

# Three Models (Version 1.0)

1. ~~Stochastic Population Forecasts~~
2. Forecasting Educational Distribution
3. Forecasting Government Budgets

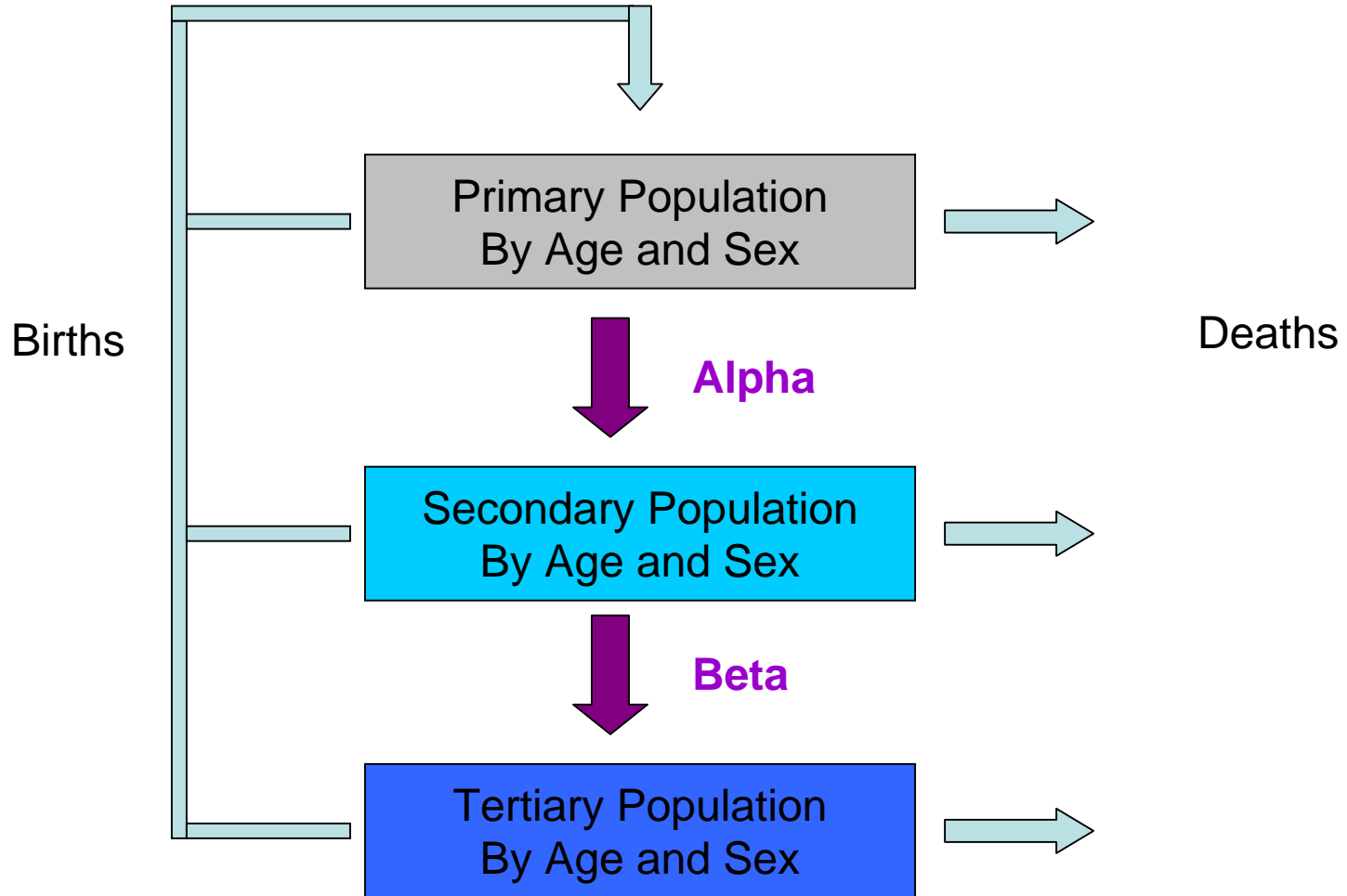
# Projecting Population by Education Level using the Census Method

Tim Miller

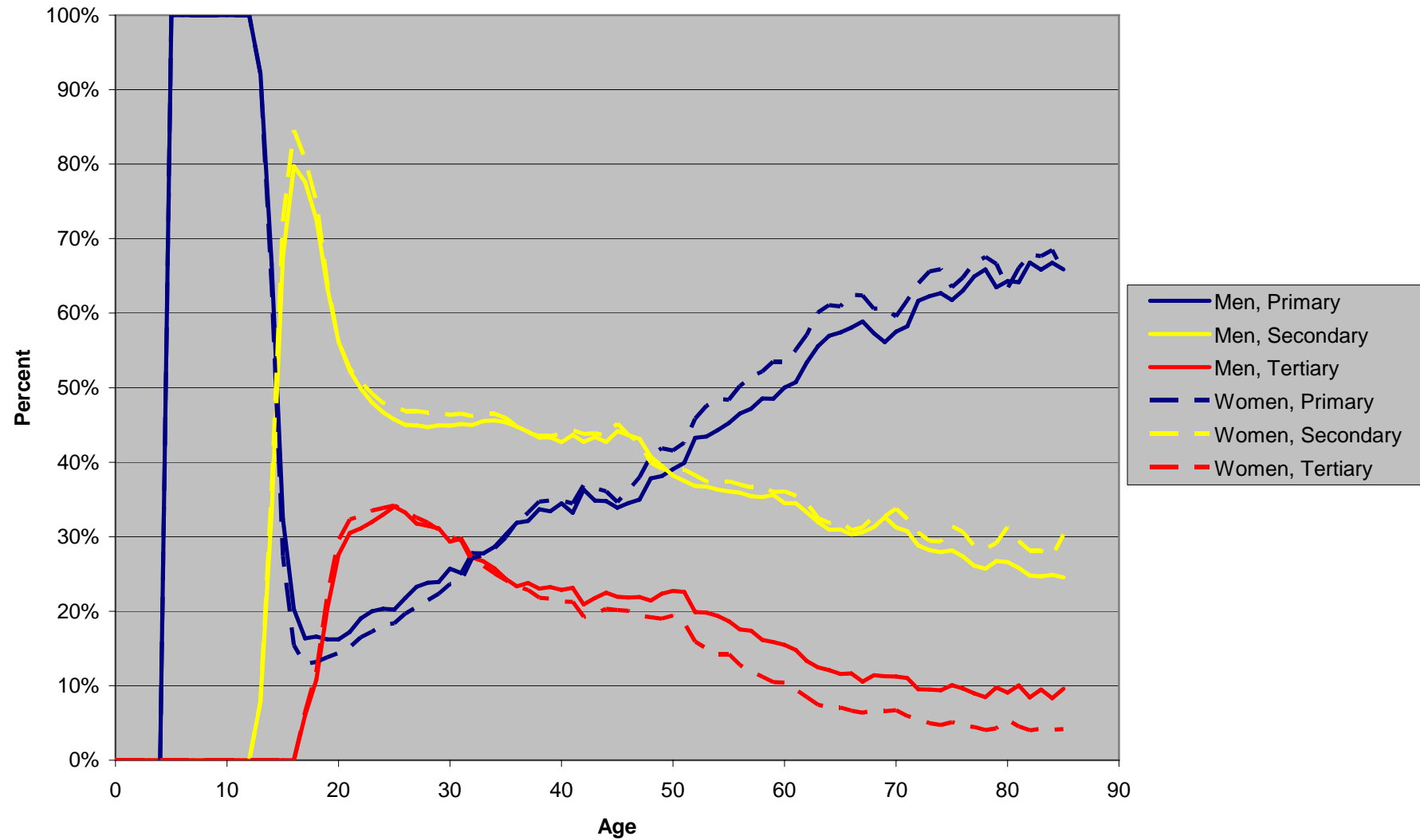
Center for the Economics and  
Demography of Aging, UC Berkeley  
tmiller@demog.berkeley.edu

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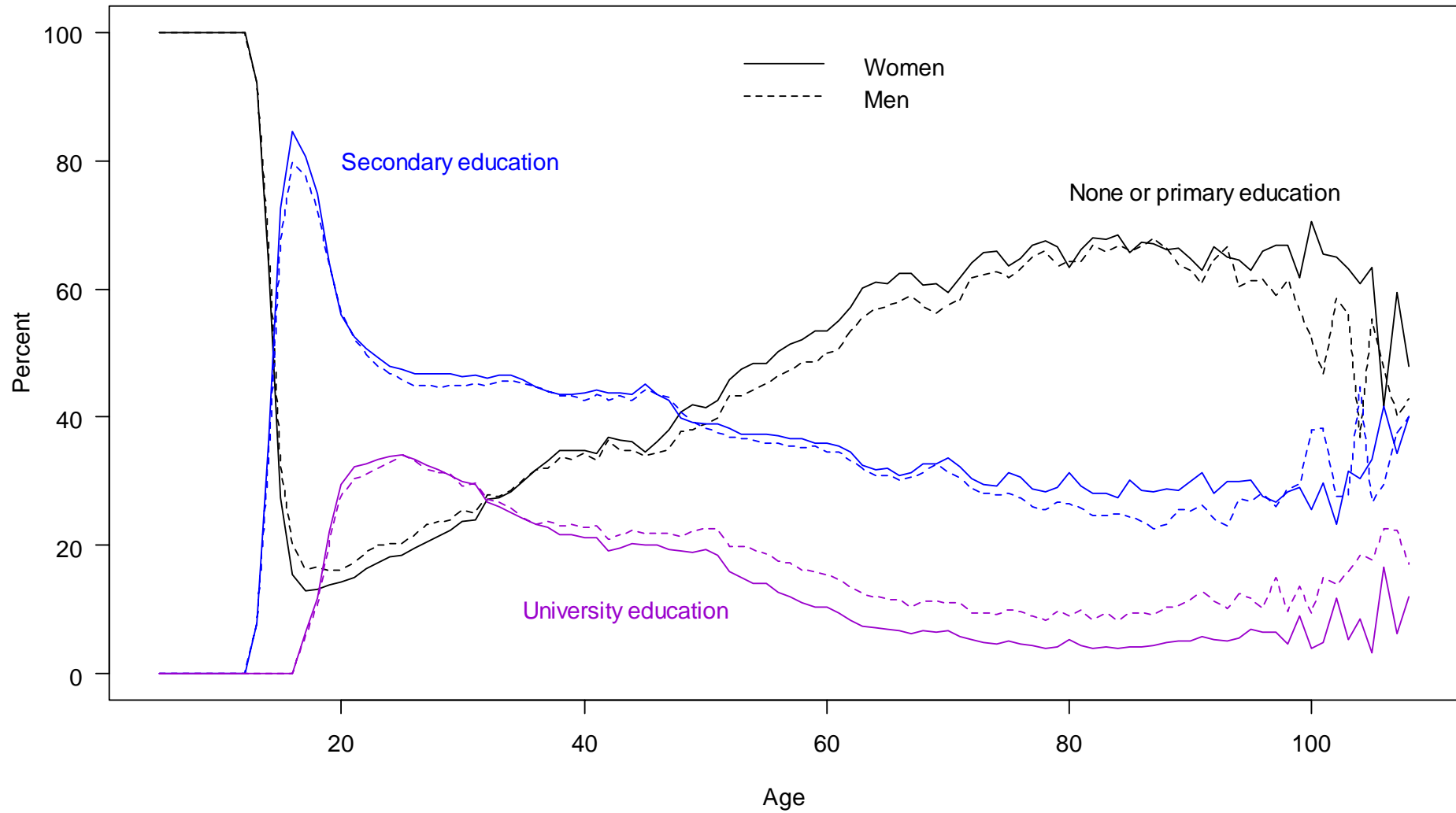
# Three Box Model



# Educational Distribution by Age and Sex for Chile, Census 2002

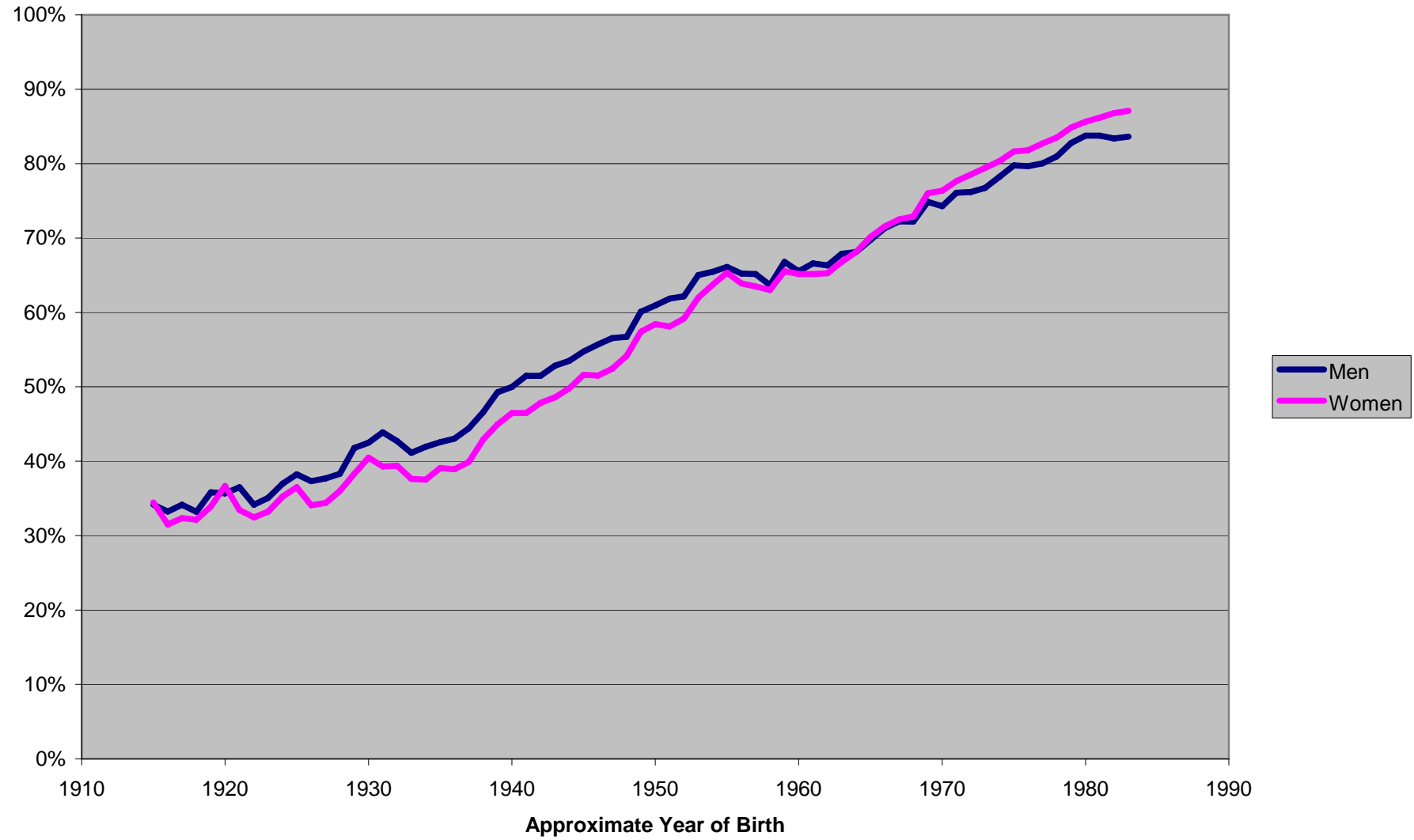


Educational distribution by age and sex, Chile 2002



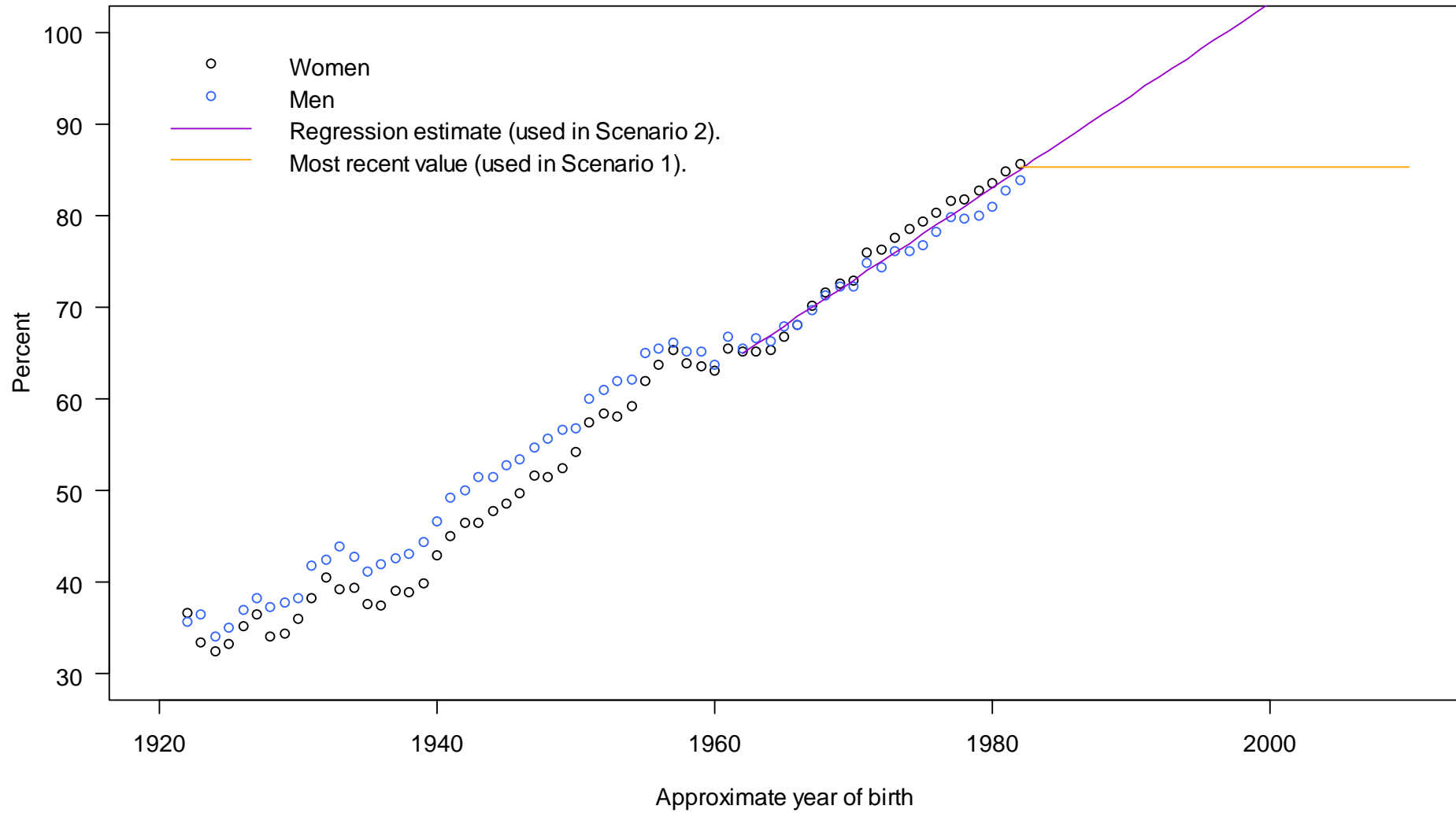
# Alpha Rate for Chile

Figure 2. Progression to Secondary Education Level



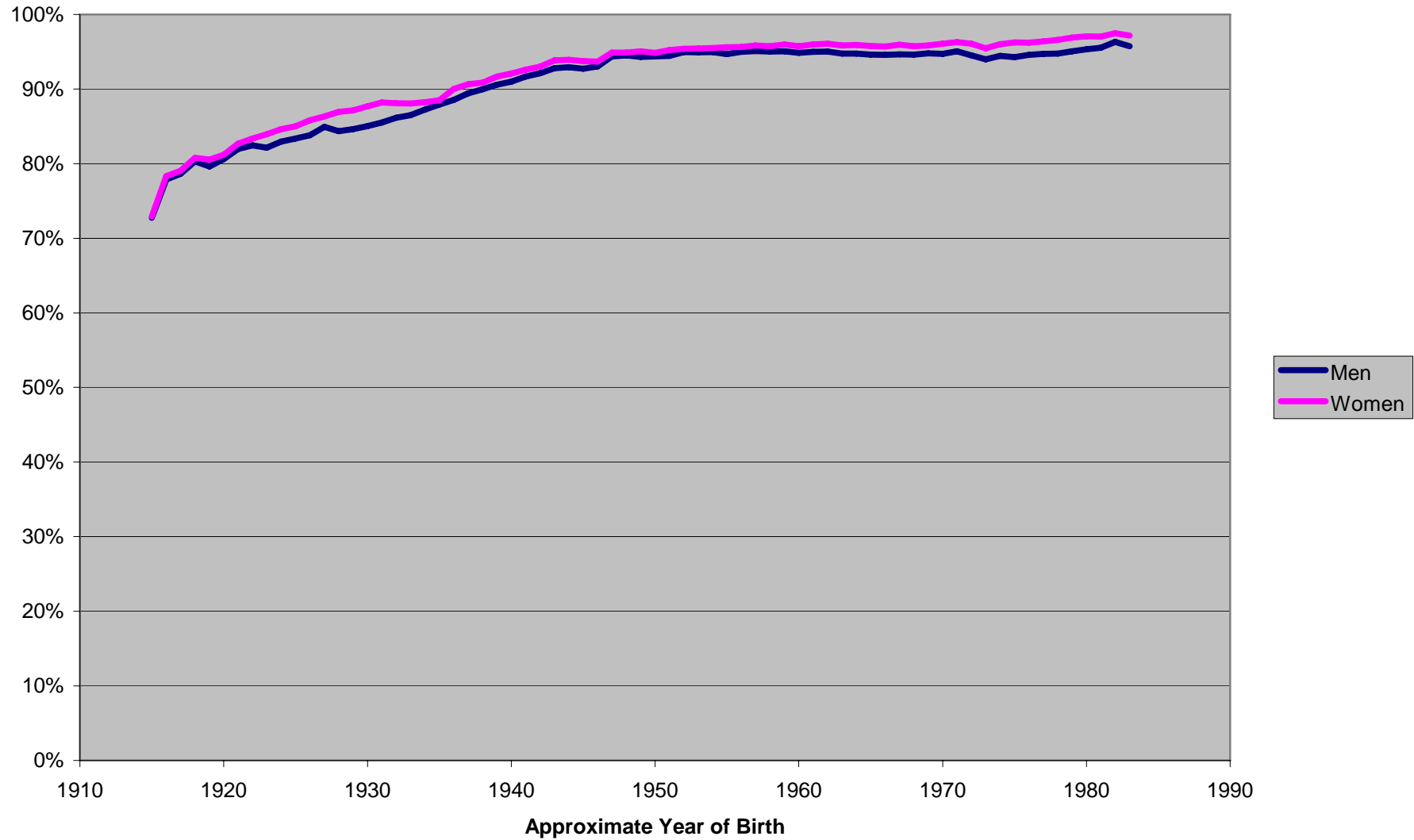
# Alpha rate.

## Percent of cohort with at least some secondary education, Chile 2002



# Alpha Rate for the United States

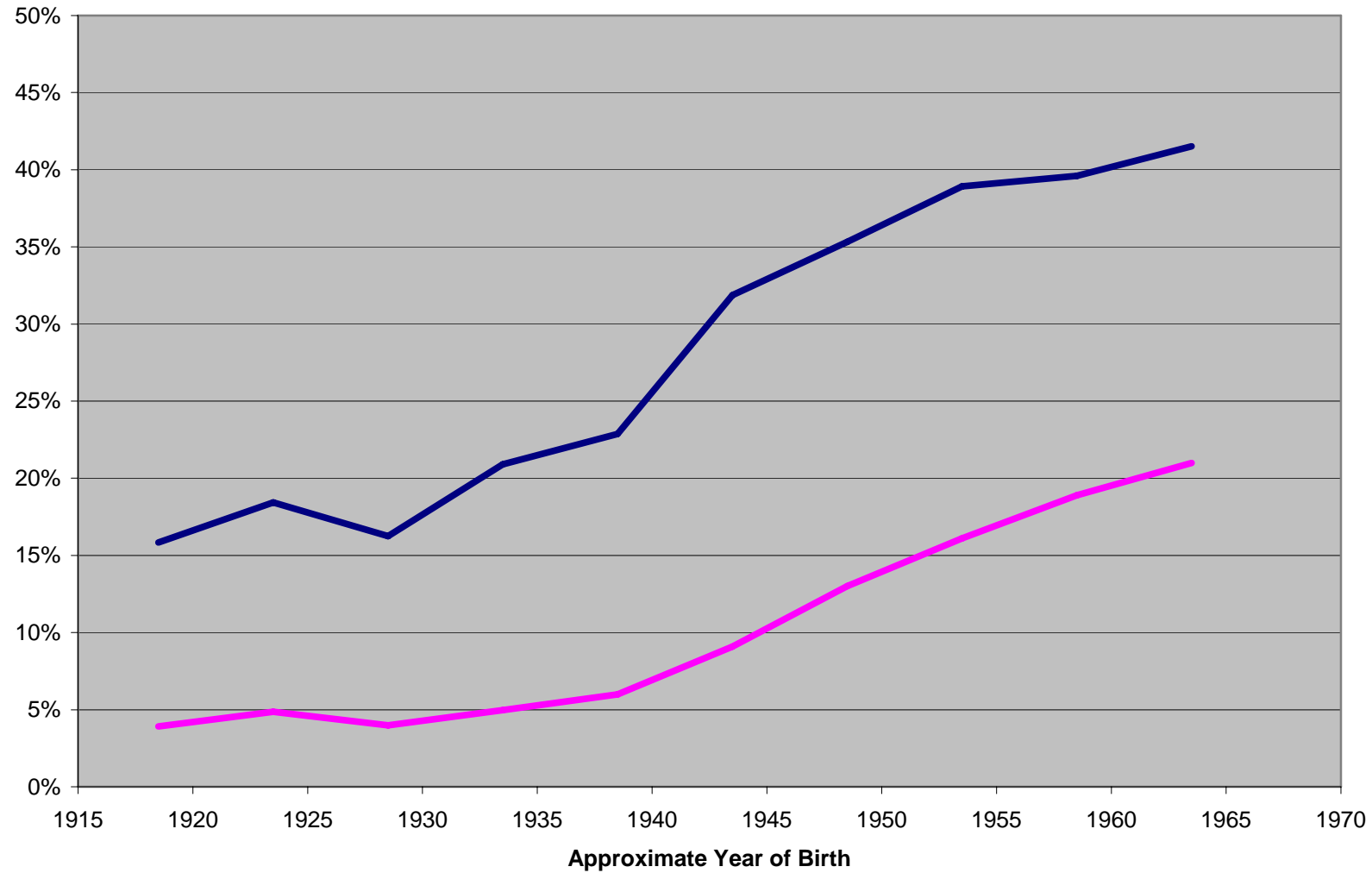
**Figure 2. Progression to Secondary Education Level**





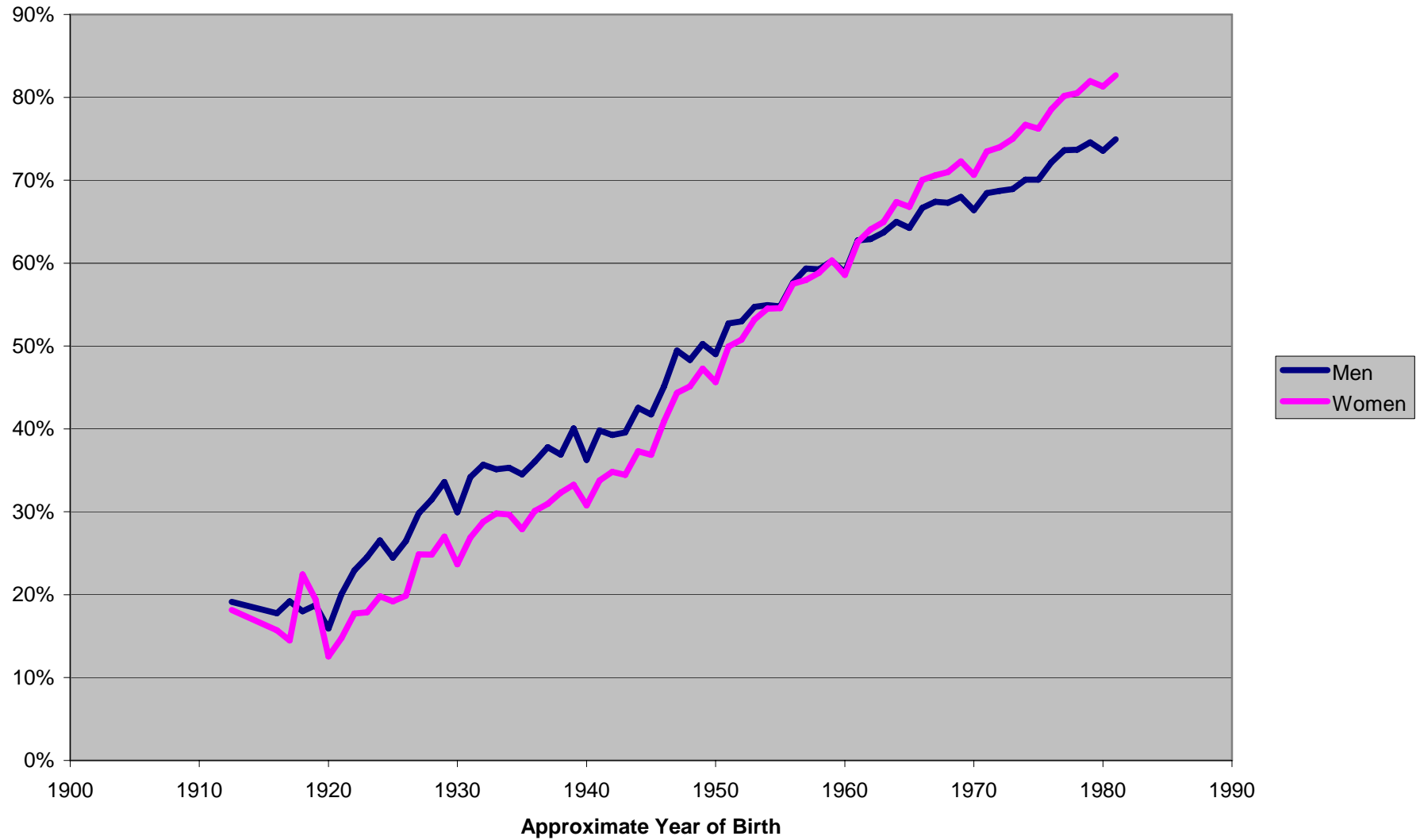
# Alpha Rate for India

**Figure 2. Progression to Secondary Education Level  
(Percent of cohort who progress to high school)**



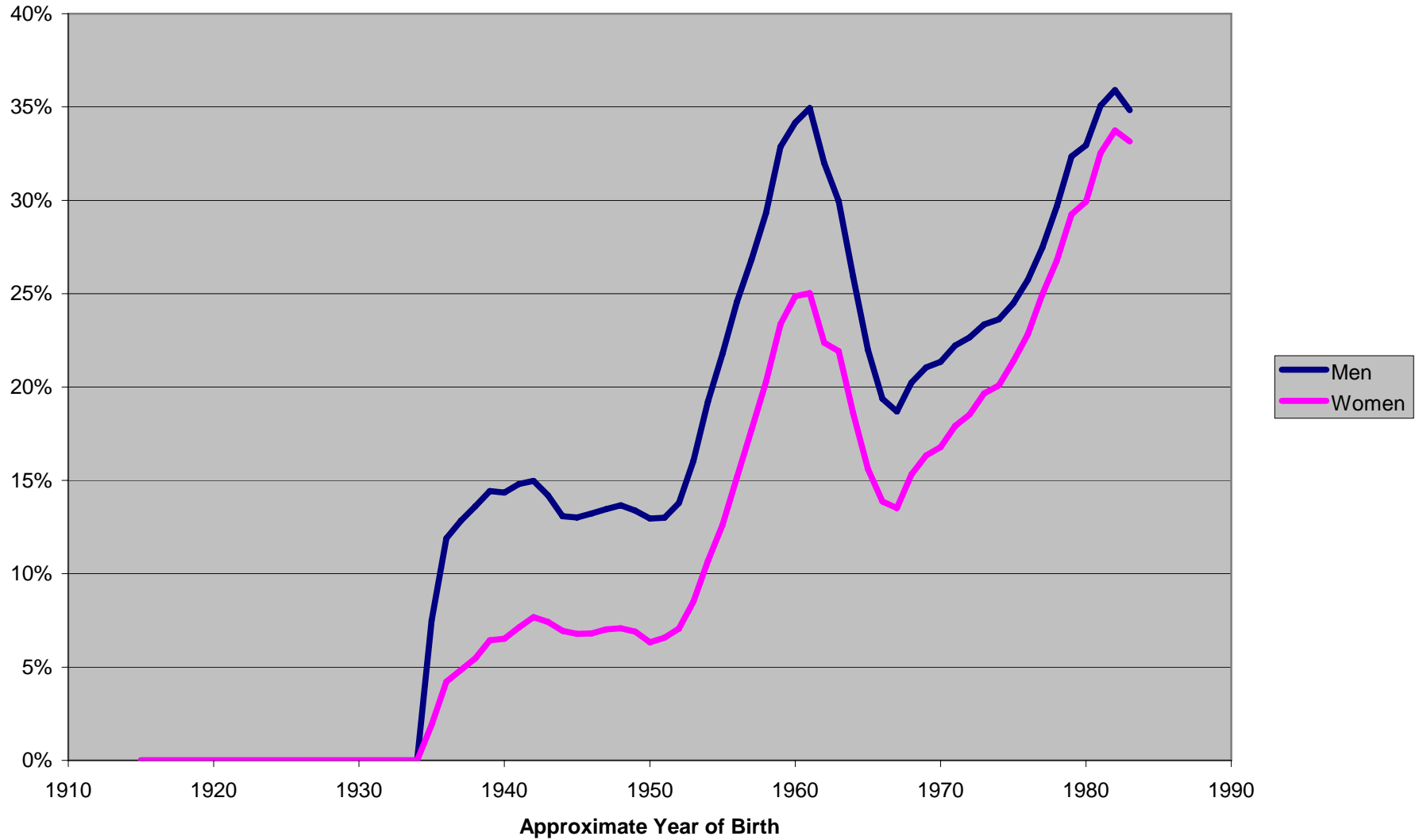
# Alpha Rate for the Philippines

Figure 2. Progression to Secondary Education Level



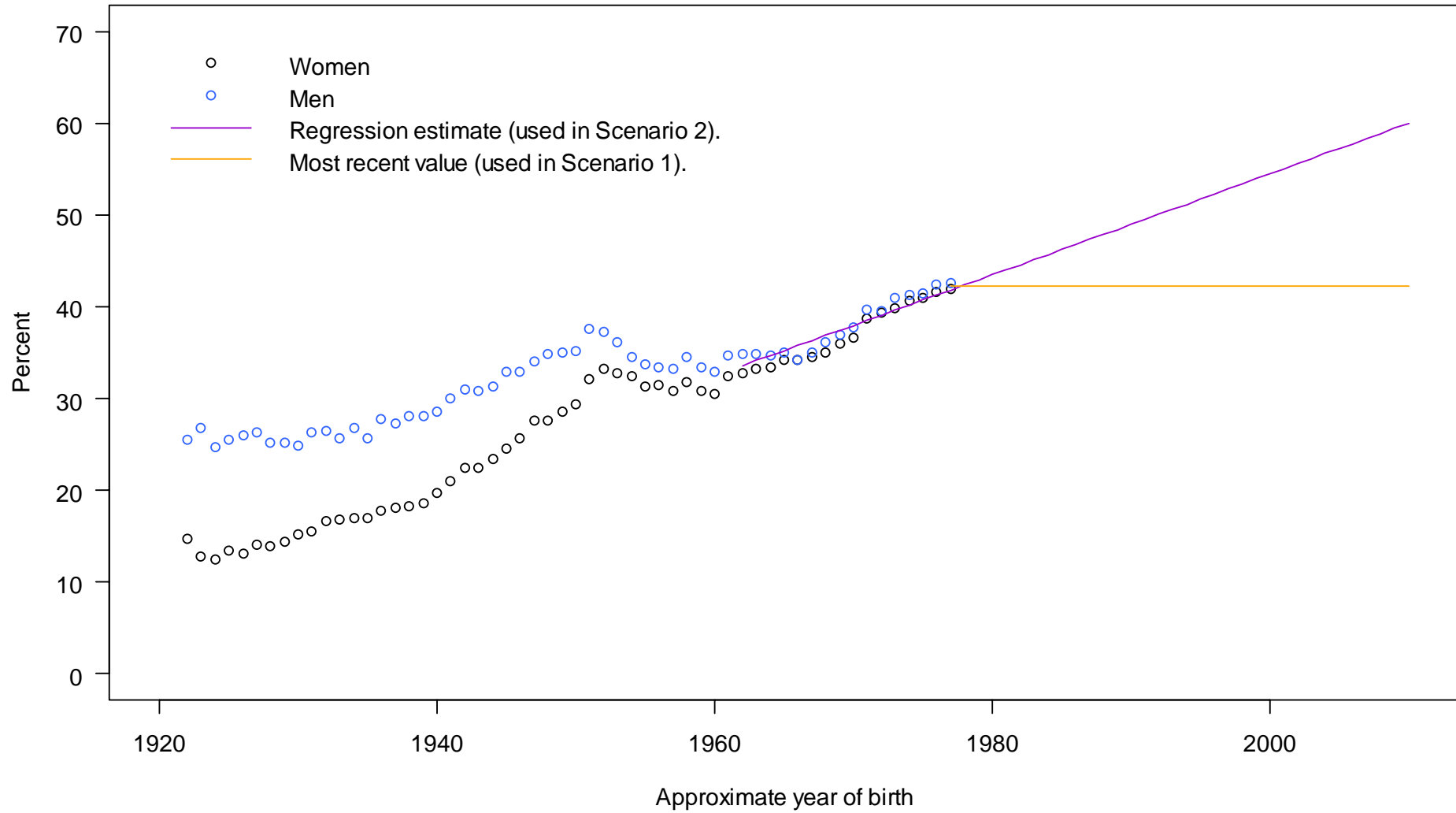
# Alpha Rate for China

Figure 2. Progression to Secondary Education Level



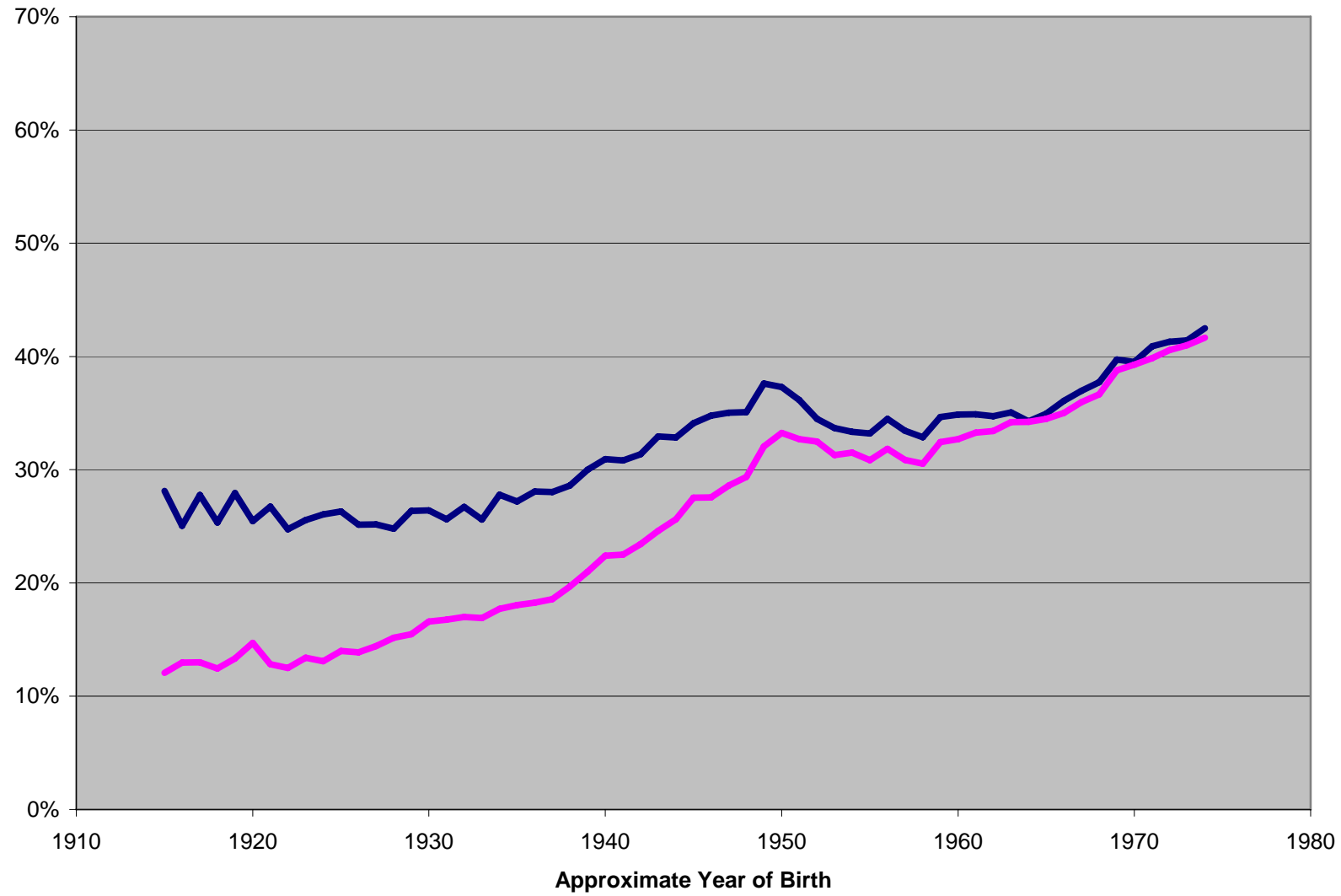
# Beta rate.

## Those with secondary education who move on to university level



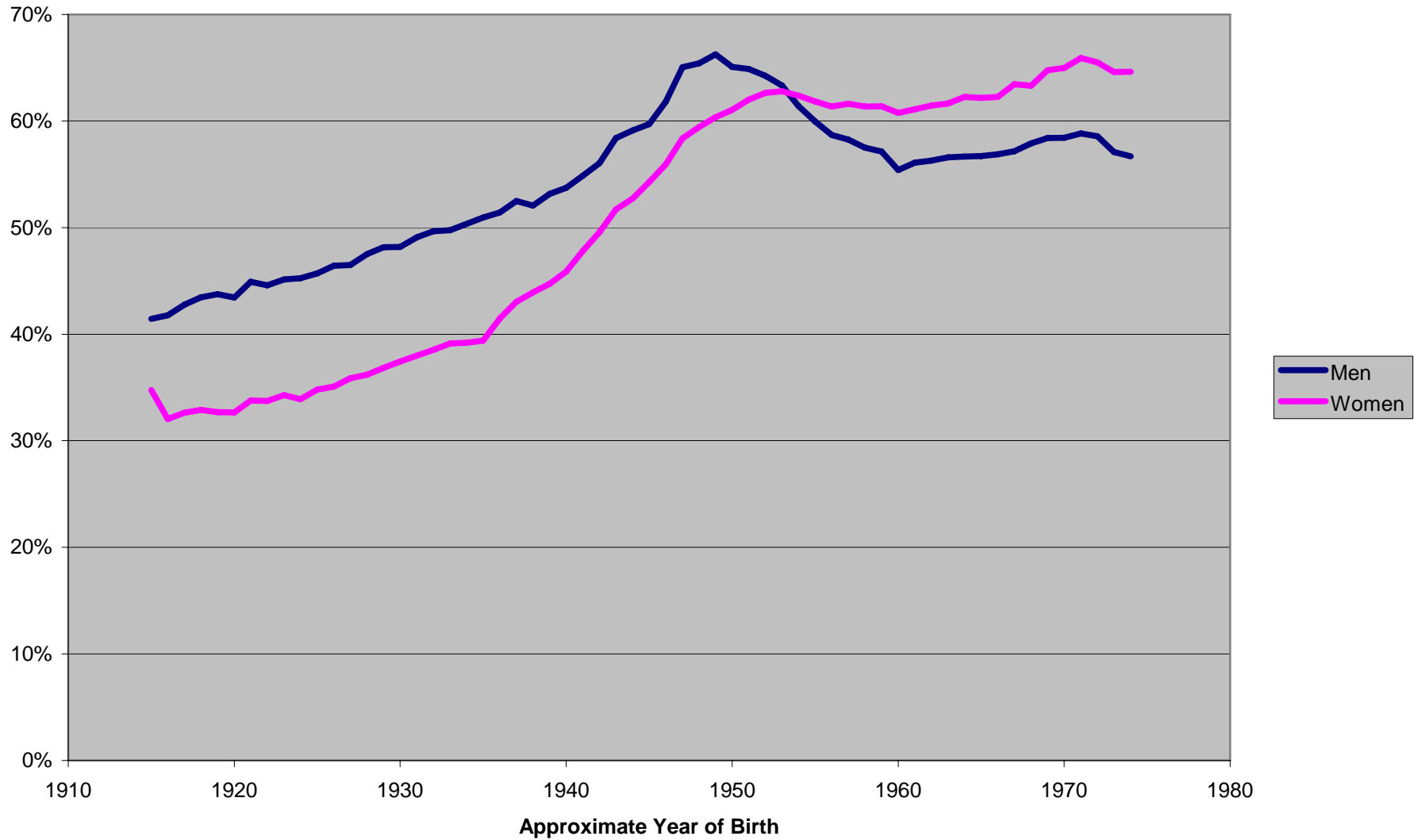
# Beta rate for Chile

Figure 3. Progression to Tertiary Education Level



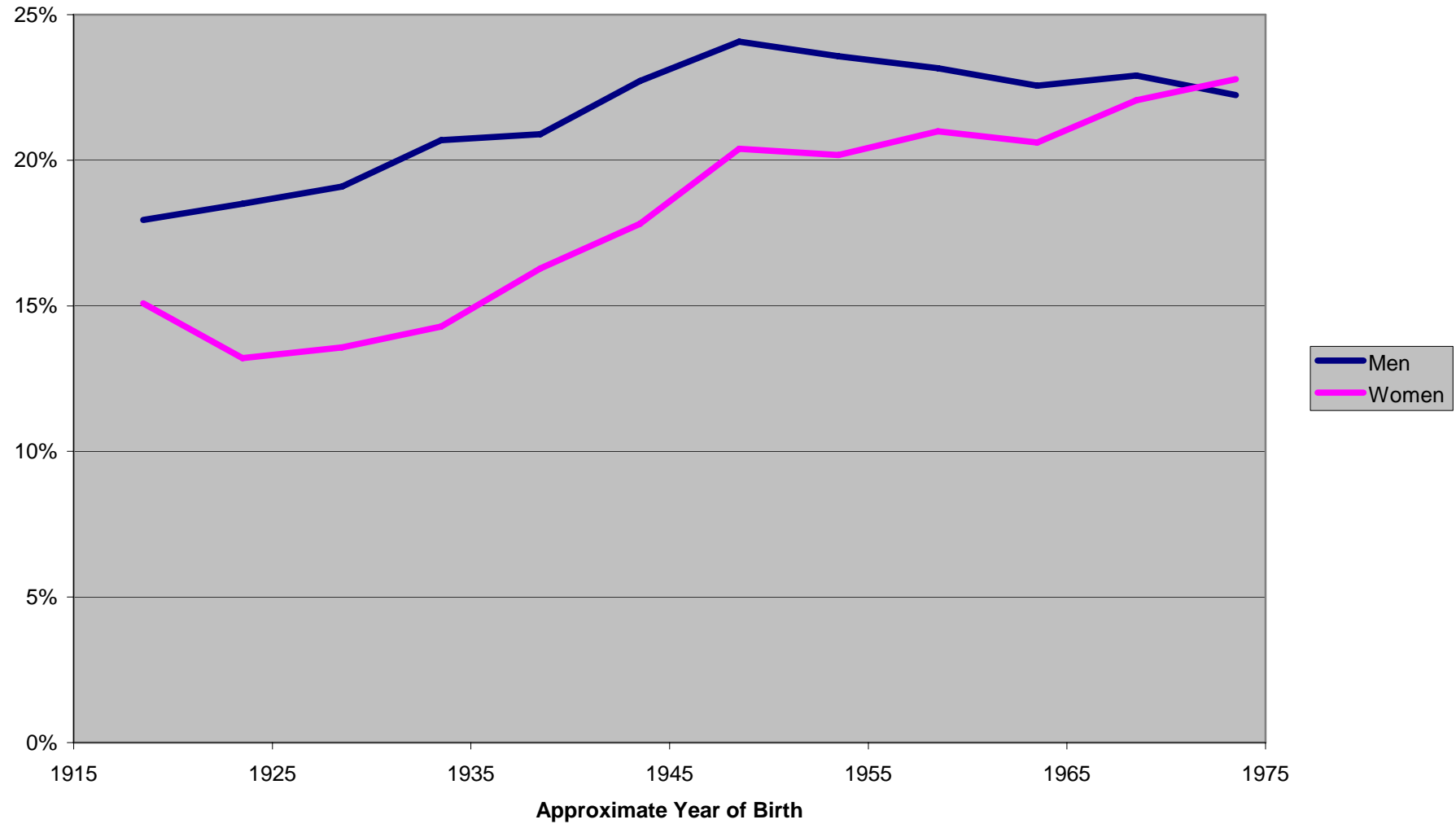
# Beta rate for the United States

## Figure 3. Progression to Tertiary Education Level



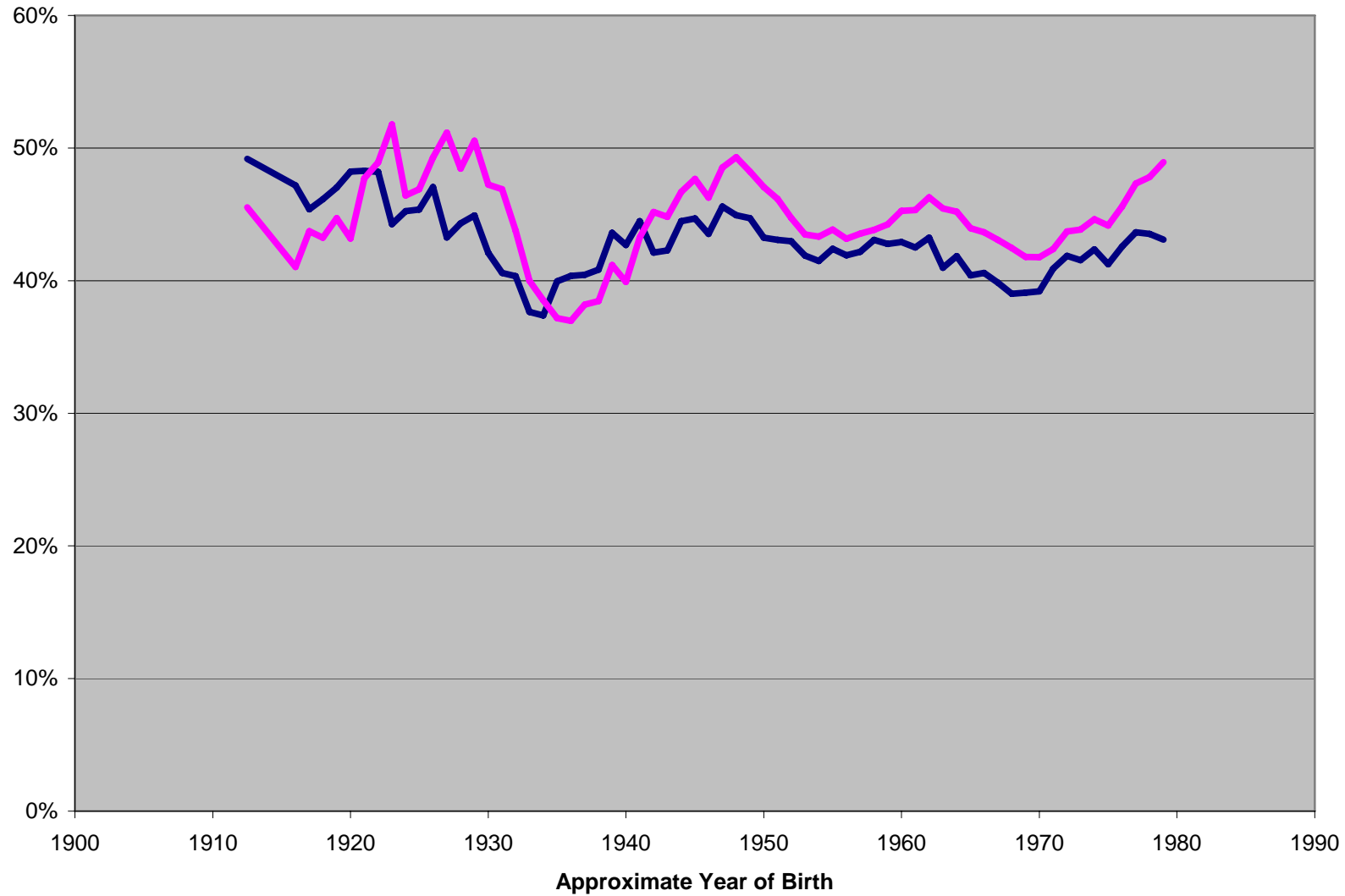
# Beta rate for India

**Figure 3. Progression to Tertiary Education Level  
(Percent of those with high school education who progress to university)**



# Beta rate for the Philippines

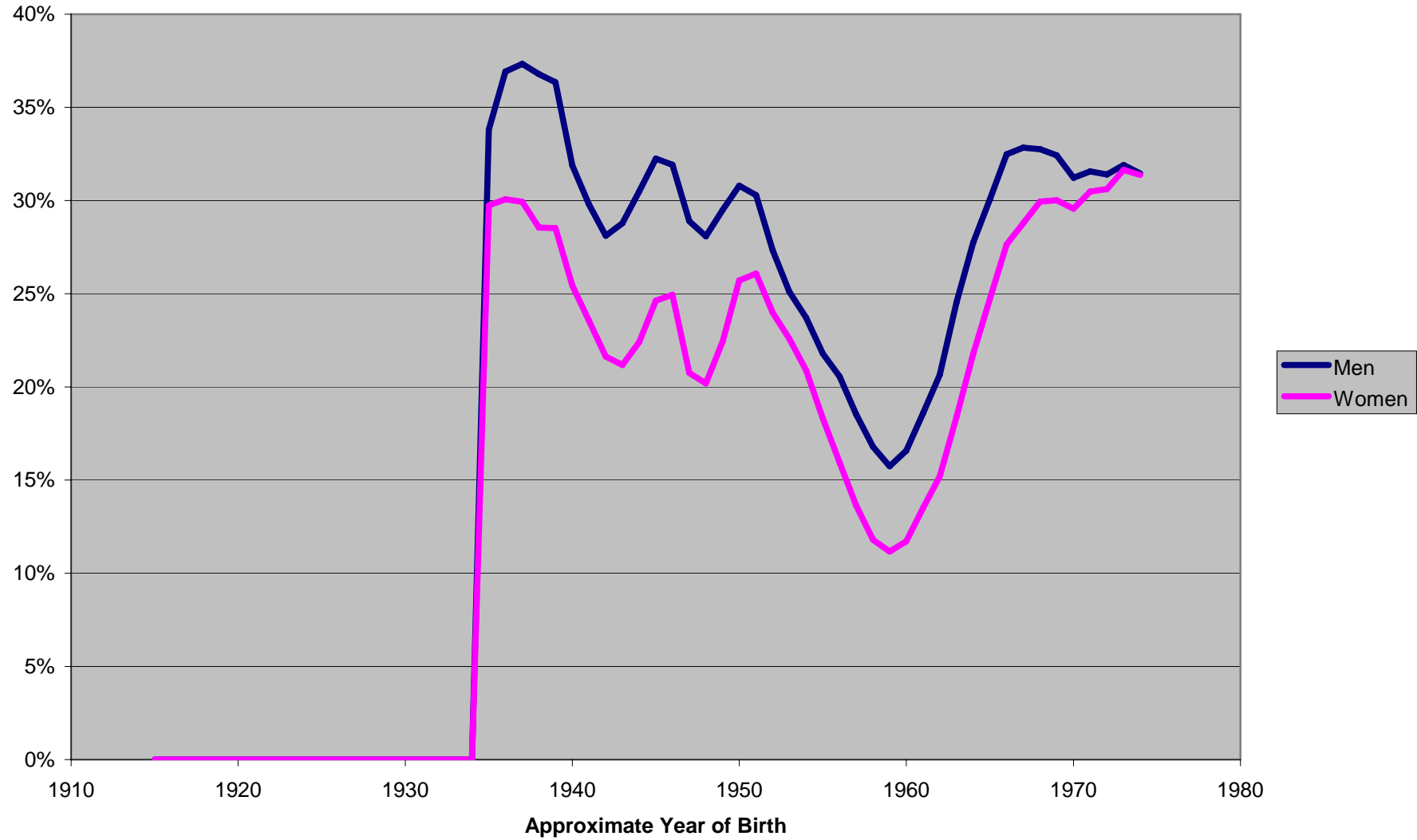
**Figure 3. Progression to Tertiary Education Level**





# Beta rate for China

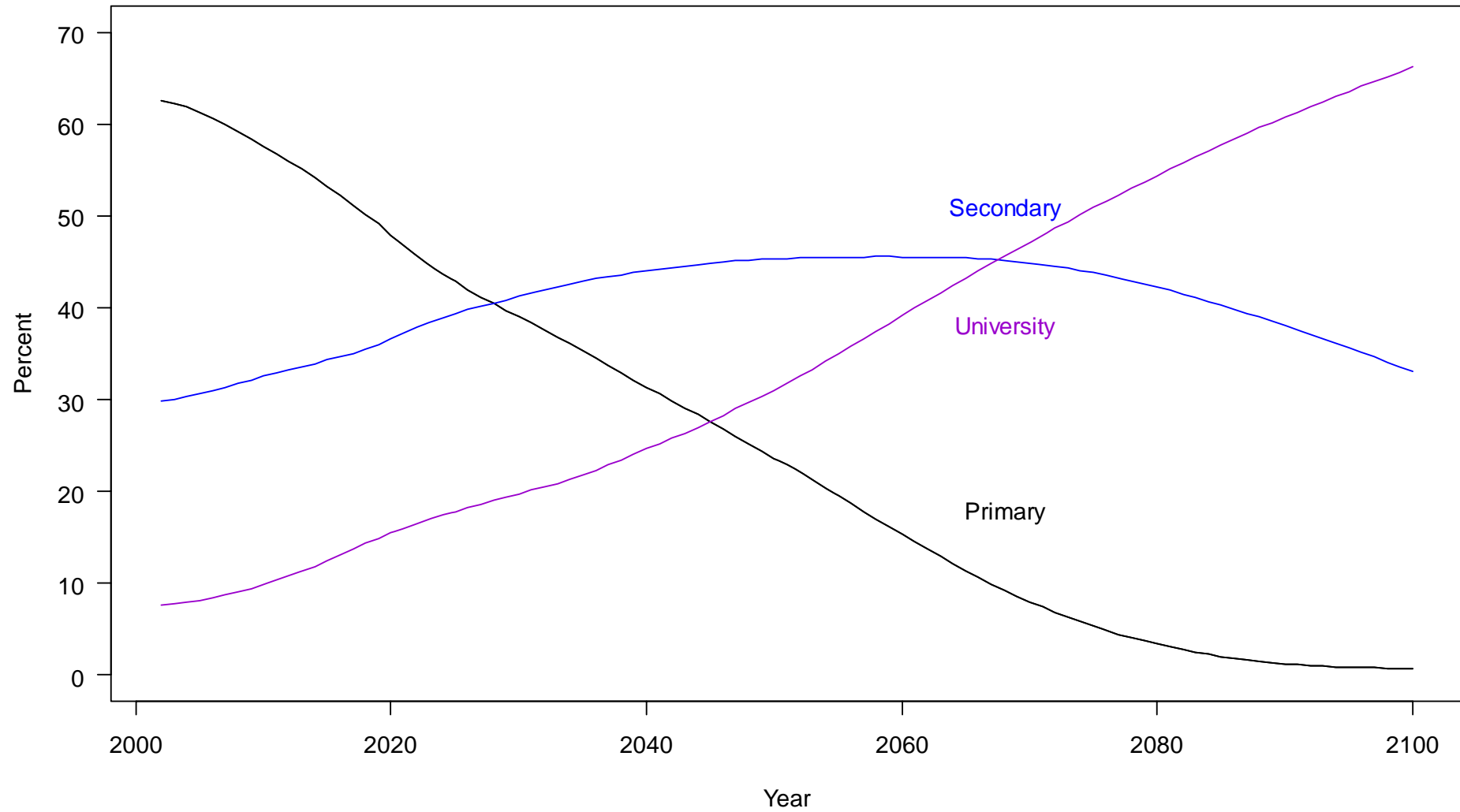
Figure 3. Progression to Tertiary Education Level



Education Forecast  
of Elderly Population in Chile:  
2002-2100

## Educational distribution of elderly population, Chile 2002-2100

Scenario 2: Education progression rates continue on historical trend.

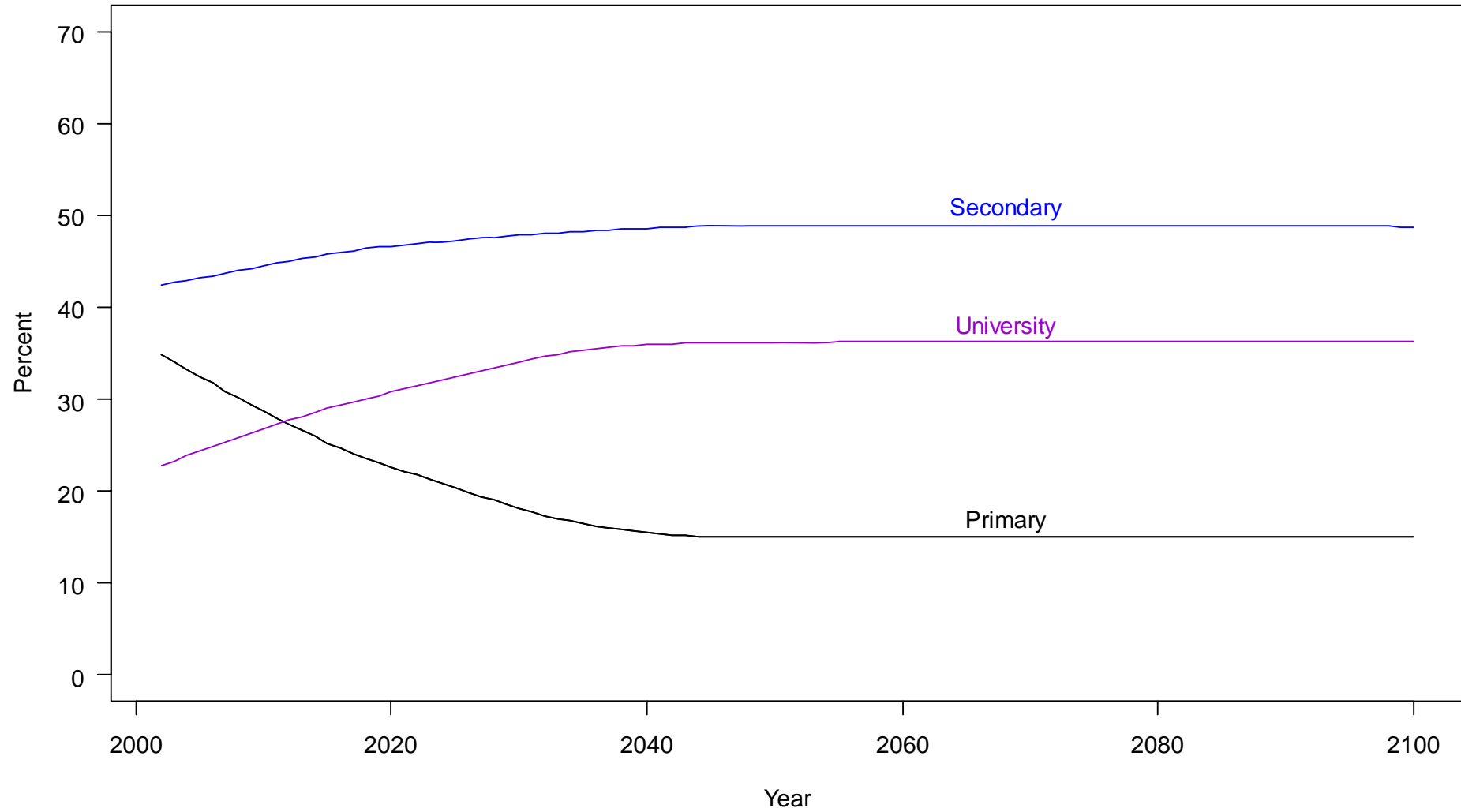


Education Forecast  
of Working Age Population  
in Chile:  
2002-2100

# SCENARIO 1

## Educational distribution of working-age population, Chile 2002-2100

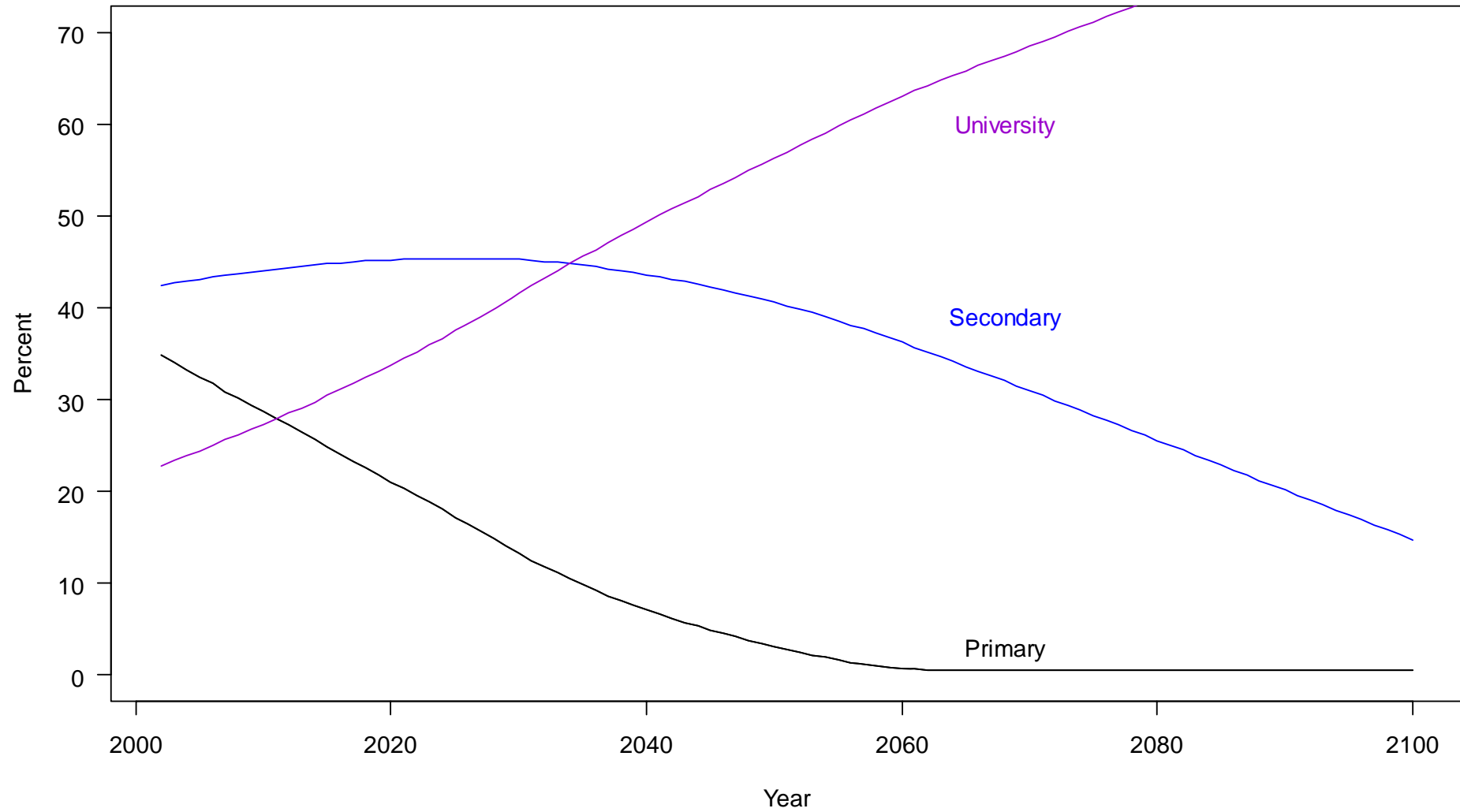
Scenario 1: No change in educational progression rates.



# SCENARIO 2

## Educational distribution of working-age population, Chile 2002-2100

Scenario 2: Educational progression rates continue on historical trend.



**Observed correlations between education and employment/wages are used as basis of workforce projection.**

## Observation

Those with higher education...

- More likely to be employed.
- Receive higher wage.

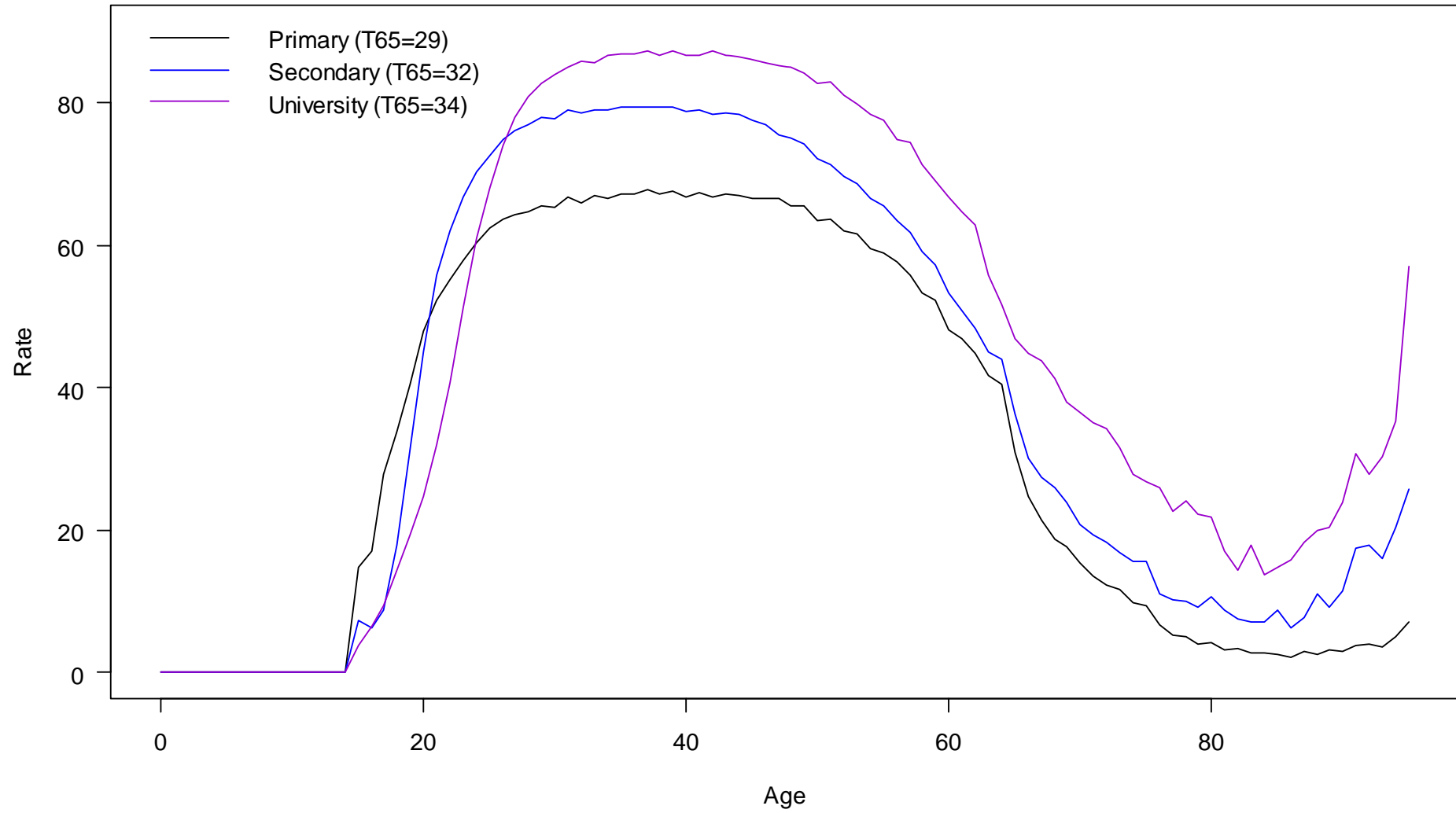


## Projection

Increase in education will lead to...

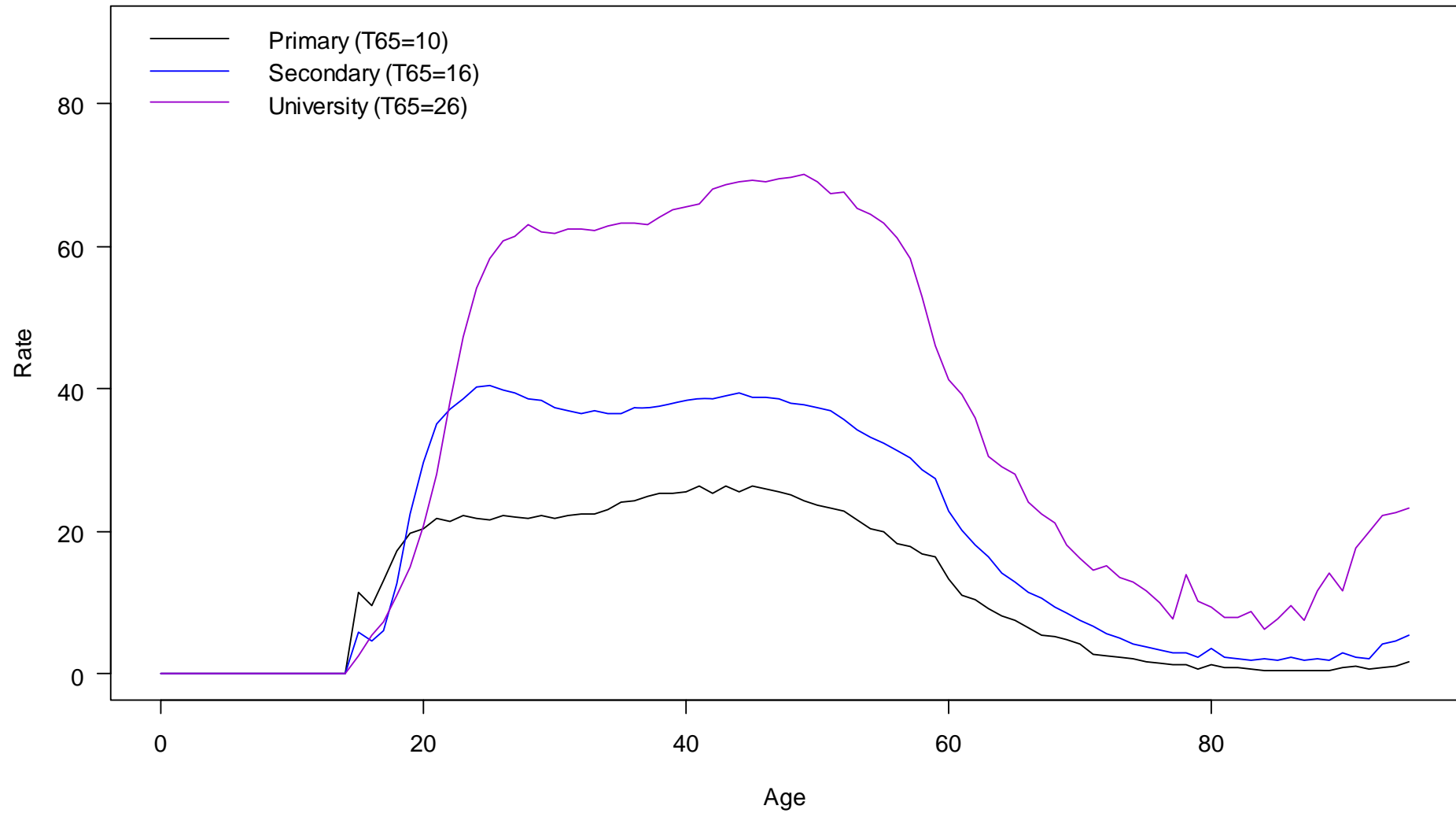
- Increase in size of workforce.
- Increase in skill level or productivity per worker.

**Labor force participation rates by education level: Chilean men, 2002.**



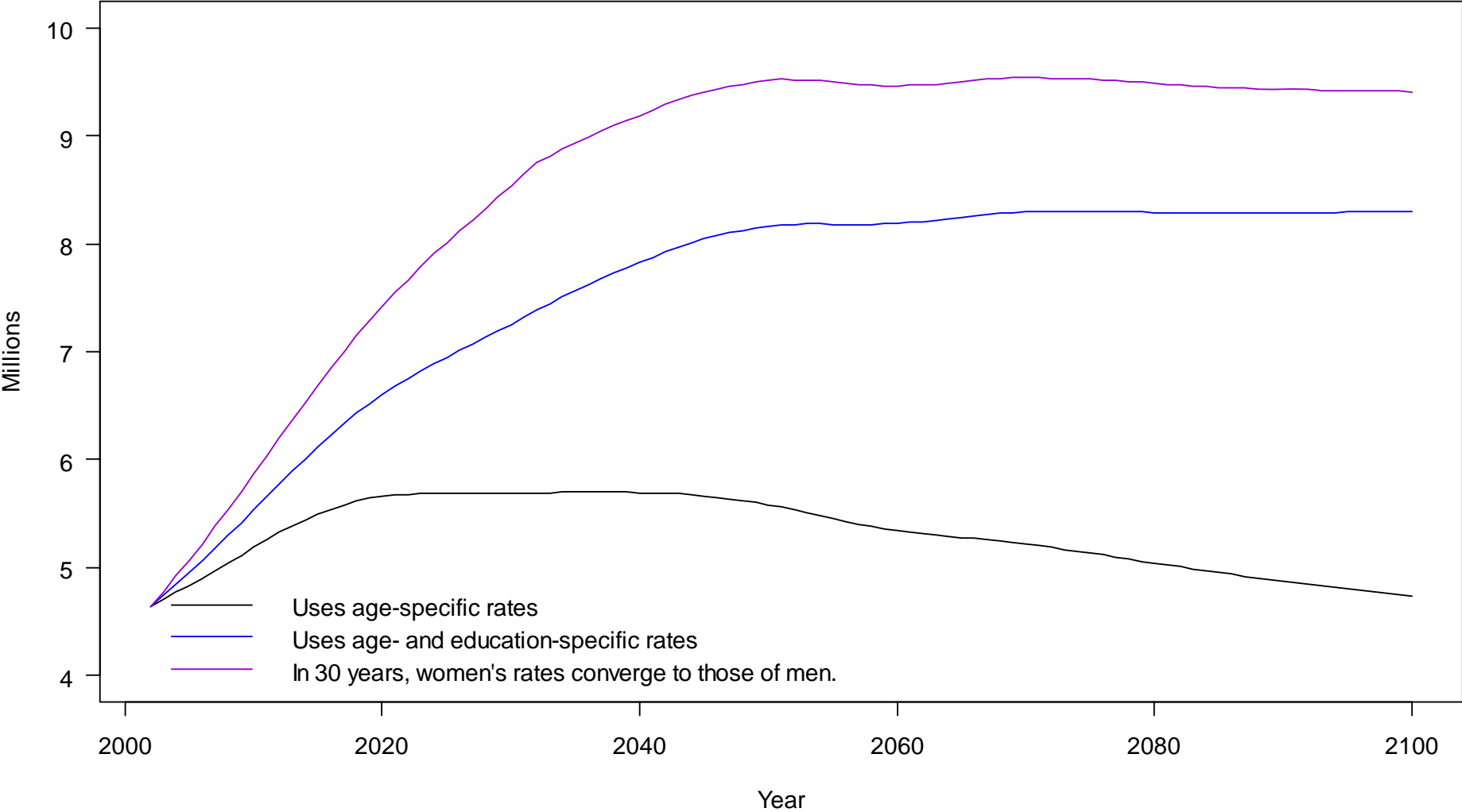


**Labor force participation rates by education level: Chilean women, 2002.**



# Effective workforce projection (with skill adjustment using educational wage differential): Chile, 2002-2100

Scenario 2: Education progression rates continue on historical trend.



# Summary

- Dramatic shifts in educational distribution of elderly... may mean equally dramatic declines in poverty and need for social support.
- Dramatic shifts in educational distribution among workers ... may lead to large increases in the skill-level, productivity, and wages of the workforce.

# Excel Spreadsheets

- tim.education.xls applies the Census Method to derive alpha and beta education rates.
- education.forecast.xls forecasts population by education level and age using alpha and beta rates.

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