

Projecting the Educational Distribution using the Single Census Method

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Workshop Goals

1. Estimate changes in the historical educational distribution.
2. Project changes in the future educational distribution.
3. Calculate the “Education Dividend.”

Estimating Changes in Educational Distributions

- Barro and Lee (1993, 1996, 2001), Center for International Development, Harvard University.
- Lutz, Goujon, Samir, & Sanderson (2007). International Institute for Applied Systems Analysis (IIASA). Full demographic method.
- Miller (2006). CELADE. Single Census Method.

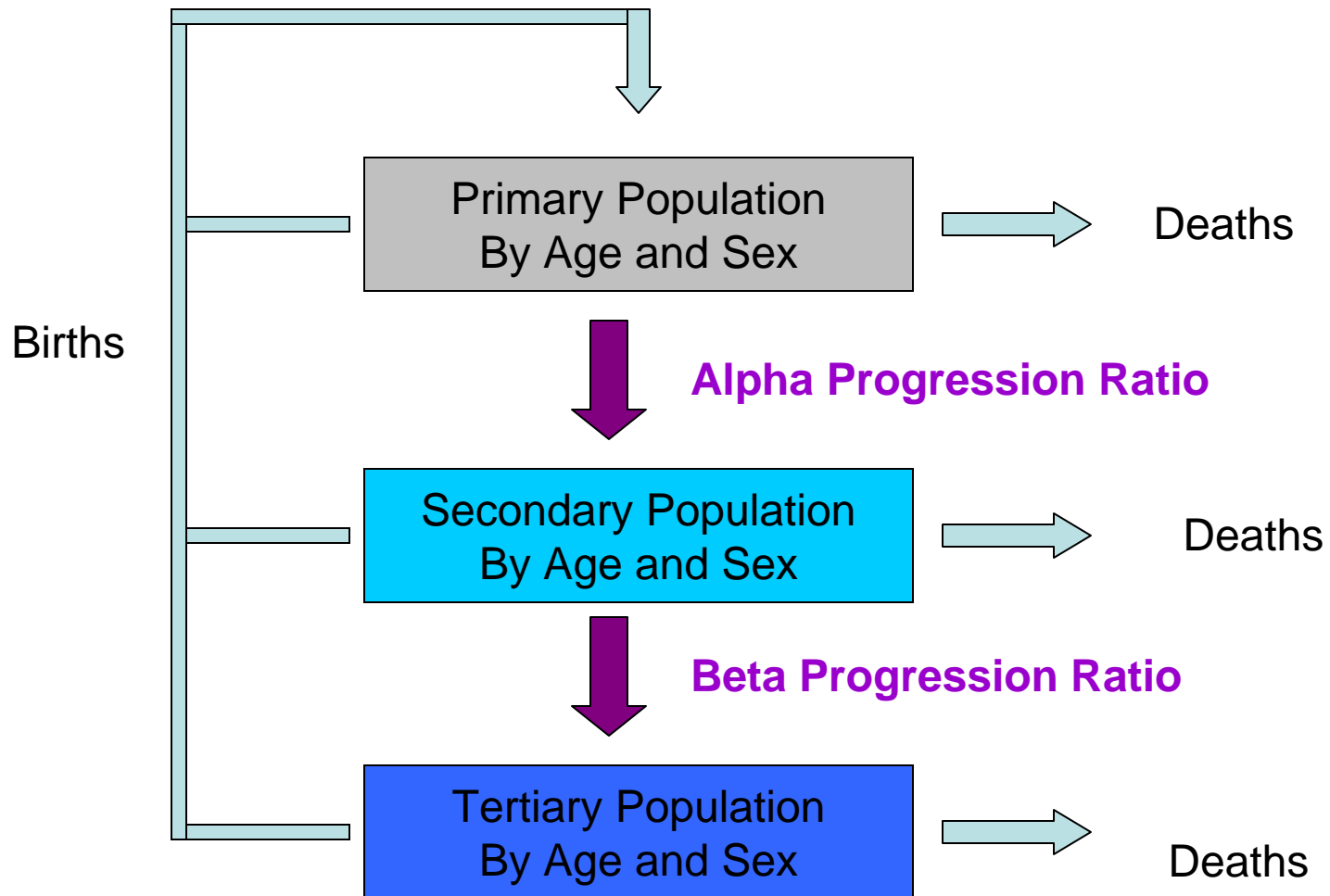
Projection Methods

- Extrapolation of period progression ratios.
Progression ratio = The proportion of a given educational level who proceed on to the next level.
- Leslie matrix of intergenerational transmission of education. (Lee and Miller, 1997).

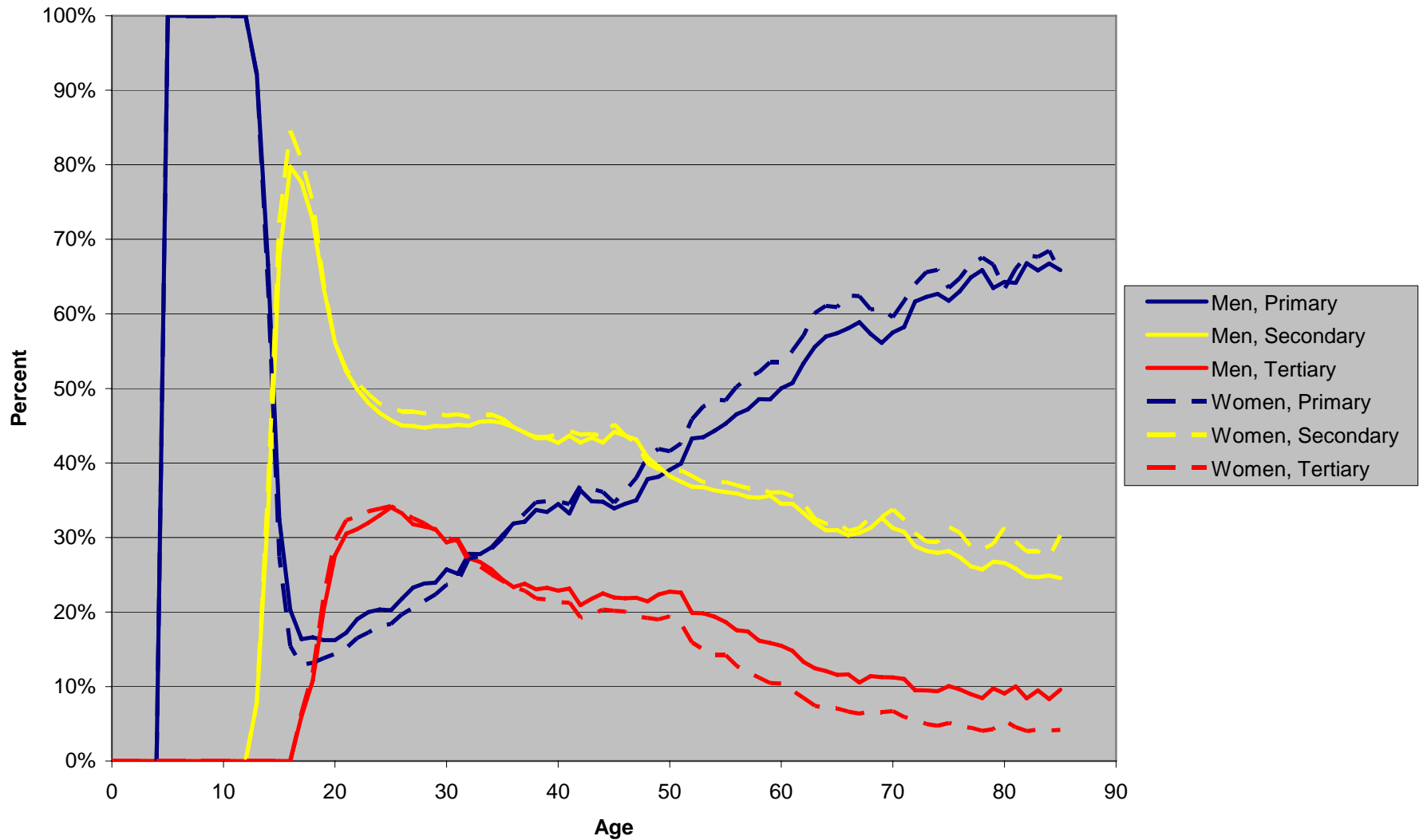
The Single Census Method

- Uses data from a single census to estimate changes in the educational distribution over time.

A Three Box Model



Educational Distribution by Age and Sex for Chile, Census 2002



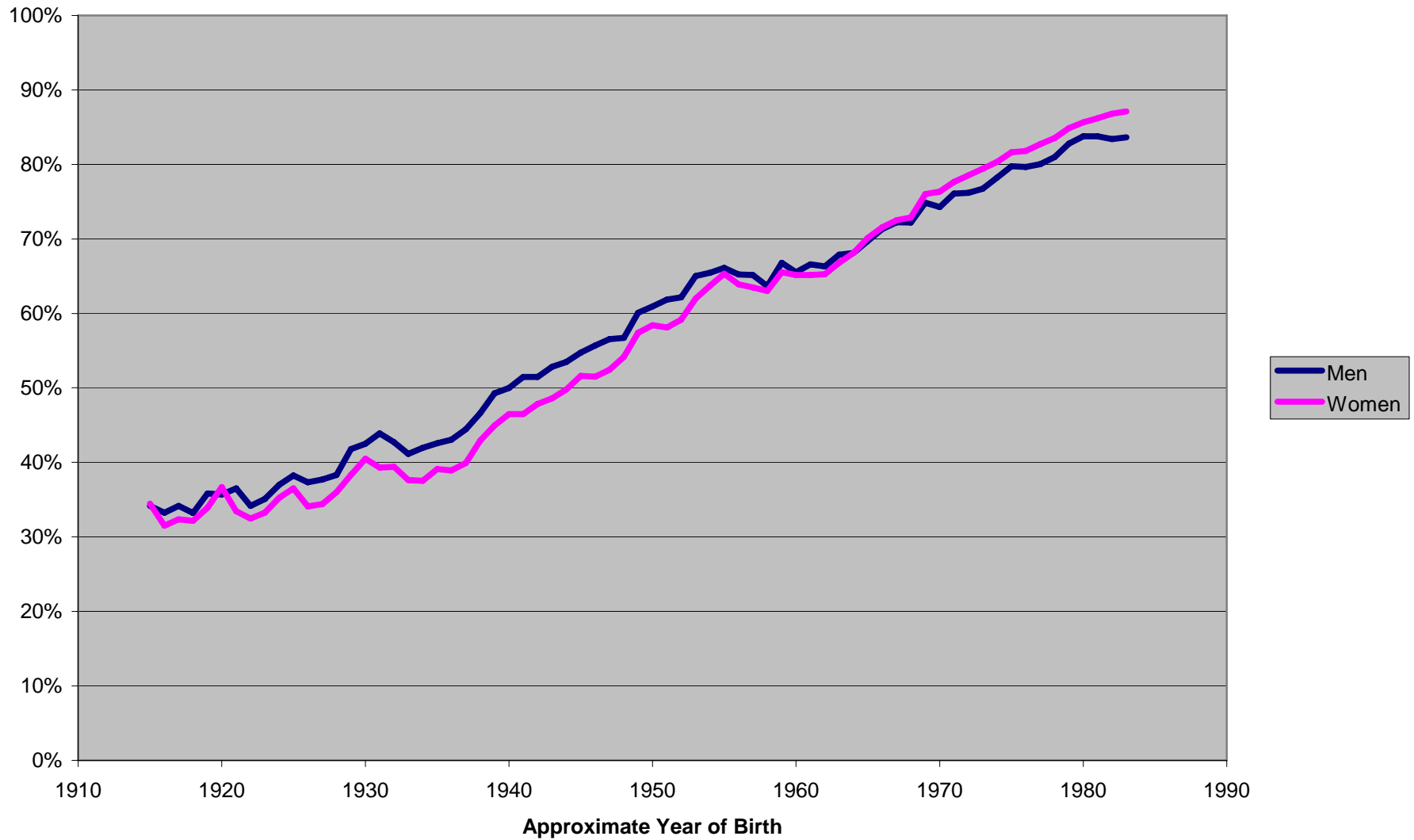
Alpha Progression Rate

Percent of cohort
who progress to secondary school

- Using Census data, calculate at each age the proportion of the population with at least some secondary education (“high school”).
- Ignoring differential mortality, we can define a birth cohort profile based on the age profile.

Alpha Rate for Chile

Figure 2. Progression to Secondary Education Level

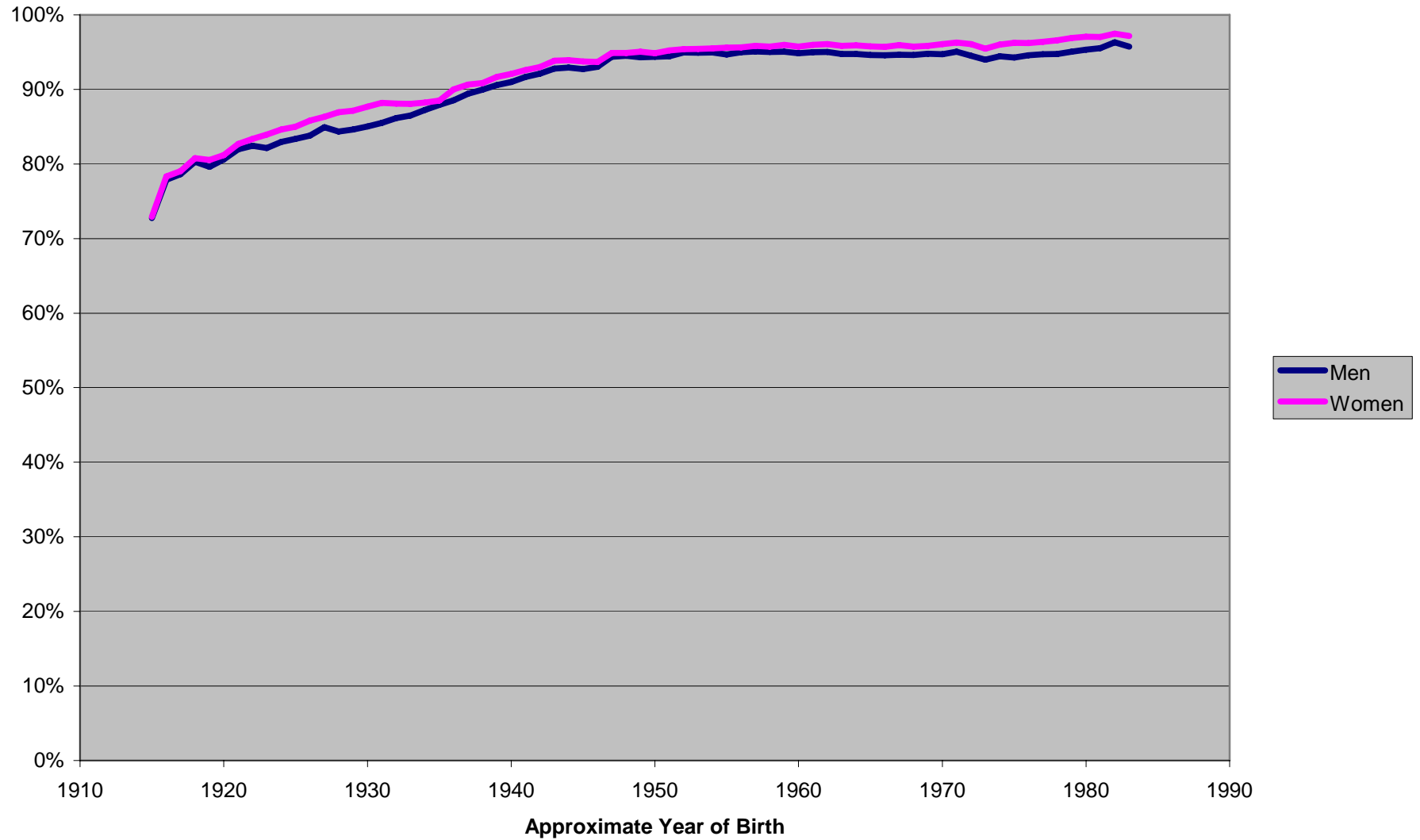


Alpha Progression Ratios

- For most countries, a steady upward trend over time -- reflecting the expansion of secondary educational system.
- For most countries, a narrowing of the gender gap throughout 20th century.

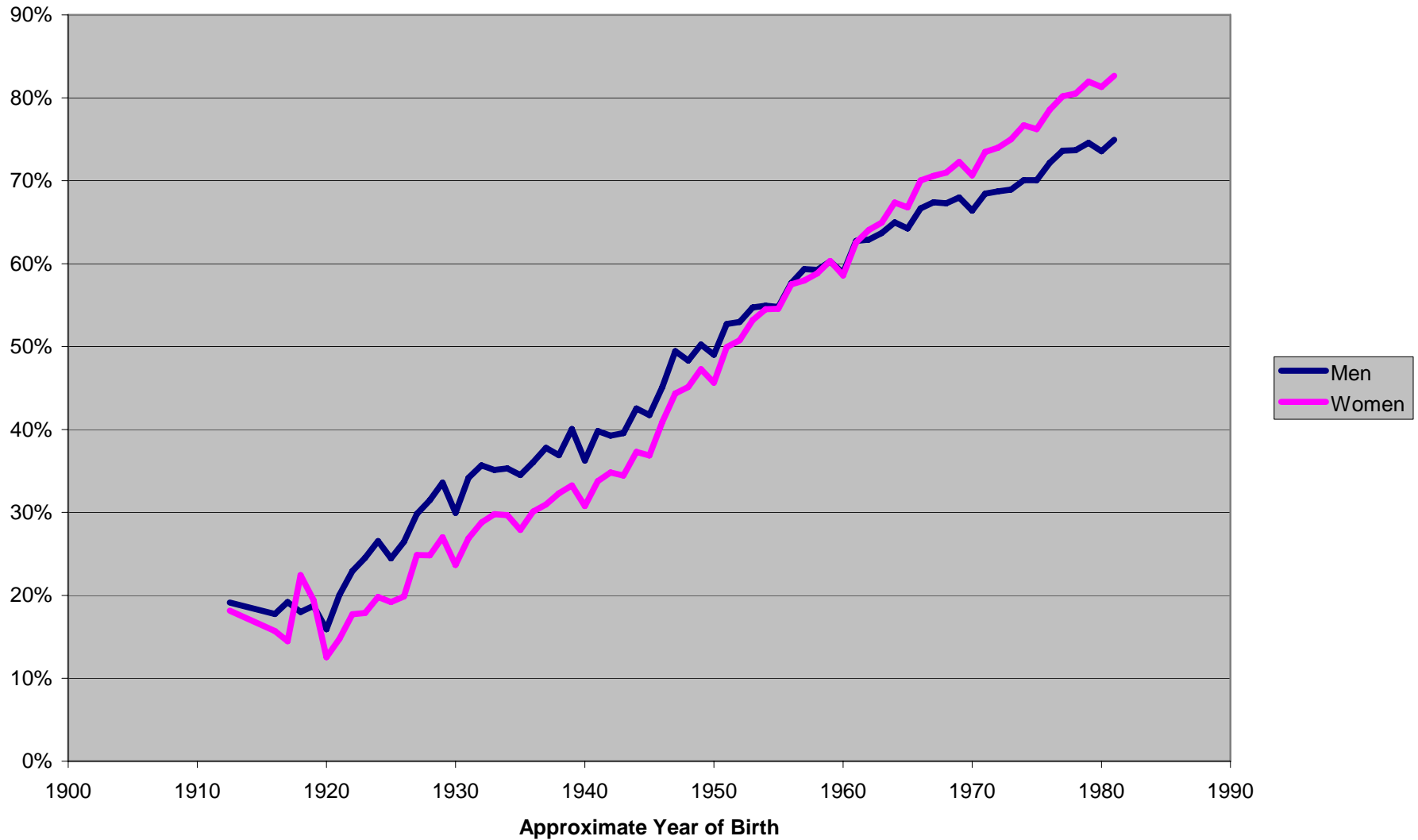
Alpha Rate for the United States

Figure 2. Progression to Secondary Education Level



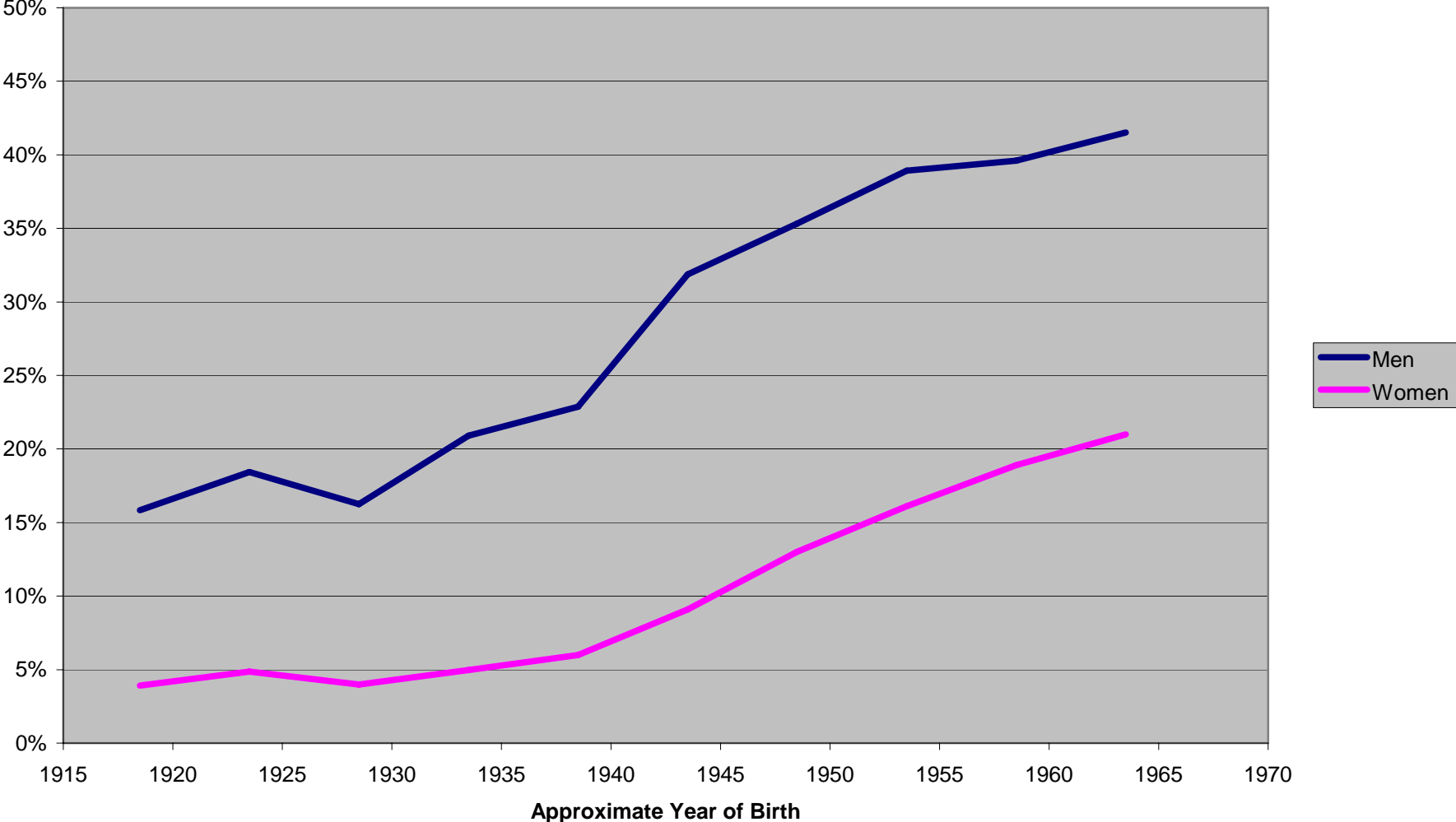
Alpha Rate for the Philippines

Figure 2. Progression to Secondary Education Level



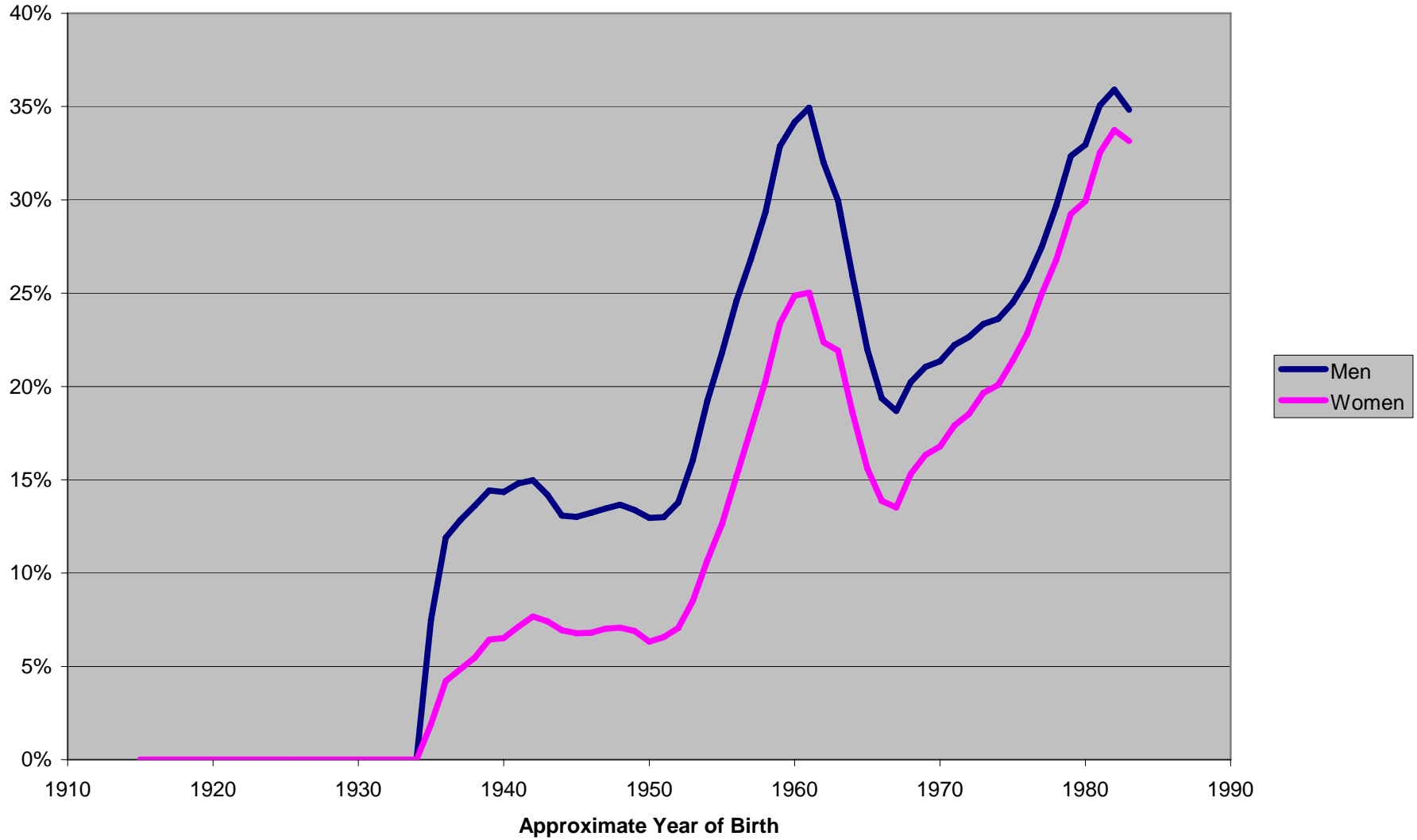
Alpha Rate for India

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



Alpha Rate for China

Figure 2. Progression to Secondary Education Level



Beta Progression Ratios

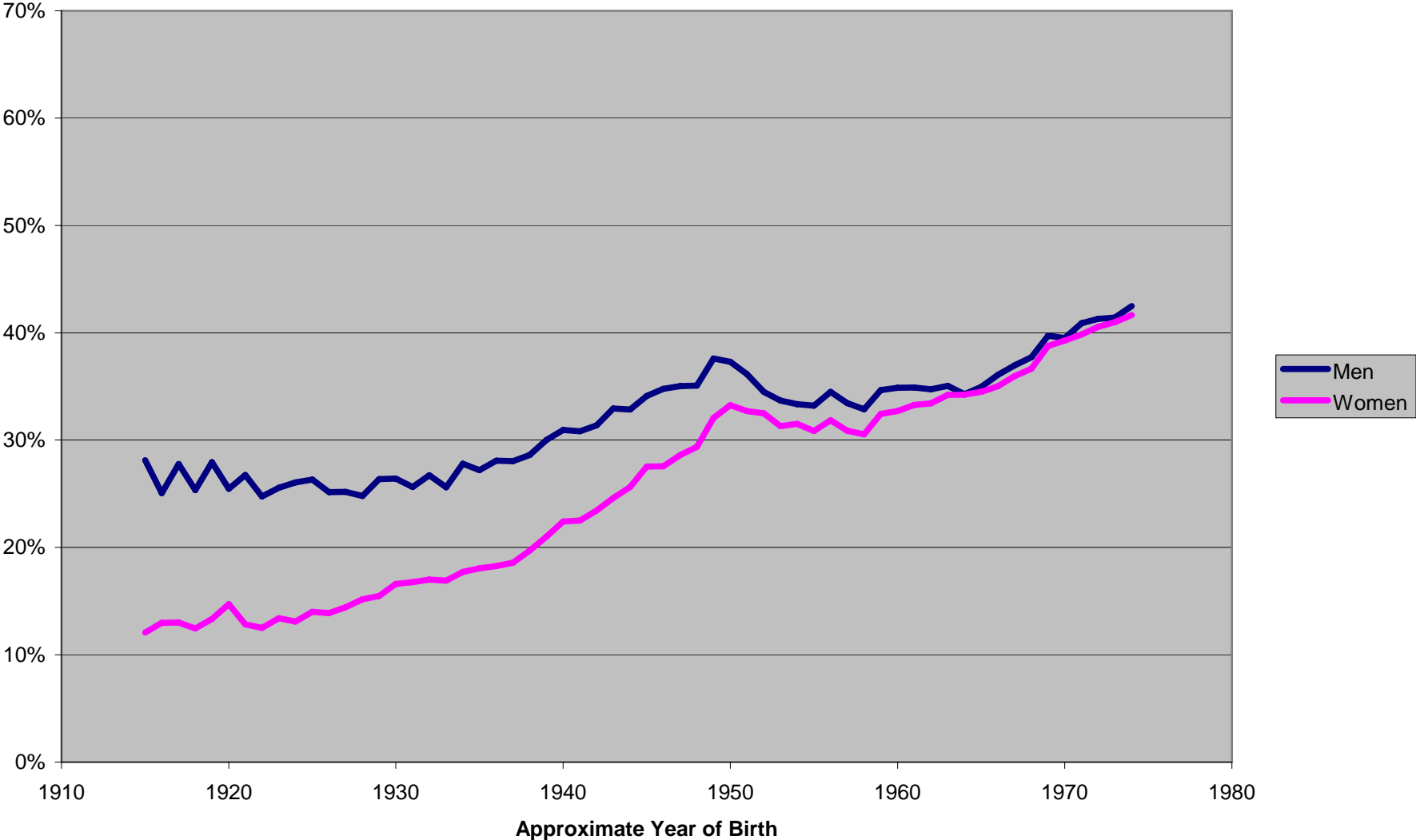
- Proportion of those with secondary education who progress to tertiary level.
- = (Tertiary Level) / (Secondary+ Tertiary Levels)

Beta Progression Ratios

- For a few countries, shows a downward trend. Tertiary systems have not always kept pace with rapid expansion of secondary educational system.
- For most countries, show narrowing gender gap throughout 20th century with women now more likely to progress to tertiary level than men.

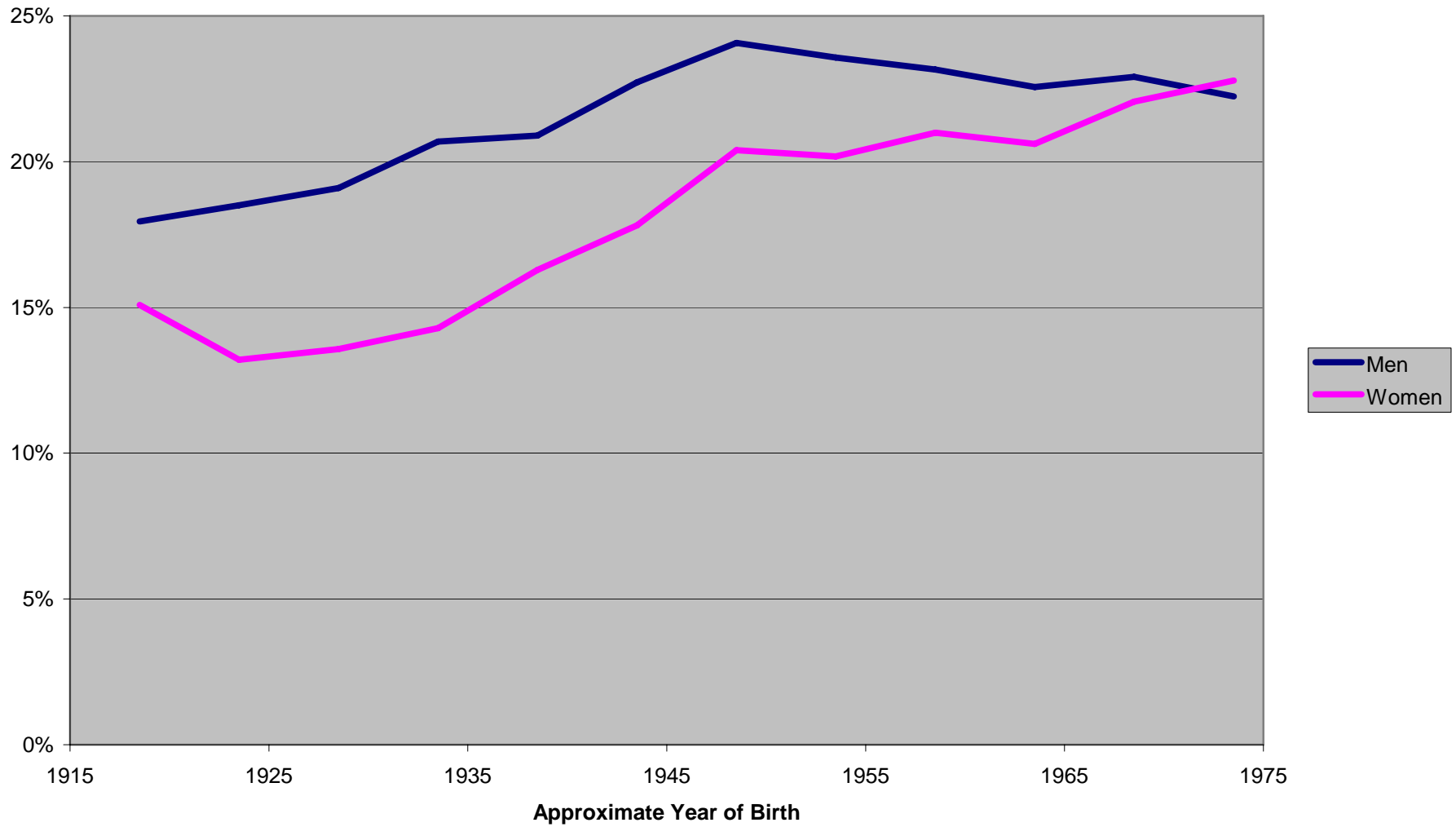
Beta rate for Chile

Figure 3. Progression to Tertiary Education Level



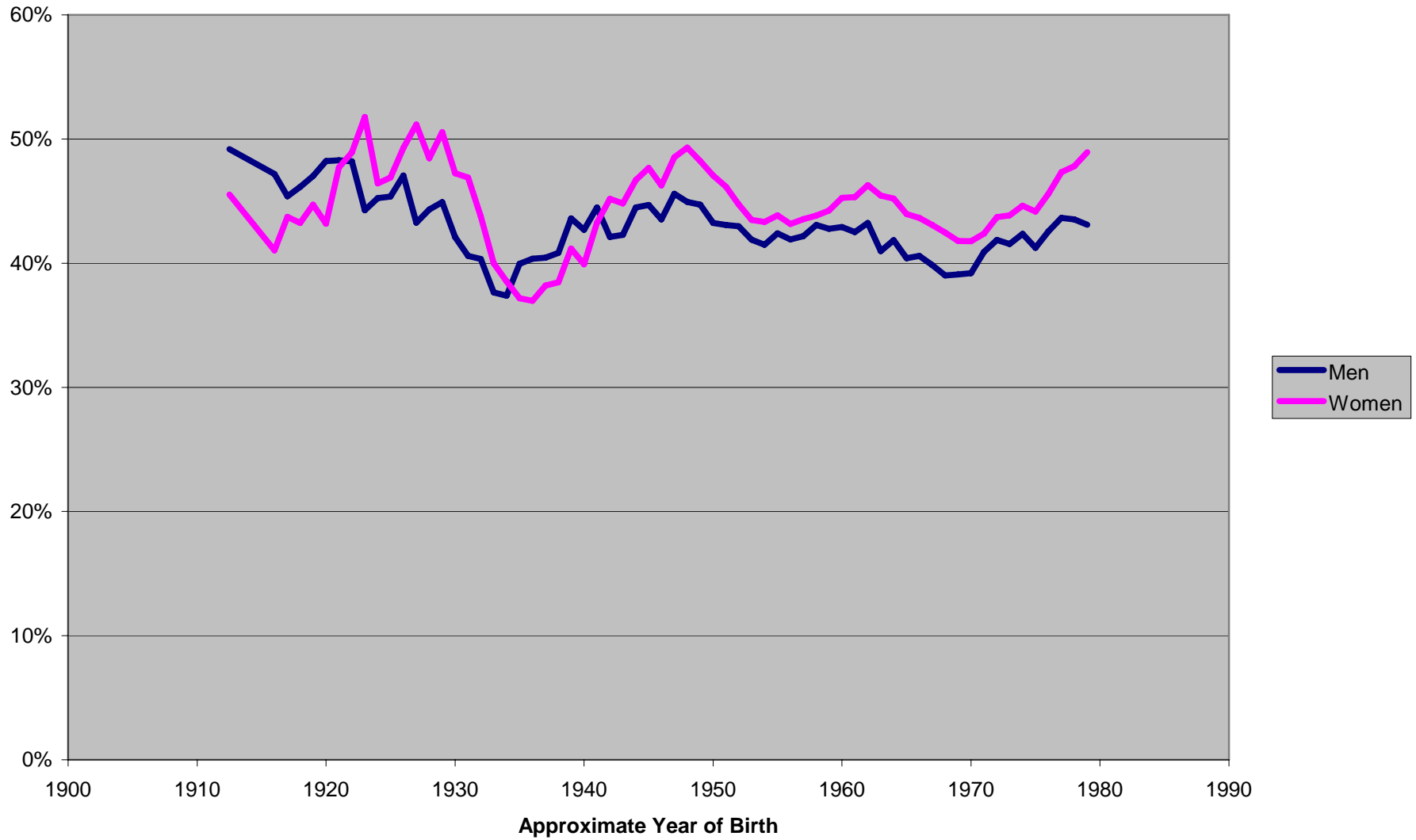
Beta rate for India

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



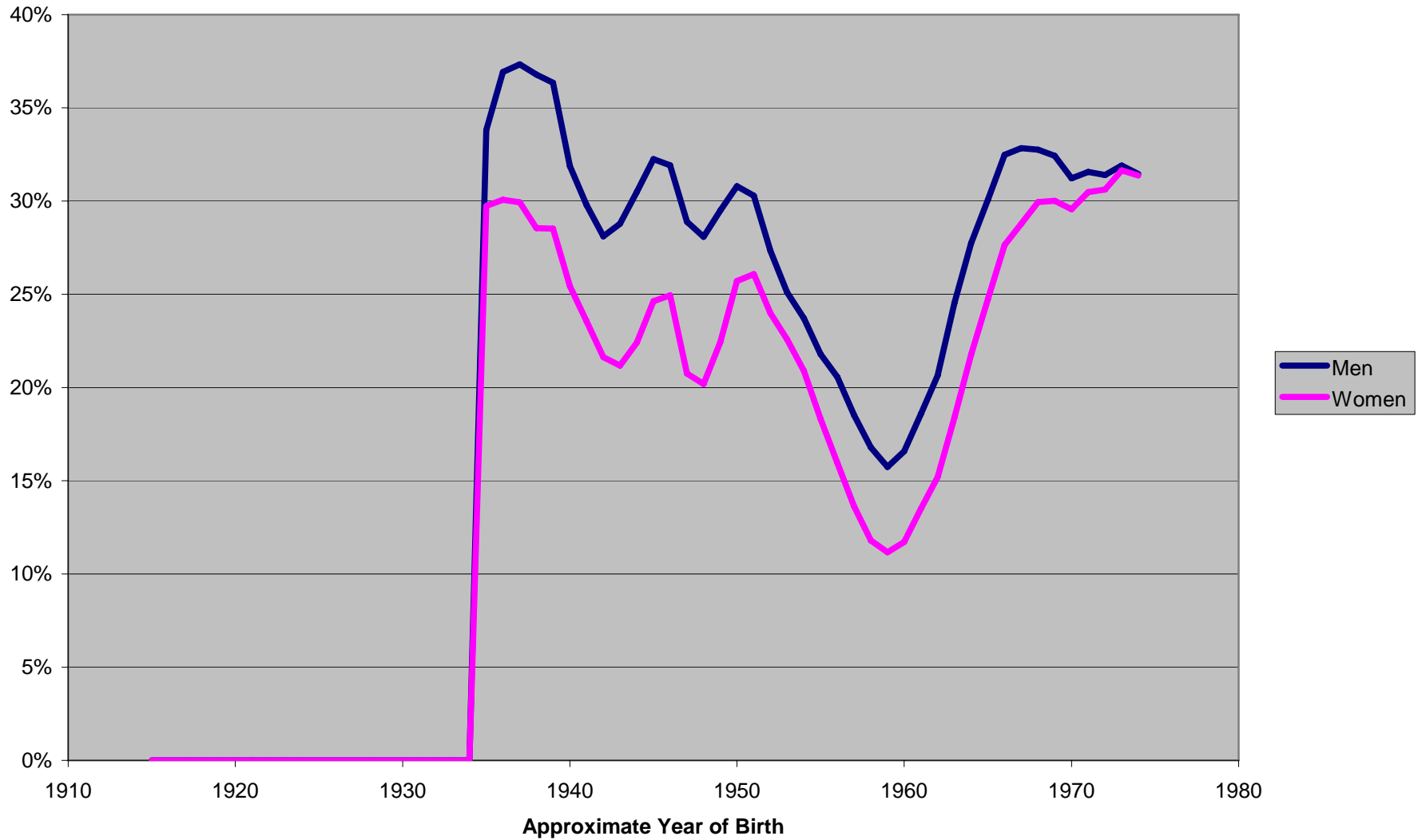
Beta rate for the Philippines

Figure 3. Progression to Tertiary Education Level

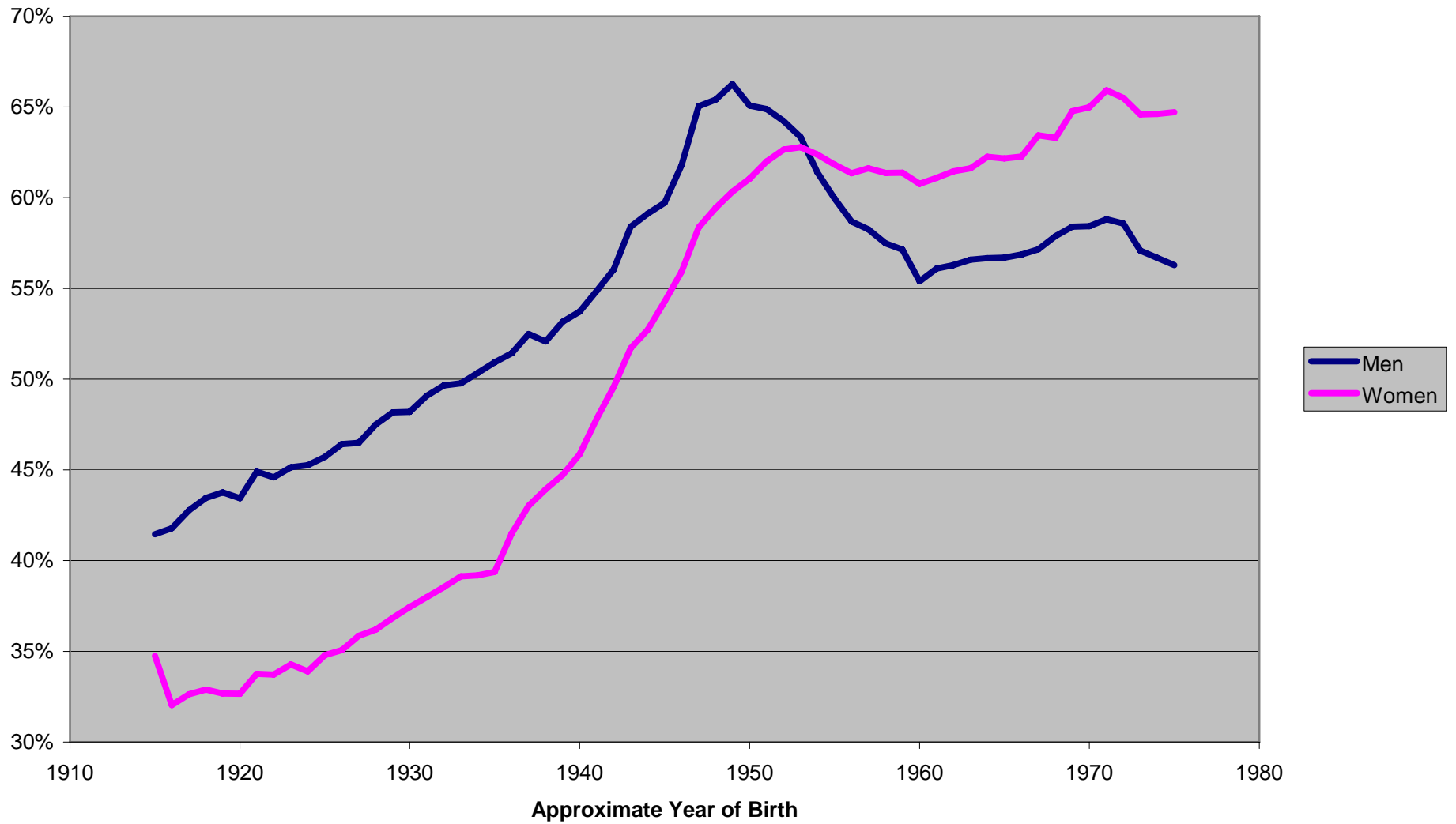


Beta rate for China

Figure 3. Progression to Tertiary Education Level



United States: Progression to Tertiary Education Level





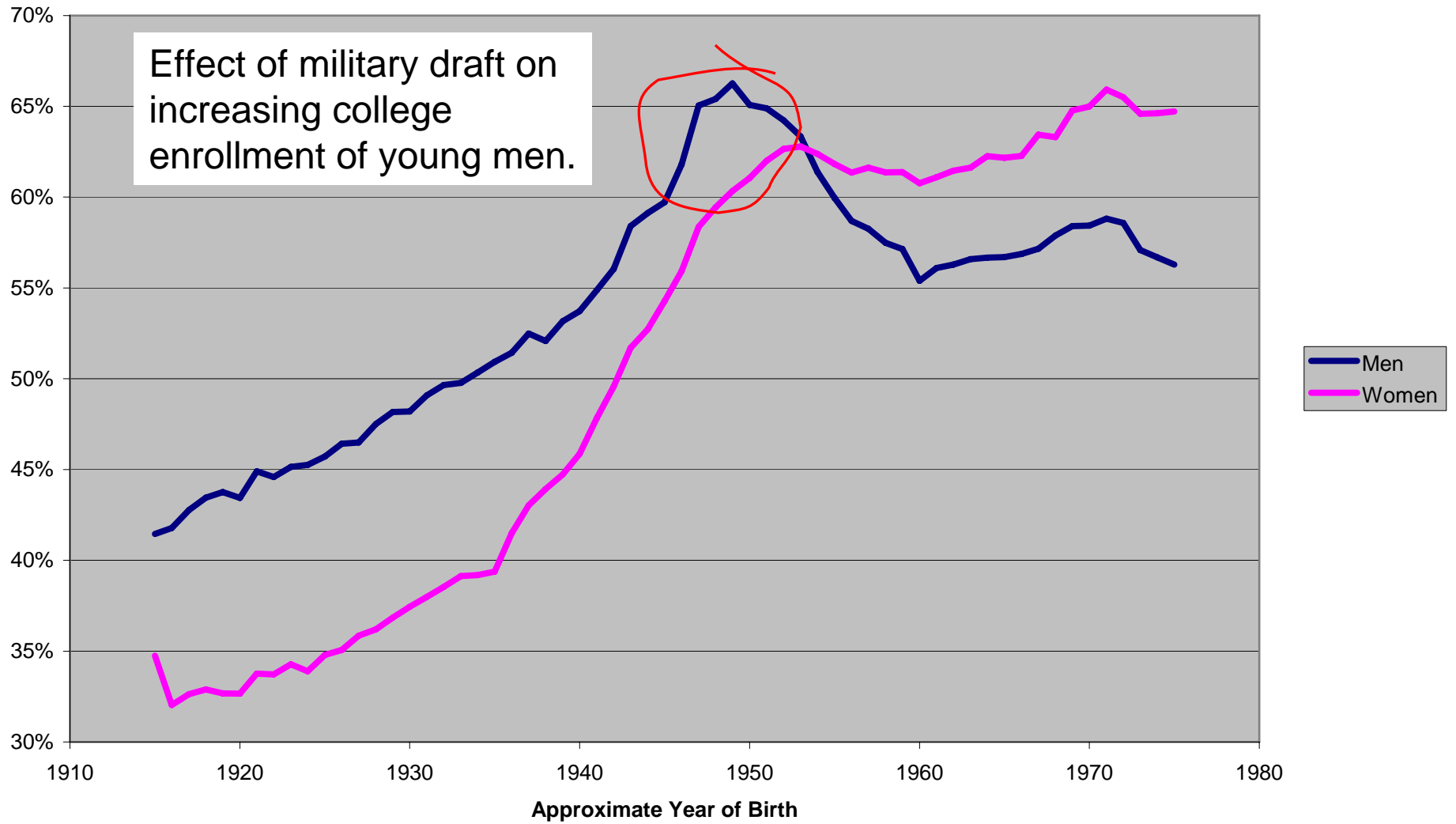


December 1, 1969.

First draft of Vietnam War

All men born between 1944
and 1950.

United States: Progression to Tertiary Education Level

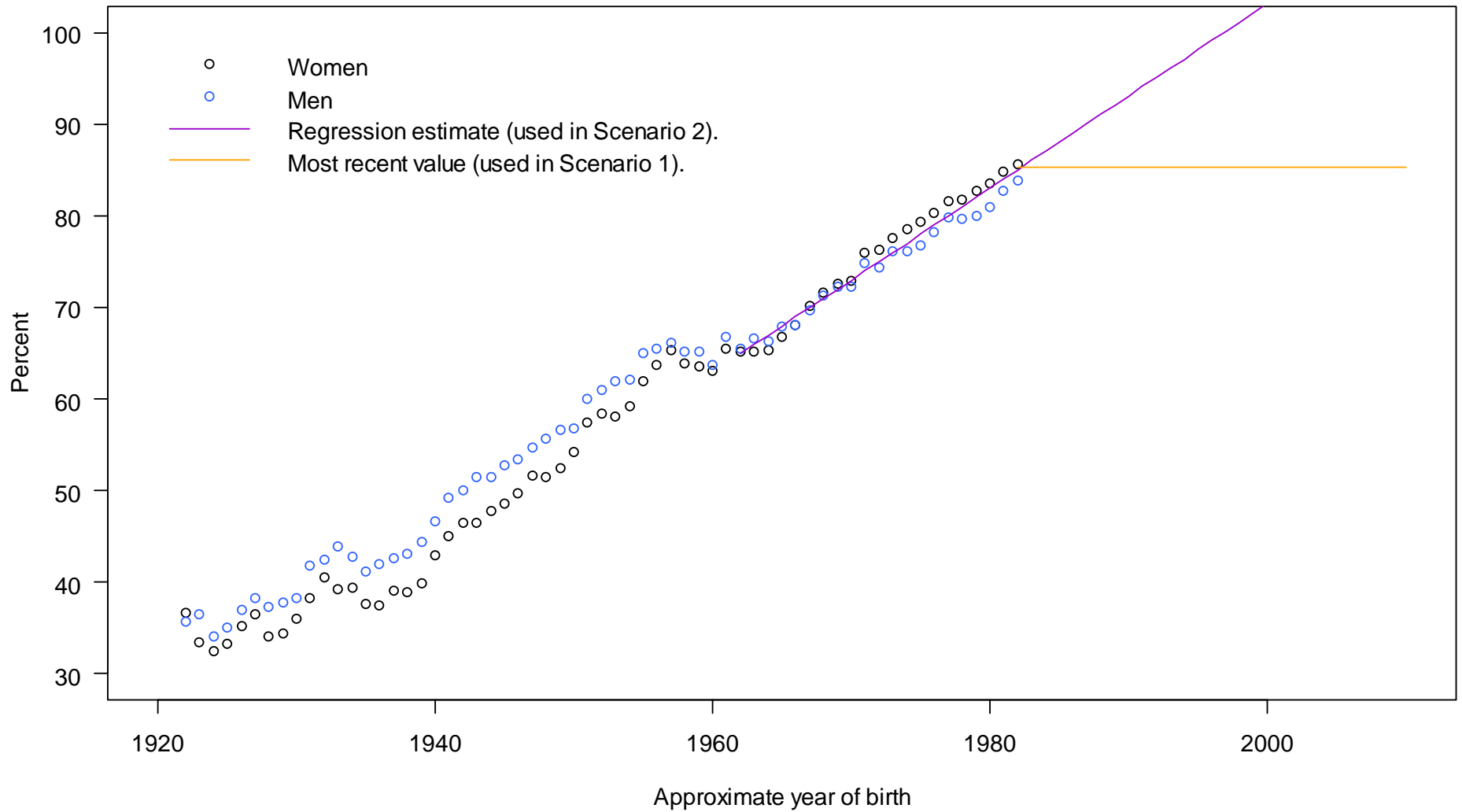


Projecting Educational Distributions

- Assume no change in progression ratios.
or
- Some model (linear?) of trend in progression ratios.

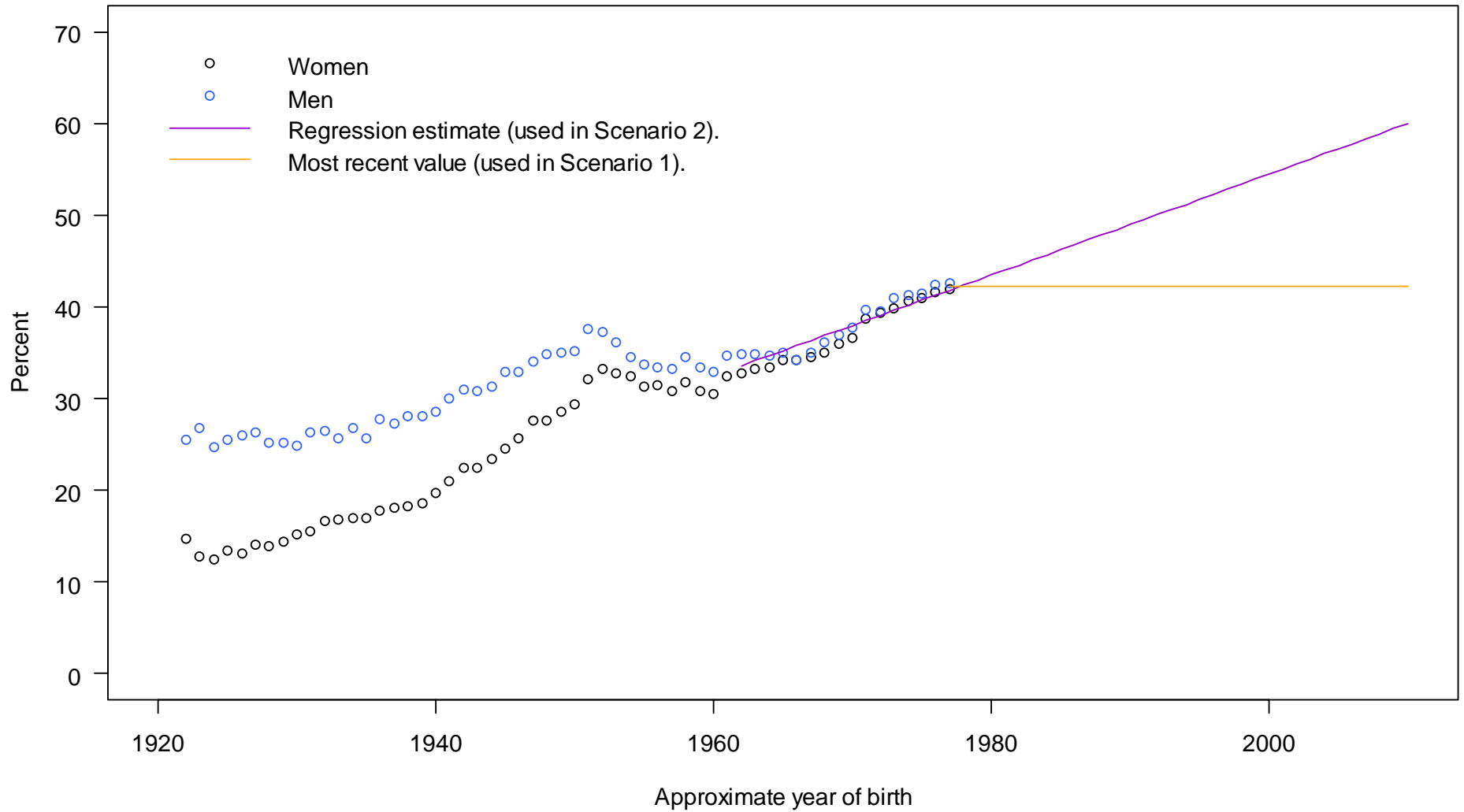
Alpha rate.

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



Beta rate.

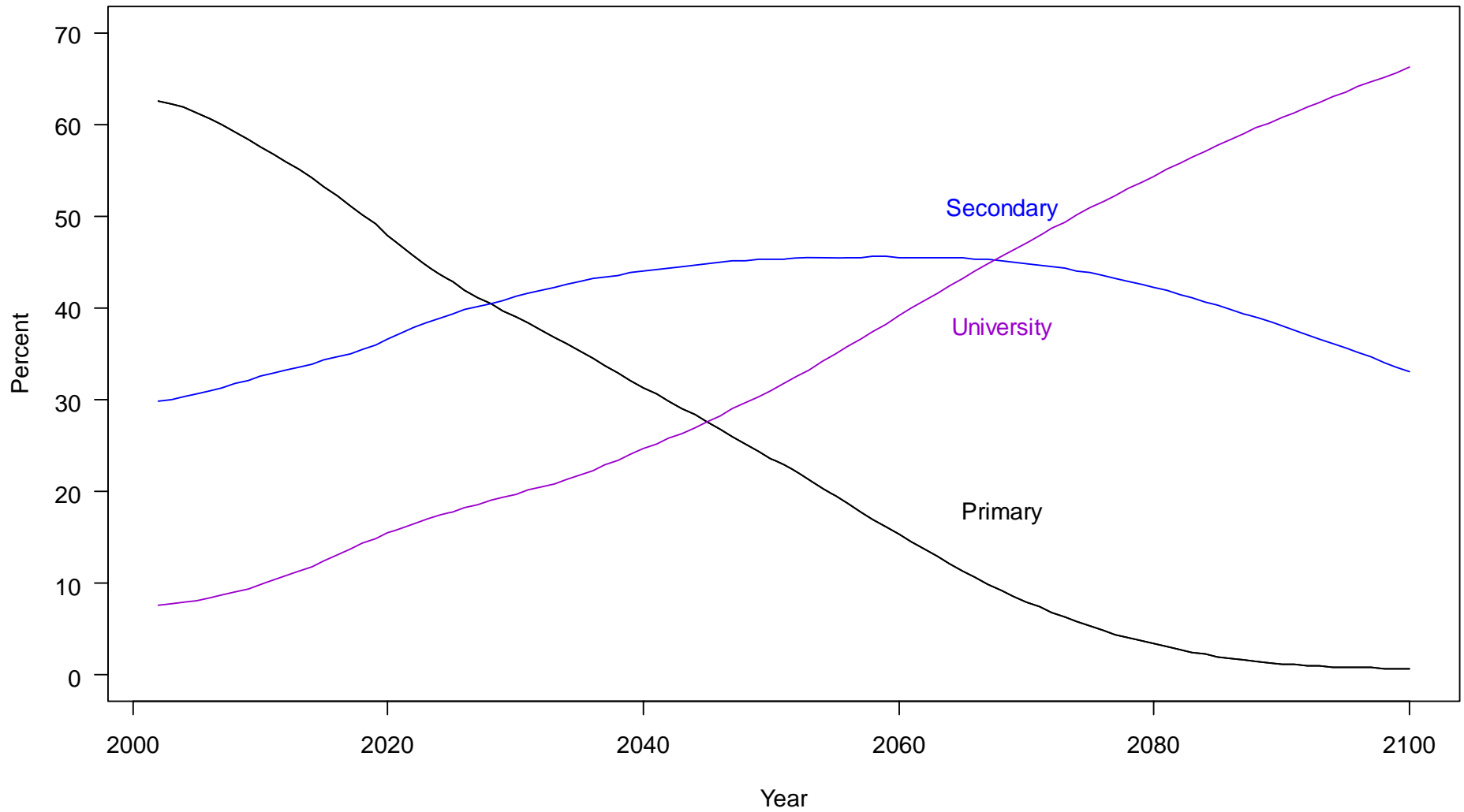
Those with secondary education who move on to university level



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.



Interpretation

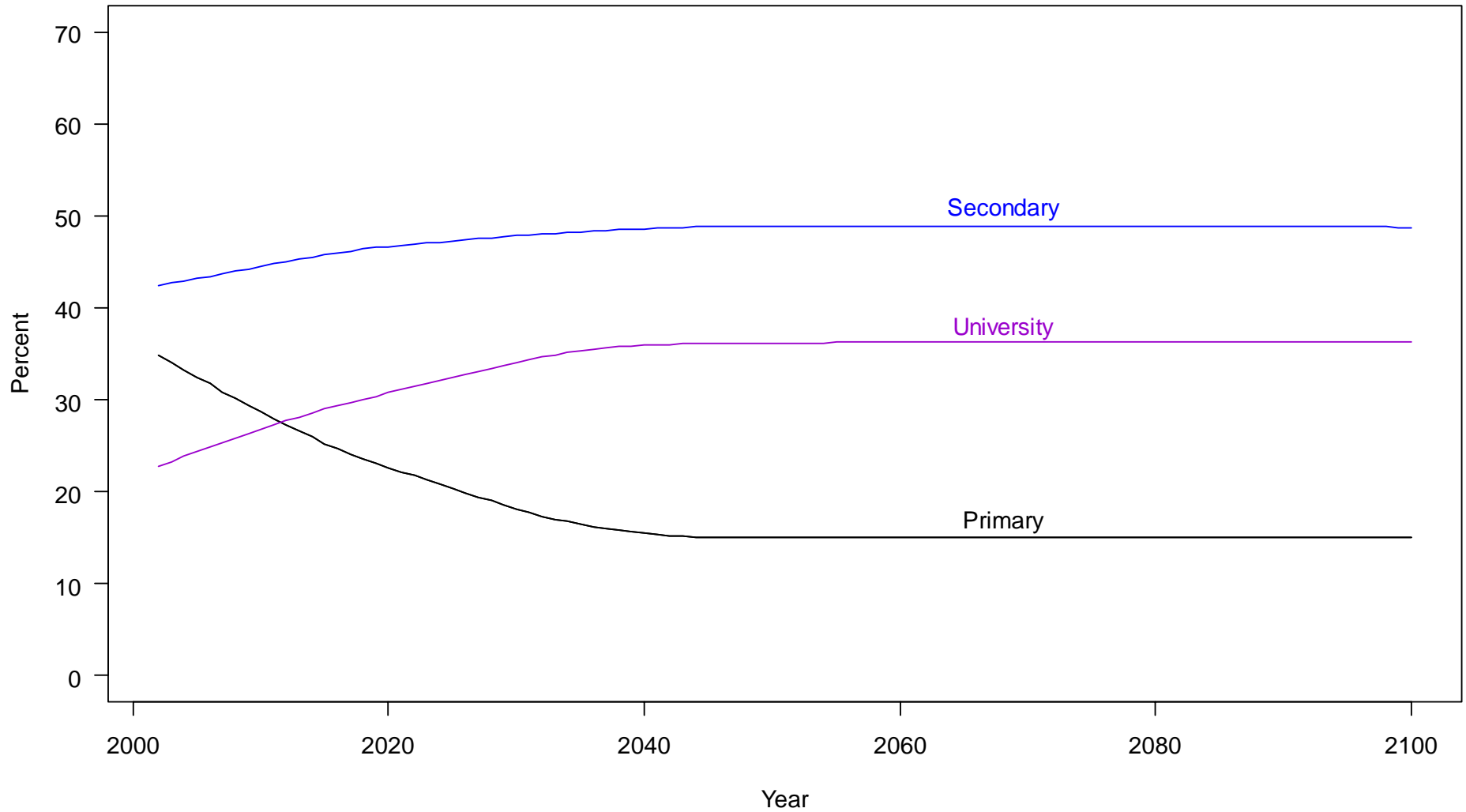
- Dramatic shifts in educational distribution of elderly may lead to equally dramatic declines in poverty and need for social support.
- Dangerous to assume that observed correlations represent causal patterns which will persist in the future.

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

SCENARIO 1

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

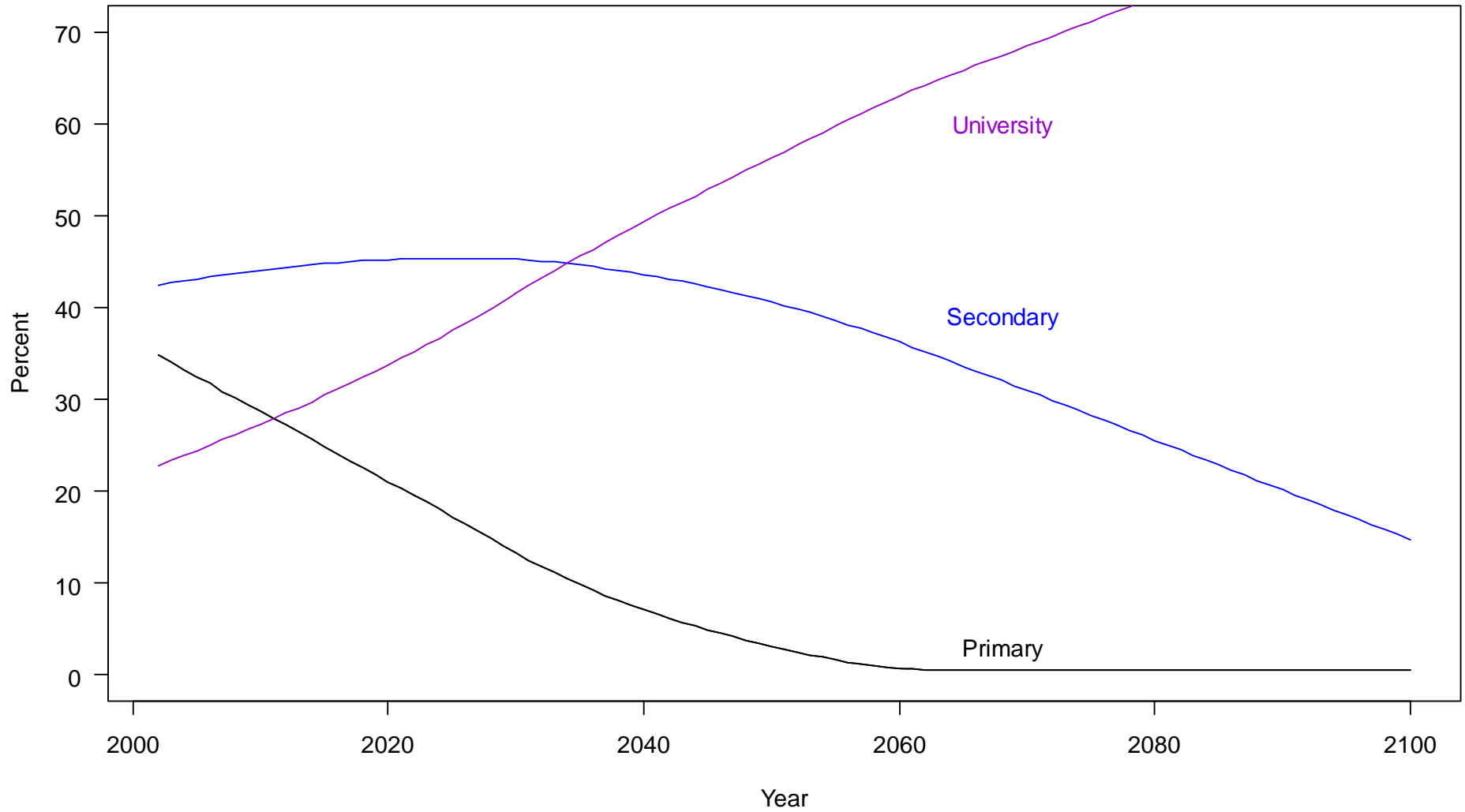
Scenario 1: No change in educational progression rates.



SCENARIO 2

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

Scenario 2: Educational progression rates continue on historical trend.

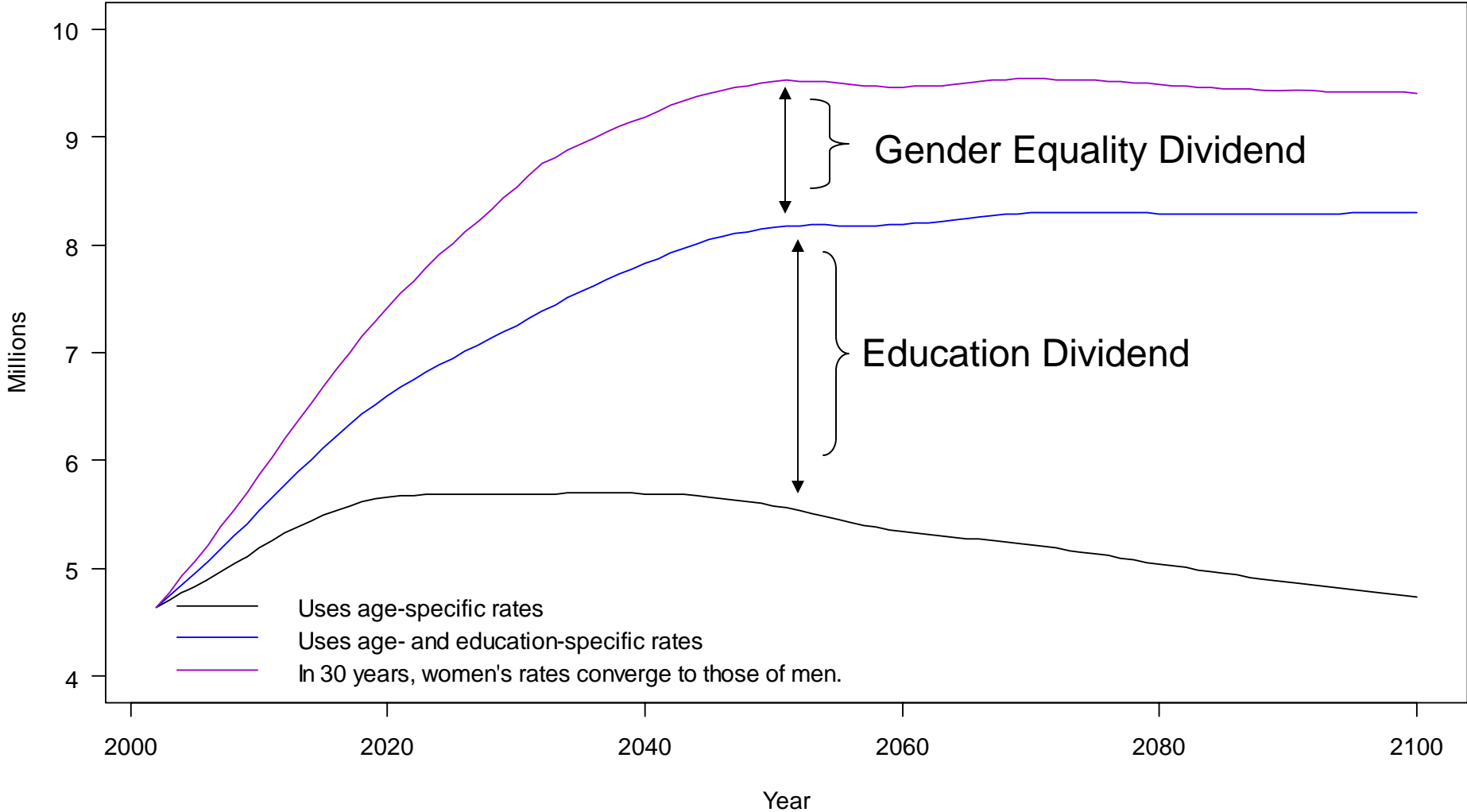


Interpretation

- Dramatic shifts in educational distribution of working age population may lead to an equally dramatic increase in the skill level, productivity and wages of the workforce. An “education dividend.”
- Dangerous to assume that observed correlations represent causal patterns which will persist in the future.

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

Scenario 2: Education progression rates continue on historical trend.



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