# You're the one that I want! Understanding the over-representation of women in the public sector*

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**Abstract**

In most countries, the public sector hires dis-proportionally more women than men. We document gender differences in employment, transition probabilities, hours, and wages in the public and private sector using microdata for the United States, the United Kingdom, France, and Spain. We then build a search and matching model where men and women decide if to participate and if to enter private or public sector labor markets. We calibrate our model separately to the four countries. Running counterfactual experiments, we quantify whether the selection of women into the public sector is driven by: (i) lower gender wage gaps, (ii) possibilities of better conciliation of work and family life, (iii) greater job security, or (iv) intrinsic preferences for public sector occupations. We find that, quantitatively, women's higher public sector wage premia and their preferences for working in the public sector explain most of the selection. We calculate the monetary value of public sector job security and work-life balance premia, for both men and women, and we quantify how wage and employment policies affect male and female unemployment, inactivity rates, and wages differently.

**JEL Classification**: J21, J16, J45, H10, E60.

**Keywords**: public sector employment, female labor force participation, gender wage gap.

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# 1 Introduction

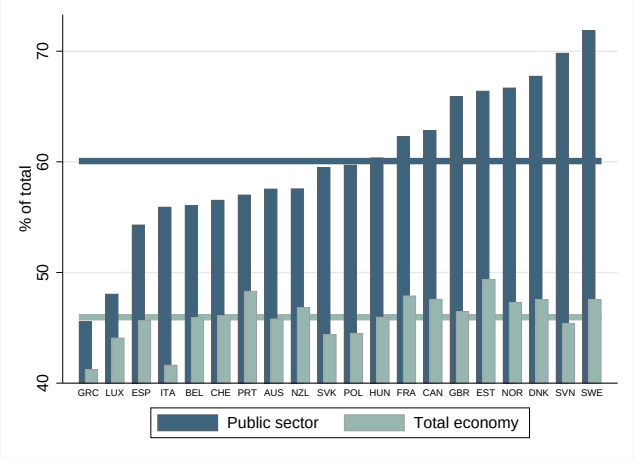
The public sector is a large employer. In OECD countries, it accounts for between 10 and 35 percent of total employment. Also, it tends to hire significantly more women than men. Figure 1 displays the fraction of women out of all workers in the public sector, as well as the fraction of women out of all workers in the total economy for 20 OECD countries. Women's share in public employment is larger than their share in total employment. With the exception of Greece and Luxembourg, the majority of public sector workers are women, their share reaching 70% in Sweden. Despite its importance for women's employment, there exist few studies on the reasons behind the over-representation of women in the public sector.

We use microdata to document several facts which are common for the United States, the United Kingdom, France, and Spain regarding gender differences in employment, transition probabilities, hours, and wages in the public and private sector. The over-representation of women in public employment persists across age groups, regions, levels of education as well as over time. This over-representation is also robust to excluding health care and education from public employment, and it is present in two thirds of the 3-digit occupations that are common across the public and private sector. Regarding transition probabilities, we estimate that the probability of moving from employment to inactivity is higher for women, and we find this probability to be significantly lower for public sector workers. We also provide evidence that gender wage gaps and working hours are lower in the public sector.

Motivated by these empirical findings, we build a search and matching model where men and women decide if to participate and if to enter private or public sector labor markets. Through the lens of our model, we view the over-representation of women in public employment as driven by supply, meaning that it is not the government that acts explicitly to hire more women, but it is women who choose the public sector more so than men. Our objective is to better understand this selection, in particular, how much of it is explained by public sector job characteristics that are related to management, organization and human resource practices in the public sector, as opposed to gender differences, for instance regarding preferences for particular occupations.

We calibrate our model separately to the four countries, using statistics from our empirical analysis to identify the model's key parameters. Running counterfactual experiments, we quantify how much of the selection of women into the public sector is driven by: (i) lower gender wage gaps and thus relatively higher wages for women in the public sector (estimated directly from the data), (ii) possibilities of better conciliation of work and family life for public sector workers (identified based on differences in flows from private and public employment to inactivity), (iii) greater job security in the public compared to the private sector

Figure 1: Share of women in the public sector and total economy




Source: OECD [2015]

(derived from differences in flows from private and public employment to unemployment), or (iv) intrinsic preferences for public sector activities (identified as a residual). We find that women's preferences are important but do not explain all of their over-representation in public employment. In particular, they explain 20 percent in France, 45 percent in Spain, 80 percent in the US, and 95 percent in the UK. The remaining over-representation of women is explained by differences in public and private sector characteristics, in particular relatively higher wages for women that explain around 30 percent in the US and Spain and 50 percent in France. Only for France and Spain, do we find work-life balance to be an important driver that explains 20 to 30 percent of the over-representation of women. Higher job security in the public sector actually reduces the over-representation of women because it is valued more by men than by women.

These last results however do not stand in contrast to men and women valuing better work-life balance and increased job security provided by the public sector, which is something we can quantify within our framework. In particular, we calculate how much of their wages private sector workers would be willing to sacrifice to face the same job separation rates or working hours as workers in the public sector. We find that the work-life balance premium is very high in Spain (25 to 36 percent), high in France and the UK (7 to 15 percent) and lower in the US (7 to 9 percent). In all countries, the job security premium is much lower, ranging from 1-2 percent in the US and the UK to 3-4 percent in France and Spain, countries with higher unemployment rates. Regarding gender differences, we find that women are willing to pay more for work-life balance, while men are willing to pay more for job security. This last result is due to the fact that women have, in general, a higher opportunity cost of working and lower wages, and hence job losses are more painful for men.

Even though female labor force participation has increased remarkably over the past decades, gender gaps in participation and employment still persist. In the US, the UK, France, and Spain participation rates of prime age women are 10 percentage points lower compared to those of men. Furthermore, women continue to earn lower wages. Many different explanations for persisting gender gaps in the labor market have been proposed and tested.[1] However, one aspect that most of this literature has overlooked so far is the particular role of public employment for female labor market outcomes and hence for gender gaps in employment, participation, and wages. Two of the most influential surveys on female employment by Killingsworth and Heckman [1986] and Blundell and Macurdy [1999] do not even mention this sector that employs such a large share of all working women. This is a serious omission because public sector labor markets operate very differently from private labor markets. In particular, the public sector does not face the same competitive forces and constraints as private firms, and its employment and wage policies are tailored to a range of different objectives.[2]

To the best of our knowledge there are only two exhaustive empirical studies – Gornick and Jacobs [1998] and Anghel et al. [2011] – which explicitly address the over-representation of women in public employment. Both studies consider cross-country data, and while several of their findings are country dependent, each point to one aspect that seems to hold across different countries. Gornick and Jacobs [1998] establish that women face lower gender wage gaps in the public compared to the private sector and suggest that this might be due to a more compressed distribution of public sector wages. Anghel et al. [2011] find that unemployed and inactive women are much more likely to search for public sector jobs than their male counterparts. Other studies regarding public employment and gender tend to focus on one particular country or can be characterized as mostly descriptive. Rosen's [1996] study on the expansion of the Swedish public sector is maybe one of the first to highlight the strong over-representation of women in public employment. His analysis reveals that between 1963 and 1993 employment of women in local government increased fourfold while that of men only doubled. Kolberg [1991] stresses that the expansion of the Scandinavian welfare state and increased public sector employment has led to more women participating in the labor

[1] Ranging from gendered education choices which lead to men and women working in differently compensated industries (Gemici and Wiswall [2014]), to maternity and institutional aspects like availability of child care and possibility of working part time (Del Boca [2002]), to maternity and better paid jobs in industries with inflexible working hours (Goldin [2014]), to behavioral gender differences showing that women shy away from competition (Manning and Saidi [2010]), to differences in time spent on household chores (Albanesi and Olivetti [2009]).

[2] For instance, attaining budgetary targets (Poterba and Rueben [1995], Gyourko and Tracy [1989]), redistributing resources (Alesina et al. [2000] and [2001] ) or satisfying interest groups for electoral gains (Borjas [1984], Matschke [2003]).

market, and according to Adserà [2004] higher fertility rates in Scandinavian countries are partly due to the higher share of women in stable public sector jobs. In line with this finding, Pertold-Gebicka et al. [2016] highlight that after the birth of their first child, Danish women tend to switch from the private to the public sector, even accepting wage losses. For France, Italy, and the UK, Lucifora and Meurs [2006] find that for women, wages in the public sector are always higher compared to the private sector while for men in the upper part of the distribution the public-private wage gap turns negative. Controlling for the endogenous selection of workers into the Spanish public sector, Hospido and Moral-Bonito [2016] on the other hand estimate a positive public sector wage premium for both men and women along the entire distribution.

The literature on the intersection of public employment and female labor market outcomes is thus limited to empirical works, with the exception of a recent paper by Bradley et al. [2017].[3] The authors set up a general model of public employment, but they calibrate it for different markets segmented by gender and education and hence ignore the interaction of women and men in the labor market. Focusing on the effect that public sector hirings have for private employment the authors also abstain from modeling individuals' participation decisions. However, given the importance of women's transitions from and to inactivity, it seems natural to extend the decision space to include non-participation when explicitly incorporating women into a search and matching model. Furthermore, according to Fontaine et al. [2020] there are more flows from public employment to inactivity than flows to unemployment or private employment. Modeling non-participation goes back to Pissarides [1990] Chapter 6, but has since then been advanced by Garibaldi and Wasmer [2005], Pries and Rogerson [2009], Krusell et al [2011], Haefke and Reiter [2011] and Albanesi and Şahin [2013]. However, none of these models specifies a public sector. Hence, to the best of our knowledge we are the first to propose a theoretical framework that combines both, public sector employment and female labor market decisions, and that allows for the study of the effect of the over-representation of women in public employment on female labor market outcomes. The remainder of this paper is organized as follows: The next section presents our empirical analysis. Sections 3 and 4 present the model and its calibration. In Section 5 we use our model to carry out counterfactual experiments, and Section 6 concludes.

[3]Separately the topics (i) female labor market outcomes and (ii) public employment have generated a large body of theoretical literature. Regarding (i) the focus has been on aspects such as child care costs (e.g. Attanasio et al [2010]), parental leaves (e.g. Erosa et al [2010]) divorce risk (e.g. Fernández and Wong [2014]), or welfare states (e.g. Greenwood et al [2000]), but none considers the effects of public sector employment. Regarding (ii), theoretical models tend to emphasize aggregate labor market effects, in particular the effects on private wages and the crowding out of private employment (see e.g. Finn [1998] in an RBC model or Gomes [2015] in a search and matching model).

# 2 Empirical analysis

We carry out an empirical analysis of the role of public employment for labor market outcomes of men and women. In particular, we analyze gender differences in employment, transition probabilities to unemployment and inactivity, hours, and wages in the public and private sector. We focus on four countries: the United States, the United Kingdom, France, and Spain. We choose these countries because their sizable public sectors encompass different industries and employ distinct hiring processes, and because these large economies have different labor market institutions and gender policies. This guarantees that common findings across these four countries are likely to be intrinsic characteristics of the public sector and not driven by country specificities. For each country, we use the representative labor force survey from which official statistics are drawn: the French *Labour Force Survey* (FLFS), the UK *Labour Force Survey* (UKLFS), the Spanish *Labour Force Survey* (SLFS) and the US *Current Population Survey* (CPS). The CPS is conducted on a monthly basis while the other three surveys are carried out every quarter.

The four surveys include individuals' demographic characteristics, as well as information on their labor force status, sector of employment, occupation, industry of employment, weeks worked and hours per week worked. We restrict our sample to individuals aged 16 to 64. For calculating stocks of unemployed, employed, and inactive individuals we use averages from 2003 to 2018 (for longer time series see Appendix A). The distinction between public and private sector jobs is based on a self-reported variable regarding each individual's employer. We define public employment in a way that is consistent with each country's official statistics. For the US, the public sector includes individuals who work for the government (further disaggregated into Federal, State or Local government). In the UK, we include the following categories: i) Central Government, Civil Service; ii) Local government or council (including police, fire services and local authority controlled schools or colleges); iii) University or other grant-funded educational establishments; iv) Health authority or NHS trust; and v) Armed forces. We exclude from our definition every private organization, as well as: i) Public company; ii) Nationalised industry or state corporation; iii) Charity, voluntary organisation or trust; and iv) other organisation.[4] A similar definition is used for France, including i) État; ii) Collectivités territoriales; iii) Hôpitaux publics; and iv) Sécurité sociale and excluding: i) Particulier; ii) Entreprise publique; and iii) Entreprise privée. For Spain, the survey asks directly whether respondents work for the public or the private sector; for more details on the methodology see Fontaine et al. [2020].

[4] As in Fontaine et al. [2020], we exclude publicly-owned companies because those sell their goods and services and thus face market forces. Including them into private employment, together with non-profit institutions tends to reduce the observed differences between the two sectors.

## 2.1 Over-representation of women in the public sector

Table 1 reports the accounting definition used in this paper. We denote the size of the employment pool by $e$, and $e_m$ and $e_f$ respectively are the number of men and women in total employment. In terms of sectors, an additional subscript $g$ refers to the government/public sector while subscript $p$ refers to the private sector. Hence for example $e_{g,f}$ indicates the stock of employed female workers in the public sector. The top two graphs of Figure 2 display what we call the raw statistics: the share of public sector employment by gender (calculated by row) and the share of women in sectoral employment (calculated by column) respectively.

The size of the public sector varies across countries, and is larger in the UK and France with public sector employment representing around 22 percent of total employment, and it is smaller in the US and Spain where it represents 16 percent of total employment. Despite differences in the size of the public sector, in all countries the share of public sector employment is larger for women who are the majority of all public sector workers.

Based on the two-by-two matrix in Table 1 we construct two indicators for the over-representation of women in public employment. The first indicator $rg$ is the ratio of public employment shares, defined as the public sector employment share for women over the public sector employment share for men. The second indicator $rf$ is the ratio of women's employment shares, defined as the share of women out of all public sector workers over the share of women out of all private sector workers. Formally:

$$rg = \frac{\frac{e_{g,f}}{e_f}}{\frac{e_{g,m}}{e_m}}, \qquad rf = \frac{\frac{e_{g,f}}{e_g}}{\frac{e_{p,f}}{e_p}}.$$

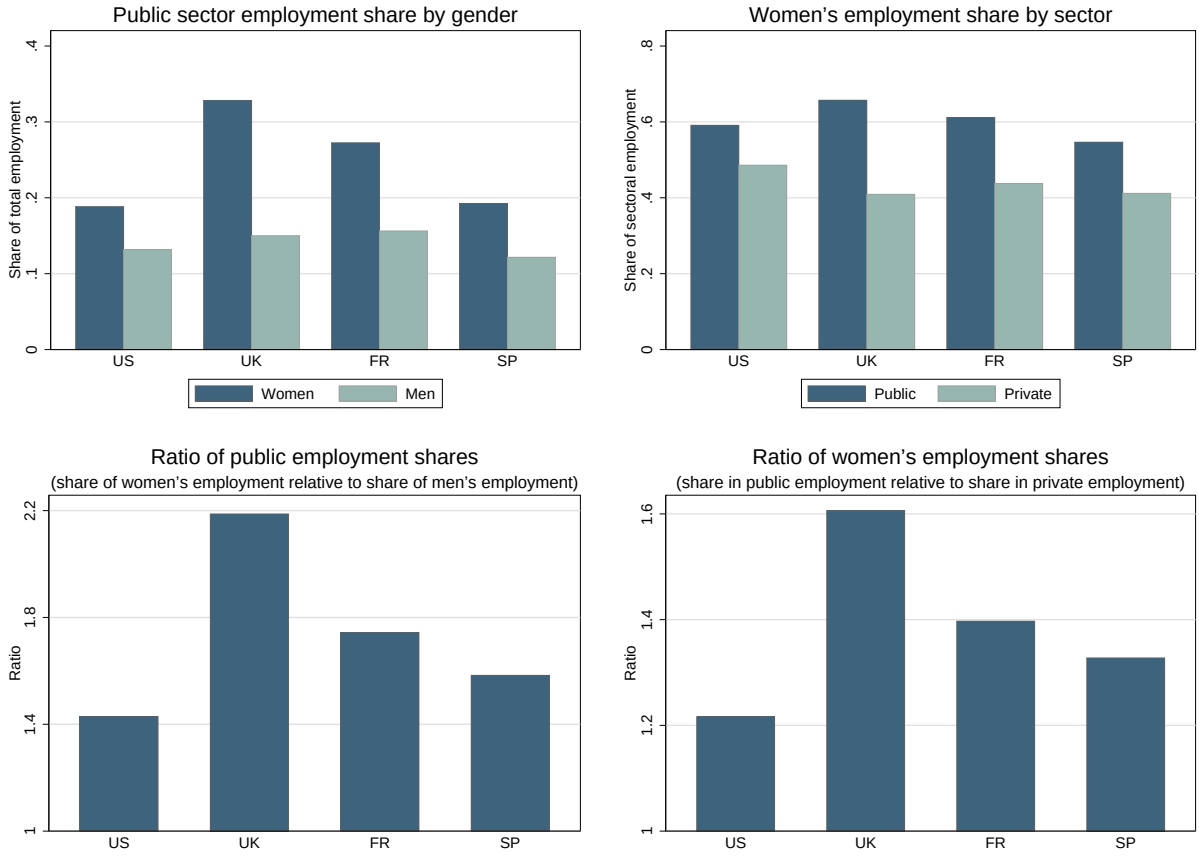
The two bottom graphs of Figure 2 display these two indicators for all four countries. In the case of perfect gender symmetry across sectors, both indicators would take on a value of 1. However, for the four countries the ratio of public employment shares lies above 1.4, and the ratio of women's employment shares lies above 1.2, indicating that women are clearly over-represented in public employment.

Table 1: Accounting definition

| | **Public sector** | **Private sector** | **Total** |
|---|---|---|---|
| **Women** | $e_{g,f}$ | $e_{p,f}$ | $e_f$ |
| **Men** | $e_{g,m}$ | $e_{p,m}$ | $e_m$ |
| **Total** | $e_g$ | $e_p$ | $e$ |

*Note: Government (g), private (p), women (f), men (m).*

Figure 2: Different measures for the over-representation of women in public employment



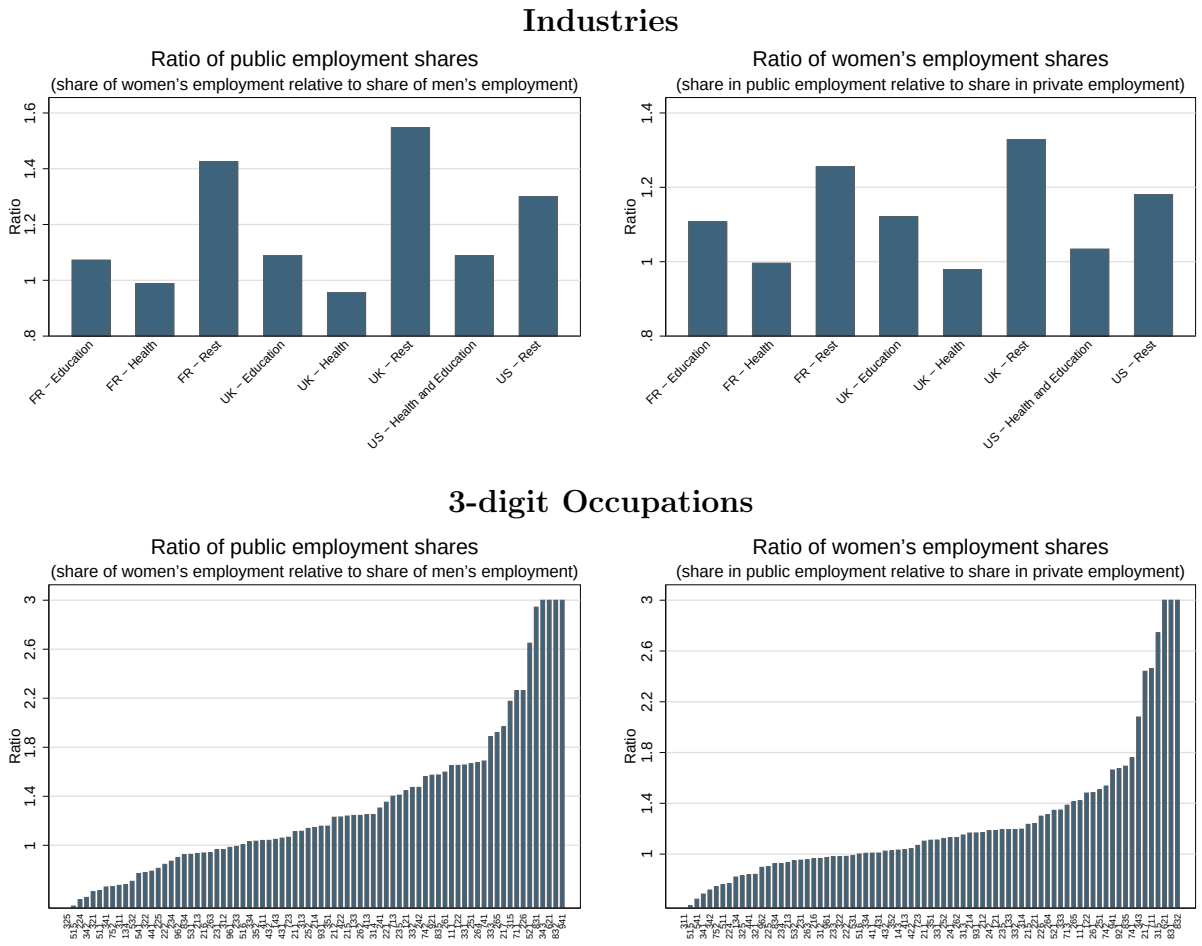

*Note: At the top, the graph on the left shows the public sector employment shares by gender and the graph on the right the share of women in sectoral employment. At the bottom, the graph on the left shows the ratio of public employment shares ($rg$), and the graph on the right shows the ratio of women's employment shares ($rf$). For the United States the data is taken from the CPS (2003-2018), for the United Kingdom from the UK Labour Force Survey (2003-2018), for France from the French Labour Force Survey (2003-2017) and for Spain from the Spanish Labour Force Survey (2003-2018); for more details on the methodology see Fontaine et al. [2020].*

A natural explanation for the over-representation of women in public employment could be that certain types of jobs that are predominately carried out by the government could be preferred by women. However, as the two top graphs of Figure 3 reveal, for the US, the UK, and France, once we exclude health care and education, while somewhat lower, women's public employment is still 20-50% higher than men's.[5] Interestingly enough, as Figure A.1 in Appendix A shows, the over-representation of women is less pronounced within public health care and public education compared to other branches of public employment.

Along similar lines, but only for the US, we are also able to analyze the gender composition of public sector jobs based on a 3-digit ISCO-08 occupational classification. We consider

[5]Unfortunately, the Spanish LFS does not allow for a disaggregation of public employment by industry.

Figure 3: Over-representation of women in public employment by industry and occupation




*Note: the 1st panel uses the French and the UK Labour Force Survey and the CPS (2003-2018). The 2nd panel shows CPS data, average between 1996 and 2017. 3-digit occupations that have an overall share of public sector employment between 0.05 and 0.95. The ratios were capped at 3 for readability.*

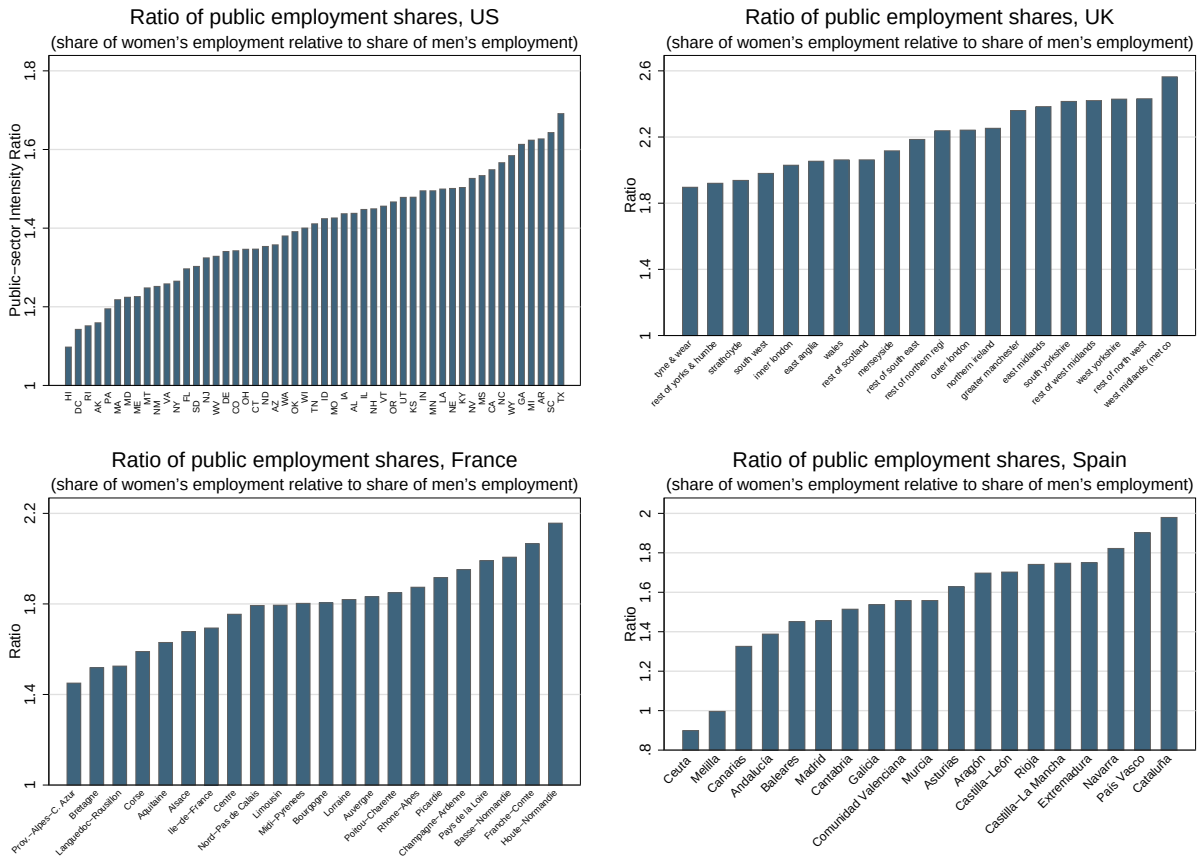
only occupations with non-trivial public and private sector employment, i.e. occupations for which the share of public sector employment in total employment is larger than 5% and smaller than 95%.[6] We find that two-thirds of these occupations display ratios of public employment shares and ratios of women's employment shares that are larger than 1; see bottom graphs of Figure 3. As Figure A.1 in Appendix A shows, this result is again robust to using the raw measures instead of the indicators. Overall, we observe quite some variability in the over-representation of women in public employment across industries and

[6]This implies that some top-paid occupations are excluded (i.e. as manufacturing, mining, construction, and distribution managers) as well as some low-paid jobs (i.e. domestic, hotel and office cleaners and helpers or waiters and bartenders).

occupations, which seems to indicate that women's preferences for certain jobs and industries matter. However, our statistics also show that this variability alone cannot account for the entire over-representation of women in public employment. Hence, in our model while gender differences in preferences for public sector jobs will play a key role, we will also add additional explanations related to sectoral differences in job characteristics (wages, job security, work-life balance) and test for the importance of each one of them.

To pin down some of the model's key parameters in our calibration we make use of the regional variation in the over-representation of women in public employment, displayed in Figure 4. This disaggregated data by regions allow us to observe how the over-representation of women varies with the size of the public sector, a crucial input in our calibration. The ratio of public employment shares is larger than one in all US states, varying between 1.1

Figure 4: Public Employment Shares Ratio, Regional Variation




*Note: For the United States the data is taken from the CPS (2003-2018), for the United Kingdom from the UK Labour Force Survey (2003-2018), for France from the French Labour Force Survey (2003-2017) and for Spain from the Spanish Labour Force Survey (2003-2018).*

and 1.7. The picture is similar for the other three countries. The only exception are two regions in Spain – Ceuta and Melilla – characterized by a strong presence of the armed forces due to their location on the African continent. Our findings by regions are also robust to using the alternative indicator or the raw measures for the over-representation of women in public employment; see Figures A.2 and A.3 in Appendix A.

To further check the robustness of our findings we also display the two indicators for the gender gap in public employment over time and by workers' age groups and levels of education; see Figures A.7 to A.15 in Appendix A. Both indicators are persistent over time, even though they fell around the time of the great recession, most likely driven by large changes in private employment. Regarding workers' age groups, both ratios are close to 1 for very young workers, but they jump around age 20 and remain relatively constant over the lifecycle. Finally, the over-representation of women in public employment is present across all levels of education and particularly strong among primary and tertiary educated workers.

## 2.2 Stocks and flows by gender

To characterize gender differences in transition probabilities we calculate stocks and flows of men and women between states of employment in each sector, unemployment, and inactivity. These are crucial statistics for identifying the parameters of our model.[7] Table 2 summarizes the key statistics, and Figure B.1 in Appendix B.2 provides a graphical representation of these numbers together with all transition rates.

In all four countries, women's inactivity rates are more than 10 percentage points higher than those of men. In the US and the UK the male unemployment rate is higher than the female rate, but the opposite is true for Spain and France. On average 16.3 and 22.3 percent of all women work in the public sector, in France and in the UK respectively. In Spain and the US, differences by gender are smaller. The Spanish and the US public sector hire 8 and 13 percent of all women respectively. These numbers are different from the ones previously reported that only considered employed workers. Public sector workers have a much lower probability of becoming inactive or unemployed compared to private sector workers. While the probability of dropping out of the labor force is much higher for women compared to men, it is much lower for women working in the public compared to the private sector. The probability of an employed woman to withdraw from the labor force is 40 to 65 percent higher if she works in the private compared to the public sector. We use these differences in hazard rates from public and private employment to inactivity, for men and women, to

[7] Providing estimates of these worker flows is, in itself, an important contribution to the literature that has mainly focused on stocks.

Table 2: Labor market stocks and hazard rates by gender

| **Targets** | **US** | | **UK** | | **France** | | **Spain** | |
|---|---|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | Men | Women | Men | Women |
| **Stocks** | | | | | | | | |
| Private emp. | 0.672 | 0.574 | 0.667 | 0.454 | 0.585 | 0.441 | 0.498 | 0.334 |
| Public emp. | 0.102 | 0.133 | 0.118 | 0.222 | 0.108 | 0.165 | 0.069 | 0.080 |
| Unemployed | 0.057 | 0.044 | 0.054 | 0.040 | 0.069 | 0.064 | 0.105 | 0.097 |
| Inactive | 0.169 | 0.249 | 0.162 | 0.284 | 0.238 | 0.330 | 0.329 | 0.490 |
| **Rates** | | | | | | | | |
| Unemployment | 0.067 | 0.059 | 0.064 | 0.056 | 0.090 | 0.096 | 0.156 | 0.190 |
| Inactivity | 0.169 | 0.249 | 0.162 | 0.284 | 0.238 | 0.330 | 0.329 | 0.490 |
| **Transition probabilities** | | | | | | | | |
| $P \to U$ | 0.0161 | 0.0121 | 0.0151 | 0.0132 | 0.0203 | 0.0217 | 0.0417 | 0.0437 |
| $P \to I$ | 0.0189 | 0.0274 | 0.0159 | 0.0295 | 0.0187 | 0.0269 | 0.0245 | 0.0450 |
| $G \to U$ | 0.0060 | 0.0076 | 0.0064 | 0.0045 | 0.0079 | 0.0083 | 0.0203 | 0.0227 |
| $G \to I$ | 0.0148 | 0.0200 | 0.0144 | 0.0179 | 0.0142 | 0.0180 | 0.0191 | 0.0274 |

*Note: French, Spanish, UK Labour Force Surveys and the CPS (2003-2018). The transition probabilities report the probability of an employed worker to be unemployed or inactive in the following quarter (month in the US).*

identify differences in work-life balance between sectors.

However, the lower probability of exiting the labor force from a public compared to a private sector job could potentially be due to composition effects. In particular, the public sector hires more educated and older workers compared to the private sector. To take this into account, we estimate the probabilities of leaving employment conditional on observable characteristics using a multinomial logit model (see Appendix B.2 for details on this estimation). Figure B.2 in Appendix B.2 visualizes the results from this estimation. In all four countries, the probability of dropping out of the labor force is higher for women than for men. For women in all three European countries, however this probability is lower if they work in the public compared to the private sector. In the US, the difference for women across sectors is almost insignificant. This conditional analysis also shows that in all four countries, the probability of moving to unemployment is lower for public compared to private sector workers. This difference in job security across sectors is highest in France, followed by the UK and Spain, and lowest in the US.

## 2.3 Wage premium and working hours

Finally, we look at gender differences in wages and hours worked in the public and private sector. To estimate public sector wage premia for men and women and to calculate the private sector gender wage gap, we run wage regressions using microdata for the three European

countries from the 2002, 2006, 2010, and 2014 *Structure of Earnings Survey*. For the US, we obtain information on individuals' income and income components from the CPS March Supplement for the years 1996 to 2018. In particular, we regress log gross yearly earnings on individual characteristics such as gender, age, and education, and job characteristics such as occupation, tenure, indicators for holding a part-time job and for working in the public sector as well as an interaction term between being female and holding a public sector job. We also control for region and year fixed effects. We chose yearly instead of hourly earnings to be consistent with the model.

Panel A in Table 3 displays the results from this estimation for each of the four countries. All columns (2) display the most complete specification that also controls for individuals' occupation (2-digits). In all countries but France, for women, working in the public sector is associated with 6-7% higher gross yearly earnings compared to working in the private sector. For men these premia are much smaller, ranging from 0-4% in Spain and the UK, to being negative in the US and France. While women also face lower earnings in the public compared to the private sector in France, they face a lower discount (-5%) compared to men (-11%). Regarding private sector wages, women face 16-31% lower wages compared to men. We estimate the largest private sector gender wage gap in the US, followed by Spain and the UK. The gender wage gap in the private sector is lowest in France.

These results are in line with literature that typically finds higher public-private wage differentials for women compared to men; see e.g. Lucifora and Meurs [2006] for France, Italy and the UK, Bargain et al. [2018] for France, and Hospido and Moral-Bonito [2016] for Spain. While all three papers use more sophisticated econometric methods to estimate the public-private wage gap along the entire wage distribution and the latter two also control for selection, their quantitative results are similar to our findings.[8] However, given that these papers mostly focus on hourly earnings and given that none includes all countries in our sample, and the samples used in the different papers are not comparable, we prefer, for consistency with our model, to present our own estimates and use these in the calibration.

We use the same data to estimate if and by how much, individuals in the public sector work fewer hours compared to those in the private sector. To this end, we regress the log of working hours on similar individual and job characteristics as before, together with year and region fixed effects. Results from this estimation are displayed in panel B of Table 3. Once more we focus on all columns (2) containing the most complete specification of our

[8] Lucifora and Meurs [2006] estimate on average 8% higher wages in the public sector in the UK, Bargain et al. [2018] also find negative public sector wage premia for France (between 0% and -5%) which are slightly lower for women, and for Spain Hospido and Moral-Bonito [2016] estimate an average 10% wage premia once controlling for selection.

Table 3: Public sector wage and hours premium and private sector gender wage gap

| | US | | UK | | France | | Spain | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (1) | (2) | (1) | (2) | (1) | (2) |
| ***Panel A: wage regressions*** | | | | | | | | |
| **Public sector wage premium** | | | | | | | | |
| Men | -0.017*** | -0.053*** | -0.006 | 0.038*** | -0.155*** | -0.117*** | -0.001 | 0.002 |
| | (-5.46) | (-16.38) | (-1.75) | (11.36) | ( -60.83) | (-0.30) | (-0.44) | (0.62) |
| Women | -0.031*** | 0.059*** | 0.083*** | 0.059*** | -0.066*** | -0.054*** | 0.090*** | 0.069*** |
| | (-10.80) | (19.88) | (29.71) | (21.97) | (-26.40) | (-22.55) | (36.88) | (28.65) |
| **Gender wage gap** | | | | | | | | |
| Private | -0.360*** | -0.314*** | -0.199*** | -0.177*** | -0.193*** | -0.163*** | -0.235*** | -0.214*** |
| | (-206.20) | (-164.45) | (-86.52) | (-76.24) | (-105.59) | (-91.22) | (-182.29) | (-163.18) |
| **Controls** | | | | | | | | |
| Demographic | X | X | X | X | X | X | X | X |
| Region and year | X | X | X | X | X | X | X | X |
| Part-time | X | X | X | X | X | X | X | X |
| Tenure (quadratic) | | | X | X | X | X | X | X |
| Occupation | | X | | X | | X | | X |
| Observations | 1,117,845 | 1,117,845 | 625,869 | 625,869 | 593,950 | 593,950 | 876,274 | 876,274 |
| R-squared | 0.426 | 0.481 | 0.498 | 0.550 | 0.419 | 0.487 | 0.566 | 0.599 |
| ***Panel B: hours regressions*** | | | | | | | | |
| **Public sector hours premium** | | | | | | | | |
| Public-sector | 0.008*** | -0.025*** | -0.048*** | -0.038*** | -0.036*** | -0.028*** | 0.013*** | -0.046*** |
| | (5.88) | (-25.01) | (-31.83) | (-34.61) | (-36.13 ) | (-37.03) | (11.10) | (-54.25) |
| **Controls** | | | | | | | | |
| Demographic | X | X | X | X | X | X | X | X |
| Region and year | X | X | X | X | X | X | X | X |
| Tenure (quadratic) | | | X | X | X | X | X | X |
| Occupation | X | X | X | X | X | X | X | X |
| Part-time | | X | | X | | X | | X |
| Observations | 1,021,443 | 1,021,443 | 620,000 | 625,869 | 593,950 | 593,950 | 876,274 | 876,274 |
| R-squared | 0.207 | 0.602 | 0.184 | 0.569 | 0.105 | 0.471 | 0.119 | 0.563 |

*Note: Estimated by OLS regressions of the log of yearly gross earnings on a female dummy and a female dummy interacted with a dummy for working in the public sector, controlling for region, year, occupation, education, age groups, part-time, tenure and tenure squared. Data for UK, France, and Spain for 2002, 2006, 2010 and 2014; for US for 1996-2018.*

regressions. Individuals holding full time jobs in the public sector work between 3-5% fewer hours compared to similar individuals holding full time jobs in the private sector.

We think that fewer working hours are just one aspect of a better work-life balance, alongside additional sick days, holidays, flexibility to work from home, employer provided child care etc. In our model we want to capture differences in work-life balance across sectors in an ample sense, and hence we do not use these estimates to identify the related parameters. Instead, we will identify them indirectly, using differences in observed flows from employment to non-participation across the public and private sector. Nevertheless, our results on fewer working hours in the public sector support the claim of a better work-life balance in the public compared to the private sector.

# 3 Model

Results from our empirical analysis suggest that the over-representation of women in the public sector could potentially be due to different job characteristic such as lower gender wage gaps, higher job security, or better work-life balance. Furthermore, women could simply have a preference for public sector occupations, unrelated to those job characteristics offered. In order to quantify the importance of each of these factors and to be able to conduct policy experiments, we set up a model economy.

In our model men and women decide to look for jobs in the public or the private sector, following Gomes [2015]. However, for tractability, we assume that private and public sector labor markets are perfectly segmented and that workers do not change sectors once this choice has been made. This assumption rules out any transitions between public and private sectors, either directly (through job-to-job transitions) or indirectly (via unemployment or inactivity). This permanent choice of sector can be interpreted as an occupational choice given that certain public sector jobs, such as teacher or police officer, require a type of training specific to the public sector. Two additional facts support this simplifying assumption: (i) The majority of inflows into and outflows from public sector employment are from and to non-employment.[9] (ii) Even after a spell of unemployment or inactivity, workers are much more likely to find a job in their sector of previous employment.[10]

Men's and women's public sector wages are set exogenously as a function of their private sector wages according to our empirical findings. Our model hence abstracts from explaining why these sector differences in wages arise. Gender differences in private wages on the other hand are modeled following Albanesi and Şahin [2013], assuming that women and men face certain opportunity costs of working, which are drawn from different distributions for each gender. In particular, women are more likely to face higher opportunity costs of working, and hence they are more likely to quit their jobs. This leads to lower expected surpluses of

[9]This particularly true in France and Spain - countries with entry exams into the public sector - where, workers employed in the private sector in the previous quarter represent only 10 to 15 percent of inflows into public employment. In the US and UK these numbers are slightly higher, with around 30 percent of inflows into public employment coming from the private sector. Similar magnitudes hold for outflows.

[10]For the US, Fontaine et al. [2020] report (in their Appendix V) job-finding rates in the public and private sector, conditional on individuals' previous sector of employment. The unconditional job-finding rate in the public sector is only 1.8 percent, but conditional on having been employed in the public sector in the month preceding unemployment it is close to 30 percent. The public sector job-finding rate conditional on being previously employed in the private sector is 1.4 percent, roughly equal to the rates conditional on previously having been unemployed or inactive. For the private sector, the job-finding rate conditional on previous private sector employment is higher than 40 percent. Being previously employed in the public sector does not raise the job-finding rate in the private sector relative to having been unemployed or inactive (with job-finding rates of around 16 percent). These numbers suggest that individuals' choice of sector is relatively persistent, even after unemployment or inactivity spells.

jobs occupied by women and hence lower female private sector wages. Finally, we build on Garibaldi and Wasmer [2005]'s version of a search model with inactivity.

To keep the model tractable, we abstract from three potentially important dimensions. First, we do not consider differences in risk aversion between gender. While there exists quite some evidence that women are more risk averse than men (see e.g. Eckel and Grossman [2008]), these findings are not conclusive (see e.g. Filippin and Crosetto [2016]). Second, we abstract from having ex-ante worker heterogeneity, either observable (education) or unobservable (ability). Although such heterogeneity has been shown to be important for understanding the effects of public sector employment for aggregate labor market outcomes, for instance by Gomes [2018], we think that, for the question at hand, this is of second-order importance. Third, we model a unique wage for all women in the public sector, rather than a wage-tenure profile. While Postel-Vinay and Turon [2007] emphasize that lifetime earning in the public sector might be lower than static wage comparisons suggest, in a more recent paper, Bradley et al. [2017] find that differences in lifetime earnings and static wages across sectors are rather similar for both men and women.

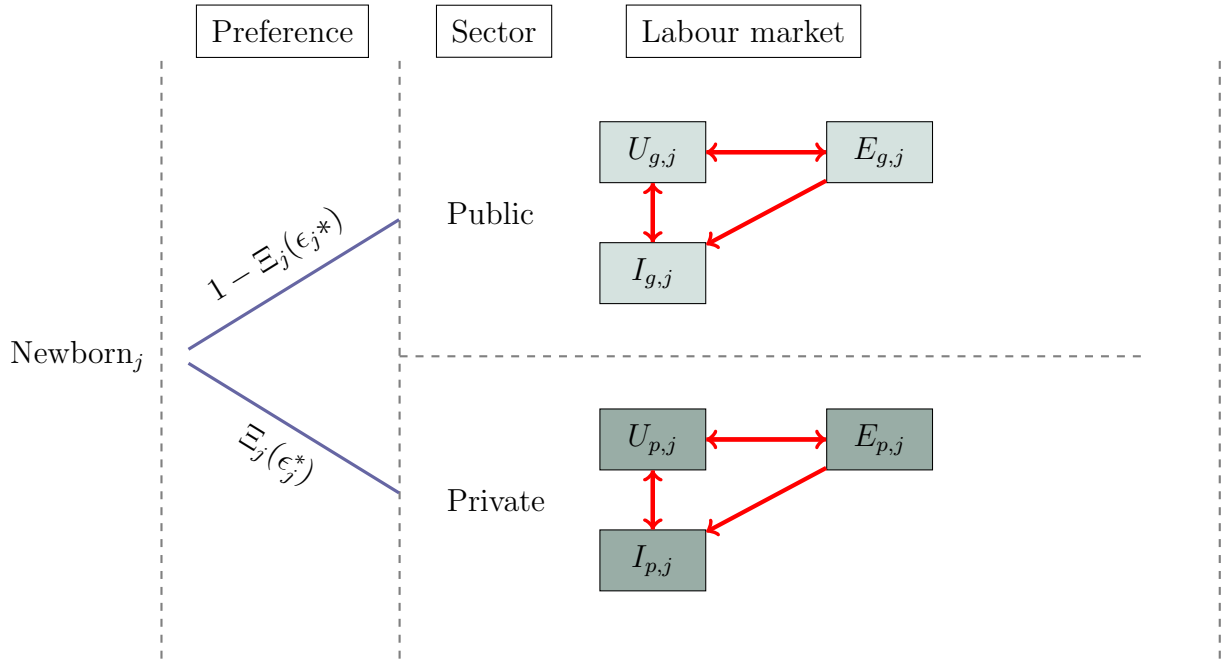
## 3.1 General setup

We consider a search and matching model with private sector firms and a public sector. Workers – men and women – can be either employed, unemployed and searching for a job or they can be inactive. Each private sector firm is endowed with a single vacancy that can be vacant or filled (job). At each instant, $\tau$ individuals are born (enter the labor market) and die (retire) such that the working population is constant and normalized to unity. Agents are risk-neutral and discount the future at a common rate $r > 0$. Time is continuous.

Figure 5 depicts the general structure of the model. Prior to entering the labor market, individuals have to decide which sector to enter: the public or the private sector. Each individual draws a preference for the public sector, denoted by $\epsilon$. This preference could reflect relative differences in intrinsic preferences for working in the public sector, preferences for public sector occupations, differences in individuals' costs for entering the private or public sector (e.g. due to requirements such as taking an exam for public sector jobs) or differences in other characteristics that are absent from the model (e.g. differences in risk aversion between men and women). We assume that for men and women this preference is distributed across individuals according to the cumulative normal distribution functions $\Xi_m(\cdot)$ and $\Xi_f(\cdot)$ respectively.

Hence, in the spirit of a generalized Roy model, an endogenous proportion of the population (those whose preferences are sufficiently high) enters the public sector while the other

Figure 5: Newborn's decisions




fraction (those whose preferences are sufficiently low) joins the private sector. All variables are therefore indexed by two subscripts, subscript $i = [g, p]$, where $g$ refers to the public (government) sector and $p$ to the private sector, and subscript $j = [m, f]$, where $m$ refers to male and $f$ to female.

In each sector $i$, a worker of gender $j$ will either be employed ($e_{i,j}$), unemployed ($u_{i,j}$) or inactive ($i_{i,j}$). Individuals' flow utilities in each state are given by

$$v^E_{i,j} = (1 - \xi_i)x + w_{i,j}, \tag{1}$$

$$v^U_{i,j} = (1 - s)x, \tag{2}$$

$$v^I_{i,j} = x, \tag{3}$$

where $x$ denotes the stochastic value of home production or the opportunity cost of working. We assume that at a constant rate, $\lambda$, independent of their labour market status, individuals draw a value for $x$ from cumulative log-normal distribution functions $F_m(\cdot)$ and $F_f(\cdot)$, which are potentially different for men and women. Individuals who are inactive enjoy the utility of home production. Those who are unemployed have to spend a fraction $s$ of their time searching, and hence they only enjoy a fraction $1 - s$ of $x$. Finally employed individuals receive a wage payment $w_{i,j}$ and spend a fraction $\xi_i$ of their time at work, which is potentially different across the two sectors.

## 3.2 Value functions

Given individuals' flow utilities described above and transition probabilities between the three states, value functions for employment, unemployment, and inactivity for men and women in each of the two sectors can be written as follows:

$$(r+\tau+\lambda)E_{i,j} = v^E_{i,j} + \delta_{i,j}[\max(U_{i,j}, I_{i,j}) - E_{i,j}] + \lambda \int_0^\infty \max(E_{i,j}(x'), U_{i,j}(x'), I_{i,j}(x'))dF_j(x'), \quad (4)$$

$$(r+\tau+\lambda)U_{i,j} = v^U_{i,j} + m(\theta_i)[\max(E_{i,j}, U_{i,j}) - U_{i,j}] + \lambda \int_0^\infty \max(U_{i,j}(x'), I_{i,j}(x'))dF_j(x'), \quad (5)$$

$$(r+\tau+\lambda)I_{i,j} = v^I_{i,j} + \lambda \int_0^\infty \max(U_{i,j}(x'), I_{i,j}(x'))dF_j(x'), \quad j=[m,f], i=[p,g], \quad (6)$$

where $\delta_{i,j}$ denotes the separation rate in sector $i$ that is potentially different by gender, and $\lambda$ is the arrival rate of shocks to the opportunity costs of working which is independent of gender and sector. The conditional job-finding rate in sector $i$ is $m(\theta_i)$, which is an endogenous object in the model, and is assumed to be the same for both genders. Hence, when firms or the government are matched with a worker, they hire him or her independently of their gender. Put otherwise, we assume there is no discrimination in the hiring process in neither sector, even though wages paid to men and women will be different in both sectors.

The value function for employment is given by the sum of the flow utility of being employed, the loss suffered when separated, and the change that occurs whenever individuals draw a new value for $x$. The loss suffered when separated will be different if individuals move to unemployment or inactivity thereafter. In particular, individuals who are so-called "attached" employed have a lower opportunity costs of working and hence prefer unemployment to inactivity. On the other hand, the so called "unattached" employed have a higher opportunity cost and prefer inactivity to unemployment upon separation. Upon a new draw of $x$, employed individuals either remain employed, or they become inactive.

The value function for unemployed individuals is given by the sum of the flow utility of unemployment, the gain in value when finding a job, plus the change in value due to a potential new draw of $x$. Finally, the value function for inactive individuals is the sum of the flow utility of inactivity and the change in value upon a new draw of $x$. Note that there is no direct transition between inactivity and employment. Individuals always have to go through unemployment and search for a job before becoming employed.

### 3.3 Thresholds

Individuals' value for home production or their opportunity costs of working $x$ will hence be a main determinant for their state in the labor market. In particular, we can implicitly define the following two thresholds:

$$U_{i,j}(\bar{x}^a_{i,j}) = I_{i,j}(\bar{x}^a_{i,j}), \tag{7}$$

$$E_{i,j}(\bar{x}^{na}_{i,j}) = I_{i,j}(\bar{x}^{na}_{i,j}). \tag{8}$$

The first threshold indicates the marginal individual who is indifferent between being inactive or searching for a job. Individuals with values of $x$ below this threshold search while those with $x$ above $\bar{x}^a_{i,j}$ prefer to be inactive. The second threshold defines an employed worker who is indifferent between working or being inactive. In particular, those with values of $x$ below $\bar{x}^{na}_{i,j}$ work while those with higher values of $x$ quit their jobs for inactivity. Figure 6 displays the value functions for employment, unemployment, and inactivity as a function of $x$, together with these thresholds. We can obtain the following analytical expressions for the two thresholds:

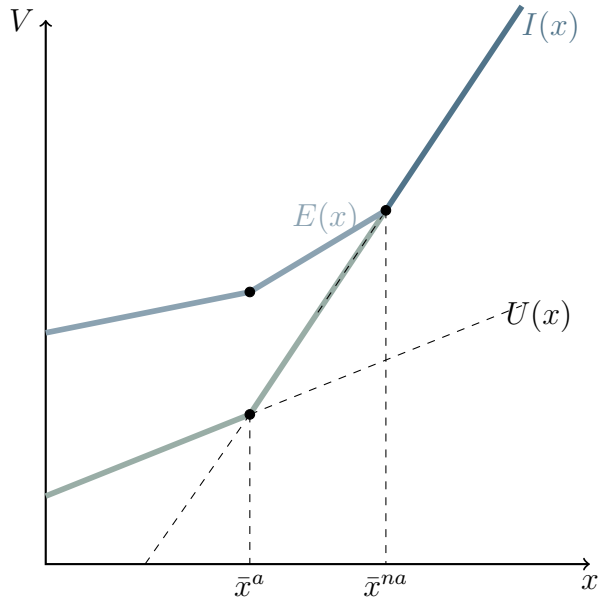
$$\bar{x}^{na}_{i,j} = \frac{w_{i,j}}{\xi_i} + \frac{\lambda}{\xi_i}[A_{i,j} - B_{i,j}], \tag{9}$$

$$\bar{x}^a_{i,j} = \frac{m(\theta_i)\xi_i(\bar{x}^{na}_{i,j} - \bar{x}^a_{i,j})}{s(\delta_{i,j} + r + \lambda + \tau)}, \tag{10}$$

where $A_{i,j} = \int_0^\infty \max(E_{i,j}(x'), U_{i,j}(x'), I_{i,j}(x'))dF_j(x')$ and $B_{i,j} = \int_0^\infty \max(U_{i,j}(x'), I_{i,j}(x'))dF_j(x')$. Equation 9 shows that as expected, a higher wage moves the first threshold to the right, such that fewer individuals decide to quit their jobs to go into inactivity. This implies a direct relationship between a larger gender wage gap and higher inactivity rates of women compared to those of men. Considering Equation 10, higher search costs $s$ move the second threshold to the left, leading to fewer individuals searching for jobs while a higher job finding rate $m(\theta_i)$ has the opposite effect.

Note that in Figure 6, the slope of the value function for employment is discontinuous. This is due to the difference between "attached" and "unattached" workers. If $x > \bar{x}^a$, then upon separation workers move directly into inactivity, while if $x \leq \bar{x}^a$ they move into unemployment. Hence, instead of one value function for employed individuals we can define two values functions, one for "attached" and another one for "unattached" workers:

Figure 6: Decision Thresholds




$$(r+\tau+\lambda)E_{i,j} = (1-\xi_i)x + w_{i,j} + \delta_{i,j}[U_{i,j} - E_{i,j}] + \lambda[A^1_{i,j} + A^2_{i,j}], \quad if x < \bar{x}^a, \quad (11)$$

$$(r+\tau+\lambda)E_{i,j} = (1-\xi_i)x + w_{i,j} + \delta_{i,j}[I_{i,j} - E_{i,j}] + \lambda[A^1_{i,j} + A^2_{i,j}], \quad if x \geq \bar{x}^a, \quad (12)$$

$$(r+\tau+\lambda)U_{i,j} = (1-s)x + m(\theta_i)[E_{i,j} - U_{i,j}] + \lambda[B^1_{i,j} + B^2_{i,j}], \quad (13)$$

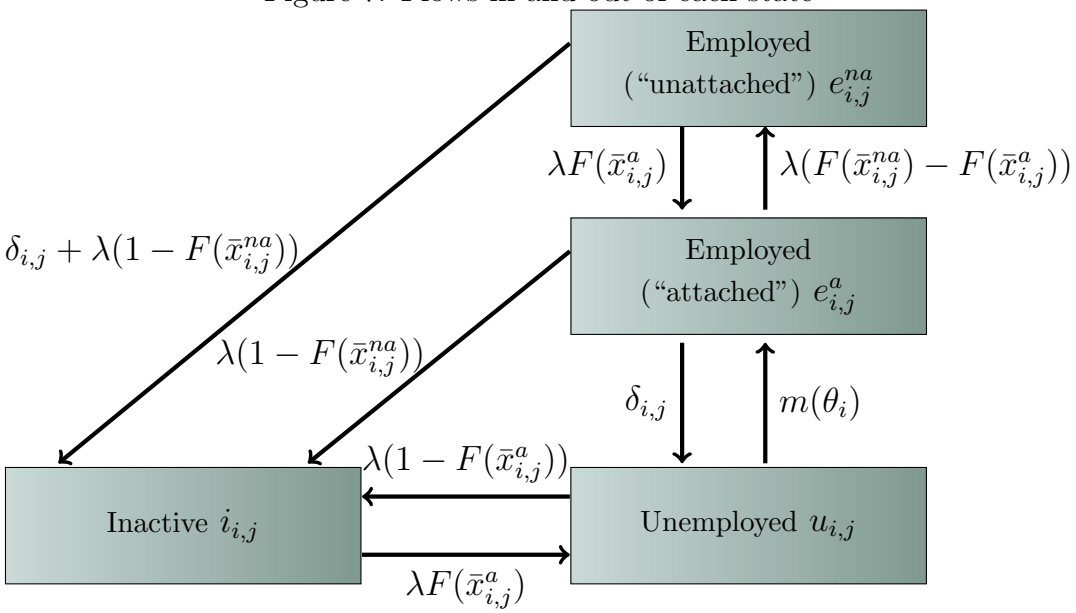
$$(r+\tau+\lambda)I_{i,j} = x + \lambda[B^1_{i,j} + B^2_{i,j}], \quad j = [m,f], i = [p,g], \quad (14)$$

where $A^1_{i,j} = \int_0^{\bar{x}^{na}} E_{i,j}(x')dF_j(x')$, $A^2_{i,j} = \int_{\bar{x}^{na}}^{\infty} I_{i,j}(x')dF_j(x')$, $A_{i,j} = A^1_{i,j} + A^2_{i,j}$, $B^1_{i,j} = \int_0^{\bar{x}^a} U_{i,j}(x')dF_j(x')$, $B^2_{i,j} = \int_{\bar{x}^a}^{\infty} I_{i,j}(x')dF_j(x')$ and $B_{i,j} = B^1_{i,j} + B^2_{i,j}$.

## 3.4 Flows in and out of each state

For men and women in each sector, there are hence four labor market states: unemployed ($u_{i,j}$), inactive ($i_{i,j}$), "attached" employed ($e^a_{i,j}$) and "unattached" employed ($e^{na}_{i,j}$); i.e. those who drop out of the labor force if they loose their job. Figure 7 shows the hazard rates between the states, abstracting from population flows. In steady state, the flows in and out of each stock have to equate. In particular, Equations 15 to 18 equate the exits (left-hand side) and the entries (right-hand side) into inactivity, unemployment, "attached" employment,

Figure 7: Flows in and out of each state




and "unattached" employment respectively:

$$i_{i,j}(\lambda F(\bar{x}^a_{i,j})+\tau) = [\delta_{i,j}+\lambda(1-F(\bar{x}^{na}_{i,j}))]e^n_{i,j}+[\lambda(1-F(\bar{x}^{na}_{i,j}))]e^a_{i,j}+[\lambda(1-F(\bar{x}^a_{i,j}))]u_{i,j}+\tau(1-F(\bar{x}^a_{i,j})) \tag{15}$$

$$u(\lambda(1 - F(\bar{x}^a_{i,j})) + \tau + m(\theta_i)) = \delta_{i,j}e^{na}_{i,j} + \lambda F(\bar{x}^a_{i,j})i_{i,j} + \tau F(\bar{x}^a_{i,j}) \tag{16}$$

$$e^a_{i,j}(\lambda(1 - F(\bar{x}^a_{i,j})) + \tau + \delta_{i,j}) = m(\theta_i)u_{i,j} + \lambda F(\bar{x}^a_{i,j})e^n_{i,j} \tag{17}$$

$$e^{na}_{i,j}(\lambda(1 - F(\bar{x}^{na}_{i,j}) + F(\bar{x}^a_{i,j})) + \tau + \delta_{i,j}) = \lambda[F(\bar{x}^{na}_{i,j}) - F(\bar{x}^a_{i,j})]e^a, \quad j = [m, f], i = [p, g]. \tag{18}$$

## 3.5 Private sector

To limit the complexity of the model, we propose a simple wage setting mechanism for male private sector wages that allows us to ignore certain general equilibrium effects of policy changes affecting male wages and feeding back into female outcomes while being able to focus on the first-order effects on female labor market outcomes. In particular, we explicitly abstain from modeling any bargaining over the surplus of the match. Instead, we assume that male private sector wages are a constant fraction $\beta$ of workers' productivity

$$w_{p,m} = \beta y. \tag{19}$$

Hence male private sector wages are going to be completely isolated from policy changes. However, this is not the case for female wages which are determined differently. Given male

private sector wages and free entry for firms, we can calculate the value of a job filled by a man for a firm as follows

$$rJ_m = (1-\beta)y - (\delta_{p,m} + \tau + \lambda(1 - F(\bar{x}^{na}_{p,m})))J_m, \tag{20}$$

which solving for $J_m$ gives

$$J_m = \frac{(1-\beta)y}{r + \delta_{p,m} + \tau + \lambda(1 - F(\bar{x}^{na}_{p,m}))}. \tag{21}$$

We follow Albanesi and Şahin [2013] and set the female private sector wage such that the value of a job for a firm is the same for male and female workers, $J_m = J_f$. Hence, while productivity is assumed to be the same for men and women, women receive lower wages because they might have higher quit rates into inactivity or face higher exogenous separation rates, which is anticipated by employers. The model thus also incorporates a possible causality between higher inactivity rates for women and lower wages. Hence, female private sector wages ($w^*_{p,f}$) are an endogenous object given by

$$w^*_{p,f} = y\left(1 - (1-\beta)\frac{r + \delta_{p,f} + \tau + \lambda(1 - F(\bar{x}^{na}_{p,f}))}{r + \delta_{p,m} + \tau + \lambda(1 - F(\bar{x}^{na}_{p,m}))}\right). \tag{22}$$

While this wage setting mechanism encompasses one particular theory to explain the gender wage gap, ex-ante it is unclear whether it will allow us to fully replicate the observed gender wage gap. Given that one of the four possible explanations for the over-representation of women in public employment to be tested within our model is a lower gender wage gap in the public sector, it is important for us to fully match the private sector gender wage gap. To make sure that this is the case, we hence assume that the actual female wage is only a fraction of what is paid by firms. Similar to the literature on the misallocation of resources, we assume that there is an exogenous wedge $0 \leq \alpha \leq 1$, acting as a tax on women's wages

$$w_{p,f} = (1-\alpha)w^*_{p,f}. \tag{23}$$

An alternative approach assuming that women are less productive than men, would essentially be similar. On the other hand, assuming that women have lower bargaining power than men, would result in firms preferring to hire women rather than men to take advantage of higher profits.

In our setting, for a firm, the value of a vacancy is hence given by

$$rV_p = -\kappa + q(\theta_p)[\psi^p J_m + (1-\psi^p)J_f], \tag{24}$$

where $\kappa$ denotes the cost of creating a vacancy, $q(\theta_p)$ is the probability of finding a worker, and $\psi^p$ denotes the fraction of men among the unemployed in the private sector. Given $J_m = J_f$, firms do not have any reason to discriminate between hiring a man or a woman. Hence, the free-entry condition that pins down tightness in the private sector is given by

$$\frac{\kappa}{q(\theta_p)} = \frac{y(1-\beta)}{r + \delta_{p,m} + \tau + \lambda(1 - F(\bar{x}^{na}_{p,m}))}. \tag{25}$$

We assume a Cobb-Douglas matching function for the private sector and hence $m(\theta_p) = \theta_p q(\theta_p) = \zeta\theta_p^{\eta}$.

## 3.6 Government

The government employs $\bar{e}_g$ workers. At every instance, it has to hire enough workers to compensate for those who retire, exogenously separate into unemployment or inactivity, or endogenously separate into inactivity. We assume that the government has the following matching function $M_g = \min\{v_g, u_g\}$. The functional form of the matching is not relevant because we set the vacancies to match the observed employment level exogenously, rather than having an job-creation condition that depends on tightness as in the private sector.

Given that the government might employ men and women in different proportions, the number of quits from the public sector (which have to be re-hired) is given by

$$v_g = \bar{e}_g[\tau + \varphi_g(\delta_{g,m} + \lambda(1 - F(\bar{x}^{na}_{g,m}))) + (1-\varphi_g)(\delta_{g,f} + \lambda(1 - F(\bar{x}^{na}_{g,f})))], \tag{26}$$

where $\varphi_g$ denotes the fraction of men in public employment. In line with our empirical findings we assume that the government pays an exogenous premium, $\pi_j$ over private sector wages that is different for men and women

$$w_{g,m} = \pi_m w_{p,m}, \tag{27}$$

$$w_{g,f} = \pi_f w_{p,f}. \tag{28}$$

## 3.7 Initial choice of sector

Once individuals are born, at rate $\tau$, men and women chose which sector to enter. To this end, individuals will hence compare the expected values of entering the private or the public sector which include their relative preference for the public sector:

$$\max\left\{(1-F(\bar{x}^a_{p,j}))I_{p,j}+F(\bar{x}^a_{p,j})U_{p,j};(1-F(\bar{x}^a_{g,j}))I_{g,j}+F(\bar{x}^a_{g,j})U_{g,j}+\epsilon_j\right\} j=m,f. \quad (29)$$

The thresholds for the choice of sector, different for men and women, are hence given by

$$\epsilon^*_j=(1-F(\bar{x}^a_{p,j}))I_{p,j}+F(\bar{x}^a_{p,j})U_{p,j}-(1-F(\bar{x}^a_{g,j}))I_{g,j}-F(\bar{x}^a_{g,j})U_{g,j},\ j=m,f, \quad (30)$$

and the shares of men and women entering the public sector labor market are given by

$$1-\Xi_m(\epsilon^*_m), \quad (31)$$

$$1-\Xi_f(\epsilon^*_f) \quad (32)$$

Gender differences in preferences for public employment in our model allow us to test for the importance of such differences for explaining the over-representation of women in public employment. In addition, without this additional heterogeneity, in our model the selection of workers into the public or private sector would only be driven by aggregate variables and would therefore be equal for all workers. As a result, in a world of gender and sector symmetry, the share of women in the public sector would be undetermined. Furthermore, if the public sector increased wages for women slightly, more women would be attracted to the public sector, lowering the job-finding probability for all workers in the public sector. Hence, all men would then prefer to enter the private sector labor market. The only possible equilibrium would thus be one where only women would be queuing in the public sector. While in our model such a mechanism is still present when increasing women's public sector wages, heterogeneity in preferences allows us to generate equilibria where both men and women enter the public sector.

## 3.8 Definition of steady-state equilibrium

**Definition 1.** *A steady-state equilibrium in our economy is defined by a set of thresholds* $\{\bar{\epsilon}_f,\bar{\epsilon}_m,\bar{x}^a_{g,m},\bar{x}^a_{p,m},\bar{x}^a_{g,f},\bar{x}^a_{p,f},\bar{x}^{na}_{g,m},\bar{x}^{na}_{p,m},\bar{x}^{na}_{g,f},\bar{x}^{na}_{p,f}\}$*, job-finding probabilities* $\{p_p,p_g\}$*, stocks of inactive* $\{i_{p,m},i_{p,f},i_{g,m},i_{g,f}\}$*, unemployed* $\{u_{p,m},u_{p,f},u_{g,m},u_{g,f}\}$*, "attached" employed* $\{e^a_{p,m},e^a_{p,f},e^a_{g,m},e^a_{g,f}\}$*, "unattached" employed* $\{e^{na}_{p,m},e^{na}_{p,f},e^{na}_{g,m},e^{na}_{g,f}\}$*, and private sector wages* $\{w_{g,f},w_{g,m}\}$*, such that, given some exogenous government policy* $\{w_{g,m},w_{g,f},\bar{e}_g\}$ *and an*

*exogenous "wedge" for female private sector wages* $\{\alpha\}$*:*

1. *Private sector firms satisfy the free-entry condition.*
2. *Male private sector wages are a constant fraction of workers' productivity.*
3. *Female private sector wages prior to applying a "wedge" are such that the value of a job for a firm is the same when hiring a man or a woman.*
4. *Newborns decide optimally which sector to join.*
5. *Workers decide optimally the threshold values of* $x$ *for quitting their job or to stop searching.*
6. *Worker flows in and out of the four stocks are constant.*
7. *The total population adds up to 1 (0.5 men, 0.5, women):*
   - $\frac{1}{2}(1 - \Xi_m(\bar{\epsilon}_m)) = i_{g,m} + u_{g,m} + e^a_{g,m} + e^{na}_{g,m}$
   - $\frac{1}{2}\Xi_m(\bar{\epsilon}_m)) = i_{p,m} + u_{p,m} + e^a_{p,m} + e^{na}_{p,m}$
   - $\frac{1}{2}(1 - \Xi_f(\bar{\epsilon}_f)) = i_{g,f} + u_{g,f} + e^a_{g,f} + e^{na}_{g,f}$
   - $\frac{1}{2}\Xi_f(\bar{\epsilon}_f)) = i_{p,f} + u_{p,f} + e^a_{p,f} + e^{na}_{p,f}$.

Summarizing, in our model men and women differ along the following dimensions: the distributions for preferences of working in the public sector and for the opportunity costs of working, $\Xi_j(\cdot)$ and $F_j(\cdot)$, respectively as well as a "wedge" $\alpha$ on women's wages and different exogenous job-separation probabilities $\delta_{p,j}$ and $\delta_{g,j}$. Public and private sectors on the other hand differ in terms of losses in home production when working, $\xi_i$, separation rates $\delta_{i,m}$ and $\delta_{i,f}$, and wage schedules for men and women, $w_{i,m}$ and $w_{i,f}$.

While both gender and sector differences act jointly to determine model outcomes, a priori we will identify them in the following way: differences in inactivity rates of men and women and their inflows from employment will identify differences in opportunity costs of working by gender. The difference in time costs of working between the public and private sector will be identified by differences in flow rates from public and private employment to inactivity. Flow rates from public and private employment to unemployment for men and women will be linked to separation rates that differ by sector and gender. Different wages in the private sector for men and women are an outcome of our model and due to gender differences in opportunity costs of working and the assumption that firms are indifferent between hiring men or women. Given our empirical findings, the wage differences by gender

in the public sector are imposed, and the "wedge" on women's wages is identified by the observed private sector gender wage gaps. Finally, we identify the different distributions for men and women regarding preferences of working in the public sector as the residual needed to explain the different representation of men and women in public employment.[11]

# 4 Calibration

We calibrate our model to data from the four countries from our empirical analysis. For France, the UK, and Spain we have quarterly data, while for the US data is recorded on a monthly frequency. Some parameters are set exogenously based on outside information or as normalizations, while the remaining parameters are calibrated to match data moments. We assume that men and women draw values of home production or opportunity costs $x$ from cumulative log-normal distribution functions $F_m(\tilde{x}_m, \sigma_m^x)$ and $F_f(\tilde{x}_f, \sigma_f^x)$ with different means and standard deviations. We assume normally distributed preferences for working in the public sector; i.e. for men and women $\epsilon$ is drawn from $\Xi_m(\tilde{\epsilon}_m, \sigma^\epsilon)$ and $\Xi_f(\tilde{\epsilon}_f, \sigma^\epsilon)$ respectively, with different means but a common standard deviation.

Table 4 displays all parameters for each country. For all countries we set the interest rate such as to match a 4% annual interest rate. For public sector wage premia for each country we use results from our empirical analysis (see Table 3). We also obtain numbers for public sector employment from our empirical analysis. We normalize the matching efficiency for all countries to 1, and we also set the time cost of working in the private sector to 1. Following Borowczyk-Martins et al. [2013], we set the elasticity of the matching function with respect to unemployment to 0.3. Regarding the time unemployed individuals spend searching, Krueger and Mueller [2012] report median times of around 110-120 minutes per day for the US, Spain, and France, and we hence set $s$ to 0.25.

For each country, we calibrate the remaining sixteen parameters to match seventeen data moments. In particular, we search for parameters such as to minimize the sum of the squared percentage difference between data and model moments for the following targets: unemployment and inactivity rates for men and women, the ratio of public employment shares, the gender wage gap in the private sector, vacancy costs in terms of weekly wages, the relative conditional job finding rate in public to private sector, the regional sensitivity of

[11] While a more natural way of identification might simply use flow rates among all states by gender, thus mechanically obtaining inactivity and unemployment rates for men and women, this approach cannot be used here. Because in our model individuals always have to be unemployed before finding a job. Instead, we target the stocks and outflows from employment to unemployment and inactivity and abstract from matching the flows from unemployment to employment.

Table 4: Baseline calibration

| | US (monthly) | UK (qt) | France (qt) | Spain (qt) |
|---|---|---|---|---|
| **Parameters set exogenously** | | | | |
| Discounting | | | | |
| Interest rate ($r$) | 0.004 | 0.012 | 0.012 | 0.012 |
| Death rate ($\tau$) | 0.002 | 0.006 | 0.006 | 0.006 |
| Public sector policies | | | | |
| Wage premium (men) ($\pi_m$) | 0.955 | 1.037 | 0.878 | 0.998 |
| Wage premium (women) ($\pi_f$) | 1.050 | 1.057 | 0.950 | 1.069 |
| Employment ($e_g$) | 0.118 | 0.170 | 0.137 | 0.074 |
| Labor market parameters | | | | |
| Matching efficiency ($\zeta$) | 1 | 1 | 1 | 1 |
| Matching elasticity ($\eta$) | 0.3 | 0.3 | 0.3 | 0.3 |
| Time cost of labor force | | | | |
| Private sector ($\xi_p$) | 1 | 1 | 1 | 1 |
| Unemployed ($s$) | 0.25 | 0.25 | 0.25 | 0.25 |
| **Calibrated parameters** | | | | |
| Labor market parameters | | | | |
| Bargaining power of men ($\beta$) | 0.924 | 0.965 | 0.967 | 0.939 |
| Cost of posting vacancies ($\kappa$) | 4.940 | 1.563 | 3.555 | 6.876 |
| "Wedge" female-male wage prv. sector ($\alpha$) | 0.299 | 0.171 | 0.158 | 0.203 |
| Time cost of labor force | | | | |
| Public sector "discount"($\mu = \xi_p - \xi_g$) | 0.264 | 0.376 | 0.610 | 0.643 |
| Arrival rate of shocks | | | | |
| Outside option ($\lambda$) | 0.057 | 0.057 | 0.046 | 0.043 |
| Job separation - private, men ($\delta_{p,m}$) | 0.022 | 0.020 | 0.022 | 0.052 |
| Job separation - public, men ($\delta_{g,m}$) | 0.007 | 0.008 | 0.008 | 0.024 |
| Job separation - private, women ($\delta_{p,f}$) | 0.016 | 0.017 | 0.022 | 0.058 |
| Job separation - public, women ($\delta_{g,f}$) | 0.010 | 0.006 | 0.008 | 0.032 |
| Outside option distribution: Log normal | | | | |
| Mean - men ($\tilde{x}_m$) | -2.755 | -1.206 | -1.945 | 0.463 |
| Difference women-men ($\tilde{x}_f - \tilde{x}_m$) | 1.305 | 0.783 | 2.248 | 0.641 |
| Std. men - ($\sigma_{x,m}$) | 5.518 | 2.379 | 5.831 | 2.027 |
| Std. women - ($\sigma_{x,f}$) | 5.858 | 1.903 | 4.157 | 1.132 |
| Preference distribution: Normal | | | | |
| Mean - men ($\tilde{\epsilon}_m$) | -132.410 | -66.815 | -7.521 | -17.258 |
| Difference women-men ($\tilde{\epsilon}_f - \tilde{\epsilon}_m$) | 26.736 | 38.030 | 0.865 | 1.904 |
| Std. - men and women ($\sigma_{\epsilon,m}$) | 134.413 | 63.853 | 8.746 | 10.938 |

the ratio of public employment shares, as well as eight flow rates between public and private employment, unemployment, and inactivity by gender. In particular, we target the following four flow rates for both men and women: private sector employment to unemployment, private sector employment to inactivity, public sector employment to unemployment, and public sector employment to inactivity. Note that these numbers used for calibration are different from those in Table 2. In particular, we apply a time aggregation bias correction to calculate the continuous rates from the probabilities of changing state within a survey frequency. Appendix B.2 describes the applied procedure in detail.

While all parameters affect all targets, certain calibrated parameters can be related to data moments which they are more likely to affect. The parameter $\beta$ indicating men's bargaining power is closely linked to male and female unemployment rates. We identify the cost of posting vacancies $\kappa$, by matching firms' expected vacancy costs equal to eight weekly wages. Our calibrated values for $\kappa$ differ across countries, being highest in Spain (and lowest in the UK) where high (low) unemployment rates imply that vacancies will be filled faster (slower). The exogenous "wedge" on female private sector wages ($\alpha$) is closely linked to the resulting gender wage gap and hence is calibrated to a lower (higher) value in France (the US) where the private sector gender wage gap is lowest (highest). Note that the calibrated parameter values for $\alpha$ are rather close to the observed gender wage gaps, indicating that similar to Albanesi and Sahin [2013] the model's mechanism of endogenously generating these gaps can only explain a 2.5 to 3.5 percent of the observed gender wage gap.[12]

There are six parameters closely linked to inactivity: the parameter $\mu = \xi_p - \xi_g$, indicating the difference in work-life balance between working in the private compared to the public sector, the arrival rate of a shock to the outside option, $\lambda$ and the parameters of the log-normal distribution of individuals' shocks to the opportunity costs of working (two different means and two different standard deviations). These six parameters pin down six variables, namely the inactivity rates and the flows from public and private employment to inactivity for men and women. In particular, a higher calibrated mean for women in all countries relates to the higher level of female compared to male inactivity as well as higher female flow rates from private and public employment to inactivity. Values for parameter $\mu$ are estimated to be larger in France and Spain and lower in the US and the UK. With the exception of France, these numbers are in line with our empirical estimates in Table 3 regarding working hour discounts in the public sector being largest for Spain, smaller for the UK and lowest for the US. However, a direct comparison across countries is not possible because the effect of $\mu$ depends on the distribution of $x$. In all countries, the mean of the opportunity cost distribution is higher for women than for men. In all three European countries, also the standard deviation is smaller for women than for men.

Figure C.1 in Appendix C.3 provides a graphical representation of the distributions of outside options together with the thresholds for men and women. For the US, the two distributions are indistinguishable and the two thresholds are similar for men and women. For the

[12] In Albanesi and Sahin [2013] the gender wage gap disappears in the 1996 calibration of the model. The authors point out that this "is due to the fact that the rise in women's labor force attachment causes their quit rates to get closer to men's. In the model, when quit rates are similar, the value associated to hiring male and female workers also converges, causing the gender wage gap to decrease. In the data, a substantial gender wage gap still remains, suggesting that the remaining gap is most likely due to factors absent in our model." (pg 61).

Table 5: Targets: model vs. data

| **Targets** | **US** | | **UK** | | **France** | | **Spain** | |
|---|---|---|---|---|---|---|---|---|
| | Data | Model | Data | Model | Data | Model | Data | Model |
| Unemployment rates | | | | | | | | |
| Male ($u_m/(1-i_m)$) | 0.069 | 0.056 | 0.064 | 0.056 | 0.090 | 0.078 | 0.156 | 0.160 |
| Female ($u_f/(1-i_f)$) | 0.059 | 0.059 | 0.056 | 0.061 | 0.096 | 0.088 | 0.190 | 0.184 |
| Inactivity rates | | | | | | | | |
| Male ($i_m$) | 0.169 | 0.178 | 0.162 | 0.168 | 0.238 | 0.210 | 0.329 | 0.325 |
| Female ($i_f$) | 0.250 | 0.259 | 0.284 | 0.271 | 0.330 | 0.335 | 0.490 | 0.482 |
| Public sector employment shares ratio | | | | | | | | |
| $(e^g_f/(e^p_f+e^g_f))/(e^g_m/(e^p_m+e^g_m))$ | 1.429 | 1.421 | 2.187 | 2.267 | 1.744 | 1.809 | 1.583 | 1.555 |
| Private sector wage gap | | | | | | | | |
| $w^p_f/w^p_m-1$ | -0.314 | -0.309 | -0.177 | -0.177 | -0.163 | -0.162 | -0.214 | -0.209 |
| Nr. of weekly wages- exp. cost vacancy | | | | | | | | |
| $\kappa\Theta^(1-\eta)/(W_{mp}/4)$ | 8.000 | 7.303 | 8.000 | 7.997 | 8.000 | 7.300 | 8.000 | 8.070 |
| Ratio probability job finding private/public | | | | | | | | |
| $p_p/p_g$ | 1.066 | 0.901 | 0.743 | 0.762 | 0.809 | 0.899 | 0.878 | 0.884 |
| Slope of public sector jobs on public-sector employment shares ratio | | | | | | | | |
| $\epsilon_{u_g/w_g}$ | 0.017 | 0.018 | 0.046 | 0.046 | 0.065 | 0.063 | 0.060 | 0.063 |
| Flows rates - male | | | | | | | | |
| $P \to U$ | 0.020 | 0.022 | 0.019 | 0.020 | 0.020 | 0.022 | 0.053 | 0.052 |
| $P \to I$ | 0.019 | 0.018 | 0.016 | 0.017 | 0.019 | 0.017 | 0.023 | 0.026 |
| $G \to U$ | 0.007 | 0.007 | 0.008 | 0.008 | 0.008 | 0.008 | 0.025 | 0.024 |
| $G \to I$ | 0.015 | 0.017 | 0.015 | 0.013 | 0.014 | 0.014 | 0.019 | 0.017 |
| Flows rates - female | | | | | | | | |
| $P \to U$ | 0.016 | 0.016 | 0.018 | 0.017 | 0.022 | 0.022 | 0.058 | 0.058 |
| $P \to I$ | 0.028 | 0.024 | 0.029 | 0.026 | 0.027 | 0.025 | 0.043 | 0.039 |
| $G \to U$ | 0.010 | 0.010 | 0.006 | 0.006 | 0.008 | 0.008 | 0.029 | 0.031 |
| $G \to I$ | 0.020 | 0.023 | 0.018 | 0.020 | 0.018 | 0.021 | 0.026 | 0.027 |

UK and France we observe minor gender differences in the distributions and somewhat larger differences, in particular for France, in the second threshold that determines who will quit into inactivity. In Spain, the country with the largest gender differences in unemployment and inactivity rates of 3.4 and 15.7 percentage points respectively distributions for men and women look quite different. In particular, only few women have very low opportunity costs of working. For the same reason, also, the gender gap in both thresholds, in particular the second one, is largest in Spain.

Flow rates from private employment to unemployment and public employment to unemployment are determined by separation rates $\delta_{p,m}$, $\delta_{p,f}$, $\delta_{g,m}$ and $\delta_{g,f}$ respectively. As expected, and given much higher flow rates from private than public employment to unemployment, for all countries we estimate 2-3 times higher values for job separation rates in the private compared to the public sector. In addition, calibrated values for Spain are higher given larger flow rates for men and women between private and public employment and unemployment.

Finally, there are three parameters related to the distribution of preferences for working in the public sector: the mean of the distribution for men, the mean of the distribution for women and the standard deviation which is assumed to be equal for both genders. These three parameters are identified using three moments in the data. First, we use the length of the queue in the public relative to the private sector; i.e. the ratio of (conditional) job finding rates in the public compared to the private sector (equal to $p_g/p_p$). In the data, this ratio is equivalent to the ratio of unemployment duration of new hires in the private over that of new hires in the public sector, which we observe in our microdata. For the UK, France and Spain this statistic is smaller than one, meaning that the unemployment duration is lower in the private sector, or in other words, queues are longer in the public sector. In the US, the number is slightly above one. The mean preference for women is determined as a residual needed to match the ratio of public employment shares. Finally, the standard deviation of the two distributions, which we assume to be equal across genders, is a crucial parameter that governs the effect of a change in the payoff in the public sector on the number of individuals applying for public sector jobs. Ideally to assign a value to this parameter we would target some causal effects of policies. However, we do not have any suitable data to do so. Furthermore, the empirical literature is scarce and, as far as we are aware, there are no natural experiments that we can use to identify this parameter. Instead we consider regional variation and check how the over-representation of women changes with the size of the public sector. In particular, we regress the ratio of public employment shares by region on each region's total size of the public sector (number of workers over the working-age population). We find statistically significant negative correlations in all four countries, with coefficients ranging from -0.017 in the US to -0.065 in France. Figure A.5 in Appendix A shows these correlations. In our calibration we thus target these coefficients.

Table 5 displays our model statistics next to the targeted data moments. Most data moments are matched well with an average percentage deviation of less than 7 percent in all countries. The model generates higher unemployment rates for women than for men in all four countries, which is true in France and Spain but not for the UK and the US. The model cannot generate a smaller queue in the public compared to the private sector as observed in the US. Finally note that including also public sector wages leads to slightly lower aggregate gender wage gaps in all countries.

# 5 Examining public sector policies

## 5.1 Counterfactual Experiments

We then use our model to run counterfactual experiments that can help us to better understand the over-representation of women in the public sector. In particular, we run five different experiments shutting down distinct features of the model and comparing the resulting statistics on the over-representation of women in public employment to those in our benchmark economy. The first experiment shuts down gender differences in preferences for working in the public sector and eliminates any differences between the two sectors. In particular, we set wages in the private sector equal to wages in the public sector for each gender, eliminate differences in time costs and separation rates between the two sectors and impose the same preferences for working in the public sector for men and women. Then to understand how each feature contributes, we run the following four experiments shutting down one by one: (i) gender differences in preferences for working in the public sector, (ii) public sector wage premia, (iii) sectoral differences in hours worked, and (iv) differences in job security between the public and private sector. Table C.1 in Appendix C.3 shows the results from the opposite exercise: again starting from a model without sector differences and without gender differences in preferences but adding each feature in turn.

For each experiment, Table 6 displays the two indicators reflecting the gender composition in the public sector next to the ones from our benchmark economy; for results on the raw measures for the over-representation of women see Table C.2 in Appendix C.3. As expected, eliminating gender differences in preferences as well as all sector differences leads to fewer women in the public sector in all countries. Note that the only impediment for a 50/50 representation of men and women in each sector (indicators taking on the value of 1) are the different distributions of outside options for men and women and the "wedge" on female private sector wages. The second experiment that only eliminates gender differences in preferences for working in the public sector comes close to generating the low representation of women in the public sector as under the first experiment. Especially in the UK, gender differences in preferences seem to almost entirely (to 94%) explain the female over-representation in the public sector. For the remaining countries, preferences explain 80 percent of the over-representation of women in public employment in the US, 45 percent in Spain, but only 20 to 25 percent in France.

In our empirical analysis we estimated positive public sector wage premia for women that were higher than those for men in most countries. The only exception was France where all individuals in the public sector earned on average lower wages. But even in France, the wage

Table 6: Gender composition of the public sector under different scenarios

| **Country** | Benchmark | No sector differences & no preference differences $\pi_w = \pi_m = 1$ $\xi_g = \xi_p$ $\bar{\epsilon}_f = \bar{\epsilon}_m$ $\delta_g = \delta_p$ | No preference differences $\bar{\epsilon}_f = \bar{\epsilon}_m$ | No wage differences $\pi_w = \pi_m = 1$ | No hours differences $\xi_g = \xi_p$ | No job security differences $\delta_g = \delta_p$ |
|---|---|---|---|---|---|---|
| Public sector employment shares ratio | | | | | | |
| US | 1.42 | 0.991 | 1.08 (79%) | 1.28 (33%) | 1.43 (-2%) | 1.45 (-7%) |
| UK | 2.19 | 0.997 | 1.07 (94%) | 2.17 (2%) | 2.17 (2%) | 2.19 (0%) |
| France | 1.83 | 0.925 | 1.6 (25%) | 1.34 (54%) | 1.63 (22%) | 1.85 (-2%) |
| Spain | 1.53 | 0.856 | 1.25 (42%) | 1.35 (27%) | 1.31 (33%) | 1.58 (-7%) |
| Women's employment shares ratio | | | | | | |
| US | 1.25 | 0.994 | 1.05 (78%) | 1.17 (31%) | 1.26 (-4%) | 1.27 (-8%) |
| UK | 1.71 | 0.998 | 1.04 (94%) | 1.7 (1%) | 1.66 (7%) | 1.71 (0%) |
| France | 1.55 | 0.941 | 1.42 (21%) | 1.25 (49%) | 1.38 (28%) | 1.56 (-2%) |
| Spain | 1.64 | 0.871 | 1.29 (46%) | 1.42 (29%) | 1.26 (49%) | 1.7 (-8%) |

*Note: Model simulations; in brackets the percentage difference between the first and second column that is explained when equating one characteristic of the sector at a time. Percentages do not necessarily add up to 1.*

discount was lower for women. In the third experiment we hence eliminate public sector wage premia. As a result, in all countries except for the UK, the representation of women in the public sector is lower than in our benchmark economy. The fact that women earn relatively higher wages in the public sector is hence an important driver for their over-representation. In the US and Spain it explains around 30 percent of the over-representation of women in public employment, and it explains around 50 percent in France.

We also presented empirical evidence showing that individuals in the public sector work on average fewer hours, something that in our model is captured by $\xi_g < \xi_p$. The fourth experiment considers a version of the model without differences in time costs between public and private sector employment. With respect to the gender composition in the benchmark economy we observe little differences in the US and the UK. This is different in France and Spain where better work-life balance in the public sector explains around 20 to 30 percent and 30 to 50 percent of the over-representation of women respectively. In our last experiment we impose the same job separation rates in the public and private sector. However, eliminating differences in job security increases the over-representation of women in public employment because more job security attracts more men to the public sector.

## 5.2 Quantifying the value of public sector characteristics

These last results that neither higher job security nor better work-life balance are the main drivers attracting women into the public sector do not imply that individuals do not value these features of public employment. It merely implies that individuals' valuation does not differ as much across genders as other aspects such as preferences or wages. To further investigate this matter we then use our model to quantify the value of different public sector characteristics. In particular, we ask how much of their wage would male and female private sector workers be willing to sacrifice to obtain: (i) the same work-life balance and (ii) the same job security as in the public sector. Alternatively in all cases, we can ask public sector workers how much they would have to be compensated to accept the same job characteristics as private sector workers. Regarding (i) a private sector worker with opportunity costs $x$ would be willing to sacrifice $(\xi_p - \xi_g)x/w_{p,j}$. To obtain the compensating differential, we then consider the average individual that prefers working to inactivity. When estimating (ii) note that a private sector worker with wage $w_1$ would only accept a private sector job with wage larger than $w_2 = w_1 + \delta_p(U_{p,j}(x|\delta_p) - E_{p,j}(x|\delta_p)) - \delta_g(U_{p,j}(x|\delta_g) - E_{p,j}(x|\delta_g))$ in case his opportunity costs of working $x$ is not very large; i.e he is an attached employed individual. For unattached employed workers in the private sector the wage they need to accept a public sector job is then given by $w_2 = w_1 + \delta_p(I_{p,j}(x|\delta_p) - E_{p,j}(x|\delta_p)) - \delta_g(I_{p,j}(x|\delta_g) - E_{p,j}(x|\delta_g))$. With some additional algebra we can obtain the compensating differential again considering the average individual with opportunity costs of working low enough to prefer employment to inactivity; see Appendix C.3 for more details. Table 7 displays the results from this exercise. Overall private sector workers seem to value work-life balance more than higher job security. While they are willing to give up 3-41% of their private sector wages for fewer working hours, they would only sacrifice 1-4% of their wages for higher job security.

The work-life balance premium is very high in Spain (25 to 41 percent), high in France and the UK (7 to 13 percent) and lower in the US (around 3 percent). Regarding gender differences, we find that women are willing to pay more for work-life balance in all countries.

Table 7: Value of public sector job characteristics from

| **Country** | **Perspective of a private sector worker** | | | | **Perspective of a public sector worker** | | | |
|---|---|---|---|---|---|---|---|---|
| | **Work-life balance** $[\xi_p = \xi_g]$ | | **Job security** $[\delta_{p,j} = \delta_{g,j}]$ | | **Work-life balance** $[\xi_p = \xi_g]$ | | **Job security** $[\delta_{p,j} = \delta_{g,j}]$ | |
| | Women | Men | Women | Men | Women | Men | Women | Men |
| US | 3.24 | 2.73 | 0.689 | 1.92 | 4.2 | 3.56 | 0.611 | 1.69 |
| UK | 12.9 | 8.76 | 1.12 | 1.29 | 18.3 | 12.3 | 1.44 | 1.6 |
| France | 12.3 | 6.73 | 2.09 | 2.32 | 28.1 | 15.6 | 2.47 | 2.62 |
| Spain | 41 | 24.2 | 2.42 | 3.89 | 96.9 | 55.4 | 3.89 | 5.04 |

We estimate a job security premium that is much lower – around one percent – in countries with low unemployment rates, like the US and the UK. We find a much higher premium, more than twice as large – between 2 and 4 percent– for France and Spain, countries where the risk of unemployment is much higher. In all countries except for France, men are willing to pay more for job security. This is due to the fact that on average men's outside options $x$ are lower and their wages are higher, and hence job losses are more costly for men.

When alternatively evaluating these differentials through the lens of a public sector worker, in the three European countries job-security premia are more than twice as large. This is due to the fact that the conditional job-finding rate in the public sector is lower than in the private sector, unemployment is hence more costly and thus public sector workers demand higher compensations for accepting a lower private sector job security. Similarly, work-life balance premia estimated this way are also higher. Because of a better work-life balance in the public sector (low $\xi_g$), there are more public sector workers with higher opportunity costs of working (higher $x$) compared to workers in the private sector. These individuals hence demand a much larger compensation for accepting a loss in work-life balance (a higher $\xi_p$).

## 5.3 Effects of public sector wages and employment

The over-representation of women in the public sector implies that public wage and employment policies could potentially have very different effects for male and female labor market outcomes. Our model allows us to test this and to quantify these differences. In particular, we consider three different policies. The first increases public sector wages by 1%, the second one increases public sector employment by 1%, and finally we consider a situation without a public sector. For each country, Table 8 displays the changes in male and female unemployment and inactivity rates as well as changes in the aggregate gender wage gap compared to the benchmark case for each of these scenarios.

Higher wages in the public sector lead to increases in male and female unemployment as more individuals and in particular more women decide to search for public sector jobs. More people queuing in a sector where job creation does not respond to labor market conditions, and fewer people in the private sector raises the unemployment rate. The negative effect of public sector wages on the unemployment rate is twice as high for women than for men. As unemployment increases, inactivity rates particularly for women decrease. Higher public sector wages reduce the gender wage gap, and even more so in countries like the UK and France (around 0.20 percentage points) with larger public sectors in which over 60% of workers are women.

Table 8: Effects of public sector policies for different countries

| **Policy** | **United States** | **United Kingdom** | **France** | **Spain** |
|---|---|---|---|---|
| *Increase of wages by 1 percent* | | | | |
| Δ unemployment rate male | 0.07 pp. | 0.08 pp. | 0.10 pp. | 0.15 pp. |
| Δ unemployment rate female | 0.13 pp. | 0.21 pp. | 0.23 pp. | 0.31 pp. |
| Δ inactivity rate male | -0.00 pp. | -0.02 pp. | 0.01 pp. | -0.01 pp. |
| Δ inactivity rate female | -0.01 pp. | -0.08 pp. | -0.01 pp. | -0.02 pp. |
| Δ aggregate wage gap | -0.06 pp. | -0.19 pp. | -0.15 pp. | -0.13 pp. |
| *Increase of employment by 1 percent* | | | | |
| Δ unemployment rate male | -0.08 pp. | -0.10 pp. | -0.03 pp. | -0.06 pp. |
| Δ unemployment rate female | -0.15 pp. | -0.25 pp. | -0.07 pp. | -0.11 pp. |
| Δ inactivity rate male | 0.02 pp. | 0.02 pp. | 0.03 pp. | 0.01 pp. |
| Δ inactivity rate female | 0.02 pp. | 0.03 pp. | 0.04 pp. | 0.00 pp. |
| Δ aggregate wage gap | -0.01 pp. | -0.01 pp. | -0.01 pp. | -0.01 pp. |
| *No public sector* | | | | |
| Δ unemployment rate male | 3.94 pp. | 3.36 pp. | 0.50 pp. | 2.41 pp. |
| Δ unemployment rate female | 8.60 pp. | 6.59 pp. | 1.99 pp. | 5.23 pp. |
| Δ inactivity rate male | -0.68 pp. | 2.51 pp. | -2.42 pp. | -1.77 pp. |
| Δ inactivity rate female | 0.38 pp. | 12.07 pp. | -5.51 pp. | 0.17 pp. |
| Δ aggregate wage gap | 1.60 pp. | 1.36 pp. | 0.29 pp. | 2.31 pp. |

Increasing public sector employment on the other hand reduces unemployment for men and more so for women in all countries because the probability to find a job in the public sector increases. Similarly to public sector wage increases, increasing public employment reduces the size of the private sector. Unlike public sector wage increases however, additional public employment has a direct job-creation effect which is larger than the crowding out effect on private employment, and hence unemployment falls. Again the magnitude of the effect is more than twice as large for women compared to men. Effects on inactivity and the aggregate gender wage gap are rather small. Inactivity rates increase slightly (by up to 0.04 percentage points), and we observe a fall in the aggregate gender wage gap by 0.01 percentage points.

Finally considering a theoretical scenario without a public sector, we observe increases in unemployment rates for men between 0.5 to 4 percentage points, but particularly for women by as much as 8 percentage points. The effect on inactivity rates is mixed. Inactivity rates would be higher in the UK but lower in all other countries. Without a public sector, the aggregate gender wage gap is equal to the private sector gender wage gap and as such up to 2.2 percentage points higher compared to the one in our benchmark scenario.

# 6 Conclusion

The public sector hires dis-proportionally more women than men. To understand why, we build a model where men and women decide if to participate in the labor market and if to enter private or public sector labor markets. We calibrate our model to the United States, the

United Kingdom, France and Spain, to quantify how much different characteristics of public sector jobs explain the selection of women into the public sector. We find different results for each country. In the UK, preferences for public sector jobs play the most important role, while for the US, Spain, and France higher wages are also important for explaining the over-representation of women in the public sector. Maybe surprisingly, higher job security in the public sector plays a more important role for men than for women, something we confirm when calculating the sacrifice private sector workers are willing to make for obtaining public sector conditions in terms of work-life balance and job security.

Our estimation of the compensating differentials of public sector jobs and our findings on the different effects for men and women of public sector wage and employment policies are important for policy makers. First, governments should be aware that such policies have asymmetric impacts on labor market outcomes of men and women. The effects of public sector wage or employment increases on unemployment rates are twice as large for women than for men. Also, to the extent that on average mothers' employment status affects children more than fathers', because upon divorce children tend to remain with their mothers and because some women are single mothers, public sector employment policies might also have important effects for children's outcomes and ultimately fertility decisions. Second, when discussing increases or cuts to public sector wages, it is commonly argued that job security and better work-life balance provide compensating differentials. While these two forms of compensation seem to be of extreme relevance for policy makers, to the best of our knowledge there are few attempts to calculate them.[13] For all four countries, we find that the work-life balance premium is larger than the job-security premium, the latter varying between 1 and 4 percent. Given that our model considers agents with linear utility, these number should be interpreted as lower bounds. We conjecture that introducing risk aversion into our model would most likely lead to larger estimates of how men and women value public sector job-security.

Our finding regarding the important role for gender differences in preferences opens up a variety of interesting questions for future research. For instance, explicitly including gender differences in risk aversion into our model would most likely increase the role of sector differences in job-separation rates, and it would reduce the importance of preferences for explaining the over-representation of women in public employment. Another interesting question, from a micro rather than a macro perspective, would be to disentangle women's preferences for public service from their preferences to work in public sector occupations.

[13] One notable exception is Danzer and Dolton [2012] who use UK survey data to calculate total reward differentials, including current earnings, pensions, hours of work, paid holidays, employer provided health care and probability of unemployment.

Given that the latter is closely linked to individuals' specialization choices, incorporating this aspect into our model would require modeling education choices prior to entering private or public sector labor markets.

# References


**Adsera, Alícia** (2004): "Changing fertility rates in developed countries. The impact of labor market institutions," *Journal of Population Economics,* 17, 17-43.

**Albanesi, Stefania and Claudia Olivetti** (2009): "Home production, market production and the gender wage gap: Incentives and expectations," *Review of Economic Dynamics,* 12, 80-107.

**Albanesi, Stefania and Ayşegül Şahin** (2018): "The Gender Unemployment Gap," *Review of Economic Dynamics,* 30, 47-67.

**Alesina, Alberto; Baqir, Reza and William Easterly** (2000): "Redistributive Public Employment," *Journal of Urban Economics,* 48(2), 219-241.

**Alesina, Alberto; Danninger, Stephan and Massimo Rostagno** (2001): "Redistribution Through Public Employment: The Case of Italy," IMF Staff Papers, 48(3), 447-473.

**Anghel, Brindusa; de la Rica, Sara and Juan J. Dolado** (2011): "The Effect of Public Sector Employment on Women's Labour Market Outcomes," IZA Discussion Paper No. 5825.

**Attanasio, Orazio; Low, Hamish and Virginia Sanchez-Marcos** (2010): "Explaining Changes in Female Labor Supply in a Life-Cycle Model," *American Economic Review,* 98(4), 1517-1552.

**Bargain, Olivier; Etienne, Audrey and Blaise Melly** (2018): "Public Sector Wage Gaps over the Long-Run: Evidence from Panel Administrative Data," IZA DP No. 11924.

**Blundell, Richard and Thomas Macurdy** (1999): "Labor supply: A review of alternative approaches," in *Handbook of Labor Economics,* edited by Orley C. Ashenfelter and David Card, 3(A), 1559-1695.

**Borjas, George J.** (1984): "Electoral Cycles and the Earnings of Federal Bureaucrats," *Economic Inquiry,* 22(4), 447-459.

**Borowczyk-Martins, Daniel; Jolivet, Grégory and Fabien Postel-Vinay** (2013): "Accounting for endogeneity in matching function estimation," *Review of Economic Dynamics,* 16, 440-451.

**Bradley, Jake; Postel-Vinay, Fabien and Hélène Turon** (2017): "Public Sector Wage Policy and Labor Market Equilibrium: A Structural Model," *Journal of the European Economic Association,* 15(6), 1214-1257.

**Danzer, Alexander M. and Peter Dolton** (2012): "Total Reward and pensions in the UK in the public and private sectors," *Labour Economics,* 19(4), 584-594.

**Del Boca, Daniela** (2002): "The effect of child care and part time opportunities on participation and fertility decisions in Italy," *Journal of Population Economics,* 15(3), 549-573.

**Eckel, Catherine C., and Philip J. Grossman** (2008): "Men, Women and Risk Aversion: Experimental Evidence," in *Handbook of Experimental Economics Results*, Vol. 1, 1061-1073, C. Plott, V. Smith, eds., New York, Elsevier.

**Erosa, Andrés; Fuster, Luisa and Diego Restuccia** (2010): "A general equilibrium analysis of parental leave policies," *Review of Economic Dynamics,* 13(4), 742-758.

**Fernández, Raquel and Joyce Wong** (2014): "Divorce Risk, Wages, and Working Wives: A Quantitative Life-Cycle Analysis of Female Labour Force Participation," *Economic Journal,* 124(576), 319-358.

**Filippin, Antonio and Paolo Crosetto** (2016): "A Reconsideration of Gender Differences in Risk Attitudes," *Management Science,* 62(11), 3085-3391.

**Finn, Mary G.** (1998): "Cyclical Effects of Governments Employment and Goods Purchases," *International Economic Review,* 39(3), 635-657.

**Fontaine, Idriss; Galvez-Iniesta, Ismael; Gomes, Pedro and Diego Vila-Martin** (2020): "Labour market flows: Accounting for the public sector," *Labour Economics,* 62, 101770.

**Garibaldi, Pietro and Etienne Wasmer** (2005): "Equilibrium Search Unemployment, Endogenous Participation, and Labor Market Flows," *Journal of the European Economic Association,* 3(4), 851-882.

**Gemici, Ahu and Matthew Wiswall** (2014): "Evolution of Gender Differences in Post-Secondary Human Capital Investments: College Majors," *International Economic Review,* 55(1), 23-56.

**Goldin, Claudia** (2014): "A Grand Gender Convergence: Its Last Chapter," *American Economic Review,* 104(4), 1091-1119.

**Gomes, Pedro** (2015): "Optimal Public Sector Wages," *Economic Journal,* 125(587), 1425-1451.

**Gomes, Pedro** (2018): "Heterogeneity and the public sector wage policy," *International Economic Review,* 59(3), 1469-1489.

**Gornick Janet C. and Jerry A. Jacobs** (1998): "Gender, the welfare state, and public employment: A comparative study of seven industrialized countries," *American Sociological Review,* 63(5), 688-710.

**Greenwood, Jeremy; Guner, Nezih and John A. Knowles** (2000): "Women on Welfare: A Macroeconomic Analysis," *American Economic Review: Papers & Proceedings,* 90(2), 383-388.

**Gyourko, Joseph and Joseph Tracy** (1989): "Public Sector Bargaining and the Local Budgetary Process," NBER Working Papers 2915.

**Haefke, Christian and Michael Reiter** (2011): "What Do Participation Fluctuations Tell Us About Labor Supply Elasticities?," IZA Discussion Paper No. 6039.

**Hospido, Laura and Enrique Moral-Bonito** (2016): "The public sector wage premium in Spain: Evidence from longitudinal administrative data," *Labour Economics,* 42, 101-122.

**Killingsworth, Mark R. and James J. Heckman** (1987): "Female labor supply: A survey," in *Handbook of Labor Economics,* edited by Orley C. Ashenfelter and Richard Layard, 1, 103-204.

**Kolberg, Jon Eivind** (1991): "The gender dimension of the welfare state," *International Journal of Sociology,* 21(2), 119-148.

**Krueger, Alan B. and Andreas I. Mueller** (2012): "The Lot of the Unemployed: A Time Use Perspective," *Journal of the European Economic Association,* 10(4), 765-794.

**Krusell, Per; Mukoyama, Toshihiko; Rogerson, Richard and Ayşegül Şahin** (2011): "A three state model of worker flows in general equilibrium," *Journal of Economic Theory,* 146, 1107-1133.

**Lucifora, Claudio and Dominique Meurs** (2006): "The public sector pay gap in France, Great Britain and Italy," *Review of Income and Wealth,* 52(1), 43-59.

**Manning, Alan and Farzad Saidi** (2010): "Understanding the Gender Pay Gap: What's Competition Got to Do with it," *Industrial and Labor Relations Review,* 63(4), 681-698.

**Matschke, Xenia** (2003): "Are There Election Cycles in Wage Agreements? An Analysis of German Public Employees," *Public Choice,* 114(1-2), 103-135.

**OECD** (2015): Government at Glance 2015. Organisation for Economic Co-Operation and Development, Paris.

**Pertold-Gebicka, Barbara; Pertold, Filip and Nabanita Datta Gupta** (2016): "Employment Adjustments around Childbirth," IZA Discussion Paper No. 9685.

**Pissarides, Christopher A.** (1990): *Equilibrium Unemployment Theory,* Blackwell, Cambridge, Massachusetts.

**Poterba, James M. and Kim S. Rueben** (1995): "The Effect of Property-Tax Limits on Wages and Employment in the Local Public Sector," *American Economic Review,* 85(2), 384-389.

**Postel-Vinay, F. and Helene Turon** (2007): "The Public Pay Gap in Britain: Small Differences That (Don't) Matter," *The Economic Journal,* 117, 1460-1503.

**Pries, Michael and Richard Rogerson** (2009): "Search frictions and labor market participation," *European Economic Review,* 125(587), 1425-1451.

**Rosen, Sherwin** (1996): "Public Employment and the Welfare State in Sweden," *Journal of Economic Literature,* 34(2), 729-740.

# COMPANION APPENDIX

## You're the one that I want! Public employment and women's labour market outcome

Pedro Gomes and Zoë Kuehn

**Appendix A: Over-representation of women in public sector employment**



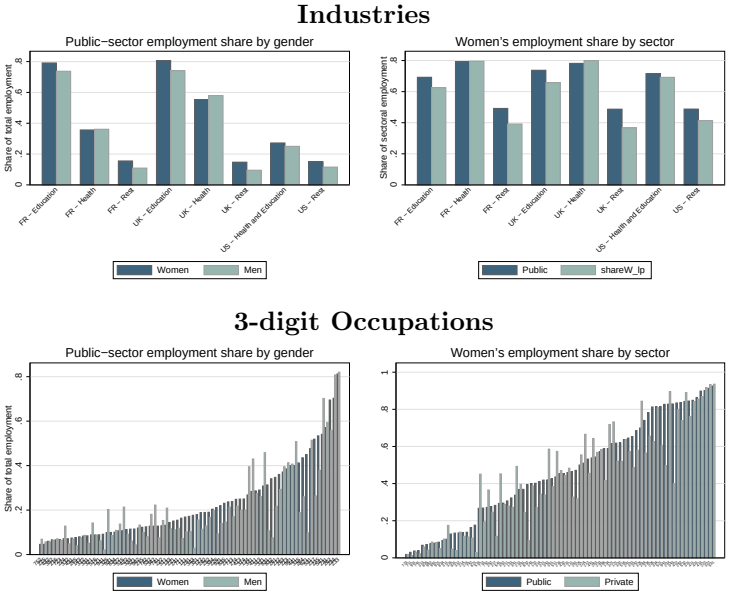
**Appendix B: Stocks and flows by gender**



**Appendix C: Further results from the model**

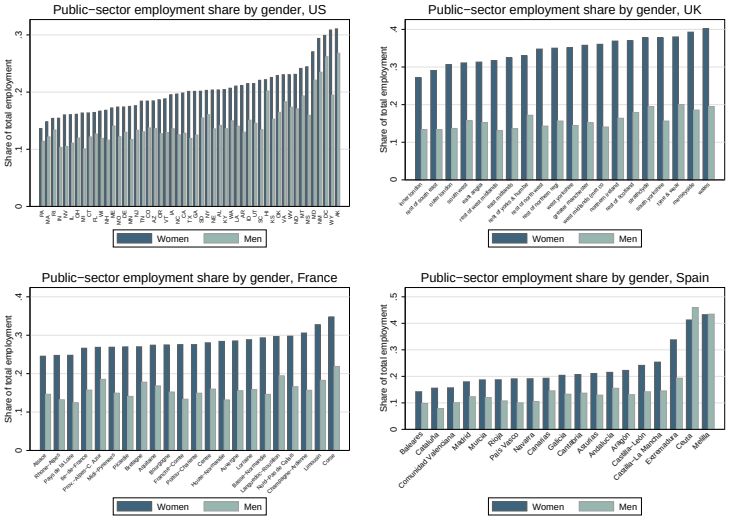
# A Over-representation of women in public sector employment

Figure A.1: Different statistics across industries and occupations



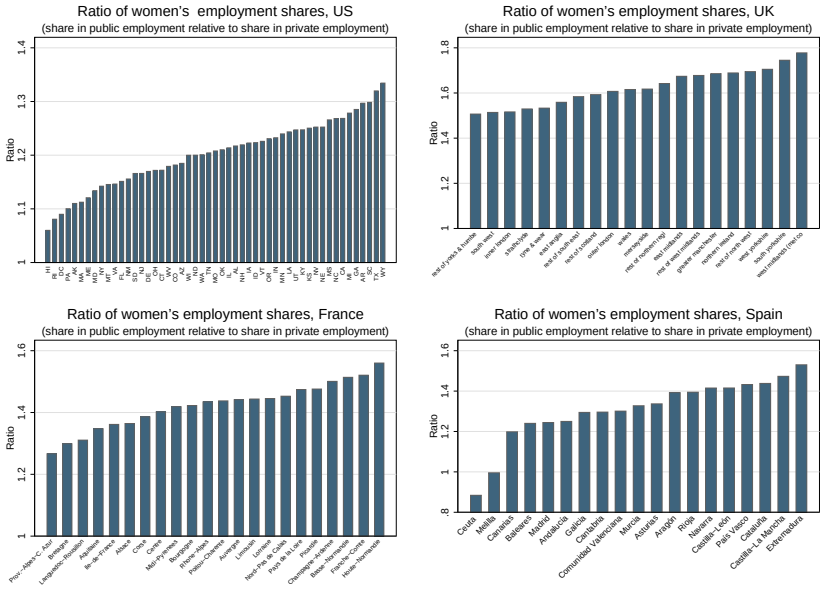

*Note: 1st panel uses the French and the UK Labour Force Surveys and the CPS (2003-2018). 2nd panel: CPS data, averages between 1996 and 2017. 3-digit occupations that have an overall share of public-sector employment between 0.05 and 0.95.*

Figure A.2: Public sector employment shares, regional variation



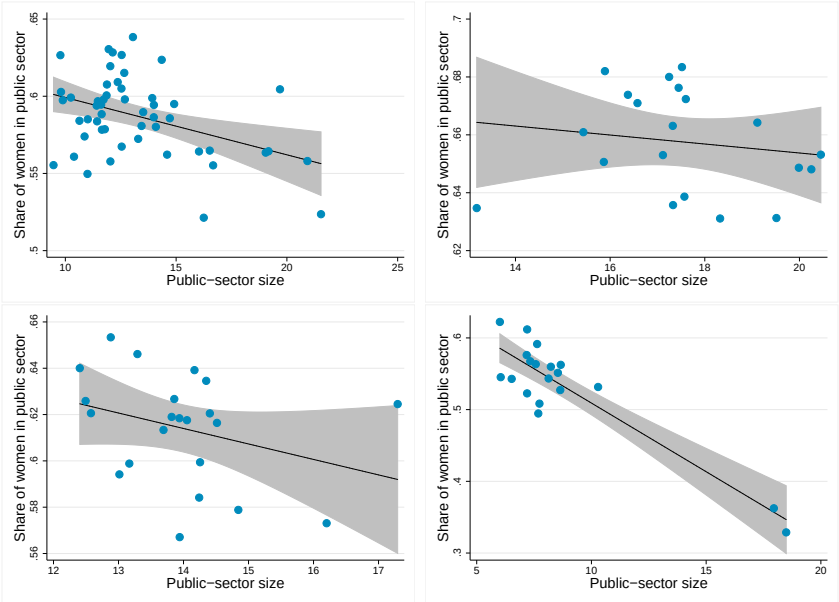

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018).*

Figure A.3: Ratio of women's employment shares, regional variation



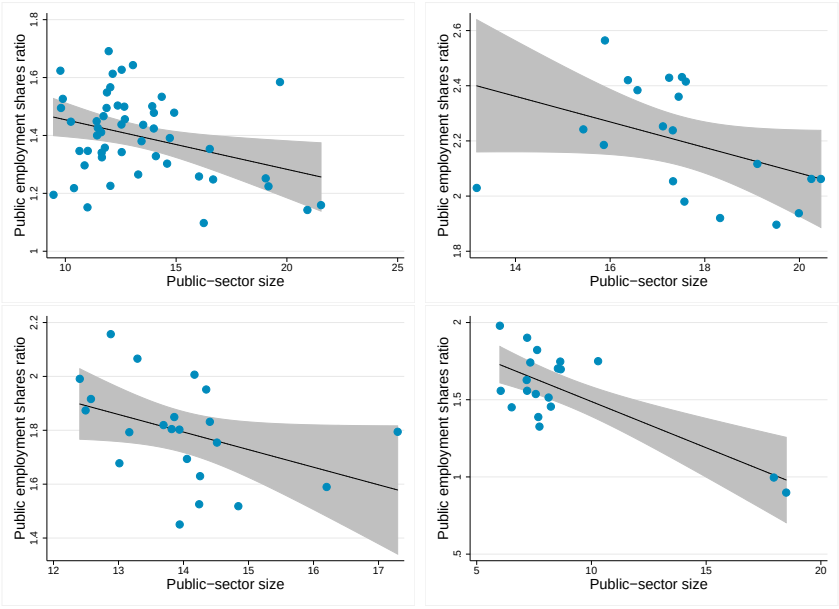

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018).*

Figure A.4: Share of women in public sector and the size of government



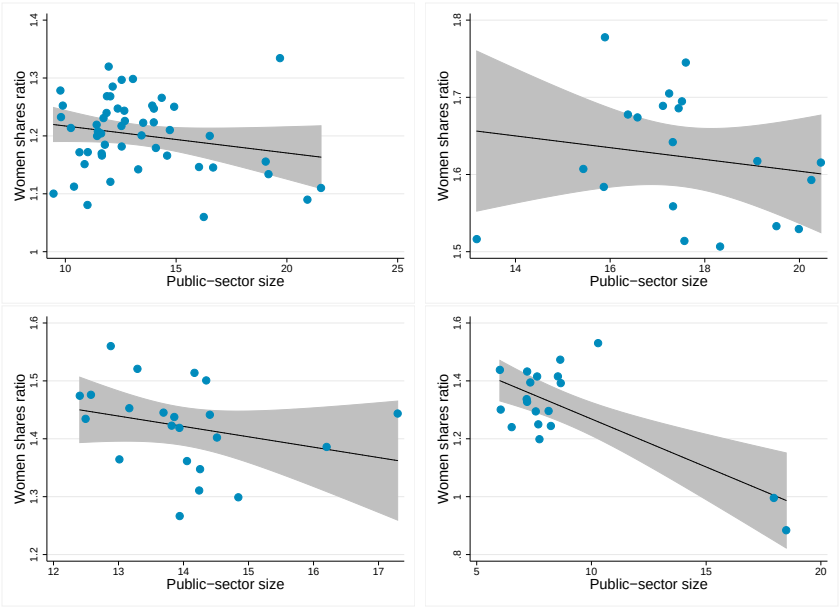

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018); clockwise from top left to bottom left: US, UK, Spain and France.*

Figure A.5: Public employment shares ratio and the size of government



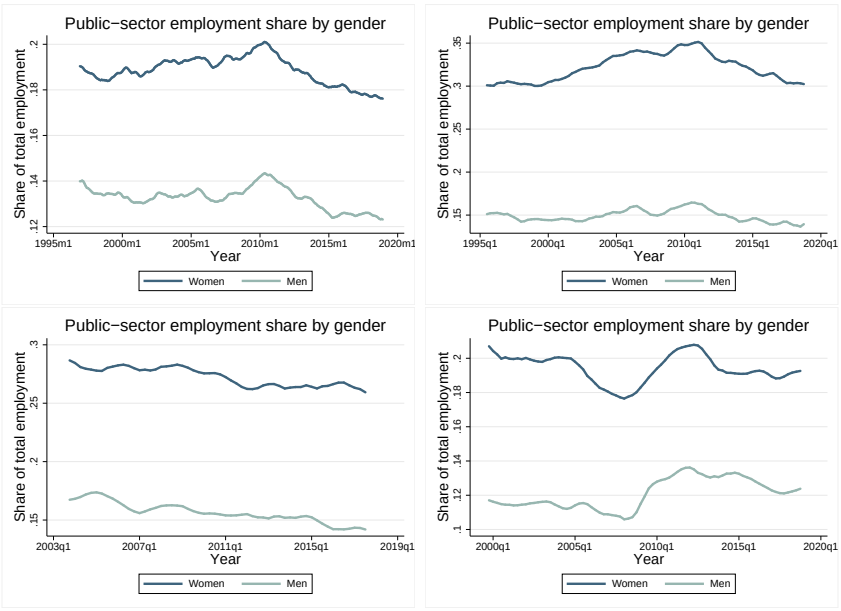

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018); clockwise from top left to bottom left: US, UK, Spain and France.*

Figure A.6: Women's employment shares ratio and the size of government



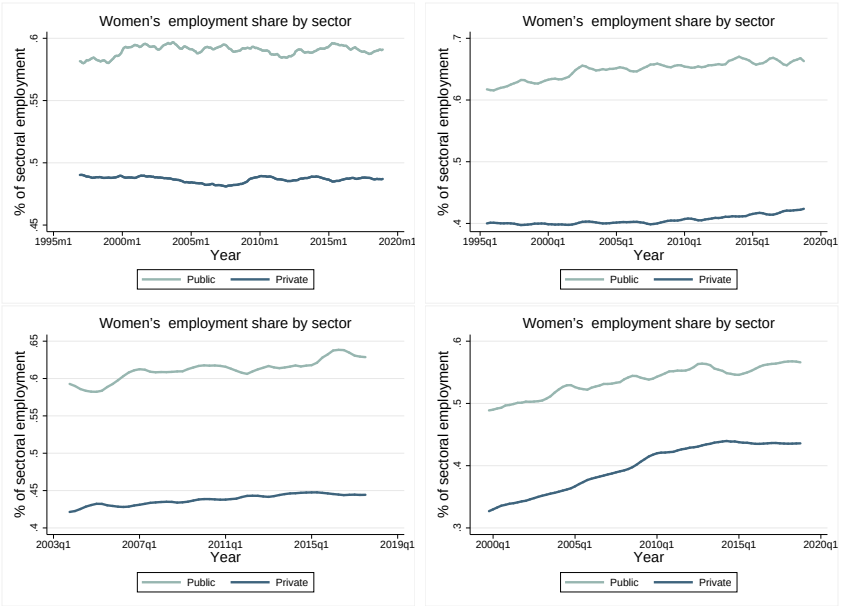

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018); ; clockwise from top left to bottom left: US, UK, Spain and France.*

Figure A.7: Public employment shares by gender, time variation



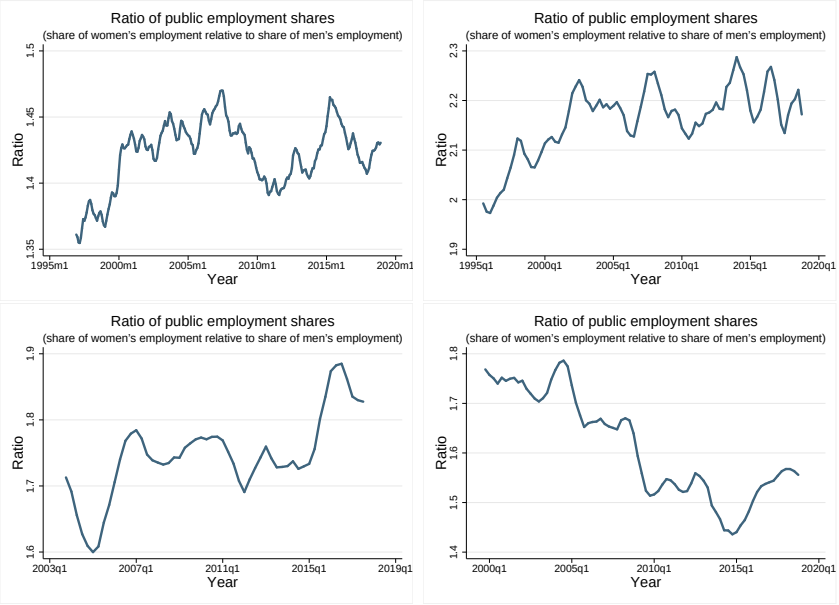

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018) ; clockwise from top left to bottom left: US, UK, Spain and France.*

Figure A.8: Women employment shares by sector, time variation



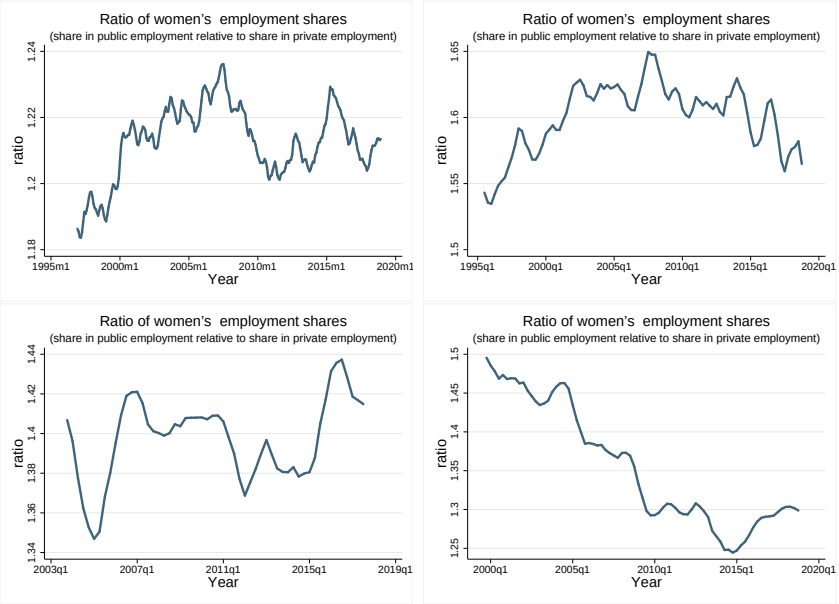

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018); clockwise from top left to bottom left: US, UK, Spain and France.*

Figure A.9: Public employment shares ratio, time variation



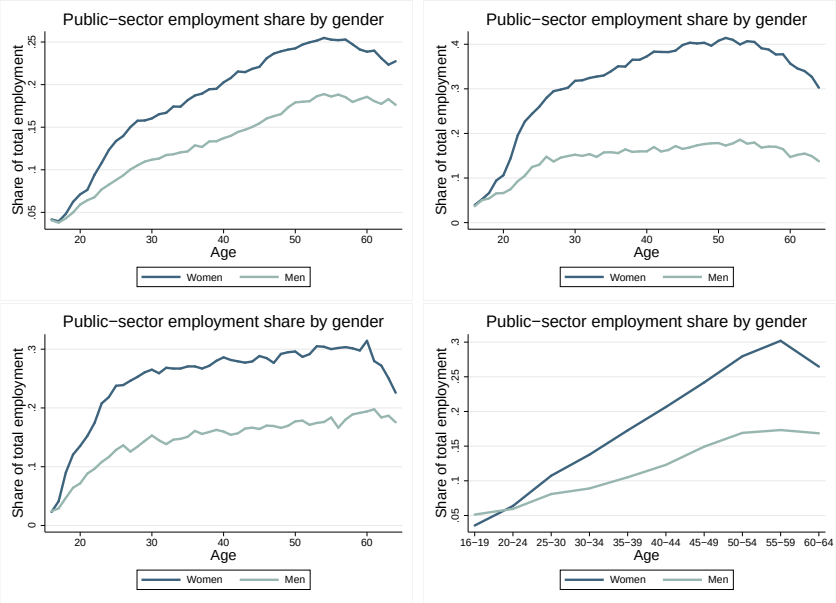

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018); clockwise from top left to bottom left: US, UK, Spain and France.*

Figure A.10: Ratio of women's employment shares, time variation



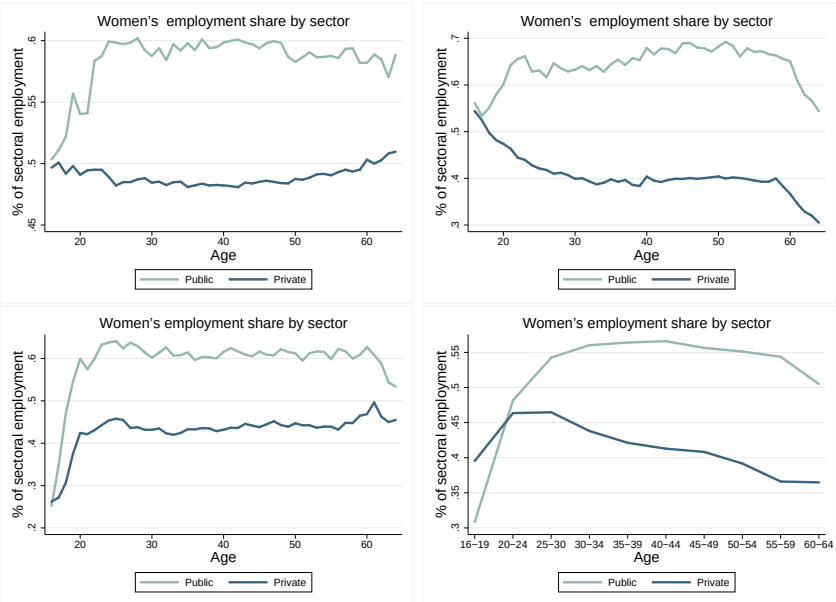

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018); clockwise from top left to bottom left: US, UK, Spain and France.*

Figure A.11: Public employment shares by gender, variation over age groups



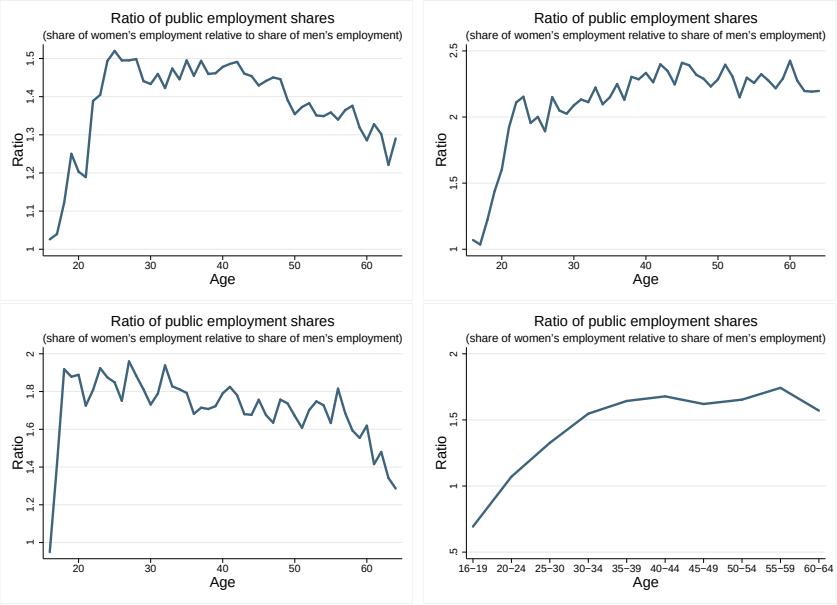

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018); clockwise from top left to bottom left: US, UK, Spain and France.*

Figure A.12: Women's employment shares by sector, variation over age groups



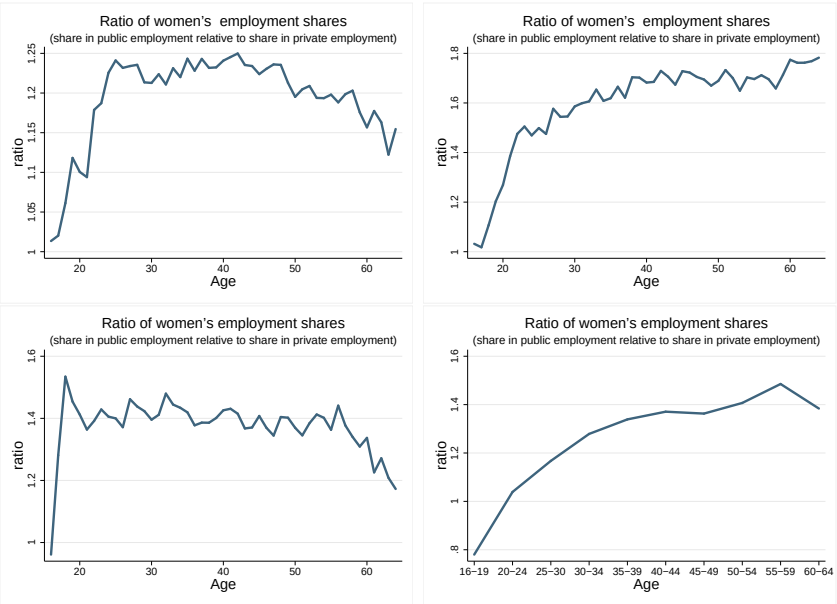

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018); clockwise from top left to bottom left: US, UK, Spain and France.*

Figure A.13: Ratio of public employment shares, variation over age groups



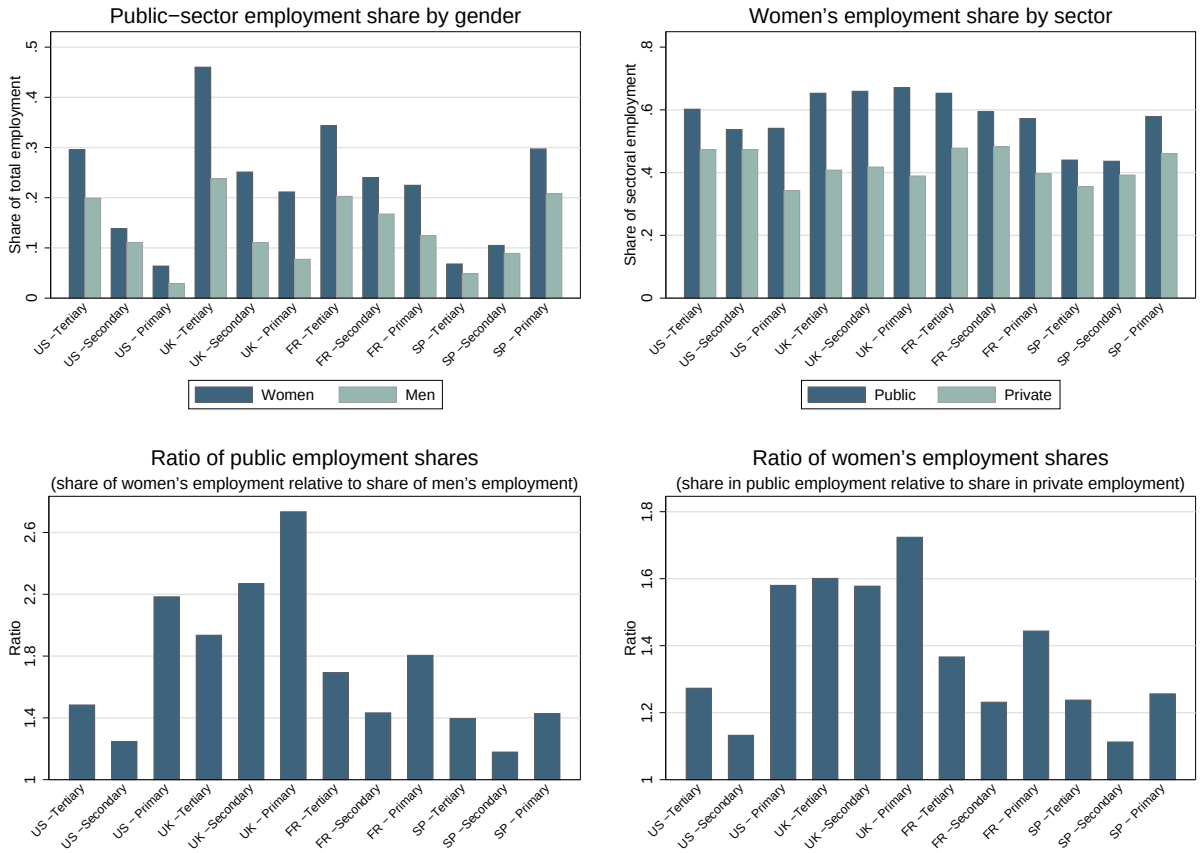

*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018); clockwise from top left to bottom left: US, UK, Spain and France.*

Figure A.14: Ratio of women's employment shares, variation over age groups




*Note: French, Spanish, and UK Labour Force Surveys and CPS (2003-2018); clockwise from top left to bottom left: US, UK, Spain and France.*

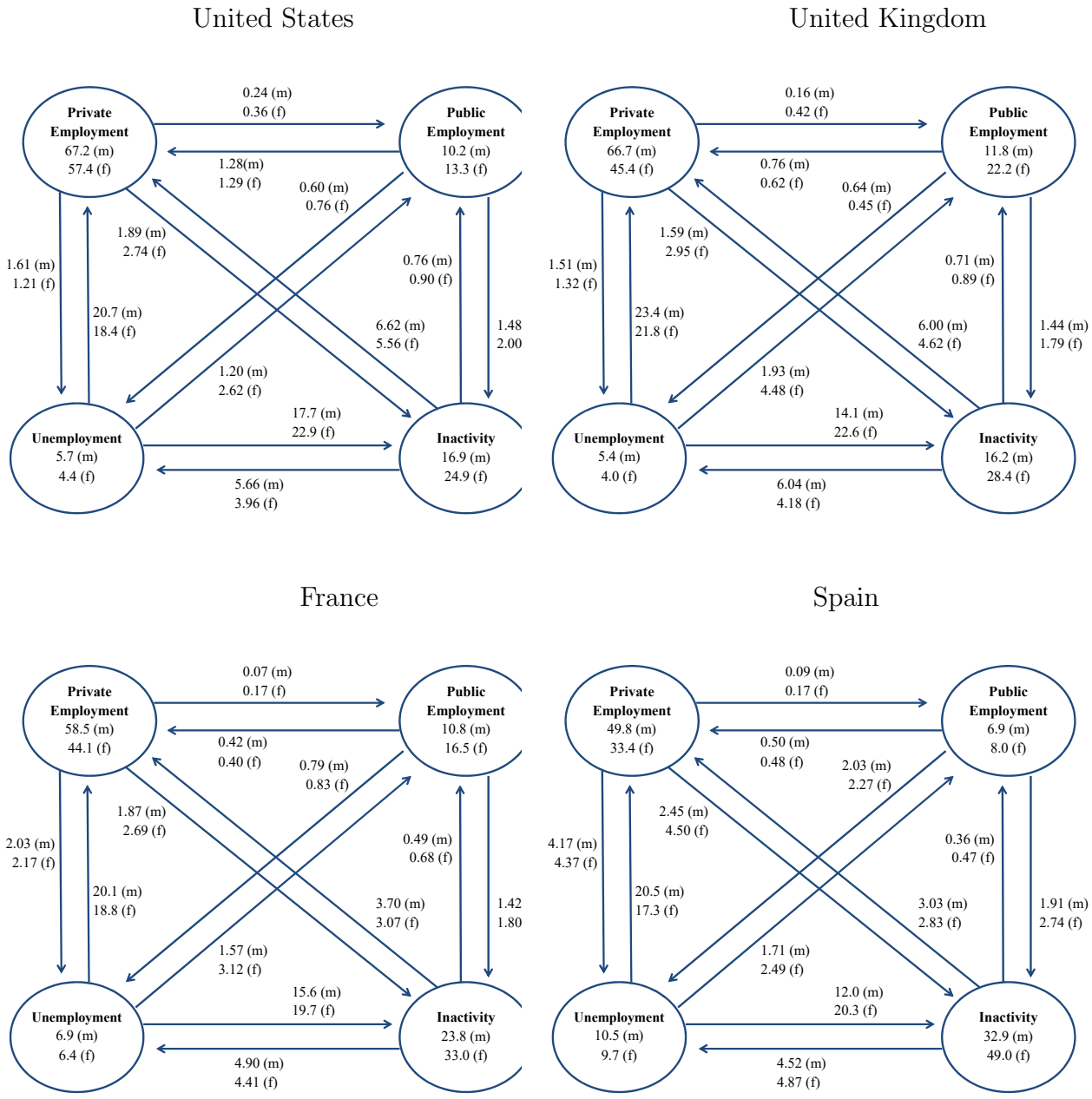
Figure A.15: Different statistics for the over-representation of women in public employment, by education




*Note: At the top, the graph on the left shows the public sector employment shares by gender and the graph on the right the share of women in sectoral employment. At the bottom, the graph on the left shows the ratio of public employment shares $rg$ and the graph on the right shows the ratio of women's employment shares $rf$. For the United States the data is taken from the CPS (2003-2018), for the United Kingdom from the UK Labour Force Survey (2003-2018), for France from the French Labour Force Survey (2003-2017) and for Spain from the Spanish Labour Force Survey (2003-2018); for details on the methodology see Fontaine et al. (2018). [2020]*

## B.2 Stocks and flows by gender

Figure B.1: Average worker flows, 2003-2018




*Note: worker stocks are expressed as a fraction of the total working-age population and flows are expressed as hazard rates. Data are extracted from the French, UK, and Spanish Labour Force Survey, and the CPS; see Fontaine et. al (2018) for details on the extraction of stocks and flows.*

## Estimation of conditional transition probabilities

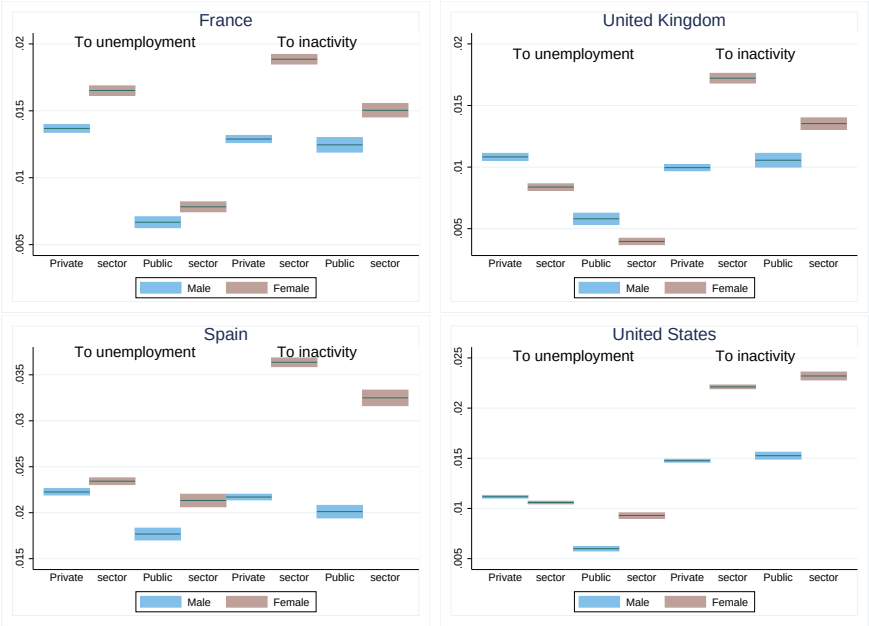
Conditional on being employed, a worker can keep his job, become unemployed or become inactive. We consider staying employed as the base outcome and compute the probabilities of becoming unemployed or inactive as:

$$\lambda_i^U = \frac{\exp(x_i\beta_U)}{1 + \exp(x_i\beta_U) + \exp(x_i\beta_I)} \tag{B.1}$$

$$\lambda_i^I = \frac{\exp(x_i\beta_I)}{1 + \exp(x_i\beta_U) + \exp(x_i\beta_I)}, \tag{B.2}$$

where $x_i$ denotes the control variables age and age squared, as well as indicator variables for education, region, year, occupation, and age between 60 and 64 to capture increasing flows into retirement. The estimation also includes a female dummy, a public sector dummy, and an interaction term between the two. These estimates then allow us to predict transition probabilities for the average female and male employee in both public and private sector.

Figure B.2: Conditional transition probabilities out of employment




*Note: Based on the estimation of equations B.1 and B.2 using a multinomial logit regression. For France the number of observations is 1,634,340 and the pseudo R-squared is 0.092. For the UK the number of observations is 1,417,683 and the pseudo R-squared is 0.077. For Spain the number of observations is 1,989,672 and the pseudo R-squared is 0.090. For the US the number of observations is 7,593,719 and the pseudo R-squared is 0.068. For France, the UK, and Spain, transition rates are quarterly, while they are monthly for the US. Included as controls are regional and year fixed effects, education and occupation dummies as well as age and age squared and a dummy for age 60-64. The predicted probability is calculated based on an individual with the average characteristics of the employed population. Data is for 2003-2016 (2005-2016 for Spain). The boxes report the 95 percent confidence interval on the prediction.*

## Calculation of continuous rates

Consider a labor market with four states: private employment (P), public employment (G), unemployment (U) and inactivity (I). Each period $t \in \{0, 1, 2, 3, ..\}$ corresponds to a quarter (a month for the US). A survey observes the transitions between $t$ and $t+1$ recorded in a $4 \times 4$ discrete time Markov transition matrix $n$, with columns summing to 1. Suppose that the transitions occur in a continuous time environment. It is possible to estimate (and correct for the time-aggregation bias) the discrete transition matrix. Let $\mu$ denote a diagonal matrix of eigenvalues and $p$ the matrix with corresponding eigenvectors of the discrete transition matrix.

Let $\lambda$ be the $4 \times 4$ continuous time Markov transition matrix that records on the off-diagonal the Poisson continuous arrival rate, $\lambda^{AB}$ from state $A \in \{P, G, U, I\}$ to state $B \neq A$. We can retrieve the continuous time transition matrix from the limit of the discrete transition matrix[14]:

$$\hat{\lambda} = \lim_{\Delta \to 0} \frac{p\mu^{\Delta}p^{-1} - I}{\Delta} \tag{B.3}$$

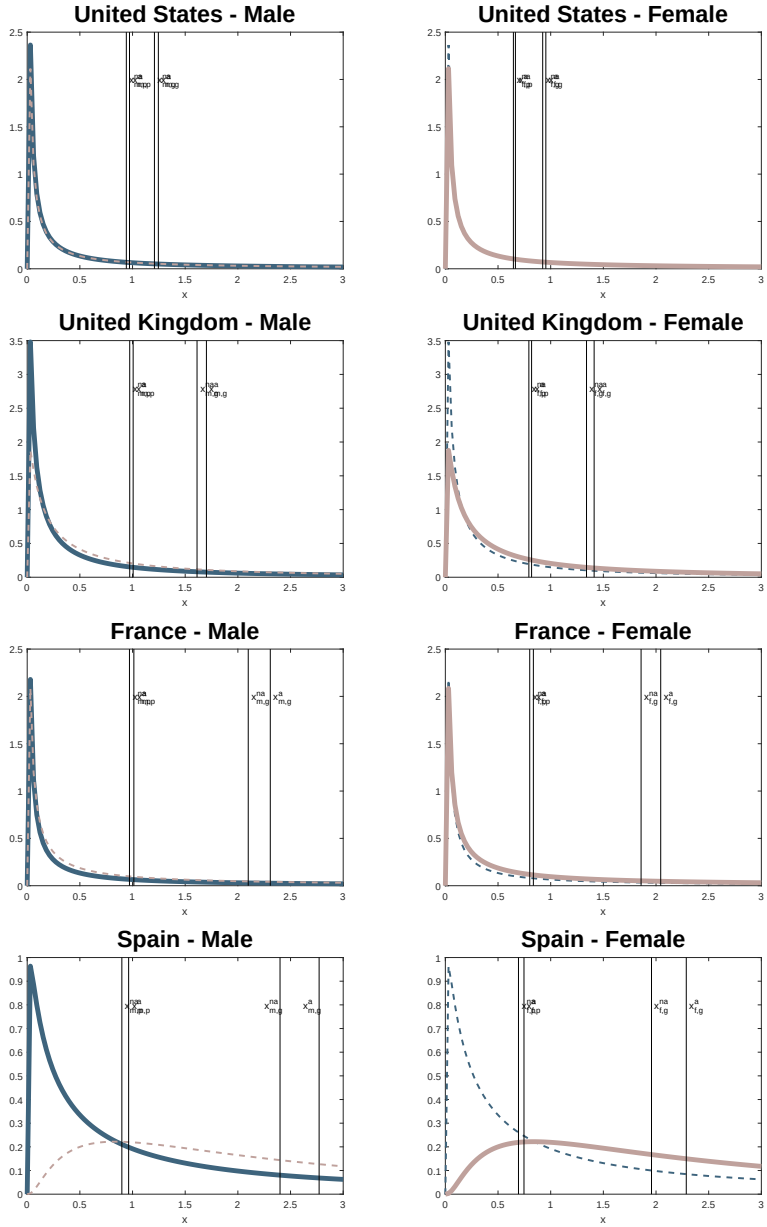
Table B.1: Continuous transition rates

| **Transitions** | **US** | | **UK** | | **France** | | **Spain** | |
|---|---|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | Men | Women | Men | Women |
| $P \to G$ | 0.0023 | 0.0034 | 0.0014 | 0.0038 | 0.0005 | 0.0012 | 0.0005 | 0.0009 |
| $P \to U$ | 0.0203 | 0.0156 | 0.0189 | 0.0177 | 0.0255 | 0.0281 | 0.0525 | 0.0576 |
| $P \to I$ | 0.0185 | 0.0275 | 0.0157 | 0.0294 | 0.0177 | 0.0256 | 0.0230 | 0.0426 |
| $G \to P$ | 0.0120 | 0.0118 | 0.0064 | 0.0053 | 0.0030 | 0.0028 | 0.0022 | 0.0019 |
| $G \to U$ | 0.0070 | 0.0096 | 0.0076 | 0.0057 | 0.0095 | 0.0104 | 0.0249 | 0.0290 |
| $G \to I$ | 0.0153 | 0.0201 | 0.0150 | 0.0183 | 0.0142 | 0.0178 | 0.0187 | 0.0260 |
| $U \to P$ | 0.2621 | 0.2387 | 0.2987 | 0.3013 | 0.2542 | 0.2470 | 0.2592 | 0.2302 |
| $U \to G$ | 0.0143 | 0.0334 | 0.0240 | 0.0607 | 0.0193 | 0.0402 | 0.0211 | 0.0323 |
| $U \to I$ | 0.2422 | 0.3185 | 0.1907 | 0.3259 | 0.2036 | 0.2652 | 0.1503 | 0.2672 |
| $I \to P$ | 0.0636 | 0.0546 | 0.0546 | 0.0423 | 0.0325 | 0.0266 | 0.0261 | 0.0246 |
| $I \to G$ | 0.0078 | 0.0089 | 0.0068 | 0.0079 | 0.0046 | 0.0061 | 0.0033 | 0.0041 |
| $I \to U$ | 0.0775 | 0.0552 | 0.0825 | 0.0608 | 0.0644 | 0.0597 | 0.0573 | 0.0648 |

[14] All these transformations can be done provided that the eigenvalues are distinct, real and non-negative which is always the case in our dataset; for more details see Gomes [2015].

## C.3 Further results from the model

Figure C.1: Calibrated distributions for individuals' outside options, $F(\tilde{x}_j, \sigma_j^x)$ $j = [m, f]$




*Note: The left-hand graphs show the distributions of individuals' outside options together with the different thresholds for men (for comparison the distributions for women are plotted as dashed lines). The right-hand graphs show the distributions of individuals' outside options together with the different thresholds for women (for comparison the distributions for men are plotted as dashed lines).*

## Alternative decomposition

Table C.1: Gender composition of the public sector under different scenarios, alternative decomposition

| **Country** | Benchmark | No sector differences & no preference differences $\pi_w = \pi_m = 1$ $e_g = e_p$ $\bar{\epsilon}_f = \bar{\epsilon}_m$ $\delta_g = \delta_p$ | Only preference differences $\pi_w = \pi_m = 1$ $e_g = e_p$ $\delta_g = \delta_p$ | Only wage differences $e_g = e_p$ $\bar{\epsilon}_f = \bar{\epsilon}_m$ $\delta_g = \delta_p$ | Only hours differences $\pi_w = \pi_m = 1$ $\bar{\epsilon}_f = \bar{\epsilon}_m$ $\delta_g = \delta_p$ | Only job security differences $\pi_w = \pi_m = 1$ $e_g = e_p$ $\bar{\epsilon}_f = \bar{\epsilon}_m$ |
|---|---|---|---|---|---|---|
| Share of public sector in women's employment | | | | | | |
| US | 0.241 | 0.167 | 0.222 | 0.174 | 0.176 | 0.168 |
| UK | 0.403 | 0.15 | 0.332 | 0.157 | 0.189 | 0.152 |
| France | 0.359 | 0.234 | 0.266 | 0.192 | 0.299 | 0.245 |
| Spain | 0.444 | 0.071 | 0.0977 | 0.0816 | 0.358 | 0.073 |
| Share of women in public sector employment | | | | | | |
| US | 0.541 | 0.45 | 0.521 | 0.478 | 0.449 | 0.445 |
| UK | 0.642 | 0.437 | 0.63 | 0.44 | 0.455 | 0.436 |
| France | 0.574 | 0.395 | 0.426 | 0.512 | 0.464 | 0.389 |
| Spain | 0.329 | 0.171 | 0.225 | 0.193 | 0.242 | 0.165 |
| Public sector employment shares ratio | | | | | | |
| US | 1.42 | 0.991 | 1.31 | 1.11 | 0.986 | 0.97 |
| UK | 2.19 | 0.997 | 2.19 | 1.01 | 1.06 | 0.994 |
| France | 1.83 | 0.925 | 1.05 | 1.49 | 1.2 | 0.901 |
| Spain | 1.53 | 0.856 | 1.2 | 0.983 | 1.11 | 0.821 |
| Women's employment shares ratio | | | | | | |
| US | 1.25 | 0.994 | 1.19 | 1.07 | 0.99 | 0.98 |
| UK | 1.71 | 0.998 | 1.66 | 1.01 | 1.04 | 0.996 |
| France | 1.55 | 0.941 | 1.04 | 1.29 | 1.15 | 0.92 |
| Spain | 1.64 | 0.871 | 1.17 | 0.985 | 1.13 | 0.839 |

Table C.2: Gender composition of the public sector under different scenarios, raw measures for the over-representation of women

| **Country** | Benchmark | No sector differences & no preference differences $\pi_w = \pi_m = 1$ $\xi_g = \xi_p$ $\bar{\epsilon}_f = \bar{\epsilon}_m$ $\delta_g = \delta_p$ | No preference differences $\bar{\epsilon}_f = \bar{\epsilon}_m$ | No wage differences $\pi_w = \pi_m = 1$ | No hours differences $\xi_g = \xi_p$ | No job security differences $\delta_g = \delta_p$ |
|---|---|---|---|---|---|---|
| Share of public sector in women's employment | | | | | | |
| US | 0.261 | 0.161 | 0.208 | 0.247 | 0.222 | 0.264 |
| UK | 0.392 | 0.122 | 0.17 | 0.387 | 0.333 | 0.392 |
| France | 0.354 | 0.228 | 0.334 | 0.306 | 0.236 | 0.359 |
| Spain | 0.401 | 0.0606 | 0.31 | 0.369 | 0.125 | 0.404 |
| Share of women in public sector employment | | | | | | |
| US | 0.523 | 0.428 | 0.458 | 0.492 | 0.521 | 0.53 |
| UK | 0.66 | 0.456 | 0.439 | 0.659 | 0.685 | 0.658 |
| France | 0.557 | 0.394 | 0.524 | 0.466 | 0.531 | 0.564 |
| Spain | 0.402 | 0.244 | 0.291 | 0.359 | 0.401 | 0.406 |

## Calculation of the work-life balance and job-security premium

Consider the flow utility for employment, $v^E_{i,j} = (1 - \xi_i)x + w_{i,j}$. Hence, a private sector worker with an opportunity cost $x$ is willing to sacrifice $(\xi_p - \xi_g)x$ in terms of wages to obtain the same job characteristics as a worker in the public sector. To calculate this compensating differential, we then take the expected value of $x$, conditional on being employed. In percentage of private sector wages we thus obtain the following expression:

$$PremiumH^p_j = \frac{(\xi_p - \xi_g)\int_0^{\bar{x}^{na}_{p,j}} xf(x)dx}{F(\bar{x}^{na}_{p,j})}\frac{1}{w_{p,j}} \times 100, j = [m, f]. \tag{C.1}$$

Alternatively, we can measure this compensating differential as the additional wage needed for a public sector worker to accept the same job characteristics as workers in the private sector:

$$PremiumH^g_j = \frac{(\xi_p - \xi_g)\int_0^{\bar{x}^{na}_{g,j}} xf(x)dx}{F(\bar{x}^{na}_{g,j})}\frac{1}{w_{g,j}} \times 100, j = [m, f]. \tag{C.2}$$

The calculation of the job-security premium uses the same approach but requires a bit more algebra. Consider a private sector worker with wage $w_1 = w_{p,j}$, job-separation rate $\delta_p$ and opportunity cost of working $x < \bar{x}^a_{p,j}$. If offered a public sector job with separation rate $\delta_g$, Equation 11 indicates that to maintain the value of employment, the worker would only be willing to accept if paid a wage larger that $w_2$, where $w_2 = w_1 + \delta_p(U_{p,j}(x|\delta_p) - E_{p,j}(x|\delta_p)) -$

$\delta_g(U_{p,j}(x|\delta_g) - E_{p,j}(x|\delta_g))$. Subtracting Equation 13 from 11, and using Equation 9 one obtains $E_{p,j}(x|\delta_i) - U_{p,j}(x|\delta_i) = \frac{(s-\xi_p)x+\xi_p x^{na}_{p,j}}{r+\tau+\lambda+\delta_i+m(\theta_i)}$.

If, on the other hand, the worker has larger opportunity costs of working, $\bar{x}^a_{p,j} > x > \bar{x}^{na}_{p,j}$, and hence if separated moves to inactivity, then combing Equations 14, 12 and 9 gives $w_2 = w_1 + \delta_p(I_{p,j}(x|\delta_p) - E_{p,j}(x|\delta_p)) - \delta_g(I_{p,j}(x|\delta_g) - E_{p,j}(x|\delta_g))$, and $E_{p,j}(x|\delta_i) - I_{p,j}(x|\delta_i) = \frac{-\xi_p x+\xi_p x^{na}_{p,j}}{r+\tau+\lambda+\delta_i)}$. Integrating over $x$ we calculate the conditional expected value to obtain the following expression:

$$
\begin{aligned}
PremiumS^p_j = \Bigg[ & \Bigg( F(x^{\bar{a}}_{p,j})\xi_p x^{\bar{n}a}_{p,j}\left(\frac{\delta_p}{\tilde{r}+\delta_p+m(\theta_p)} - \frac{\delta_g}{\tilde{r}+\delta_g+m(\theta_p)}\right) \\
& + (s-\xi_p)\left(\frac{\delta_p}{\tilde{r}+\delta_p+m(\theta_p)} - \frac{\delta_g}{\tilde{r}+\delta_g+m(\theta_p)}\right)\int_0^{\bar{x}^a_{p,j}} x f_{p,j}(x)dx \Bigg) \\
& + \Bigg( (F(x^{\bar{n}a}_{p,j}) - F(x^{\bar{a}}_{p,j}))\xi_p x^{\bar{n}a}_{p,j}\left(\frac{\delta_p}{\tilde{r}+\delta_p} - \frac{\delta_g}{\tilde{r}+\delta_g}\right) \\
& + (-\xi_p)\left(\frac{\delta_p}{\tilde{r}+\delta_p} - \frac{\delta_g}{\tilde{r}+\delta_g}\right)\int_{\bar{x}^a_{p,j}}^{\bar{x}^{na}_{p,j}} x f_{p,j}(x)dx \Bigg) \Bigg] \frac{1}{F(x^{\bar{n}a}_{p,j})w_{p,j}} \times 100, j \\
= & [m, f],
\end{aligned}
\tag{C.3}
$$

where $\tilde{r} = r + \tau + \lambda$. Again we can calculate a similar expression measuring the wage compensation (in % terms) required for a public sector worker to accept a lower job-security in the private sector:

$$
\begin{aligned}
PremiumS^g_j = \Bigg[ & \Bigg( F(x^{\bar{a}}_{g,j})\xi_g x^{\bar{n}a}_{g,j}\left(\frac{\delta_g}{\tilde{r}+\delta_g+m(\theta_g)} - \frac{\delta_p}{\tilde{r}+\delta_p+m(\theta_g)}\right) \\
& + (s-\xi_g)\left(\frac{\delta_g}{\tilde{r}+\delta_g+m(\theta_g)} - \frac{\delta_p}{\tilde{r}+\delta_p+m(\theta_g)}\right)\int_0^{\bar{x}^a_{g,j}} x f_{g,j}(x)dx \Bigg) \\
& + \Bigg( (F(x^{\bar{n}a}_{p,j}) - F(x^{\bar{a}}_{p,j}))\xi_g x^{\bar{n}a}_{g,j}\left(\frac{\delta_g}{\tilde{r}+\delta_g} - \frac{\delta_p}{\tilde{r}+\delta_p}\right) \\
& + (-\xi_g)\left(\frac{\delta_g}{\tilde{r}+\delta_g} - \frac{\delta_p}{\tilde{r}+\delta_p}\right)\int_{\bar{x}^a_{g,j}}^{\bar{x}^{na}_{g,j}} x f_{g,j}(x)dx \Bigg) \Bigg] \frac{1}{F(x^{\bar{n}a}_{g,j})w_{g,j}} \times 100, j \\
= & [m, f].
\end{aligned}
\tag{C.4}
$$