Comment on "New Use of an Old Italian Invention" by Ole Settergren

Seiritsu Ogura

Hosei Institute on Aging

Tokyo, Japan

Settergren: Contents

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Settergren:1. Introduction(1)

- Public pension plans are the largest financial systems
- Public pension plans represent most long-term commitments of governments
- Public pension systems represent single largest "asset" for individuals
- Yet, financial reporting is "medieval"
  - Reporting is scarce
  - Reporting is low quality

Settergren:1. Introduction(2)

- Financial reporting of public pensions is of low-quality
  - Statements of cash flows and projections of cash flows
  - Do not effectively answer "what **cause**, what **effect**, by what **means**, and at what **rate**"
  - Swedish public pension system has adopted the double-entry bookkeeping since 2001 as an intermediate step to ensure financial stability.
  - A pension plan to guarantee the financing of its obligations with a fixed contribution rate of 16%.

Settergren:2.Conventional measures

- Sweden presented projection of buffer-fund development in terms of "*fund ratio*", once every 5 years (prior to 2001).

- US Social Security Administration reports annually on the financial status using the "*actuarial balance*".

- The analyses reflect by how much the contribution rate must be increased to ensure that the buffer (trust) fund *never drops below a stipulated level* in the projection period.

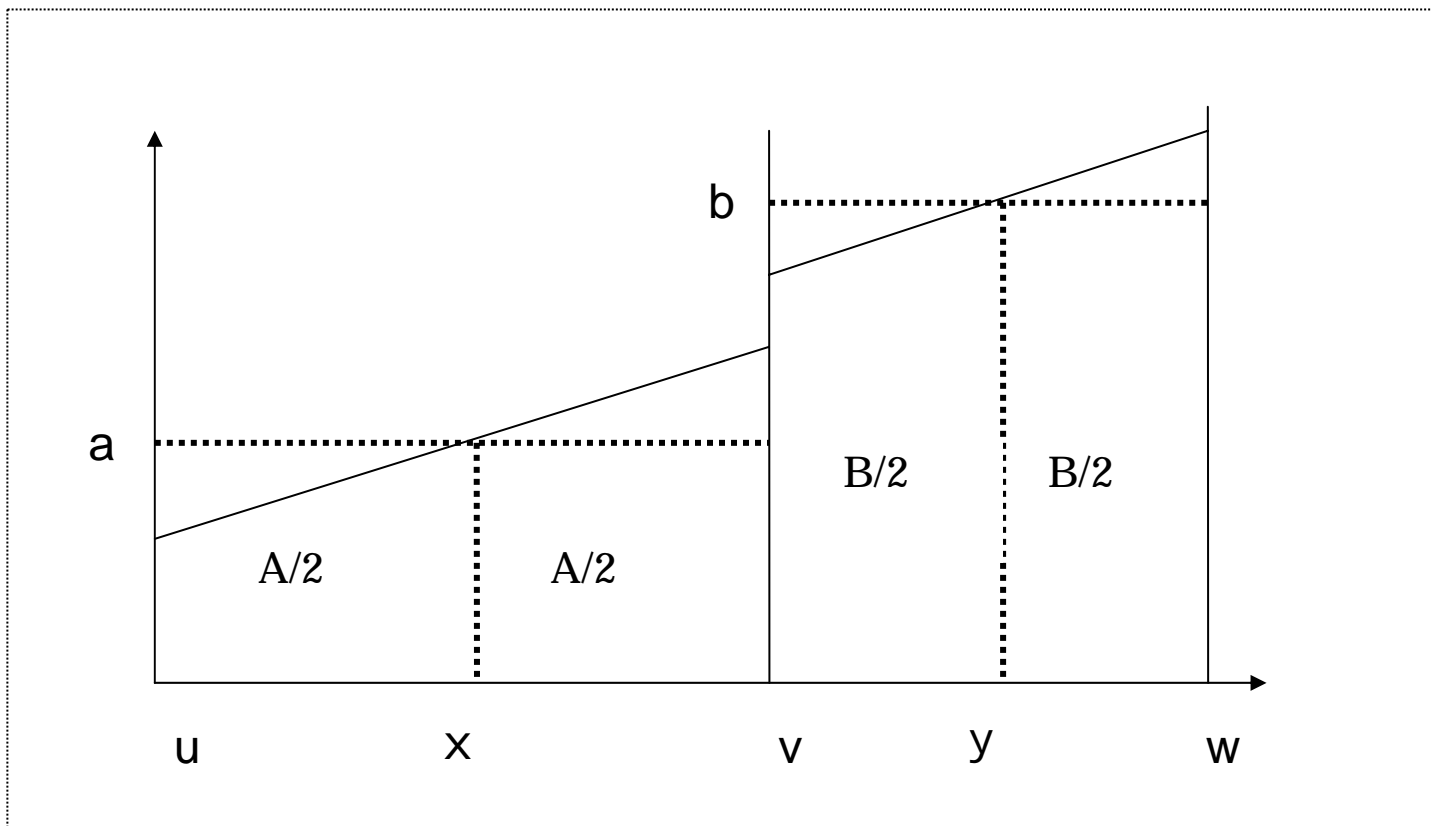- Difficult to answer "what *cause*, what *effect*, by what *means*, and at what *rate*".

Settergren: 3.Pay-as-you-go assets?

- Contribution asset
  - It is the product of the size of the **cash flow** per unit time (a year), and the **expected turnover duration** (i.e. time between payment of contributions and receipts of pensions).
  - e.g. in Sweden, (weighted) **average age of contributor** is 43, and the **expected age of retirees** is 74: expected turnover duration=32.
  - Reflects **demographic factors** (nativity,mortality) X **economic factors** (contribution base,age-related average income)

Settergren: 4.Swedish use of an Italian device

- Income statement is divided into three sections.
  - Section (a): ***Change in funded assets*** = <contributions> minus <disbursements> plus <buffer fund>. Notice that buffer fund is valued at market prices at the end of the accounting period.
  - Section (b): ***Change in contribution assets*** = <change in contribution revenue> plus <changes in turnover duration>.
  - Section © : ***Changes in pension liability*** = <new pension credits> plus <pension disbursements> plus < indexation> plus <changes in life-expectancy> plus <inheritanced gains arising> plus <inheritance gains distributed> plus <deduction of administrative costs>

Analytics(1)

- A worker of age x pays "a" dollars for (v-u) years, while a pensioner of age y receives "b" dollars for (w-v) years.
- a*(v-x)+b*(y-v)=A/2+B/2=A=B

Analytics(1)

- Assets=Pension Liability+Equity

$$Assets = PensionLiability + Equity$$

$$\Delta Assets = \Delta PensionLiability + \Delta Equity$$

$$\Delta FundedAssets + \Delta ContributionAssets = \Delta PensionLiability$$
$$+ \Delta Equity$$

$$NetIncome = \Delta FundedAssetts + \Delta ContributionAssets$$
$$- \Delta PensionLiability$$

Analytics(2)

$$Asset(t) = C(t) * TD(t)$$

$$\Delta Asset(t) = \Delta C * TD(t) + C(t) * \Delta TD$$

Notice that, in pay-as-you-go,

- one could have simply solved for p using

    pM=cN

    p: average pension

    M:number of pensioners

    c: average contribution

    N:number of contributors

$$\Delta p \cdot M + p \cdot \Delta M = \Delta c \cdot N + c \cdot \Delta N$$

$$\Delta p \cdot M = c \cdot \Delta N - p \cdot \Delta M$$

What's really behind the Swedish system?

- But the Swedes used "contribution assets" instedad. Why?
  – No explicit discount rates used (which I like, because no one agrees what discount rate we should use).
  – B*TD implies pension benefits of the current pensioners are secured by contribution assets if B=C.
  – Does this insulates the pension parameters from short-term fluctuations inherent in p.a.y.g.?   Or,
  – Does this add an extra constraint in addition to cash flow constraint? I think it is the case.

Very clever!

- Sweden has incorporated the cash-flow constraint into the long-term sustainability condition.

- Income statement gives equal weight to cash flow and long-term sustainability, which probably insulates the system from cash starvation.

- Under extrraordinary circumstances, however, the system can be short-funded.