

# **ECON 4921: Lecture 9**

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# Roadmap

1. Introduction
2. Institutions and Economic Performance
3. The Firm
4. Organized Interest and Ownership
5. Complementarity of Institutions
6. Institutions and Commitment
- 7. Agency problems: Voters- Politicians-Bureaucrats**
8. Fiscal Federalism
9. System Competition

# Principal-agent problem

- Public sector service provision characterized by principal agent relationships.

## **Voters- Politicians-Bureaucrats**

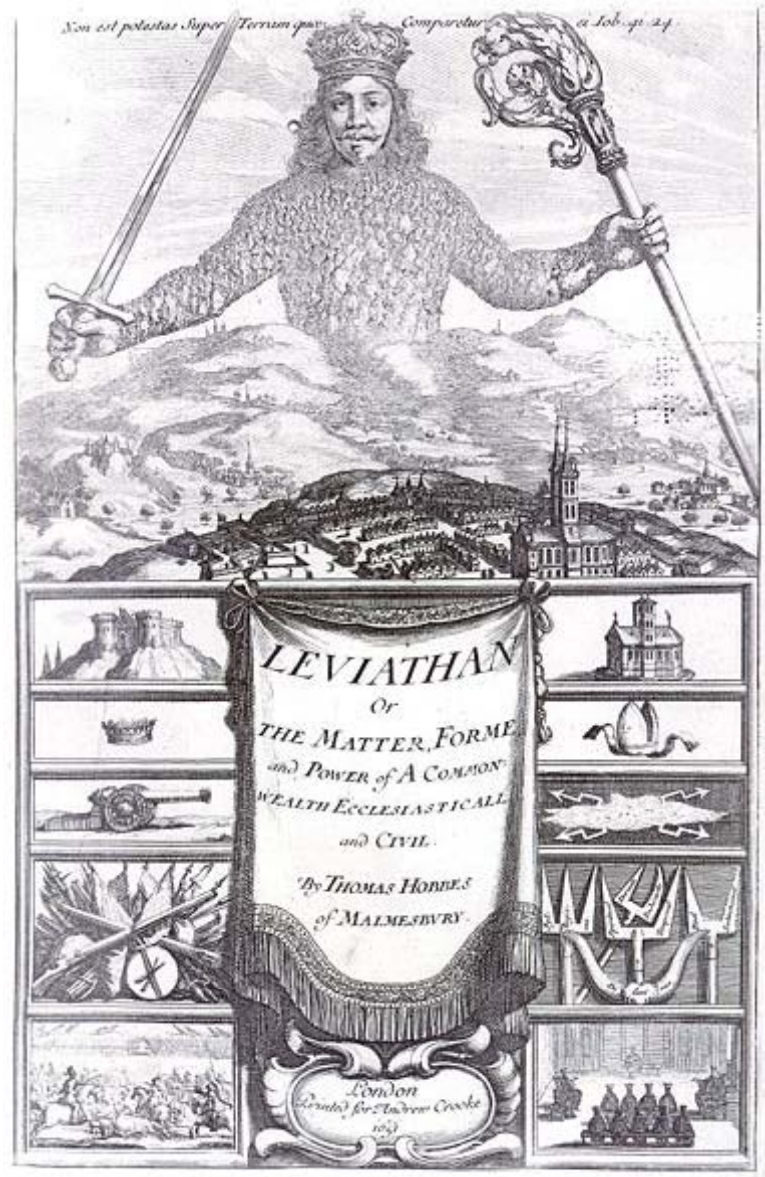
- Agent have information advantage
- Can exploit this to choose actions different from what the principal prefers, i.e. low effort.

# Two contrasting visions of the state

- Traditional public finance:
  - Politicians/bureaucrats with no self-interest
  - Benevolent policymakers maximize ‘well being of society’
- Public choice school:
  - Politicians/bureaucrats with self-interest
  - Do not necessarily act in the best interest of citizens
  - Revenue maximizing Leviathans (Brennan and Buchanan, 1980)



(source Wikipedia)



(source Wikipedia)

# Self-interested politicians

- How can politicians further their own interest at the expense of the general public?
  - Much studied phenomenon: corruption
  - What about political rents in a non-corrupt democracy? (Svaleryd and Vlachos, 2009)
    - Legal political transfers ('partistøtte') in Sweden
    - Decided on at the local government
    - Panel data set: approx 250 local governments, 30 years

# Empirical Strategy

- Idea: the ability for politicians to extract rents should be higher:
  - If political competition is low (proxy: bloc diff)
  - If voter information is low (proxy: media)
- Main equation of interest:

$$\text{Political Rents}_{it} = \mu_i + \lambda_t + \beta_1 \text{Political competition}_{it} + \beta_2 \text{Voter information}_{it} + \gamma \text{Controls}_{it} + \epsilon_{it}.$$

(8)

- Political competition may be endogenous.  
(Why?)



# Empirical strategy cont.

- Instrument political competition with the results from the national election in neighboring municipalities.
- Idea: changes in local political competition is partly driven by general trends independent of local politics.
- Identifying assumption?

# Results

- Theoretical predictions from political agency models receive support in the data.
  - Increased political competition reduce rents
  - Increased media coverage reduce rents
- Additional evidence:
  - Political comp. effect varies over election cycle
  - Structure of financial support

# Self-interested bureaucrats

- We abstract from: voters → politicians
- Focus on: politicians → bureaucrats.
- Bureaucracy as an institution
  - Sponsor and bureau , e.g. local council → producers of elderly care services.
- Niskanen 1971: bureaucracy and representative government
  - Bureaucracy as one reason to incr. public sector spending
  - Bureaucracy modeled as economists have modelled firms:
    - Max budget, rather than profits
    - Income through lump sum transfers rather than revenues from sale.

# Bureaucratic power

- Output of public services hard to measure
- Assymmetric information
- Monitoring hard/costly
- Bureaucrats have better information about output of public services than politicians.

# Strategic behavior

- Niskanen71: principal is assumed to be passive.
- Moene86: strategic behavior of both politicians and bureaucrats.

# The set-up

- $X$  – activity level
- $B$  – Budget
- $W(X)$  – Principal's maximum willingness to pay

$$W(0) = 0, \quad W'(X) > 0, \quad W''(X) < 0, \quad W'(\infty) = 0.$$

$C(X)$  – minimum total costs

$$C'(X) > 0 \quad \text{and} \quad C''(X) \geq 0$$

$\hat{C}(X)$  – reported costs by the bureau

# The set-up cont.

- Budgetary slack (Z):

$$Z = B - C(X), \tag{1}$$

- Bureau has preferences for both Z and X:

$$U = U(\underset{+}{X}, \underset{+}{Z}). \tag{2}$$

- X, Z are normal goods: B incr  $\rightarrow$  incr Z and X.

# The set-up cont.

- The optimal level of  $X$ :

$$X = F(B), \tag{3}$$

$F$ : optimal response function of bureau

- From (1):  $B = Z + cX$ , where  $c = C(X)/X$ .

When  $C(X)$  is strictly convex,  $c$  is increasing in  $X$ .



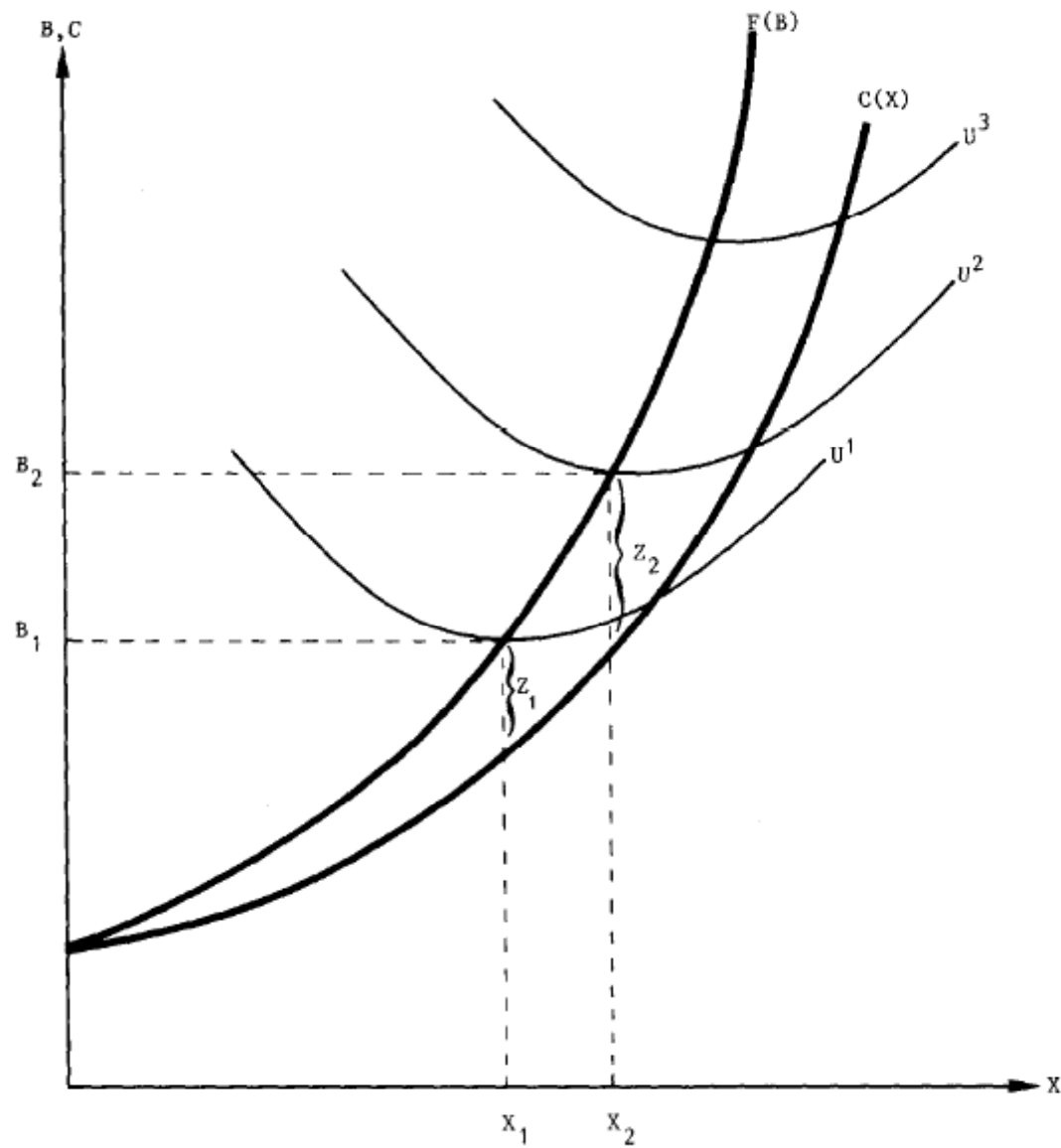


Fig. 1.  $U^1 < U^2 < U^3$ . The relationship between the appropriated budget  $B$ , the slack  $Z$  and the bureaucratic activity level  $X$ .

# The set-up cont.

- Sponsor wants to maximize net utility:

$$S = W(X) - B.$$

(4)

# Models

- We make various assumptions about:
  - Which agent choose X and B
  - The cost of information

# Models cont.

## Sponsor det. X , B

### 1a Benchmark

1b Misrepresentation of costs

1c Restrictions on information monopoly

1d Uncertainty on sponsor response

## Sponsor det. B , bureau X

2a Sponsor moves first

2b Perfect information

# 1a) Benchmark

- Sponsor chooses  $X$  and  $B$ :

$$\begin{aligned} \max_{X, B} & W(X) - B \\ \text{s.t.} & \\ & B \geq C(X). \end{aligned} \tag{5}$$

- FOC:

$$W'(X_a) = C'(X_a) \quad \text{and} \quad B_a = C(X_a). \tag{6}$$

- Outcome: Social optimum

# Models cont.

## Sponsor det. X , B

1a Benchmark

**1b Misrepresentation of costs**

1c Restrictions on information monopoly

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## Sponsor det. B , bureau X

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# 1b) Misrepresentation of costs

- Bureau has information advantage
  - Bureau knows  $W(X)$  (party programs etc...)
  - Sponsors do not know  $C(X)$  (politicians lack specialized knowledge)
- Yields similar solution as in benchmark, but:

$$W'(X) = \hat{C}'(X) \quad \text{and} \quad B = \hat{C}(X). \quad (7)$$

# 1b) Misrepresentation of costs

- Which  $\hat{c}(X)$  does the bureau report?
- Max  $U(X,Z)$  s.t. (7) and  $B \geq C(X)$
- Two steps:
  - Best feasible level of  $X$  and  $B$ , according to bureau
  - Construct the reported cost fn.



# Best feasible level of X and B

- Sponsor formally decides on X and B:  $W(X) \geq B$ .
- The best the bureau can do (for each X):  $B = W(X)$
- Using def. of slack ( $Z = B - C$ ) and inserting for B:

$$\max_x U(X, W(X) - C(X))$$

s.t.

$$W(X) \geq C(X), \tag{9}$$

- Solution characterized by overproduction:

$$X_b \geq X_a, \tag{10}$$

# Construct the reported cost fn.

- Construct  $\hat{C}(X)$  s.t.  $X_b$  and  $B_b = W(X_b)$  are chosen by the procedure (7), i.e.

$$W'(X_b) = \hat{C}'(X_b) \quad \text{and} \quad W(X_b) = \hat{C}(X_b). \quad (11)$$

- With linear cost fn,  $C = \alpha X + \beta$ , bureau reports:
  - Lower value of  $\alpha$
  - Higher value of  $\beta$
- Sponsor believes MC is low  $\rightarrow X_b > X_a$
- Fixed costs allow for the optimal level of slack.

# Important point

- When bureau has monopoly on information on the true cost curve:
  - doesn't matter whether bureau has decision making power over  $X$ !

(Why not?)

# Models cont.

## Sponsor det. X , B

1a Benchmark

1b Misrepresentation of costs

**1c Restrictions on information monopoly**

1d Uncertainty on sponsor response

## Sponsor det. B , bureau X

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# 1c Restrictions on info. monopoly

- Interpret  $X$  as possible expansions of existing bureau.
  - Cannot misrepresent fixed costs (already invested)
- The variable costs of expansion are assumed to be proportional to  $X$ , but  $\alpha$  unknown.
- Sponsor chooses  $X$ :

$$X = H(\hat{\alpha}) \quad \text{and} \quad B = \hat{\alpha}H(\hat{\alpha}), \quad (12)$$

where  $H(\hat{\alpha})$  is the value of  $X$  determined by

$$W'(X) = \hat{\alpha}, \quad (13)$$

# Social optimum and bureau max problem

- Social optimum:  $X = H(\alpha)$  and  $B = \alpha H(\alpha) \leq W(H(\alpha))$
- Bureau reports variable cost that maximizes  $U$  s.t. (12) and (13):

$$\max_{\hat{\alpha}} U(H(\hat{\alpha}), (\hat{\alpha} - \alpha)H(\hat{\alpha}))$$

s.t.

(i)  $\hat{\alpha}H(\hat{\alpha}) \leq W(H(\hat{\alpha}))$ , and

(ii)  $(\hat{\alpha} - \alpha)H(\hat{\alpha}) \geq 0$ ,

(14)

# Bureau trade-off

- In choosing  $\alpha$  the bureau makes a trade-off:
  - (i) Red. X (bad)
  - (ii) Incr. Z (good)
- If (ii) is sufficiently strong: underexpansion of X.
- Assuming interior solution:

$$\frac{U_1}{U_2} = \frac{H + (\hat{\alpha} - \alpha)H'}{-H'}, \quad (15)$$

# Models cont.

## Sponsor det. X , B

1a Benchmark

1b Misrepresentation of costs

1c Restrictions on information monopoly

**1d Uncertainty on sponsor response**

## Sponsor det. B , bureau X

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# 1d Uncertainty about WTP

- Introduce random variable  $\varepsilon$ 
  - Mean zero
  - Positive density for some interval  $I$
- WTP:  $W(X) + \varepsilon$
- WTP revealed after bureau reports costs
- Chance that budget do not get approved

# Expansion or no-expansion

- Let

$$\begin{aligned} X = H(\hat{\alpha}) \text{ and } B = \hat{\alpha}H(\hat{\alpha}), & \quad \text{if } W(H(\hat{\alpha})) + \varepsilon \geq \hat{\alpha}H(\hat{\alpha}), \\ X = 0 \text{ and } B = 0, & \quad \text{if } W(H(\hat{\alpha})) + \varepsilon < \hat{\alpha}H(\hat{\alpha}). \end{aligned} \tag{16}$$

- And, prob. Of expansion:

$$\Pr(\varepsilon \geq \hat{\alpha}H(\hat{\alpha}) - W(H(\hat{\alpha}))) = G(\hat{\alpha}), \quad G' < 0. \tag{17}$$

# Bureau trade-off

- Bureau max U, taking (16) and (17) into account. Assume  $U(0,0)=0$ .
- Expected utility of bureau:

$$EU = G(\hat{\alpha})U(H(\hat{\alpha}), (\hat{\alpha} - \alpha)H(\hat{\alpha})). \quad (18)$$

- FOC:

$$\frac{U_1}{U_2} = \frac{H + (\hat{\alpha} - \alpha)H'}{-H'} - g, \quad (19)$$

- In choosing  $\alpha$  the bureau makes a trade-off:
  - (i) Red. X (bad)
  - (ii) Incr. Z (good)
  - (iii) **Red. probability of expansion (bad)**

# Solution

- Expansion will be larger when expansion takes place.
  - Mechanism: Bureau reports lower value of  $\alpha$  to increase the probability of expansion.
- If  $\varepsilon$  is simply “political noise” then sponsor is better off.

# Models cont.

## Sponsor det. X , B

1a Benchmark

1b Misrepresentation of costs

1c Restrictions on information monopoly

1d Uncertainty on sponsor response

## Sponsor det. B , bureau X

**2a Sponsor moves first**

2b Perfect information

## 2a Sponsor moves first

- Sponsor determines  $B$ , Bureau determines  $X$
- We assume that the sponsor knows the optimal response of bureau,  $X=F(B)$ .
- Sponsor problem:

$$\max_B W(X) - B$$

s.t.

$$X = F(B), \tag{20}$$

- FOC:

$$W' = 1/F'. \tag{21}$$

## 2a Sponsor moves first

- $B_c$  the resulting budget
- $X_c$  the activity level ( $X_c = F(B_c)$ )
- $X_c < X_a$ . Why?
- It is not clear what happens to B.

# Models cont.

## Sponsor det. X , B

1a Benchmark

1b Misrepresentation of costs

1c Restrictions on information monopoly

1d Uncertainty on sponsor response

## Sponsor det. B , bureau X

2a Sponsor moves first

**2b Perfect information**



## 2b Perfect information

- Sponsor det. B, bureau det. X
- Bureau moves first.
- Bureau passes cost on to sponsor ex post.
- Both sides are fully informed.
  - True cost is public information (equipment etc.)
  - Bureau cannot obtain slack:  $U(X,0)$ .
- Bureau wants to expand X to infinity, but we assume  $C(X)$  cannot exceed  $W(X)$ . Then:

$$W(X_d) = C(X_d).$$

(23)

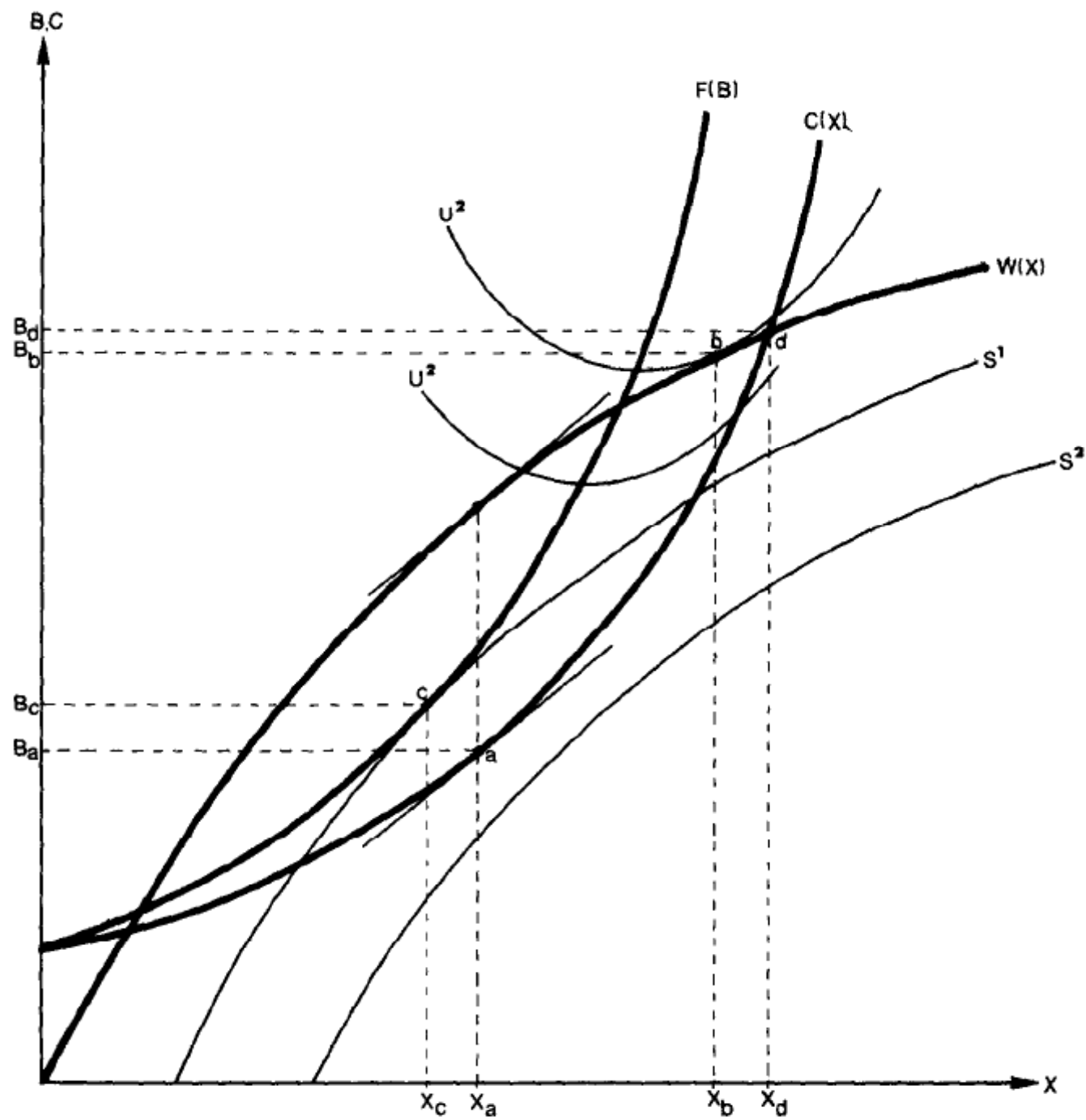


Fig. 2. The outcomes of different types of bureaucratic interaction.

# Models cont.

Figure	Sponsor det. X , B	Outcome
Xa	1a Benchmark	Social optimum
Xb	1b Misrepresentation of costs	Overprovision
	1c Restrictions on information monopoly	May have underprovision (when caring a lot about Z)
	1d Uncertainty on sponsor response	Larger expansion when expansion takes place

Figure	Sponsor det. X , bureau B	Outcome
Xc	2a Sponsor moves first	Underprovision
Xd	2b Perfect information	Overprovision