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Understanding low female labour force participation:
Policy evaluation using microsimulation

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Abstract

We project medium to long term trends in labour force participation and employment for selected low-participation EU countries (Italy, Spain, Ireland, Hungary and Greece), with Sweden as a benchmark, by means of a dynamic microsimulation model. By exploring alternative scenarios to our baseline forecasts and their implications for GDP growth, we find that the gap between male and female participation is mostly explained by (i) differences in the individual conditional behaviour of older female cohorts, (ii) inadequate family policies. In particular, our results show that the conditional behaviour of younger women in the low-participation countries is similar to that in Sweden. In a nutshell, what is needed is not a change of behaviour on the side of women but a change of mentality on the side of institutions and firms.

1. Introduction

Despite recent increases in female labour market participation, the female employment rate in Europe is still 11.5 percentage points (ppt) below the employment rate of men, with huge disparities among Member States. The employment gap is highest in Italy and Greece (19.4 and 18.3 ppt respectively) and lowest in Sweden (4.6 ppt), Lithuania (2.5 ppt) and Finland (1.9 ppt).

Fostering the higher participation of women is crucial to meet the Europe 2020 target of achieving an overall employment rate of at least 75% by 2020. In this context, the 'Strategy for equality between women and men 2010-2015' (European Commission, 2011) proposed concrete actions for addressing a number of issues such as economic independence of women and equality in decision making. In the Social Investment Package, the European Commission (2013) also reaffirmed the importance of fostering higher participation of women. According to this document, gender gaps in employment rates, as well as other gender disparities in the labour market, need to be reduced or eliminated to decrease the risk of social exclusion and poverty for women and to achieve inclusive growth. A Policy Roadmap has been provided to facilitate the 2014 implementation of the Social Investment Package in EU Member States and to help them reach the goals set in the Europe 2020 strategy.

Our companion paper (Richardson et al., 2016) presents medium- and long-term projections of female participation and employment rates for a selected number of EU Member States: Italy, Spain, Ireland, Hungary and Greece. These case studies have been selected because they are among the most problematic in terms of female participation and employment rates, and gender (in)equality. Sweden has also been included as a high participation benchmark. The evolution of participation and employment rates in the selected countries are investigated by means of a dynamic microsimulation model. Different life course events are simulated (e.g. educational choices, entry in the labour market, household formation and dissolution, fertility, evolution of work careers, retirement, death) with specific microsimulation sub-models having a focus on different dimensions (e.g. demography, work, family etc.) and different subgroups of the population. The microsimulation approach has several advantages over simpler (and more common) methodologies. Most importantly, it produces forecasts not only on the outcomes of interest (participation and employment) but also on their determinants (e.g. educational attainments, household composition).

Our projections in the companion paper suggest that by 2020, no country except Sweden will have reached the employment rate target, though Ireland will be close. According to the projections, the 75% target will only be approached at the end of the simulation period, at 2050, in all countries with the exception of Hungary. There is a general trend of increasing participation rates towards the very high Swedish levels, which accelerates in the 20-64 years old population after 2030, when older cohorts are finally replaced by younger cohorts who exhibit higher participation rates. These projections are not too dissimilar from other forecasting exercises in the literature. In particular, we reach the same conclusions as the 2015 Ageing Report (EC, 2015) in the aggregate with respect to Greece, Spain and Hungary, while we are less pessimistic than the 2015 Ageing Report with regards to Italy and Ireland. However, the microsimulation approach permits a finer disaggregation of the results, which turns out to be crucial in understanding the dynamic causal mechanisms at work. Female participation rates in Sweden remain high and approximately similar also when disaggregating by age group, region, education and family composition. The picture however changes dramatically when moving to low-participating countries where large differences in participation rates are detected between different population sub-groups. The low female participation rates in Italy, Spain, Greece, Hungary and Ireland, with respect to Sweden, are mainly due to the low participation of low educated, older women, and mothers, though with different levels of intensity across countries.

In the present paper, we analyse the role played by some key drivers - demography, education, participation behaviour - and policy actions, in shaping future female labour market participation in the same selection of

countries. We explore the implications of different scenarios for the parameters of the microsimulation model introduced in the companion paper, and contrast these scenarios with the baseline projections for the selected EU Member States that were also presented in that paper. In presenting the results we focus mainly on participation rates, as employment rates, which are computed in the microsimulation conditional on participation, do not feed back into the evolution of the other variables (see table 2 of the companion paper): differences in employment rates are entirely explained by differences in participation rates, for given parameters controlling the speed of recovery from the Great Recession (table 3 of the companion paper)[1]. Employment rates will be discussed for the scenarios involving a change in those parameters

The different parameterisations analysed here are chosen with two objectives in mind. First, we wish to offer a better comprehension of the drivers of the baseline results presented in our companion paper, by deliberately "switching off" country-specific differences one at a time. Hence, we analyse what happens in the low participation countries (Italy, Spain, Greece, Hungary and Ireland) when we endow them with 'Swedish features', from demographic evolution, to educational attainments and conditional participation behaviour of women. Second, we wish to investigate the effects of key parameters which might be affected by policies. These involve the speed of recovery from the Great Recession, the suppression of early retirement opportunities, and more favourable family policies. We will label the two sets of different parameterisations *baseline drivers* and *policy actions*, respectively, though the distinction between the two sets is fuzzy and mainly concerns the choice of the parameters values: when analysing the *baseline drivers*, we set the relevant parameters to "extreme" values (those of the benchmark country, which are generally implausible for the other countries), while when we investigate *policy actions* we choose "reasonable" values for the parameters. Moreover, the following three remarks should be kept in mind:

1. Policies might also affect the baseline drivers – for instance, by modifying the incentives that shape fertility rates, migration flows, or educational choices. Starting from the "extreme" Swedish values for educational attainments, we will further elaborate on the responsiveness of the model outcomes with respect to educational levels, in order to provide an idea of the effects of more realistic educational policies.

2. Key "policy relevant" parameters might be only partially under the control of the regulators – this holds, for example, for the path of recovery from the Great Recession since 2009 and for the availability of part-time opportunities. Changing parameters that are not directly set by policy levers should be interpreted as providing an investigation of the space for policy intervention, where the effects of specific policies on the target variables should be the object of further analysis.

3. The scenarios considered, both *baseline drivers* and *policy actions*, are not exhaustive of all possible scenarios that could be analysed within the modelling framework proposed, and are chosen mainly for their relevance and interest. For instance, when analysing *baseline drivers* we are not aiming to decompose the total projected change in participation and employment rates into their different causal pathways; rather, we wish to provide an intuitive way of discriminating between more and less important channels.

The paper is structured as follows. In section 2, we describe the different scenarios. In section 3 we analyse, country by country (with the exception of Sweden, which works as a benchmark), the baseline drivers, while section 4 is devoted to *policy actions* scenarios. Section 5 concludes.

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[1] The relationship between participation and employment rates is given by the following equation:

$$\text{EMPL\_RATE} = \text{\#EMPLOYED} / \text{POP} = \text{\#ACTIVE} (1\text{-}u) / \text{POP} = \text{PART\_RATE} (1\text{-}u) \qquad (1)$$

where EMPL_RATE is the employment rate, PART_RATE is the participation rate, #EMPLOYED is the number of employed individuals, #ACTIVE is the number of active individuals participating in the labour market, POP is the working age population and u is the aggregate unemployment rate, a scenario parameter in the model. Hence, given a value of u, a higher participation rate translates one-to-one into a higher employment rate.

2. The scenarios

We construct the following scenarios, which depart from the baseline described in our companion paper only in terms of the specified parameters values.

Baseline drivers:

1. **Swedish demography**. In the *Swedish demography* scenario, the demographic evolution is the same as in Sweden. Table 2.1 reports the projected evolution of the old-age dependency ratio (the ratio between the projected number of persons aged over 65 years and the projected number of persons aged between 15 and 64 years, expressed per 100 persons aged 15-64 years) in the baseline scenario, ordered from lowest (Ireland) to highest (Italy) in 2015. Sweden is the country which is closest to a demographic equilibrium, with an old-age dependency ratio that is projected to grow only moderately over the forecasting horizon: from being in the middle of the ranking in 2015, it is expected to become the country with the lowest ratio among the selected countries from 2040 onwards. This reinforces the choice of Sweden as a benchmark.

	Old-age dependency rates (%)				
year	2015	2020	2030	2040	2050
Ireland	19.8	23.2	30.3	38.6	44.8
Hungary	26.4	30.5	34.4	39.8	47.3
Spain	27.8	30.4	39.6	53.5	62.5
Sweden	**31.2**	**33.0**	**35.5**	**37.4**	**37.5**
Greece	31.9	34.3	41.2	53.2	63.6
Italy	33.3	34.9	40.8	49.9	52.9

Table 2.1: Projected old-age dependency ratio, baseline scenario. Source: Eurostat – Population Projections EUROPOP2013.

2. **Swedish education**. In the *Swedish education* scenario, the distribution of educational attainments is the same as in Sweden. Table 2.2 reports the share of individuals with respectively high and low levels of education, in the baseline scenario, in the base year of the simulation. Sweden is the country with the highest (lowest) proportion of people with high (low) education. In the *Swedish education* scenario, initial educational attainments are modified to reflect the same distribution of educational levels as in Sweden. Then, the share of highly educated individuals increases, in all countries, as predicted in the aggregate projections presented in section 1 of our companion paper, at the expenses of the share of poorly educated individuals.

	High education (%)		**Low education** (%)	
	Females	Males	Females	Males
Italy	16.8	13.5	37.3	38.9
Hungary	21.6	15.1	24.8	21.2
Greece	22.8	20.8	35.6	34.2
Spain	30.4	26.6	44.7	48.8
Ireland	33.0	35.3	29.1	34.2
Sweden	**38.4**	**26.5**	**13.6**	**17.0**

Table 2.2: Share of people aged 18-65 years with high (ISCED level 3) and low (ISCED level 1) education, base year.

3. **Swedish participation**. The *Swedish participation* scenario is meant to disentangle the effects of individual characteristics from composition effects, in explaining participation rates. For instance, having small children negatively affects female participation, to a degree which is estimated in the data and is country-specific. The (country-specific) estimated coefficients measure the effects of the covariates (having versus not having small children in our example) on the outcome.[2] On top of the differences in the estimated coefficients, countries also differ with respect to the fraction of women with small children, and in their characteristics (age, education, etc.), that is in the composition of the population with respect to the determinants of the outcome of interest. The *Swedish participation* scenario assumes that in all countries, all covariates have the same effect as in Sweden, with respect to participation. Hence, differences in outcomes must be attributed to composition effects only. While in the *Swedish demography* and the *Swedish education* scenarios we keep population characteristics fixed to Swedish levels, here we keep their effects fixed to Swedish levels, and keep the country-specific population characteristics as in the baseline.[3] Hence the *Swedish participation* scenario allows us to answer the following questions: What would happen in country X if individuals were to behave as in Sweden, with respect to their labour force participation decisions? Is it behaviour (conditional on characteristics), or is it the characteristics of the population in terms of the distribution of individual traits, that matters the most in explaining the outcome? Finally, the decision to focus on participation stems from the centrality of participation in the model: employment, the other outcome of interest, is computed on the basis of participation, conditional on individual characteristics but aligned to match externally provided aggregate projections (variation of these scenario parameters is explored in the *Delayed recovery* scenario, see below).[4]

Policy actions:

4. **Delayed recovery**. In the *Delayed recovery* scenario we assume that the effects of the Great Recession on participation and employment fade away more slowly. As explained in our companion paper, the Great Recession enters the model in two ways. First, we introduced a flag that signals the presence of the crisis in the participation and employment equations, which is set to zero in the estimation data prior to 2009 and set to one from 2009 onwards: the estimated coefficient of this flag measures, in each country, the strength of the effects of the crisis. Second, the aggregate unemployment rate that enters the employment equation is measured in the estimation data and also reflects the effects of the crisis. In the simulations, the estimated coefficient of the flag is kept constant, but the flag itself, signalling the presence of the crisis, is allowed to "shrink" towards zero. In the baseline scenario, the value of this flag decreases linearly from one to zero, and reaches zero in 2020 (2030 in Greece). The aggregate unemployment rate is also assumed to decrease linearly to pre-crisis levels, which are reached in 2020 (2030 in Greece). Hence, in the baseline scenario the Great Recession is assumed to be completely over by 2020 (2030 in Greece). In the *Delayed recovery* scenario this is postponed by 10 years, to 2030 in all countries except Greece, where recovery is complete by 2040.

5. **No early retirement**. In this scenario, the minimum retirement age is set to 60 years old in all countries (the baseline value is 45). Note however that because retirement age is randomly drawn for each individual from a normal distribution with mean equal to the average (expected) retirement age, and standard deviation equal to the standard deviation in retirement age observed in the estimation

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[2] The estimated coefficients are also referred to in the econometric literature as *returns* to the covariates. The rationale for using the term 'returns' is better understood when thinking of monetary variables like income (which are absent in the microsimulation model), where for instance high education commands a positive return (a *premium*).

[3] The values of the estimated coefficients are reported in Appendix A of our companion paper.

[4] See our companion paper for more information about the model structure and assumptions.

data (table 2.3, see our companion paper for more details), there are only a minority of people for which the minimum retirement age constraint is binding.

year	Mean retirement age						Std. deviation	
	2015		2030		2050			
	Males	Females	Males	Females	Males	Females	Males	Females
Hungary	61.1	61.8	64.9	65.3	70.0	70.0	5.1	4.1
Greece	62.8	60.0	65.9	64.3	70.0	70.0	5.8	6.2
Spain	63.3	63.8	66.2	66.5	70.0	70.0	4.7	4.5
Italy	64.0	65.9	66.6	67.7	70.0	70.0	6.5	6.6
Ireland	65.8	63.1	67.6	66.0	70.0	70.0	3.5	4.5
Sweden	66.6	65.8	68.0	67.6	70.0	70.0	3.4	3.8

Table 2.3: Assumptions concerning the mean and standard deviation of retirement age (prior to imposing the minimum retirement age constraint).

6. **Enhanced family policies**. In the *Enhanced family policies* scenario we consider that the duration of maternity leave, the amount of public childcare expenditures per child, and the overall diffusion of part-time arrangements among employed workers all increase by 20% with respect to the baseline scenario (the values for the baseline scenario, taken from the OECD Family Database and kept constant throughout the simulations, are reported in table 2.4).

	On leave benefits	Public childcare expenditures per child				Part-time
		Age of child				
		0	1	2	3	
	# weeks	2009 US$ PPP				%
Greece (EL)	15	154	293	432	571	7.6
Spain (ES)	24	129	1,561	2,996	4,431	12
Hungary (HU)	74	48	78	108	3,045	3.9
Ireland (IE)	12.4	0	0	0	9,384	20.2
Italy (IT)	25	1,017	2,043	3,540	5,286	15.3
Sweden (SE)	74	1,541	2,586	3,630	9,042	24.4

Table 2.4: Family-policies related parameters, baseline scenario. Source: OECD Family Database.

The *Enhanced family policies* scenario is then disaggregated in three sub-scenarios, where each component in turn (maternity leave, public childcare expenditures, and part-time rate) is increased by 20%, while leaving the others unchanged.

3. The *baseline drivers* scenarios

The objective of this analysis is to identify the main drivers of the female participation gaps of the low-participation countries with respect to Sweden. These gaps, in the baseline scenario, are quite remarkable, going from 15.5 ppt in Spain to 27.4 ppt in Italy at the beginning of the simulation period, and reducing only slightly over time (table 3.1, see also Appendix B of our companion paper).

	Females (20-64 years old)				
year	2013	2020	2030	2040	2050
Participation rates (%)					
Sweden	86.4	88.3	89.6	89.4	89.7
Spain	70.9	72.3	71.8	73.3	75.5
Hungary	65.1	66.8	70.2	71.3	71.3
Ireland	62.8	69.5	69.6	69.6	72
Greece	62.4	64.1	67.1	70	73
Italy	59.0	63.3	64.7	67	68.8
Participation gap w.r.t. Sweden (%)					
Spain	15.5	16.0	17.8	16.1	14.2
Hungary	21.3	21.5	19.4	18.1	18.4
Ireland	23.6	18.8	20.0	19.8	17.7
Greece	24.0	24.2	22.5	19.4	16.7
Italy	27.4	25.0	24.9	22.4	20.9

Table 3.1: Participation rates and participation gaps with respect to Sweden, female population aged 20-64 years, baseline scenario.

Figure 3.1 reports, for each country, the projected participation rates in the three *baseline drivers* scenarios: demographic evolution, educational attainments, and participation behaviour. The shaded areas in grey in the background represent uncertainty around the baseline projections (see our companion paper for more details), against which each scenario can be evaluated.[5]

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[5] Assessing the statistical significance of the differences with respect to the baseline would entail performing an assessment of the uncertainty of the projections in all the different scenarios, in addition to the one performed around the baseline. We leave this for future research. While being somewhat loose from a statistical perspective, the graphical analysis shown here gives a pretty good idea of the "economic significance" of the different results, and is a big improvement on the state of the art of simulation modelling (see our companion paper for a more in-depth discussion on this point).
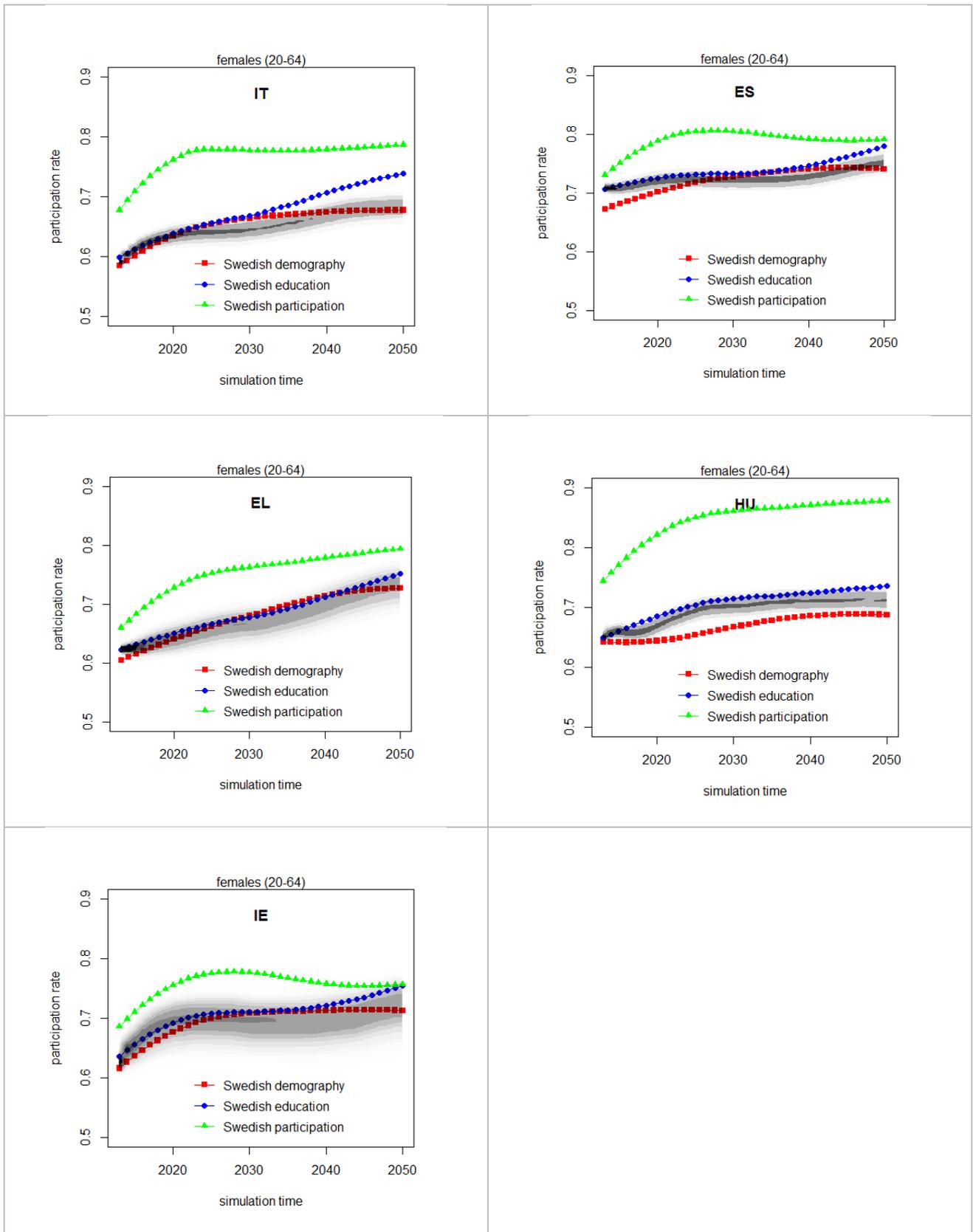
Figure 3.1: Participation rates in the *baseline drivers* scenarios, female population aged 20-64 years. The shaded areas are the estimated densities of the baseline projections, computed over 1,000 replications with bootstrapped values of the coefficients.

In all countries, the gap in female participation with respect to Sweden is explained mostly by differences in the individual conditional behaviour, rather than in the composition of the population: *ceteris paribus*, conditional on individual characteristics, Swedish women are more active. This can be seen from the projections in the *Swedish participation* scenario, which are consistently and significantly higher than the baseline (5-10 ppt in Spain, Greece and Ireland; 10-15 ppt in Italy and Hungary). If women in Italy, Spain and Greece would have the same labour market behaviour of Swedish women, they would approach, by the end of the forecasting horizon, participation rates close to 80%, not far away from the near 90% value projected for Sweden (see table 3.1).

Note that the result that behaviour matters more than individual characteristics in explaining the participation gap does not mean that the characteristics of the female population in the low-participation countries are similar to those of the Swedish population (they are not): what our analysis shows is that these differences do not matter much, as Swedish women participate more regardless of their attributes.

Indeed, endowing the low-participation countries with *Swedish demography* or *Swedish education* leads only to minor changes in participation rates. In particular, demography is actually helping Hungary and – up to around 2030 – Spain, in driving up participation rates with respect to Sweden, as can be seen by the fact that the projections for the *Swedish demography* scenario lie below the baseline. Differences in educational attainments play a role in explaining the participation gap with respect to Sweden, albeit relatively small (up to 2-3 ppt, 5 ppt in Italy), and concentrated in the second half of the simulation horizon, when the new hypothetical "Swedish like" cohorts will have replaced the old population.

The picture changes dramatically when focusing on the younger cohorts in childbearing years, where the participation gap with respect to Sweden is less pronounced (table 3.2), except in Greece.

| | Females (20-44 years old) | | | | |
year	2013	2020	2030	2040	2050
Participation rates (%)					
Sweden	84.2	84.6	86.1	85.1	85.6
Spain	76.8	77.5	73.8	74.5	76.5
Hungary	71.7	73.7	74.3	74.1	74.6
Ireland	68.1	74.4	69.3	68.9	73.6
Greece	66.2	64.1	63.3	62.7	62.1
Italy	64.7	70.8	71.2	71.1	72.1
Participation gap w.r.t. Sweden (%)					
Spain	9.6	10.8	15.8	14.9	13.2
Hungary	14.7	14.6	15.3	15.3	15.1
Ireland	18.3	13.9	20.3	20.5	16.1
Greece	20.2	24.2	26.3	26.7	27.6
Italy	21.7	17.5	18.4	18.3	17.6

Table 3.2: Participation rates and participation gaps with respect to Sweden, female population aged 20-44 years, baseline scenario.

The impact of the different drivers on the participation rates in this age group is shown in figure 3.2. With the exception of Hungary, projections in the *Swedish participation* scenario for the 20-44 age group lie below the baseline, meaning that the conditional behaviour of younger women is not too different from their counterparts in Sweden, and if anything even more favourable to participation. Turning to differences in individual characteristics (the composition effect), figure 3.2 shows that the lower educational attainments are responsible, as in the 20-64 years population, only for a small part of the participation gap (up to 2-3 ppt in all countries except Italy, where the participation rate would be 5 ppt higher, in the middle of the

forecasting horizon, if women had the same educational attainments as in Sweden).[6] Moreover, demography in this age group plays slightly in favour of low-participation countries, especially in the first part of the forecasting exercise (up to 2030). This is due to the fact that fertility rates are lower in these countries, hence the age distribution is more biased towards later ages (in the 20-44 years range), where participation is typically higher.
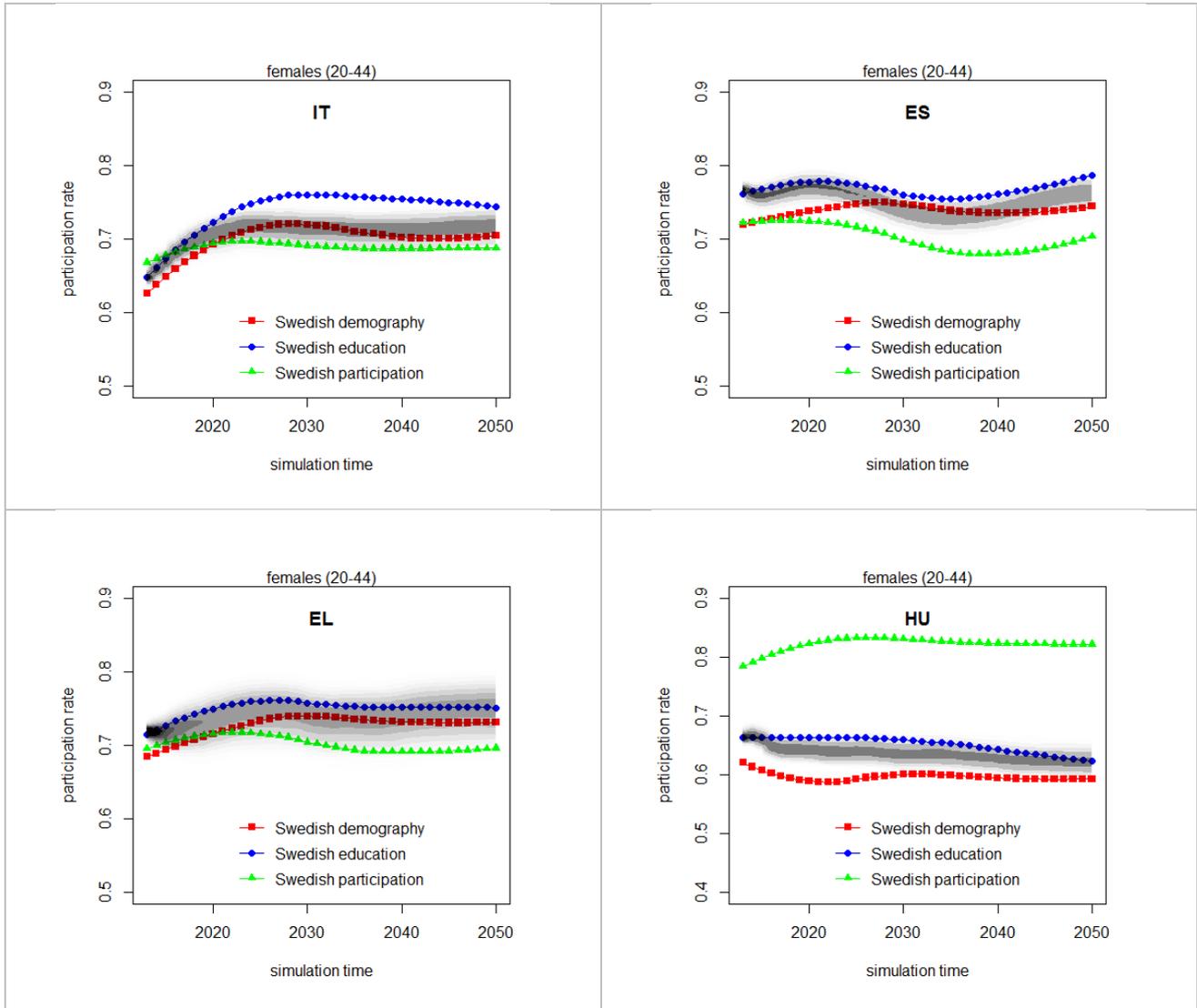
[6] The effects of education are computed assuming a convergence to Swedish educational levels. These results can also be used to get a first order intuition about the effects of more plausible incentives to acquire further education. For instance, at the beginning of the simulation period, Italy – the country with the lowest educational attainments – has a share of women aged 20-44 years with low education of 27.8% (not considering students), compared to 6.5% in Sweden. Under the *Swedish education* scenario, the participation rate in Italy is 2.2 ppt higher than the baseline, in 2050. Using a linear interpolation, to achieve an increase in participation of 1 ppt in 2050 with respect to the baseline, a fairly limited objective, the share of women with low education in Italy should be pushed down to around 15%, an impressive achievement for education policies. Similar results hold for Spain. To put it differently, education policies are simply not a promising area of intervention to increase participation and hence move towards the Europe 2020 employment targets (though they might be important to achieve other policy objectives).
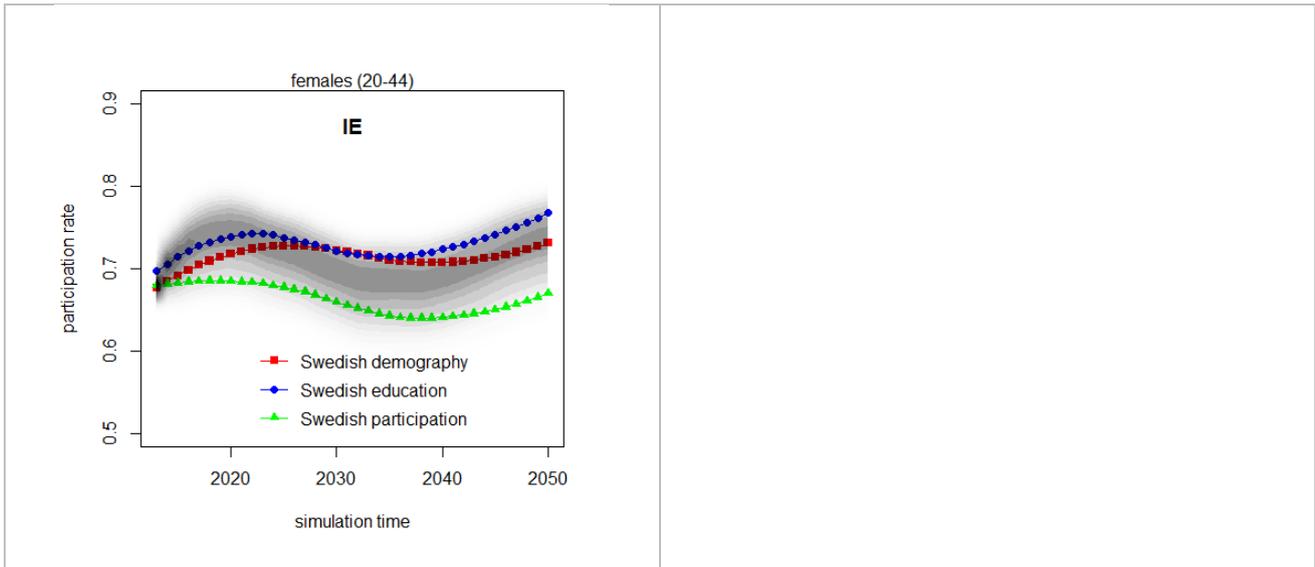
Figure 3.2: Participation rates in the *baseline drivers* scenarios, female population aged 20-44 years. The shaded areas are the estimated densities of the baseline projections, computed over 1,000 replications with bootstrapped values of the coefficients.

What other determinants are then responsible for the participation gap? In the participation equation, the only other individual characteristics considered are household composition, and participation and employment history (see table 2 of our companion paper). However, the share of women in the 20-44 years old age range that are living in a union is higher in Sweden than in all other countries under analysis (see Appendix B of our companion paper), so differences in household composition, if anything, play a role in attenuating the participation gap, rather than in explaining it. Part of the answer has to be found in the path persistent dynamics of participation itself: in Sweden it is easier to find employment; women are encouraged to participate in the labour market, even if only marginally, from an early age, and re-entry after maternity leave is facilitated. This has dynamic consequences as attachment to the labour market increases even at later ages.

To summarise our main findings so far, the low female participation rates in the countries under analysis can be explained mainly by an adverse behaviour of older women (even after controlling for differences in individual characteristics). Moreover, the behaviour of younger women is not detrimental to participation, their lower educational attainments are only partly responsible for the participation gap, and demography doesn't help either in explaining it. The last source of the participation gap for women in childbearing years – in the model – is the role of family-friendly policies, and in particular the presence of public, affordable childcare, maternity leave, and part-time opportunities. As it turns out, inadequate family policies and part-time opportunities are important determinants of the low participation rates of younger women, thus completing our picture of the causes of the female participation gap: in short (and with some inevitable simplification) it is the adverse behaviour of older women, and insufficient policies and lack of opportunities for younger women.

The next section explores the impact of the family policy variables, together with policies aimed at increasing labour force participation at later ages by closing down opportunities for early retirement, and policies aimed at supporting aggregate demand, hence a faster recovery from the Great Recession.

4. The *policy actions* scenarios

Figure 4.1 is the analogue of figure 3.1 for the *policy actions* scenarios. It shows, for each country, the projections for female participation rates in the age group 20-64 years, in the *Enhanced family policies, No early retirement* and *Delayed recovery* scenarios, against the background of the baseline. With the exception of Greece, where abolishing early retirements has an impact on aggregate participation rates of about two ppt in the mid 2020s, the only detectable effects at an aggregate level come from the *Enhanced family policy*

scenario, with an increase in female participation rates that goes from 1 to 3 ppt. No further gains can be obtained, according to these projections, in Sweden. This is consistent with the findings of the previous section, as we pointed out that differences in conditional behaviour of women explain almost entirely, in the aggregate, the participation gap.

Moreover, the fact that these effects are small should be of no surprise, given that some of the policies have an impact on specific segments of the population only: in particular, childcare benefits and paid maternity leave are only relevant for mothers in childbearing years, for whom part-time opportunities also matter, while the abolition of early retirement options impacts only individuals who would otherwise retire before the new minimum retirement age. Accordingly, in the next sections we investigate the impact of the different scenarios in the most relevant subgroups of the population.
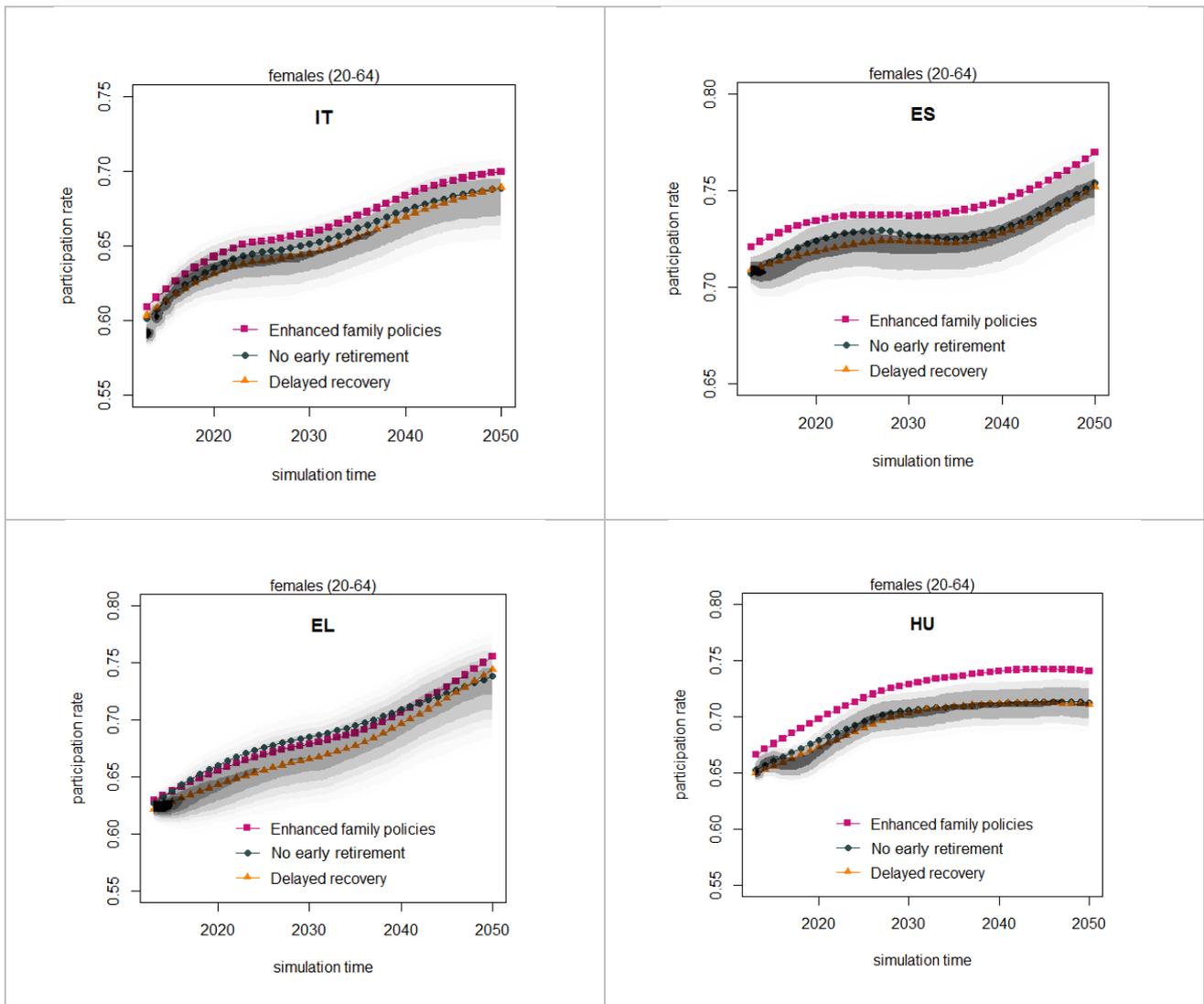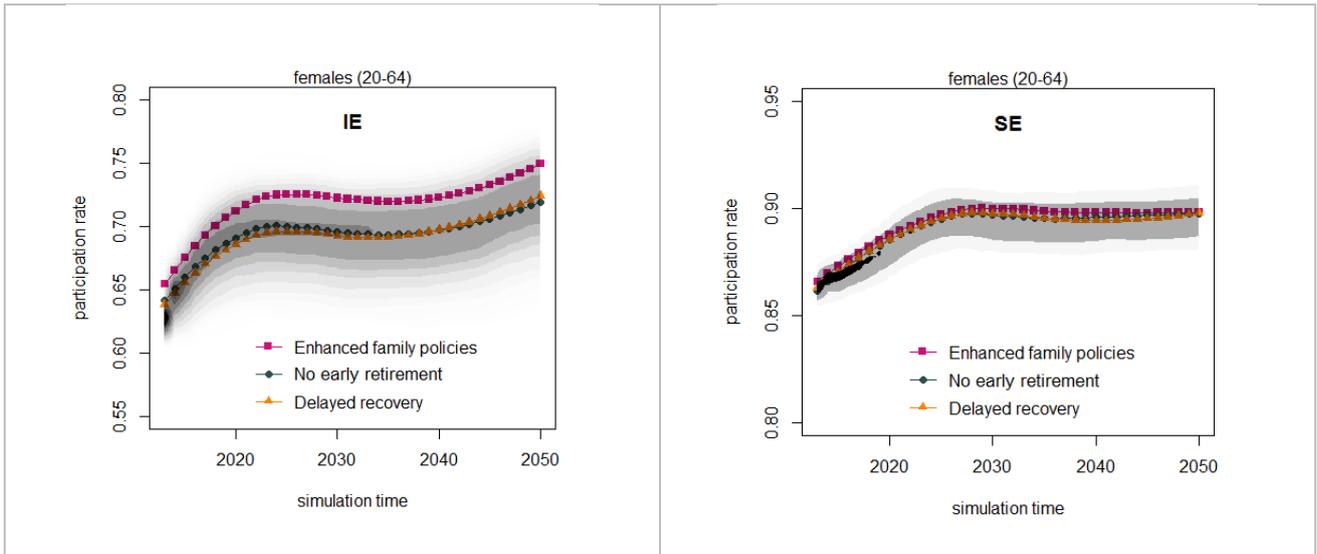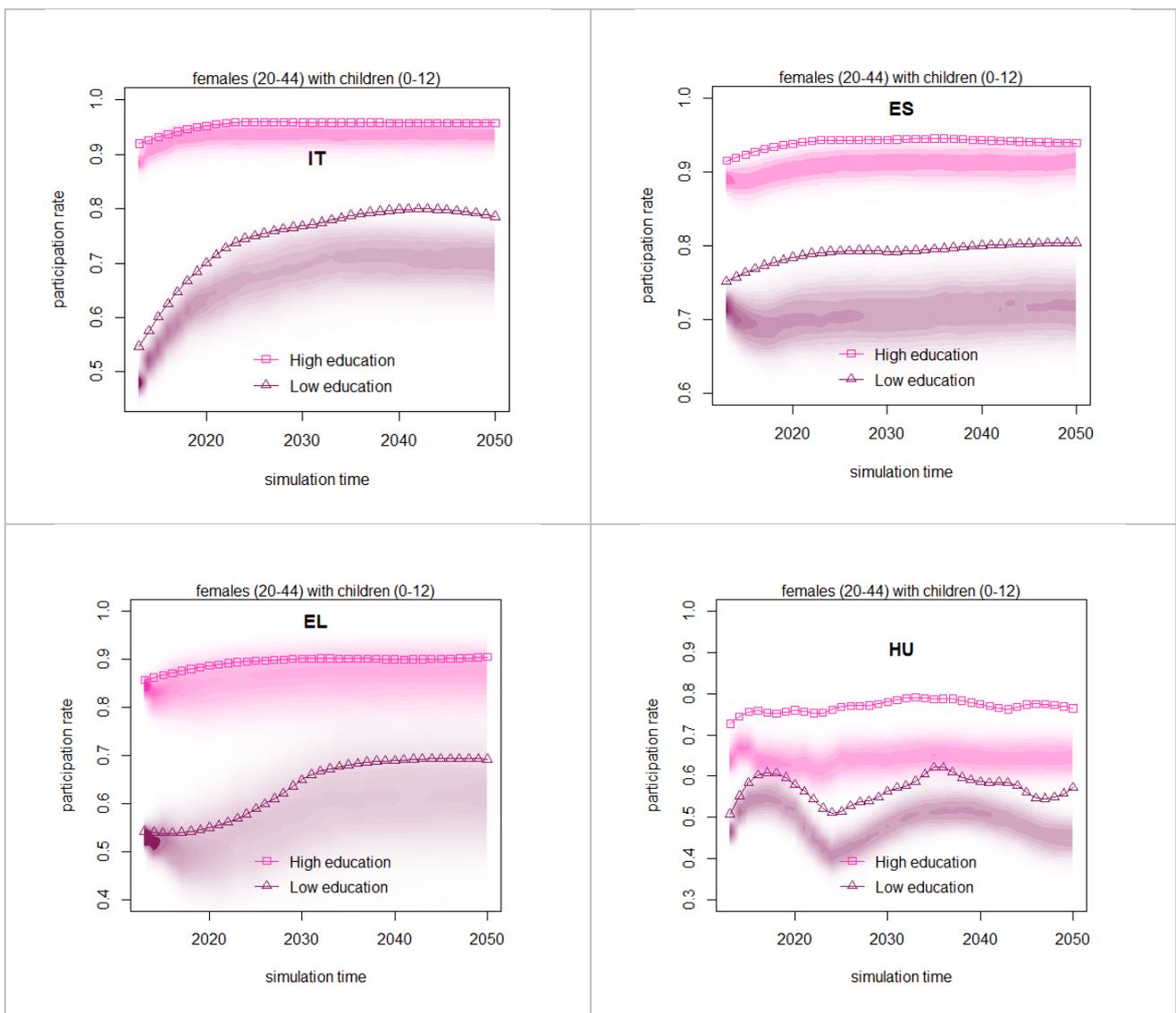
Figure 4.1: Participation rates in the *policy actions* scenarios, female population aged 20-64 years. The shaded areas are the estimated densities of the baseline projections, computed over 1,000 replications with bootstrapped values of the coefficients.

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4.1 The *Enhanced family policies* scenario

Figure 4.2 depicts projected participation rates in the *Enhanced family policies* scenario for mothers aged 20-44 years with children aged 0-12 years. For each country, we report participation rates separately for women with high and low education, against their respective baseline trends[7]. In all countries except Sweden, improving the family policies increases participation rates for women with low education by about 10 ppt, a remarkable amount. Even in Sweden, where participation rates are very high to start with, increasing childcare, on leave periods and part-time opportunities by 20% would increase the participation rate women with low education from about 95% to about 97%. Gains for highly educated women are more limited but still substantial, except in Hungary where both high and low educated women experience similar magnitudes of increase in participation.

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[7] Results for Hungary are subject to more oscillation due to sample variability in the original EU-SILC data.
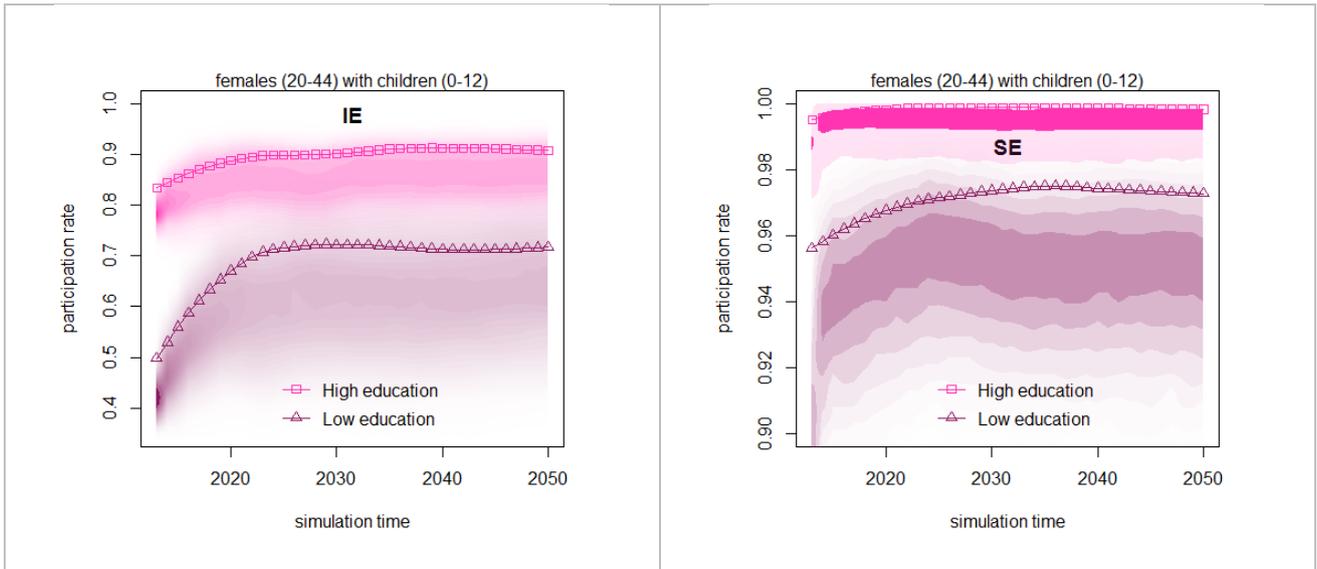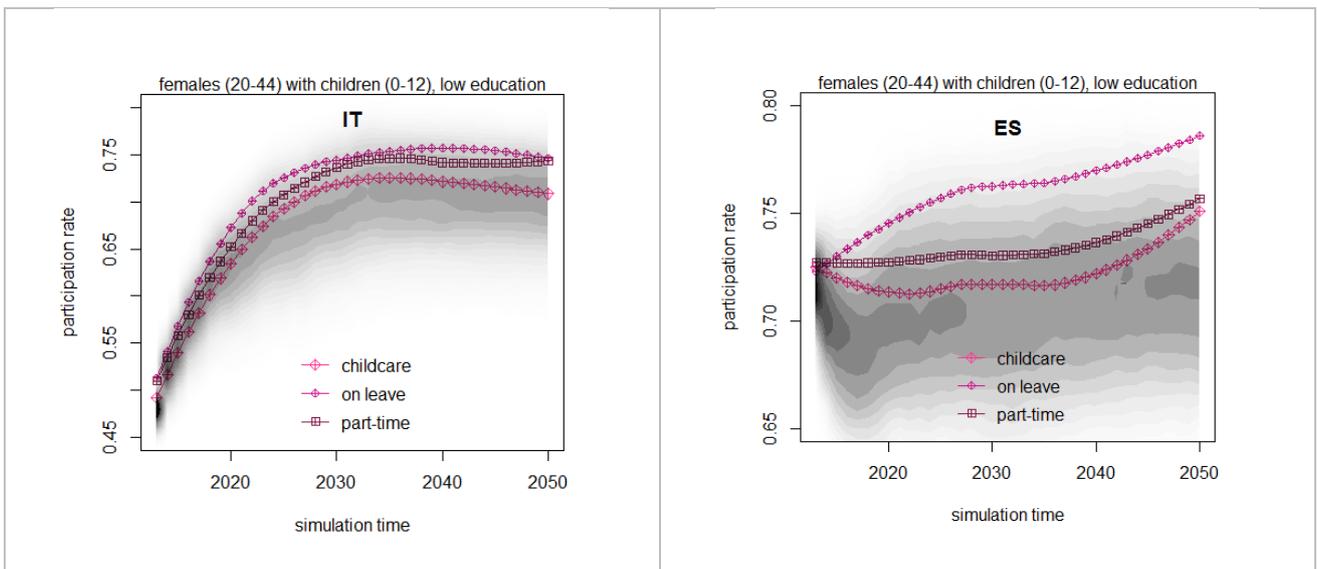
Figure 4.2: *Enhanced family policies* scenario: public childcare benefits, duration of maternity leave and availability of part-time employment are jointly increased by 20%. Participation rates by educational attainments, female population aged 20-44 years not in education. The shaded areas are the estimated densities of the baseline projections, computed over 1,000 replications with bootstrapped values of the coefficients.

Finally, we explore the individual contributions of the different policies in the *Enhanced family policy* scenario: public childcare, maternity leave, and availability of part-time. For the sake of brevity, in presenting the results we focus on the most vulnerable group, in terms of participation: women (aged 20-44 years) with children (aged 0-12 years) and a low education. Figure 4.3 shows the effects of an increase of 20% in the values of each of these three scenario variables, separately. All variables have an effect, though it is their combination that drives participation rates up to the levels analysed above. In most countries, and in particular in Spain and Hungary, it is an increase in the duration of paid parental leave that is deemed to have the bigger effect (though the effects are generally so close that any difference is likely not to be robust to statistical testing). This is not surprising as maternity leave allows women to remain formally employed while taking care of their children.
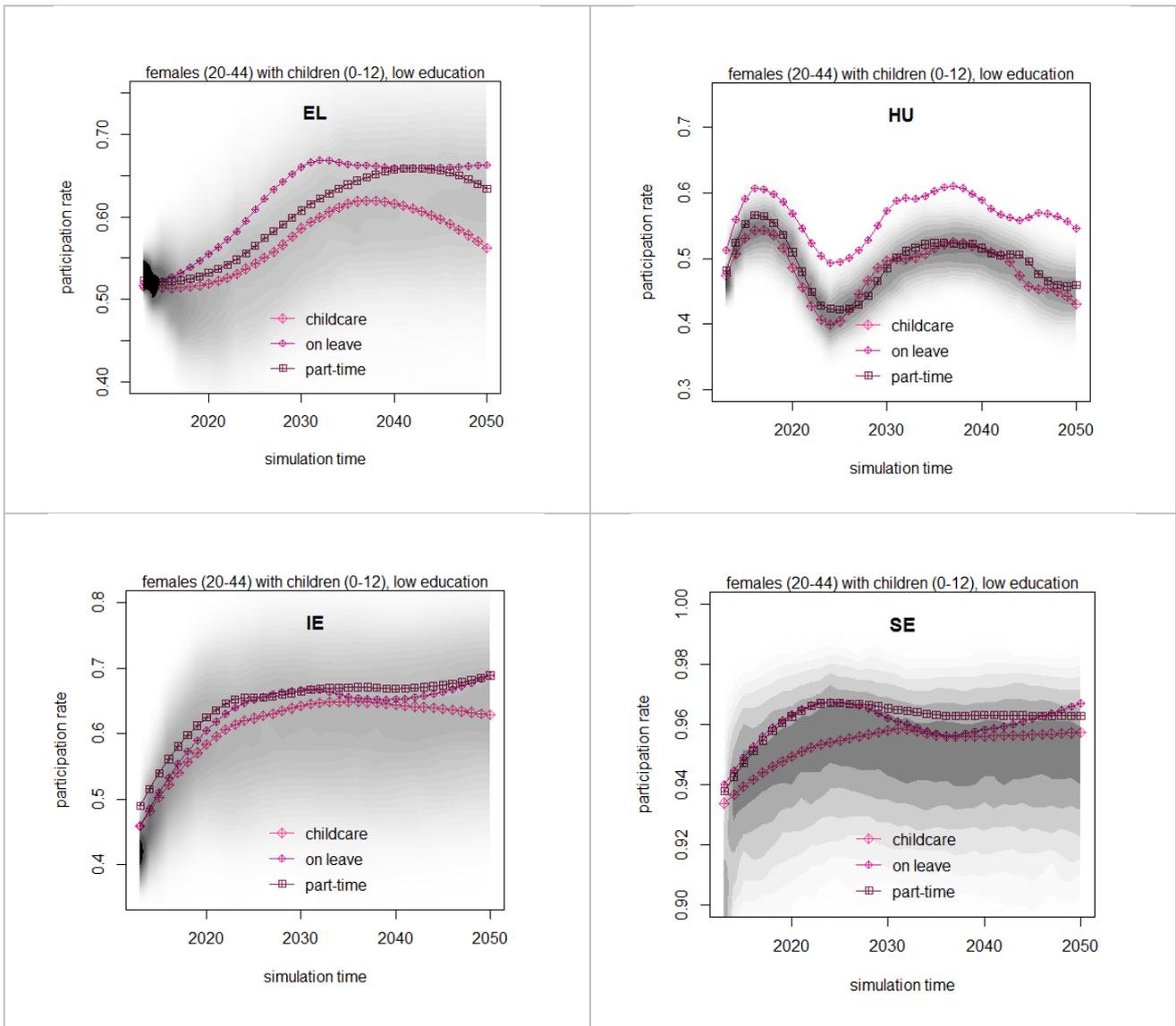
Figure 4.3: Decomposition of the *Enhanced family policies* scenario: public childcare benefits, duration of maternity leave and availability of part-time employment are separately increased by 20%. Participation rates, female population aged 20-44 years with children aged 0-12 years and low education. The shaded areas are the estimated densities of the baseline projections, computed over 1,000 replications with bootstrapped values of the coefficients.

4.2 The *No early retirement* and the *Delayed recovery* scenarios

Finally, we investigate the effects of the *No early retirement* and *Delayed recovery* scenarios in the sub-population of interest. Figure 4.4 reports the increase in the employment rate with respect to the baseline, due to a hypothetical minimum effective retirement age of 60 years old, both for males and females. The policy is evaluated on the population in the 50-59 age group. Despite the aggregate effects of this policy being negligible (see figure 4.1) due to the relatively small size of the group of affected individuals, the effects on this sub-population are substantial, with an increase in the employment rate that peaks at almost 6 ppt in Greece, about 4 ppt in Hungary and Italy, and 2 ppt in Spain. The effects of raising the minimum effective retirement age obviously decline over time, as the average retirement age is expected to increase even without this additional policy – hence, the number of people that are affected, and would otherwise consider retiring before the newly imposed minimum retirement age, diminishes.
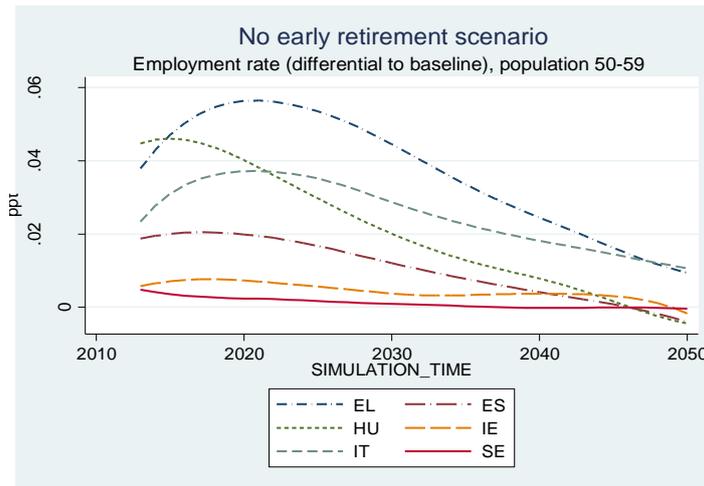
16

Figure 4.4: *No early retirement* scenario: minimum effective retirement age is 60 years old. Employment rates, differential to baseline, population aged 50-59 years.

As for what concerns the sensitivity of our results to the assumptions about the path of recovery from the crisis, figure 4.5 shows that slowing down the recovery by 10 years reduces employment rates by about 3 ppt in Ireland, Spain and Greece, while smaller effects are expected elsewhere. These are the countries where the unemployment rate increases the most, with respect to the pre-crisis levels).
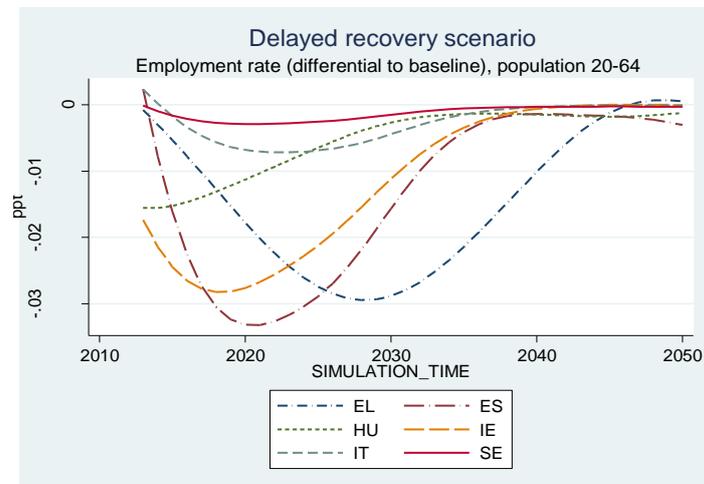

Figure 4.5: *Delayed recovery* scenario: the effects of the Great Recession fade away at a slower pace; complete recovery is achieved 10 years later than in the baseline (so 2040 in Greece and 2030 in other countries). Employment rates, differential to baseline, population aged 20-64.

5. Conclusions

In this paper, we have presented alternative scenarios for the parameters of the microsimulation model, aimed at understanding the drivers of the baseline results, and the expected effects of policies aimed at increasing participation and employment.

In the baseline scenario presented in our companion paper, we identify a general trend of increasing participation rates towards the very high Swedish levels, which accelerates in the population aged 20-64 years old after 2030 when older cohorts are replaced by younger cohorts who exhibit higher participation rates. The only exception to this general pattern is Hungary, where participation rates of mothers are

particularly low and, given the recent trends as observed in the EU-SILC data, are not projected to increase. However, Sweden will not be joined by any other country in our sample in meeting the Europe 2020 target of 75% overall employment rate by 2020, though Ireland will get close. According to the projections, the 75% target will only be approached at the end of the simulation period at 2050, by all countries with the exception of Hungary.

In this paper, we have argued that the low female participation rates in Italy, Spain, Greece, Hungary and Ireland, with respect to Sweden, are due to (i) low participation of older women, (ii), inadequate family policies and limited opportunities for family-work conciliation for younger women. According to our model, education plays a limited role, as older women with high education also participate little, and younger women in childbearing years are constrained by factors other than their level of education. An increase in the minimum retirement age is effective in keeping more women close to retirement in the labour force: however, due to the small number of women affected, the aggregate effects are small. Finally, a prolonged state of labour market distress due to the consequences of the Great Recession would push countries further away from the Europe 2020 targets, though again a lack of aggregate demand is not a primary explanation for the low observed female participation rates, and their incomplete projected convergence to the Swedish benchmark.

In the so called 'baseline drivers' alternative scenarios, by endowing low participation countries with 'Swedish features', possibly involving extreme, highly hypothetical departures from the baseline parameters, we learn that the gap in female participation with respect to Sweden is explained mostly by differences in the individual conditional behavior, rather than in the composition of the population by age and education. Interestingly, this result turns out to be driven by older cohorts, i.e. people aged 45 years or more in the initial population. The conditional behavior of younger women is not too different from their counterparts in Sweden, and if anything it is even more favorable to participation. Putting it differently, this indicates that there is not much room for manoeuvre to increase participation through higher education, and little can be done about the effect of choices made far in the past by older cohorts of women regarding their participation in the labour market.

Indeed, population ageing is a powerful as well as 'automatic' driver of participation, given that older cohorts tend to participate less, notwithstanding policies aimed at raising retirement age and creating incentives to extend their permanence in the labour force. Whilst population ageing might well create important labour supply shortages in the future, differences in the demographic trends cannot explain the incomplete and inadequate expected convergence to Swedish participation rates. Indeed, as many low-participation countries in the past few decades have experienced a stronger demographic transition than Sweden, with dramatic shrinkage of their younger cohorts, demographic evolution will contribute positively to convergence, as the relatively larger older cohorts, characterised by low participation rates, will gradually exit working age.

With respect to education not being an important policy lever to increase participation – a somehow counterintuitive result – it should be noted that this is consistent with the literature, which finds a significant effect of education on participation, but does not identify education policies as a key area of intervention (Jaumotte, 2004; Thévenon, 2013). Education matters a lot in explaining *current participation levels* of the older cohorts, as older women with low education often never considered entering the labour force, and is still significant in explaining current participation levels of younger generations because of the lower returns women with low education can expect from their participation in the labour market, both in terms of a lower probability of finding a job and lower wages. At the same time, education is less relevant for explaining *future participation changes* because (i) younger women in low-participation countries have already closed most of their education gap, with respect to benchmark countries like Sweden, and (ii) the premium that education commands with respect to unemployment and pay for younger women has also shrunk, partly due to increasing work insecurity and labour market dualisation, with young women getting a disproportionate share of 'bad' jobs, irrespective of their education level (Berton et al., 2012).

The reason for persistently low participation of prime age women has therefore to be found in the economic and institutional environment in which they live: our model highlights that inadequate family policies and part-time opportunities are important determinants of the observed and projected low participation rates. This is consistent with the findings of the literature, which point to the importance of flexibility of working-time

arrangements and support to families with young children (ILO-IMF-OECD-WBG, 2014) as key policy drivers of female participation rates.

Indeed, our country experts mention a whole set of family friendly policies that would be desirable in their countries but are not implemented to a sufficient degree, because of - but not solely due to - budgetary constraints imposed by austerity. In particular, in our so called "policy actions" alternative scenarios, we have discussed two sets of family-work conciliation policies: first, policies that would facilitate women to perform both family and labour market related tasks (part time work, maternity leave); second, those that would allow women to access services provided by professionals that could substitute them in several basic care tasks (public childcare, but also elderly care or subsidies to families in order for them to hire caregivers, as underlined by all country experts).

The first set of policies (part time jobs and parental leave) has the downside to detach women – at least partially – from the labour market, with the risk of not being able to revert in the future to full participation. Moreover, such policies require cooperation on the side of firms, which should accommodate (costly) part timers and on-leave mothers without penalizing their career. Incentives and support from the Governments are clearly needed to achieve this goal. For instance, most Swedish companies are flexible regarding parental duties, and employees still get 80 per cent of their pay when they have to stay home with sick children or dependents. Yet, this does not happen at the expense of productivity: Sweden ranks 9th in the Global Competitiveness Index 2015-2016 (Ireland is 24th Spain 33rd, Italy 43rd, Hungary 63rd and Greece 81st; see Schwab, 2015).

Our reference country, Sweden, is also a leading example for parental leave policies. In Sweden, parents are entitled to 480 days of paid parental leave when a child is born or adopted. For 390 days, parents are entitled to nearly 80 per cent of their normal pay, up to a ceiling; the remaining 90 days are paid at a flat rate; those who are not in employment are also entitled to paid parental leave. The measure is financed to a large extent by employers' contributions and for the remaining part (about a quarter) by general taxation. Parental leave can be taken up until a child turns eight years old. The leave entitlement applies to each child (except in the case of multiple births), so parents can accumulate leave from several children. In this period, parents also have the legal right to reduce their normal working hours by up to 25%. The duration of parental leave in Sweden is very high by international standards and is perhaps Sweden's most famous argument when it comes to being a child-friendly system. Generous parental leave is not sufficient by itself though, to ensure a family-work balance. Hungary provides even longer periods of parental leave: 156 weeks for either parent, with cash benefits totalling 70% of previous earnings, up to a ceiling, for insured parents in the first 104 weeks, and flat rate benefits for non-insured parents or for insured parents in the last 52 weeks (Addati et al., 2014). However, participation rates in Hungary are among the lowest in Europe, and are projected to grow only at a comparatively slow rate. The reason is that parental leave can backfire when gender equality is not firmly rooted in the workplace, as women might lose their attachment to the labour force, or end up being discriminated against. It is difficult to separate the directions of the causal link between attitudes and behaviours, a positive attitude towards female participation being both a prerequisite and a consequence of increased female participation. However, policies aimed at promoting gender equality favour both. In Sweden, for instance, each parent is entitled to 240 of the 480 days of paid parental leave. Each parent has two months reserved exclusively for him or her. Should a father – or a mother for that matter – decide not to take them, they cannot be transferred to the partner. 85% of Swedish fathers take parental leave, and men in Sweden take nearly a quarter of all parental leave. Those who don't take the leave face questions from family, friends and colleagues. And in an effort to further improve these figures, the government provides a gender equality bonus, consisting of an extra daily payment if 270 days of the paid parental leave are divided evenly between the mother and the father.

The second set of policies (child care services and subsidies) has fewer downsides regarding the risk of detaching women from the labour market, but is more costly for the public budget and requires a strong political will to engage in long-term investments aimed at empowering women and sustaining families. In our reference country, Sweden, public childcare is guaranteed to all parents and it operates on a whole-day basis: most childcare facilities are open from 6.30 a.m. until 6.30 p.m. Pre-school is free for children aged between three and six years old for up to 15 hours per week. Aside from paid leave, the government provides an additional monthly child allowance until a child reaches the age of 16 years old, which covers the cost of additional childcare in pre-school years. Education for children aged six years old to university level is free of charge. The list of family friendly policies could proceed further. In 2010, for instance, the Swedish

government introduced a new rule into its social insurance scheme to help single parents who fall ill and cannot look after their child. The rule allows another insured person (i.e. a person legally living and/or working in Sweden) who forgoes paid work to receive temporary parental benefits to look after the child. Low income parents may be entitled to a housing allowance. Parents pushing infants and toddlers in prams and pushchairs can ride for free on public buses. All in all, the government is an active player in structuring the whole society around the needs of young families.

In conclusion, our study points to the prominent role of family policies: what is needed is not a change of behaviour on the part of women (which has already happened), nor a rebalancing of the demographic structure (which will inevitably happen), but a change of mentality on the side of institutions and firms, which could prompt much needed further changes in the role of women in our societies at large.

As for what regards the directions for future research, at least two avenues seem promising, given the results achieved by the present study. First, the microsimulation analysis could be extended to all European member states, with the purpose of providing a scoreboard of indicators and scenarios of projected participation rates, extending the rather limited analysis by sub-groups of the population in existing studies. Second, the model could be extended to include income dynamics, allowing for more distributional analysis, for instance with respect to inequality and poverty.

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