What can we learn from population ratios?

Doug Andrews, FCIA, FIA, FSA, CFA
Adjunct Professor
dwa007@hotmail.com

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www.math.uwaterloo.ca

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Agenda

1. Introduction
2. The Real Elderly Dependency Ratio
3. Longer lives have different effects
4. Insights from Turnover Duration
5. Better ratios
6. Recommendations

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See the paper for references

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Old Age Support Ratio & Old Age Dependency Ratio

- These ratios and projected changes in them are often used in forecasting the financial burden of social support systems
- OASR is calculated as population aged 20 – 64 divided by the population aged 65 and over
- OADR is calculated as population aged 65 and over divided by the adult population aged 16 - 64

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Real Elder Dependency Ratio REDR

- **Spijker and MacInnes define the REDR as:**
  - **the total number of people with a remaining life expectancy of 15 years or less,**
  - **divided by the actual number of people working, regardless of their age**
- **They argue REDR provides a clearer measure than OADR**
- **References: 2013a. Population Ageing in Scotland: Time For A Rethink? *Scottish Affairs,* 85, 53-74**

  2013b. Population Ageing: the timebomb that isn't?

  ***BMJ* 2013; 347:f6598 doi: 10.11.36/bmj.f6598**

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Reasons

1. Age 65 is both too broad and too narrow to measure dependency
2. A better measure of dependency for the financial impact of health costs is to the 15 years prior to expected death
3. Although OADR is rising, REDR is level or decreasing, with Japan as the one exception

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But Social Support Systems Differ

- Their argument may be strong for health and care costs
- But it is not correct for PayGo pension costs
- Especially if the Age of Full Entitlement (AFE) is not rising in line with increases in longevity

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Case Study: Sweden & the Financial Pension Burden

- **Main components**
  - **Notional defined contribution (NDC)**
  - **With a fixed contribution rate – 16%**
  - **Regular adjustments to the AFE**
  - **An automatic balance mechanism (ABM)**

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Apply the ABM When Liabilities > Assets

Assets

- **Any actual assets, plus**
- **Annual contributions multiplied by Turnover Duration (TD)**

Liabilities

- **Value of account balances, plus**
- **Estimate of the present value of pensions in payment**

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How is TD defined?

- **Based on a steady state model using existing membership**
- **With value of expected contributions and the value of expected pensions assumed to be paid in a lump sum**
- **Calculated as the sum of Pay-in Duration and Pay-out Duration**
- **Pay-in Duration is AFE minus the weighted-average age at which contributions are made**
- **Pay-out Duration is the weighted-average age at which pensions are paid minus AFE**

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This Overstates Assets

- **By an amount equal to annual contributions multiplied by Pay-out Duration**
- **Suppose the system were closed to new entrants – how can the contributions of contributors which create an equivalent liability also be used to pay pensioners?**
- **Or suppose there is an unexpected increase in the life expectancy of pensioners**

➢ **We would expect an increase in liabilities**

➢ **But we also get an increase in assets, because Pay-out Duration increases, which is not correct**

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The Calculation Can Be fixed Simply

- **In the asset calculation just use Annual Contributions multiplied by**
  - **Pay-in Duration, rather than by**
  - **Turnover Duration**
- **But the political consequences are enormous – assets would decrease by about one third**

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But TD is a Useful Concept

- It provides another rough measure of how we might better understand the financial impact of pensions
- Calculate Turnover Adjusted Old Age Support Ratio as
  - Adult Population less than AFE multiplied by Pay-in Duration
  - Divided by Population of AFE and older multiplied by Pay-out Duration
- A similar calculation could be done for TAOADR

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An Illustration for Sweden (* using 2000 as base year)

Year	OASR	TAOASR	Δ OASR*	Δ TAOASR*
2000	3.41	7.26	1	1
2005	3.44	6.85	0.99	1.06
2010	3.19	6.05	1.06	1.20

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Recommendation 1

The Swedish pension system should correct its method of calculating assets to use Pay-in Duration rather than Turnover Duration

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Recommendation 2

- **OASR and OADR should not be used for the estimation of the financial burden due to population aging**
- **For health care and LTC, REDR might be used**
- **For pensions TAOASR or TAOADR might be used**

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Recommendation 3

To permit the estimation of the financial burden of pensions due to population aging, national pension authorities (or another body such as the OECD) should calculate and publish Pay-in Duration and Pay-out Duration

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Recommendation 4

To provide a fairer distribution of the burden of pension costs due to population aging, countries should take action to raise the AFE and to continue to raise the AFE if life expectancy increases and the period of pension receipt to pension contribution changes

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