Stocks from flows and the Rate of Return in the Hungarian pension system

7th Global NTA Meeting:

Population Aging and the Generational Economy

June 11-12, 2010, Honolulu

Róbert I. Gál (gal@tarki.hu)

TÁRKI
TÁRSADALOMKUTATÁSI INTÉZET RT.

Structure of presentation:

* The contribution asset of a PAYG scheme: how to assess it from period values and why is it interesting?

* Annual returns in a PAYG scheme

* Illustration on Hungarian data

Stocks from flows

Let A_c and A_y be the money-weighted average age of consumers and producers, respectively.

When

$$A_c < A_y$$

consumers have to borrow against their future labour income and build up a debt or negative wealth.

When

$$A_c > A_y$$

a positive wealth is accumulated.

Based on Willis (1988) and Lee (1994) we can establish a relationship between a combination of current flows and age profiles and accumulating stocks.

TÁRKI
TÁRSADALOMKUTATÁSI INTÉZET ZRT.

A pension analogy

Accumulating contribution asset can be assessed from current contributions and age profiles (Settergren and Mikula 2005):

$$CA \approx C*TD,$$

Where

CA: is contribution asset, the (negative) present value of future net contribution flows
C: aggregate contributions in year *t*
TD: turnover duration, $A_{pe} - A_{ct}$ (money-weighted average age of pensioners and contributors, respectively)

TD is standing for the time contributions (eligibilities) spend in the pension system before they are translated into pensions.

TD and ETD

TÁRKI

What is the annual return in a PAYG system?

CA can be applied in assessing the annual returns in PAYG pension schemes.

PAYG pensions are based on past investments in contribution paying capacities. In principle, returns of such investments can be measured.

Here the annual return is the rate with which the value of the individual accounts (individual eligibilities) can be raised so that the amount of net pension liabilities should not exceed the value of the contribution asset.

This definition (offering a proxy to returns in a PAYG scheme) derives annual returns from long-term sustainability: annual returns are the maximum growth of the value of eligibilities affordable under contribution constraints.

TÁRKI

Annual returns (period RR, PRR)

$$PRR = \frac{C_{t1} \cdot TD_{t1} - C_{t0} \cdot TD_{t0} + F_{t1} \cdot r_{t1}}{PL_{t0}}$$

where
C is current contributions,
TD: is turnover duration,
PL: is net pension liabilities,
F: is capital fund of the pension system; in the Hungarian case the capital accumulated in the mandatory private funds,
r: is the market interest rate on capital, and
t_0 and t_1: are time-indices.

TÁRKI
TÁRSADALOMKUTATÁSI INTÉZET ZRT.

The Hungarian case

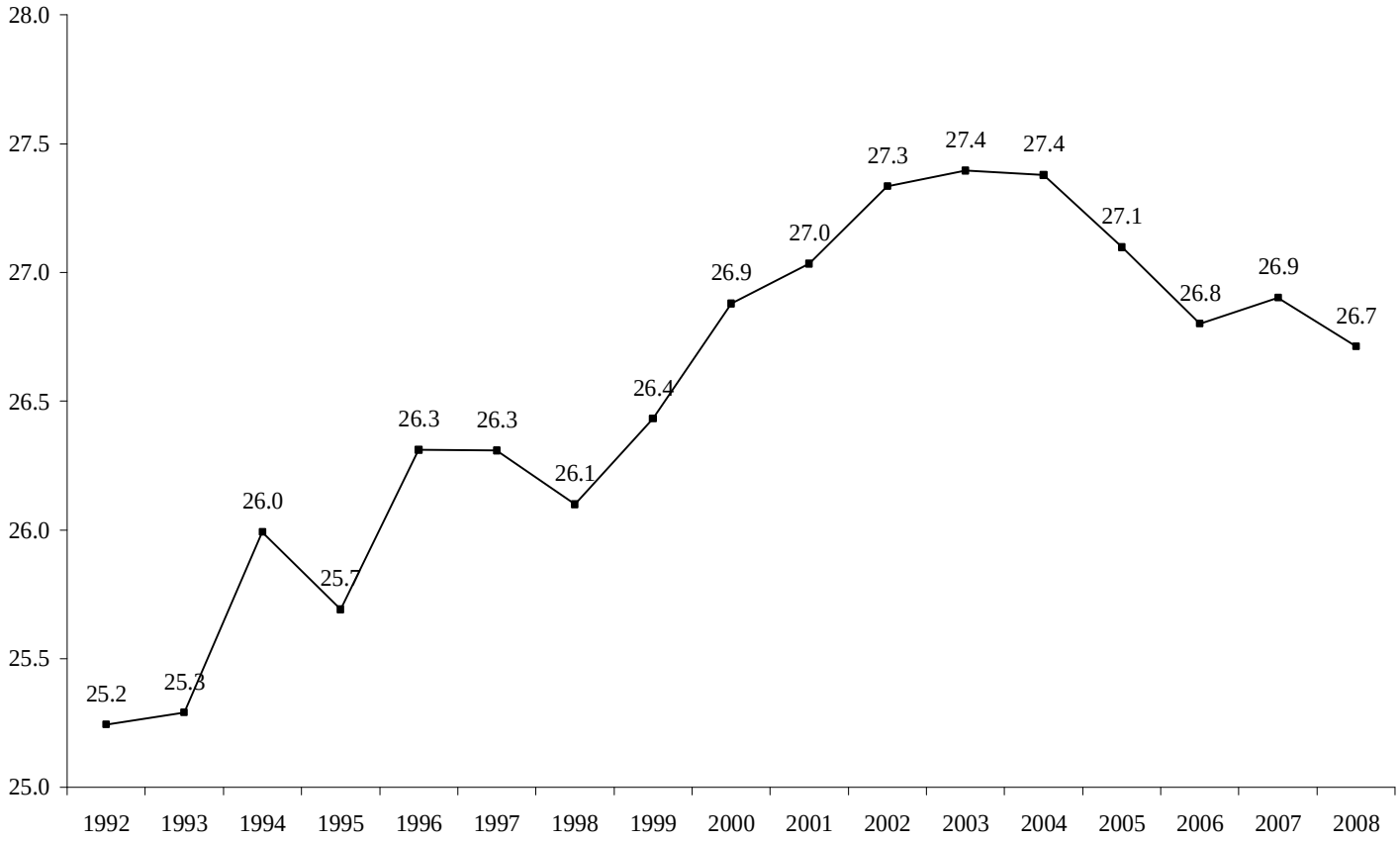
Some background facts:

* A baby boom postponed: no afterwar fertility boom (men in POW camps) but a jump in fertility in the mid-1950s

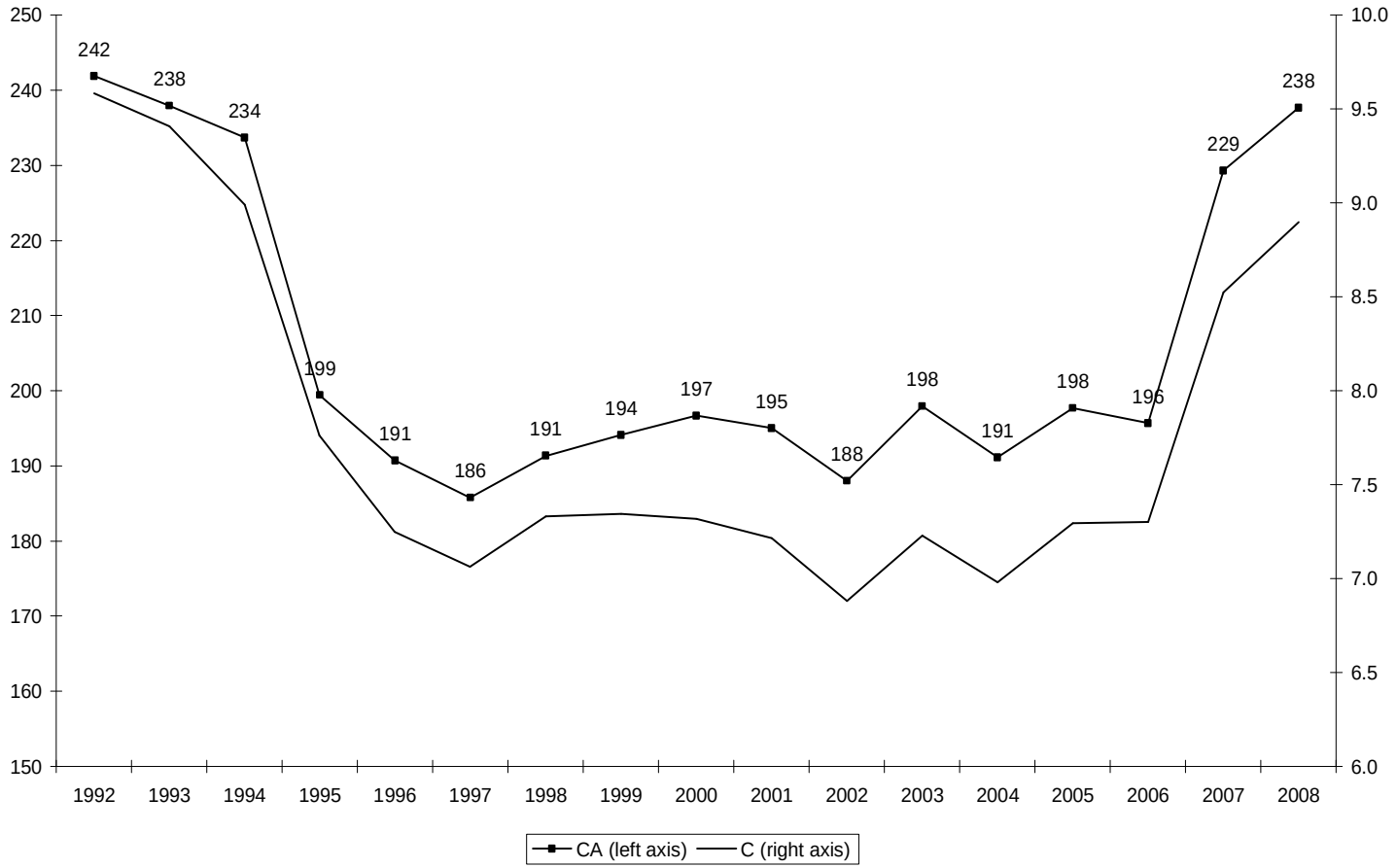
* shortage economy with full employment and a transition from central planning to a market economy in the early 1990s: an employment crisis

* explicit electoral cycle in pension expenditures: frequent changes in the pension system

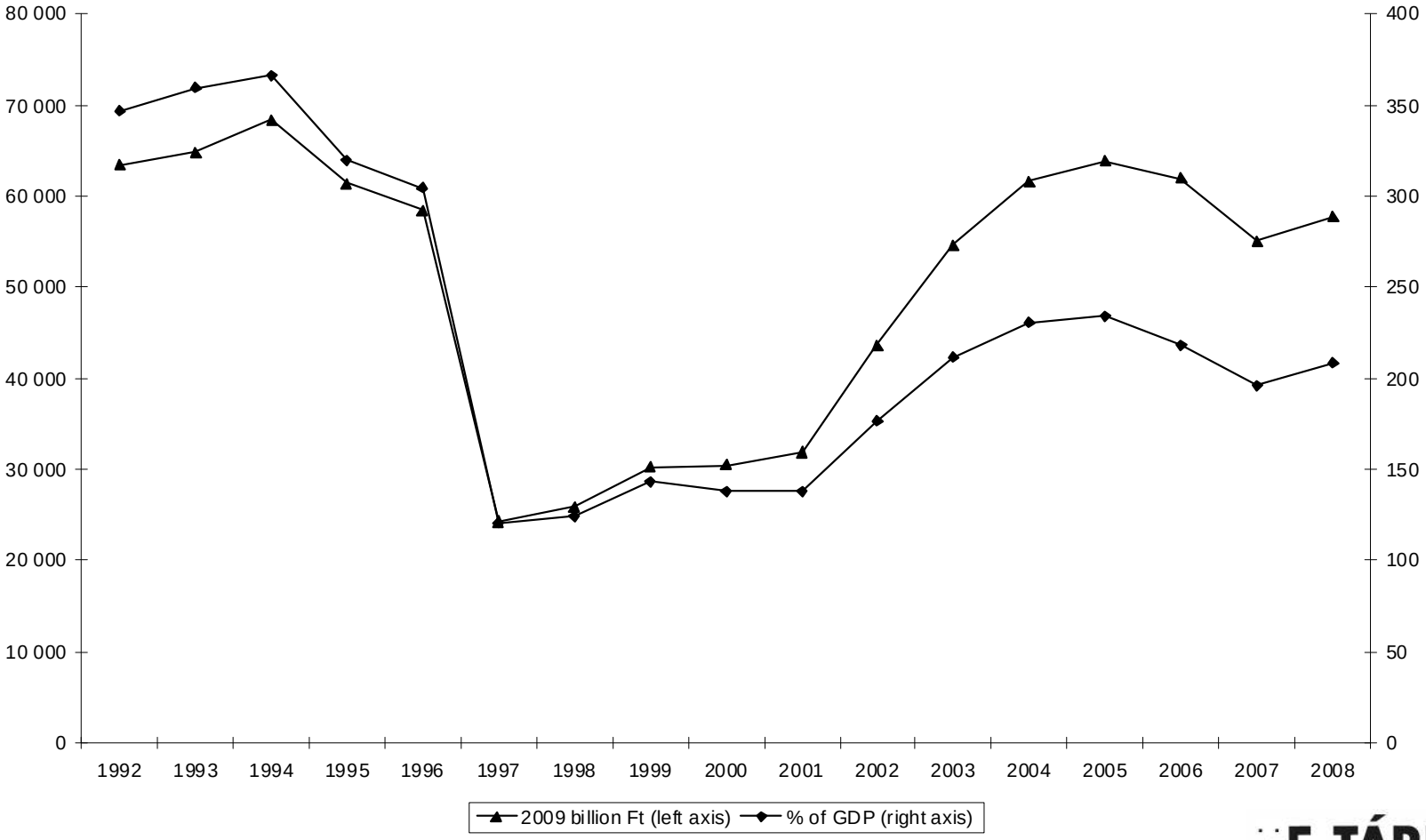
The Hungarian case: ETD



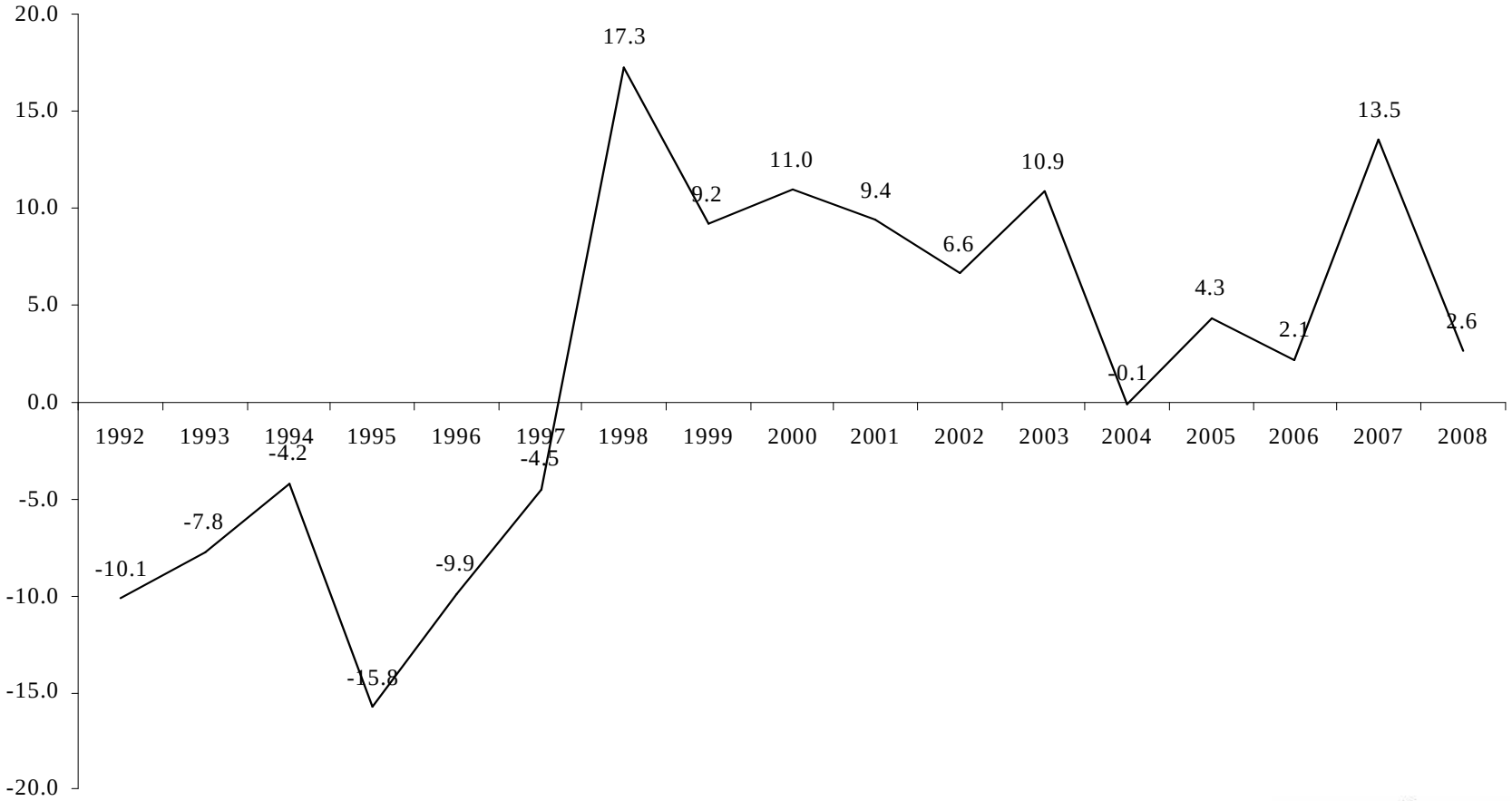
The Hungarian case: C and CA



The Hungarian case: PL



The Hungarian case: PRR



PRR: some conclusions

- Not only funded schemes produce negative returns
- PRR is a proxy measure for returns in a PAYG scheme
- There are limits of the applicability/interpretation of the PRR as a return concept:
  - What if PL is not equal to CA in t_0?
  - What if PL has independent changes?

The overall CA/PL ratio (%)