The Performance Pay Premium
How Big Is It and Does It Affect Wage Dispersion?

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National Institute of Economic and Social Research

Motivation

- Vast literature on wage effects of performance pay (PP)
- Most of it reliant on household surveys
- Problem if PP firms differ from fixed pay (FP) firms
    - May bias estimates of premium/penalty
    - cf union wage premium (Bryson, 2002)
    - A few studies indicate this might be the case
        - Pekkarinen and Riddell 2008; Lemieux et al 2009; Manning and Saidi, 2010
- Expectation that PP should increase wage dispersion
- But does it? Depends on
    - Who receives it
    - Size of any PP premium/penalty across the distribution
- Evidence on contribution to changes in wage dispersion are contested
    - Important: Lemieux et al., 2009
    - Not really: Gittleman and Pierce, 2013; Bryan et al., forthcoming
- What about Britain today?

What we do

- Probability of PP rather than FP
  - Types of PP, individual level
  - Within workplace
- PP wage premium
  - Within workplace
- Effects of PP on wage dispersion
  - Estimate counterfactual wage distribution
- Value of linked employer-employee data with information on types of PP received at individual level
  - Available for the first time

Findings

- ¼ employees receive PP. 4x more in private than public
- Positive selection into PP on observable ability but confined to private sector
- PP workplaces higher paying than FP
- Large raw PP wage premium (.36 log points) but falls to .10 log points comparing 'like' employees in same workplace
- Wage returns to observable ability higher in PP jobs but only in private sector
- PP wage premium rises as move up wage distribution
  - .06 log points at 10^{th} pctile; .42 log points at 90^{th} pctile
- Contributes to higher wage dispersion than in absence of PP

Data

- Workplace Employment Relations Survey 2011
- Nationally representative survey of workplaces with 5+ employees n=2,680
  - Face-to-face interview, HR manager
- Linked to nationally representative survey of employees in those workplaces n=21,981
  - Self-completion questionnaire
- Surveyed between March 2011 and June 2012
- Survey weighting throughout
- Wages: construct log hourly wage using banded wages and continuous hours
  - But imputation within bands using ASHE
  - Doesn't make any difference to results

PP measure

- "Which of the following do you receive in your job here...payments based on your individual performance or output; payments based on the overall performance of a group or team; payments based on the overall performance of your workplace or organisation (eg. profit-sharing scheme)."

- Tick all that apply so can distinguish between individual PP; team PP; organisation PP

- Distinction usually important in theory and sometimes empirically

PP INCIDENCE

PP Incidence - Descriptives

- 23% employees are PP
- Of these 1/3 on 2+ schemes
- Only 3% on PP without any FP
- PP incidence is 4X higher in private than public sector
- Nothing on size of PP payments but know it is small % total pay for most (Bell and Van Reenen 2013) and constitutes a small % wage bill outside finance (Forth et al., 2013)

INCIDENCE OF PP

	Private Sector			Public Sector			Whole Economy		
	Men	Women	All	Men	Women	All	Men	Women	All
Type of PP:									
Any	33	23	28	10	6	7	28	18	23
Individual	18	12	15	6	5	5	16	10	13
Group/Team	11	8	9	3	1	2	9	6	8
Workplace/Organisation	18	11	15	3	*	1	15	8	11
Number of PP schemes:									
0	67	77	72	90	94	93	72	82	77
1	22	17	20	9	5	7	19	13	16
2	7	5	6	1	*	1	6	3	5
3	4	2	3	*	*	*	3	1	2
Mix of PP:									
None	67	77	72	90	94	93	72	82	77
Individual only	8	7	8	5	5	5	8	6	7
Group/team only	4	4	4	2	*	1	3	3	3
Workplace/org only	10	6	8	2	*	1	8	4	6
Ind+Group	2	2	2	*	*	*	2	1	2
Ind+WP/Org	4	2	3	*	*	*	3	1	2
Group+WP/Org	1	*	1	1	*	*	1	1	1
All three	4	2	3	*	*	*	3	1	2

PP v FP – Overarching Idea

- Firms prefer PP where efficiency outweighs monitoring costs
  - High marginal returns to productivity
  - Employer seeking to attract high ability workers in markets with high ability variance
- Assumptions:
  - Monitoring costs confined to PP, not FP
  - Ability/effort not rewarded in FP contracts
  - Both over-simplifications
- Employee preferences/attributes matter
  - Tastes for risk, competition, effort; attributes including ability

PP v FP – Hypotheses (slide 1)

- HI: PP rises with ability (qualifications)
  - More able employees can earn more than in FP or same for less effort. For employer more efficient
  - Evidence supportive (Bockerman et al., 2013; Lemieux et al. 2009)
- H2: PP less likely for women than men
  - Heterogeneous tastes for risk, competition. Lab evidence
  - Alternative: objective performance criteria lower opportunity for discrimination
  - Evidence: no association, but occupation-level (Manning and Saidi, 2010)
- H3: PP where output sensitive to effort/ability
  - Managerial hierarchy (Rosen)
  - Job autonomy
  - Evidence from CEO's strong but less so for job autonomy (Bryson and Freeman, 2010 but PP at workplace-level)

PP v FP – Hypotheses (slide 2)

- H4: PP rises with unionisation
  - Unions lower monitoring costs (Barth et al., 2012)
  - Unions bargain over surplus created by PP
  - Alternative: union preference to attach wages to jobs not ability
  - Booth and Frank (1999) supportive but Pendleton et al. (2009) suggest unclear; O'Halloran (2013) says depends on PP type
  - We are first to exploit within workplace variance in union membership and coverage

- H5: PP more likely in larger organisations
  - Absorb fixed monitoring costs
  - Evidence mixed: depends on definition of PP (Gittleman and Pierce, 2013) and varies by type (Pendleton et al., 2009)

PP v FP – Results (slide 1)

- HI: PP rises with ability (qualifications)
  - Yes, but only in private sector
    - Monotonic, large but attenuated with WP FE (large % variance)
    - Suggests some due to workplace sorting
  - Public sector can attract able/incentivise with careers
- H2: PP less likely for women than men
  - Yes
  - Raw dif is 2X larger in private sector than public sector
  - Differential quantitatively quite small with controls and NS in public sector with WP FE
- H3: PP where output sensitive to effort/ability
  - Managerial hierarchy: Yes but only in private sector
  - Job autonomy: Yes but only in private sector and disappears with WP FE

PP v FP – Results (slide 2)

- H4: PP rises with unionisation
  - No
  - Private sector: membership NS. PP negatively associated with union coverage in private sector but NS with introduction of WP FE
  - Public sector: Coverage and membership negatively associated with individual and team PP but effects NS with introduction of WP FE.
  - Opportunities for rent capture and any union agency role are insufficient to induce positive correlation

- H5: PP more likely in larger organisations
  - Yes. PP more likely for employees in multi-site firms compared with single site and rises in workplaces with 500+ employee

Table 2: Highest Educational Qualifications and Receipt of Performance Pay

	Whole Economy						*Private sector*						*Public Sector*					
	(1) Raw		(2) Controls		(3) FE		(4) Raw		(5) Controls		(6) FE		(7) Raw		(8) Controls		(9) FE	
Other	0.04	*	0.02		-0.01		0.06	*	0.03		0		-0.01		-0.01		-0.02	
	(1.78)		(0.98)		(-.32)		(1.88)		(1.12)		(-.07)		(-.33)		(-0.52)		(-.94)	
CSE	0.05	***	0.03	*	0.01		0.06	***	0.04	*	0.02		0.03		0.02		0.01	
	(3.03)		(1.66)		(0.72)		(2.76)		(1.67)		(0.70)		(1.45)		(1.15)		(0.59)	
O level	0.09	***	0.05	***	0.04	***	0.12	***	0.07	***	0.06	***	0.03	**	0.03	*	0.01	
	(6.17)		(3.71)		(3.35)		(6.40)		(3.83)		(3.52)		(2.15)		(1.72)		(0.35)	
1 A level	0.09	***	0.08	***	0.07	***	0.13	***	0.09	***	0.08	***	0.05	**	0.05	*	0.02	
	(3.83)		(3.39)		(3.36)		(3.88)		(2.96)		(3.16)		(2.10)		(1.80)		(0.63)	
2+ A levels	0.12	***	0.08	***	0.07	***	0.16	***	0.1	***	0.08	***	0.04	**	0.04	*	0.02	
	(5.97)		(4.00)		(3.66)		(6.13)		(3.97)		(3.57)		(2.03)		(1.77)		(0.97)	
Degree	0.18	***	0.11	***	0.07	***	0.26	***	0.15	***	0.1	***	0		0.01		0	
	(9.04)		(6.23)		(4.36)		(10.64)		(6.60)		(4.79)		(0.06)		(0.43)		(0.08)	
Further degree	0.16	***	0.11	***	0.07	***	0.23	***	0.14	***	0.09	***	0.01		0.02		0.02	
	(4.68)		(4.32)		(3.31)		(5.47)		(4.40)		(3.44)		(0.56)		(0.65)		(0.67)	
r2	0.02		0.21		0.47		0.04		0.21		0.46		0		0.04		0.31	
N	18103		17717		17717		11172		10918		10918		6931		6799		6799	

Notes: (1) Reference for qualifications: no qualifications (2) Linear estimation. FE=workplace fixed effects (3) Controls are: female; age (6 dummies); white; disability; married/living as married; any dependent children; union member; covered by collective bargaining; occupation (9 dummies); usual hours worked (5 dummies); workplace tenure (5 dummies); contract type (3 dummies); job autonomy scale; industry (13 dummies); N employees at workplace (6 dummies); single-establishment organisation; region (11 dummies). Workplace-level controls are replaced by workplace fixed effects in columns (3), (6) and (9) (4) t-stats in parentheses *=sig at 90% CI; **=sig at 95% CI; ***=sig at 99% CI.

Table 3: Gender and Receipt of Performance Pay

	Whole Economy			*Private sector*			*Public sector*		
	(1) Raw	(2) Controls	(3) FE	(4) Raw	(5) Controls	(6) FE	(7) Raw	(8) Controls	(9) FE
Fem	-0.11 ***	-0.03 ***	-0.03 **	-0.10 ***	-0.04 **	-0.03 **	-0.05 ***	-0.05 ***	-0.01
	(-.63)	(-2.96)	(-.34)	(-.31)	(-2.43)	(-.00)	(-.88)	(-3.39)	(.55)
r2	0.02	0.21	0.47	0.01	0.21	0.46	0.01	0.04	0.31

Table 4: Performance Pay Where Output is Sensitive to Performance

	Whole economy						*Private sector*						*Public sector*		
	(1) Raw		(2) Controls		(3) FE		(4) Raw		(5) Controls		(6) FE		(7) Raw	(8) Controls	(9) FE
Manager	0.2	***	0.12	***	0.11	***	0.19	***	0.13	***	0.12	***	0.01	0	0.01
	(7.71)		(6.01)		(5.70)		(7.06)		(5.88)		(5.44)		(0.43)	(-0.22)	(0.50)
Job control	0.67	***	0.45	***	0.16		0.82	***	0.65	***	0.14		-0.24	-0.2	0.17
	(4.03)		(3.08)		(1.20)		(3.97)		(3.45)		(0.79)		(-.28)	(-1.07)	(1.35)
r2	0.02		0.2		0.47		0.02		0.2		0.46		0	0.03	0.31

PP PREMIUM

PP Premium Hypotheses (slide 1)

- H6: PP premium arising from incentives, sorting and firm heterogeneity
  - Raw gap will narrow with ability controls (qualifications, tenure, age), effort control (how hard work) and WP FE
  - Evidence: McGovern et al 2007 sizeable varying with PP type. Manning and Saidi (2010) .17 log points raw but down to .025 with WP FE.
- H7: PP premium lower for women
  - If distaste for competition will affect performance, especially under individual PP
  - But what if helps overcome discrimination? May close gender pay gap
  - Evidence: Manning and Saidi (2010) similar PP premium for men and women

PP Premium Hypotheses (slide 2)

- H8: returns to skill higher in PP jobs
  - If more able can earn more under PP than FP expect to see higher premium for observable skill
  - Evidence: Lemieux et al. 2009 returns to education and experience are larger for PP jobs
- H9: PP premium higher among unionised
  - If unions can successfully extract additional surplus under PP

PP Premium Results(slide 1)

- H6: PP premium arising from incentives, sorting and firm heterogeneity
  - Human capital accounts for large part of raw PP premium and falls again with WP FE confirming firm heterogeneity/sorting
  - But PP premium remains 0.1 log points within workplace
  - Working harder has no effect on PP coefficient
  - Unexpected finding: PP premium rises with N PP schemes
- H7: PP premium lower for women
  - Yes in raw data but difference disappears with controls
  - So selection into PP more strongly correlated with wage enhancing attributes for men than for women
  - Perhaps performance damaging distaste for competition is outweighed by positive selection of women on unobservables
  - Or else PP is a break on wage discrimination?

PP Premium Results (slide 2)

- H8: returns to skill higher in PP jobs
  - Yes higher returns to qualifications in PP jobs in raw data and when controlling for demographics and job
  - However becomes NS with WP FE. Implication: additional skill premium in PP jobs is driven by ***worker sorting across workplaces***
  - Also PP*tenure ns while PP*age is weak
- H9: PP premium higher among unionised
  - No. Raw PP premium actually higher among non-unionised but differential across union and non-union employees NS with addition of controls
  - Perhaps union bargaining over returns to PP is ineffectual?

Table 5: Log Hourly Wages and Any Performance Pay

	Whole Economy				*Private sector*			
	(1) Raw	(2) HC	(3) Controls	(4) WP FE	(5) Raw	(6) HC	(7) Controls	(8) WP FE
Any Performance Pay	0.36 ***	0.29 ***	0.15 ***	0.10 ***	0.44 ***	0.33 ***	0.18 ***	0.11 ***
	(10.47)	(11.16)	(8.91)	(6.37)	(12.13)	(12.09)	(9.96)	(6.78)
r2	0.06	0.24	0.58	0.70	0.09	0.27	0.61	0.70
N	16751	17751	16412	16412	10329	10329	10109	10109

Notes: (1) The dependent variable is log hourly wages as described in the text. (2) HC=human capital controls, namely highest academic qualification (8 dummies), workplace tenure (5 dummies) and the employee's age, which is a proxy for labour market experience (6 dummies). Columns (3) and (7) incorporate all the controls referred to in the footnote to Table 2. Columns (4) and (8) contain all the individual level demographic and job characteristics plus workplace fixed effects. (3) See Table 2 for other conventions.

Table 6: Log Hourly Pay by Gender (separate regressions)

Panel A: Whole Economy

	Men						*Women*					
	(1) Raw		(2) Controls		(3) FE		(4) Raw		(5) Controls		(6) FE	
Any Performance Pay	0.38	***	0.13	***	0.10	***	0.25	***	0.14	***	0.10	***
	(9.70)		(6.36)		(5.10)		(6.14)		(5.54)		(3.64)	
r2	0.07		0.64		0.79		0.02		0.52		0.67	
N	7455		7333		7333		9420		9187		9187	
Panel B: Private sector												
Any Performance Pay	0.45	***	0.16	***	0.12	***	0.34	***	0.17	***	0.12	***
	(10.84)		(7.54)		(5.93)		(7.93)		(6.15)		(4.08)	
r2	0.10		0.66		0.80		0.05		0.53		0.70	
N	5211		5121		5121		5196		5055		5055	

Notes: (1) The dependent variable is log hourly wages described in the text. (2) Models are run separately for men and women. Panel A is for the whole economy. Panel B is confined to employees in the private sector. (3) Controls are those in Models (3) and (7) in Table 5, other than gender. Columns (3) and (6) contain all the individual level demographic and job characteristics plus workplace fixed effects. (4) See Table 2 for other conventions.

Table 7: Log Hourly Pay: Interactions between Performance Pay and Human Capital

	Whole Economy:			Private sector:		
	Raw	Controls	FE	Raw	Controls	FE
Any Performance Pay	0.082	0.003	-0.04	0.058	-0.021	-0.049
	0.91	0.05	-0.74	0.61	-0.34	-0.88
Highest qualification	0.099***	0.039***	0.032***	0.096***	0.037***	0.030***
	25.8	12.29	10.43	20.23	9.49	7.47
PP*qualifications	0.033***	0.018**	0.008	0.038***	0.022**	0.01
	3.75	2.77	1.39	4.02	3.17	1.65
Age	0.073***	0.045***	0.037***	0.079***	0.050***	0.048***
	11.39	8.54	6.96	10.39	7.8	7.38
PP*age	0.041*	0.025*	0.025*	0.043*	0.024	0.021
	2.48	2.2	2.36	2.42	1.92	1.89
Tenure	0.070***	0.038***	0.040***	0.065***	0.033***	0.034***
	11.22	8.2	9.13	8.62	5.69	6.42
PP*tenure	-0.018	-0.003	0.005	-0.005	0.01	0.015
	(-1.12)	(-0.25)	0.51	(-0.31)	-0.85	1.3
r2	0.216	0.57	0.482	0.248	0.597	0.487
N	16751	16412	16412	10329	10109	10109

Notes: (1) Models are similar to those in Table 5 but interact performance pay (PP) with human capital variables entered as linear terms.

PP AND WAGE DISPERSION

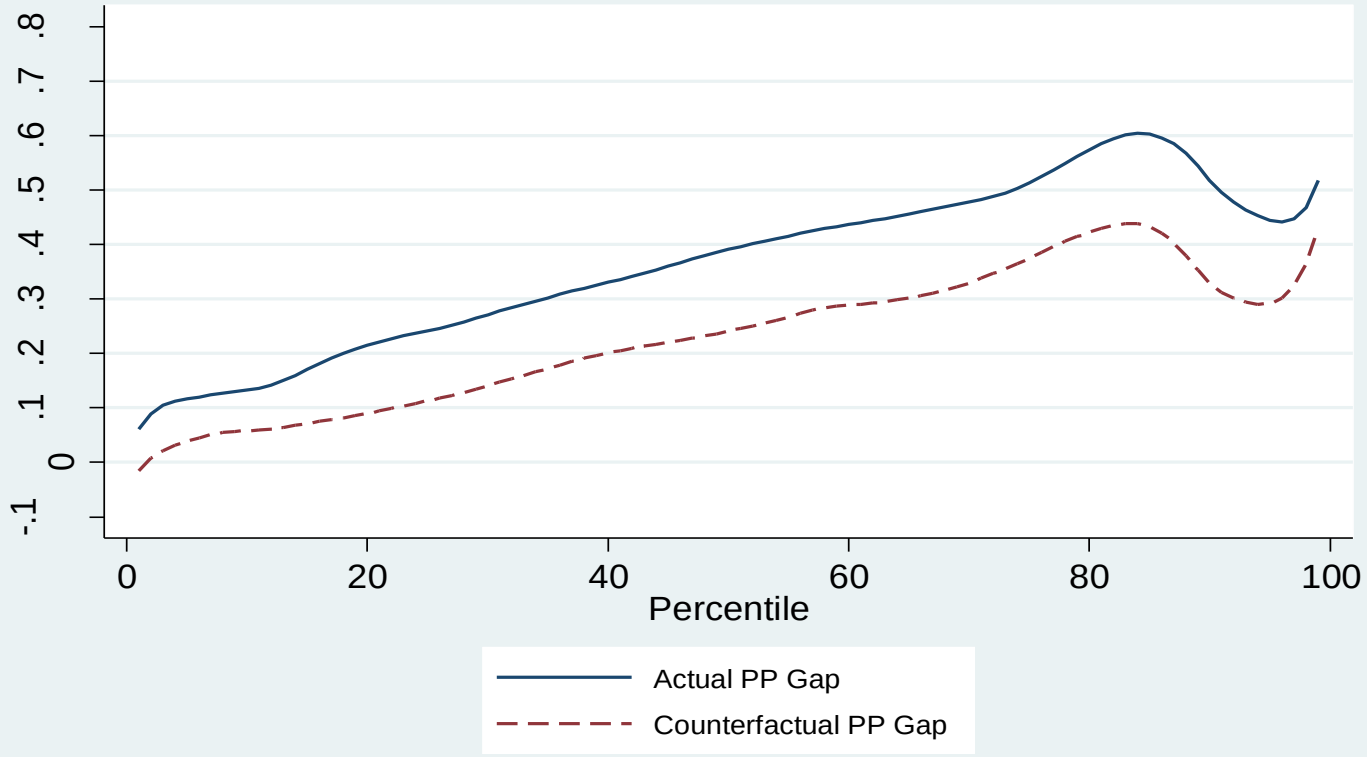
PP Effect on Wage Dispersion

- H10: PP raises wage dispersion but union coverage will attenuate this effect
  - PP raises wage dispersion via worker sorting (Lazear, Prendergast)
  - And because PP better reflects individual underlying marginal productivity than FP jobs
  - High ability workers able to recover higher wages for that ability in presence of PP
  - Effect will therefore be enhanced by high incidence of PP at top end of wage distribution (Bell and Van Reenen, 2010)
  - Unions' desire to standardise wages and link wage setting to job attributes, not individual ability, should attenuate this effect (Barth et al 2012)
  - Evidence contested
    - Lemieux et al; Gittleman and Pierce; Manning and Saidi

Estimating PP Effect on Wage Dispersion

- Reweighting estimator
  - Dinardo Fortin and Lemieux 1996
  - Constructs counterfactual wage distribution that proxies wage distribution that would have obtained in the absence of performance pay
  - Achieved by reweighting sample members on FP such that their observable characteristics closely resemble those of their PP counterparts
  - Achieved via weights derived from a probit estimating likelihood of PP
    - Gives additional weight to FP employees with a high probability of being a PP employee
- Recover PP effect at different parts of wage distribution after reweighting
- Cf propensity score matching, but across wage distribution

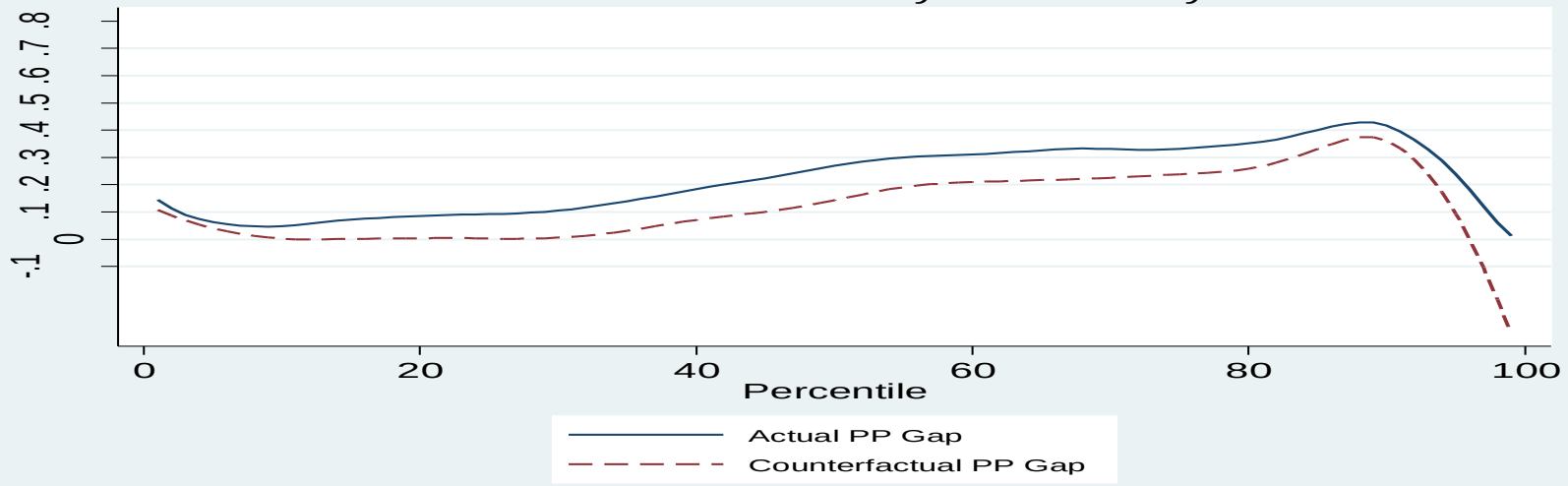
Figure 2. Performance Pay Wage Gap



Smoothed by Locally Weighted Regression

Figure 3. Performance Pay Wage Gap

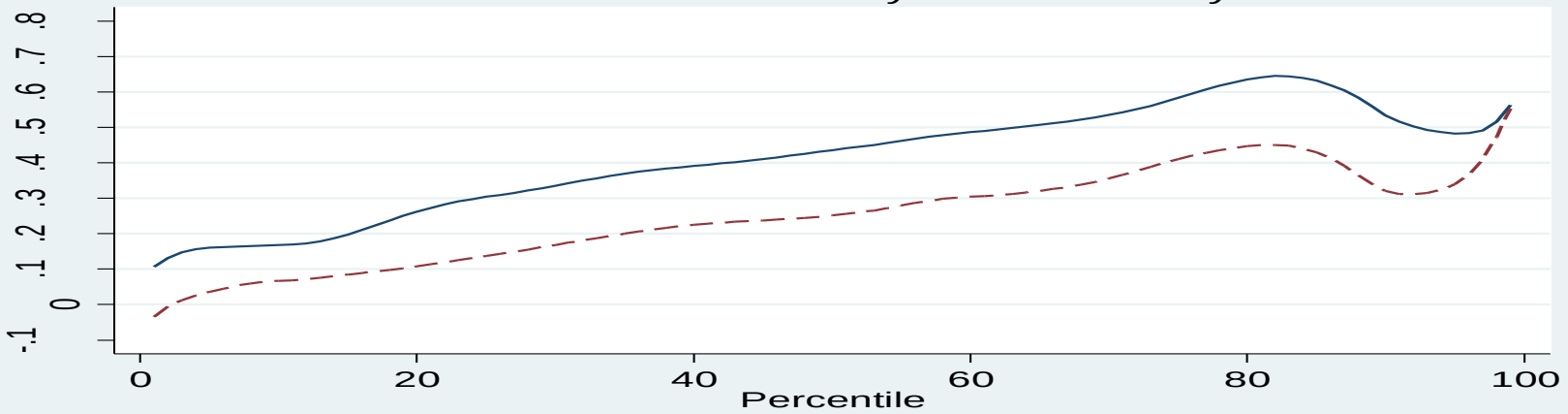
WERS Whole Economy covered only



Smoothed by Locally Weighted Regression

Figure 4. Performance Pay Wage Gap

WERS Whole Economy uncovered only



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- Large raw PP wage premium (.36 log points) but falls to .10 log points comparing 'like' employees in same workplace
- Wage returns to observable ability higher in PP jobs but only in private sector
- PP wage premium rises as move up wage distribution
  - .06 log points at 10th pctile; .42 log points at 90th pctile
- Contributes to higher wage dispersion than in absence of PP