



EUROPEAN CENTRAL BANK

**WORKING PAPER SERIES**

**NO 454 / MARCH 2005**

**EUROPEAN WOMEN**

**WHY DO(N'T)  
THEY WORK?**

by Véronique Genre  
Ramón Gómez Salvador  
and Ana Lamo

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by Véronique Genre,  
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## Abstract

*This paper provides an empirical study of the determinants of female participation decisions in the European Union. The analysis is performed by estimating participation equations for different age groups (i.e. young, prime-age and older females), using annual data for a panel of 12 EU-15 countries over the period 1980-2000. Our findings show that the strictness of labour market institutions negatively affects the participation rate. Decisions linked to individual preferences with regards to education or fertility are also found relevant to participation of the youngest and prime-age females respectively. The inclusion of a proxy to capture cohort effects is crucial in order to explain the oldest females' participation.*

Keywords: labour force participation, labour market institutions.

JEL classification: J21

## Non technical summary

GDP per head in Europe is around 65% that of the United States and the main reason for this gap is the relatively low labour utilisation in European countries. In particular, Europeans work 13% less hours on average than Americans do. While the existence of the gap on hours worked per head is not disputed, there is some disagreement as how to explain it. Some argue that the gap reflects social norms according to which Europeans value leisure more than Americans do, while others put emphasis on the influence of the institutional framework, in particular the disincentive effect of taxes on labour. This paper indirectly contributes to this debate by analysing another aspect behind the relatively low labour utilisation in Europe, i.e. low participation rates. Concretely, it examines the determinants of women's participation in Europe.

Using annual data for a panel of 12 EU-15 countries over the period 1980-2000, this paper looks into the role that economic, institutional and social factors have played in explaining female participation rates and their developments in the last two decades. The analysis is performed by estimating participation equations for 3 different age groups (namely, the young – 15 to 24 years old –, the prime-age – 25 to 54 – and the older – 55 to 64 –).

We find that the influence of general economic variables on participation is not even across age groups. In particular, the unemployment rate, which is meant to mainly capture labour market pressures arising from business cycle fluctuations, appears to have some relevance in explaining participation, albeit only for the youngest and prime-age women. As expected, high unemployment tends to have a discouragement effect on these women, who, when considering that they have little chance to find a job, refrain from participating to the labour force.

For all three age groups considered, the strictness of labour market institutions negatively affects participation decisions. Indeed, the declining tightness of the institutional framework ruling labour markets in some countries over the last two decades appear to have significantly favoured women's participation, in particular of the older age group. We also find that measures aimed at reconciling motherhood with professional life, such as maternity leave, seem to favour participation to the labour force.

Along with the changing institutional framework, a number of specific decisions influenced by preferences, institutions and social norms appear to have driven participation developments of the different age groups. For example, for the younger age group, the increasing use of flexible forms of work (such as part-time employment) is found to explain a large part of participation developments between the 1980s and the 1990s. Education enrolment, which can be seen as an alternative to finding a job or being unemployed, is also a major driving force behind the decline in young female participation. Turning to prime-age female, a fertility variable, which can be seen as the outcome of the decision to have children versus participation to the labour force, significantly curbs labour force participation. Finally, the participation of the oldest age group appears significantly influenced by the lifetime behaviour of older women. If they did not participate at an

earlier age, they are not likely to participate at an older age. Once again, this points to the influence of cultural habits and social norms.

In sum, our results discard any doubt on the influence of institutions on women's participation in Europe. Institutional factors, together with preferences and economic factors have shaped female participation decisions. Identifying these factors is all the more important since it appears as a prerequisite to the successful design of efficient policy measures. These measures should help attract female labour supply into the labour force, raise female participation towards the targets set by the 2000 Lisbon European Council and help Europe to be more dynamic and catch-up with the United States in terms of hours worked per head, and thereby GDP per head.



## Introduction

GDP per capita in Europe was around 65% of US GDP per capita in 2003.<sup>1</sup> One possible reason for this gap is that Europeans work less than Americans do. Indeed, the ratio of hours worked per person in the EU-15 relative to the hours worked per person in the US was around 77% in 2000, which represents a significant decrease from a ratio of around 100% in 1970. This decrease was coupled however with an increase in relative productivity that left relative GDP per capita broadly unchanged, i.e. the increase in productivity did not have a catch-up effect in relative GDP per capita because labour utilisation in Europe was clearly below that of the US. In other words, if Europeans were prepared to work as many hours per person as Americans, GDP per capita in the EU-15 would be comparable to that of the US.

While the existence of the gap on hours worked per capita is not disputed, there is some disagreement as how to explain it. The debate on whether Europeans work less due to preferences or due institutional features of the labour market has recently attracted considerable growing interest.

The paper that initiated this debate was Blanchard (2004); Blanchard decomposes the change in hours worked per person as the sum of the change in hours worked per worker, the change in the ratio of employment to the labour force and the participation rate. He shows that the decrease in hours worked per person in EU-15 relative to the US during the period 1970-2000 is only due to a decrease in the number of hours worked per worker, with no substantial change in the relative growth (EU-15 vs. US) of employment and participation rates.

Blanchard argues then that the fact hours per worker (in particular full time workers) is responsible for the decrease in worked hours per capita is an indication that Europeans work less because they prefer to do so, thus valuing leisure relatively more than Americans.

Prescott (2004) and Ueberfeldt (2004) on the other hand, find that some institutional features, in particular taxes, play a determining role in shaping the dynamics of hours worked per capita. However, the latter papers do not disentangle whether the effect of taxes is via hours per worker, via employment and/or via participation rates.

This paper contributes indirectly to this debate by examining the determinants of just one of the components of worked hours per capita: the participation rate; and more precisely female participation rates in Europe. We think that increasing the female participation rate in Europe is a feasible channel for increasing hours worked per capita and in turn GDP per capita. Indeed, participation levels in Europe are low, implying that around 76 million people aged between 15 and 64 are currently not actively participating in the labour market, the so-called inactives, of which two-thirds are women.

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<sup>1</sup> Europe in this paper refers to the 15 members European Union prior to the May 2004 enlargement. Both terms Europe and EU-15 will be used indiscriminately.



Labour market participation in the EU-15 has increased from 65% in the mid-1970s to nearly 70% in 2000 (see Chart 1), led by the positive contribution of female participation, which grew by more than 12 percentage points to reach around 60% in 2000.<sup>2</sup> A similar increase in overall participation was recorded in the US over the same period, but EU-15 participation rate in 2000 was no higher than that of the US three decades earlier (in the 1970s). In 2000, the gap between US and European participation still reached 12 percentage points for women and 5 percentage points for men.

This paper seeks to identify the determinants of the evolution of female participation in Europe. The analysis is performed by estimating women participation equations for three different age groups (young (15-24 years old), prime-age (25-54) and older age groups (55-64)) using annual macro data for a panel of 12 of the EU-15 countries over the period 1980-2000.<sup>3</sup>

The separate analysis for each one of the relevant age groups of potentially active women can be easily justified. For example, fertility decisions are key for prime-age women but irrelevant for the old ones, while other factors such as social protection are important determinants for old women.

An innovative feature of our paper is its focus on institutions as explanatory factors for participation rates. The analysis of the effects of institutions on unemployment and employment has largely developed in recent years since the dataset compiled by Blanchard and Wolfers (2000) and Nickell and Nunziata (2001) have become available. Nickell (1997), Elmeskov et al. (1998), Belot and van Ours (2000, 2001) and Bertola et al. (2003) are some examples of studies that focus on the direct effect of institutions, while Blanchard and Wolfers (2000), Jimeno and Rodriguez-Palenzuela (2001) and Nunziata (2002) follow an approach based on the interactions between institutions and shocks. We exclusively focus on the direct impact of institutions. To our knowledge this paper is among the first ones to look at the impact that institutions could have on participation decisions, other examples are Blöndal and Scarpetta (1999) who analyse retirement decisions and Jaumotte (2003), which also looks at females' participation.

Our findings discard any doubt on the influence of institutions on women's participation in Europe. Institutional factors can shape female participation decisions and therefore the dynamics of worked hours per capita and, in turn, GDP per capita and economic growth in the EU. However the degree to which these factors shape or interact with preferences is outside the scope of this paper.

The strictness of labour market institutions negatively affects the participation decisions in the three groups considered. Indeed, changes in rules or in features that increased the overall flexibility of labour market institutions in many European countries in recent years (e.g. declining union density, decreasing employment protection, tightening of eligibility criteria for unemployment benefits, etc.) have generally supported female participation. We also find that institutional features

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<sup>2</sup> By comparison, male participation rates fell by more than five percentage points to around 78% over the same period.

<sup>3</sup> Countries include Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and the UK.

aimed at reconciling motherhood with professional life such as maternity leave schemes favour participation of prime-age women.

More linked to preferences, but also to social norms and institutions, fertility and education decisions have been dominant forces in determining the evolution of participation rates during the sample period considered for prime-age and young females respectively, while the extensive use of part-time employment has been relevant for both age groups. Finally, cohort effects, which are also linked to institutions, preferences and social norms, appear to be crucial to understand the developments in participation for oldest females.

The paper is organised as follows. Section 2 presents the empirical model and discusses how the overall institutional framework and other variables traditionally suggested by economic theory are expected to influence labour market participation of women. Section 3 reviews the stylised facts and presents the estimation results. Section 4 discusses the main findings and gives some conclusions.

## 2. Empirical model

The general version of the empirical participation equation estimated for each group is the following:

$$\text{Log}(PR_{it} / 1 - PR_{it}) = \beta X_{it} + \gamma Z_{it} + b_t + c_i + \varepsilon_{it}.$$

The dependent variable is the logit transformation of participation rates of each group, for country  $i$  and period  $t$ . The participation rate is a variable bounded between zero and one. This can be taken into account by specifying the regression of participation rates on the conditioning variables as  $E(PR_{it}) = F(\beta X_{it} + \gamma Z_{it} + b_t + c_i)$ , where  $F$  is a probability distribution function. If  $F$  is chosen to be a logistic function, this model will lead to a linear equation with the transformed variable  $\text{log}[(PR_{it}/1-PR_{it})]$  as the dependent variable.<sup>4</sup>  $b_t$  and  $c_i$  are period and country effects respectively.

The explanatory variables include a range of plausible determinants of each age group's participation rate. These determinants may be organised into two main groups. Vector  $Z_{it}$  gathers variables traditionally suggested by standard economic theory and usually found in empirical studies. Vector  $X_{it}$  is meant to bring together variables reflecting the institutional framework ruling European labour markets and general preferences.

For all age groups, the vector of market institutions  $X_{it}$  includes the following elements: union density, employment protection, unemployment benefit systems and labour taxes, all of the taken from Nickel and Nunziata (2001). These variables are time varying and are available until 1998. In

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<sup>4</sup> The estimations in this paper were also performed using the actual (non-transformed) participation rate as dependent variable, the results did not show any relevant changes with respect to the ones presented in the paper.

addition, this vector includes a number of institutional features that are thought to be specific to each age group and will be discussed in more details in Section 3.

The relevance of the institutional framework as a determinant of female participation decisions can be discussed on the basis of a standard “insider-outsider” model, in which prime-age males could be seen as insiders because they show a more stable attachment to the labour market, while women of all ages tend to be less attached to the labour market and can be seen as outsiders.

Union density, defined as the ratio of union members to total employees, is a labour market institutional feature expected to be an important determinant of participation.<sup>5</sup> The involvement of unions in the wage bargaining will lead to a higher wage compression and larger employment differences between insiders and outsiders, which will impact on the expectations of outsiders to get a job. Therefore, we expect more unionised economies to display lower average participation rates among the less attached workers, hence, women. During the 1980s and the 1990s, union density has declined in many countries and may have favoured a convergence in participation rates among age and gender groups.<sup>6</sup>

Employment protection is another institutional feature that should play an important role in determining participation, while the overall influence may go in any direction. A stringent employment protection framework should restrain employers’ willingness to hire and fire workers. As a result, employment, hence, participation rates of workers with numerous lapses of inactivity should be negatively affected. At the same time, employment protection is also meant to provide a positive incentive to participate in a labour market where risks of getting unemployed are smaller. Employment protection is measured as a range from 0 to 2 depending on the relative strictness of employment protection in each European country. In general, employment protection is high in all European countries, but the strictness of it has significantly declined over the last two decades.

The potential effects of unemployment benefits on participation follow a similar mechanism to the one of employment protection. To the extent that a more generous unemployment benefit coverage strengthens union bargaining strategies, it would reduce the employment rates of the outsiders and indirectly, their participation rates. On the other hand, however, the existence of more generous unemployment benefit systems could represent a positive incentive to participate in the labour market from the viewpoint of workers. Unemployment benefits may be described by two variables: the replacement ratio and the benefit duration. Replacement ratios are measured as the ratio of total unemployment benefits for the first year to average net earnings. They have generally decreased in the last two decades, although this has varied across countries. Unemployment benefit duration is a measure of the amount of time the unemployed keep on receiving unemployment benefits.

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<sup>5</sup> We have considered, at an early stage, the degree of wage bargaining co-ordination, but it was found to be insignificant in the estimations and, in general, highly correlated with other institutions.

<sup>6</sup> It should be noted that this is a quite imperfect measure of unionisation. There are countries with low affiliation rates like Spain or France where union agreements apply to all workers at a national level.

Developments in unemployment benefit duration during the last two decades have varied significantly across European countries: some have extended it, some have reduced it.

Finally, labour taxes are also expected to be a relevant determinant of women's participation. Any increase in taxes leading to lower net wages will increase participation in order to keep the income level constant. However, the substitution effect (cheaper leisure) will tend to lower participation. Our labour taxes variable measures the sum of income and consumption taxes from countries' national accounts. It shows a high dispersion among EU-15 countries and an increase in all countries (but the Netherlands and the United Kingdom) in the last two decades.

Closely related with institutional factors, labour market programmes are also expected to have some influence on female participation. This influence could be direct, by allowing individuals to qualify for unemployment benefits, or indirect, by increasing the probability to find a job after participating in the programme. However, the lack of international comparable data by age and gender groups does not allow us to include labour market programme variables in our study.<sup>7</sup>

The vector  $Z_{it}$  contains variables suggested by economic theory that are usually found in empirical studies. Economic theory gives a central role to potential earnings or potential wages as a determinant of participation.<sup>8</sup> The participation decision of women is usually modelled as women choosing between market work, household work and leisure. If potential earnings in the market (relative to home productivity) increase, participation decisions will be influenced by an income effect, which will increase demand for leisure given the higher income, and a substitution effect. Labour market participation will increase if the positive substitution effect is larger than the income effect.

In practice, it is very difficult to find adequate variables to measure potential earnings of each group of women considered. Average wages for a specific group of women could reflect skill composition and self-selection rather than participation behaviour. An alternative measure used in the literature is the level of education of the relevant group.<sup>9</sup> In the case of women, this variable is likely to capture not only higher potential wages associated to higher human capital, but also preferences, women with higher education, who have invested more in human capital accumulation are likely to have higher preferences for market production. To disentangle these potential effects is very difficult and in general the coefficient of education in participation equations cannot be interpreted as capturing exclusively potential earning.

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<sup>7</sup> See Johansson (2002) for a recent study on the effects of labour market programs on labour force participation in Sweden.

<sup>8</sup> See for example the seminal work of Mincer (1962).

<sup>9</sup> One major drawback of education measures used as proxies of human capital is that it does not take into account on-the-job training and accumulated experience.



In addition to the above mentioned shortcomings, it should be added the scarcity of valid data. Measures of average wages by gender and age group are not available for our sample. In the case of education, some comparable indicators exist across countries but only as 5 year averages.<sup>10</sup>

The prevailing economic conditions are also expected to influence participation decisions. To control for the economic business cycle we included the overall unemployment rate. We prefer labour market related proxies to capture business cycle developments to alternative measures such as the output gap because omitting the unemployment rate could imply that the institutions' coefficients also captures the indirect effect of institutions on participation via unemployment. In addition, the unemployment rate is expected to better capture cyclical labour market pressures than other business cycle indicators. Additionally, we include average aggregate real wages, which are expected to account for the general macro economic and labour market conditions. The potential problem of endogeneity of these variables is diminished by the fact that our dependent variable is defined for a specific group of population and consequently its potential feedback to aggregate unemployment and/or wages should be limited. Nevertheless, in most of our specifications, we instrumented these variables using lags, real productivity, and a measure of the output gap.

Not only general economic conditions are relevant but also sectoral developments. The relative importance of service activities in the EU-15 has increased, which has fostered certain types of occupation and work arrangements (e.g. part-time jobs) that are expected to favour female participation.

The error term in our equations,  $\varepsilon_{it}$ , is likely to suffer from autocorrelation. The population in the sample moves in and out of each age group over time, these slow moving cohort effects will be the responsible for autocorrelation. Including lags of the dependent variable among the explanatory variables would likely bias the estimated by capturing these slow moving components of the error. Instead, estimations are performed using feasible GLS allowing for autoregressive, AR(1), and heteroskedastic residuals. We implemented unit root and cointegration test for our panel to ensure that our results are not based on spurious regressions. However, due to the short time series dimension of our panel the unit roots and cointegration results must be interpreted with caution.

### 3. Results

In this section we estimate participation equations for three different age groups of women using time series of annual macro data for a panel of 12 EU-15 countries.<sup>11</sup>

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<sup>10</sup> See Barro and Lee (2000) and De la Fuente and Domenech (2002).

<sup>11</sup> The panel is unbalanced for some of the explanatory variables.

### 3.1. Prime-age females' participation

Participation rates of prime age women in the 12 countries of our sample rank from below 60% in Spain, Ireland and Italy to well over 80% in Finland, Sweden and Denmark. Within each country prime age women are the most active ones, with the remarkable exception of the Netherlands where young and prime age women have similar participation rates.<sup>12</sup>

When comparing the average participation rate for this group during the 1980s with the one during the 1990s for each country (Chart 3), one can see there has been a significant increase in prime age female participation (up to 20 percentage points in Spain and the Netherlands) in all countries except Sweden, Finland and Denmark. However, in these three Nordic countries, prime-age participation rate was already very high in the 1980s and had therefore little room for a further rise. An interesting feature of the cross-country dynamics of participation of prime age women is the catching up process that has taken place during the last two decades. The countries with lowest participation rates have witnessed the highest increases and vice versa, although the ranking of participation rates levels across countries has hardly changed from one decade to the next.

The main specificity of this age group is that it includes the period of the life cycle when women have children. Indeed, in 2000, the average age of European women at the birth of the first child ranged from nearly 27 years old in Portugal to almost 30 years old in the Netherlands. Having a family, and especially having small children, conditions the preferences of women as it implies more opportunities for home production. Consequently, when estimating the participation equation for this group one needs to account for the relationship between fertility and participation decisions. In fact, having children and participating to the labour force could be understood as joint decisions. It could be argued however that causality is more likely to go from fertility to participation because having children is a permanent decision, while participation is reversible, and therefore can adjust in the short run. In addition to the general determinants of female participation discussed in the previous section, we include then a fertility variable (fertility rates) among the explanatory variables and try to alleviate potential endogeneity biases by instrumenting it with using lags.

Other specific determinants of participation for this group are institutional features like maternal/parental leave or the availability of childcare services. These, together with the possibility to take up a part-time job, could play an essential role on the arbitrage faced by prime age women between leisure, market work and home production, by enabling women to reconcile motherhood with professional life.<sup>13</sup> Therefore, these features are expected to have a positive impact on prime age female participation and are included in our equation specifications.

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<sup>12</sup> The extended use of flexible working arrangements in the Netherlands allows young people to conciliate studying and working activities.

<sup>13</sup> Recent studies using micro data have found evidence in support of this fact, see for example Del Boca *et al* (2004).

Estimation results for prime age women are presented in Table 1. In order to check integration and cointegration properties in our panel, we performed a Fisher test as suggested by Maddala and Wu (1999): twice the sum of the log of p-values from the individual tests is a chi-squared distribution with degrees of freedom twice the number of cross-sections (12 countries). We combined p values (MacKinnon's approximations) from the Phillips Perron test and accepted the null of a unit root for prime age female participation. The same exercise implemented for the residuals of the regressions in Table 1 resulted in a rejection of the null hypothesis of no cointegration. Therefore we reject the hypothesis of spurious regressions.<sup>14</sup> The common (to all the countries) autocorrelation coefficients that we estimated ranked from 0.4 - 0.55 depending on the specification.<sup>15</sup>

Labour market institutions appear to be relevant for participation decisions of this group. The estimation coefficients of the unemployment benefit variables (both, replacement ratio and duration) and union density are negative, significant and very stable across specifications, while employment protection is found not to be significant. Labour taxes, as measured in Nickell and Nunziata (2001), do not appear statistically significant. This was expected because it measures country average tax revenues including income and consumption taxes, while the relevant variable to capture the impact of taxes on prime age female participation should be the average tax rate of the second earner in the household. This tax rate is not available for our sample because some of the countries have family taxation and it is not possible to allocate the various tax reliefs between household partners. Additionally, there are difficulties to make comparable the different tax income legislation across countries. Nevertheless, an interesting attempt to construct a measure of second earner tax rate for OECD countries has been made in Jaumotte (2003).<sup>16</sup> We introduced this variable in our estimations, but it turned out having a non-significant coefficient.

Maternity/parental leave measured in weeks (taken from Gauthier and Bortnik, 2001) seem to have an encouraging effect on participation if the leave is not too long. According to our estimations, the effect of maternity/parental leave becomes negative after approximately 10 months.

If institutions had remained at the 1980's level the participation of women aged 25-54 would have increased in the Netherlands 20% less than predicted, almost 30% less than predicted in Portugal or 20% less UK. While on the other hand, the development of institutions has prevented participation from further increase in Italy and Finland, this is mainly due to the rise of unemployment benefit replacement ratio in these two countries. All this can be seen in the first panel of Chart 10, which gives an idea of the net contribution that the development of some of the variables considered in the regressions make to the total change in female labour force participation in each country. It compares changes in participation predicted by our models with

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<sup>14</sup> Similar tests were performed for each demographic group and in every case we rejected the hypothesis of spurious regressions.

<sup>15</sup> For the main specifications of this table we also tried running pooled OLS including period and country effects, the overall fit was good, adjusted R2 over 0.95 .

<sup>16</sup> We are most grateful to Florence Jaumotte for kindly allowing us to use tax and childcare related variables from her database.



those obtained had specific explanatory variables remained constant since the beginning of the 1980s.

We encountered difficulties to find a proxy of childcare availability for our sample. We tried three different variables to account for childcare availability and child benefits, namely public childcare expenditure per child in formal day care from Jaumotte (2003), family allowances per child (Gauthier, 2003) and public expenditure in child benefits as percentage of GDP (calculated from Eurostat data). None of them was found to be statistically significant, failing then to capture the potential positive impact of childcare availability on female participation.

Regarding to the influence of prevailing economic conditions, their role is only captured by the unemployment rate, with an statistically significant and negative coefficient, which reflects discouragement effects, due to low attachment to the labour market. Our measure of aggregate wage turns to be non significant despite several attempts to improve it. In order to account for the influence of potential earnings we constructed a measure of real wage for women using the average wage gap (unadjusted for skills) provided by Eurostat and gender weights in total employees. Data prior to 1994 was assumed on the basis of qualitative trends reported by the European Industrial Relations Observatory. This variable did not provide more satisfying results. Similarly, several interpolation of different indicators of education available on a 5-year average basis, did not provide concluding results.

As regards the relationship between fertility and participation, a fact well-documented in the recent literature is that some European countries with high female participation also have high fertility rates.<sup>17</sup> Our data confirm this for Sweden, Denmark and the Netherlands, while the relationship is negative for the rest of the countries in our sample. Therefore, in our specifications, we interact fertility rates with a dummy for Sweden, Denmark and the Netherlands, allowing for an asymmetric effect of fertility on participation rates. Fertility rates turn out to be significant and positive for this group of countries with a net coefficient of around 0.4/0.5, and negative and also statistically significant for the rest of European countries.

The availability of part-time jobs, which can help women to reconcile work and family life, is found to have a positive influence on prime age female participation. The most remarkable case is Ireland where according to chart 10a, part-time jobs are responsible for about 12 points (almost 40%) of the total predicted increase in prime age participation and the Netherlands were they account for more than 30%.

In the results shown in Table 1 we used as a proxy to the availability of part-time jobs the percentage of females (of all ages) working part-time. Alternatively, we tried employment in services over total employment since part-time jobs are concentrated in the services sector and

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<sup>17</sup> See for example Pissarides *et al* (2004) and Del Boca *et al* (2004).

employment in the service sector has been booming over the last two decades. Results were quite similar.

Finally, we introduced the percentage of parliamentary seats occupied by women as a proxy for gender discrimination. It is meant to possibly reflect the changing role of women in the society. Interestingly, it is found to be statistically significant and positive in some of the specifications.

The ability of the estimations to explain the evolution over time of participation rates for each country is examined in Chart 4. It shows a good overall fit for each country.

### **3.2. Participation of females aged 55-64**

The participation rate of women aged 55-64 have slightly increased in most of the countries of our sample, with the exception of France and Finland (see Chart 5). However, the changes recorded between the 1980s and the 1990s were relatively small and did not affect the overall ranking of participation across countries. Indeed, Sweden, Denmark, Ireland and the UK remained as the countries with the highest participation rate, while Belgium, France and the Netherlands did not show any significant catch up between both decades.

In addition to the general determinants of participation previously discussed, older women's participation decisions are expected to be influenced by some specific institutional features. Two specific institutions are considered in this group, both trying to capture the retirement system framework. The first one is the official retirement age, which should allow taking into account differences in the legal systems across countries. It has remained broadly stable over time in most countries, but the differences across countries are significant. The second institutional factor tries to capture differences in social protection across countries, by measuring the expenditure on social protection for old aged people as a percentage of GDP. In general, this ratio, which shows some heterogeneity in social protection at the country level, has increased over time, partly reflecting the ageing of the population in all European countries.<sup>18</sup>

We have also included in the estimates of this group the participation rate of prime-age women lagged 10 years.<sup>19</sup> This variable tries to capture cohort effects, i.e. the fact that the participation behaviour of women aged 55-64 today is linked to their participation decisions when they were 25-54 years old. Chart 6 illustrates cohort effects at the euro area level. The horizontal movement along each line shows how participation evolves with age, showing a decline for the oldest groups, while the vertical distance between lines reflects the cohort effect, which appears non-negligible for women. Indeed, for those 45-49 years old, we can see that the cohort effect on the participation rate has been of around 20 percentage points in the past 15 years.

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<sup>18</sup> Variables on retirement systems are from Blöndal and Scarpetta (1999). See Annex.

<sup>19</sup> Constructed using ten-year data published by the International Labour Office (ILO), which have been interpolated to obtain annual data by dividing the change homogeneously through time.

The results of the estimations are shown in Table 2. The hypothesis of spurious regressions is rejected and the autocorrelation coefficients common to all countries was about 0.54.

Starting with the cyclical factors, which are measured by the unemployment rate and real wages, both are found to be non-significant. This suggests that participation of the oldest group is mainly explained by factors of a more structural nature. Indeed, column 2 in Table 2 shows that cohort effects play a determinant role in explaining the participation rate of this group. Cohort effects are expected to measure mainly preferences, but, indirectly, also institutional effects and social norms. Chart 10b shows that keeping the cohort effect at the early 1980s levels would have resulted in a lower increased in participation levels in all the countries, cohort effects have even prevented Italy, France, Finland, and Spain from null or negative (predicted) increases in participation.

As regards the institutional framework, retirement age, as expected, is positively correlated with participation. In this case, however, we need to control for the influence of Spain in our panel, where the retirement age appears to be relatively less binding than in other countries. Expenditure in old age social protection programmes is also found significant and has a negative effect on participation.<sup>20</sup> Finally, most of the remaining labour market institutions, including union density, employment protection and labour taxes, have negative effects on participation. Remarkably, the changes in the relevant institutions for this group since 1980 in Germany, the Netherlands and Portugal, can explain half of the change in participation predicted by the model (see Chart 10b).

Chart 7 examines the ability of the equation 2 in Table 2 to explain the evolution over time of participation rates for each country and it shows, overall, a good fit for each country.

### **3.3. Participation of females aged 15-24**

Young European women, aged 15 to 24 years old, make up for a far more heterogeneous group than their elders as far as participation to the labour force is concerned. Their participation rate varies widely across countries, from no higher than 32% in Belgium to nearly 70% in the Netherlands in 2000. Yet, they all share two common characteristics. First, their participation rates are generally lower than that of prime-age women and higher than that of older women (aged 55 to 64 years old). Second, unlike their elders, participation rates of young women declined between the 1980s and the 1990s in virtually all European countries, with the remarkable exception of the Netherlands (see Chart 8). On average, the participation rate of young European women fell by nearly 8 percentage points between 1980 and 2000. The magnitude of that fall, however, differs substantially among countries. In general, countries with a high participation rate of young women in the 1980s (such as Denmark or the United Kingdom) saw less of a fall in participation.

Along with the list of general determinants of participation discussed earlier, it is likely that young women are specifically influenced by three additional factors. First, enrolment in education

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<sup>20</sup> Blöndal and Scarpetta (1999) find that this variable does not influence participation decisions for older males. Our result for females can be possibly explained by a lower degree of attachment of older females to the labour market.

appears to be extremely relevant for this age group. Young women may indeed decide either to continue studying in order to increase their skills and their chances to easily get a job in the future, or simply, to avoid being unemployed. Second, flexible types of contracts (i.e. temporary and part-time jobs) should exert a positive influence on participation for the younger age group. It should be seen as an incentive both for firms, since their costs are lower, and for workers, since they provide a temporary attachment or a “stepping stone” to get a better job. Third, minimum wages have often been presented in the literature as an impediment to hiring young workers – who have lower skills and productivity – and could therefore also be a relevant determinant of young women participation rates.

Estimation results for the younger age group are presented in Table 3. The hypothesis of spurious regressions is rejected and the autocorrelation coefficients common to all countries ranked from 0.45 to 0.54 depending on the specification.

The first column shows the results for the basic specification. By contrast with other age groups, the institutional framework seems to have little bearing in explaining participation of younger European women. This may be surprising since, of all women, the youngest, freshly arrived on the labour market, would probably be assigned the most prominent “outsider” status in an “insider-outsider” model. However, in many European countries, young people – since they have never worked before - are not entitled to social or unemployment benefits, so that their participation behaviour cannot be influenced by these types of institutions. Taxes appear to be the only significant factor consistently discouraging the labour supply of young women in all estimations. Labour taxes increased in all European countries (but the Netherlands and the United Kingdom) between the 1980s and the 1990s. Their significant negative influence on participation may suggest that, for young women, the substitution effect of taxes exceeds the favourable income effect they might have on participation. In other words, participating to the labour force would not bring along sufficient income to make participation worthwhile compared with staying out of the labour force. Looking at country details (Chart 10c), we find that changes in labour taxes did not have an homogenous impact across countries. For example, the impact of labour taxes counteracted the decrease in young female participation in most European countries, but it had a clear worsening effect in some others (in particular, France, Ireland and Italy). Other institutional features do not appear to have a strong influence on young female participation.

Economic conditions have a significant impact on the participation rate of young women. The lower is the unemployment rate the higher is participation. This surely illustrates the discouragement effect that labour market developments may have on specific groups. Positive economic developments increase the probability to find a job and attract people on the labour market. Inversely, sluggish developments on that same labour market discourage people from participating. Wage variables give unsatisfying results. Average wages do not seem to matter in explaining young women participation. However, this may only be due to the shortcomings of our average wage variables. Similarly, a variable measuring minimum wages is found insignificant, but

this information being available for no more than five countries, estimations including minimum wage reduce the number of observations by more than half. We therefore decided to leave minimum wage out of our estimations.

Like fertility decisions for prime-age women, education enrolment may present some endogeneity problems. Going to university or going to find a job can indeed be intermingled decisions. Therefore, in an attempt to control for potential endogeneity problems, education enrolment is instrumented using lags. As expected, deciding to remain in the education system negatively affects the participation rate of young women. There is no doubt that the continued rise of the proportion of young people in education observed in our sample has significantly reduced the participation rate of this group. Chart 10c confirms that education has had a big impact on all European countries, confirming the driving force that increased education enrolment had on decreasing young participation.

Column 2 estimates the impact of the part-time ratio on young female participation. In order to take into account the likely endogeneity problem attached to the use of a part-time ratio specific to the youngest age group, we reported the results with the share of part-time employment in the 15-64 age group. Results show that part-time contracts have a positive influence on participation. Chart 10c shows that the rapid growth in part-time employment has had a fairly homogenous impact on young female participation. With only a few exceptions (in particular Denmark and Sweden), part-time employment has significantly contributed to limit the decline in young female participation. In an alternative estimation (column 3) we have also included the temporary ratio but it does not appear to be significant. This can be due to the fact that these types of contracts can interact between themselves, i.e. part-time contracts can be temporary or permanent, and therefore some overlap may arise.

Chart 9 reports the ability of equation 2 to explain the evolution over time of participation rates for each country, showing broadly a good fit for each country.

Apparently, these results point to a small influence of the institutional framework in explaining the participation rates of young European women. By contrast, choices of further education or flexible types of work seem to play a prominent role. Yet, staying at school or at university, albeit surely depending on preferences, may indirectly be highly influenced by the government subsidies and grants to education, which in Europe are significantly larger than on the other side of the Atlantic. Similarly, flexible types of work are generally more highly regulated in Europe than they are in the United States, pointing to further indirect influence of the institutional sphere.

## 4. Discussion and conclusions

Why don't European women work more? Is it due to the burden of excessively stringent labour market institutions or to general preference for leisure? By stepping away from the micro-analysis of individual determinants of participation, this study provides an interesting viewpoint from which to consider the question.

Using annual data for a panel of 12 EU-15 countries over the period 1980-2000, this paper has looked at the role that economic, institutional and social factors have played in explaining female participation rates and their developments in the last two decades. The analysis was performed by estimating participation equations for 3 different age groups (namely, the young – 15 to 24 years old –, the prime-age – 25 to 54 – and the older – 55 to 64 –).

The influence of general economic variables on participation is not even across age groups. In particular, the unemployment rate, which is meant to mainly capture labour market pressures arising from business cycle fluctuations, appeared to have some relevance in explaining participation, albeit only for the youngest and prime-age women. As expected, high unemployment tends to have a discouragement effect on these women, who, when considering that they have little chance to find a job, refrain from participating to the labour force. Other indicators of the prevailing economic conditions such as average real wages did not appear to be statistically significant, but this might be due to the difficulty of properly measuring a relevant wage variable.

For all three age groups considered, the strictness of labour market institutions negatively affects participation decisions. Indeed, the declining tightness of the institutional framework ruling labour markets in some countries over the last two decades appeared to have significantly favoured women's participation, in particular of the older age group. We also found that measures aimed at reconciling motherhood with professional life, such as maternity leave, should favour participation to the labour force.

Along with the changing institutional framework, a number of specific decisions influenced by preferences, institutions and social norms appeared to have driven participation developments of the different age groups. For example, for the younger age group, the increasing use of flexible forms of work (such as part-time employment) has been found to explain a large part of participation developments between the 1980s and the 1990s. Education enrolment, which can be seen as an alternative to finding a job or being unemployed, has been a major driving force behind the decline in young female participation. Turning to prime-age female, a fertility variable, which can be seen as the outcome of the decision to have children versus participation to the labour force, significantly curbs labour force participation.

Finally, the participation of oldest age group appeared significantly influenced by the lifetime behaviour of older women. If they did not participate at an earlier age, they are not likely to participate at an older age. Once again, this points to the weight and influence of cultural habits.

In sum, our results discarded any doubt on the influence of institutions on women's participation in Europe. Institutional factors, together with preferences and economic factors have shaped female participation decisions. Therefore, for the successful design of efficient policy measures that can bring inactives to the labour force, help Europe to be more dynamic and catch-up with the United States in terms of hours worked per head, and thereby, GDP per capita, it is very relevant to identifying all factors influencing female labour force participation. This paper is a step in that direction.



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**Table 1**  
**Panel data estimates of participation rates**  
**Prime-age females 25-54**

	(1)	(2)	(3)	(4)*	(5)*
<b>Institutional determinants</b>					
UB Replc. Ratio	-0.393 (-3.29)	-0.361 (-3.78)	-0.350 (-4.36)	-0.297 (-3.46)	-0.286 (-3.39)
UB duration	-0.476 (-4.2)	-0.410 (-3.69)	-0.538 (-5.31)	-0.581 (-5.30)	-0.581 (-5.35)
Union density	-0.887 (-3.16)	-0.929 (-3.68)	-0.819 (-3.65)	-0.698 (-2.91)	-0.644 (-2.52)
Empl. Protection	0.086 (0.89)				
Taxes	0.354 (1.26)				
Maternity leave weeks			0.033 (3.36)	0.032 (3.06)	0.032 (2.96)
Maternity leave weeks squared*100			-0.047 (-4.51)	-0.043 (-3.83)	-0.040 (-3.61)
<b>Other determinants</b>					
Real wage	-0.224 (-1.26)	-0.220 (-1.28)	-0.159 (-1.03)		-0.179 (-1.05)
Fertility rate	-0.337 (-3.75)	-0.344 (-3.78)	-0.469 (-5.22)	-0.470 (-3.78)	-0.496 (-4.07)
Fer.rate*Nordic&Netherlands	0.981 (6.14)	0.981 (5.86)	1.126 (6.83)	0.873 (4.25)	0.837 (4.20)
Unemployment rate	-0.013 (-3.7)	-0.012 (-3.47)	-0.005 (-1.63)	-0.011 (-3.02)	-0.016 (-4.26)
Female part-time	0.029 (8.86)	0.029 (8.81)	0.033 (10.06)	0.030 (9.89)	0.028 (9.29)
% Women Parliamentary seats	0.536 (2.47)	0.452 (2.17)	0.446 (2.11)	0.143 (0.65)	0.113 (0.53)
Obs. No.	196	196	184	184	184

Note: Except when indicated, estimations are performed by FGLS including time and country dummies. \* 2 stages FGLS. Instruments not included in the equation are lagged (4 and 5 lags) fertility, lagged unemployment (2 and 3 lags), productivity and output gap. t-statistics in parentheses. Sample period: 1984-2000. Countries include Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and the UK. For variable definitions see the text and annex.

**Table 2**  
**Panel data estimates of participation rates**  
**Old females 55-64**

	(1)	(2)
<b>Institutional determinants</b>		
Old-age social protection (% GDP)	-0.043 (-2.65)	-0.043 (-2.65)
Retirement age	0.003 (0.11)	0.123 (7.41)
Retirement age * Spain		-0.015 (-4.52)
UB Replc. Ratio	-0.067 (-0.65)	-0.067 (-0.65)
UB duration	-0.318 (-3.12)	-0.318 (-3.12)
Union density	-0.937 (-3.74)	-0.937 (-3.74)
Empl. Protection	-0.487 (-4.21)	-0.487 (-4.21)
Labour taxes	-0.469 (-1.79)	-0.469 (-1.79)
<b>Other determinants</b>		
Unemployment rate	0.004 (0.46)	0.004 (0.46)
Real wage	0.106 (0.67)	0.106 (0.67)
Cohort effect	0.610 (4.74)	0.610 (4.74)
Obs. No.	236	236

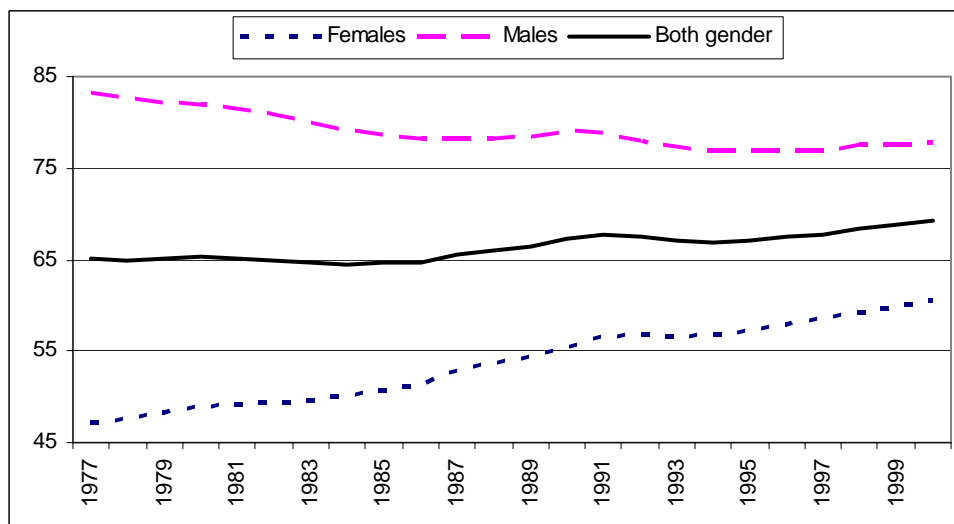
Note: Estimations are performed by 2 stage FGLS including time and country dummies. Instruments not included in the equation are, lagged unemployment (2 and 3 lags), productivity and output gap. t-statistics in parentheses. Sample period: 1980-2000. Countries include Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and the UK. For variable definitions see the text and annex.

**Table 3**  
**Panel data estimates of participation rates**  
**Young females 15-24**

	(1)	(2)	(3)
<b>Institutional determinants</b>			
Unemployment benefit replacement ratio	0.111 (0.59)	0.279 (1.57)	0.324 (1.78)
Unemployment benefit duration	-0.189 (-1.37)	-0.148 (-1.14)	-0.122 (-0.95)
Union density	-0.332 (-0.83)	-0.307 (-0.88)	-0.459 (-1.26)
Employment Protection	-0.202 (-1.23)	-0.328 (-2.30)	-0.399 (-2.63)
Labour taxes	-1.550 (-3.36)	-1.937 (-4.72)	-2.107 (-4.93)
<b>Others determinants</b>			
Unemployment rate	-0.025 (-4.24)	-0.024 (-4.45)	-0.028 (-4.36)
Real wage	-0.454 (-1.69)	-0.325 (-1.32)	-0.268 (-1.11)
Young in education	-0.024 (-3.21)	-0.024 (-3.63)	-0.024 (-3.58)
Part-time ratio 15-64	-	0.021 (3.61)	0.019 (3.28)
Temporary employment	-	-	0.233 (1.22)
Obs. No.	172	172	172

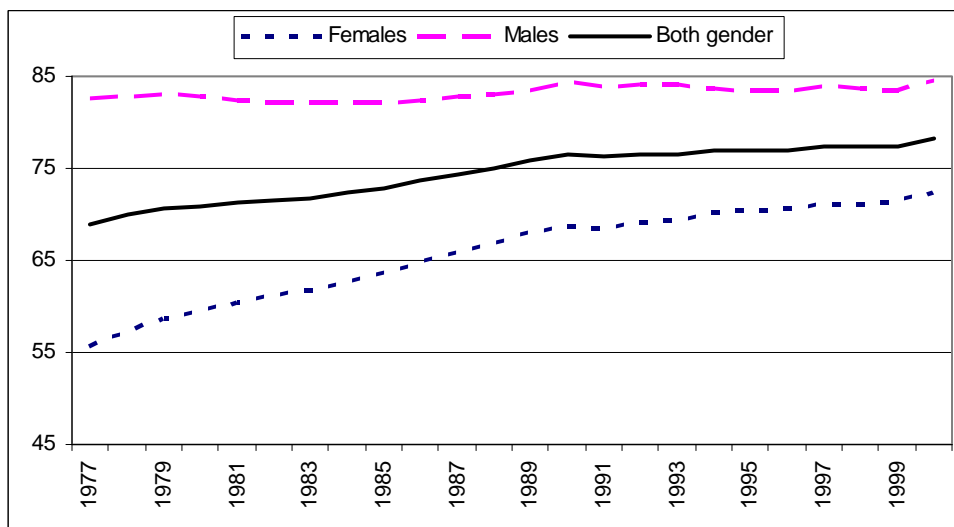
Note: Estimations are performed by 2 stages FGLS including time and country dummies. The instruments not included in the equations are labour productivity, the output gap and lags. t-statistics in parentheses. Sample period: 1985-2000. Countries include Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, UK. For variable definitions see the text and annex.

**Chart 1: Labour force participation in the EU**  
*(as a percentage of working age population)*



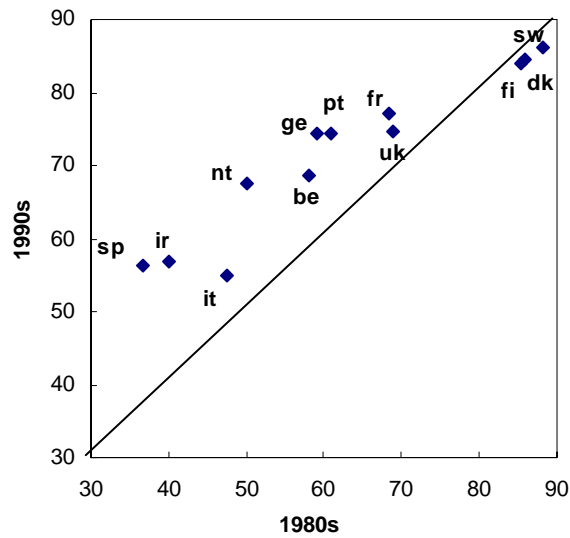
Source: OECD.

**Chart 2: Labour force participation in the US**  
*(as a percentage of working age population)*



Source: OECD.

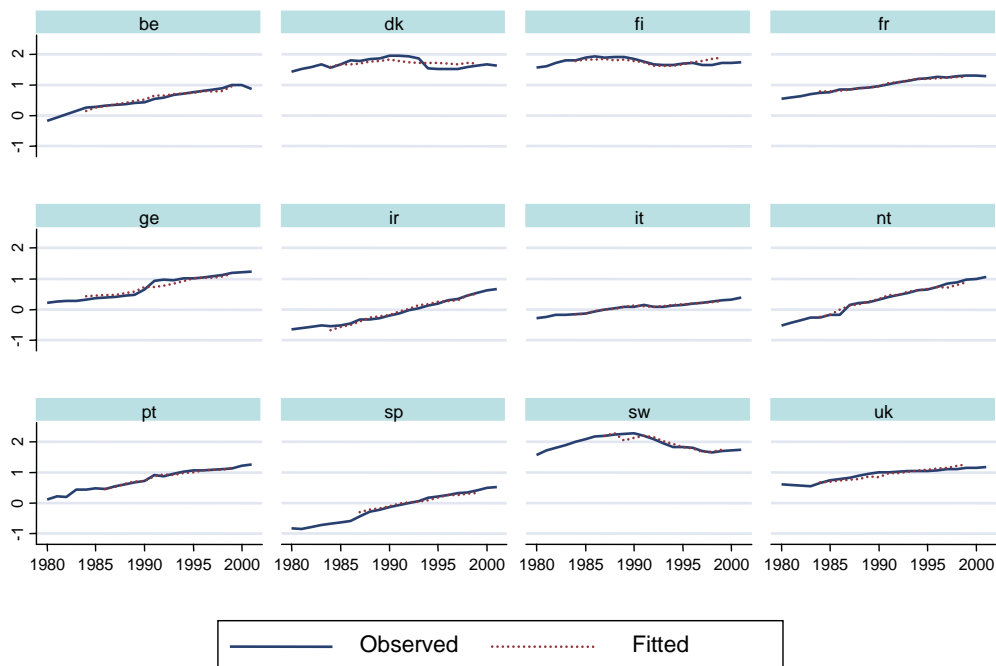
**Chart 3: Labour force participation of women 25 to 54 years old, 1980s versus 1990s**  
*(as a percentage of working age population)*



Sources: Eurostat, OECD and ECB calculations.

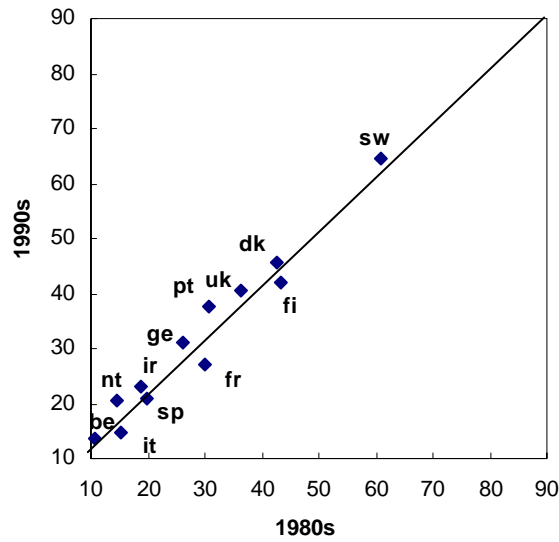
Note: The chart displays average female participation rates for the 1990s, plotted against the average rates for the 1980s for all EU countries in our sample. Averaging the two decades is an attempt to control for the cyclical movements in participation. The 45 degrees line is added in order to facilitate the comparison of the developments. Points above the line imply an increase in participation between the two decades, while points below the line indicate a decline.

**Chart 4: Females' participation developments, 1980-2000, 25-54 years old**  
*(Model 2, Table 1)*



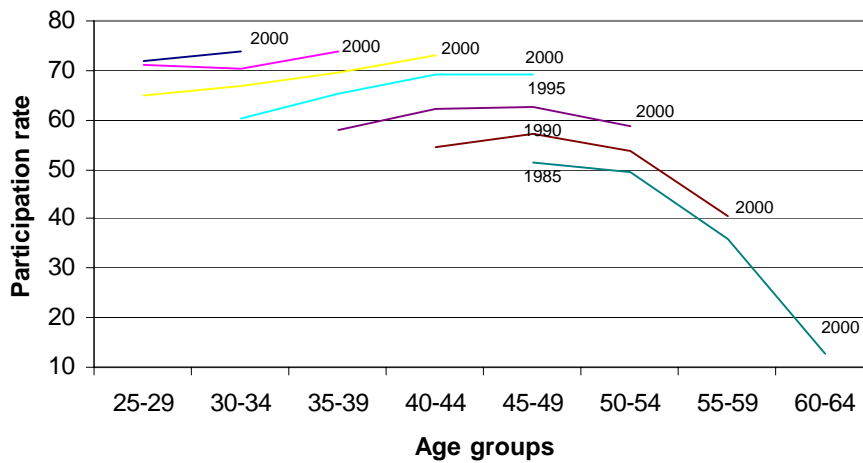


**Chart 5: Labour force participation of women 55 to 64 years old, 1980s versus 1990s**  
*(as a percentage of working age population)*



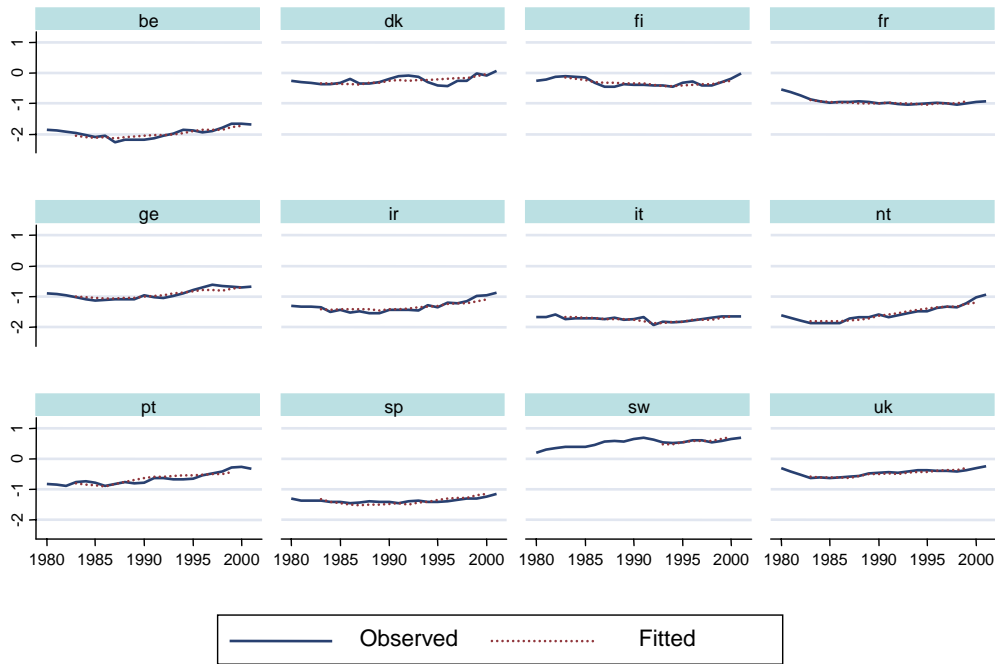
Sources: Eurostat, OECD and ECB calculations.  
 Note: See note in Chart 3.

**Chart 6: The cohort effect on females' participation**

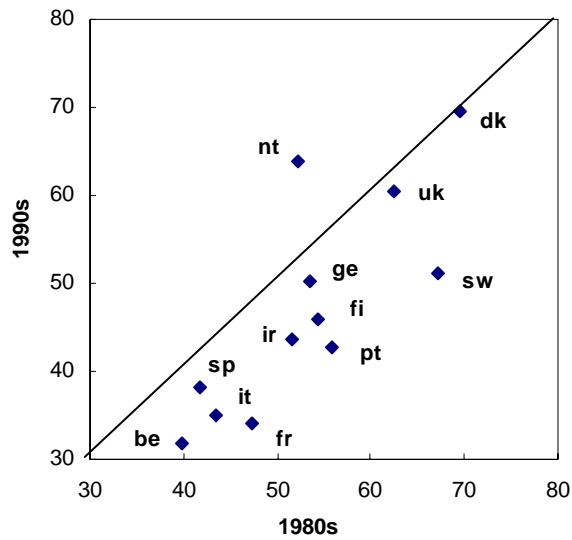


Sources: Eurostat, OECD and ECB calculations.

**Chart 7: Females' participation developments, 1980-2000, 55-64 years old**  
*(Model 2, Table 2)*

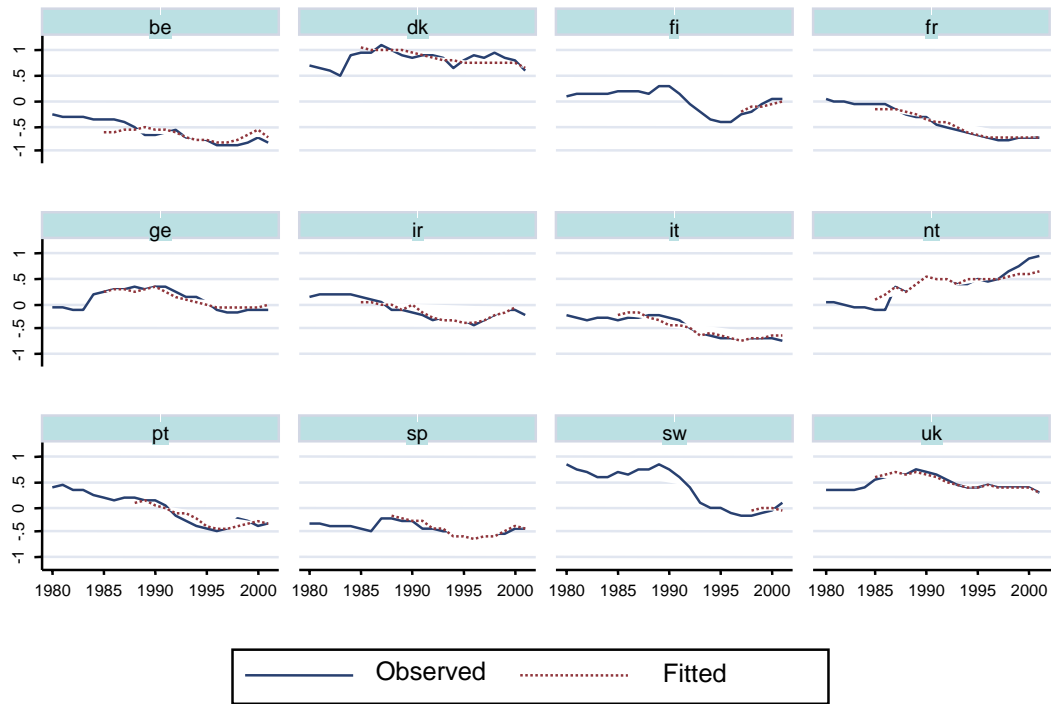


**Chart 8: Labour force participation of women 15 to 24 years old, 1980s versus 1990s**  
*(as a percentage of working age population)*



Sources: Eurostat, OECD and ECB calculations.  
 Note: See note in Chart 3.

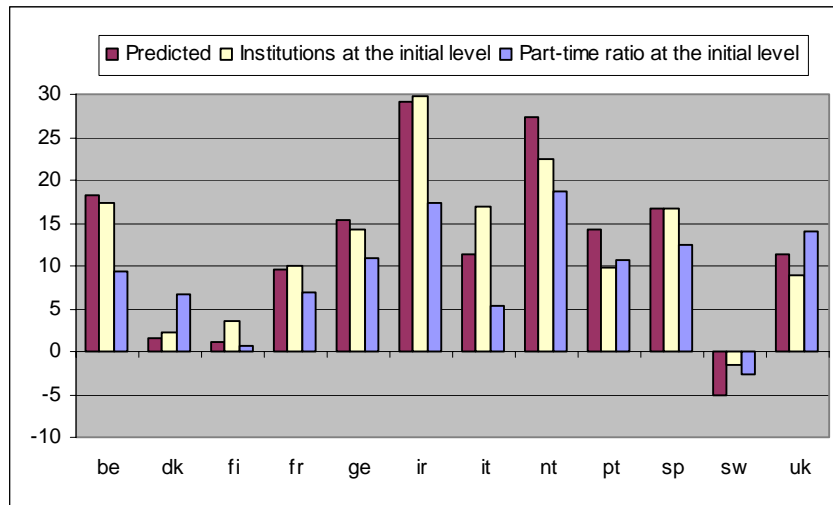
**Chart 9: Females' participation developments, 1980-2000, 15-24 years old**  
*(Model 2, Table 3)*



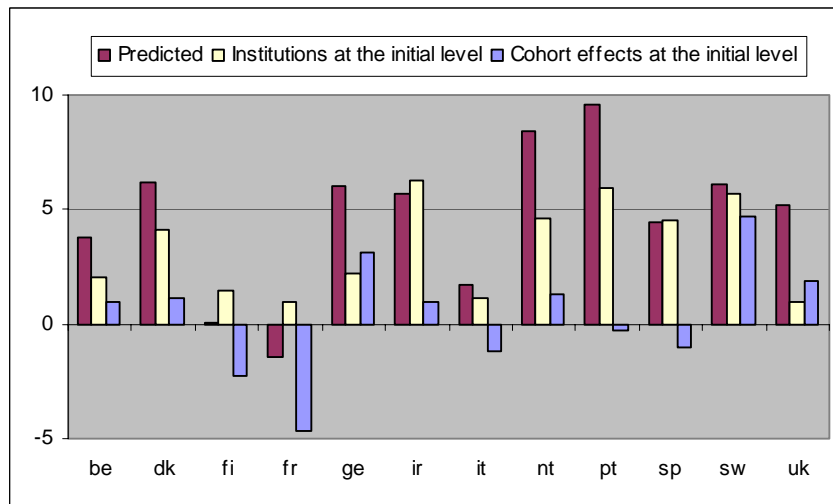
**Chart 10: Contribution of different factors to participation developments<sup>(\*)</sup>**

(in percentage points)

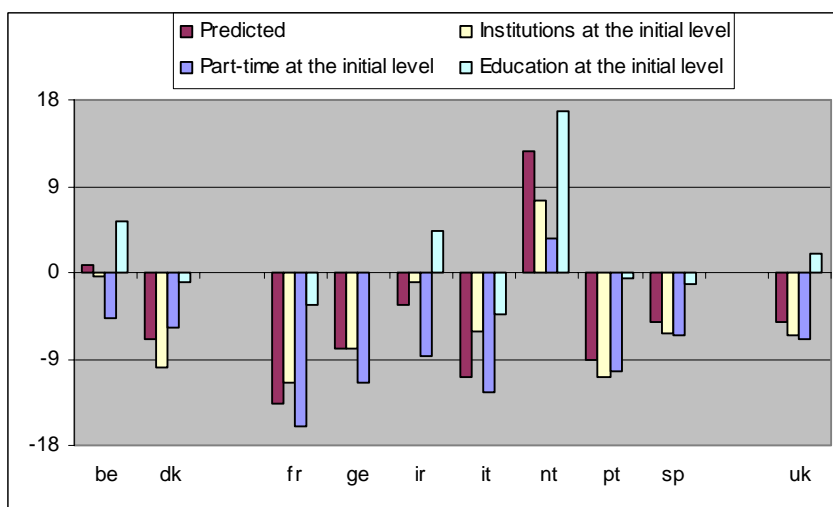
a: women 25 to 54 years old



b: women 55 to 64 years old



c: women 15 to 24 years old



Note: This chart compares predicted changes in participation with those obtained if specific explanatory variables are maintained at the levels of 1980, in order to show the relevance of the developments in each selected variable to explain changes in participation. As regards institutions, all institutional determinants shown in Tables 1 to 3 are considered (models 2, 2 and 3 respectively), excluding those that are non-significant. Finland and Sweden are not shown in chart c, given that the predicted series is too short.

## ANNEX                      Data sources and definitions

*Participation rate:* defined as the percentage of people in the labour force in the total working age population. The total labour force (or currently active population) comprises all persons aged 15 to 64 who are either employed or actively looking for a job. The working age population comprises all people aged between 15 and 64 years old. The data on participation rates and unemployment rates are derived from the annual European Community Labour Force Survey, which has been conducted every year in the spring since 1983.<sup>22</sup> OECD and ILO data have been used to extend participation rates back to 1980.

*Unemployment rate:* defined as the percentage of people actively looking for a job into the labour force. The data on unemployment rates are derived from the annual European Community Labour Force Survey, which has been conducted every year in the spring since 1983. OECD data have been used to prolong the unemployment rate back to 1980.

*Real wage:* defined as nominal wages deflated by the GDP deflator, obtained from the European Commission AMECO database.

*Vacancy rate:* defined as the number of vacant jobs as a percentage of the labour force. Vacancy data are obtained from the OECD.

*Fertility rate:* defined as the mean number of children that would be born alive to a woman during her lifetime if she were to pass her childbearing years conforming to the fertility rates by age of a given year. It is obtained from the NewCronos database, Eurostat.

*Part-time ratio:* defined as the fraction of part-time workers in total employment, obtained from the annual European Community Labour Force Survey.

*Services ratio:* defined as the percentage of employment in the services sector, obtained from the European Commission AMECO database.

*Old-age social protection:* includes old age pensions and the provision of goods and services (other than medical care) to the elderly, as a percentage of GDP. These data are drawn from European Social Statistics, Eurostat.

*Children benefit:* Three measures of children benefits were used. First, a measure including support (other than medical care) in connection with pregnancy, childbirth and the care of children and other dependent family members, as a percentage of GDP. These data are drawn from European Social Statistics, Eurostat. Second, we used monthly family allowances for the first, second and third child as a percentage of monthly earnings. These data are drawn from the

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<sup>22</sup> Eurostat compiles these data and a detailed description of the sampling methods and adjustment procedures can be found in the latest *Labour Force Survey – Methods and definitions*, 1998. There is no information available for countries before they joined the European Union (i.e. for Spain and Portugal prior to 1986, for Austria and Finland prior to 1995). The series were extended to 1980, whenever possible, using OECD Labour Force Statistics or directly, relevant national sources. German data prior to 1991 only refer to West Germany.

Gauthier database (2003). Finally, a third measure refers to public childcare spending per child in formal day care and pre-primary school (from Jaumotte, 2003).

*Maternity/parental leave*: refers to the official duration of maternity/parental leave in the event of a child birth (in weeks). In some countries, this leave may be shared between parents. The data is drawn from the Comparative Maternity, parental, and childcare leave and benefits database (Gauthier, 2001).

*Women parliamentary seats*: defined as the percentage of seats in the parliament occupied by women. United Nations Statistics and ECB calculations.

*Unemployment benefit replacement ratio*: refers to first year of unemployment benefits, averaged over family types of recipients, as a percentage of average earnings before tax. Data are taken from Labour Market Statistics Database, Nickell and Nunziata (2001).

*Unemployment benefit duration*: obtained as a weighted average of the replacement rate received the second and third years of unemployment and in the fourth and fifth years, relative in both cases to the replacement rate in the first year. Data are taken from Labour Market Statistics Database, Nickell and Nunziata (2001).

*Union density*: defined as the ratio of union members to total employees. Data are taken from Labour Market Statistics Database, Nickell and Nunziata (2001).

*Employment protection*: measures in a range between 0 and 2 the strictness of employment protection. Data are taken from Labour Market Statistics Database, Nickell and Nunziata (2001).

*Labour taxes*: defined as the sum of the employment tax rate, the direct tax rate and the indirect tax rate. Data are taken from Labour Market Statistics Database, Nickell and Nunziata (2001).

*Retirement age*: defined as the official retirement age. Data are taken from Blöndal S. and S. Scarpetta (1999).

*Minimum wage*: defined as the ratio of the minimum wage to the medium wage. OECD.

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