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Pensions in a shrinking economy

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Adjustments of the economy to a declining labour force

- (1) increase in retirement age**
- (2) longer working days / weeks**
- (3) higher participation of the working age population**
- (4) higher productivity per worker (technological progress)**
- (5) the capital (or Solow) effect**
(i.e. by not replacing part of the capital resources become available for consumption)

Adjustment of the economy to a declining labour force

The capital or Solow effect: adjustment of the p.c. capital intensity

- (1) no reduction in net investments \rightarrow higher capital intensity**
- (2) any reduction in net investment, but remaining positive \rightarrow the capital intensity is still increasing**
- (3) negative investments with constant capital intensity**

Aging in the Netherlands: scenario analysis

TABLE9 Welfare in 2027 (consumption level of the 20+ -population
; 2012 = 100)

	growth rate of productivity (%)		
participation rate	0	1	2
0.73	91	109	130
0.76	94	112	134
0.80	99	118	141

Aging in the Netherlands: scenario analyses

TABLE 10 Growth rates of productivity necessary for a higher level of welfare in 2027

	growth of consumption level from 2012 to 2027 (%)			
participation rate	0	25	50	75
0.73	0.5	1.8	2.8	3.7
0.76	0.3	1.6	2.6	3.5
0.80	0.0 ⁵	1.3	2.3	3.2

Adjustment of the economy to a declining labour force

The capital or Solow effect: adjustment of the p.c. capital intensity

No or small reduction in net investments \rightarrow higher capital intensity.

Leading to:

- * higher p.c. level of output**
- * higher wage rate**
- * lower return on capital**

Adjustment of the economy to a declining labour force

The capital or Solow effect: negative investment with constant capital intensity

After the transitional period equilibrium on a lower level of GDP with zero net investment is restored, thereby disengaging resources which can be transferred to the aged

Model calculations

Assumptions

- (1) two identical overlapping generations: N persons working and N persons retired**
- (2) neo-classical stationary economy with net zero savings and investments**
- (3) the elderly lend the total amount of savings accumulated during their working years to the pension institutions, which in turn invest them in productive activities**
- (4) savings of the workers equal dissavings of the elderly**

Model findings: one-off decline of the labour force

Population decline in period 1 ; pensions financed by funding (contribution rate 0.2855)

<u>no workers</u>	<u>no. retirees</u>	<u>GNP</u>	<u>K</u>	<u>S</u>
100	100	1345	268	0
90	100	1250	268	- 19
90	90	1220	250	- 5
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.
.
90	90	1210	242	0

Model findings: secular decline of the labour force

Population decline 5% yearly; pensions financed by funding (contribution rate 0.2855)

<u>no workers</u>	<u>no. retirees</u>	<u>GNP</u>	<u>K</u>	<u>S</u>
100	100	1345	268	0
95	100	1298	268	- 9
90.3	95	1239	259	- 12
.
.
.
50	50	673	134	0

Adjustments of the economy to a declining labour force

Concluding (1)

there is room for a further increase in welfare in European countries due to a continued increase in participation from 0.70 to at least 0.75 (2025) and to 0.78 (2055) and an annual 1¾ percent productivity growth.

Adjustments of the economy to a declining labour force

Concluding (2)

The adverse effects of a decline in the labour force on economic well-being of the population can at least partly be offset by dissavings (or the effect of non replacing part of the capital stock)