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Wage elasticities of long-term care labour supply in England

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Motivation

- Increase in demand for LTC services
  - # of people with dementia to increase from 750,000 in 2019 to about 1.35 million by 2040 (Wittenberg et al., 2019)
- Supply of LTC services
  - # LTC workforce ↗20% the between 2010 and 2020; estimated ↗32% 2035 (Skills for Care, 2020)
  - 112,000 vacant ASC jobs (7.3%) vacant and over >30% of staff left their job in 2019/20 (Skills for Care, 2020)
  - Job vacancy and staff turnover ↗50% the between 2010 and 2020 (Skills for Care, 2020)
- Potential drivers of recruitment and retention
  - Pay/pay progression, status, contract type (i.e. full-time, guaranteed working hours)
  - RESSCW project: Vadean and Saloniki (2021) (ASC-WDS data), Forth and Bryson (forthcoming) (APS data)
- Aims
  - Wage differentials – what can and cannot explain differences in wages?
  - Wage elasticities of labour supply – how responsive is ASC labour supply to change in wages?

Model and econometric framework

- Dynamic monopsony model of labour market (Manning, 2003)
  - Some level of employer market power generated by frictions in the market, e.g. alternative preferences, mobility costs
  - Steady state – total job separations equal the inflow of recruits –> elasticity of labour supply facing the firm: $\varepsilon_{Nw} = \varepsilon_{Rw} - \varepsilon_{sw} = -2\varepsilon_{sw}$
- Estimating wage elasticity of job separation
  - Discrete time proportional hazards model (Jenkins, 2005)
  - Omitted variable – wage elasticities of job separations biased towards zero
    - Covariates: large set of individual, job, employer, and local market characteristics
    - shared frailty models (RE); correlated random effects (CRE) probit (i.e. Mundlak type FE)

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Data

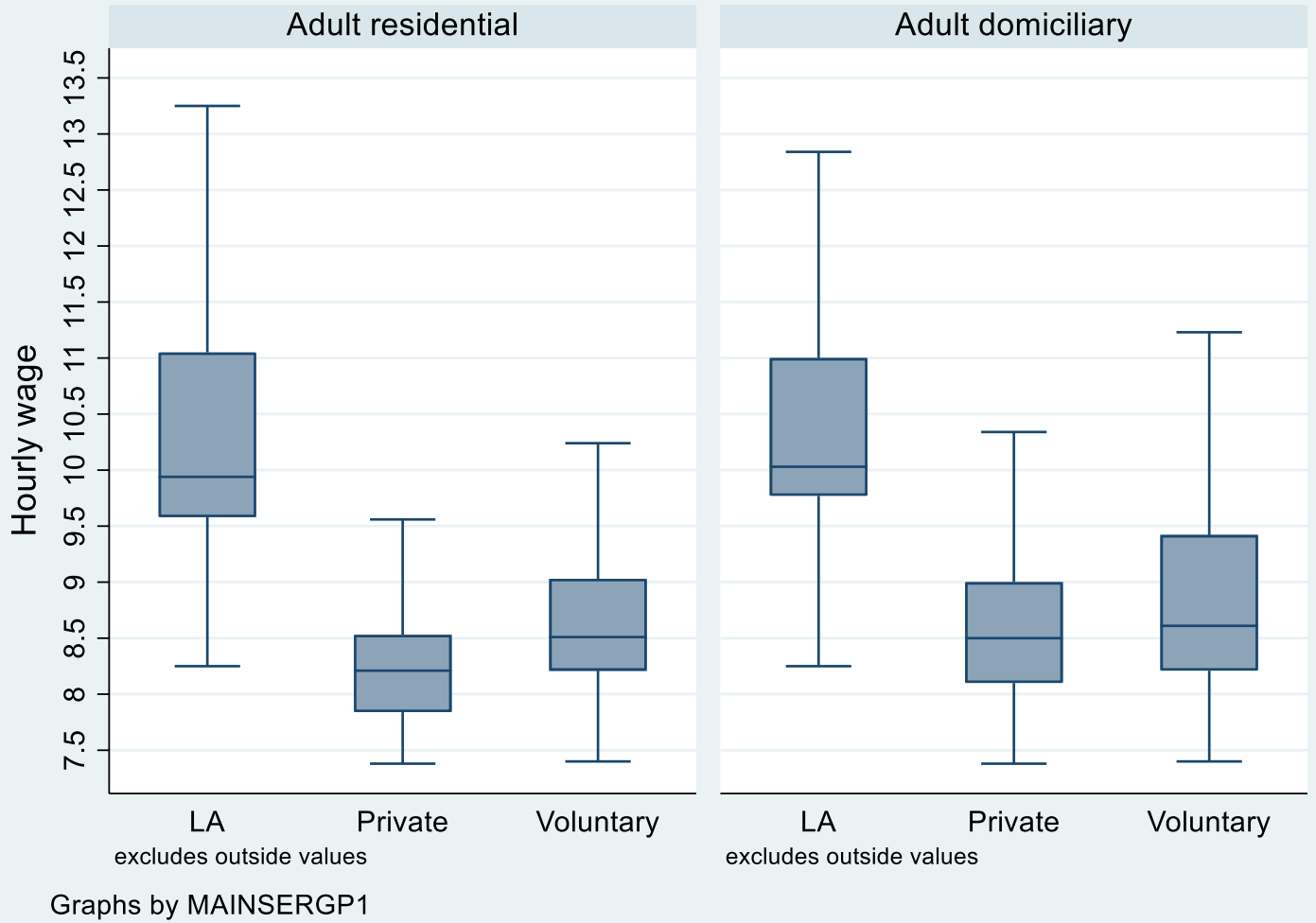
Adult Social Care Workforce Data Set (ASC-WDS) at Oct 2016 to 2019

- >700k LTC staff, >20k establishments; ~50% of LTC market
- unique/permanent IDs for both establishments and workers –> traced over time to identify of job separations
- Inclusion criteria
  - Establishments – statutory LA (i.e. public), private (i.e. for-profit), and voluntary (i.e. not-for-profit) establishments; care home services with nursing, care home services without nursing and domiciliary care (i.e. home care)
  - Workers – employed under a permanent or temporary contract; aged 16 to 64; direct care role (i.e. 86% care workers, 10% senior care workers, 4% other care providing)

Final sample

- 355,170 observations of 211,294 job-spells in 8,313 care establishments
  - Sector – statutory LA (6%), private (79%), voluntary (15%)
  - Care setting – CH w/ nursing (23%), CH w/o nursing (33%), domiciliary care (44%)

Wage distribution 2019



- Narrow distribution
  - Private sector, residential care: p95/NLW = 1.18
  - Private sector, domiciliary care: p95/NLW = 1.25
  - Voluntary sector, residential care: p95/NLW = 1.33
  - Voluntary sector, domiciliary care: p95/NLW = 1.29
- Share of frontline staff aged 25+ paid at (or below NLW)
  - residential care: 50%
  - domiciliary care: 35%

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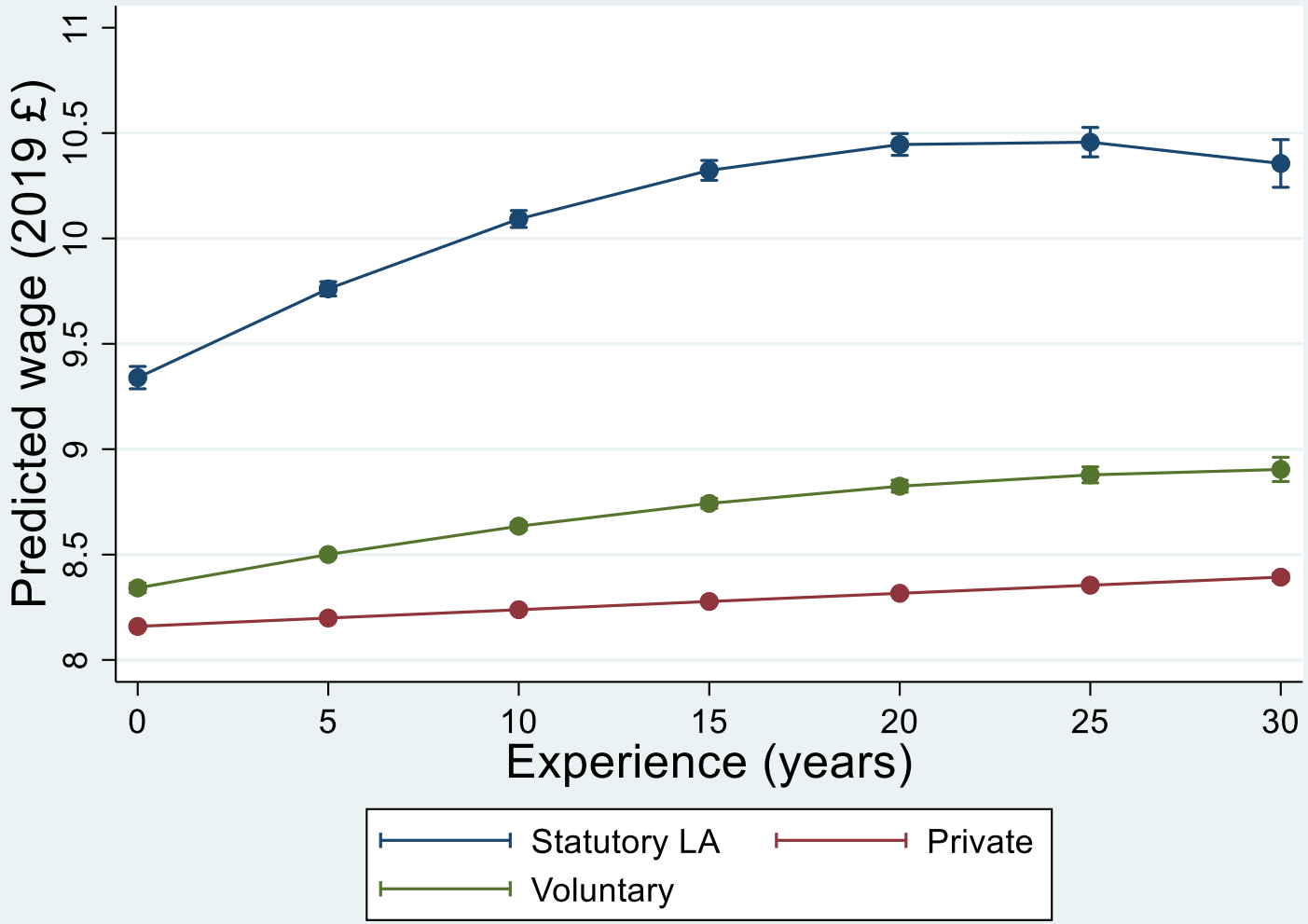
Wage differentials

- Mincerian wage equations
  1. qualifications, experience, experience squared + job role, sector (GLM)
  2. + worker, job, employer, and local market characteristics (GLM)
  3. + worker, job, employer, and local market characteristics (population-averaged GLM)
- Results
  - training (-0.5%), ZHC (-0.6%) <–> lower wages;
  - medium/large establishments (+0.3%), CH w/o nursing (+2.1%), domiciliary care (+5.1%), good leadership (+0.3%), care tariffs paid by LAs (+1.2 to +2.5%) <–> higher wages
  - large wage differential between sectors: private vs public (-19%) and voluntary vs public (-15%); lower for care workers and highest for senior care workers

		Statutory LA	Private	Voluntary
Residential care	Senior care worker	11.23	8.63 (-23%)	9.50 (-15%)
	Care worker	9.78	7.94 (-19%)	8.35 (-15%)
Domiciliary care	Senior care worker	11.61	8.76 (-25%)	9.48 (-18%)
	Care worker	9.77	8.39 (-14%)	8.52 (-13%)

Wage progression by sector



- Low real wage progression with job experience in private (2.9%) and voluntary (6.7%) compared to public sector (12%)

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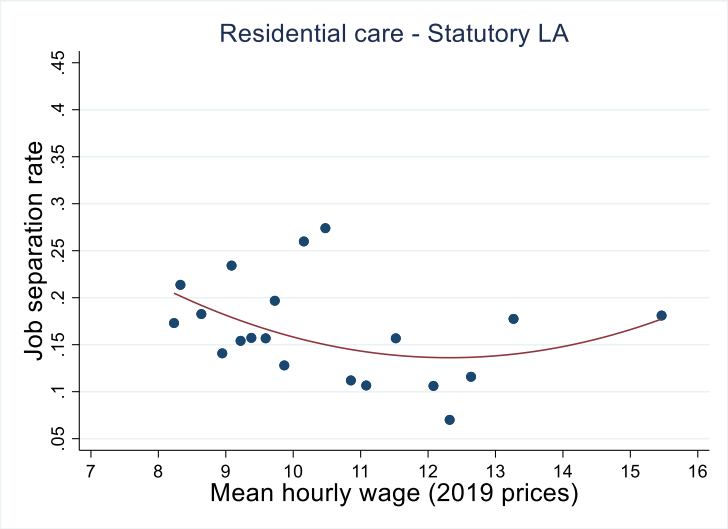
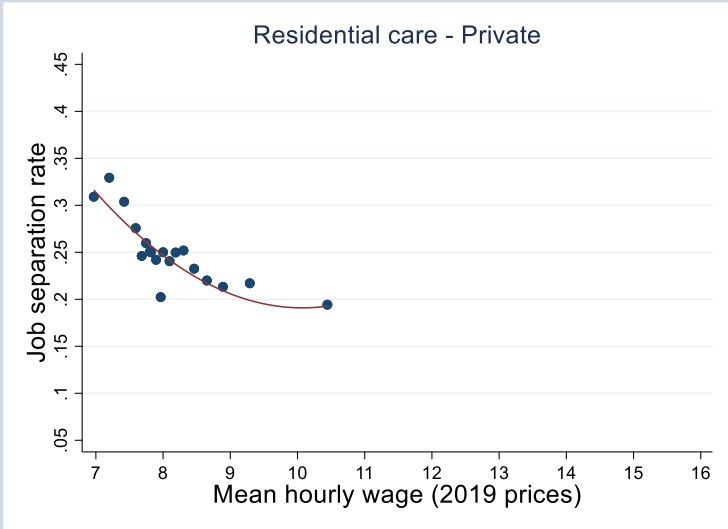
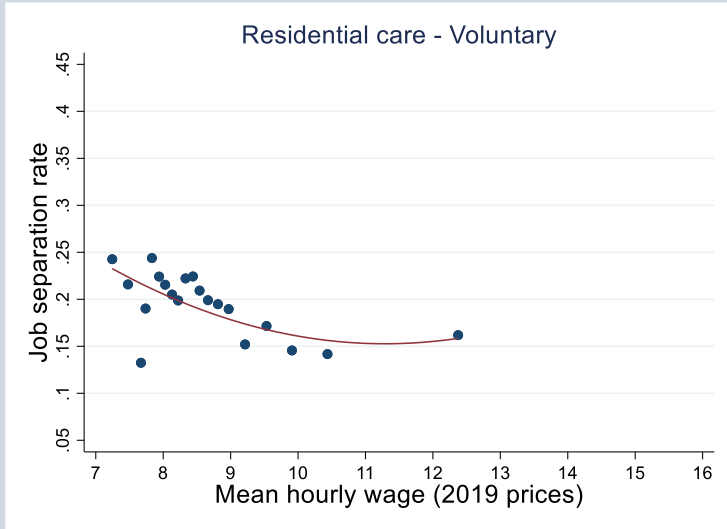
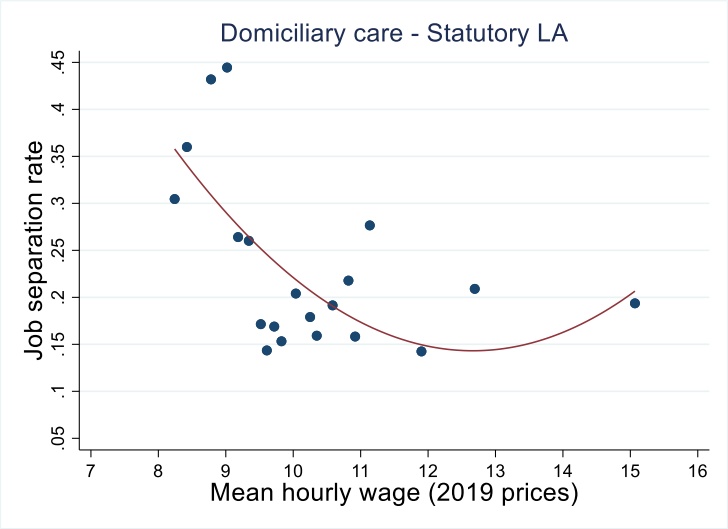
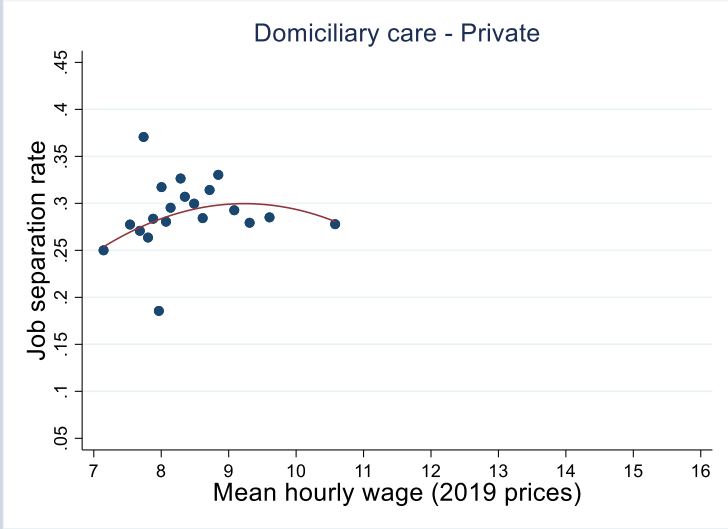
Wages and job separations

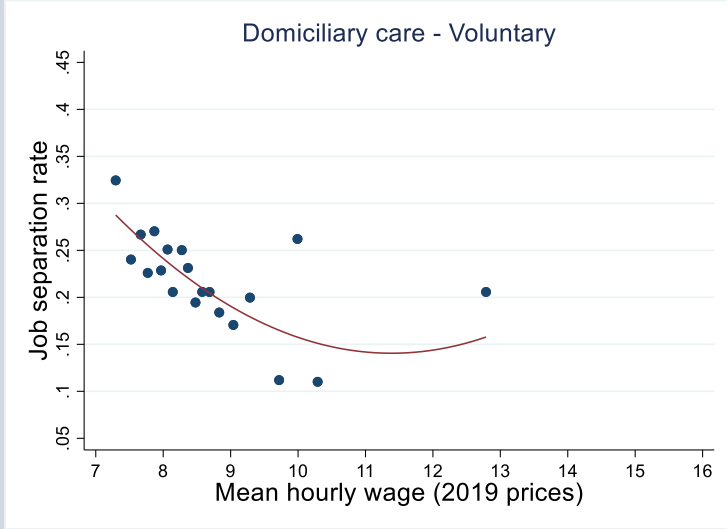












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Wage elasticities

- Discrete time proportional hazard model (cloglog)
  - job separation wage elasticities comparable to those found in previous studies: LTC workforce in US (Rapp and Sicsic, 2020);
  - Wage elasticities larger than those found for NHS nurses (0.066; Frijters, Shields and Price, 2007) or for the whole UK economy (0.75; Manning, 2003)
- 'Shared frailty' (RE) models – small unobserved heterogeneity bias correction
- 'Within' estimates (CRE probit) – large unobserved heterogeneity bias correction
  - Wage elasticities of labour supply: 4.08 for residential care and 4.01 for domiciliary care workers

	cloglog	RE cloglog	probit	RE probit	CRE probit (panel RE)	CRE probit (pooled)
Residential care						
Elasticity job separation	-0.79	-0.80	-0.72	-0.73	-1.59	-2.04
Elasticity labour supply	1.58	1.60	1.44	1.45	3.17	4.08
Domiciliary care						
Elasticity job separation	-0.37	-0.39	-0.38	-0.40	-1.51	-2.01
Elasticity labour supply	0.73	0.78	0.75	0.79	3.02	4.01

Wage elasticities of labour supply

	Elasticities of labour supply			
	Residential care		Domiciliary care	
A. Hourly wage level (2015 £)				
7.00	5.29	***	7.49	***
7.50	5.35	***	7.27	***
8.00	5.22	***	6.55	***
8.50	4.90	***	5.44	***
9.00	4.39	***	4.09	***
9.50	3.69	***	2.62	***
10.00	2.81	***	1.18	
10.50	1.77	*	-0.12	
B. Age group				
16-24	2.97	***	2.09	*
25-34	5.29	***	3.73	***
35-44	4.10	***	3.68	***
45-54	4.48	***	3.96	***
55-64	2.43	***	5.89	***
*** p<0.01, ** p<0.05, * p<0.1				

- Based on pooled CRE probit
- Wage level (Panel A)
  - Labour supply more responsive to wages at lower wages levels
  - Substantial drop in elasticity at higher wages
- Age (Panel B)
  - Labour supply more responsive to wages around age 25-34, when young adults are making career choice and establishing a family
  - Older (more experienced) staff may continue working for longer in domiciliary care if wages were to increase

Wage elasticities of labour supply

	Elasticities of labour supply			
	Residential care		Domiciliary care	
C. Job role				
Senior Care Worker	3.32	***	5.05	***
Care Worker	4.53	***	4.10	***
Other care-providing	1.41		2.77	***
D. Sector				
Statutory local authority	-0.25	***	3.00	
Private sector	4.99	***	7.10	***
Voluntary or third sector	6.31	**	0.35	**
E. Job role & Sector				
Senior Care Worker; Statutory LA	-0.95	**	1.91	
Senior Care Worker; Private	5.83	***	9.02	***
Senior Care Worker; Voluntary	2.17		-0.25	
Care Worker; Statutory LA	-0.19	*	2.91	
Care Worker; Private	7.52	***	7.98	***
Care Worker; Voluntary	5.31	*	0.25	
Other care-providing; Statutory LA	-0.31		-1.03	
Other care-providing; Private	1.57		5.11	
Other care-providing; Voluntary	5.59		0.51	
*** p<0.01, ** p<0.05, * p<0.1				

- Job role (Panel C)
  - No statistically different wage elasticities between care workers and senior care workers
- Sector (Panel D)
  - Higher wage elasticities in the private vs. public sector
- Job role & Sector (Panel E)
  - Wage elasticities of labour supply higher for senior care workers and care workers in the private sector

Wage elasticities of labour supply

	Elasticities of labour supply			
	Residential care		Domiciliary care	
F. Region (v1)				
North East	4.34		3.99	
North West	2.26		3.74	**
Yorkshire and the Humber	4.30	**	1.30	
East Midlands	1.56		6.97	***
West Midlands	14.06	***	12.31	*
Eastern	1.76		10.14	***
London	2.67		0.24	
South East	4.89	**	5.94	***
South West	19.99	*	5.62	**
G. Region (v2)				
North (North East, North West, and Yorkshire and the Humber)	3.32	***	1.67	***
Midlands (East Midlands and West Midlands)	7.59	***	6.27	***
South (East, South West, South East, and London)	3.37	***	6.63	***
*** p<0.01, ** p<0.05, * p<0.1				

- Region (Panel F and G)
  - Highest wage elasticities in the Midlands (in particular West Midlands); for domiciliary care also South (in particular Eastern, South East and London)
  - More outside job opportunities around large metropolitan areas (i.e. London, Birmingham)
  - North East has fewer LTC providers; weakest regions in terms of domiciliary care provisions are the North East, North West, and South West (Allan, 2021; Allan and Nizalova, 2020)

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Limitations / Future research

- Employment and non-employment as distinct labour market states (Manning, 2003)

$$\varepsilon_{Nw} = \theta_R \varepsilon^e_{Rw} + (1 - \theta_R)\varepsilon^n_{Rw} - \theta_s \varepsilon^e_{sw} - (1 - \theta_s)\varepsilon^n_{sw}$$

  - θ_R - share of recruits from employment
  - θ_s - share of job separations being a direct move to another job
  - ε^e_{sw} - wage elasticity of job separation to other employment
  - ε^n_{sw} - wage elasticity of job separation to non-employment
  - ε^e_{Rw} - wage elasticity of recruitment from employment
  - ε^e_{Rw} - wage elasticity of recruitment from non-employment
- ASC-WDS – no information on job separations to employment and non-employment
- Annual Survey of Hours and Earnings (ASHE) – identification of separations to employment/non-employment; limitations: less information on employer characteristics, and smaller sample of LTC workers

Discussion

- LTC in England is a quasi-market – services provision by 18,000 organisations, 90% independent (Skills for Care, 2021); main buyer of LTC services is the public sector (152 LAs) –> LA have market power to set prices, fees paid dependent on limited budgets
- substantial unexplained wage differentials of direct care staff between sectors (-19% private vs public; -15% voluntary vs public)
  - downwards pressure on care fees by LAs might have led to a downward pressure on wages
  - poor wage progression in the private and voluntary sectors compared to the public sector
- LTC labour supply more responsive to wages than found by previous studies – importance of controlling for unobserved heterogeneity to reduce bias
  - Labour supply to the firm is elastic (>1), higher at lower wage levels, higher after age 25, higher in the private sector
  - Labour supply in LTC in England can be increased by increasing wages –> likely positive impact on care outcomes (e.g. Allan and Vadean, 2021; Towers et al., 2021)

Thank you!

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