THE ECONOMIC JOURNAL

The Economic Journal, DOI: 10.1111/ecoj.12533

Technical Appendix to

PUBLIC-SECTOR EMPLOYMENT IN AN EQUILIBRIUM SEARCH AND MATCHING MODEL

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Economic Journal, doi: 10.1111/ecoj.12533

Appendix A. Robustness Checks

The calibration presented in our article is based on the assumption that $\beta = \gamma = 0.5$. That is, the wage-setting rules in both the private and public sectors are assumed to place equal weight on match-specific productivities and worker outside options. The assumption that $\beta = 0.5$ is a common one in the literature; the assumption that $\beta = \gamma$ is a natural starting point for our analysis.

In this appendix, we explore the implications of assuming different values for β and γ. We do this in two steps. First, we hold β fixed at 0.5 and look at how our calibration results change when we assume lower and higher values for γ, namely, $\gamma = 0.4$ and $\gamma = 0.6$. Second, we look at how our results change when we jointly vary the values we assume for β and γ. Specifically, we look at $\beta = \gamma = 0.4$ and then $\beta = \gamma = 0.6$.

In the body of our article, we present the parameter estimates from our calibration in Tables 5 and 6. Table 5 presents estimates of the parameters that are assumed to be the same for all worker types, and Table 6 presents the estimates of parameters that are allowed to vary with worker type. In this Appendix, we present Tables 5 and 6 for:

(*i*) the calibration presented in our article (the baseline calibration with $\beta = \gamma = 0.5$); and
(*ii*) the calibrations corresponding to different assumed values for β and γ.

The objective is to carry out a robustness check, that is, to see how our parameter estimates are affected by different assumptions about β and γ.

As we discuss in the article, the need to assume values for β and γ follows from a standard identification problem. If wages are high, it could be that workers are very productive or it could be that workers capture a large share of the surplus associated with their employment. The first-order effect of a change in the assumed value(s) for β and/or γ is therefore a corresponding change in the estimated values of the parameters that characterise the match-specific productivity distributions. These estimated parameter values move in an offsetting direction. For example, in our first robustness check, as we lower γ from 0.5 to 0.4 while holding β fixed at 0.5, the estimated values for $\{\mu_g^j\}_{j=1}^5$ and $\{\sigma_g^j\}_{j=1}^5$ increase relative to the baseline case. If the assumed rewards to public-sector productivity fall, then, to fit the wage data, estimated productivities in that sector must rise. Another way to fit the observed public-sector wage data given the assumed decrease in γ is via an increase in the estimated values for the pure public-sector premia, i.e. the $\{\psi^j\}_{j=1}^5$, and this effect can also be seen in the version of Table 6 that corresponds to $\beta = 0.5$ and $\gamma = 0.4$. Symmetric effects are observed for an increase in γ while holding β fixed in our second robustness check. The other parameter estimates are minimally affected by the variations we consider for γ while holding β constant. Focusing in particular on our first robustness check ($\beta = 0.5$ and $\gamma = 0.4$), we see that:

(*i*) the estimated private-sector reservation productivities are unaffected (this is the case for all our robustness checks since the $\{R_p^j\}_{j=1}^5$ are estimated directly from the private-sector wage data);
(*ii*) the estimated public-sector reservation productivities increase slightly (because $R_g^j = \{[\psi^j/(1-\gamma)] + R_p^j\}$;
(*iii*) the estimated job destruction rates are essentially unchanged (this follows from equations (16) and (17) in the body of the article); and
(*iv*) the estimated values of the type-specific flow utilities associated with unemployment fall slightly.

Further, the parameter estimates in Table 5, i.e. the ones that do not vary with worker type, are close to unchanged, basically because the public sector is small relative to the labour market as a whole.

When we vary β and γ simultaneously, the implications for type-specific parameter estimates are exactly as one would expect from the discussion in the preceding paragraph. For example, when we set $\beta = \gamma = 0.4$ (Robustness Check 3), the estimates of the parameters that govern expected match-specific productivity increase relative to the baseline calibration, as do the estimated public-sector premia. These estimates move in the opposite direction in our fourth robustness check ($\beta = \gamma = 0.6$). In both cases, the other estimated type-specific parameters are at most minimally affected. The main difference relative to the cases in which we vary γ while holding β fixed is that changing the wage-setting rule in both sectors has some spillover effects. Specifically, as we decrease both β and γ relative to our baseline case, our estimate of the vacancy posting cost, c, increases. The reason is that, as β falls, the fraction of the surplus captured by firms increases, and the estimated value of c needs to increase for the free-entry condition to continue to hold. This spillover also affects v_g, the fraction of vacancies posted in the public sector. As β and γ fall, the estimated value of v_g falls from 0.018 to 0.017. These effects are similar, but in the opposite direction, when we increase the productivity weights to $\beta = \gamma = 0.6$.

The tables that follow present the parameter estimates from our baseline calibrations and our four robustness checks.

Baseline: $\gamma = 0.5$, $\beta = 0.5$

Table 5

Estimated Parameters – Baseline

	Description	Value
$m(\theta)$	Contact rate	0.314
ϕ	Fraction private-sector vacancies	0.933
v_g	Vacancies public sector	0.018
c	Vacancy posting cost	2.914

Table 6

Estimated Parameters – Baseline

Education	$j=1$	$j=2$	$j=3$	$j=4$	$j=5$
R_p^j	0.573	1.033	2.164	2.314	2.480
R_g^j	0.698	1.240	2.926	3.306	3.441
ψ^j	0.063	0.103	0.381	0.496	0.481
μ_p^j	1.56	1.73	2.51	2.87	3.10
μ_g^j	1.94	2.10	2.71	2.77	3.04
σ_p^j	0.41	0.56	0.83	0.62	0.82
σ_g^j	0.44	0.46	0.53	0.39	0.72
δ_p^j	0.067	0.068	0.070	0.045	0.031
δ_g^j	0.125	0.054	0.039	0.021	0.006
z^j	−1.255	−3.510	−15.639	−31.270	−45.909

Robustness Check 1: $\gamma = 0.4$, $\beta = 0.5$

Table 5

Estimated Parameters – Robustness Check 1

	Description	Value
$m(\theta)$	Contact rate	0.314
ϕ	Fraction private-sector vacancies	0.933
v_g	Vacancies public sector	0.018
c	Vacancy posting cost	2.969

Table 6

Estimated Parameters – Robustness Check 1

Education	$j=1$	$j=2$	$j=3$	$j=4$	$j=5$
R_p^j	0.573	1.033	2.165	2.315	2.480
R_g^j	0.699	1.240	2.927	3.307	3.442
ψ^j	0.075	0.124	0.457	0.595	0.577
μ_p^j	1.56	1.73	2.51	2.87	3.10
μ_g^j	2.14	2.29	2.90	2.95	3.23
σ_p^j	0.41	0.56	0.83	0.62	0.82
σ_g^j	0.45	0.47	0.55	0.41	0.74
δ_p^j	0.067	0.068	0.070	0.045	0.031
δ_g^j	0.124	0.054	0.039	0.021	0.006
z^j	−1.289	−3.541	−15.859	−31.801	−47.291

Robustness Check 2: $\gamma = 0.6$, $\beta = 0.5$

Table 5

Estimated Parameters – Robustness Check 2

	Description	Value
$m(\theta)$	Contact rate	0.314
ϕ	Fraction private-sector vacancies	0.933
v_g	Vacancies public sector	0.018
c	Vacancy posting cost	2.914

Table 6

Estimated Parameters – Robustness Check 2

Education	$j=1$	$j=2$	$j=3$	$j=4$	$j=5$
R_p^j	0.573	1.033	2.165	2.315	2.480
R_g^j	0.699	1.240	2.927	3.306	3.442
ψ^j	0.050	0.083	0.305	0.397	0.385
μ_p^j	1.56	1.73	2.51	2.87	3.10
μ_g^j	1.78	1.95	2.57	2.63	2.89
σ_p^j	0.41	0.56	0.83	0.62	0.82
σ_g^j	0.44	0.45	0.52	0.38	0.71
δ_p^j	0.067	0.068	0.070	0.045	0.031
δ_g^j	0.125	0.054	0.039	0.021	0.006
z^j	−1.210	−3.462	−15.857	−31.494	−46.731

Robustness Check 3: $\gamma = 0.4$, $\beta = 0.4$

Table 5

Estimated Parameters – Robustness Check 3

	Description	Value
$m(\theta)$	Contact rate	0.314
ϕ	Fraction private-sector vacancies	0.933
v_g	Vacancies public sector	0.017
c	Vacancy posting cost	4.629

Table 6

Estimated Parameters – Robustness Check 3

Education	$j=1$	$j=2$	$j=3$	$j=4$	$j=5$
R_p^j	0.573	1.033	2.165	2.315	2.480
R_g^j	0.699	1.240	2.927	3.307	3.442
ψ^j	0.075	0.124	0.457	0.595	0.577
μ_p^j	1.76	1.92	2.71	3.06	3.30
μ_g^j	2.14	2.29	2.90	2.95	3.23
σ_p^j	0.42	0.57	0.84	0.63	0.83
σ_g^j	0.45	0.47	0.55	0.41	0.74
δ_p^j	0.067	0.067	0.071	0.045	0.031
δ_g^j	0.124	0.054	0.039	0.021	0.006
z^j	−1.251	−3.397	−15.211	−30.501	−45.076

Robustness Check 4: $\gamma = 0.6$, $\beta = 0.6$

Table 5

Estimated Parameters – Robustness Check 4

	Description	Value
$m(\theta)$	Contact rate	0.314
ϕ	Fraction private-sector vacancies	0.933
v_g	Vacancies public sector	0.020
c	Vacancy posting cost	1.763

Table 6

Estimated Parameters – Robustness Check 4

Education	$j=1$	$j=2$	$j=3$	$j=4$	$j=5$
R_p^j	0.573	1.033	2.165	2.315	2.480
R_g^j	0.699	1.240	2.927	3.307	3.442
ψ^j	0.050	0.083	0.305	0.397	0.385
μ_p^j	1.40	1.59	2.35	2.72	2.94
μ_g^j	1.78	1.95	2.57	2.63	2.89
σ_p^j	0.40	0.54	0.82	0.61	0.81
σ_g^j	0.43	0.45	0.52	0.38	0.71
δ_p^j	0.067	0.068	0.070	0.045	0.031
δ_g^j	0.125	0.054	0.039	0.021	0.006
z^j	−1.260	−3.624	−16.060	−32.041	−46.743