

Labour Force Participation in the Euro Area: A Cohort Based Analysis

Almut Balleer (University of Bonn)

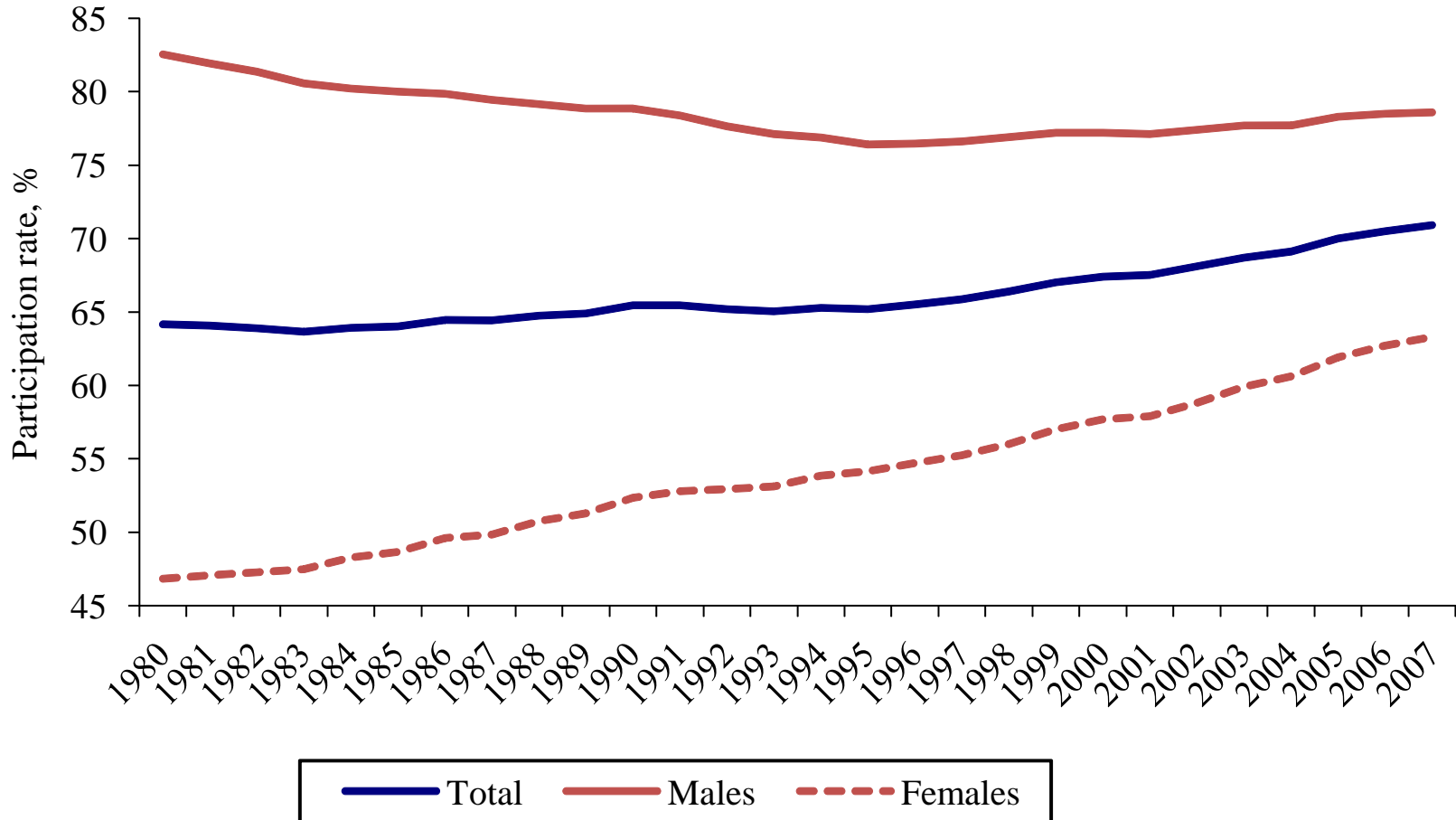
Ramon Gomez-Salvador (European Central Bank)

Jarkko Turunen (European Central Bank)

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Note: our views only, not necessarily those of the ECB

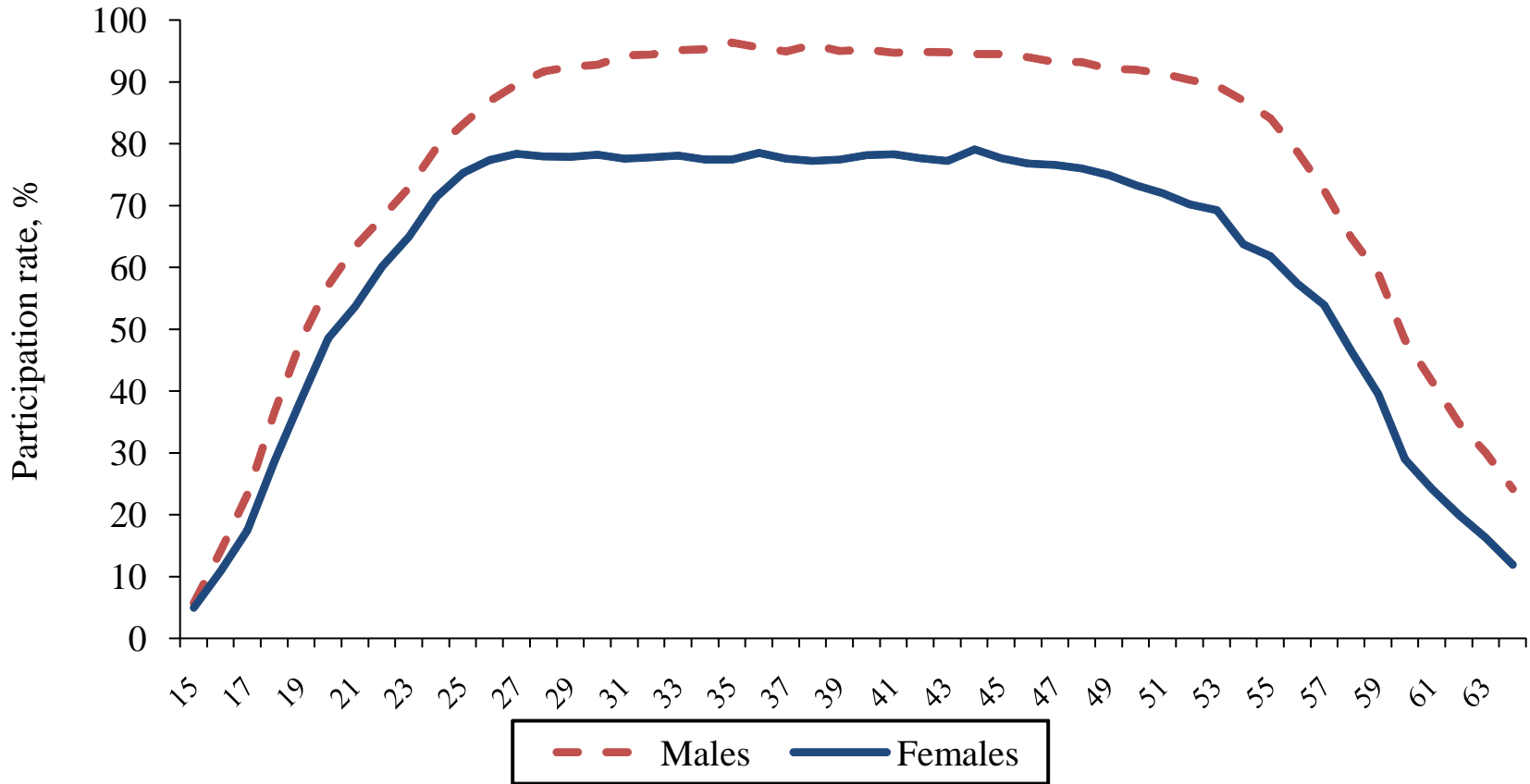
Increase in euro area labour supply, especially for females



Introduction

- Significant heterogeneity in evolution of participation rates across age, gender groups and euro area countries
 1. What explains this increase?
 - Reforms aimed at those with marginal attachment to labor market?
 - Favorable demographic factors: increasing share of those in prime working age (with higher propensity to participate)?
 - Other changes in participation behavior, including change in cultural attitudes?
 2. Looking forward, can the increase in labor supply be sustained?

Euro area age-participation profiles



Age and cohort effects

- Participation differs by age, e.g. younger and older workers are less likely to participate than those in prime working age
- Participation differs by birth year, e.g. at age 45 those born before 1940 are less likely to participate than those born after 1960 at 45. Birth-year specific or cohort effects on participation shift age-participation profiles up/down
- Both age and cohort effects differ for men and women, and across euro area countries

Cohort based model

- Constrained OLS system of equations for each age (separately for men and women):

$$\ln(LFPR_{g,t}/1-LFPR_{g,t}) = \alpha_g + \sum_b C_{g,b,t}\beta_b + \lambda_g X_{g,t} + \varepsilon_{g,t}$$

- g is age (for both males or females) $g=1,\dots,56$
- t is time $t=1983,\dots,2007$
- b is birth year $b=1917,\dots,1984$
- $LFPR$ is labor force participation rate
- $X_{g,t}$ contains the business cycle (contemporaneous value and two lags) and other time-varying factors
- $C_{g,b,t}$ represent dummies for the birth years equal to one if the birth year (=cohort) b appears in the equation for age g at time t

Cohort based model

$$\ln(LFPR_{g,t}/1-LFPR_{g,t}) = \alpha_g + \sum_b C_{g,b,t}\beta_b + \lambda_g X_{g,t} + \varepsilon_{g,t}$$

- α_g are average propensities to participate at age g – age effect
- β_b are average propensities to participate when born in a particular year. β_b are constrained to be the same across age equations – cohort effect
- Both age and cohort effects are constant over time and capture unobserved factors affecting participation
- λ_g are the impact of observed time-varying determinants that account for other changes in age-specific participation behaviour over time

Data

- Annual data on population, employment and unemployment for one-year age groups from the Labour Force Survey for 1983-2007 period – harmonised across countries
- Output gap calculated as deviations from an HP filtered trend of real output
- OECD indicators for union density, labour taxes, the unemployment benefit replacement rate, share of young in education, implicit tax on retiring, life expectancy (Eurostat), average number of children and the marriage rate
- Population projections from Eurostat up to 2030
- Euro area 12 aggregate and five largest euro area countries: Germany, France, Italy, Spain and the Netherlands (euro area 5 aggregate)

Results in three steps

1. Basic model

- Age, cohort effects and business cycle only
- Explore shape of age and cohort effects
- How much of the trend can be explained by age and cohort effects alone?

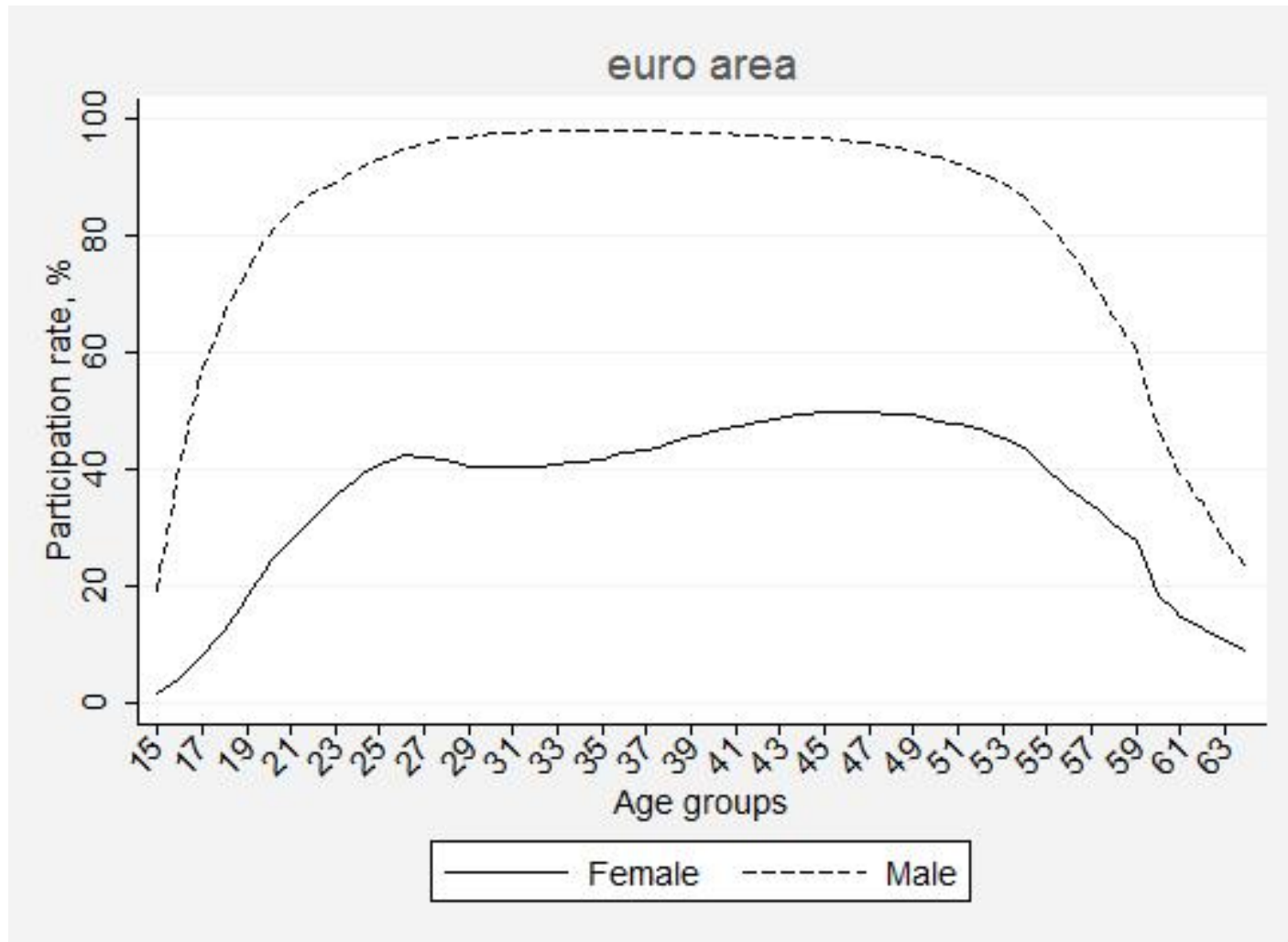
2. Full model

- Add observed determinants (e.g. labour market institutions)
- What is the impact of institutions on trends?

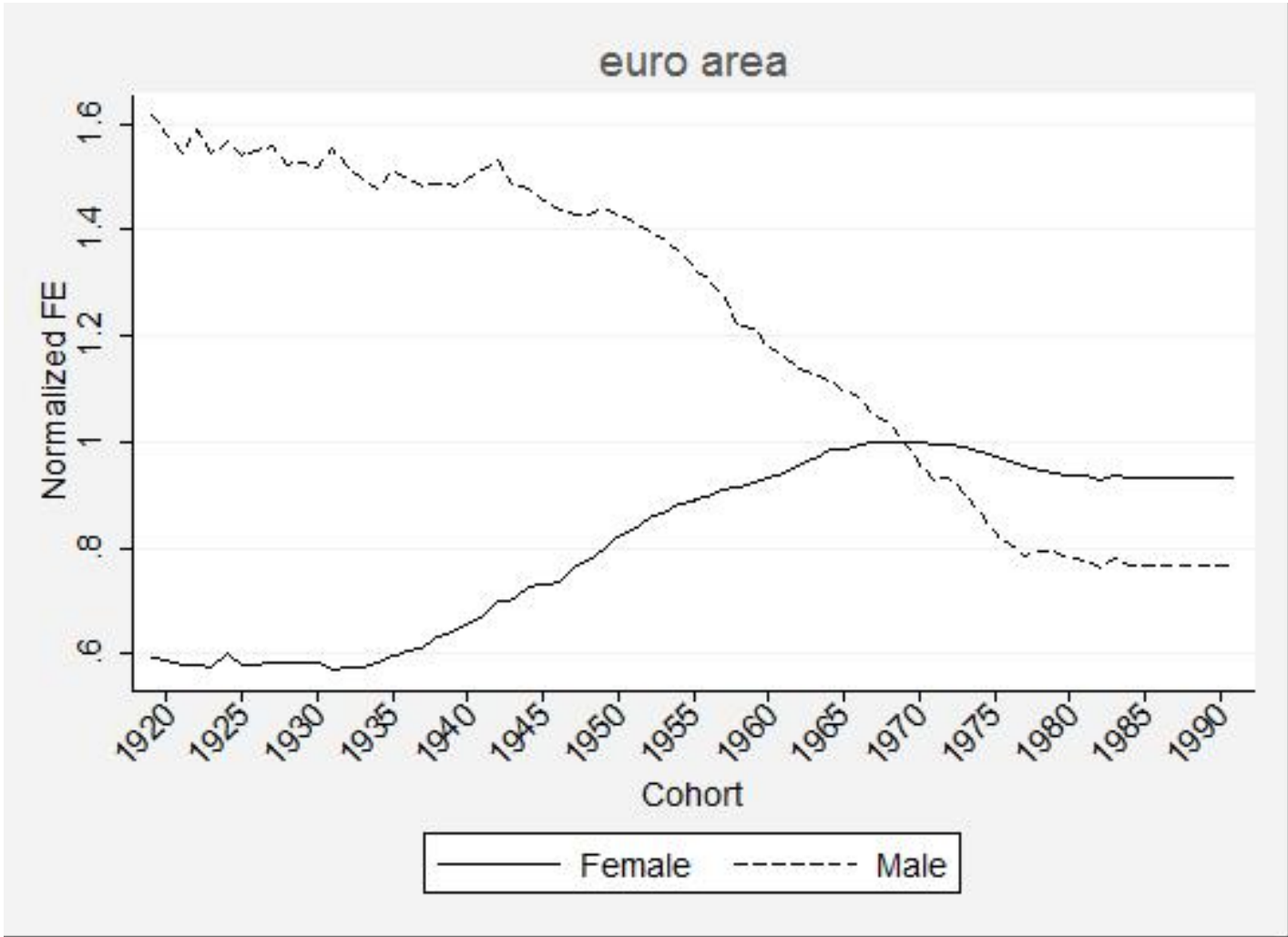
3. Projections

- Use full model results to build scenarios for future participation
- How much support to future participation from cohort effects?

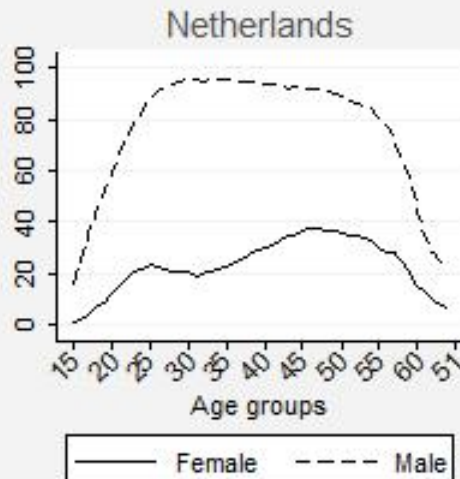
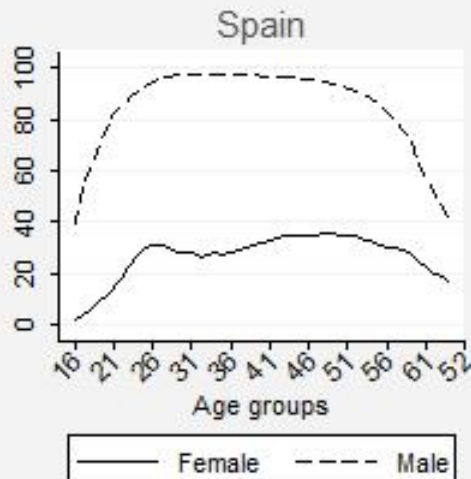
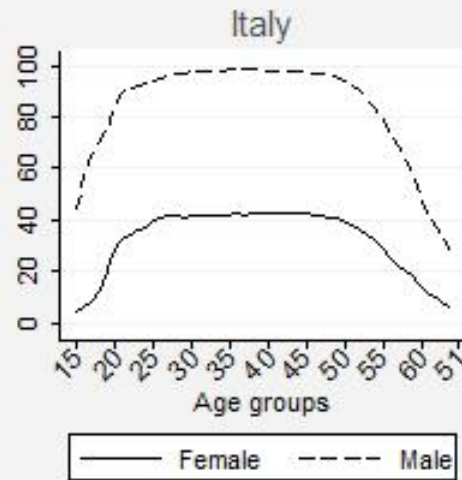
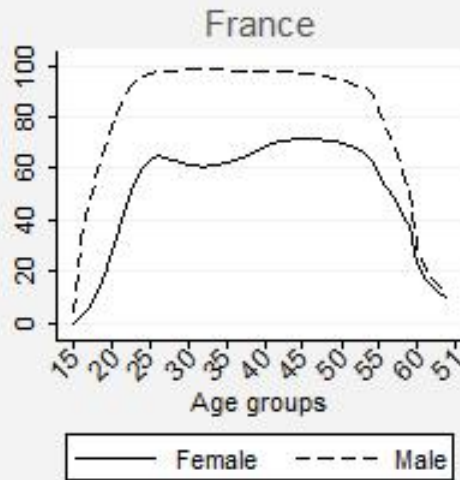
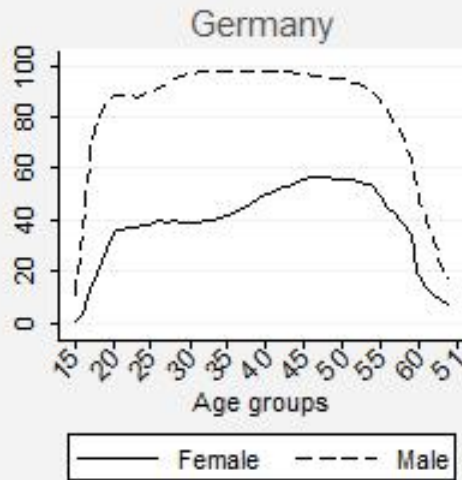
Estimated age effects



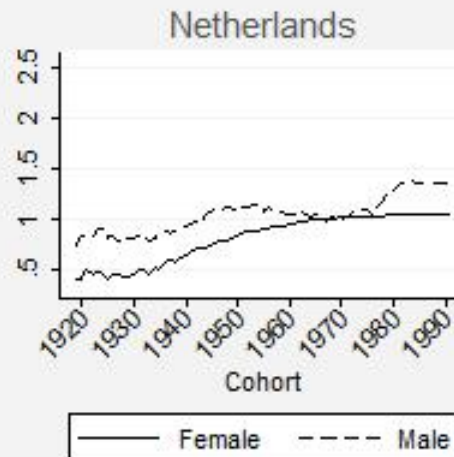
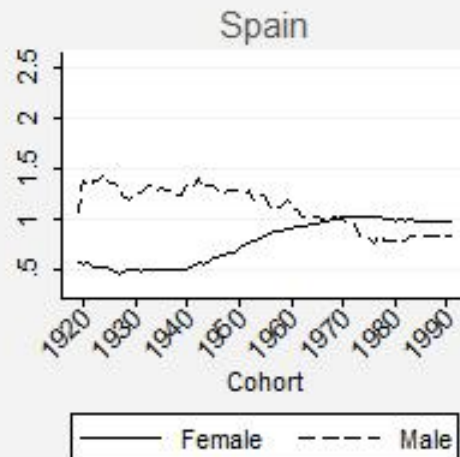
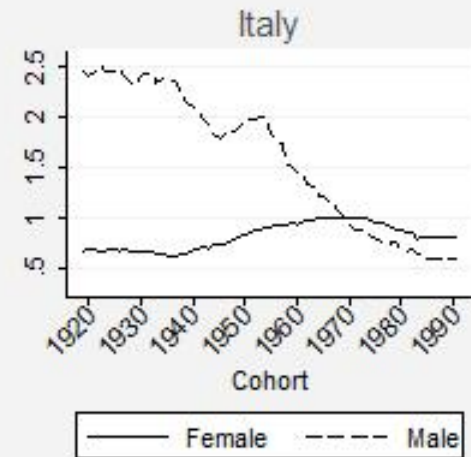
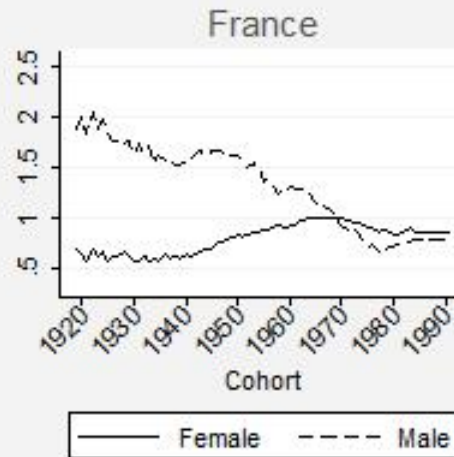
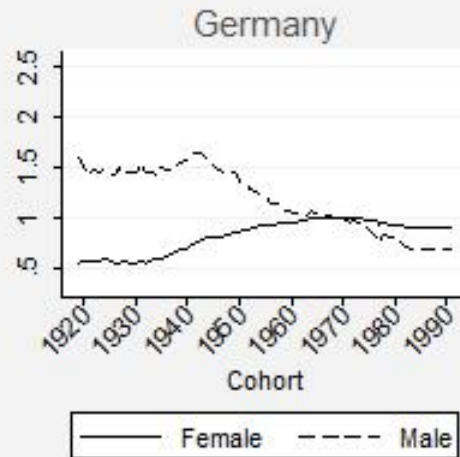
Estimated cohort effects



Country results: age effects



Country results: cohort effects



Note: X-Axis denotes fixed effects normalized to equal 1 in 1969

Summary of age and cohort effects

- Gradually declining cohort effects for males
- Females: gradually increasing cohort effects for those born in the late 1930s up to the late 1960s, lower cohort effects thereafter
- Cohort effects have supported the increase in female labor force participation (those born in the 1950s and 1960s in prime-age from 1985 onwards), but this support is waning (those born in the 1970s and 1980s entering prime-age now)
- Basic model captures broad trends in participation well, particularly for females

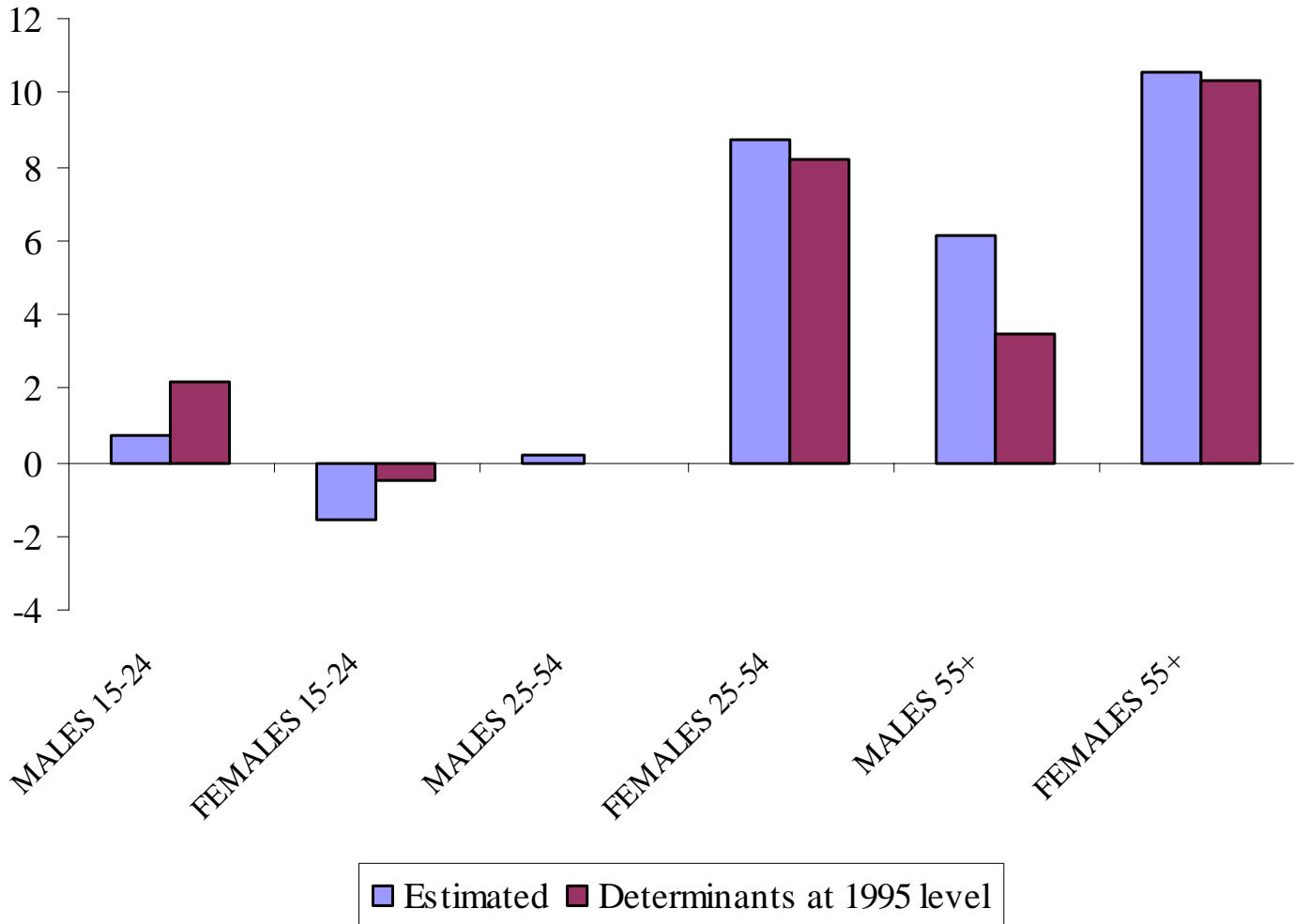
Full model

- Basic model does not fully capture medium-term developments for some groups
- Cohorts effects likely to also reflect trends in observable determinants, e.g. labour market institutions
- Include time-varying observable determinants: union density, labour taxes, unemployment benefit replacement rate (all groups), share of young in education (ages up to 25), implicit tax on retiring, life expectancy (ages from 55 up), the average number of children and the marriage rate (only women)

Summary of full model results

- Output gap often statistically insignificant: participation decisions appear largely unrelated to the business cycle
- Caution: for institutions identification relies on time-variation only, this is reflected in fewer statistically significant coefficients for observable determinants
- Higher labour taxes lower participation
- More tentatively, higher union density, more generous unemployment benefits and more children (for females) lower participation
- Other variables have less consistent effects across gender, age groups and countries

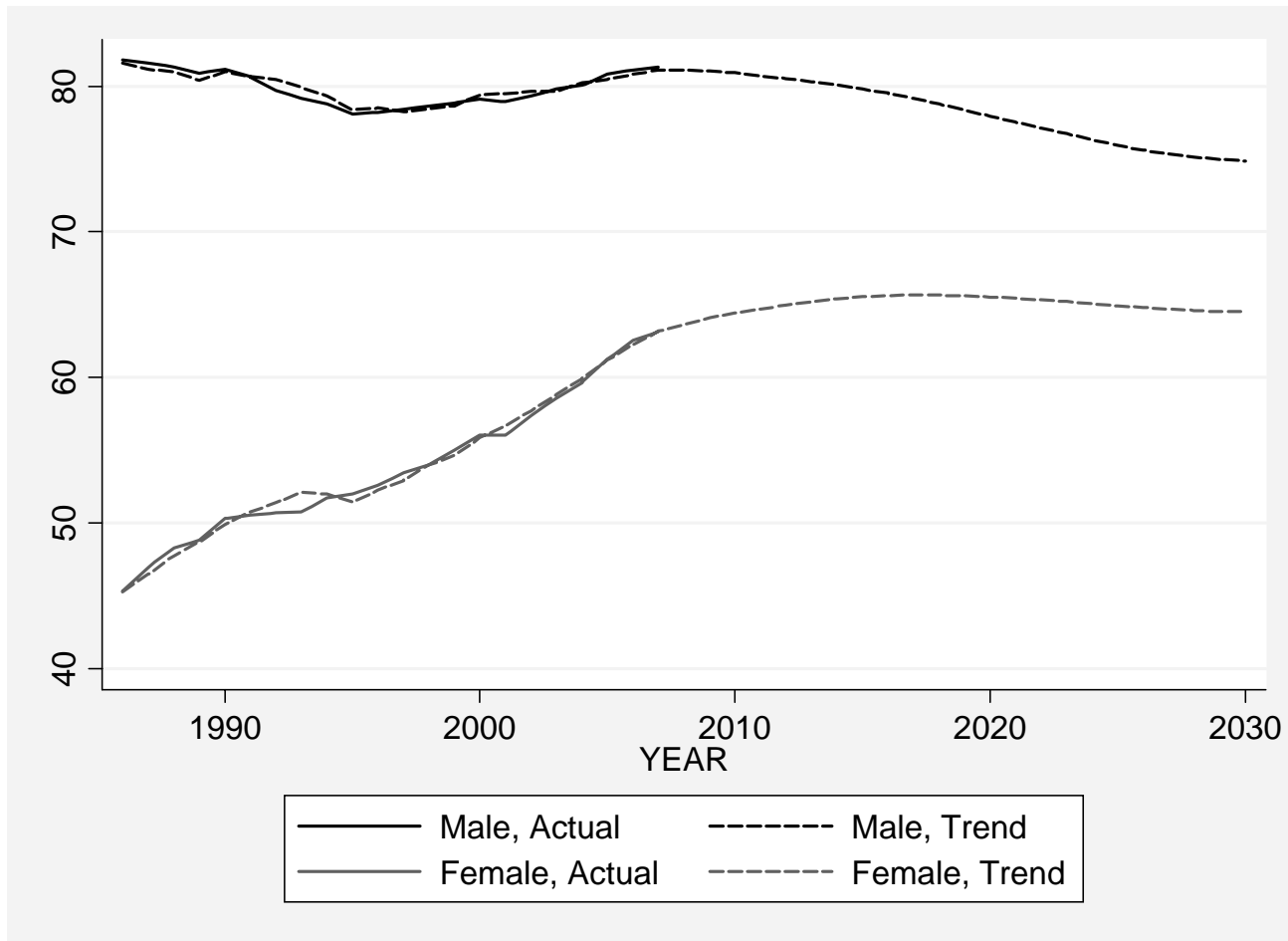
Total impact of institutions, 1995-2005



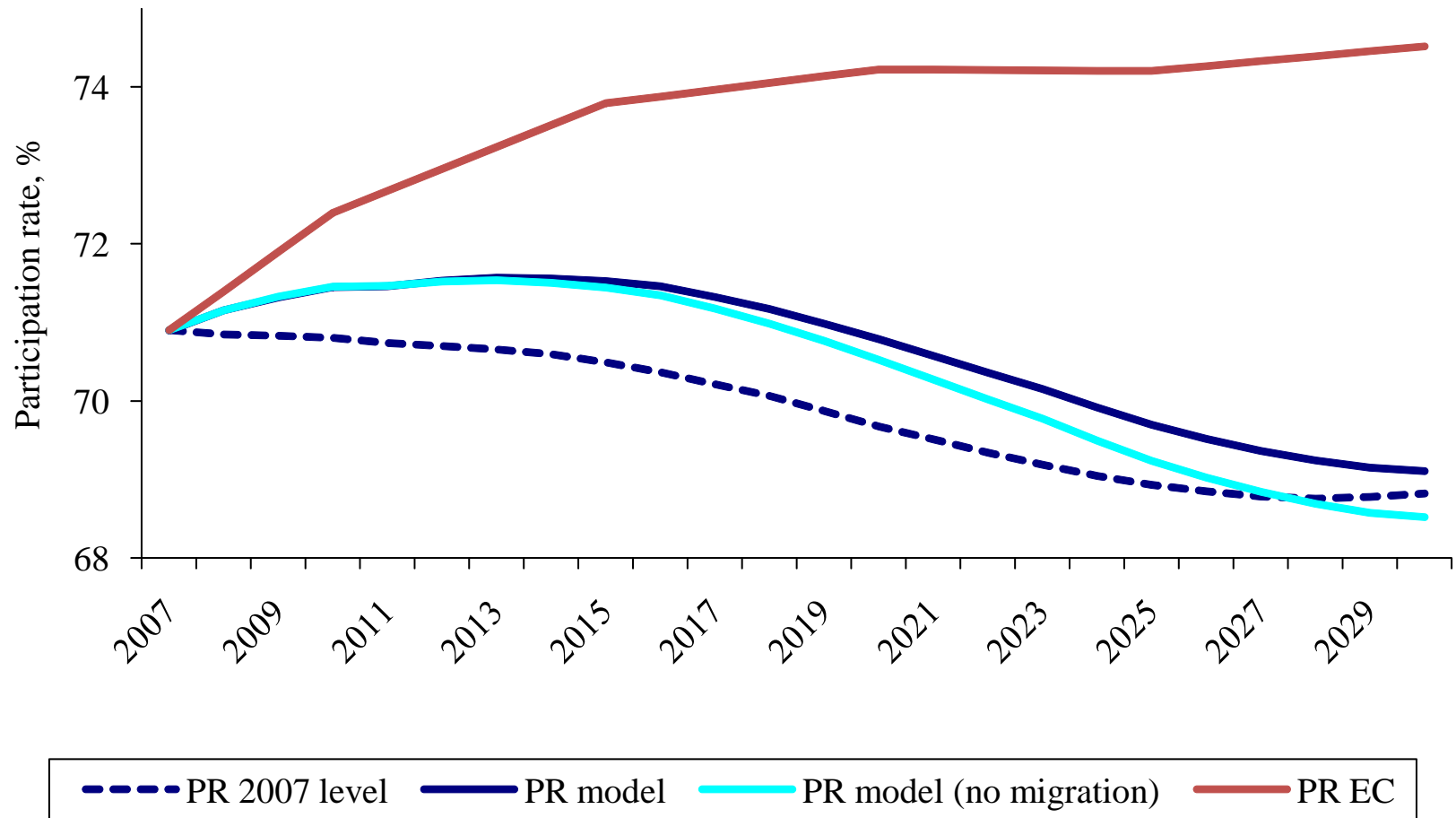
Projections

- Age and cohort effects contain information about future participation rates that can be used to build scenarios for future trend participation
- Construct projections based on population projections from Eurostat, and age and cohort effects (keeping observable determinants at their 2007 value) for the EA5 aggregate based on full model results for Germany, France, Italy, Spain and the Netherlands

Trends and projections for EA5



Alternative scenarios for EA5



Conclusions

- Decomposition to age and cohort effects can account for the underlying trend increase in labor force participation in the euro area
- Part of the acceleration since the mid-1990s reflects other factors (such as institutional reforms)
- Gradually declining cohort effects for males. More substantial and gradually increasing cohort effects for females born in the late 1930s up to the late 1960s, lower cohort effects thereafter

Conclusions

- Variation across countries in age and cohort effects likely to reflect differences in institutional frameworks and social attitudes
- Looking forward, positive cohort effects for women are not large enough to compensate for the downward impact of population ageing on labor supply in the euro area