

# Age structure effects on the economy

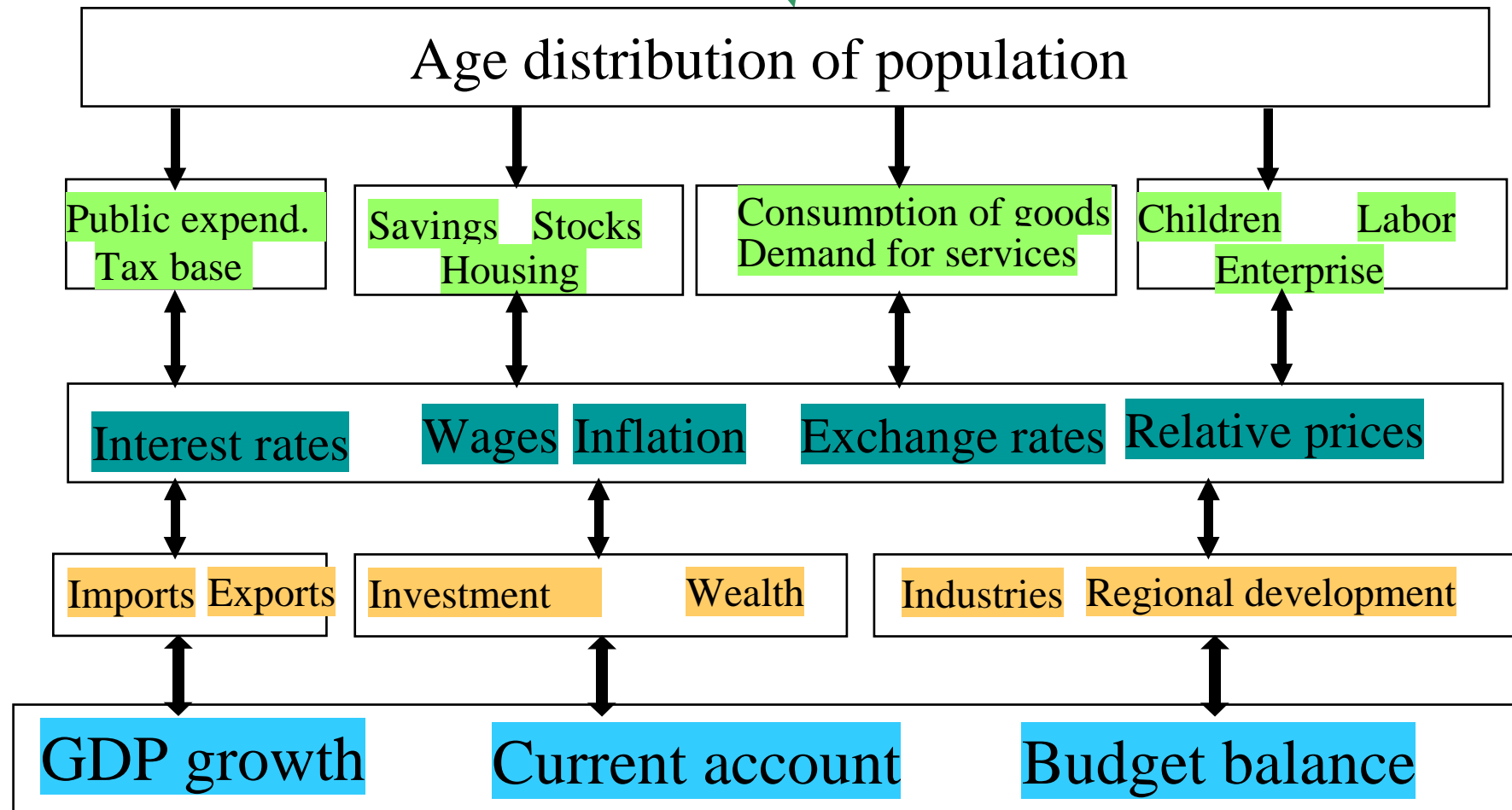
*Thomas Lindh*

Research Director  
and Professor in Economics

# Why is age structure one of the determinants of the macroeconomy?

1. Biological and economic reasons imply that human behavior and resources vary over the life cycle
2. Age structure change therefore correlate with macroeconomic change.
3. Useful because such changes can be independently predicted for many years.

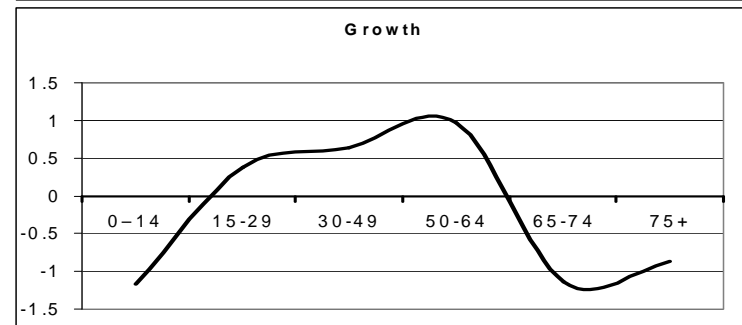
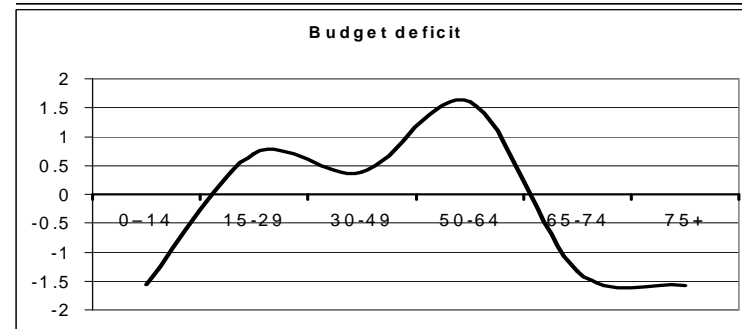
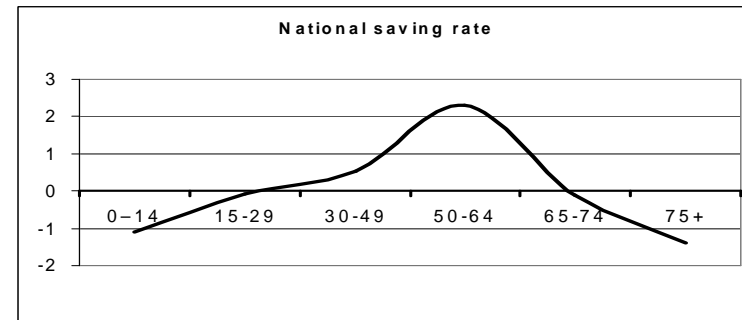
# Age structure effects on the economy



# Age profiles I

Source: Malmberg & Lindh, Swedish estimates

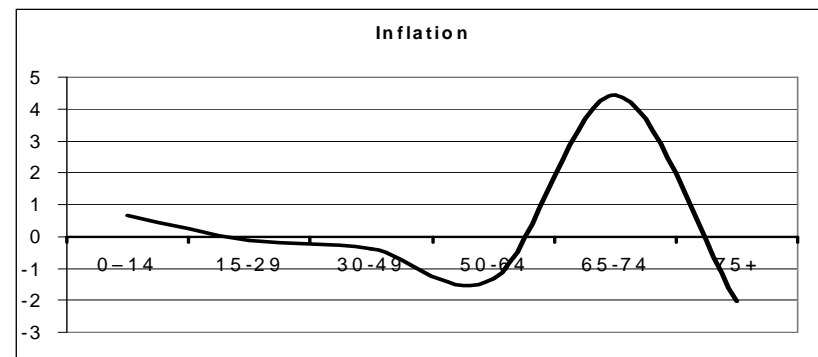
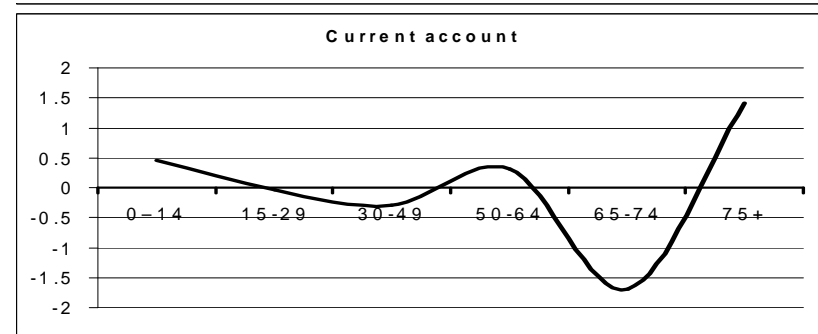
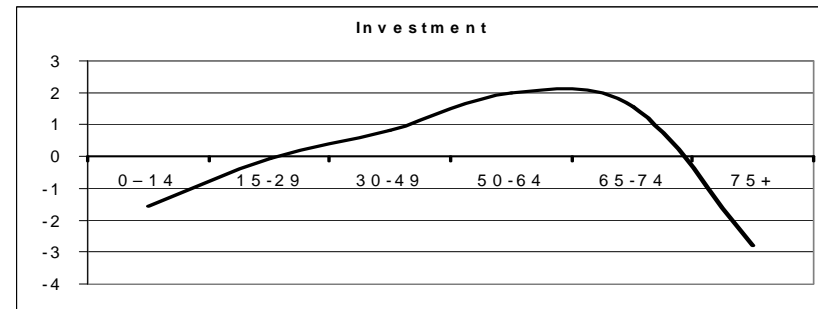
- National savings
  - 50-64 pos
  - 0-14, 75+ neg
- Government budget
  - 15-29, 50-64 pos
  - 0-14, 65+ neg
- GDP growth
  - 15-64 pos
  - 0-14, 65+ neg



# Age profiles II

Source: Malmberg & Lindh, Swedish estimates

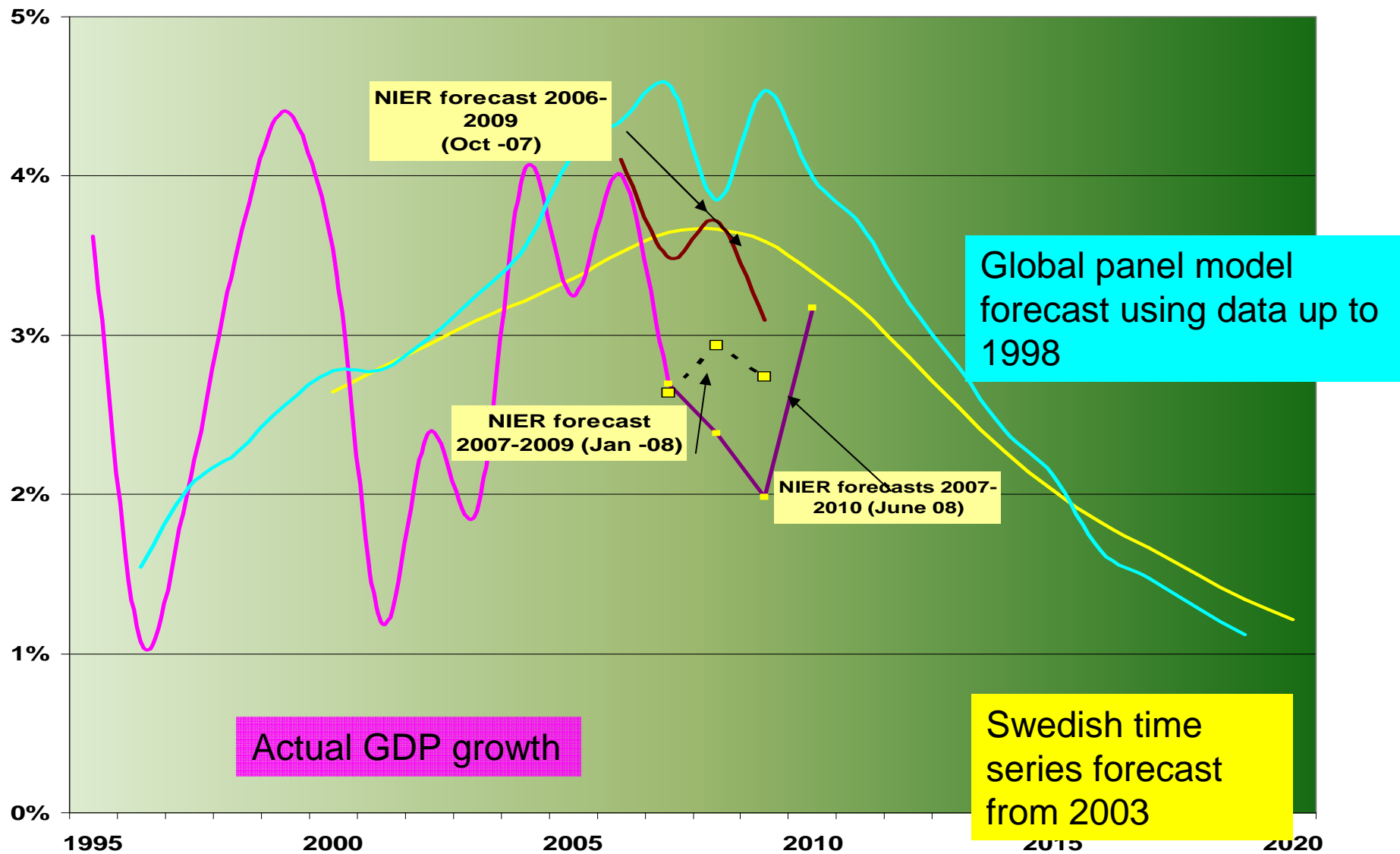
- Investment
  - 30-74 pos
  - 0-14, 75+ neg
- Current account
  - 50-64, 75+ pos
  - 65-74 neg
- Inflation
  - 65-74 pos
  - 50-64, 75+ neg



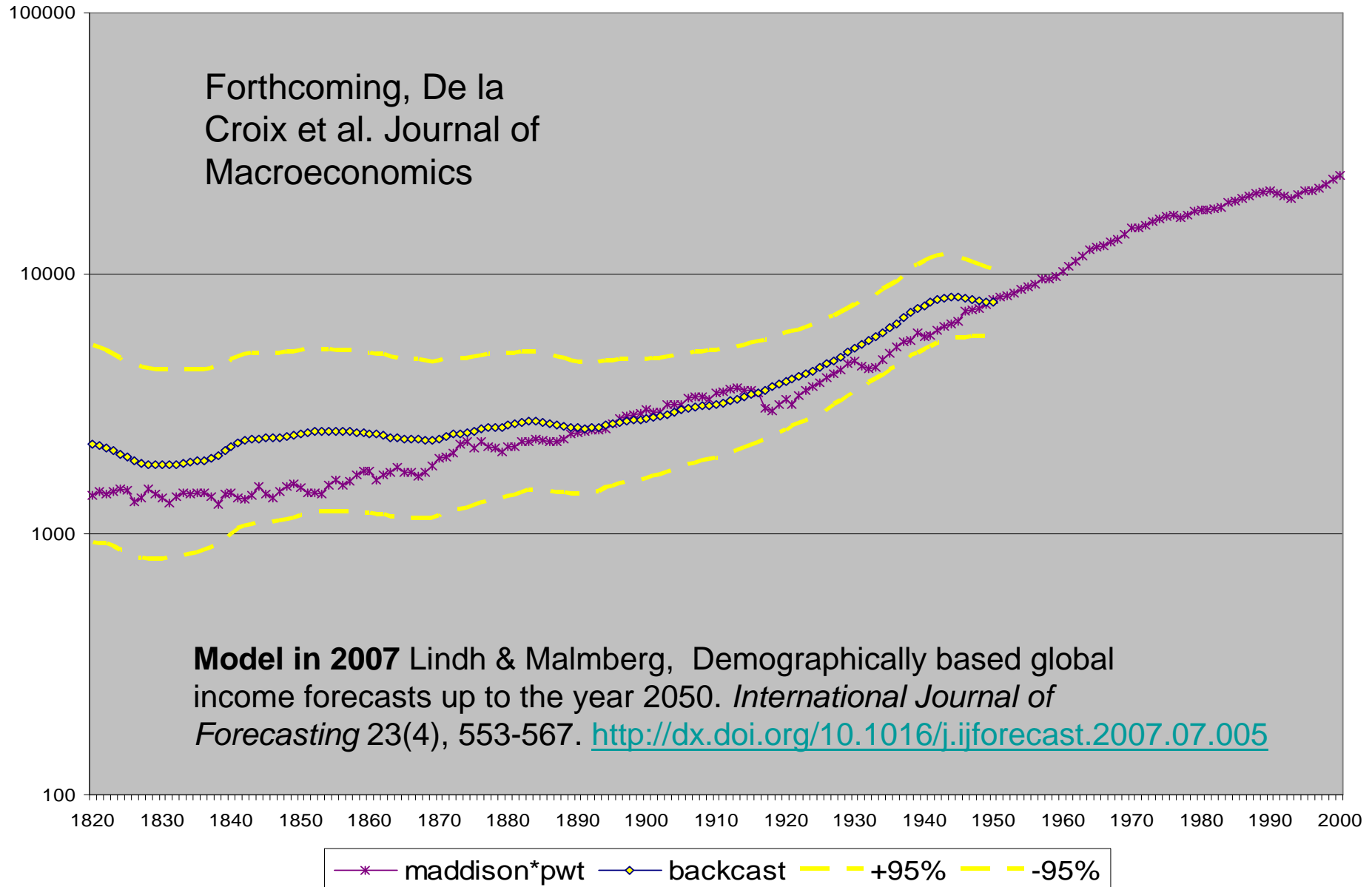
# OECD evidence

- **2007**, Lindh & Malmberg “Age structure effects on investment, saving and trade”. Chapter 7 in: Population aging, intergenerational transfers and the macroeconomy, Clark et al. (eds). Edward Elgar Publishing, 163-191.
- **1999**, Lindh & Malmberg “Age structure effects and growth in the OECD, 1950-90” *Journal of Population Economics*, 12(3), 431-449.
- **1998**, Lindh & Malmberg “Age structure and inflation - A Wicksellian interpretation of the OECD data” *Journal of Economic Behavior and Organization*, July, 36(1), 19-37.

# GDP growth forecasts Sweden



# Backcast of global GDP per capita model Sweden 1820-1950



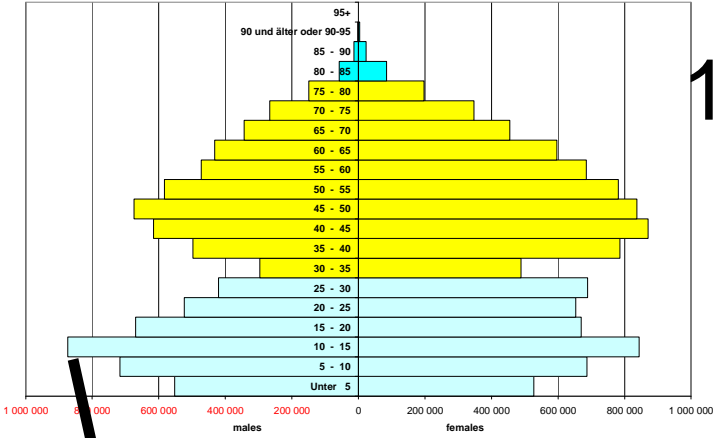
# What about Germany?

- Report forthcoming financed by Bertelsmann Stiftung
- **Age structure effects on the German economy, with an international comparison.** Lindh & Malmberg, Institute for Futures Studies
- Results still preliminary...
- ...but basically similar

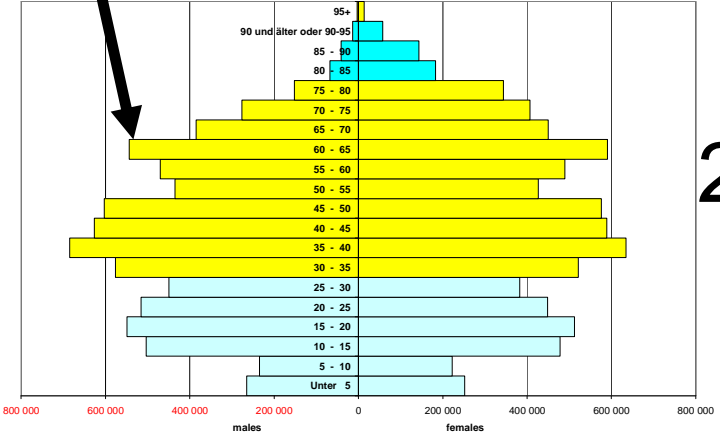
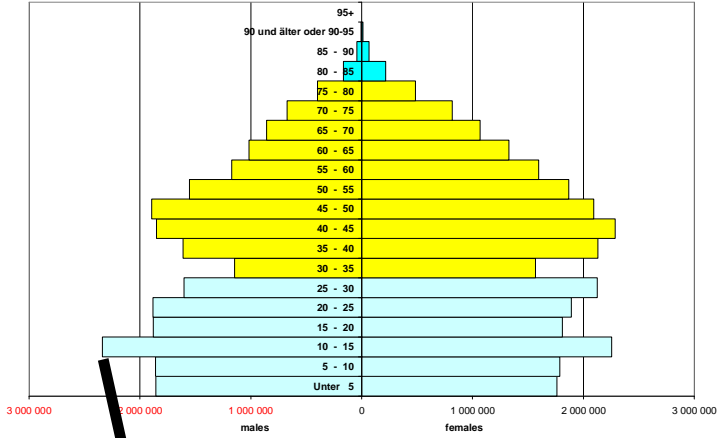
# German age structure

East

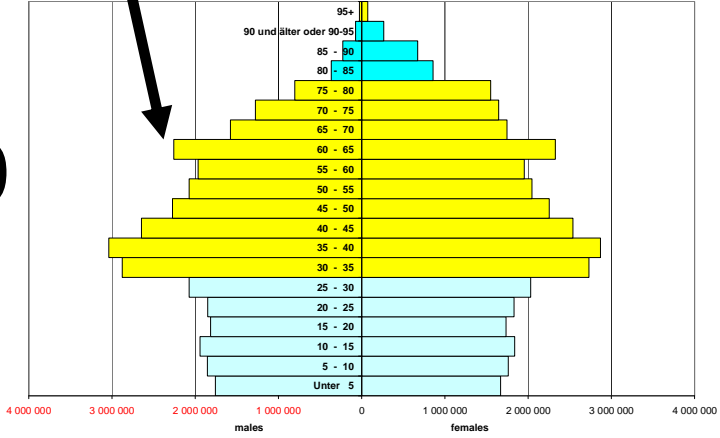
West



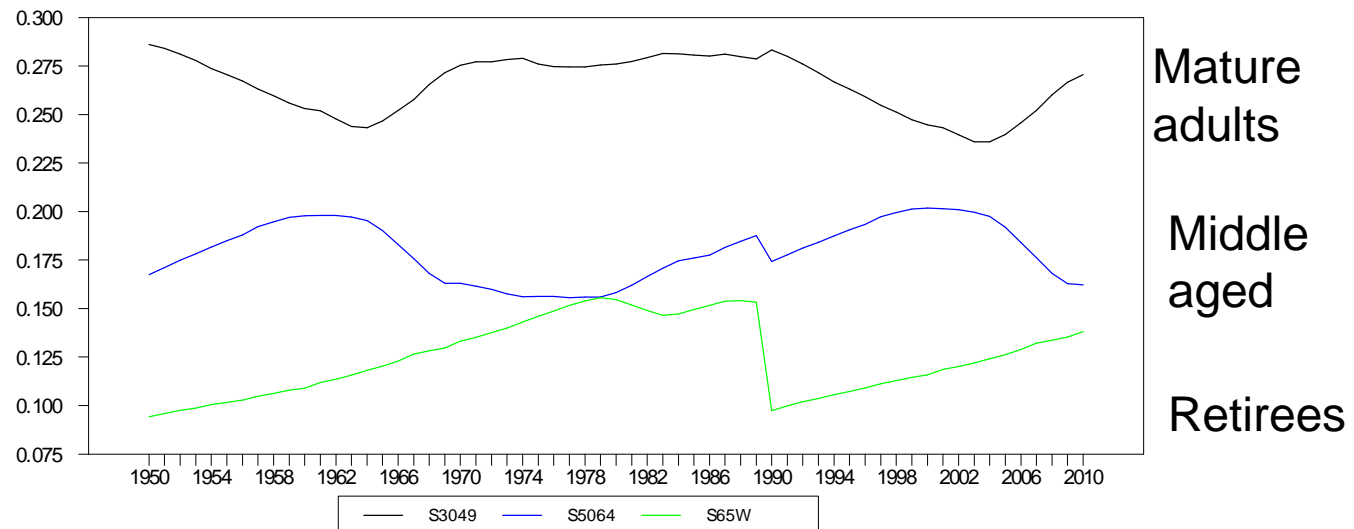
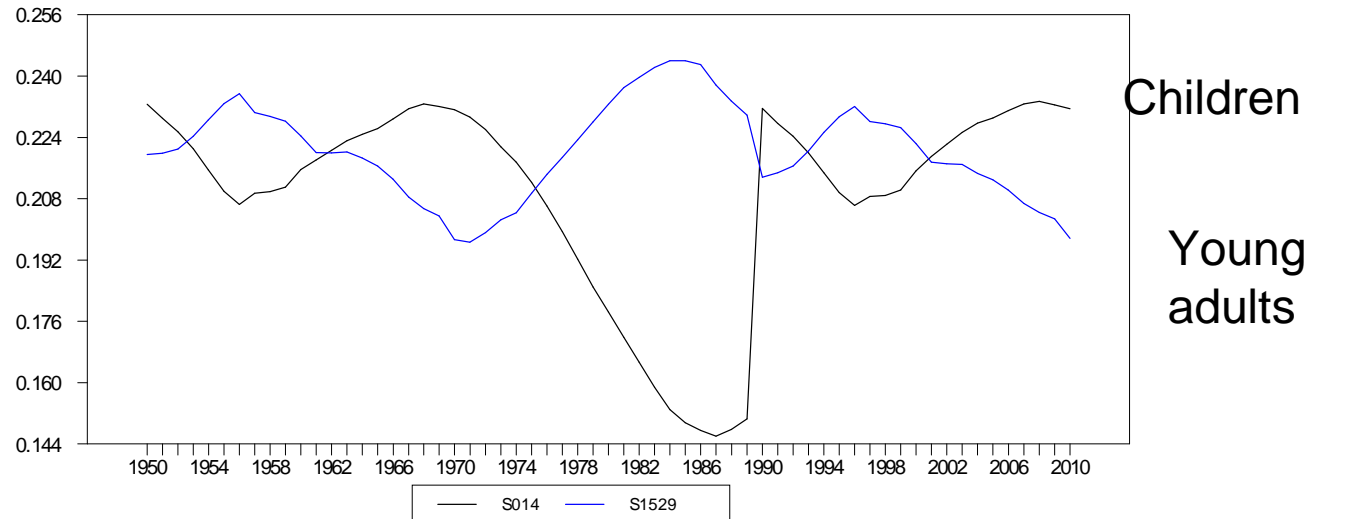
1950



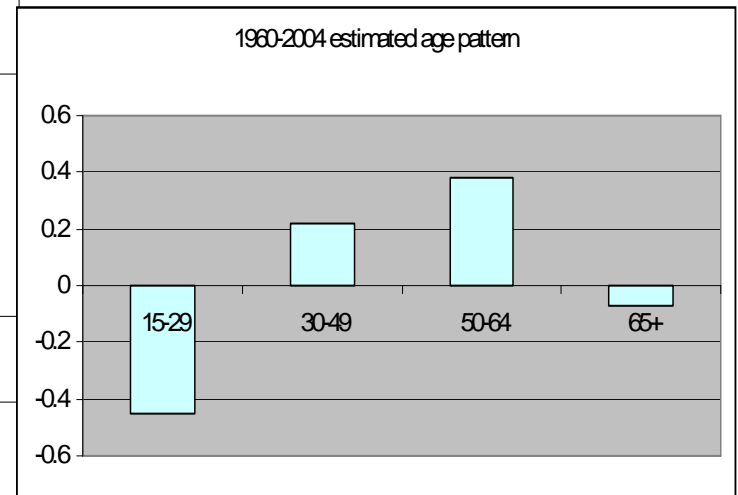
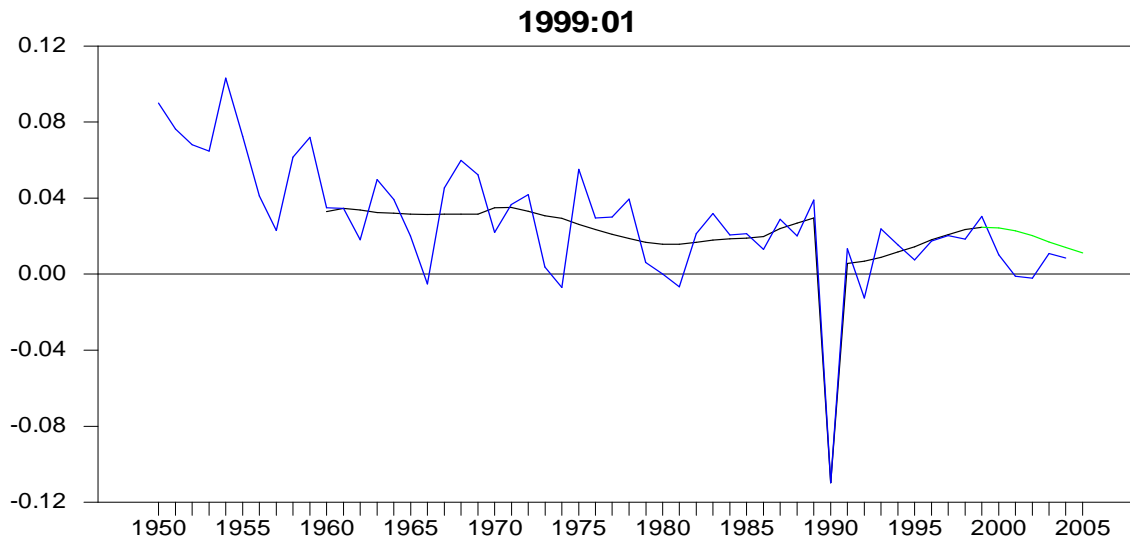
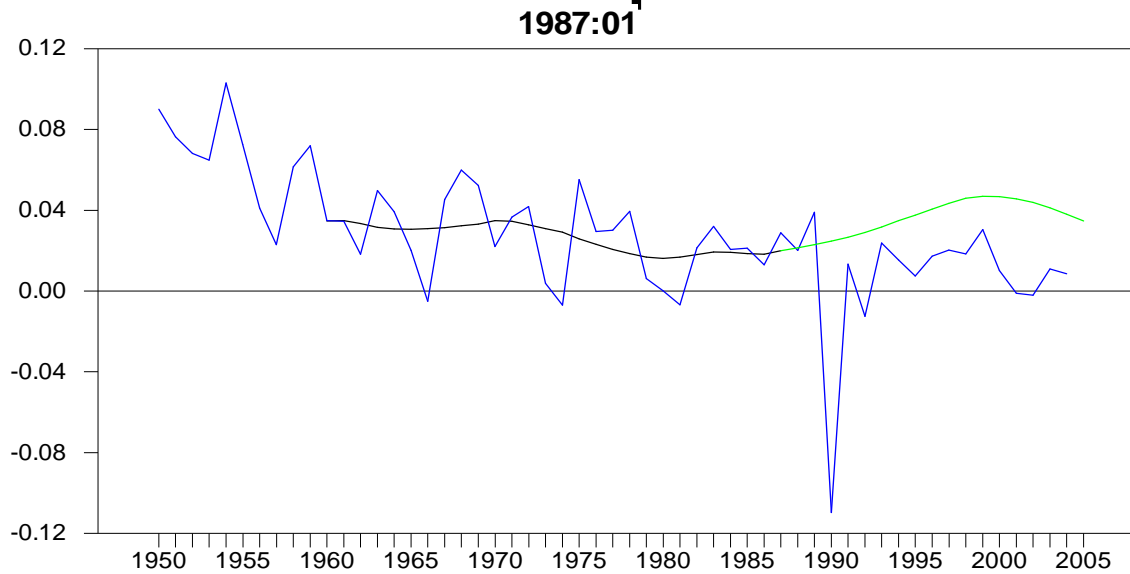
2000



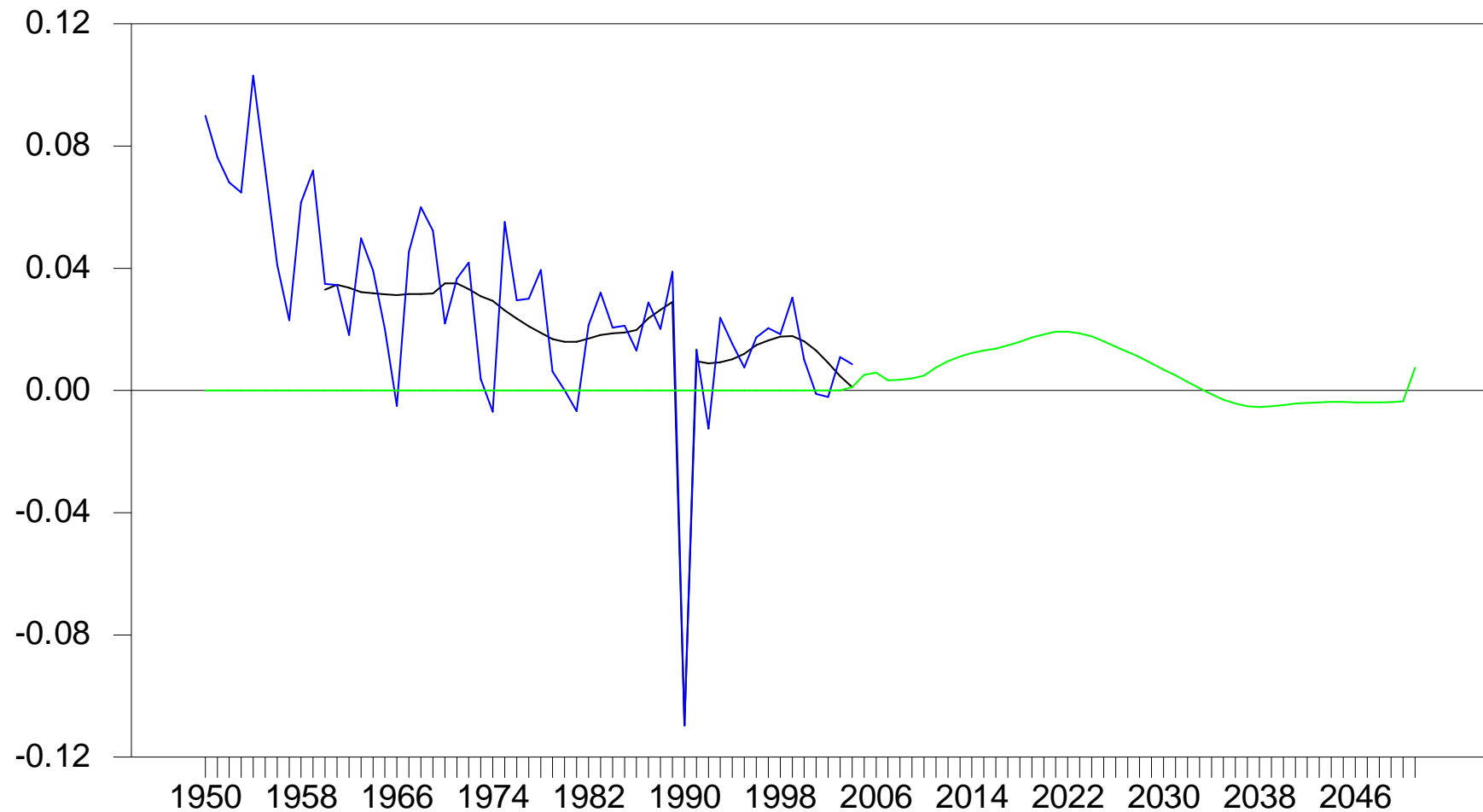
# Unification and age shares



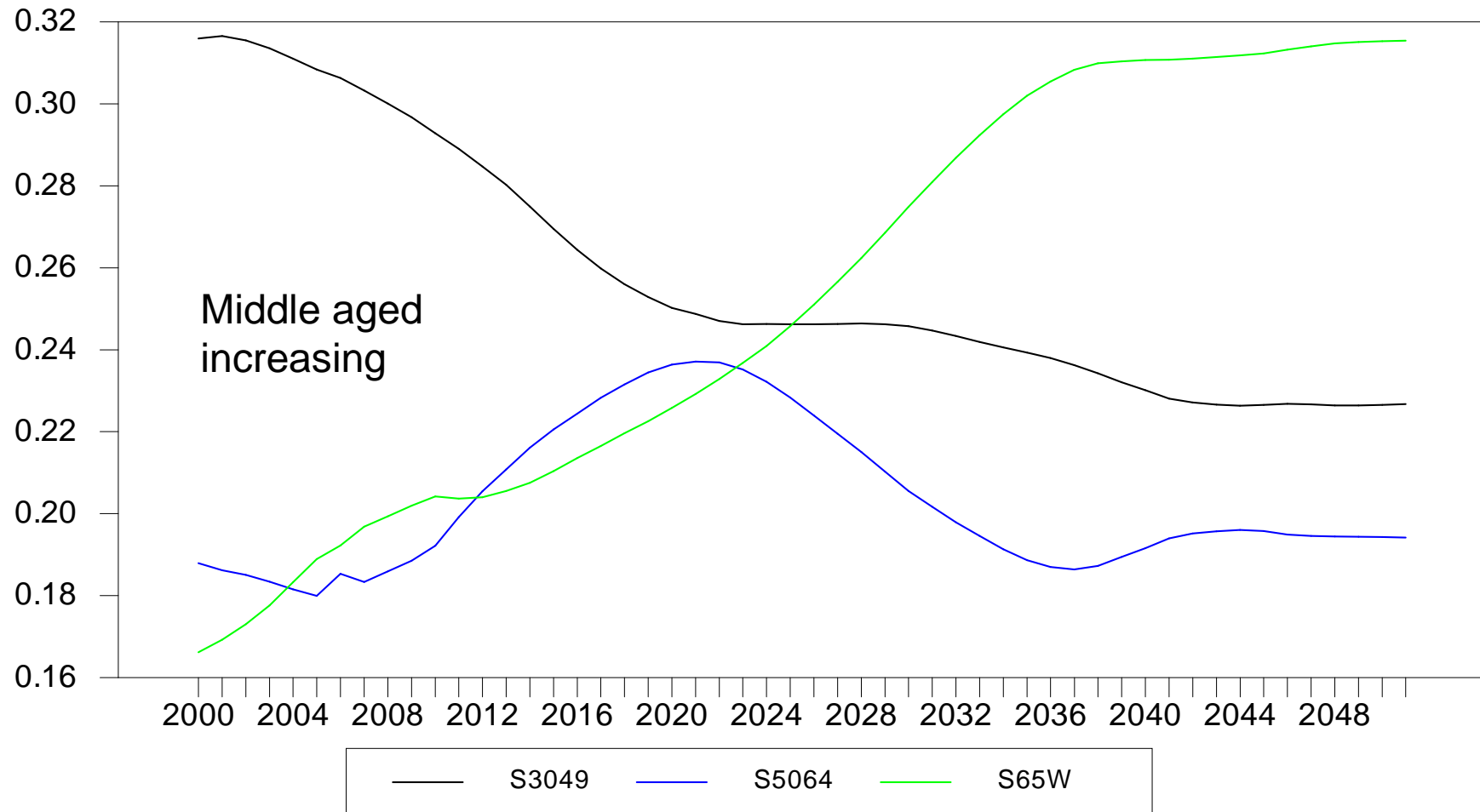
# GDP/cap growth forecasts out-of-sample for Germany



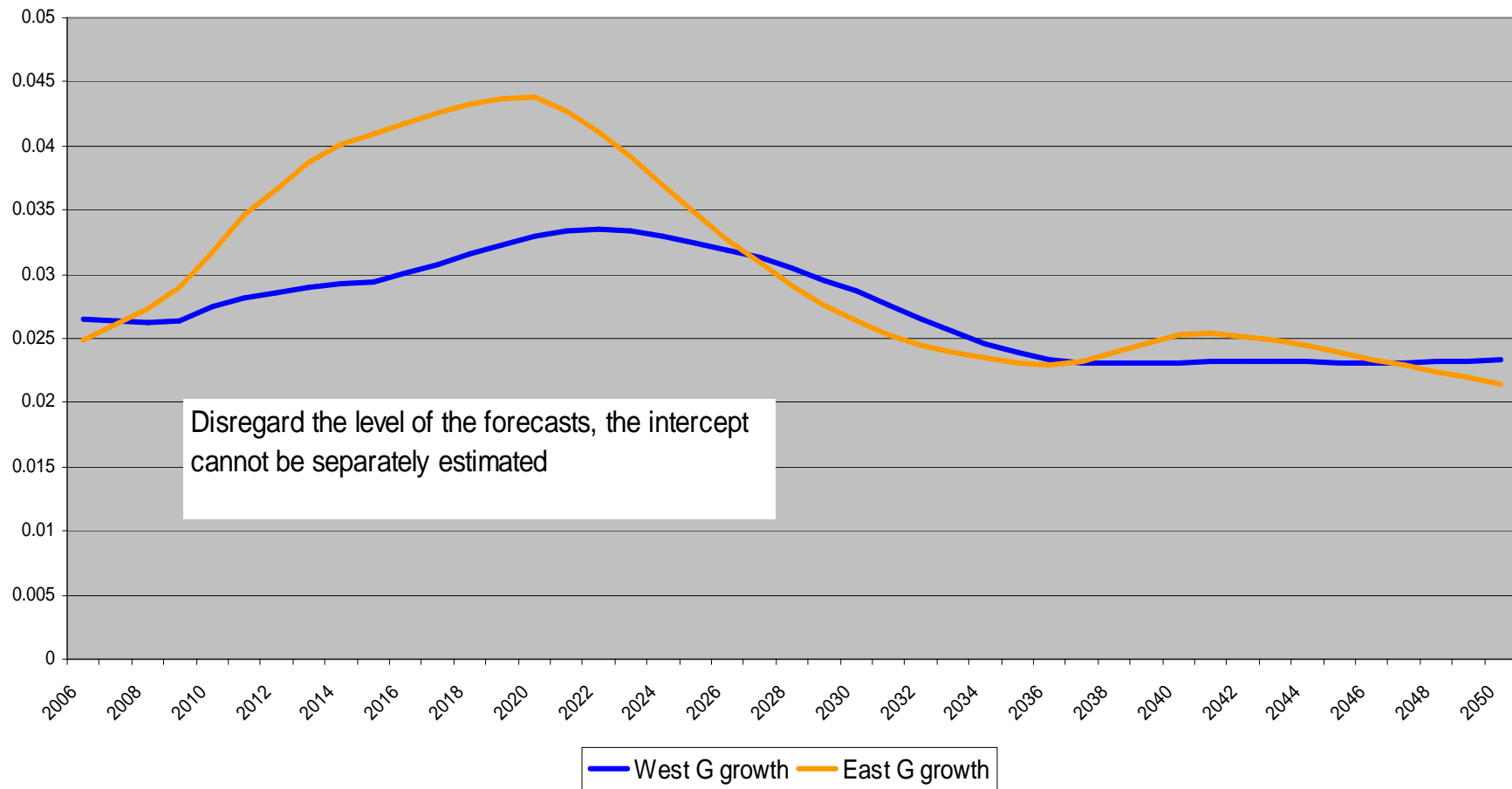
# Long term forecast of German GDP/capita up to 2050



# Age share variation



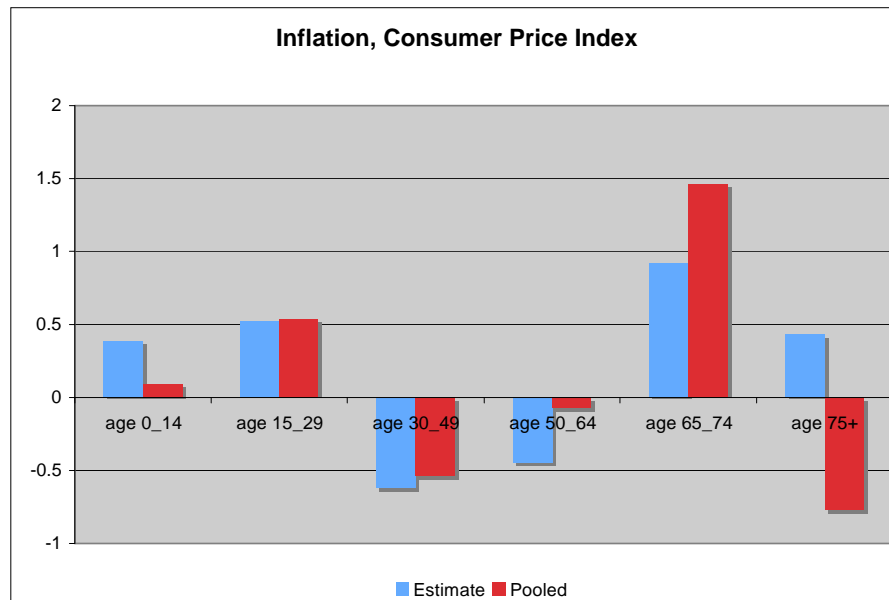
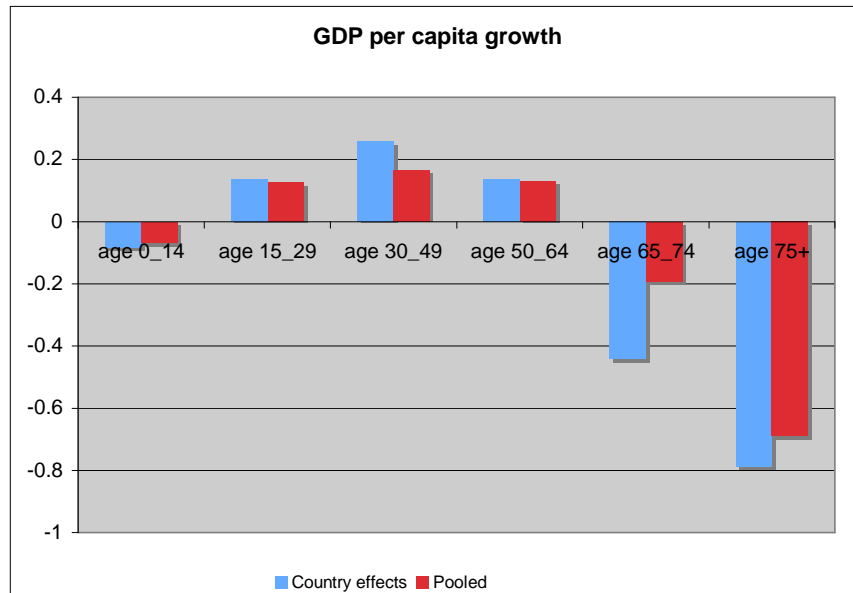
# Demographic part of growth in East and West according to demographic projections



# EU15, China, USA, Japan and India

Age profile estimates  
from panel data

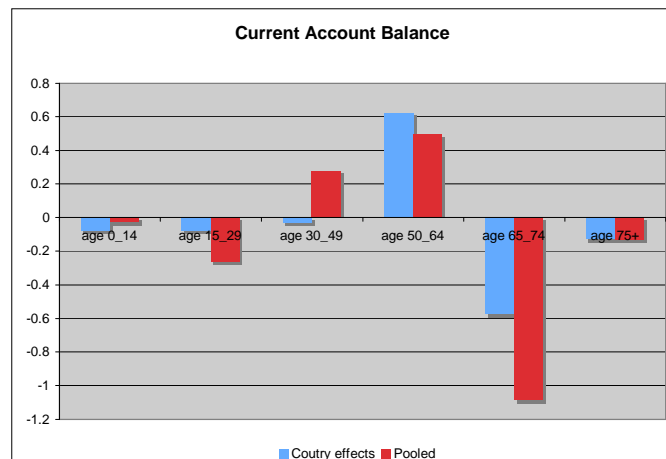
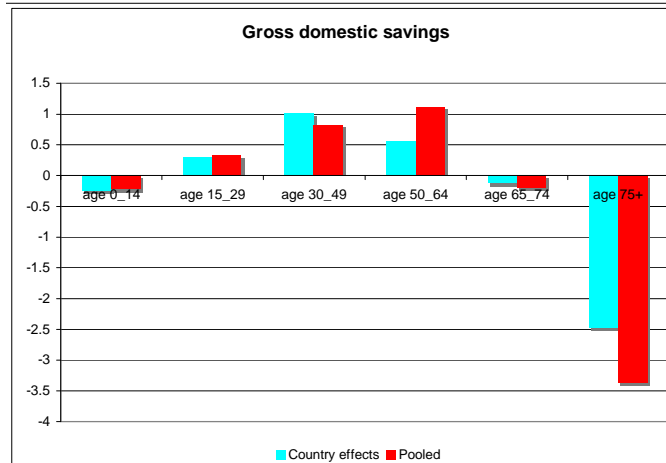
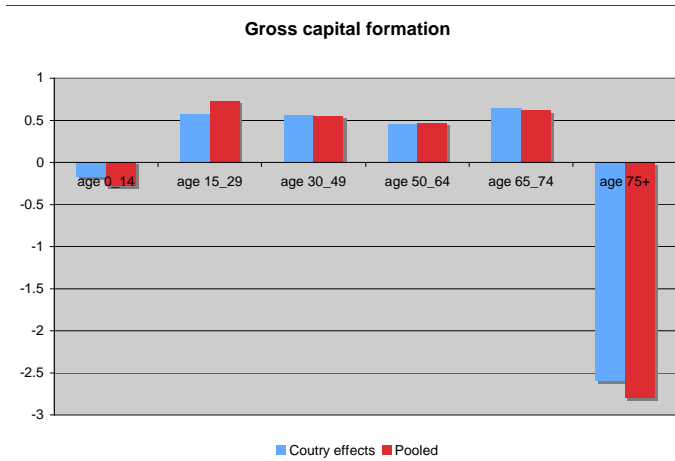
WDI and WPP

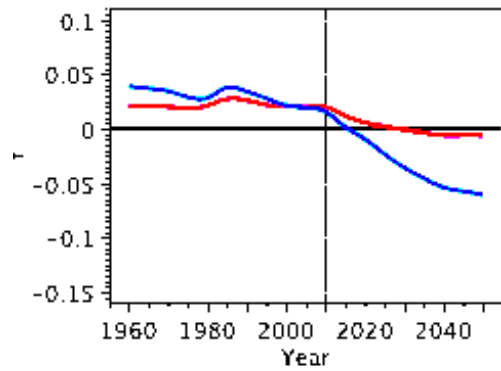


EU15, China, USA,  
Japan and India

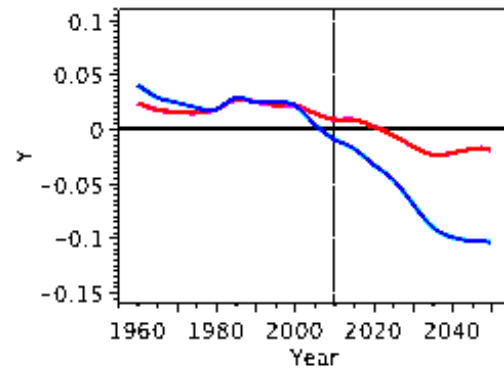
Age profile estimates  
from panel data

WDI and WPP

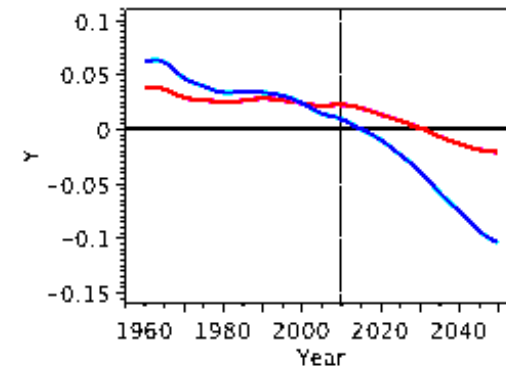




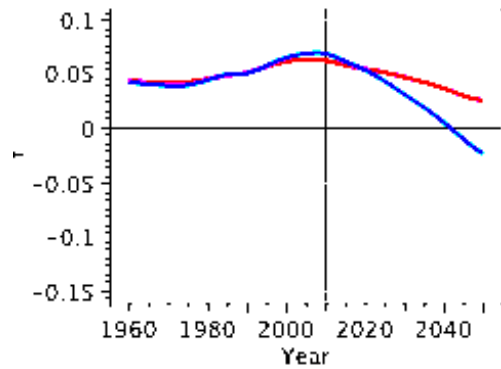
ot for Country Name=France



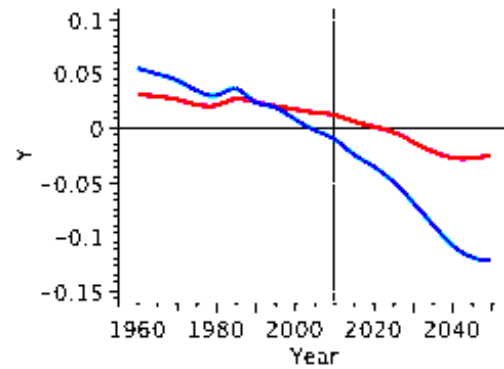
Plot for Country Name=Germany



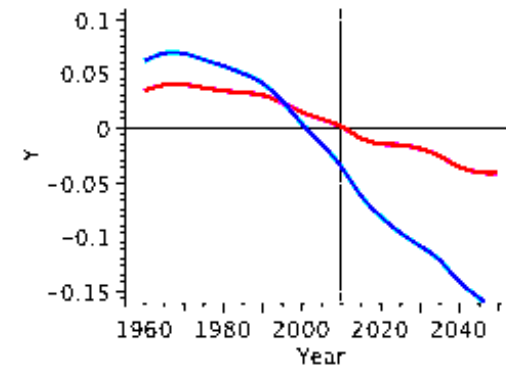
Plot for Country Name=Greece



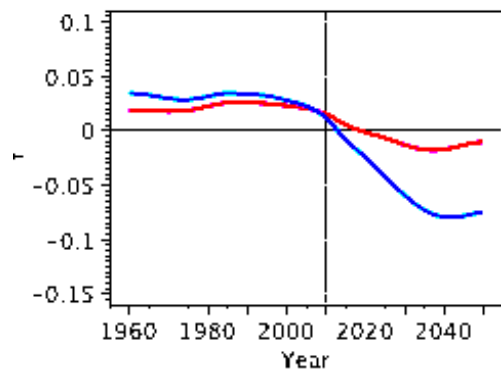
ot for Country Name=Ireland



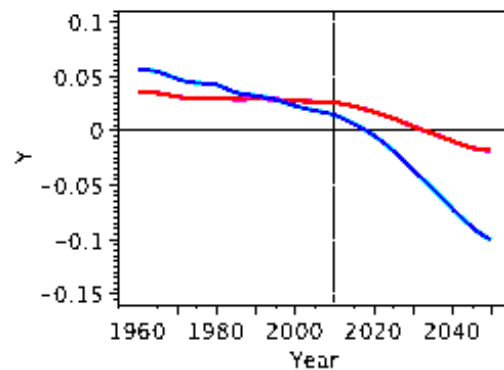
Plot for Country Name=Italy



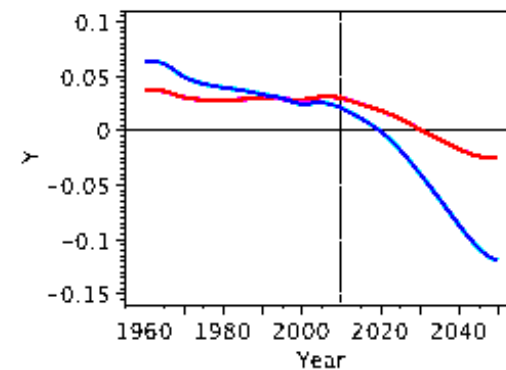
Plot for Country Name=Japan



ot for Country Name=Netherlands



Plot for Country Name=Portugal



Plot for Country Name=Spain

# Favourite quote

”Understanding how to adjust economic policy with respect to future demographic change will be a crucial question for policy makers in the aging industrial countries”

(Alvin Hansen AER 1939

presidential address at AEA).

# Is Doomsday here?

- Forecasts are contingent on assumptions
  - Correlations remaining the same
    - Change over time although slowly in this case
  - Demographic projections
    - Although fairly accurate 10-20 years uncertainty then increases fast
  - Nobody reacting to the forecast
    - But surely people are reacting and starting to adapt
    - Only remember the Hansen quote: to react adequately we have to understand the mechanisms better
    - There are many margins to adapt on that work at widely different horizons

# How to adapt and when?

- Work longer
- Start to work earlier
- Work harder
- Educate and work better
- Immigration
- Save capital
- Population growth

- Maybe 5-15 years
- Immediate (short edu)
- Immediate (but hard)
- 10-40 years (cost)
- 2-30 years (integration)
- Global long term horizon?
- 25-60 years (massive investment costs)

Adaptations interact, investment and benefits at different times

# Global context

- Timing differs considerably within EU
- Global competition may thwart some adaptations and favour others
- Aging tends to make us internationally more dependent both on migration and capital markets