

**International Seminar on
Strengthening Public Investment and Managing Fiscal Risks from
Public-Private Partnerships**

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Public Capital and Economic Growth: Key Issues for Europe

Jan-Egbert Sturm
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Outline presentation

Public capital represents (if not the engine then) the 'wheels' of economic activity

- Introduction
- Role of public capital in economic growth
- Development of public capital expenditure
- Empirical findings
 - Three waves of results
- Concluding remarks

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Background information

- Sturm, J.-E. (1998), *Public capital expenditure in OECD countries: The causes and impact of the decline in public capital spending*, Cheltenham: Edward Elgar Publishing
- Romp, W. and J. de Haan (2005), "Public capital and economic growth: A critical survey", *EIB Papers* (10:1), pp. 40-70

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Theory

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Why does public capital matter for economic growth?

- Noticeable absence of formal economic models of the productivity effects of infrastructure
- Normally it is assumed that public capital
 - increases multifactor productivity and/or
 - is a third production factor

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Some theoretical issues

- Congestion
 - Congestion gives rise to non-linearities in the relationship between public capital and growth
- Network effects
 - Once the basic links of a network are established, opportunities for productive investment diminishes
- Spill-over effects
 - Not only own stock of infrastructure is relevant, but also the neighbor's stock
- Economies of scale
 - Lower transportation costs might lead to more centralized production and thereby economies of scale

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Data

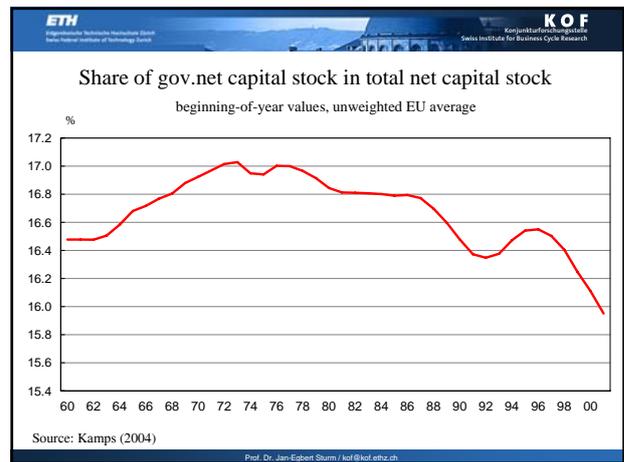
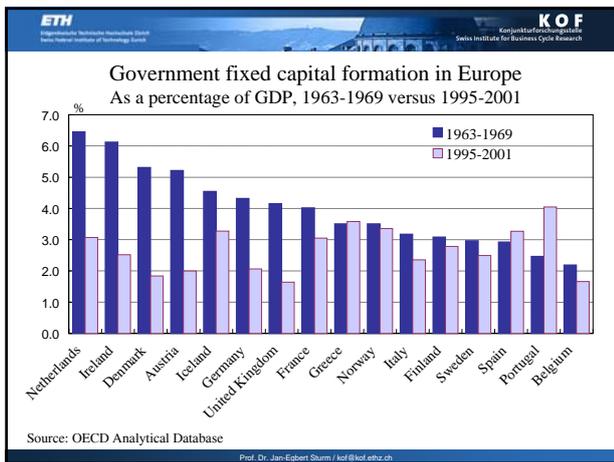
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How to measure public capital?

- What is more relevant?
 - Ownership (public / private), or
 - Type of investment (infrastructure / machinery & equipment)
- National Accounts divide by ownership and include non-productive spending items (e.g., swimming pools)
- Stock of public capital equals
 - Sum of past investments adjusted for depreciation
- More relevant are the services provides from the stock
 - Even more difficult to measure

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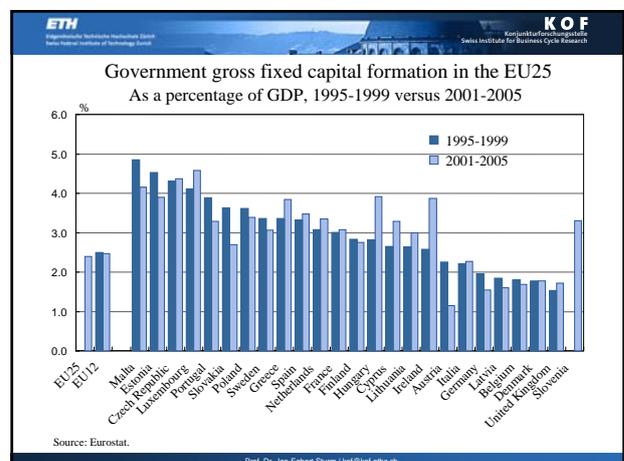
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Development of public capital expenditure within the (central) government budget

OECD	Goods & Services	Subsidies & Transfers	Capital Expenditure	Interest Payments
1970-79	30.2%	53.2%	11.9%	4.8%
1980-89	25.4%	55.4%	8.6%	10.5%
1990-01	24.9%	57.4%	6.8%	10.9%

Source: OECD Analytical Database

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Development of public investment

- Since the early 1970s, there has been a decline in public investment in industrialized countries
 - as share of GDP
 - as share of the government budget
- What can explain the drop?
 - Political, demographic, economic reasons?
- During the last decade some shifts within the government budget have been made towards more public investment

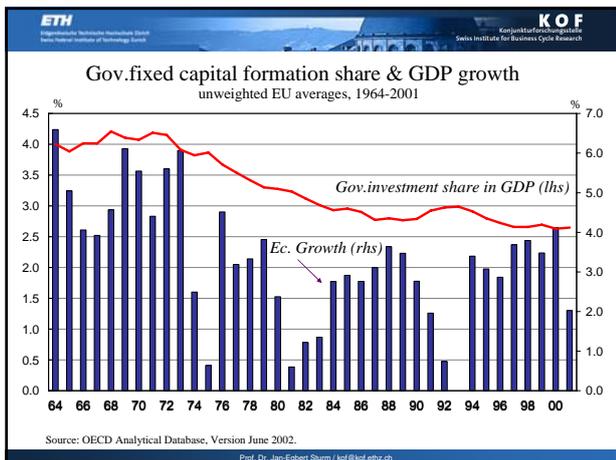
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Empirics

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How to examine the impact of public capital on growth?

- Four approaches:
 1. Production function approach
 2. Cost function approach
 3. Vector AutoRegression (VAR) models
 4. Cross-country growth models
- Each approach has its own set of problems

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Summary empirical results

- Aschauer (1989) found an output elasticity of public capital equal to 0.4
 - First wave of studies confirmed this result
- Subsequent studies often did not find a growth-enhancing impact
 - By solving some econometric issues, the relationship turned out to be not robust
- Now, there is more consensus that public capital furthers growth
 - However, the impact reported in recent studies is substantially less than suggested in the first wave of studies

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Relevant question from a policy perspective

- The relevant policy question is:

“What is the net effect of more infrastructure taking into account that infrastructure construction diverts resources from other uses”

 - Most research only focuses on the growth-enhancing effect of public capital
 - What is the optimal level of the public capital stock?
 - Public and private investment are financed out of total savings
 - Public capital should not only be productive, but also productive enough to offset the negative effect of less private investment

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Role of maintenance

- Most studies focus on the importance of additional public investment spending
- Maintenance of the existing stock is hardly addressed
- Policymakers have a perverse incentive:
 - new public investment projects are politically more attractive than spending on infrastructure maintenance
- Public capital deterioration is mostly considered as an exogenously given technical relationship
 - Neglecting the choice between investing in 'new' public capital and extending the durability of the existing public capital stock via maintenance

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Conclusions

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Concluding remarks

- There is now more consensus than in the past that public capital furthers economic growth
- However, the impact reported by recent studies is not as big as some earlier studies suggested
- There is evidence for reverse causality
- There is evidence for heterogeneity
 - the effect of public capital on growth differs across countries, regions and sectors

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Concluding remarks

- Network effects cause non-linearities
 - The effect of new public capital depends on the extent to which it alleviates bottlenecks in existing networks
- Research on explaining the differences in public investment is still in its infancy
- Maintenance and efficient use of existing infrastructure might be more important than building new infrastructure

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