

# The Dutch growth accounts – Updates and extensions



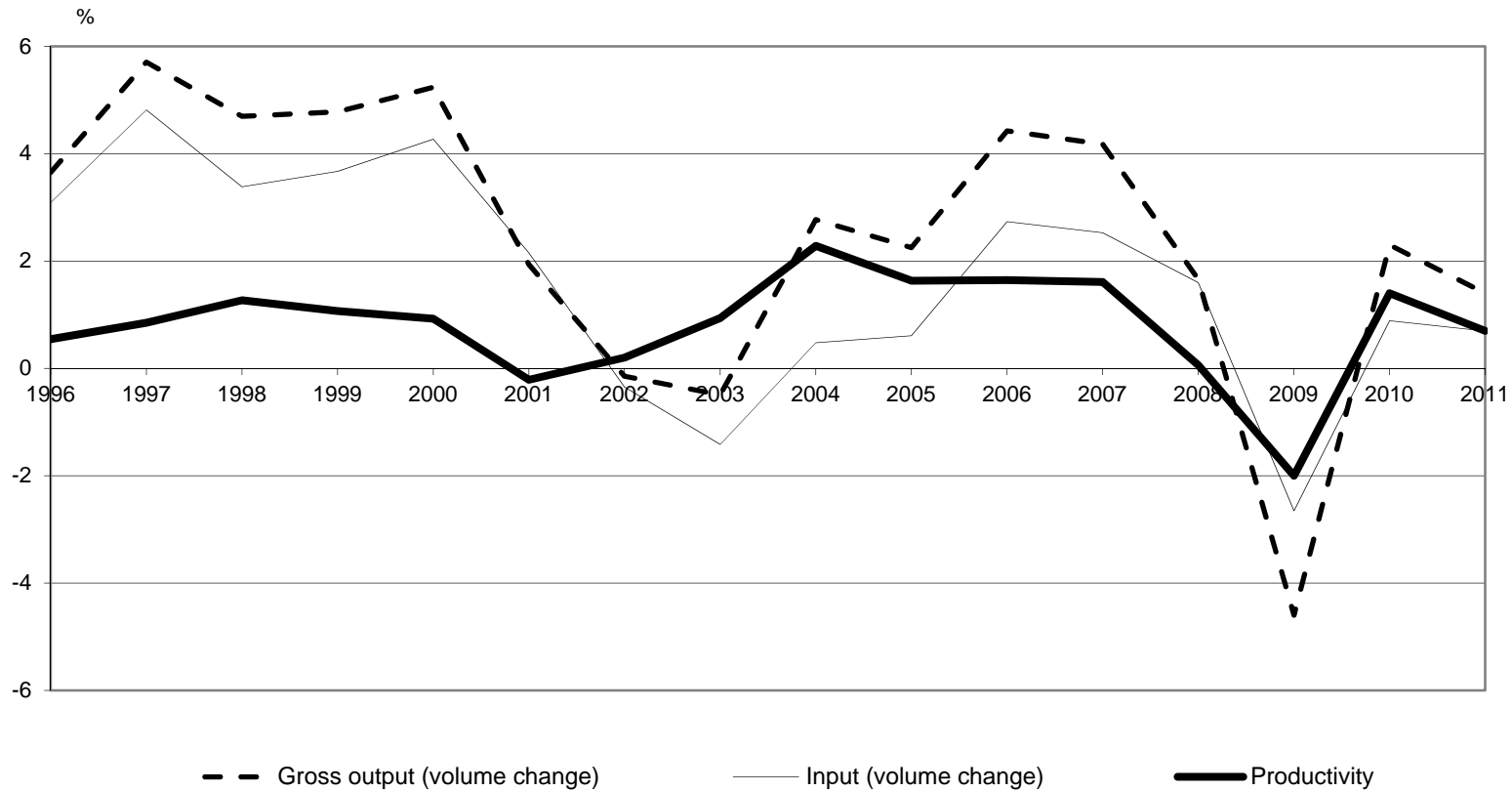
Erik Veldhuizen and Murat Tannriseven  
2nd World-KLEMS Conference,  
Harvard University,  
Cambridge, MA



## Background

- First published in 2007
- Time-series from 1995 onwards
- Exogenous and endogenous model
- Y-KLEMS and VA-KL
- 33 industries (SBI 2008, NACE rev.2)
- Extended with additional asset types

# Productivity of the Dutch commercial sector



## Additional asset types

### Regular growth accounts

- Subsoil assets
- Land
- Inventories

### Extended growth accounts

- Intellectual property products

## Including subsoil assets

- Oil and gas reserves and other subsoil assets (e.g., sand, salt, clay and gravel)
- Resource rent calculated as a residual (operating surplus minus exogenously determined user cost of produced capital)
- Division between different types of subsoil assets based on production values
- Volume change based on physical extraction

## Including land

- Three different types of land (land underlying dwellings, land underlying other buildings and agricultural land)
- No depreciation/unexpected holding gains
- Industry classification based on capital stock (dwellings and other buildings)
- Volume change based on reclassifications and quality changes (land in densely populated areas has higher quality)

## Including inventories

- Four different types of inventories
- Service provided is certainty of delivery
- No depreciation/unexpected holding gains
- Industry classification based on supply and use tables
- Volume change based on quantity changes of inventories by commodity type

## Capital cost shares, average 1996-2009

	Exogenous		Endogenous	Profitability
	Excluding subsoil assets, land and inventories	Including subsoil assets, land and inventories	Excluding/Including subsoil assets, land and inventories	Profitability (exogenous)
	<i>Percent</i>			
<b>Commercial sector</b>	14,2	17,2	22,7	7,1
Agriculture, forestry and fishing	20,2	28,3	14,8	-15,7
Mining and quarrying	37,0	72,5	72,4	-0,4
Manufacturing	8,0	8,7	12,6	4,4
Electricity, gas and water supply	22,5	22,8	27,8	7,2
Construction	4,0	4,1	7,1	3,2
Trade, hotels, restaurants and repair	9,0	10,7	20,1	11,7
Transport, storage and communication	18,8	19,1	21,9	3,7
Financial and business activities	9,4	10,0	18,0	9,8
Care and other service activities	9,7	10,3	13,2	3,3



# Effects on real rate of return and profitability

	RR Exogenous	RR Endogenous		Profitability (exogenous)	
	Excluding/Including subsoil assets, land and inventories	Excluding subsoil assets, land and inventories	Including subsoil assets, land and inventories	Excluding subsoil assets, land and inventories	Including subsoil assets, land and inventories
	<i>Percent</i>				
<b>1996</b>	3,8	9,3	6,1	7,5	3,9
<b>1997</b>	3,9	10,1	6,6	8,3	4,6
<b>1998</b>	4,0	10,5	7,0	8,6	5,2
<b>1999</b>	2,9	10,1	6,8	9,6	6,9
<b>2000</b>	2,5	10,6	6,6	10,4	7,3
<b>2001</b>	2,8	11,1	6,7	10,7	7,0
<b>2002</b>	3,0	11,1	6,9	10,3	6,9
<b>2003</b>	3,1	11,5	7,3	10,8	7,3
<b>2004</b>	3,1	12,0	7,5	11,1	7,5
<b>2005</b>	2,4	14,0	8,7	14,1	10,4
<b>2006</b>	2,9	14,9	8,9	14,0	9,5
<b>2007</b>	4,2	15,9	9,7	13,1	8,5
<b>2008</b>	4,8	17,3	10,0	13,2	7,2
<b>2009</b>	4,4	15,2	9,2	12,7	7,8

## Productivity effects, average 1996-2009

	Exogenous		Endogenous	
	Excluding subsoil assets, land and inventories	Including subsoil assets, land and inventories	Excluding subsoil assets, land and inventories	Including subsoil assets, land and inventories
	<i>Percentage point</i>			
<b>Commercial sector</b>	0,74	0,79	0,76	0,75
Agriculture, forestry and fishing	0,57	0,62	0,60	0,60
Mining and quarrying	-1,73	-0,52	-0,94	-0,53
Manufacturing	0,57	0,56	0,54	0,53
Electricity, gas and water supply	0,60	0,60	0,65	0,65
Construction	-0,13	-0,13	-0,17	-0,17
Trade, hotels, restaurants and repair	1,17	1,14	1,19	1,03
Transport, storage and communication	1,52	1,52	1,53	1,54
Financial and business activities	0,30	0,34	0,42	0,47
Care and other service activities	-0,09	-0,08	-0,10	-0,08

## Intellectual property products

- Computerized information
  - Computer software (3 years)
  - Computerized databases (3 years)
- Innovative property
- Economic competencies

## Intellectual property products

- Computerized information
- Innovative property
  - (Scientific) R&D (12 years, 2 exceptions)
  - Mineral exploration (40 years)
  - Other innovative property (e.g. new architectural and engineering designs, 8 years)
- Economic competencies

## Intellectual property products

- Computerized information
- Innovative property
- Economic competencies
  - Brand equity (advertising expenditures and market research, 2 years)
  - Firm specific human capital (7-13 years)
  - Organizational structure (5 years)

## Including intellectual property products

### **Own-account production of intellectual property products**

- Gross output increases with own-account production
- Investments increase with production value
- Value added increases with production value

### **Purchased intellectual property products**

- Intermediate consumption decreases with value of purchased intellectual property products
- Investments increase with value of purchases
- Value added increases with value of purchases

# Investments in intellectual property products for the Netherlands

	1990	2000	2010
	<i>% of GDP</i>		
Computerised information	0,8	1,5	1,4
Innovative property	2,3	1,9	1,6
R&D	1,2	1,0	0,9
Mineral exploration	0,2	0,0	0,0
Other	0,9	0,9	0,7
Economic competencies	5,5	6,5	5,7
Brand equity	2,3	2,6	2,1
Firm-specific human capital	1,0	1,2	1,1
Organisational structures	2,1	2,6	2,4
Total investment in intellectual property	8,6	9,9	8,7

# Contributions to gross output growth for the Dutch commercial sector

	1996/2001	2002/2008
<i>percent</i>		
Consolidated output	4.35	1.95
<i>percentage point</i>		
Labour	1.03	0.21
Capital	1.02	0.20
Other fixed assets	0.58	0.16
<b>Intellectual property products</b>	<b>0.44</b>	<b>0.04</b>
<b>Computerized information</b>	<b>0.14</b>	<b>0.04</b>
<b>Innovative property</b>	<b>0.05</b>	<b>0.00</b>
<b>Economic competencies</b>	<b>0.24</b>	<b>0.00</b>
Intermediate consumption	1.49	0.46
Multi-factor productivity	0.82	1.09



## Conclusions

- Including additional asset types improved growth accounting outcomes and increased convergence between productivity models in most industries
- Rate of return (in the endogenous model) and profitability (in the exogenous model) are highly sensitive to asset coverage
- Including intellectual property products in growth accounts is important for (policy) analysis