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Baumol's cost disease, fiscal rules and the quality of government services

by

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1. Motivation

- Since the 1990s fiscal rules have become ever-more popular, in particular, balanced-budget rules (IMF 2018).
  - EU Stability- and Growth Pact since 1999
  - Swiss debt brake at federal level since 2003
  - German debt brake since 2011 (federal level) and since 2019 (regional level)
  - EU member states: Fiscal Compact (TSCG 2012)

- Balanced-budget rules turn a blind eye to exogenous factors of government budget
  - Well-known: demographic change
  - Almost forgotten: Baumol‘s cost disease (Ryan 1992, Baumol 1985, Baumol/ Oates, 1979)

1. Motivation

- Somewhat related
  - Dahan & Strawcynski (2013): Fiscal rules and public consumption, public investment & transfers
  - Empirical literature on U.S. states (Joyce and Mullins 1991; Penner and Weisner 2001): Fiscal rules and welfare spending
- We show that the cost disease is inconsistent with a balanced-budget rule
- Baumol‘s (and Bowen’s) cost disease => Governments face a dilemma
  - Breaching the rule or reduction in quantity (or curbing government-wage growth)
  - Adverse growth effects

1. Motivation

- How far is the government sector affected by the cost disease?
  - Decomposition of government expenditure by function
  - Related studies give evidence for the cost disease in healthcare and public education (e.g. Hartwig (2008), Bates & Santerre (2013), Nose (2015), Colombier (2017))
  - Innovative approach by Hartwig (2008) and Colombier (2017): *The adjusted Baumol variable*
  - Application of outlier-robust estimator
    - Particularly apt for distinct heterogeneity of panel-data sets

- Can we expect a budget crowding-out of cost-disease affected public expenditure under a balanced-budget rule?

2. The concept of a balanced budget rule

- Balanced budget rule according to Fiscal Compact

$$g_y \leq \sigma + \tau - ib \quad \text{with } 0 < \sigma \leq 0.05 \qquad (1)$$

  - with: σ:= limit on structural budget deficit (as % of GDP)

    g_y:= ratio of primary public expenditure to GDP

    τ:= ratio of total public revenues to GDP

    ib:= interest paid on outstanding government debt

- In the medium term: public-expenditure-to-GDP ratio has to be stabilised under a debt-brake rule => g_y=const.

3. The fiscal impact of Baumol‘s cost disease

- Key characteristics of Baumol‘s model of unbalanced growth (Baumol, 1967)
  - Two sectors
    - High productivity growth (progressive sector A) (r)
    - Low or zero productivity growth (Baumol sector B) (s)
  - Ratio of real output is constant
  - Wages in both sectors increase with productivity growth of the progressive sector

- Baumol's cost disease: increase in unit costs of Baumol sector is equal to difference of productivity growth (r-s) => relative price of the stagnant sector climbs steadily

3. The fiscal impact of Baumol's cost disease

- Our extended version of Baumol's model of unbalanced growth shows that:
  - The cost disease causes a steady increase of the government-expenditure-to-GDP ratio =>
  - Long-run inconsistency with a balanced-budget rule
- If the cost disease touches government services either
  - The balanced budget rule is breached ***or***
  - The quantity (and quality) of the affected government services is continuously reduced ***or***
  - None-affected government services are crowded out
- In the long run:
  - Reputional losses of the government
  - Adverse consequences on growth and social cohesion

4. Method and data: first step

$$\Delta g_{j,i}(t) = \alpha_j \underbrace{\frac{1}{l(t)_{B,i}}(\hat{w}_i(t) - \hat{\mu}_i(t))}_{\text{adj. Baumol variable}} + \beta_j \Delta z_i(t) + \delta_i d_i(t) + \sigma_i + \lambda(t) + u_i(t) \quad (4)$$

- Sample: 25 OECD countries from 1990 to 2015
- Two-way fixed effects approach with unobserved country- (σ_i) & time-fixed ($\lambda(t)$) effects
- Application of outlier-robust MM estimator
- Δ:= first differences in logs
- $g_{j,i}(t)$:= per-capita public expenditure item j of country i at time t (classified by function)
- Adjusted Baumol variable:
  - α_j:= 1, i.e. full Baumol effect; α_j:= 0; i.e. no Baumol effect
  - Benefit: Avoids using notoriously difficult to calculate price deflators for government activity

4. Method and data: second step

$$\bar{g}_{t,i,s} = \alpha_s \sum_{m=1}^{10} \delta_{m,s} d_{t,i,m} + \sum_{n=1}^{4} \beta_{n,s} z_{t,i,n} + \sigma_{i,s} + \rho_{t,s} + u_{t,i,s} \qquad (5)$$

- Based on the estimations of the first step: decomposition of government expenditure affected by the cost disease and others => Test on budget crowding out under fiscal rules
- Dependent variables:
  - The shares of cost-disease affected government expenditure and other government expenditure in total government expenditure ($\bar{g}_{t,i,s}$)
  - Ratio of general government expenditure to GDP ($\bar{g}_{t,i,s}$)
- Dummies for a balanced-budget rule (e.g. Fiscal Compact, Swiss debt brake) and the SGP, $d_{t,i,m}$
- Controls of equation (4) excluding the adj. BV are included
- Same approach as for equation (4) is applied in levels

5. Empirical results: cost disease

Step I	**The impact of the cost disease**		
Regressor	Adj. Baumol var.	GDP per capita	Rob. adj. R^2 (as %)
General government exp.	**0.06****	**0.49*****	41
Health	**0.12*****	**0.59*****	38
Education	**0.09*****	**0.48*****	34
General administration	0.01	**0.66*****	15
Public order & safety	**0.09****	**0.19***	23
Environm. protection	**0.25*****	**0.59*****	9
Recreation, culture, religion	**0.09***	**0.30****	25
Social protection	*0.02*	**0.26*****	55
Defence	*0.06*	**0.47*****	20
Economic affairs	**0.21*****	**1.35*****	18
Housing & community amneties	-0.03	**0.53***	7

5. Empirical results: budget crowding out

Step II	**Budget crowding out of government expenditure**		
Dependent var.	General gov. exp.	Cost-disease affected	Other
	(as % of GDP)	(as a share of general government expenditure)	
Debt-brake rule	**-0.02***	**-0.01*****	**0.02*****
Maastricht criteria	-0.02	**-0.03*****	**0.13*****
SGP, initial	**-0.02*****	0.001	0.01
SGP, post 2005 reform	-0.03	**0.01****	**-0.03****
SGP, post 2011 reform	**-0.06*****	**-0.01*****	**0.02*****
Real GDP per capita	0.04	**-0.01*****	**0.58*****
Rob. Adj. R^2 (as %)	92	89	89

6. Conclusion

- Baumol‘s cost disease is not consistent with a balanced budget rule
- Estimations show that the government sector is substantially affected by the cost disease
  - Apart from general government services and housing and community amenities, government functions are contracted by the cost cost disease
    - Evidence is less strong for defence and social protection
  - IV regression point to an underestimation of the cost disease impact by the original regression
- Budget crowding-out of cost-disease-affected government expenditure by balanced budget rules:
  - Fiscal Compact, the SGP and the Swiss debt brake

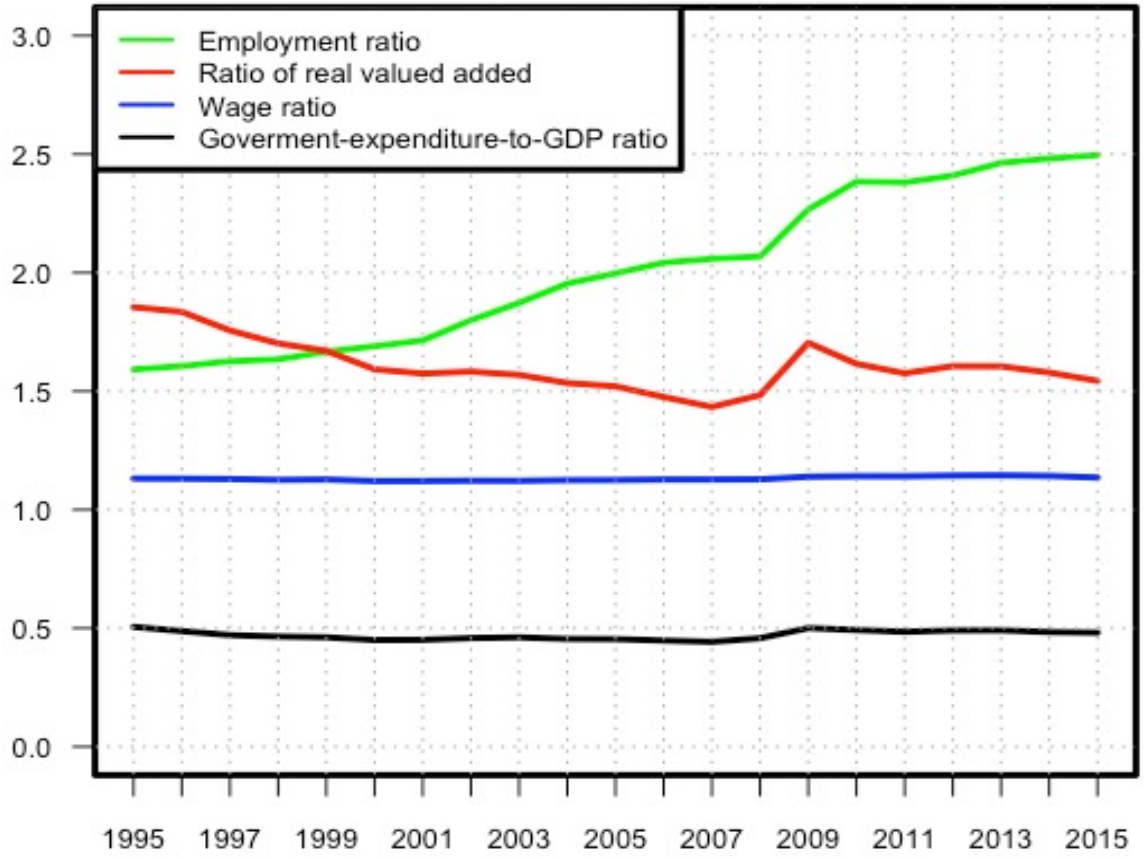
6. Conclusion

- Balanced budget rules should take account of Baumol's cost disease
  - Otherwise, government risks having adverse consequences in the long run on
    - Economic growth => lower revenues
    - Quality of government services => lower voter satisfaction
- Viable solutions that should be examined
  - Deflate government expenditure affected by the cost disease by the above average inflation and keep the latter constant to GDP
  - Maintain an income elasticity of taxes slightly above one
    - Progressive income tax
  - Consider a wealth tax (if non-existent)

Appendix

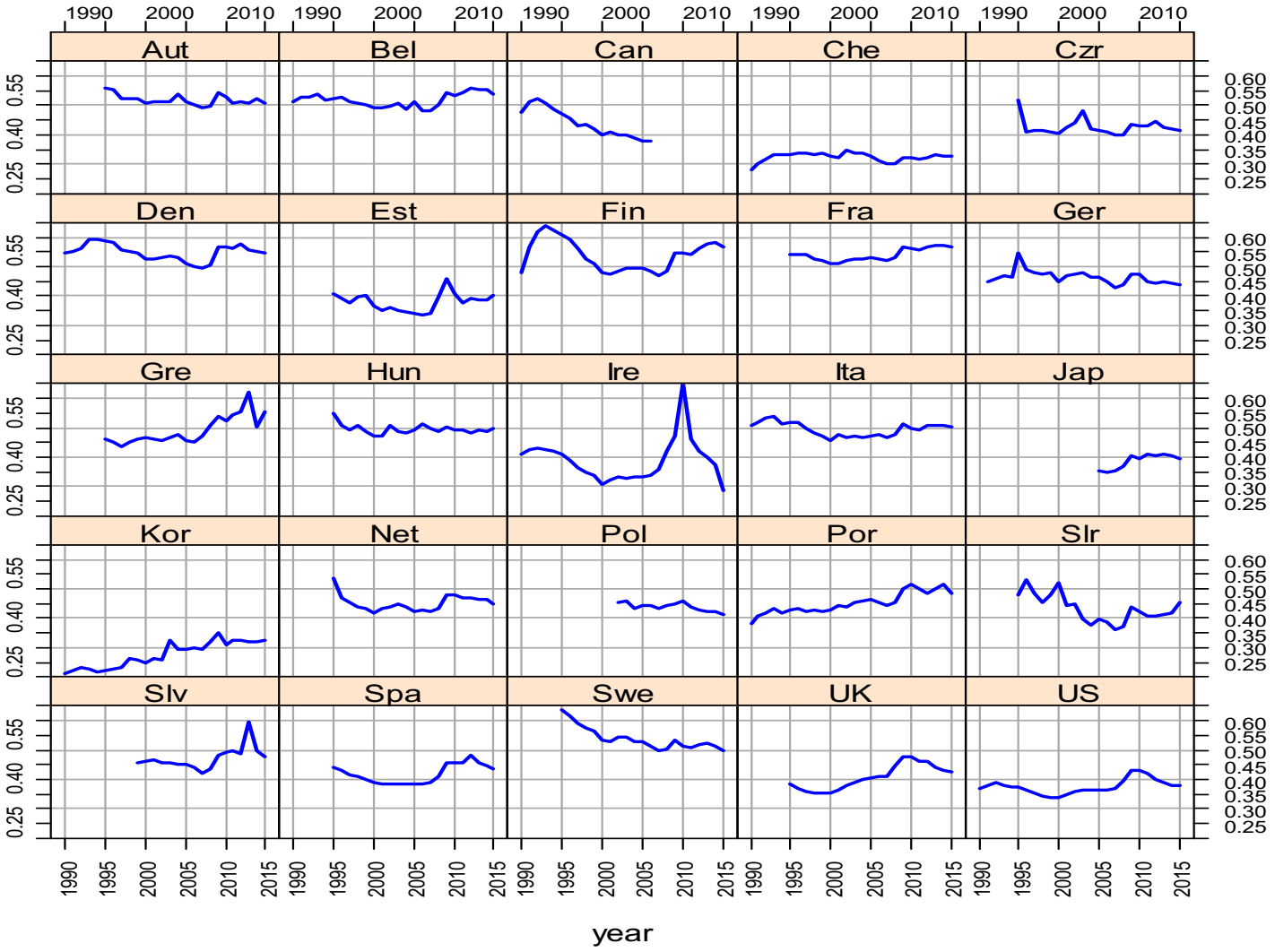
1. Stylized facts of the cost disease

Baumol's cost disease stylized facts – ratios of community, social and personal services to manufacturing and government-expenditure-to-GDP ratio 1995–2015 (cross-country means)



2. Public-expenditure-to-GDP ratio

Ratio of general-government-expenditure-to-GDP by country from 1990 to 2015 (as % of GDP)



3. The fiscal impact of Baumol's cost disease

- Hypothesis: government transforms a part of privately produced goods into publicly provided goods

$$g_y = \mu e_A + \lambda e_B \text{ with } \lambda \gg \mu; 0 < \lambda \leq 1; 0 \leq \mu < 1 \quad (2)$$

μ:= government share of the progressive sector A

λ: =government share of the Baumol sector B

$e_{A/B}$:= respective shares of the valued-added of sectors A and B resp. in nominal GDP

- Growth rate of public-expenditure-to-GDP ratio

$$\hat{g}_y = \frac{(\lambda - \mu)\varphi^2}{(\mu + \lambda e^{\varphi t})(1 + e^{\varphi t})} \geq 0$$

$$\text{if } \varphi \geq 0 \ \vee \hat{g}_y < 0 \text{ if } \varphi < 0; \ \varphi := \left(\frac{\hat{L}_B}{\hat{L}_A}\right) \quad (3)$$

- Baumol case: φ=r-s

3. The fiscal impact of Baumol's cost disease

- Government options to stick to a balanced-budget-rule; $\hat{g}_y = 0 \ \wedge \ g_y = \bar{g}_y$

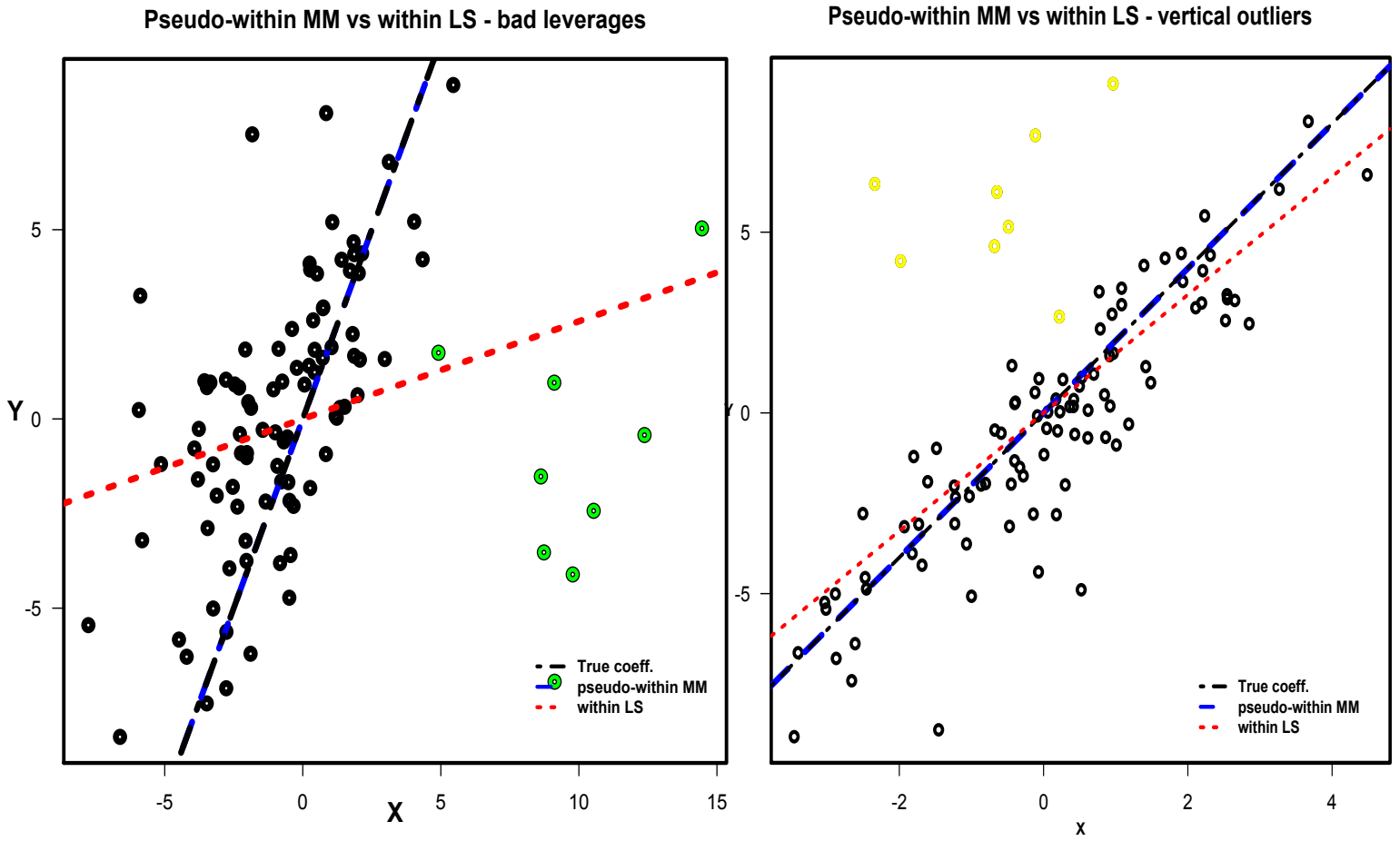
  - I: φ=0 => The quantity of the public Baumol sector continuously shrinks. Budget crowding-out of the public Baumol sector.

  - II: Government reduces public Baumol sector (dλ/dt<0) so that λ=μ.
    - However: unrealistic scenario and politically unfeasible.

  - III: Wage restraint in the public Baumol sector:
    - Wage growth =s <=> $\hat{g}_y \leq 0 \text{ if } \varphi \leq$r-s
    - In the longer run:
      - Adverse impact on public employment and the quality of public services
      - φ<r-s => Public Baumol sector steadily decreases

4. Method and data

"…heterogeneity is a key feature of national experience."
Durlauf (2000)



5. Results – decomposition of general government expenditure