

# Do International Bureaucrats Matter? Evidence from the IMF

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## Summary

- Explanations for IO policy emphasize preferences of powerful members.
- Some IOs (e.g. IMF) highly bureaucratized; suggests delegation by member states.
- Little theory or evidence supporting credibility of bureaucratic delegation.
- Theory:** IMF staff hold bargaining power over outcomes; selected strategically to induce reform.
- Evidence:** Investor reactions to staff appointments estimated via event study.

## Actors and Actions

- Consider a principal, bureaucrat, and set of member states,  $i \in \mathcal{C}$  where  $|\mathcal{C}| = C < \infty$ .
- Principal selects bureaucrat type,  $\theta \in [0, 1]$
- Country  $i \in \mathcal{C}$  selects costly reform,  $x_i \in \mathbb{R}^+$
- Crisis occurs w.p.  $\gamma(x_i) \in (0, 1)$ ;  $\gamma' < 0, \gamma'' > 0$
- If crisis in country  $i$ :
  - Players bargain over loan,  $L_i \in \mathbb{R}^+$
  - Bureaucrat ideal implemented w.p.  $r \in [0, 1]$ .
  - Principal ideal implemented w.p.  $(1 - r)$
  - $r > 0$  implies credible delegation

## Preferences

Principal utility:

$$u_P = \sum_{i \in \mathcal{C}} \frac{\eta(x_i)}{\text{Value of Reform}} - \frac{\gamma(x_i)}{\text{Pr(Crisis)}} \times \frac{(\omega_i - \mathbb{E}[L_i|r, \theta])}{\text{Preferred} - \mathbb{E}[\text{Loan}]}$$

where  $\eta' > 0, \eta'' < 0$ .

Bureaucrat:

$$u_B = - \sum_{i \in \mathcal{C}} \frac{\gamma(x_i)}{\text{Pr(Crisis)}} \times \frac{(\mathbb{E}[L_i|r] - \theta\omega_i)}{\mathbb{E}[\text{Loan}] - \text{Preferred}}$$

where  $\mathbb{E}[L_i|r] \geq \theta\omega_i$  for any  $r, \omega_i$ .

Member State  $i$ :

$$u_i = - \frac{\gamma(x_i)}{\text{Pr(Crisis)}} \times \frac{(D_i - \mathbb{E}[L_i|r, \theta])}{\text{Debt} - \mathbb{E}[\text{Loan}]} - \frac{\phi(x_i)}{\text{Cost of Reform}}$$

where  $\phi' > 0, \phi'' > 0$ .

## Equilibrium Characterization

P1. Member state optimally chooses  $x_i$  s.t.,

$$\frac{\phi'(x_i^*)}{\text{MC of Reform}} = \frac{-\gamma'(x_i^*)}{\Delta \text{Pr(Crisis)}} \times \frac{[D_i + \omega_i[r(1 - \theta) - 1]]}{\mathbb{E}[\text{Cost of Crisis}]}$$

P2. Optimal reform decreases in  $\theta$ ,

$$0 > \frac{dx_i^*}{d\theta} = \frac{\gamma'(x_i)(r\omega_i)}{\phi''(x_i) + \gamma''(x_i)(D_i + \omega_i[r(1 - \theta) - 1])}$$

P3. Principal optimally chooses  $\theta$  s.t.

$$\sum_{i \in \mathcal{C}} \frac{\gamma(x_i^*(\theta^*))r\omega_i}{\text{MC of Delegation}} = \sum_{i \in \mathcal{C}} \frac{[\gamma'(x_i^*(\theta^*))r(1 - \theta^*)\omega_i - \eta'(x_i^*(\theta^*))] \frac{dx_i^*}{d\theta}}{\text{Marg. Reduction in Pr(Crisis)} + \text{Marg. Gain from Reform}}$$

## Investor Valuations

- Continuum of investors buy, sell sovereign debt.
- Observe all parameters, but  $\omega = (\omega_1, \dots, \omega_C)$ .
- Prior beliefs,  $F: \mathbb{R}^C \rightarrow (0, 1)$
- Sovereign risk at time  $t$  reflects:
  - Commonly known exogenous factors,  $\Gamma_{i,t}$
  - Probability of crisis,  $\gamma(x_i^*(\mathbb{E}_F[\theta^*(\omega)]))$
  - Expected crisis loss,  $I - \mathbb{E}_F[L_i(\omega_i, \theta^*(\omega))|r]$
- Risk premium,
 
$$V_{i,t} = \Gamma_{i,t} - \gamma(x_i^*(\mathbb{E}_F[\theta^*(\omega)])) [I - \mathbb{E}_F[L_i(\omega_i, \theta^*(\omega))|r]]$$

## Effect of Staff Appointments

Appointments ( $\theta = \theta^*$ ) reveal info about:

- Principal preferences,  $\omega$
- Expected loan size,  $\mathbb{E}_F[L_i(\omega_i, \theta^*(\omega))|r]$
- Anticipated reforms,  $x_i^*(\theta^*(\omega))$ ,
- Resulting change in crisis probability,  $\gamma(x_i^*(\theta^*(\omega)))$

## Quantity of Interest: Change in Investor Beliefs

Investor change in expected risk:

$$\Delta_i = \gamma(x_i^*(\mathbb{E}_F[\theta^*(\omega)])) [I + \mathbb{E}_F[\omega_i][r(1 - \mathbb{E}_F[\theta^*(\omega)]) - 1]] - \gamma(x_i^*(\theta^*)) [I + \omega_i[r(1 - \theta^*) - 1]]$$

- If  $r = 0$ , then member state reform unresponsive to  $\theta^*$  and Principal randomizes since indifferent.
- No information transmission  $\Rightarrow \Delta_i = 0$  for all  $i$ .

**H1. Delegation is credible ( $r > 0$ ).**

## Statistical Model

- Suppress  $i$  and let  $t = 0 \Rightarrow$  revelation of  $\theta$
- Exogenous factors,  $\Gamma_t$  comprised of:
  - Observable time invariant factors,  $\alpha_0$
  - Observable time-varying factors,  $\mathbf{X}_t\beta$
  - Unobservable (to econometrician) factors,  $\epsilon_t \sim \mathcal{N}(0, \sigma^2)$
- Denote investor expected loss at  $t$  by  $\alpha_t$
- Risk premium at  $t$ ,

$$V_t = \alpha_0 + \alpha_t + \mathbf{X}_t\beta + \epsilon_t$$

## Estimation

### Step One

- Note  $\alpha_t = \alpha_{t'} = \alpha_1$  for any  $t, t' < 0$ .
- Letting  $\alpha = \alpha_0 + \alpha_1$ , estimate parameters  $(\alpha, \beta)$  employing pre-treatment observations.
- Estimating equation:

$$V_t = \alpha + \mathbf{X}_t\beta + \epsilon_t \quad \text{for } t < 0$$

### Step Two

- Note  $\alpha_t = \alpha_{t'} = \alpha_2$  for any  $t, t' \geq 0$ .
- Using  $(\hat{\alpha}, \hat{\beta})$  calculate:
 
$$\hat{V}_t = \hat{\alpha} + \mathbf{X}_t\hat{\beta} \quad \text{for } t \geq 0$$
- Quantity of interest is,

$$V_t - \hat{V}_t = \alpha_2 - \alpha_1 + \epsilon_t \quad \text{for } t \geq 0 = \Delta + \epsilon_t$$

Comments:

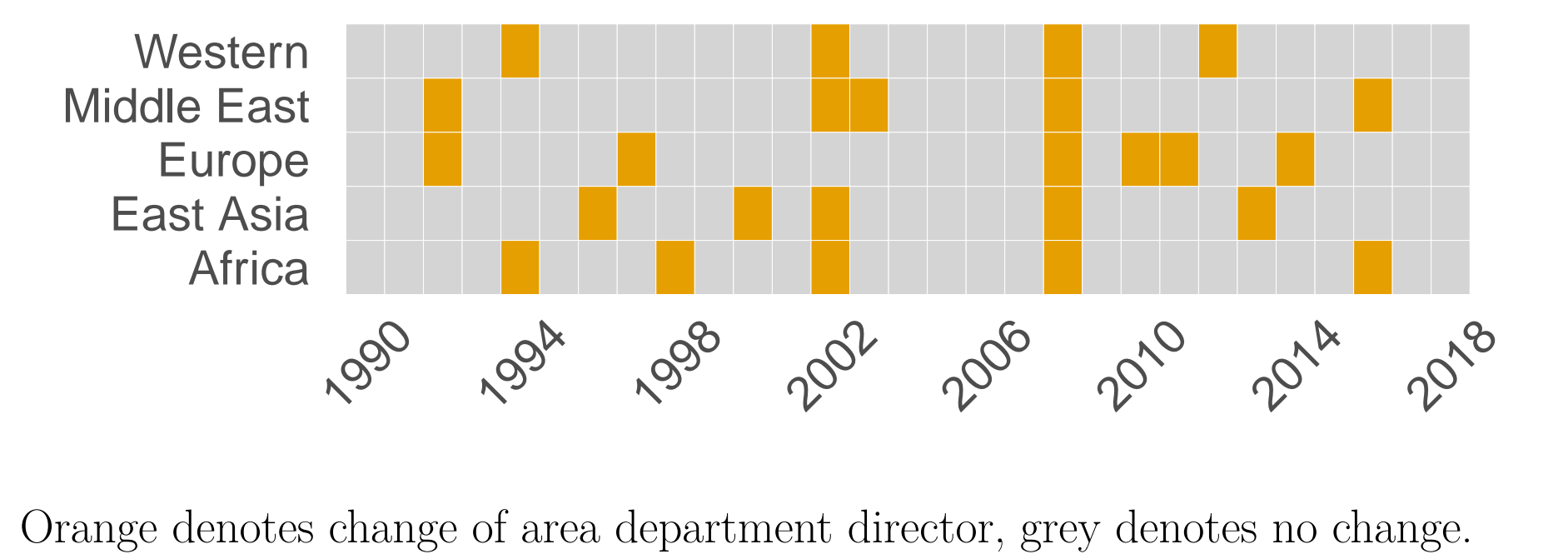
- Estimate  $\Delta_i$  for each  $i$ ; average across region.
- Use pre-treatment sample variance for inference.
- Identical to “market model” event study.

## Data & Identifying Assumptions

Data:

- $V_t$ : Daily sovereign bond spreads for  $i$  (GFD).
- $X_t$ : Daily sovereign bond spreads for  $\mathcal{C} \setminus i$ .
- Events: IMF area head appointments (IMF).

Fig 1. Changes in Area Department Heads



Orange denotes change of area department director, grey denotes no change.

Exogeneity of Appointments:

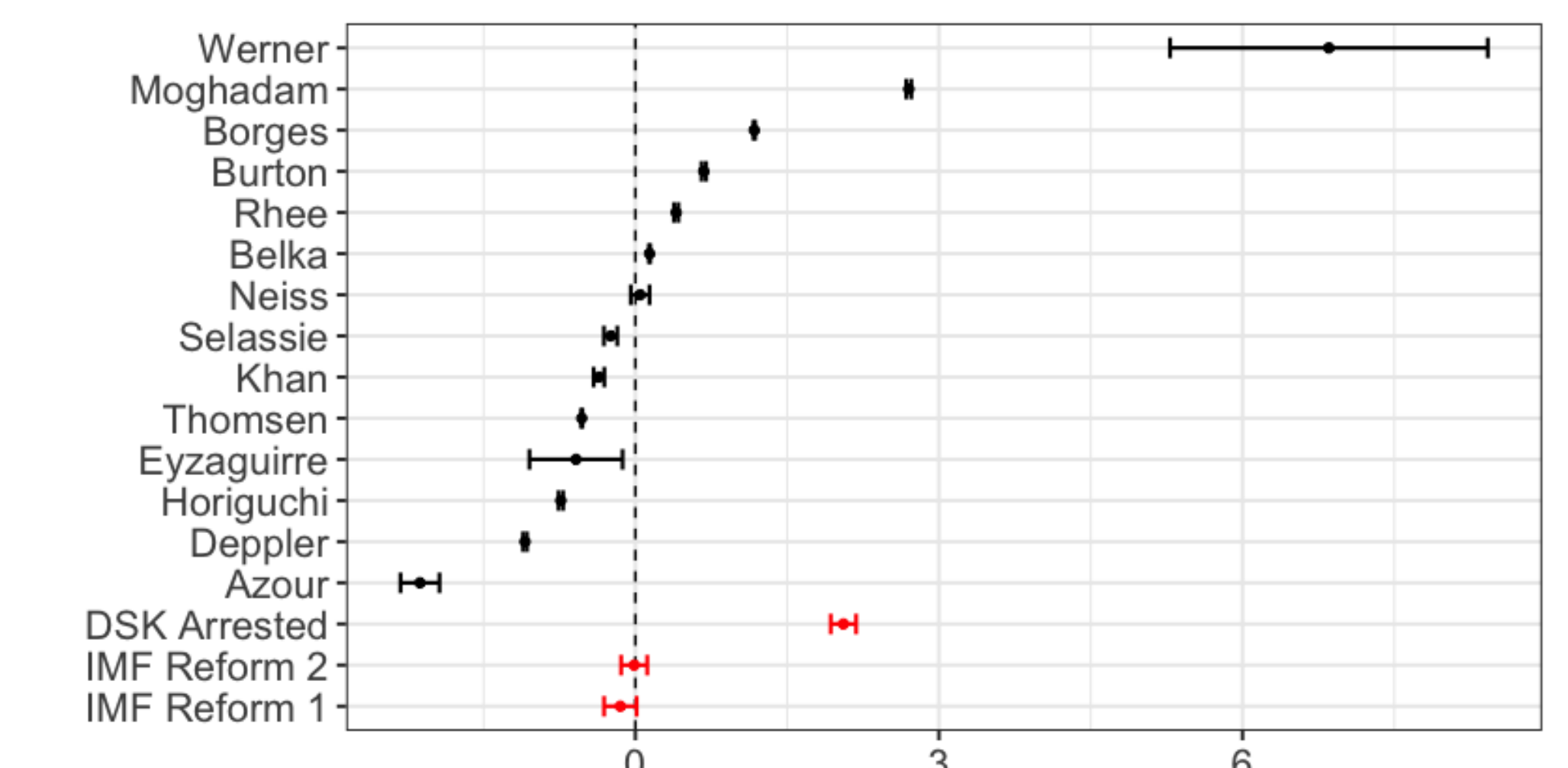
- Secretive process (interviews with IMF staff).

SUTVA:

- Drop covariate yields for in-region countries.

## Results

Fig 2. Average Change in Investor Beliefs



- Mean  $\Delta_i$  with 95% confidence intervals.
- Red depicts average effect for IMF borrowers of voice and quota reforms, departure of DSK.
- Similar results obtain employing PanelMatch and gsynth packages in R.

## Conclusions & Next Steps

- Evidence of credible delegation to senior members of IMF staff.
- Develop measure of individual reputations.
- Extend to explore applicability to other IOs.