

“Innovating Bureaucracy” Conference
World Bank, Washington DC
November 8th and 9th, 2017

The public sector labour market:

Composition, motivation and pay

Richard Disney

Institute for Fiscal Studies, London
Department of Economics, University of Sussex

Plan of paper

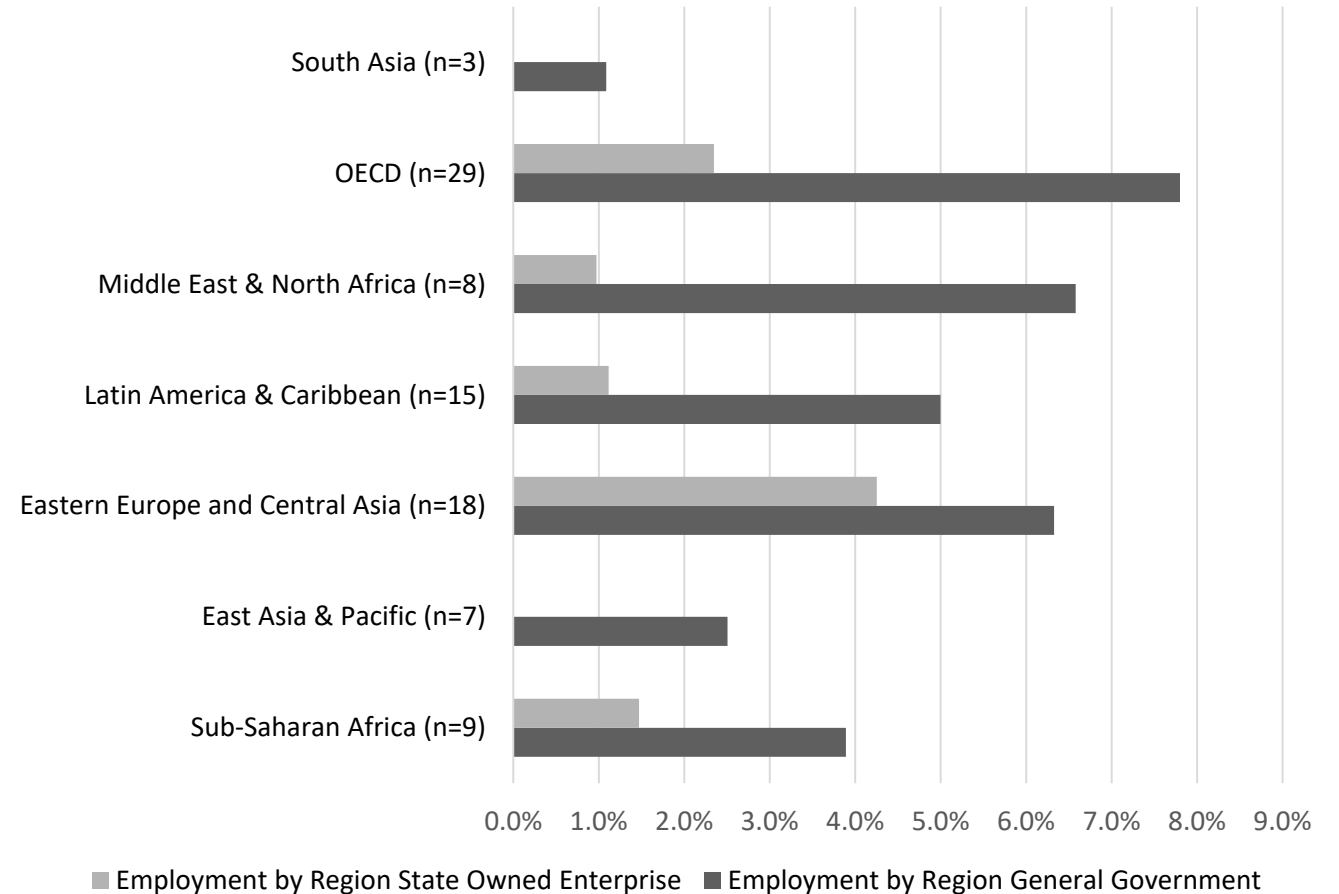
- Some basic 'facts' about size of public sector labour market & its composition.
- Why workers join the public sector: monetary and non-monetary considerations
- Estimating the public sector pay 'premium' or 'penalty': methodological issues.

Some basic 'facts' about size of public sector labour market & its composition.

Public sector employment as % of total employment by region

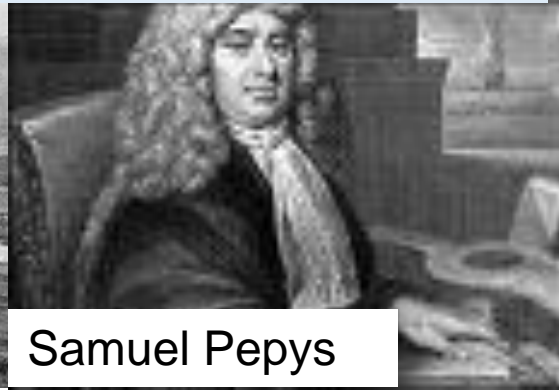
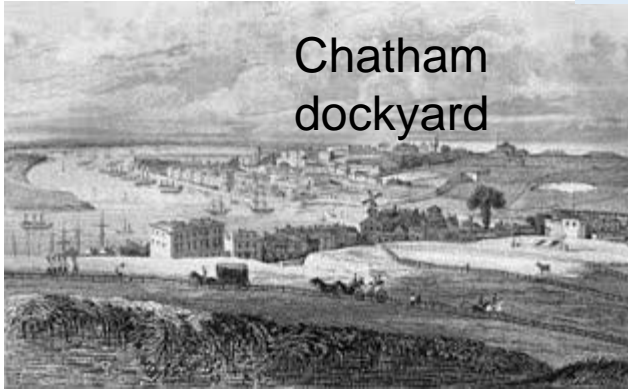
- Size of government sector positively related to per capita income.
- % of SOEs are related to political economy e.g. transition economies
- This graph uses ILO definition of employment = paid employment + self-employment + temporarily unemployed
- If we excluded small businesses, informal sector etc., share of *formal sector* employment covered by public sector would be much larger in low & medium income economies.

Public employment as % of total employment by region:
(Source: World Bank 2015)



UK: Occupational composition of public sector through history

The Eighteenth Century



Composition of public sector labour market: summary

- Employment in public sector tends to grow as share of employment as GDP per capita increases.
- Other than in 'semi-militarised' states e.g. Eritrea.
- But ILO figures on shares understate importance of public sector in *formal* sector – may be dominant employer in formal sector even in low and middle income countries.
- How 'formality' defined matters when we consider e.g. comparisons of wages and total remuneration with 'outside' options.
- In westernised economies, public sector employment has shifted from 'basic' state functions (e.g. military/police) through blue collar male unionised occupations to white collar often female-dominated occupations (e.g. health/education)
- 'State-owned enterprises' are important in centralised v. decentralised economies (by definition!?).

Why workers join the public sector:
monetary and non-monetary considerations

What differs between public and private sector jobs?

- Pay
 - (more on this later)
- Working conditions & regulatory compliance
 - Enforcement of minimum wages, hours restrictions
 - Health & safety at work etc.
- Pensions
 - Next slide
- Job characteristics
 - Next slide + 1
- Job preferences e.g. 'economics of vocation'/'public duty'
 - Next slide +2

Pensions

- Public sector workers typically have more generous pension arrangements e.g DB pension plans
- IFS reckons this raises effective (discounted) markup of public over private sector workers in UK by 10%+
- And in some Middle and LICs e.g. sub-Saharan Africa, (some) public sector workers are the *only* workers (outside finance sector) with pensions.
- And these are costly:
 - Inheritance rights of spouses (and sometime children) typically more generous than 'standard' N. America/W. Europe
 - Polygamy (affects inheritance rules, not just #wives)
 - Age differences of wife (last wife) to original beneficiary.

Job characteristics

- Jobs present package of remuneration + non-pecuniary benefits.
- Latter may be as important or more important than remuneration to applicant quantity and quality.
- Example 1:
 - Di Tommaso, Strom and Saether: 'Nurses wanted: is the job too harsh or is the wage too low?' *JHealthEcon*, 2009.
- Example 2:
 - Crawford and Disney IFS WP 15/19 on police recruit quality in England and Wales (using data on four years of police recruit assessment test scores):
 - From highest to lowest pay 'outside option' police area, recruit quality test score +4ppt.
 - From higher to lowest area by share of violent crime, recruit quality variation much higher (note: e.g. women, more educated applicants do much better in test scores).

The 'public sector' as a vocation

- The 'economics of vocation' (e.g. Heyes, JHealthEcon, 2005 on nursing sector):
 - 'a person is particularly devoted, going beyond the 'call of duty' in doing their job, and/or:
 - 'They do a job because they like it or 'care' about it'.
 - Higher pay attracts the 'wrong' kind of applicant (i.e. sorting), unobservable at hire.
- And most professionals don't like bureaucratic control:
 - e.g. Frey, *EER*, 1993 argues that 'intrinsic motivation' declines with greater emphasis on monitoring performance and on financial reward.
 - Hence 'incentivised pay' + bureaucratic control may lower productivity.
- Mixed results for low and middle income countries e.g.:
 - Ashraf et al (EOPP#54, STICERD, LSE, 2016) – career incentives + steeper wage profile leads to better nursing recruits in Zambia, but:
 - De Ree et al (NBER#21806, 2016) – salary increases have no effect on teacher quality in Indonesia.

A simple model with both sorting on pay and 'efficiency wages'

A pure 'Heyes model'

- As the wage offer is raised, the share of 'money oriented' applicants for nursing increases.
- And the share of 'vocational oriented' nurses in the pool decreases.
- Define: P = proportion of 'money oriented' nurses and $(1-P)$ = proportion of 'vocational' nurses. Total employed = 1000.
- If you pay e.g. £10,000 per annum, only 'vocational' nurses will work for you.
- If you pay e.g. £60,000 per annum, applicant pool dominated by 'money oriented nurses'.
- If (say) this relationship between P and wage = W is linear, the regression line can be written as:
 $P=0.002W-20$

A 'Heyes model' + efficiency wages

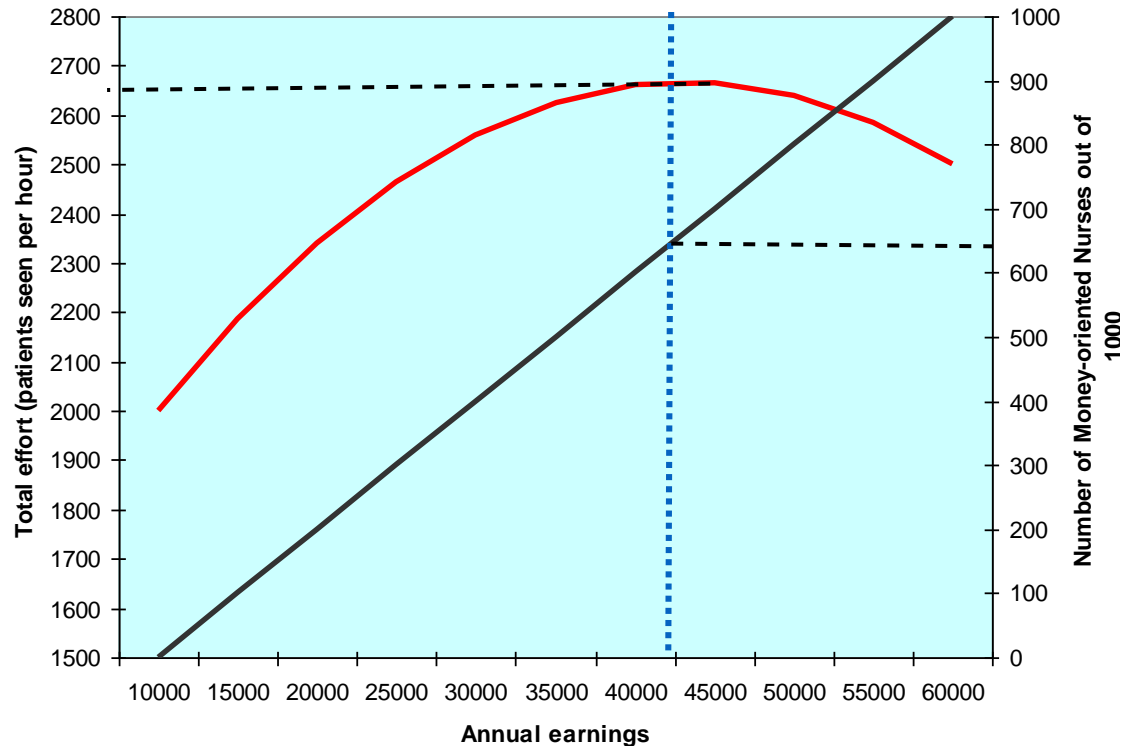
- A 'vocational' nurse (V) will treat 2 patients an hour if you pay them £10,000 and 5 patients an hour if you pay them £60,000.
- For (V), the relationship between effect (E) and pay is linear and can then be written as: $E_v = 0.00006W+1.4$
- A 'money oriented' nurse (M) will treat 1 patients an hour if you pay them £10,000 and 2.5 patients an hour if you pay them £60,000.
- For (M), the relationship between effect and pay is linear and can then be written as: $E_m = 0.00003W+0.7$
- With unlimited budget, hospital maximises: $E^* = \max\{N[P(E_m(W)) + (1 - P)(E_v(W))]\}$

Solutions to 'Heyes + efficiency wages'

Unlimited budget, Pay £40k p.a.

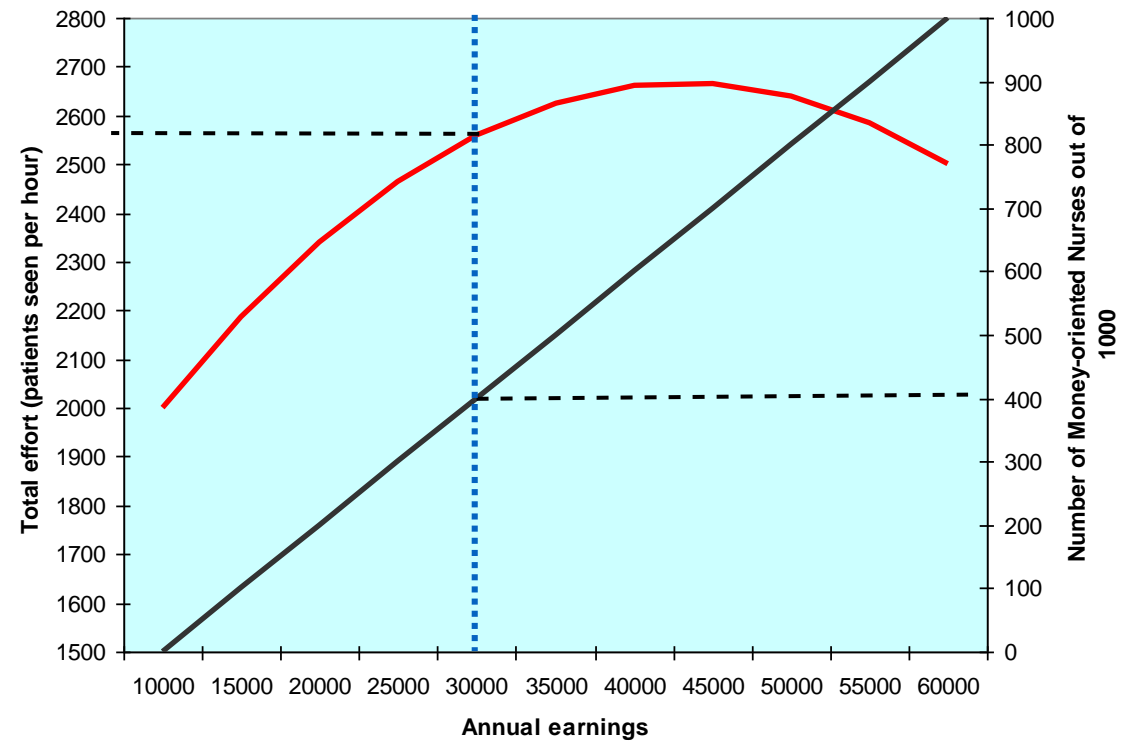
With pay budget constraint
e.g. £30 million, pay £30k p.a

Total Effort, and Number of Money-oriented Nurses by pay level



— Total effort — Number of Money-oriented nurses

Total Effort, and Number of Money-oriented Nurses by pay level



— Total effort — Number of Money-oriented nurses

Note: This is a straightforward example of Stiglitz-Weiss, AER, 1981.

Estimating the public sector pay 'premium' or 'penalty': methodological issues.

Studies of the public-private pay differential

- There are many, and not just for North America/W. Europe
- For example:
 - Bales and Rama (WB #2747): Vietnam +20% in SOEs
 - Nielsen and Rosholm: Zambia, +ve but varies by quantile
 - Stelcner, Van der Gaag, and Vijverberg – several country studies e.g. Ivory Coast and Peru.
 - Lindauer and Sabot for Tanzania
 - Tansel: Turkey
 - Terrell: Haiti
 - Etc. etc.
- Choice of comparators, identification strategy etc. vary country by country.
 - LSMS surveys are often used
 - Most OLS, or IV involving selection on observables, or switching models

A general model

Consider a general model of the determination of public sector status and wages:

$$w_{it}^P = \gamma_i \delta_t^P + x_{it} \alpha_t^P + \beta_t + \varepsilon_{it}^P$$

and

$$w_{it}^P = \gamma_i \delta_t^{NP} + x_{it} \alpha_t^{NP} + \varepsilon_{it}^{NP}$$

where:

- w_{it}^J = wage received by individual i at t in sector j
 - P = public sector, NP = other sectors
 - γ_i = a set of unobservable characteristics which have prices δ_t^J normalised to 0.
 - x_i = a set of observable characteristics with prices α_t^J .
 - ε s are uncorrelated shocks independent of x 's or sector.
 - β is the parameter of interest.
- This model, as it stands, cannot be identified.

Cross section estimates of β (using OLS or IV)

- Cross sectional differences estimated using OLS give:

$$E(w^P - w^{NP} | x) = E(\gamma | P) \delta^P - E(\gamma | P) \delta^{NP} + x(\alpha^P - \alpha^{NP}) + \beta$$

- as the γ s are not observed, the OLS restriction is:

$$E(\gamma | P, x) = E(\gamma | NP, x)$$

- This does not allow for public sector vocational motivation etc. Nor does it allow for selection mechanisms e.g. by public sector employers.
- *IV methods* (e.g. Heckman models, or switching models) attempt to use additional information (i.e. exclusion restrictions from the wage equations) to construct a *sectoral selection equation*.
- The identification strategies are often *ad hoc*.

Panel data methods

- Panel data methods, at the cost of some restrictions, allow us to eliminate the unobservables. Write:

$$w_{it} = \gamma_i + x_{it} \alpha_t^P P_{it} + x_{it} \alpha_t^{NP} (1 - P_{it}) + \beta_t P_{it} + v_{it}$$

- Where $P_i = 1$ if the individual works in the public sector and where the residual v is orthogonal to the ε s by construction.
- Restrictions that α s and β s are stable and $\alpha^P = \alpha^{NP}$ give the standard *fixed effects* model: $E(w_{it} - w_{it-1} | x_i) = \beta(P_{it} - P_{it-1})$
- Problem with identifying off transitions is that *voluntary* sectoral transitions generally associated with wage gains, so asymmetric effects.
- So suggestions: involuntary transitions e.g. privatisations? Instrument individual sector status by ‘% public sector-ness’ of sector? (Disney & Gosling, CEPR WP#3787, 2003).

Conclusions

- In looking at public v private sector wages:
- Think about comparators: what is 'private sector'?
- Different specifications will give different results.
- Development of panel data methods looks encouraging....
- But identifying off sectoral transitions needs more thought.
- Widespread 'experiments' e.g. contracting-out public services, wholesale privatisations in Eastern Europe, may offer scope for more precise estimates.