</sup>	+0.51 <sup>.14</sup>	+0.40 <sup>.10</sup>	+0.00 <sup>.03</sup>
	<i>0.66</i>	+0.42 <sup>.13</sup>	+0.33 <sup>.10</sup>	+0.00 <sup>.02</sup>	+0.37 <sup>.11</sup>	+0.29 <sup>.08</sup>	+0.00 <sup>.02</sup>	+0.31 <sup>.10</sup>	+0.24 <sup>.08</sup>	+0.00 <sup>.02</sup>
<b>Estimated Impact of 0.25 Increase in Bargaining Coordination (<math>0.25 \cdot d\pi/dBC</math>)</b>										
<i>CBA=</i>	<i>0.26</i>	-1.61 <sup>.30</sup>	-1.26 <sup>.21</sup>	-0.00 <sup>.08</sup>	-1.39 <sup>.26</sup>	-1.09 <sup>.19</sup>	-0.00 <sup>.07</sup>	-1.17 <sup>.25</sup>	-0.92 <sup>.19</sup>	-0.00 <sup>.06</sup>
	<i>0.46</i>	-1.15 <sup>.20</sup>	-0.90 <sup>.15</sup>	-0.00 <sup>.06</sup>	-1.00 <sup>.18</sup>	-0.78 <sup>.13</sup>	-0.00 <sup>.05</sup>	-0.84 <sup>.18</sup>	-0.66 <sup>.14</sup>	-0.00 <sup>.04</sup>
	<i>0.66</i>	-0.70 <sup>.15</sup>	-0.55 <sup>.12</sup>	-0.00 <sup>.03</sup>	-0.60 <sup>.13</sup>	-0.47 <sup>.11</sup>	-0.00 <sup>.03</sup>	-0.51 <sup>.13</sup>	-0.40 <sup>.10</sup>	-0.00 <sup>.03</sup>
<b>Estimated Impact of Unit Increase in ln(real GDP per Capita) (<math>d\pi/dAW</math>)</b>										
<i>CBA=</i>	<i>0.26</i>	+0.71 <sup>.27</sup>	+0.56 <sup>.20</sup>	+0.00 <sup>.04</sup>	+0.62 <sup>.23</sup>	+0.48 <sup>.17</sup>	+0.00 <sup>.03</sup>	+0.52 <sup>.20</sup>	+0.41 <sup>.15</sup>	+0.00 <sup>.03</sup>
	<i>0.46</i>	+0.51 <sup>.20</sup>	+0.40 <sup>.15</sup>	+0.00 <sup>.03</sup>	+0.44 <sup>.17</sup>	+0.35 <sup>.12</sup>	+0.00 <sup>.02</sup>	+0.37 <sup>.14</sup>	+0.29 <sup>.11</sup>	+0.00 <sup>.02</sup>
	<i>0.66</i>	+0.31 <sup>.13</sup>	+0.24 <sup>.10</sup>	+0.00 <sup>.02</sup>	+0.27 <sup>.11</sup>	+0.21 <sup>.08</sup>	+0.00 <sup>.01</sup>	+0.23 <sup>.09</sup>	+0.18 <sup>.07</sup>	+0.00 <sup>.01</sup>
<b>Estimated Impact of 1% Increase in Financial-Sector Employment-Share (<math>d\pi/dFS</math>)</b>										
<i>CBA=</i>	<i>0.26</i>	-0.66 <sup>.18</sup>	-0.52 <sup>.12</sup>	-0.00 <sup>.03</sup>	-0.57 <sup>.16</sup>	-0.45 <sup>.11</sup>	-0.00 <sup>.03</sup>	-0.48 <sup>.15</sup>	-0.38 <sup>.11</sup>	-0.00 <sup>.03</sup>
	<i>0.46</i>	-0.47 <sup>.13</sup>	-0.37 <sup>.09</sup>	-0.00 <sup>.02</sup>	-0.41 <sup>.12</sup>	-0.32 <sup>.08</sup>	-0.00 <sup>.02</sup>	-0.35 <sup>.11</sup>	-0.27 <sup>.08</sup>	-0.00 <sup>.02</sup>
	<i>0.66</i>	-0.29 <sup>.10</sup>	-0.22 <sup>.07</sup>	-0.00 <sup>.01</sup>	-0.25 <sup>.09</sup>	-0.19 <sup>.06</sup>	-0.00 <sup>.01</sup>	-0.21 <sup>.08</sup>	-0.16 <sup>.06</sup>	-0.00 <sup>.01</sup>
<b>Estimated Impact of 10% Increase in Trade Exposure (<math>.1 \cdot d\pi/dTE</math>)</b>										
<i>CBA=</i>	<i>0.26</i>	-0.50 <sup>.28</sup>	-0.39 <sup>.19</sup>	-0.00 <sup>.03</sup>	-0.43 <sup>.23</sup>	-0.34 <sup>.16</sup>	-0.00 <sup>.02</sup>	-0.36 <sup>.19</sup>	-0.28 <sup>.14</sup>	-0.00 <sup>.02</sup>
	<i>0.46</i>	-0.36 <sup>.19</sup>	-0.28 <sup>.13</sup>	-0.00 <sup>.02</sup>	-0.31 <sup>.16</sup>	-0.24 <sup>.11</sup>	-0.00 <sup>.02</sup>	-0.26 <sup>.14</sup>	-0.20 <sup>.09</sup>	-0.00 <sup>.01</sup>
	<i>0.66</i>	-0.22 <sup>.11</sup>	-0.17 <sup>.08</sup>	-0.00 <sup>.01</sup>	-0.19 <sup>.10</sup>	-0.15 <sup>.07</sup>	-0.00 <sup>.01</sup>	-0.16 <sup>.08</sup>	-0.12 <sup>.06</sup>	-0.00 <sup>.01</sup>
<b>Estimated Impact of 1% Increase in Average Inflation Abroad (<math>d\pi/d\pi_a</math>)</b>										
<i>CBA=</i>	<i>0.26</i>	+0.49 <sup>.14</sup>	+0.41 <sup>.13</sup>	+0.11 <sup>.05</sup>	+0.50 <sup>.12</sup>	+0.43 <sup>.11</sup>	+0.17 <sup>.07</sup>	+0.52 <sup>.10</sup>	+0.46 <sup>.10</sup>	+0.24 <sup>.09</sup>
	<i>0.46</i>	+0.38 <sup>.10</sup>	+0.32 <sup>.09</sup>	+0.11 <sup>.04</sup>	+0.41 <sup>.08</sup>	+0.36 <sup>.08</sup>	+0.17 <sup>.06</sup>	+0.44 <sup>.08</sup>	+0.39 <sup>.08</sup>	+0.24 <sup>.08</sup>
	<i>0.66</i>	+0.27 <sup>.06</sup>	+0.24 <sup>.06</sup>	+0.11 <sup>.04</sup>	+0.32 <sup>.06</sup>	+0.28 <sup>.06</sup>	+0.17 <sup>.06</sup>	+0.36 <sup>.06</sup>	+0.33 <sup>.06</sup>	+0.24 <sup>.08</sup>

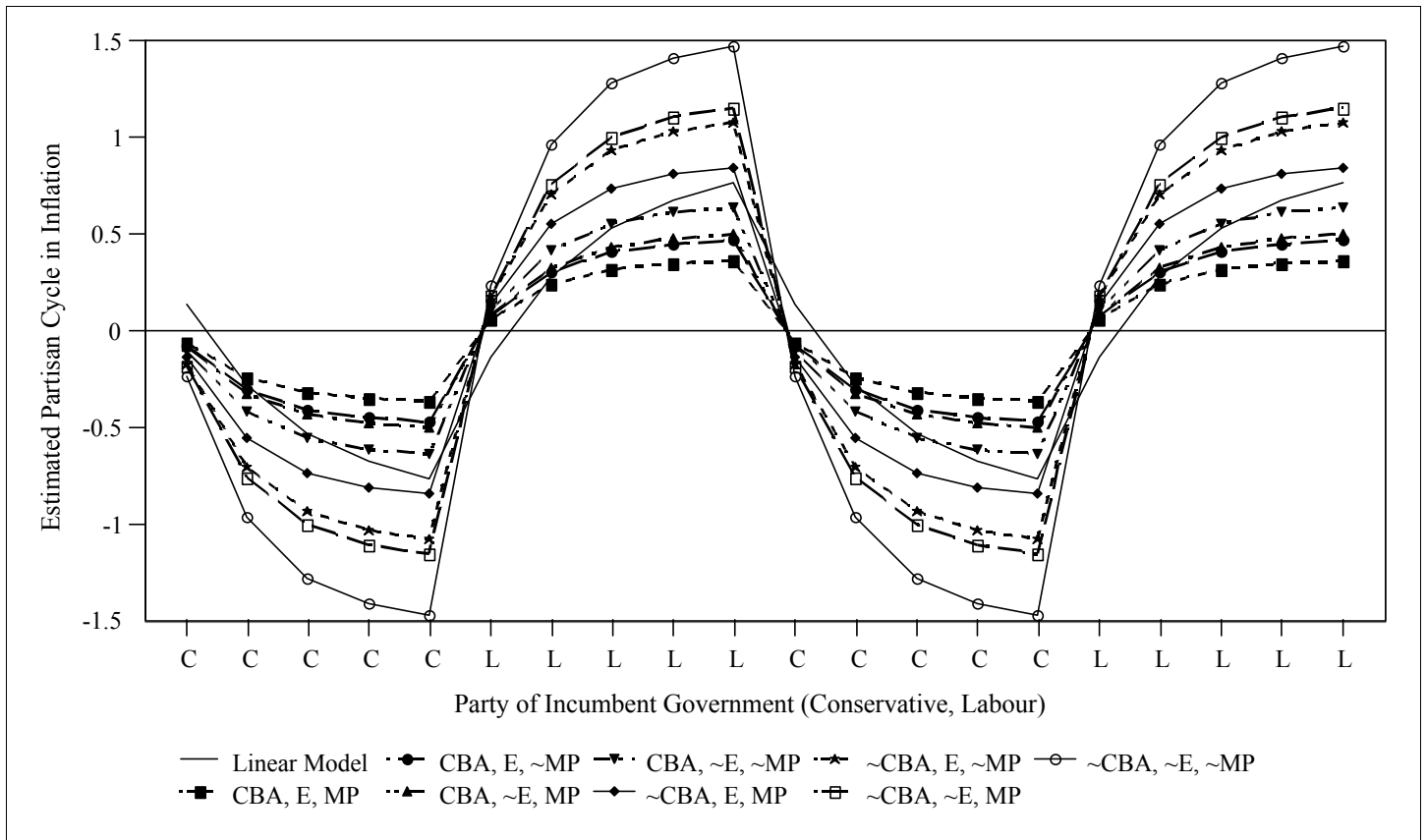
NOTES: Standard errors noted in superscripts.<sup>1</sup>

**Table 2: Estimated Immediate Effect of .1 Increase in CBA as a Function of E, P, and  $\pi(X_g)$**

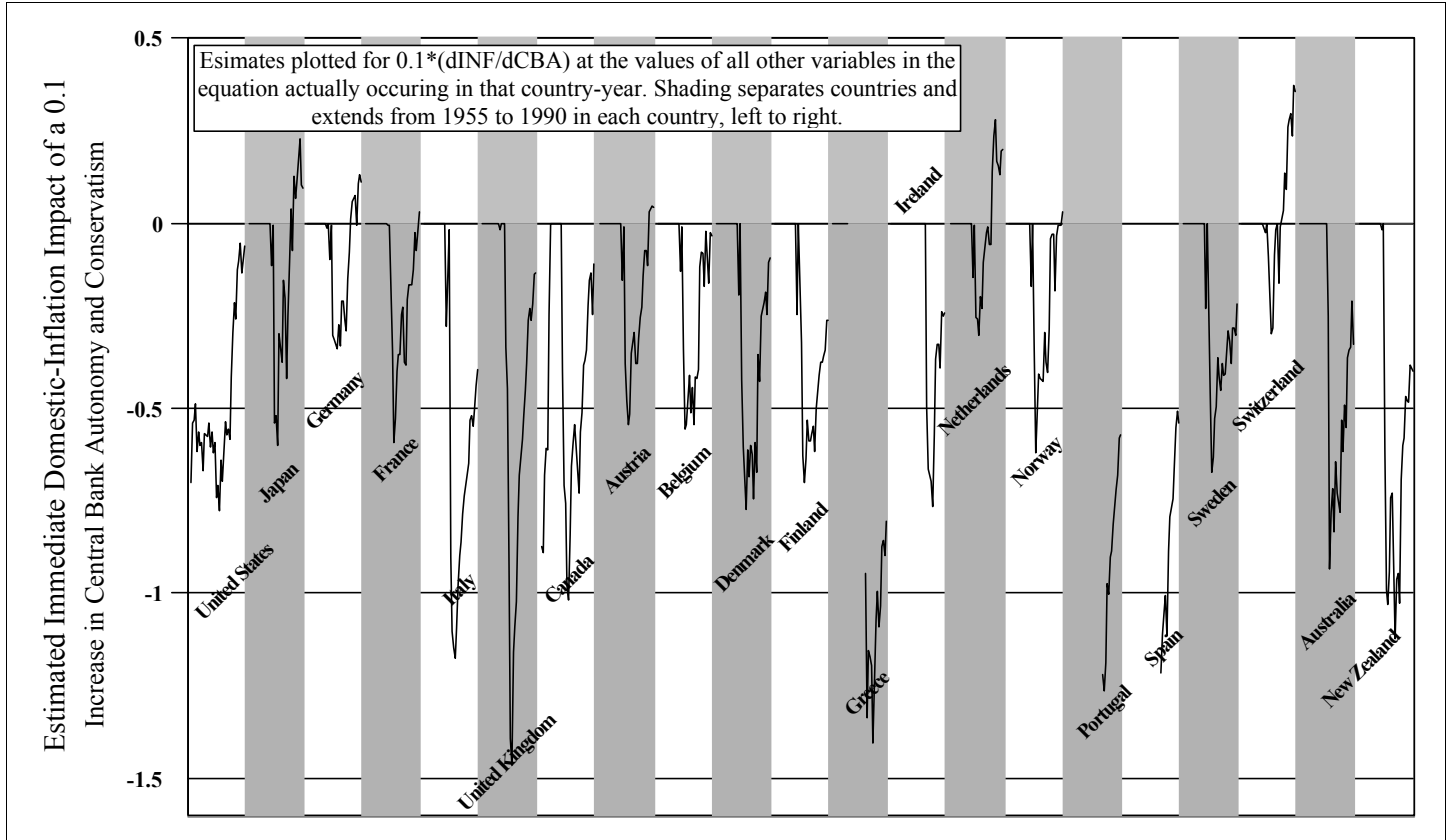
Inflation Under Full Domestic Government Control [ $\pi(X_g)$ ]		$\pi(X_g) = 2.00$			$\pi(X_g) = 6.00$			$\pi(X_g) = 10.00$		
		0.40	0.65	0.90	0.40	0.65	0.90	0.40	0.65	0.90
Exchange-Rate Regime [P]	SP=1	-0.00 <sup>.01</sup>	-0.00 <sup>.01</sup>	-0.00 <sup>.01</sup>	-0.00 <sup>.01</sup>	-0.00 <sup>.01</sup>	-0.00 <sup>.01</sup>	-0.00 <sup>.01</sup>	-0.00 <sup>.01</sup>	-0.00 <sup>.01</sup>
	MP=1	-0.17 <sup>.07</sup>	-0.15 <sup>.05</sup>	-0.12 <sup>.04</sup>	-0.43 <sup>.08</sup>	-0.37 <sup>.06</sup>	-0.31 <sup>.06</sup>	-0.68 <sup>.11</sup>	-0.59 <sup>.10</sup>	-0.50 <sup>.10</sup>
	SP=MP=0	-0.21 <sup>.09</sup>	-0.19 <sup>.07</sup>	-0.16 <sup>.05</sup>	-0.54 <sup>.07</sup>	-0.47 <sup>.05</sup>	-0.40 <sup>.05</sup>	-0.87 <sup>.06</sup>	-0.76 <sup>.06</sup>	-0.64 <sup>.09</sup>

NOTES: Standard errors noted in superscripts.

<sup>1</sup> Standard errors for all conditional effects reported derived from  $a/f$  where  $f$  is the square root of the F-statistic for the Wald test that the effect is zero and  $a$  is the estimated effect



**Figure 8:** Estimated Partisan Cycles in the Linear & Theoretically Informed Models at High & Low CBA, E, & MP



**Figure 9:** Estimated Immediate Domestic-Inflation Impact of 0.1 Increase in CBA in 21 Countries, 1957-90

**Table 4: Estimated Domestic-Inflation Impact of a Single-Country Exchange-Rate Peg (SP) as a Function of the Difference between Domestic and Peg-Country Inflation and of E**

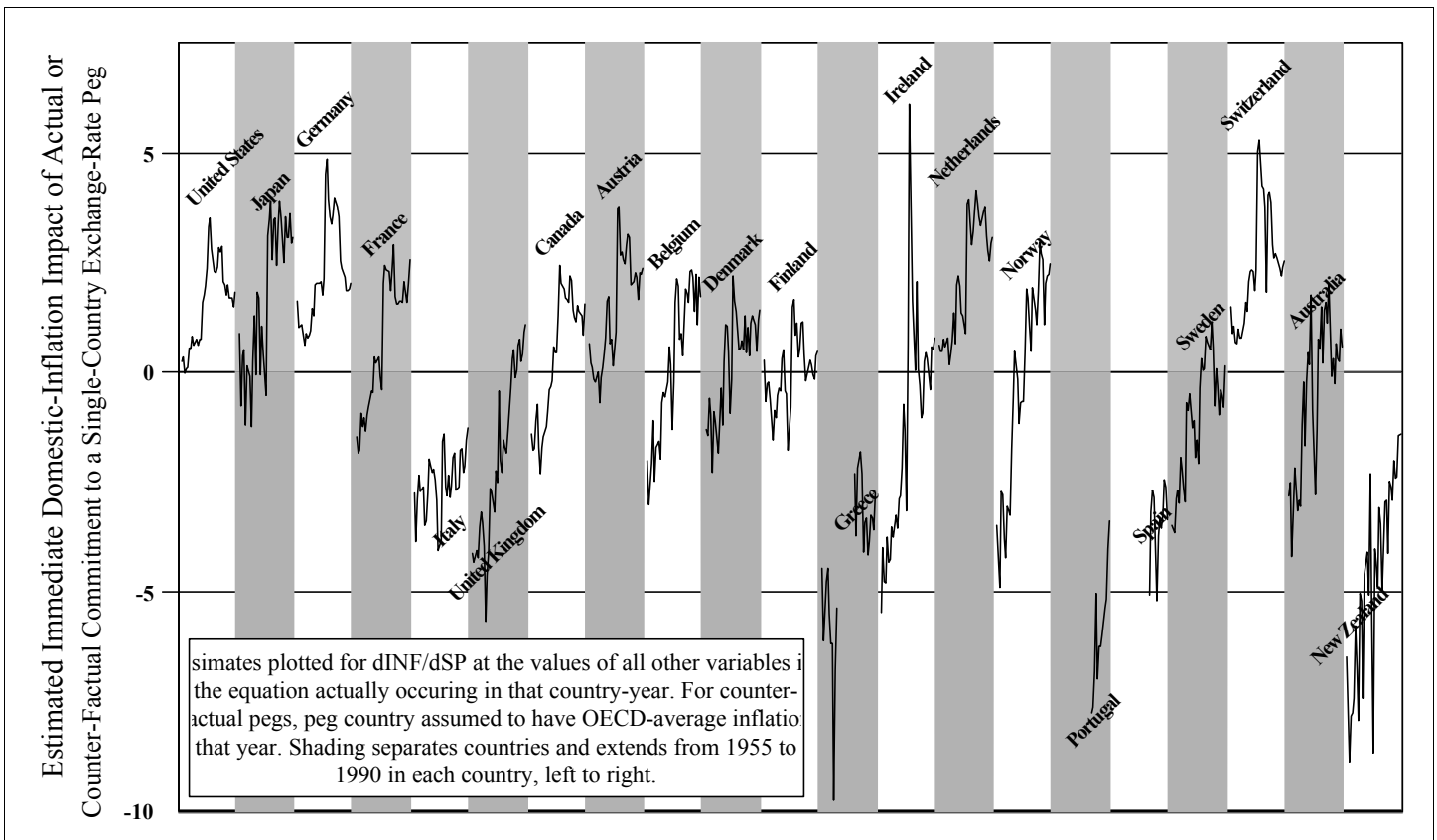
		<i>E</i> =.40			<i>E</i> =.65			<i>E</i> =.90		
$\pi(C, X_g) =$		2	6	10	2	6	10	2	6	0
$\pi_p(Z_p^*) =$	2	-0.67 <sup>.14</sup>	-3.96 <sup>.41</sup>	-7.25 <sup>.71</sup>	-0.58 <sup>.14</sup>	-3.43 <sup>.53</sup>	-6.28 <sup>.96</sup>	-0.49 <sup>.15</sup>	-2.90 <sup>.68</sup>	-5.30 <sup>1.2</sup>
	6	+1.29 <sup>.41</sup>	-2.01 <sup>.43</sup>	-5.30 <sup>.66</sup>	+1.11 <sup>.34</sup>	-1.74 <sup>.42</sup>	-4.59 <sup>.78</sup>	+0.94 <sup>.34</sup>	-1.47 <sup>.44</sup>	-3.87 <sup>.94</sup>
	10	+3.24 <sup>.71</sup>	-0.05 <sup>.60</sup>	-3.34 <sup>.72</sup>	+2.81 <sup>.64</sup>	-0.04 <sup>.52</sup>	-2.89 <sup>.70</sup>	+2.37 <sup>.69</sup>	-0.04 <sup>.44</sup>	-2.44 <sup>.73</sup>

NOTES: Standard errors, in superscripts, assume hypothetical  $\pi_p$  and  $\pi(C, X_g)$  known without error.

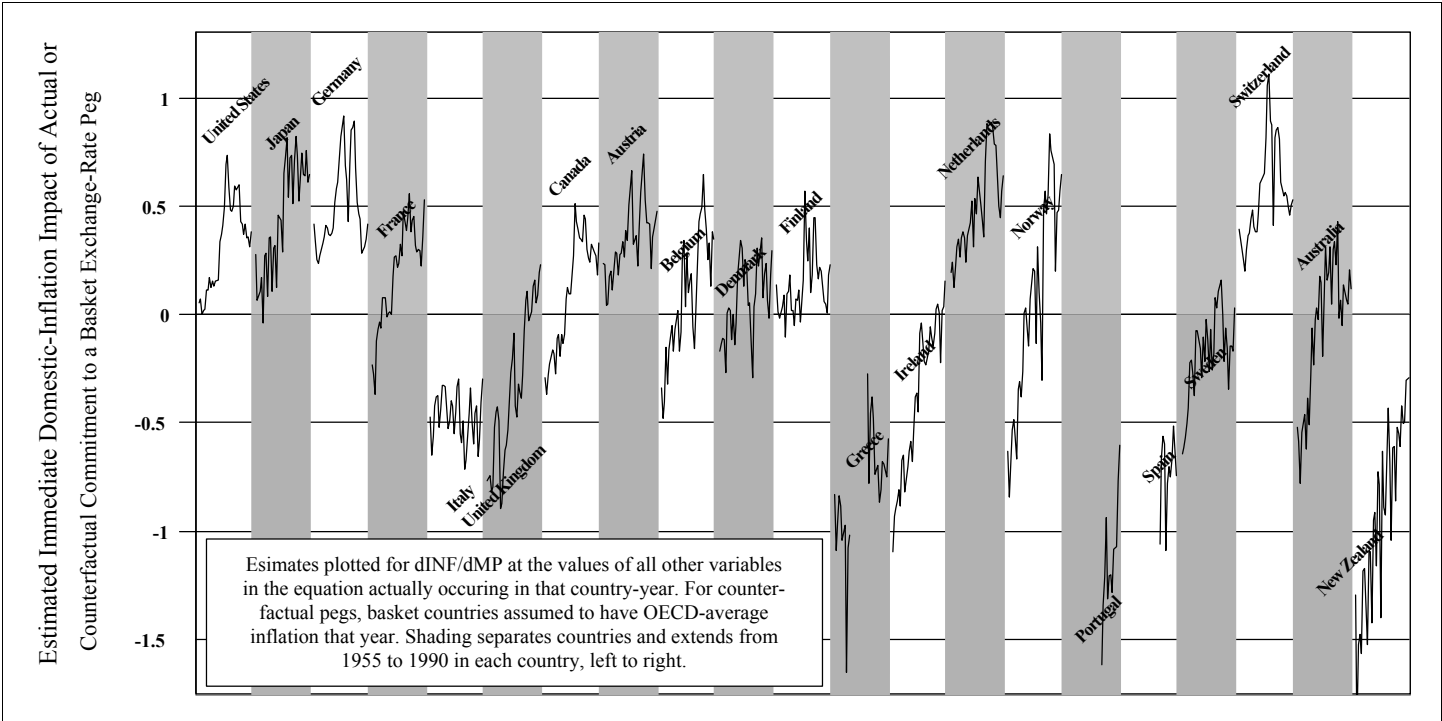
**Table 5: Estimated Immediate Domestic-Inflation Effect of a Multi-Country Peg (MP) as a Function of the Difference between Domestic and Peg-Country Inflation and of E**

		<i>E</i> =.40			<i>E</i> =.65			<i>E</i> =.90		
$\pi(C, X_g) =$		2	6	10	2	6	10	2	6	0
$\pi_p(Z_p^*) =$	2	-0.15 <sup>.09</sup>	-0.86 <sup>.50</sup>	-1.57 <sup>.91</sup>	-0.13 <sup>.08</sup>	-0.74 <sup>.43</sup>	-1.36 <sup>.79</sup>	-0.11 <sup>.07</sup>	-0.63 <sup>.38</sup>	-1.15 <sup>.69</sup>
	6	+0.28 <sup>.18</sup>	-0.44 <sup>.26</sup>	-1.15 <sup>.67</sup>	+0.24 <sup>.15</sup>	-0.38 <sup>.23</sup>	-1.00 <sup>.58</sup>	+0.20 <sup>.13</sup>	-0.32 <sup>.20</sup>	-0.84 <sup>.51</sup>
	10	+0.70 <sup>.42</sup>	-0.01 <sup>.13</sup>	-0.73 <sup>.44</sup>	+0.61 <sup>.37</sup>	-0.01 <sup>.11</sup>	-0.63 <sup>.38</sup>	+0.51 <sup>.32</sup>	-0.01 <sup>.09</sup>	-0.53 <sup>.33</sup>

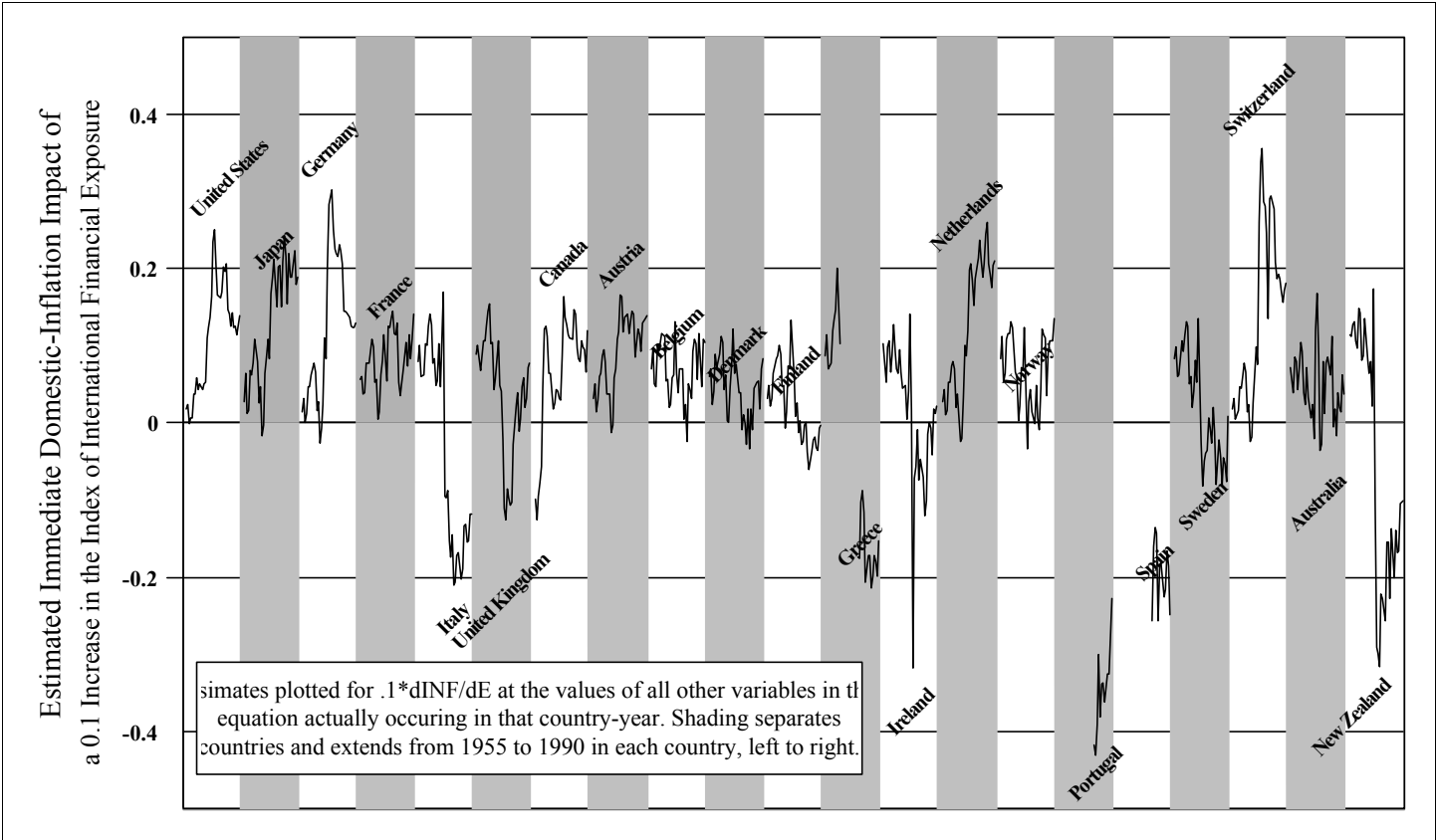
NOTES: Standard errors, in superscripts, assume hypothetical  $\pi_p$  and  $\pi(C, X_g)$  known without error.



**Figure 10: Estimated Immediate Domestic-Inflation Impact of Actual or Counter-Factual SP in 21 Countries, 1957-90**



**Figure 11:** Estimated Immediate Domestic-Inflation Impact of Actual or Counter-Factual MP in 21 Countries, 1957-90



**Figure 12:** Estimated Immediate Domestic-Inflation Impact of 0.1 Increase in  $E$  in 21 Countries, 1957-90

## Conclusions and Where Next?

- Back to Foundations of Comparative and International Political Economy:
  - Foreign & domestic inst's & interests interact to shape policies & outcomes (Katzenstein, Gourevitch, Hall; *VoC*: Hall-Soskice; Rogowski, Frieden, Garrett).
  - Alternative compromise gains empirical leverage on these complex contentions: *Empirical analysis must be theoretical informed to be theoretically informing.*
- Endogenizing the Institutions:
  - Findings again suggested that institutional *reforms* generally occur when least effective economically ⇒
    - McNollGast: Create admin. proc's (e.g., CBA) to induce delegate to respond to particular support groups before know exact circ's in which they'll respond... *AND, in particular, might be able to say who wins in battle to do so when...*
    - Bawn: in delegation, tradeoff b/w expertise of delegate & control of delegator... *AND, expertise unlikely to be interest-neutral in their biases. Not just efficiency...*
  - Extension: Substitute model for now-assumed-constant parameters like... “effective degree of commitment to various exchange-rate regimes” ⇒
    - $$\mathbf{p} = C \cdot \{ \mathbf{p}_c + f(E, TE, P) \cdot \mathbf{p}_a \} + (1 - C) \cdot \{ \mathbf{p}_g(X_g) + g(E, TE, P) \cdot \mathbf{p}_a \}$$
    - Have tried something like this ⇒ *E* may reduce effective binding-ness of pegs
    - Similarly, model effective degree of CBA rather than assume fixed & estimate...
  - BUT beware tradeoff in empirical leverage as these complications introduced:
    - Federalism & bureaucratic autonomy (e.g., most recently, Lohmann, Weingast)
    - Divided interest w/in government and CBA (e.g., most recently, Bernhard)
    - More generally, # & location of Veto Actors (e.g., Tsebelis)
- Other Delegation & P-A situations (e.g., bureaucratic (e.g., CB) influence):
  - Generally, P-A relations problematic b/c, w/ perfect latitude & capability, *A* would act as  $y_1=f(X)$ , while *P*, w/ same freedom & capacity,  $y_2=g(Z)$ .
  - Some institutional &/or other aspects of environ. ⇒ information, monitoring, enforcement, & other costs, *c*, *P* must incur to force *A* by  $g(Z)$  instead of  $f(X)$ .
  - Will often ⇒ observed  $y=k(c) \cdot f(X) + [1-k(c)] \cdot g(Z)$  w/  $0 \leq k(c) \leq 1$  with  $k'(c) \geq 0$
  - ⇒ effects of *c* generally depend on *X* & *Z* & effect of each *x* & *z* depend on *c*.

- Presidential and bi-/uni-cameral systems
  - *If* partisanship or other *measurable* aspects of branches differ (constit. struct.?),
  - & theory  $\Rightarrow$  differing policy or outcome functions if each had full control, *then*
  - Convex-combinatorial model would enable estimation of each degree of control.
  - Might originally assume constant and subsequently model as above.
- PM, *v.* cabinet-average/-median, *v.* portfolio-minister, *v.* bargaining power of cabinet members, control of policy in parliamentary democracy. E.g.:
  - Laver-Shepsle coalition-form./portfolio-alloc. model & ministerial autonomy
  - *If* data show sufficient partisan variation b/w PM & portfol. min.'s, degree that each controls various policy-outcomes model-able this way.
  - Again, might originally model as constant, then use theory to inform exploration of conditions that determine degree of ministerial discretion.
- Opposition & Extra-parliamentary influence on policy, etc., etc.
- Partisan & electoral economic-policy manipulation:
  - E.g., Alesina *et al.*, Tufte, Hibbs, Bernard, Boix, Clark, Garrett, Leblang, Oatley, Way
  - Excellent venue to explore such things at C&IPE Core: Multiple policies available; multiple constraints on policymaker discretion; multiple domestic, foreign, int'l inst's & struct's that modify effectiveness of different policies; multiple policymakers.
- Electoral Systems & processing of distribution of voter interests into representation
  - Via impact on party system: Ordeshook & Shvetsova
  - Via impact on participation: (e.g., extending Franzese 2002, ch. 2)
- Strategic-voting incentives alter effect of choice-theoretic interest factors similarly
- Veto actors & other “status-quo-biasing” alter many other factors’ impact sim’ly
- Multiple constituencies:
  - E.g., Weingast-Shepsle-Johnson & Distributive Politics. BUT What’s a constituency?
- Anywhere where policy control is shared, or where one or some set of factors modify the impact of several others similarly...