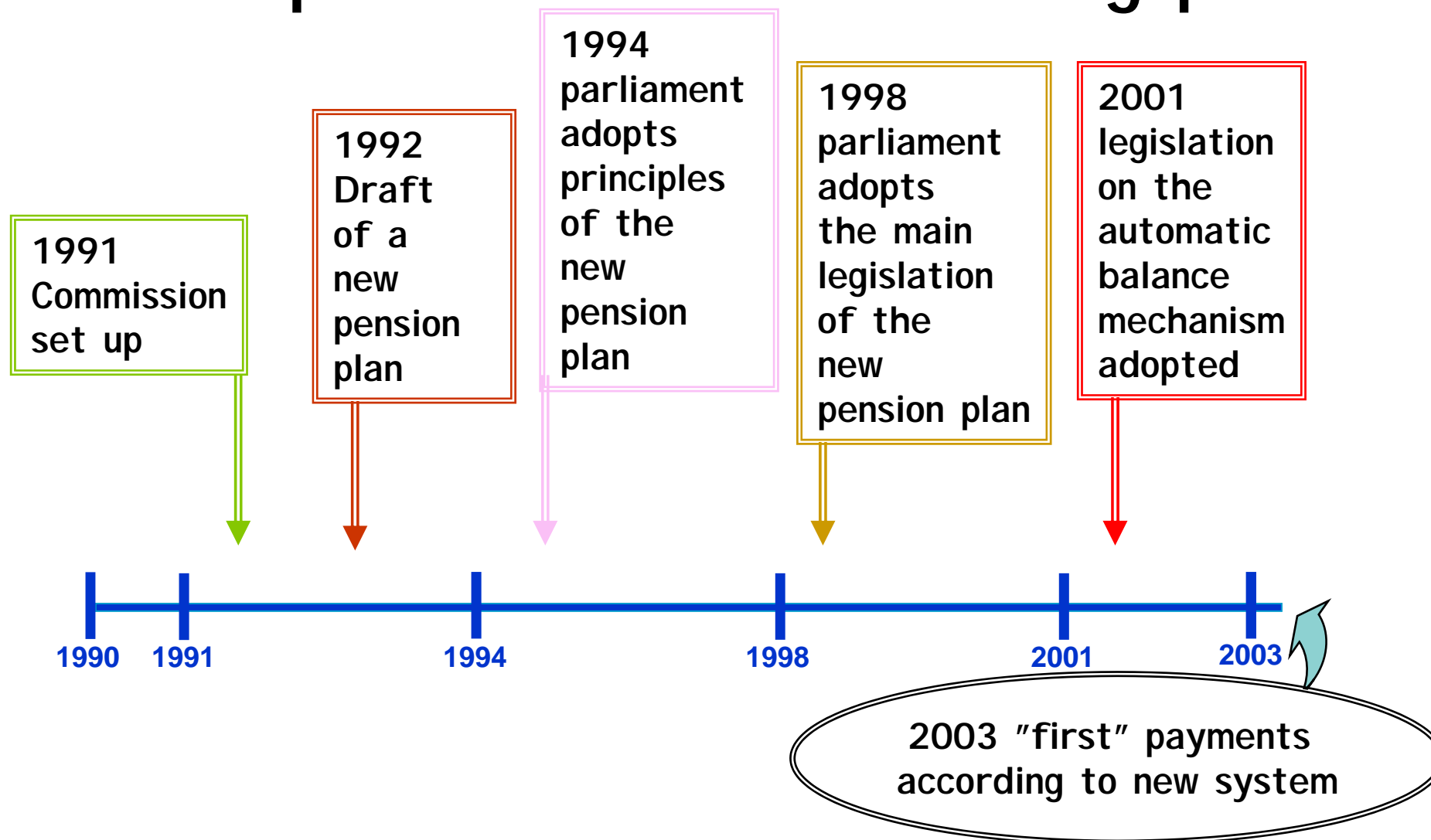


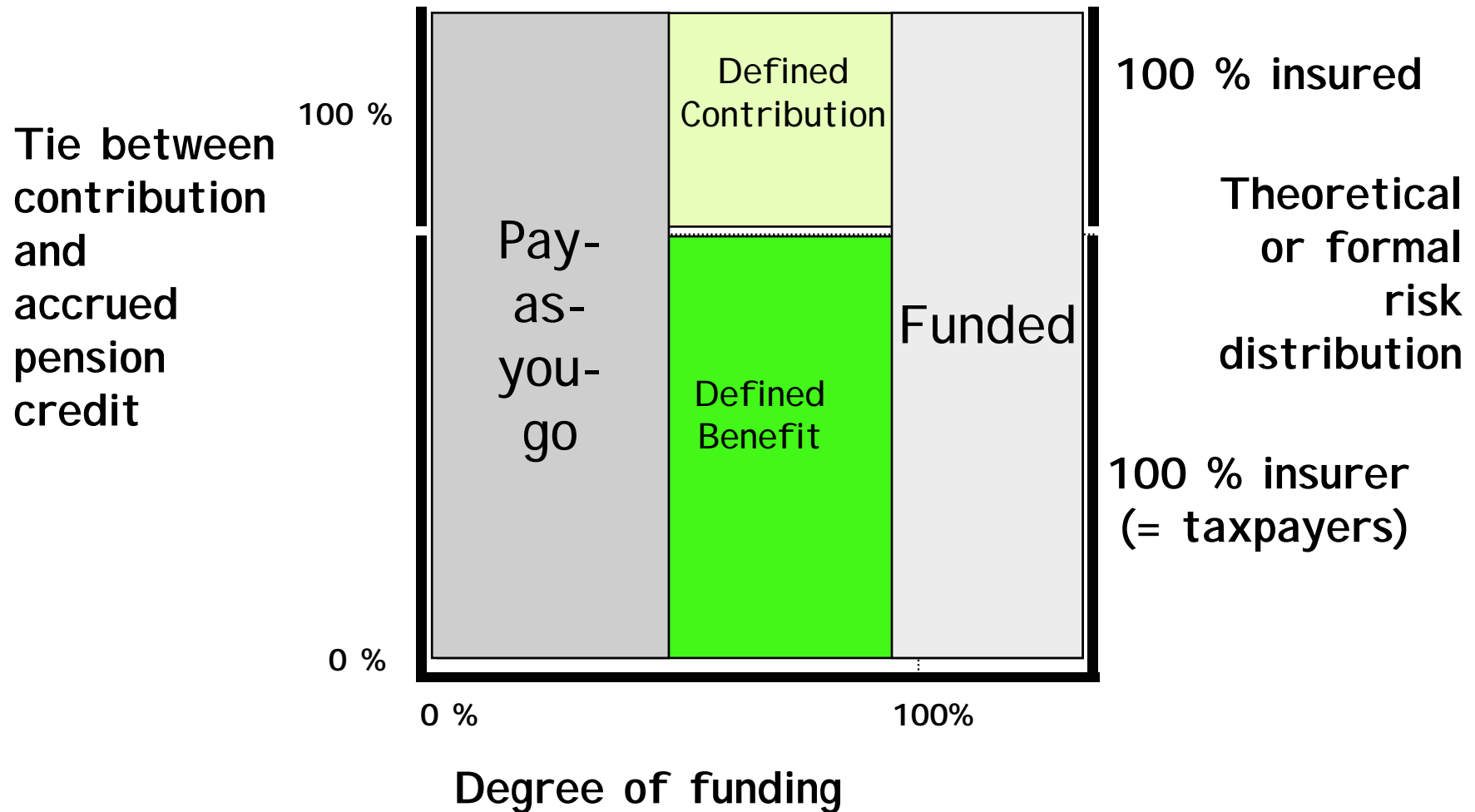
The Balance Sheet of the Swedish National Pension System

Swedish pension reform - a long process

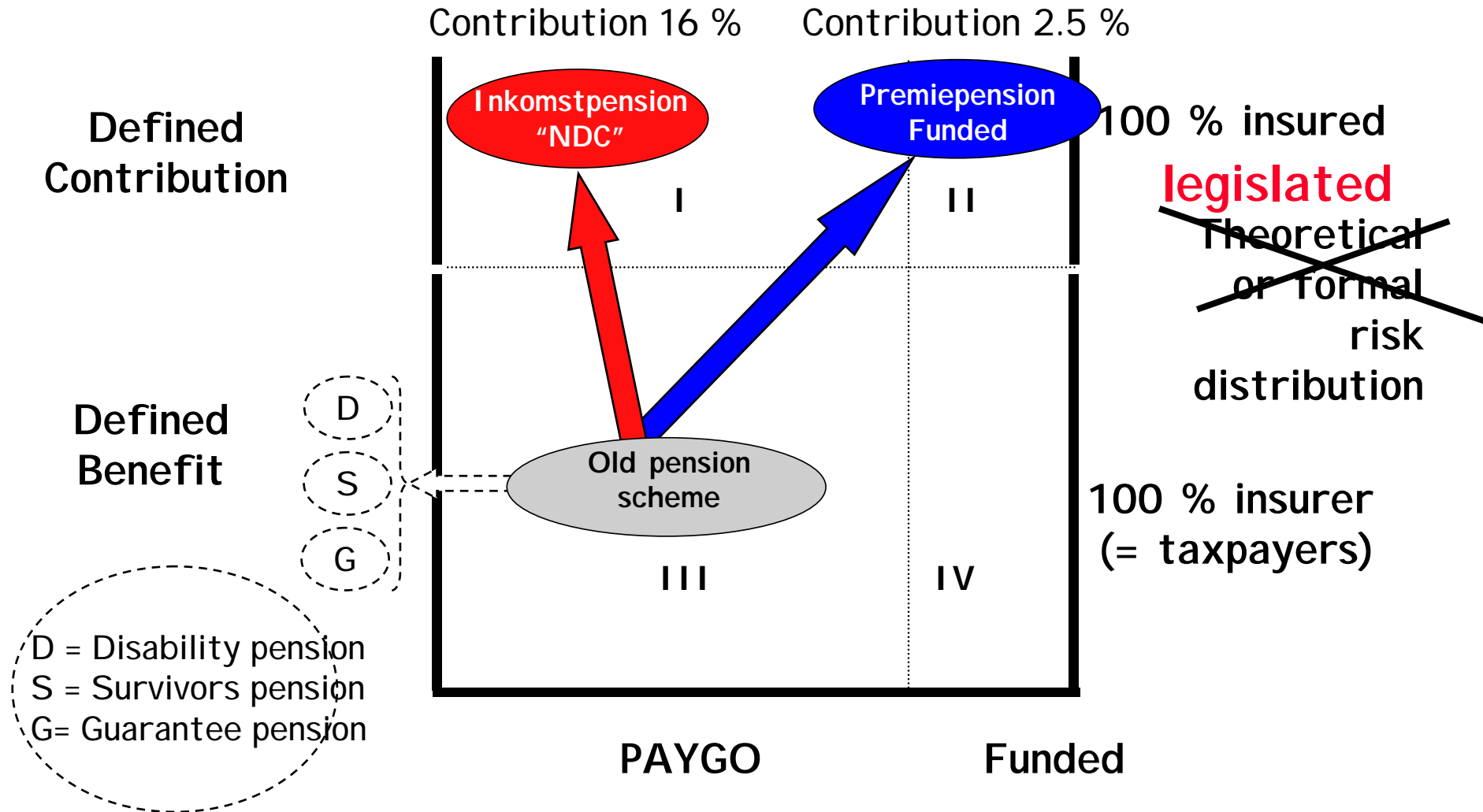


But transition to new system is relatively quick!

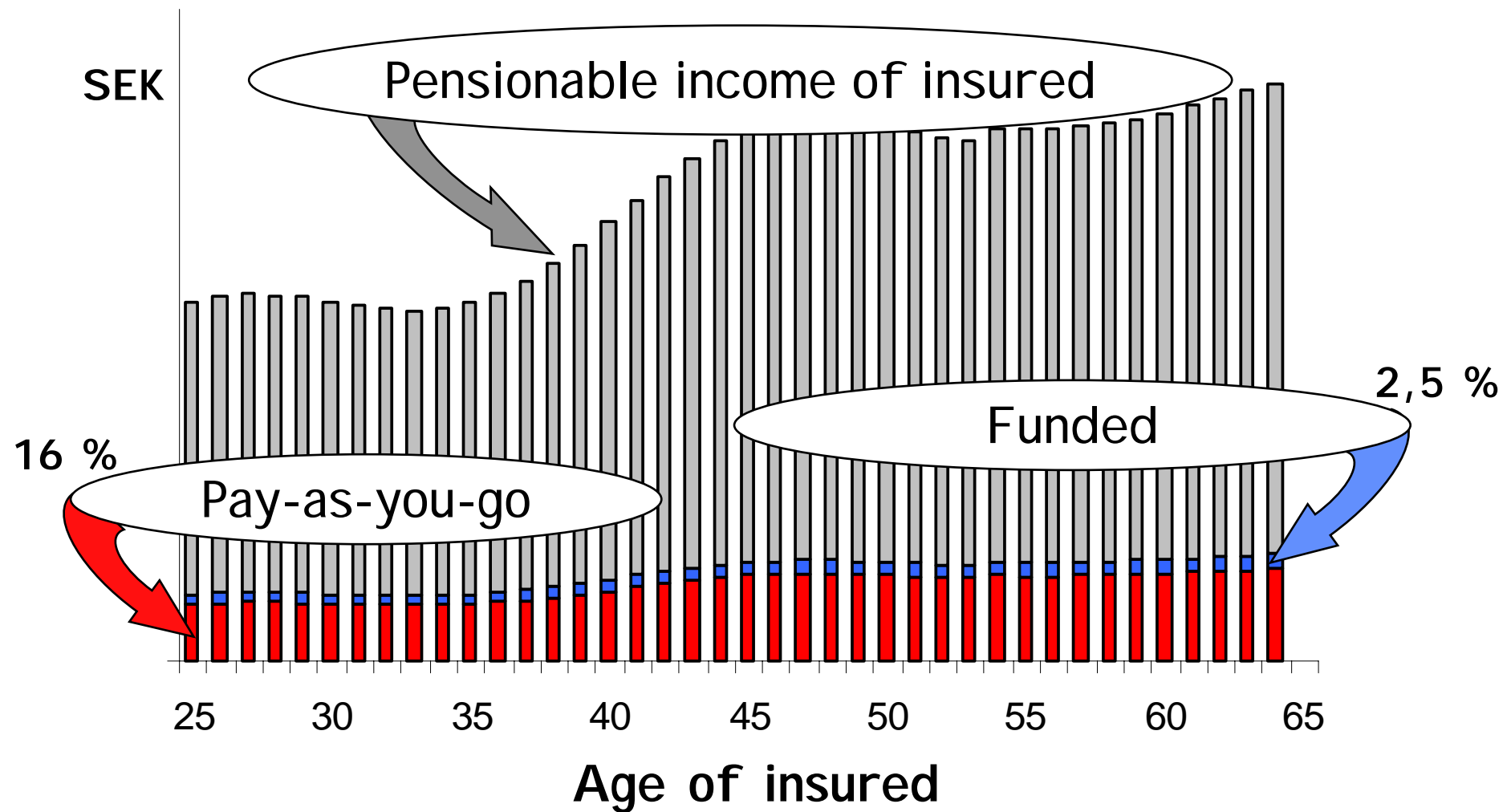
Four basic design options



Swedish Reform Strategy

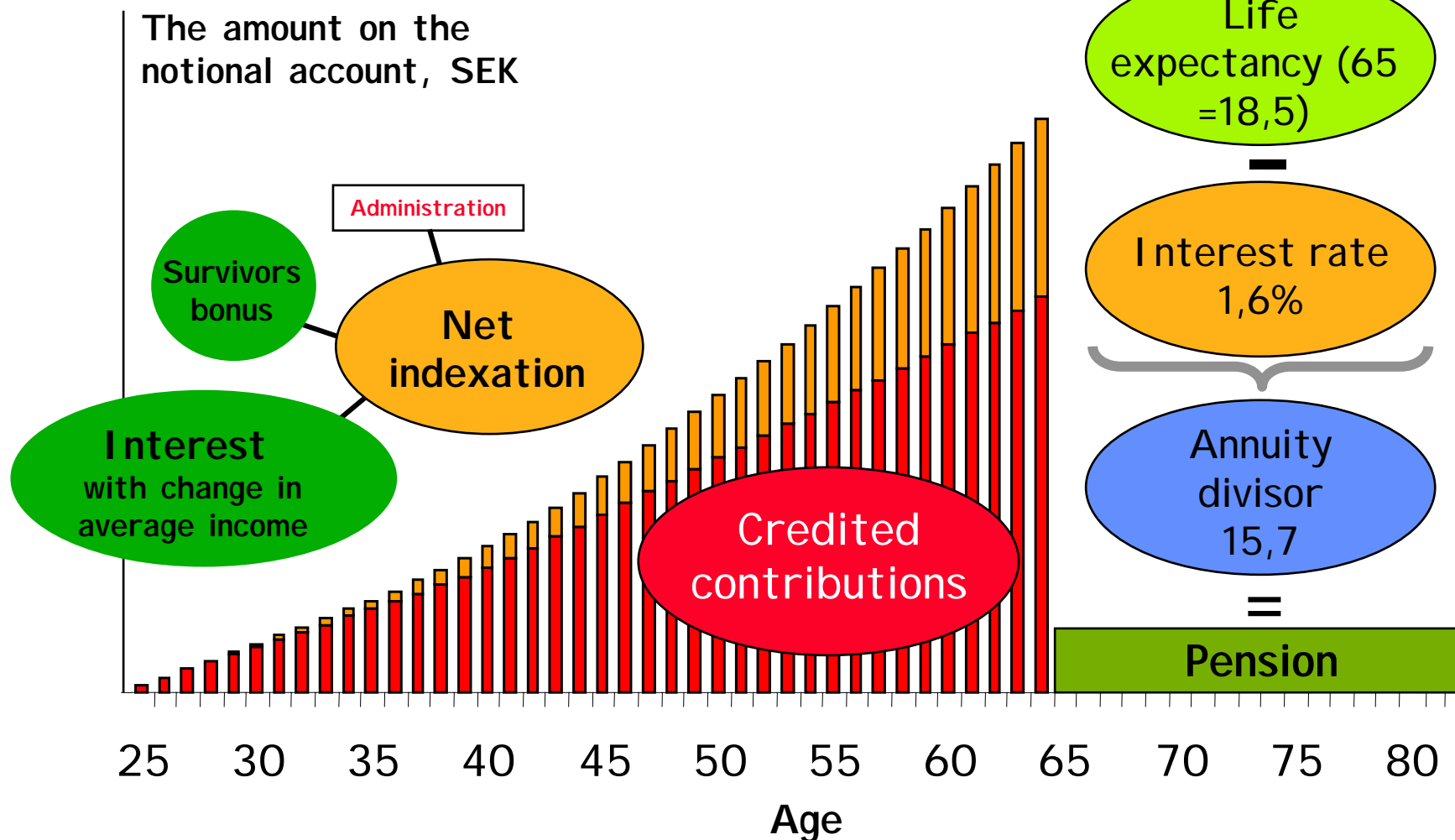


Each crown paid during life result in the same amount of pension credit



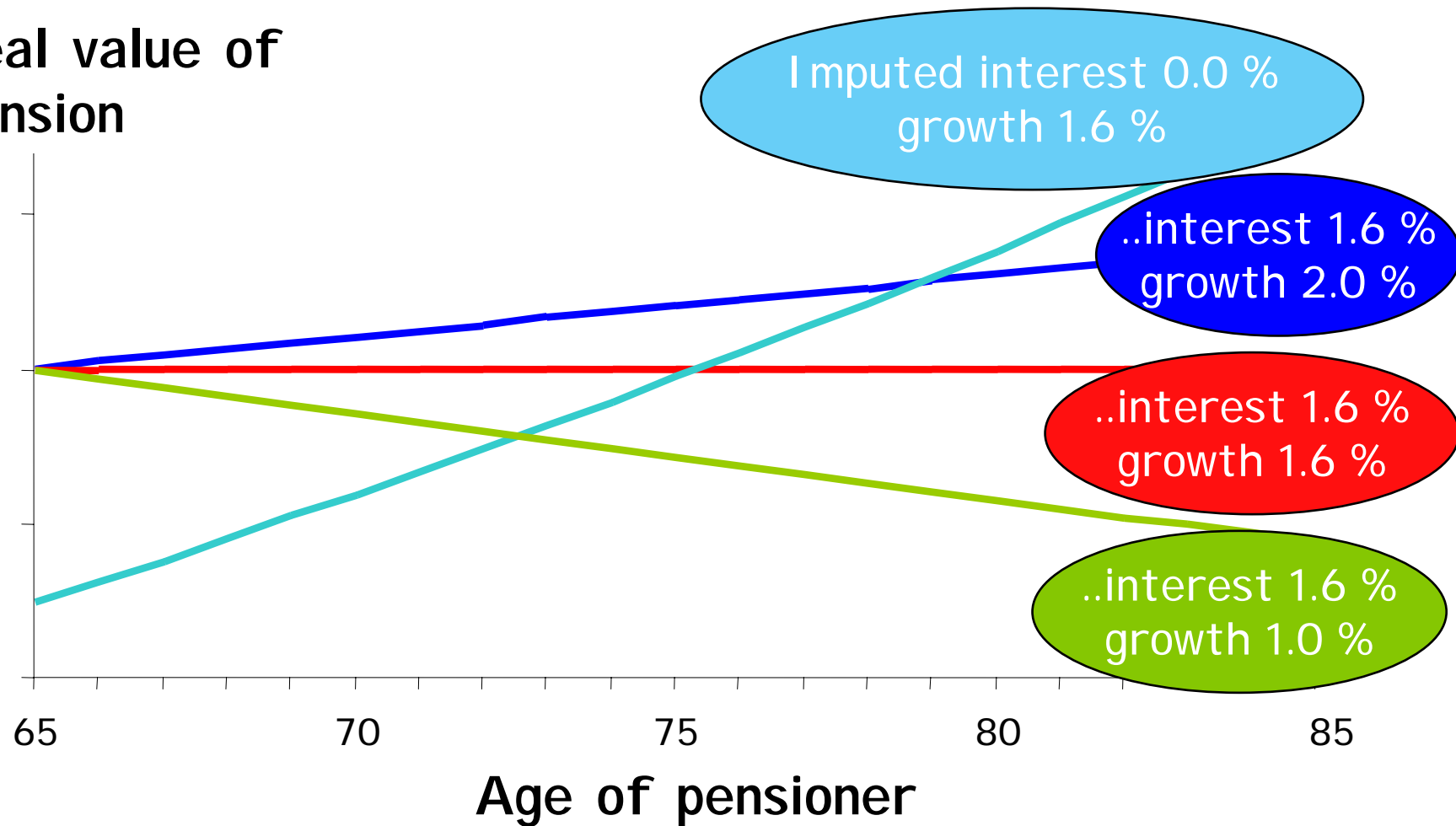
Development of notional account

Conversion to an annuity



Pension as an annuity

Real value of pension



**Traditional social security indicators of
financial balance (single entry)**

versus

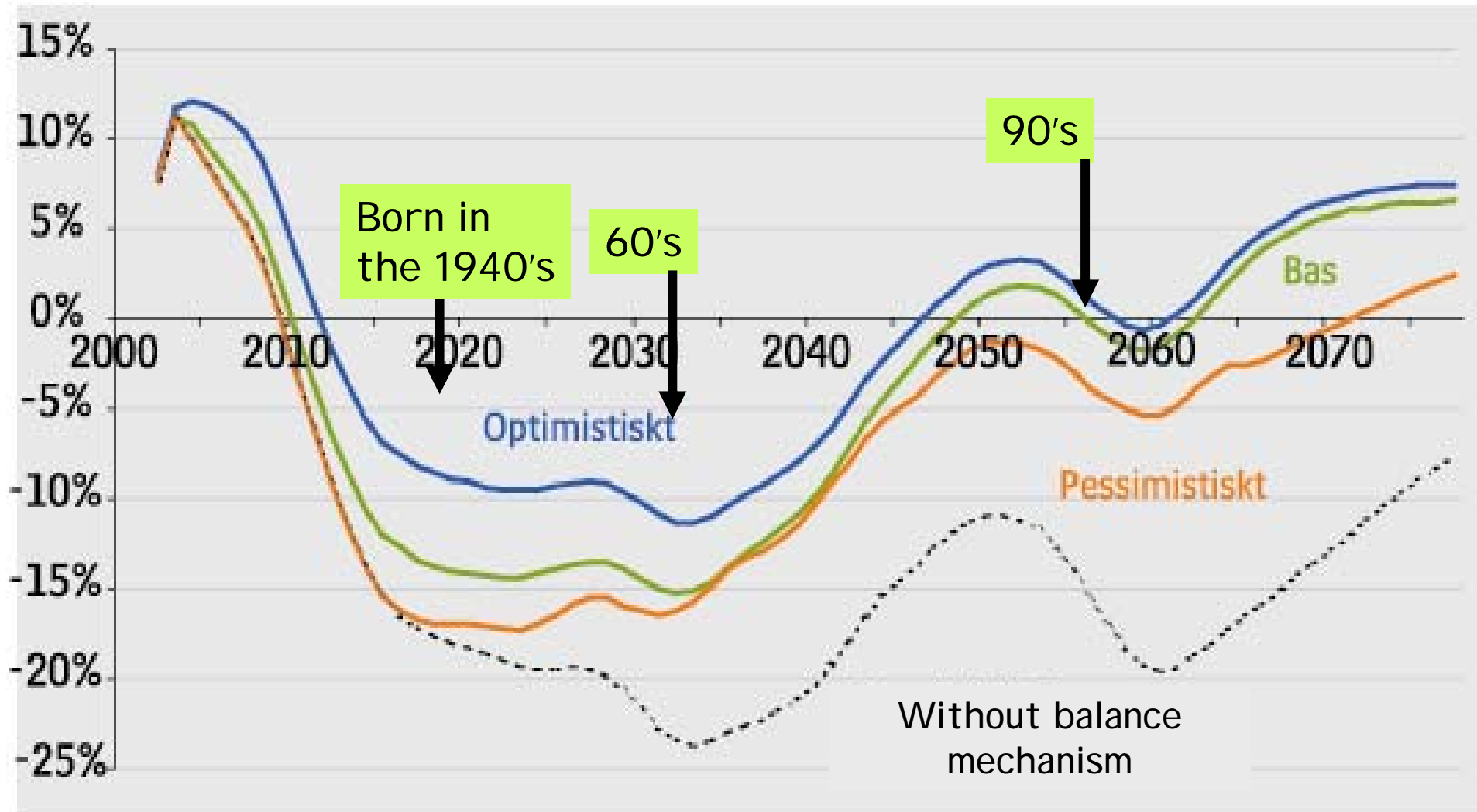
**The double entry bookkeeping
indicators of financial balance
developed for the
Swedish NDC scheme**

Traditional social security indicators of financial balance (single entry)

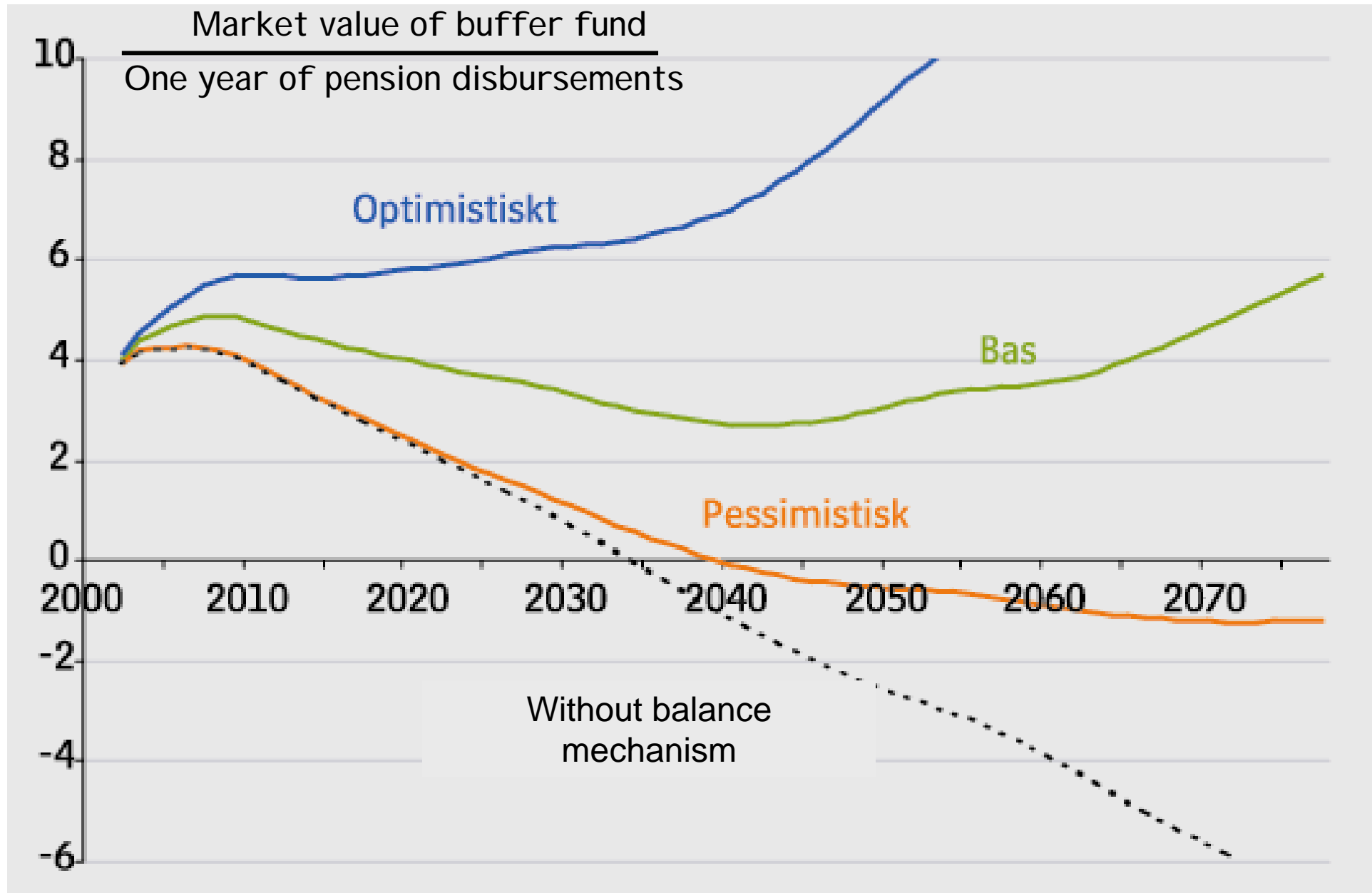
**Examples from the Swedish NDC
system:**

Simulations of net contribution 2002-2077

in percent of total contributions



Simulations of fund ratio, 2002-2077



**The double entry bookkeeping
indicators of financial
balance developed for the
Swedish NDC scheme**

To get the net present value of pensions, contributions must be deducted from the expected flow of pensions...

Which flow of pensions?	Which flow of contributions?
A. All individuals that at time of measurement have entered work force (closed group defi.)	Contributions from the same individuals
B. During a 75 year period, as the US SSA does	All contributions during the 75 years
C. Infinite time horizon	Infinite time horizon
D. The flow of pensions that derive from pension credits accrued at the time of measurement.	No contributions

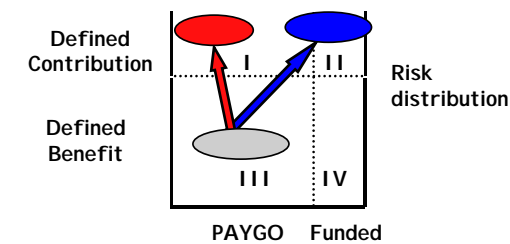
Which discount factor?

- A. The expected capital market return?
- B. The expected growth in average income?
- C. The expected internal rate of return of the public pension system?

Imagine a defined contribution pension system,
i.e. a pension system where

A. The annual pension credit = annual contribution

B. The "return" (indexation) of pension credit &
pension benefit = internal rate
of return of the system



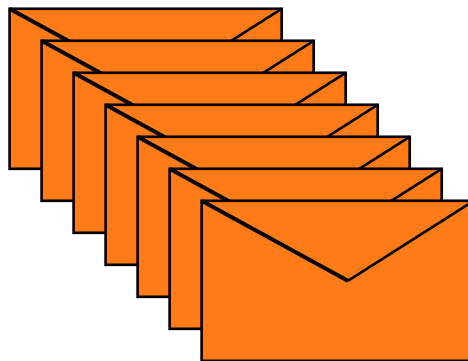
What is the net present value of the
pension liability of such a system?

accumulated contributions
+ accumulated return
- accumulated paid pensions

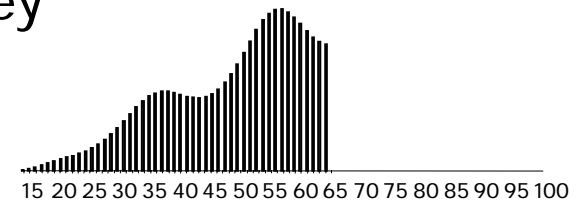
= net present pension liability

More simply calculated as...

1.

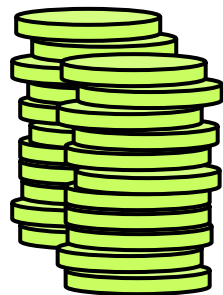


The sum of the money value of notional accounts of the active population



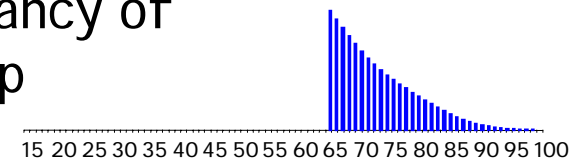
+

2.



×

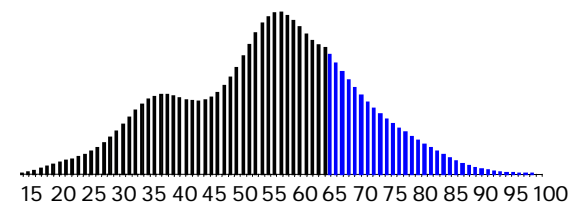
Remaining life expectancy of each retired age group



Pension payments to each retired age group

=

Total net pension liability



The super simple, legislated, rule for calculating the Swedish pension liability (implicitly) implies that the:

- A: relevant pension flow is that which derive from pension credits already earned at the time of measurement
- B: internal rate of return of the public pension system is the relevant discount factor.
- C: notional pension capital and pensions are indexed at the same rate as the internal rate of return of the pension system. (Which is only true if and when the automatic balance mechanism is active.)

The defined contribution design eliminates - **by definition** - the need to consider the future, when estimating pension liability.

Thus no projected cash flows, no assumed discount rate.

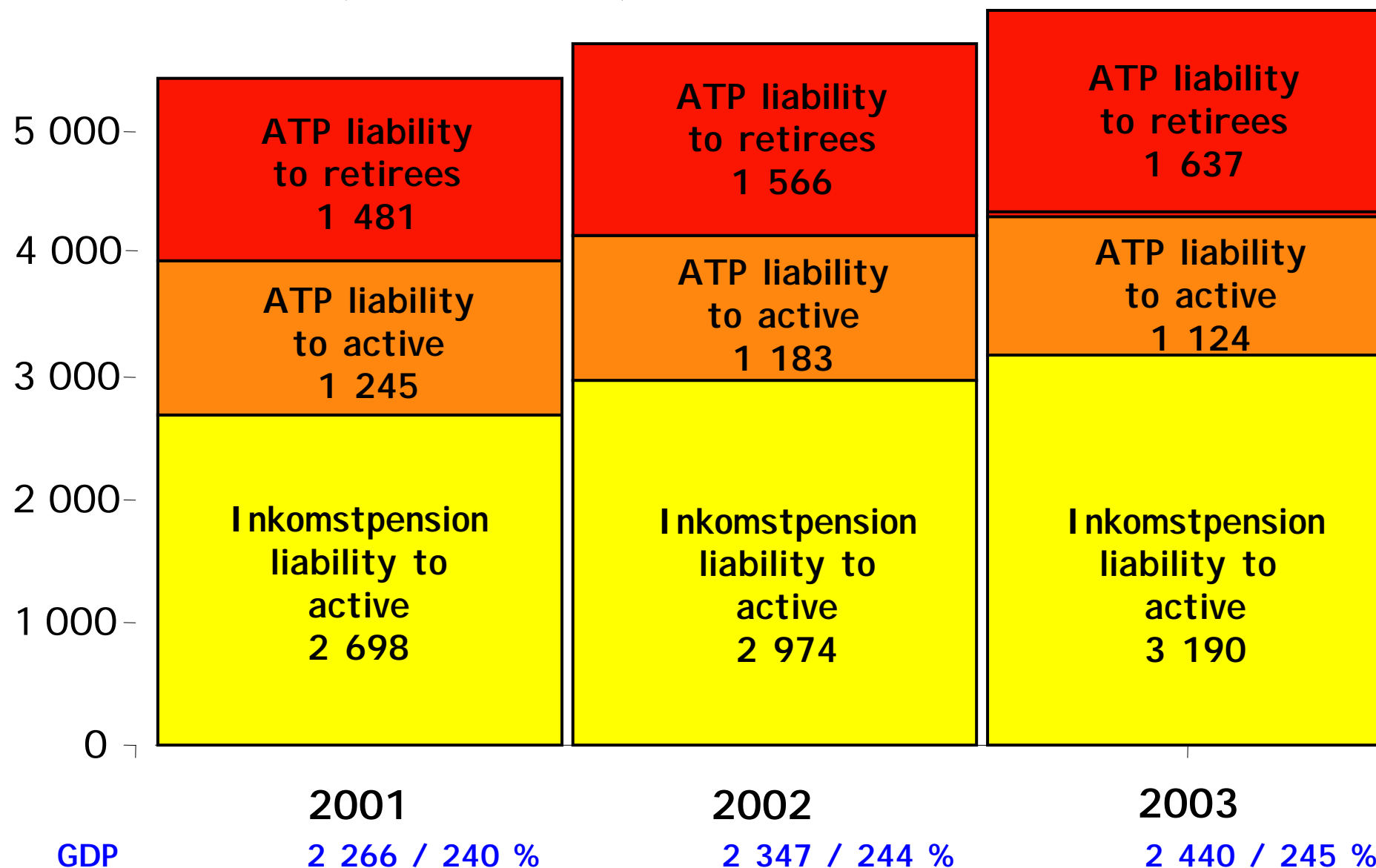
This is equally true for a (true) NDC scheme as for a funded DC.

WYSIWYG

What You See Is What You Get

What did we get? Some real and big numbers

Billions of SEK (1 Euro = 9 SEK)



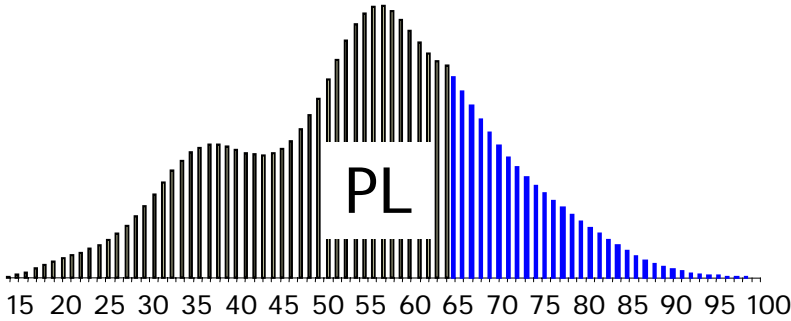
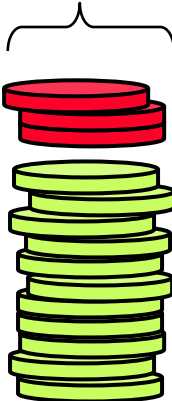
**Does a PAYG pension system have
Assets?**

Balance Ratio

Contribution asset

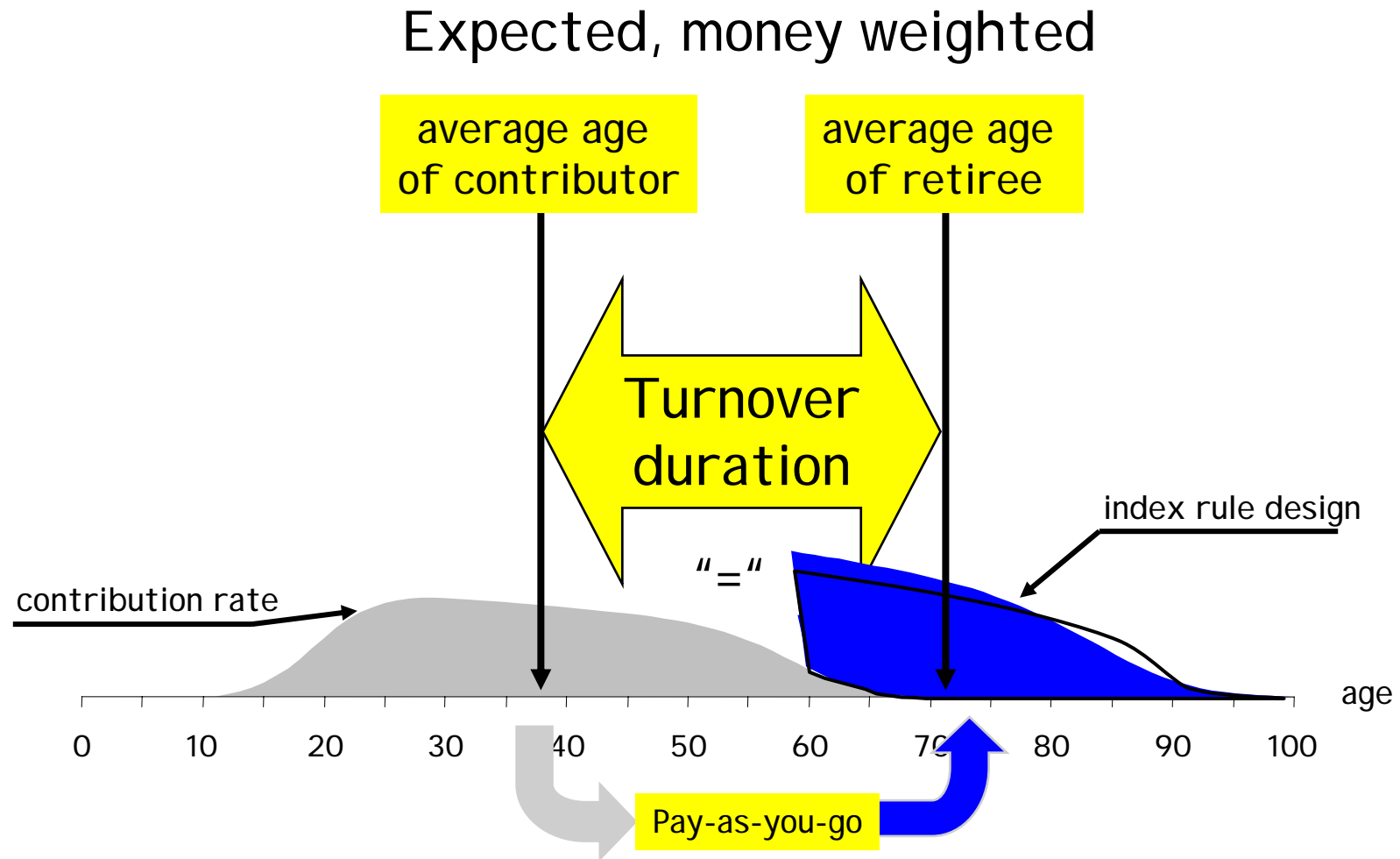
+

Buffer fund

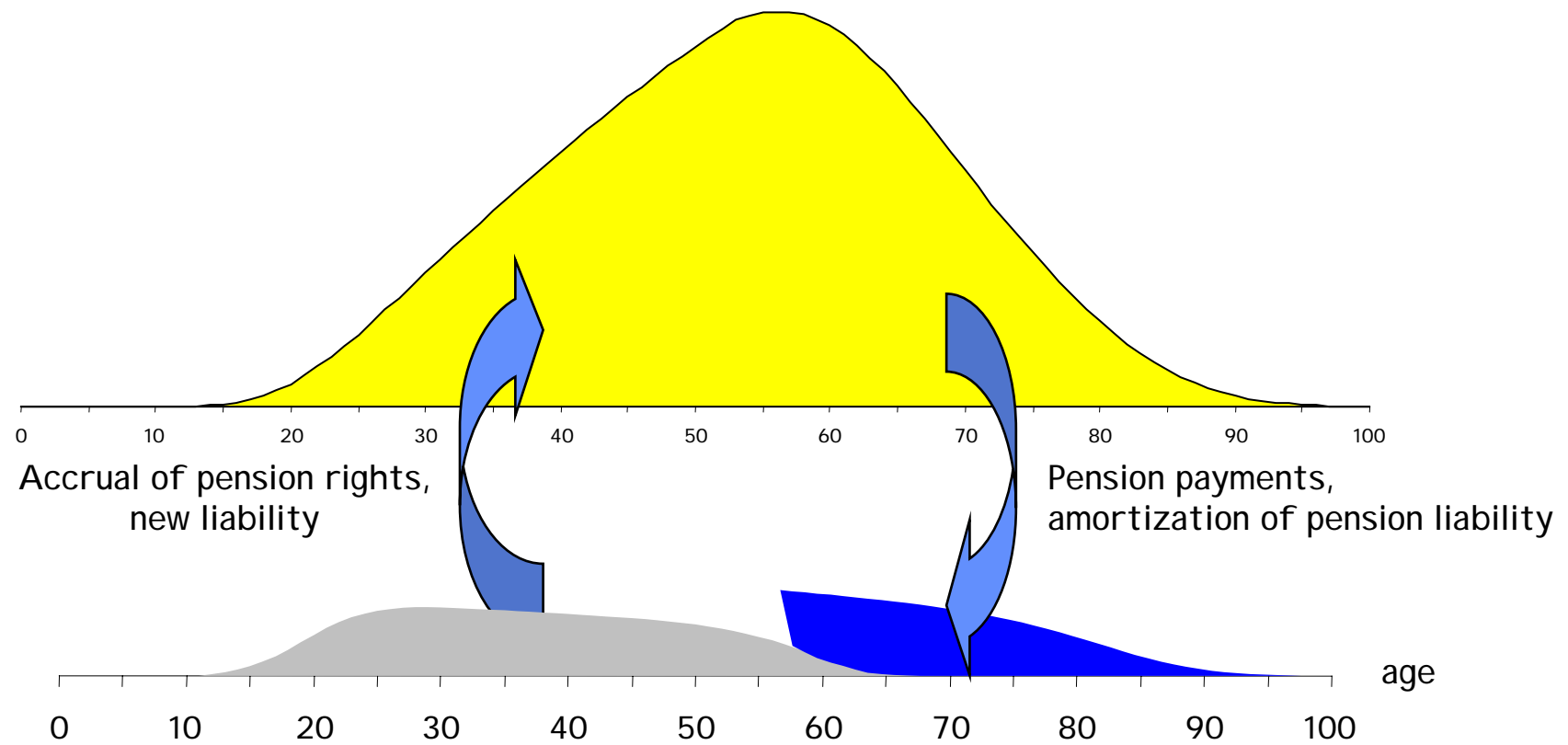


Pension liability

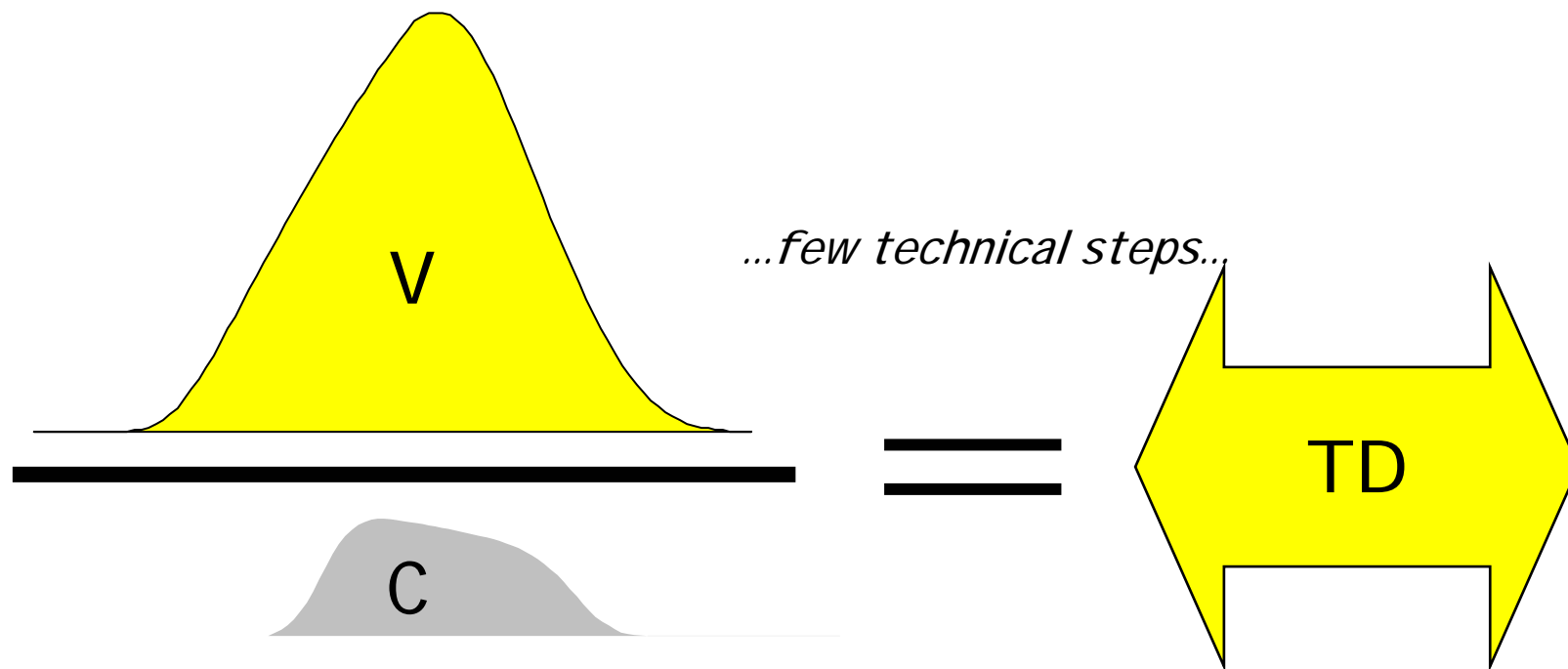
Expected contributions & pensions



Expected Pension Liability



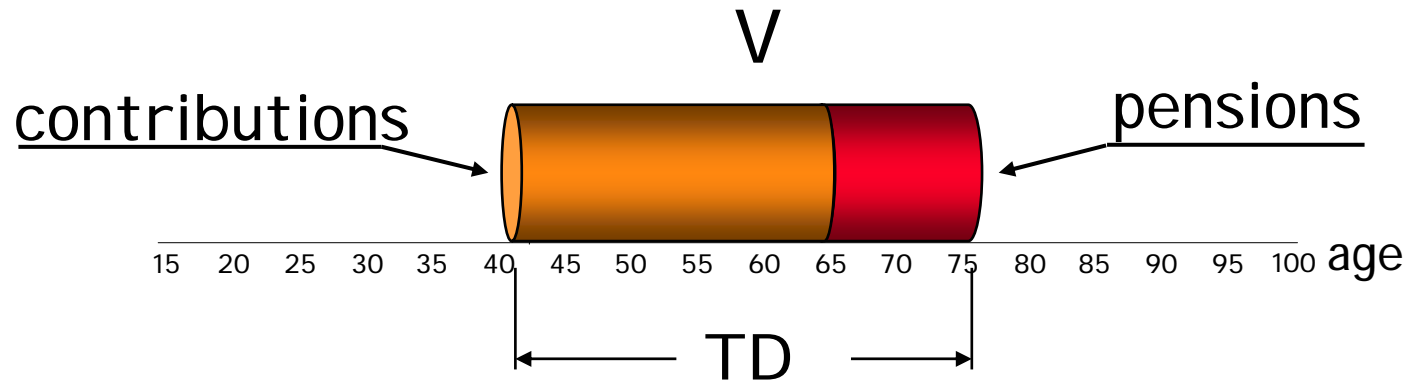
Expected Pension Liability Expected Contributions



$$\frac{V}{C} = TD \Rightarrow V = TD \times C$$

Volume

Structure

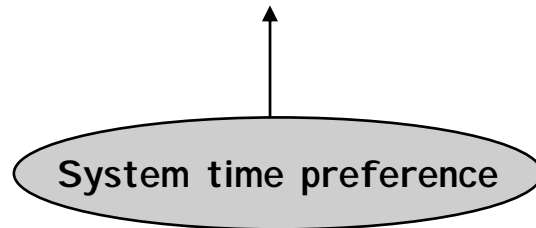


Expected Pension Liability



Contribution asset

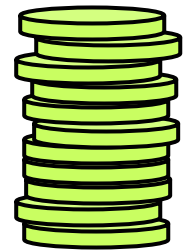
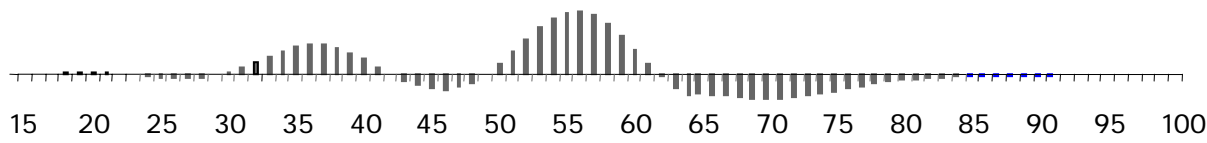
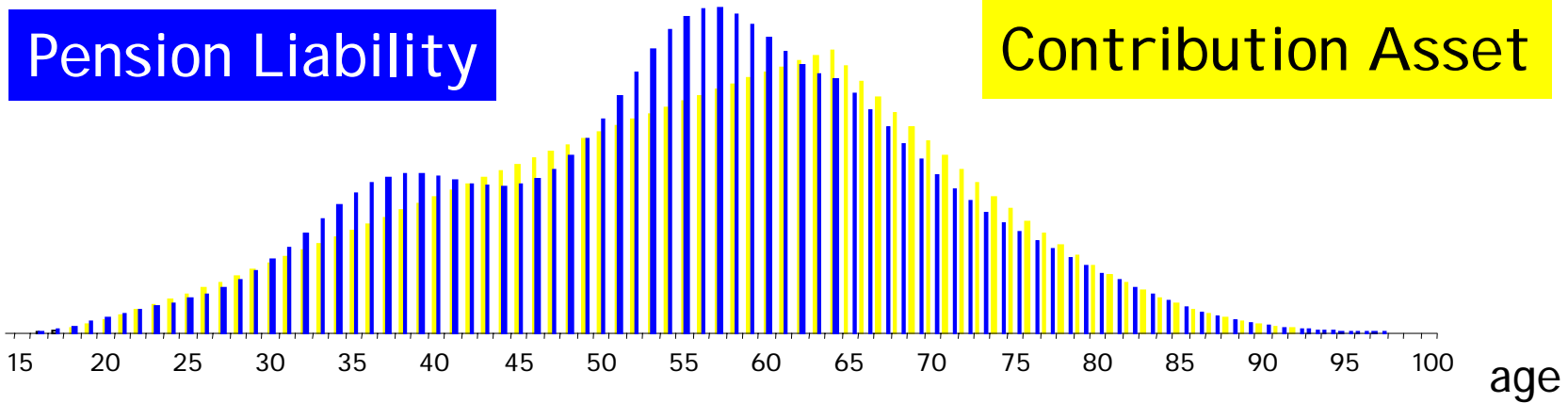
$$V = \frac{C}{\left(\frac{1}{TD}\right)} = PV(\text{contribution flow})$$



Pension Liability and the Fund

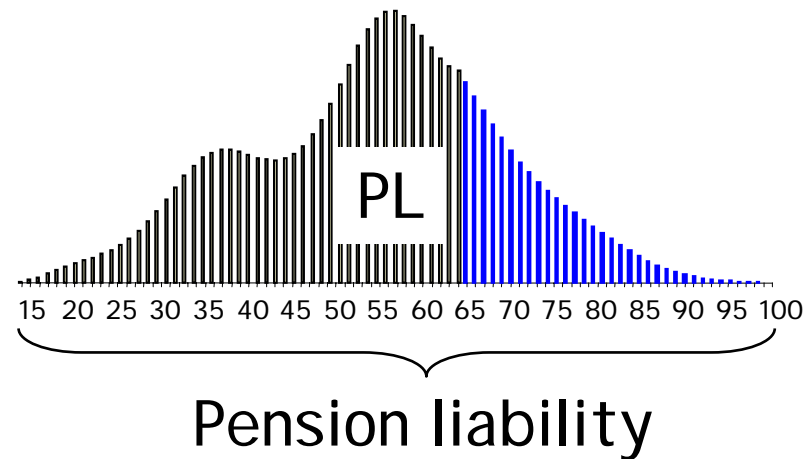
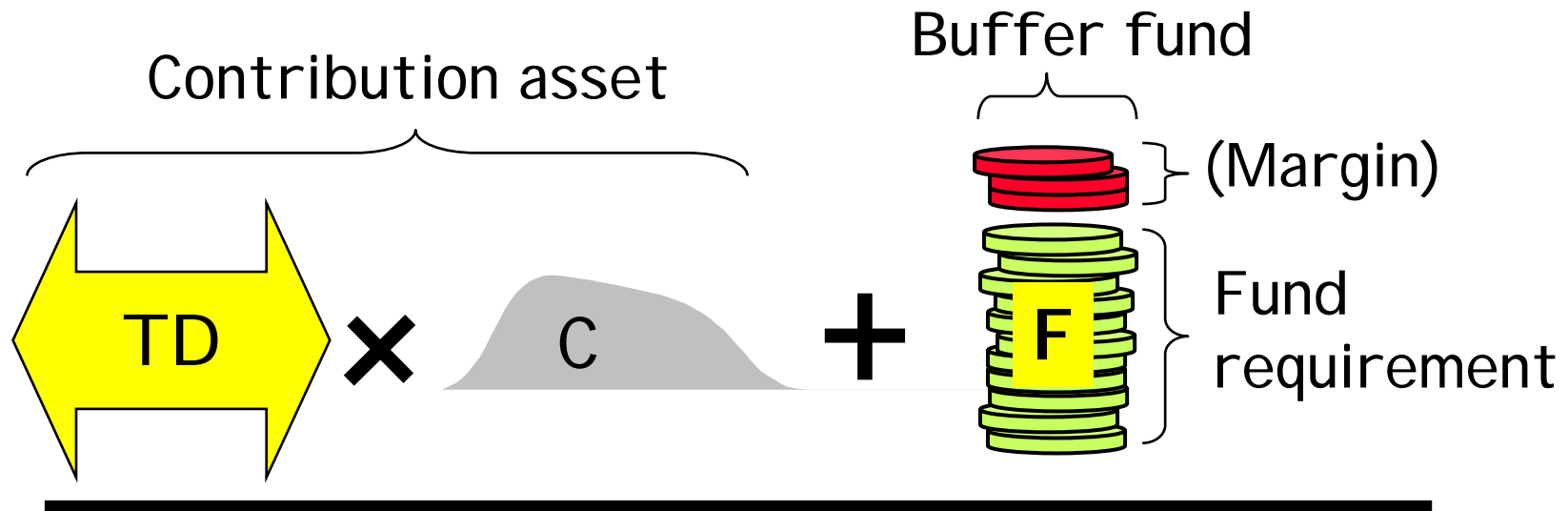
Pension Liability

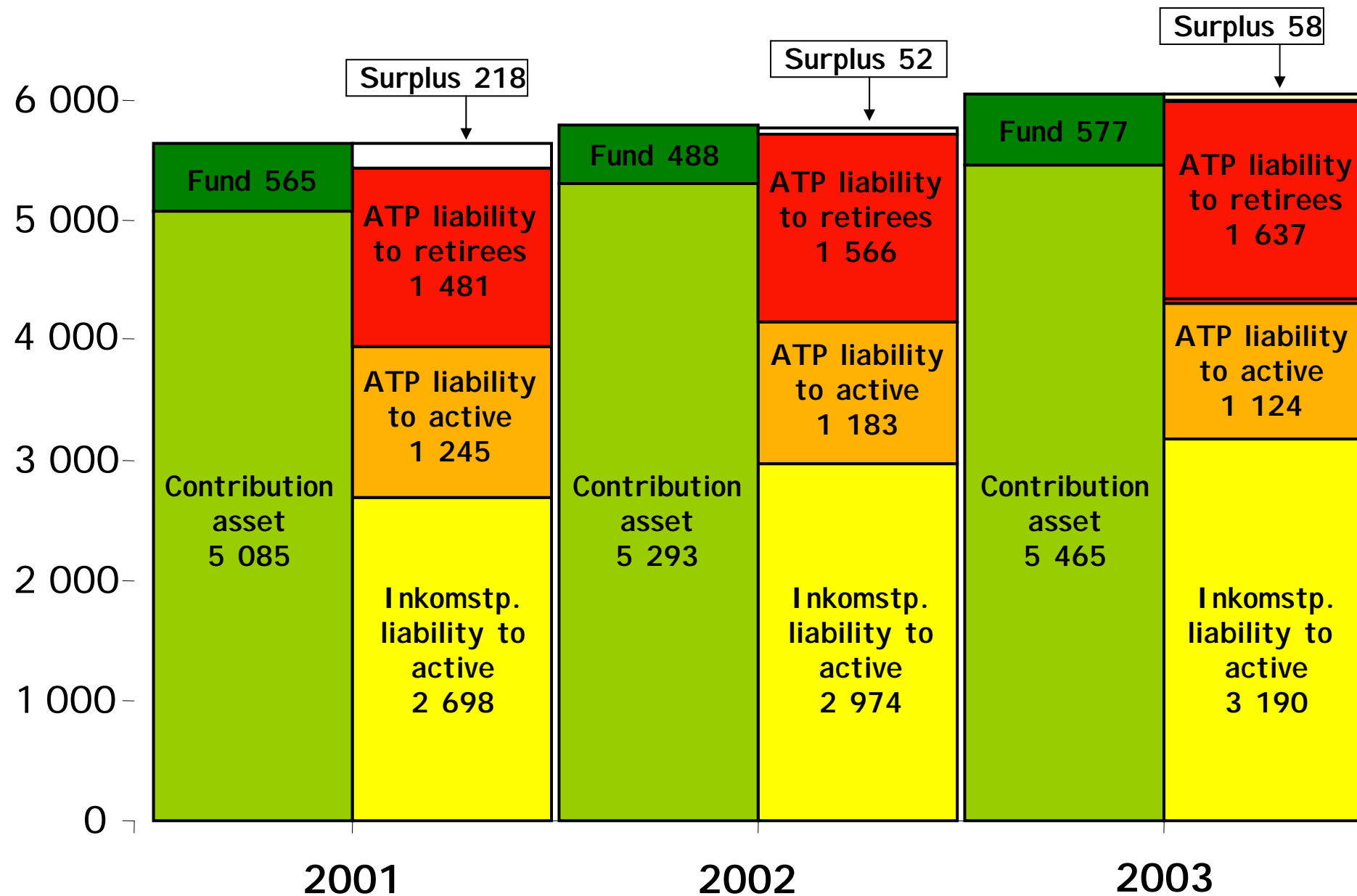
Contribution Asset



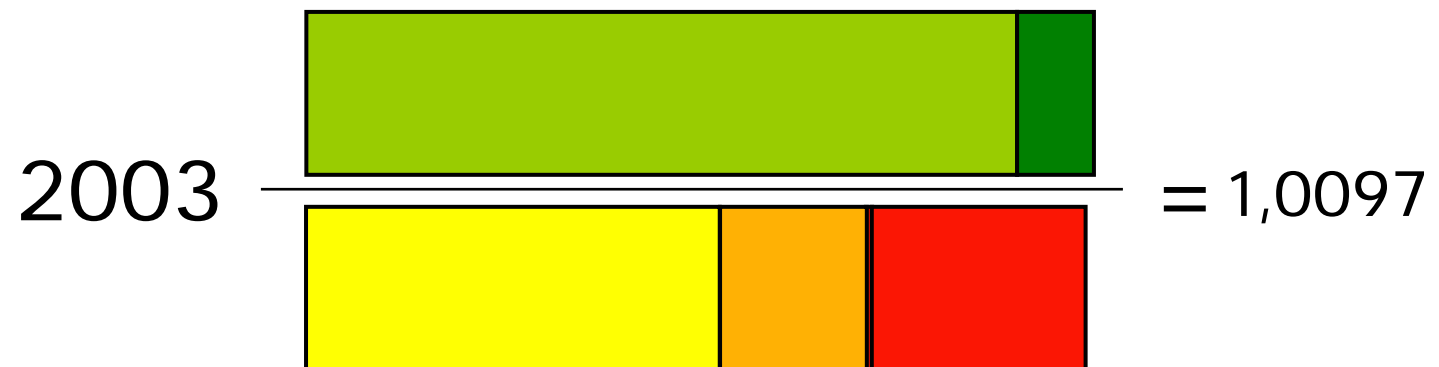
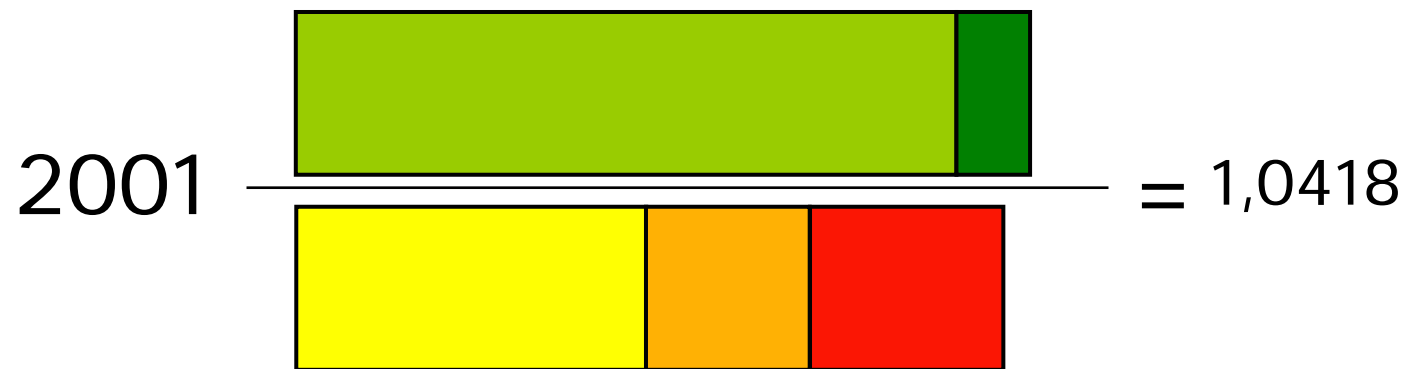
Fund requirement

Balance Ratio





Balance Ratios



Income Statement, in percent of GDP

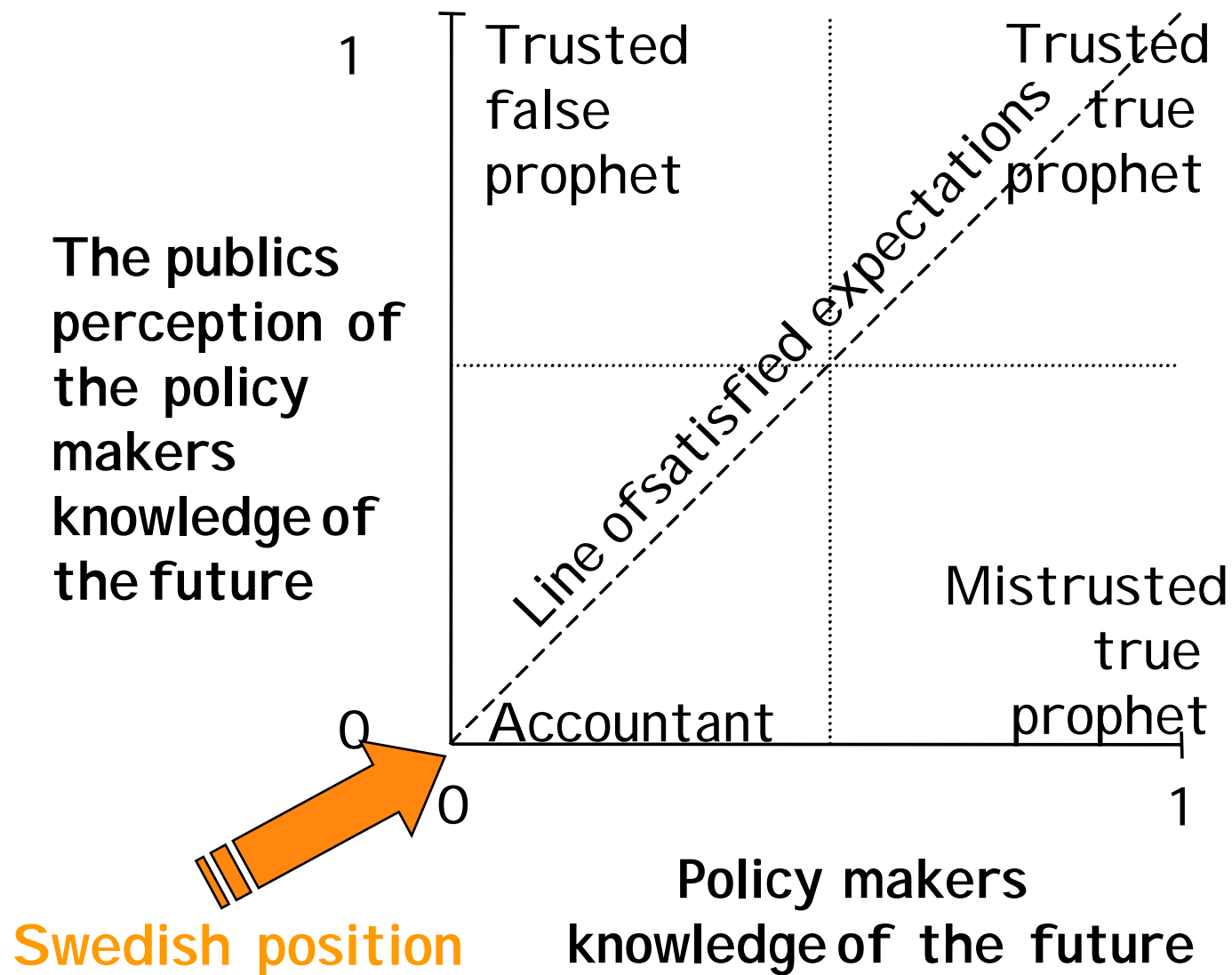
	2003	2002	2001
<i>GDP, millions of SEK (1 Euro » 9 SEK)</i>	2,440,058	2,347,400	2,266,387
Change in funded assets (a)			
Pension contributions	6.8	6.8	6.9
Pension disbursements	-6.4	-6.5	-6.3
Return on funded capital	3.4	-3.6	-1.1
Costs of administration	-0.1	-0.1	-0.1
<i>Total change in funded capital (a)</i>	<i>3.7</i>	<i>-3.3</i>	<i>-0.6</i>
Change in contribution asset (b)			
Value of change in contribution revenue	6.6	9.6	17.9
Value of change in turnover duration	0.5	-0.7	0.7
<i>Total change in contribution asset (b)</i>	<i>7.1</i>	<i>8.8</i>	<i>18.6</i>
Change in pension liability (c)			
New Pension credits and ATP points	-7.1	-7.1	-6.1
Pension disbursements	6.4	6.5	6.3
Indexation	-9.4	-11.8	-5.1
Value of change in life-expectancy	-0.5	-0.3	-0.8
Inheritance gains arising	0.3	0.3	0.2
Inheritance gains distributed	-0.3	-0.3	0.0
Deduction for costs of administration	0.1	0.1	0.0
<i>Total change in pension liability (c)</i>	<i>-10.5</i>	<i>12.6</i>	<i>-5.7</i>
Net income/ -loss (a)+(b)+(c)	0.3	-7.1	12.3

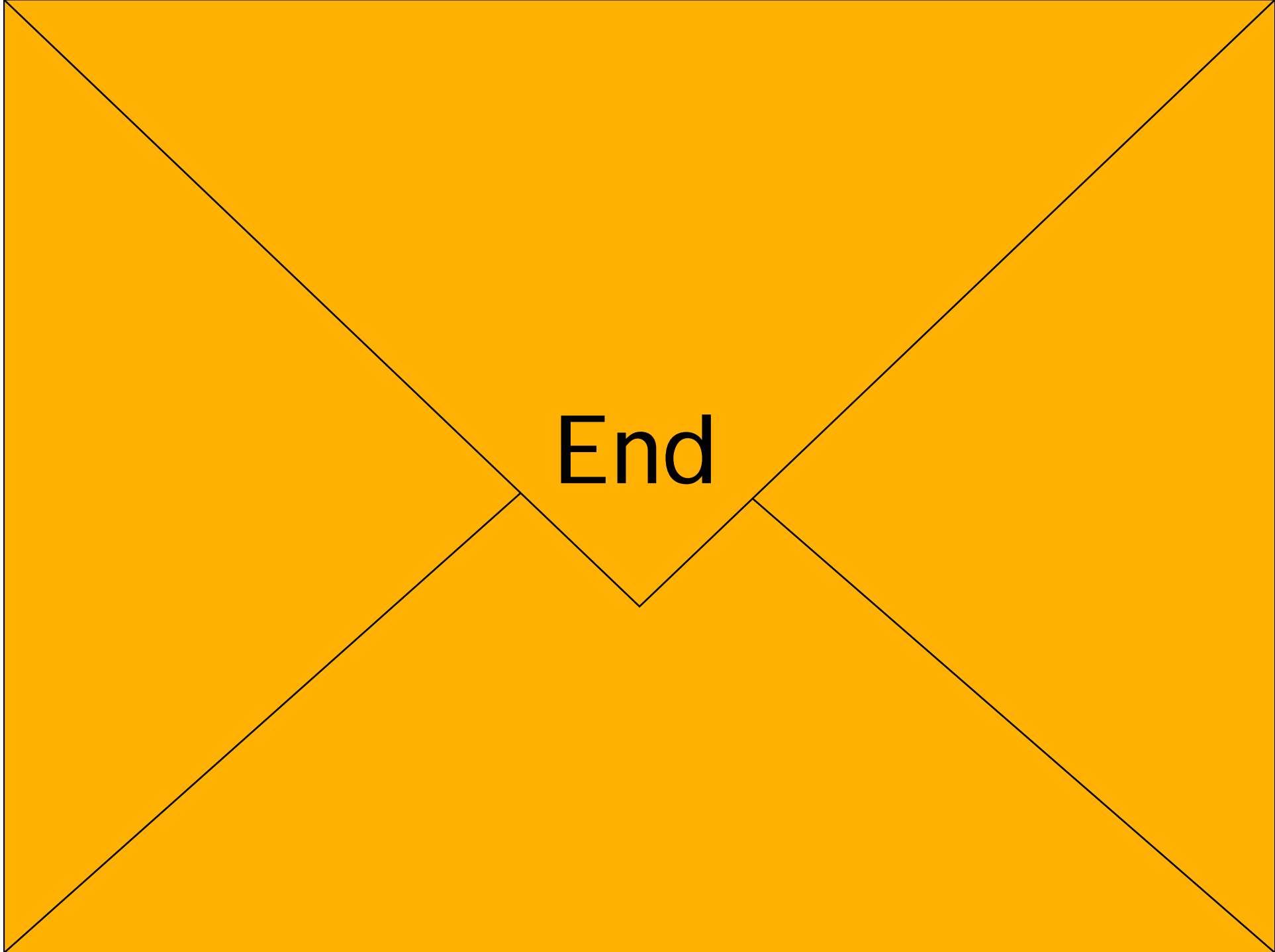
Balance sheet of the *Inkomstpension* as a percent of GDP

	Dec. 31 2003	Dec. 31 2002	Dec. 31 2001
Assets			
National Pension Funds	23.6	20.8	24.9
Contribution asset	224.0	225.5	224.4
<i>Total assets</i>	<i>247.6</i>	<i>246.2</i>	<i>249.3</i>
Liabilities and surplus			
Opening surplus/-deficit	2.1	9.3	-2.7
Net income / -loss for the year	0.3	-7.1	12.3
Total (closing) surplus /-deficit	2.4	2.2	9.6
Pension liability	245.2	244.0	239.7
<i>Total liabilities and surplus</i>	<i>247.6</i>	<i>246.2</i>	<i>249.3</i>

Does measures matter?

Four stylised policy makers – which one are you?





End