

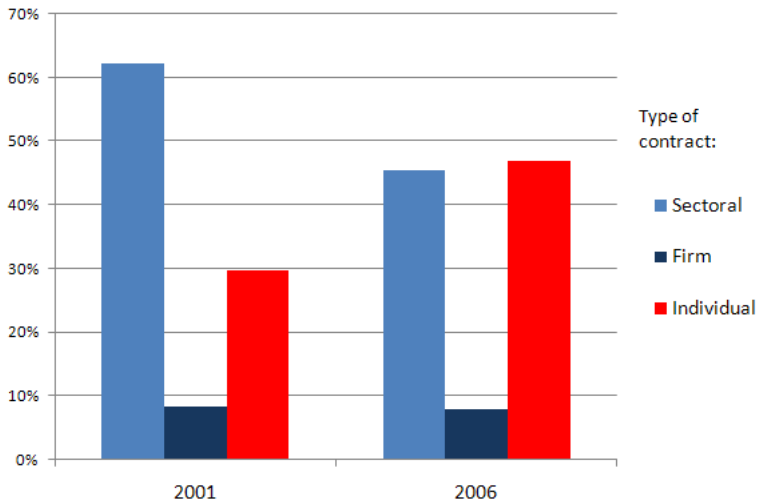
Rising Wage Inequality, the Decline of Collective Bargaining, and the Gender Wage Gap

Dirk Antonczyk, Bernd Fitzenberger, Katrin Sommerfeld

"Increasing Labor Market Flexibility"
IAB Workshop Nürnberg, 19th March 2011



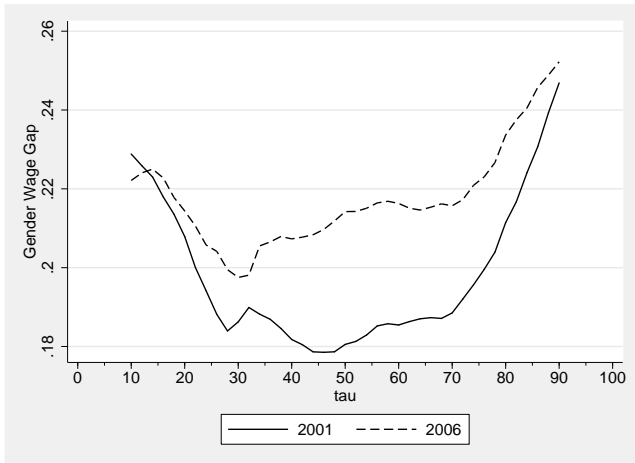
Collective Wage Bargaining Coverage



Wage Inequality



Gender Wage Gap



- ▶ This paper investigates the link between

Decline in bargaining coverage

Recent increase in wage inequality

Development of the Gender Wage Gap

Literature

- ▶ Decline of union membership and of coverage
- ▶ Collective bargaining is associated with wage compression
- ▶ Rising Wage Dispersion, After All!
- ▶ Declining Gender Wage Gap ...
- ▶ ... but recently stagnating

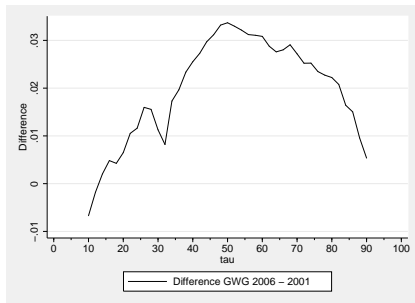
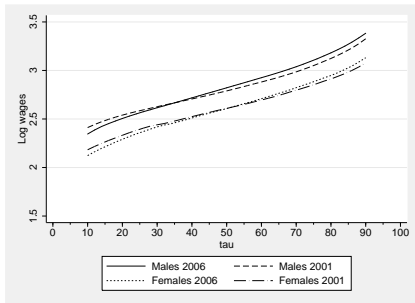
Data

- ▶ German Structure of Earnings Survey, 2001 and 2006 (GSES; “Verdienststrukturerhebung”)
- ▶ Random sample of all German firms with at least ten employees, mainly in private sector
- ▶ Linked employer-employee data set
- ▶ Information on bargaining regime on individual level
- ▶ Use full-time employees in West Germany, aged 25-55
- ▶ 2001: 420,000 employees, 17,000 firms
2006: 830,000 employees, 22,600 firms
- ▶ Logarithmized gross real hourly wage

Decomposition of collective bargaining coverage

	Males	Females
Total decline in coverage	-16,8	-19,3
Coefficients	-14,7	-17,3
Characteristics	-2,1	-2,0
Standard error counterfactual	(0,7)	(0,7)

Development of Wages and the Gender Wage Gap



Econometric Approach

- ▶ Wage equations via quantile regressions
- ▶ Decomposition into Coefficients and Characteristics effect

$$\Delta_{\tau}^{06/01} = \underbrace{\underbrace{\Delta_{\tau}^1}_{\text{Personal}} + \underbrace{\Delta_{\tau}^2}_{\text{Firm}} + \underbrace{\Delta_{\tau}^3}_{\text{Coverage}}}_{\text{Coefficients}} + \underbrace{\Delta_{\tau}^4}_{\text{Time-trend}} + \underbrace{\underbrace{\Delta_{\tau}^5}_{\text{Coverage}} + \underbrace{\Delta_{\tau}^6}_{\text{Firm}} + \underbrace{\Delta_{\tau}^7}_{\text{Personal}}}_{\text{Characteristics}}$$

- ▶ Counterfactual quantile function estimated á la Melly (2006), Chernozhukov, Fernandez-Ival, Melly (2008)

Sequential Decomposition Results

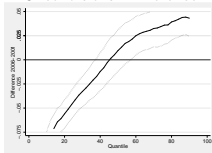
	Males			Females		
	90-10	90-50	50-10	90-10	90-50	50-10
Overall 2006-2001	0.131	0.034	0.098	0.113	0.054	0.060
Personal Coefficients	0.018	0.007	0.011	0.041	0.020	0.021
Firm Coefficients	0.057	0.010	0.048	0.041	0.008	0.033
Bargaining Coefficients	0.020	0.015	0.005	0.019	0.016	0.003
Residual	0.026	0.013	0.013	0.025	0.014	0.012
Bargaining Regime	0.021	0.015	0.006	0.025	0.014	0.010
Firm Characteristics	0.019	0.000	0.019	0.017	-0.002	0.019
Personal Characteristics	-0.029	-0.026	-0.003	-0.056	-0.016	-0.040

Sequential Decomposition Results

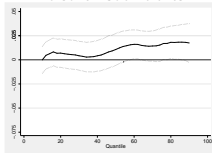
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Sequential decomposition of Δ male wage distribution

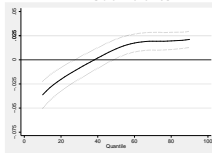
Unconditional Difference



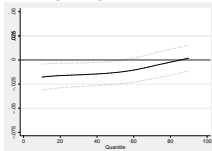
Personal Coefficients



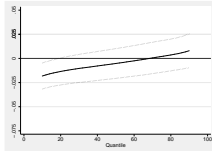
Firm Coefficients



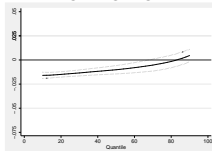
Bargaining Coefficients



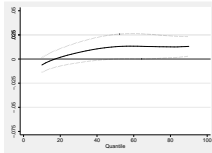
Residual



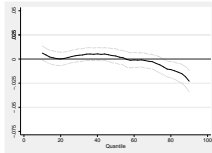
Bargaining Regime



Firm Characteristics

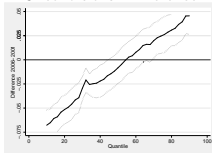


Personal Characteristics

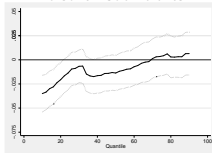


Sequential decomposition of Δ female wage distribution

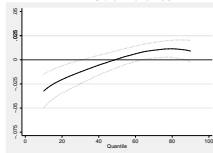
Unconditional Difference



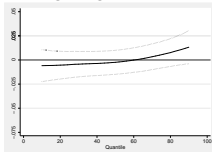
Personal Coefficients



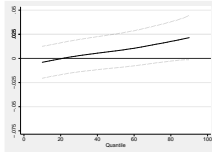
Firm Coefficients



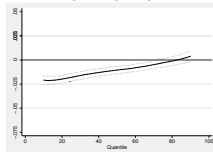
Bargaining Coefficients



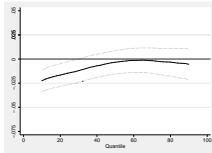
Residual



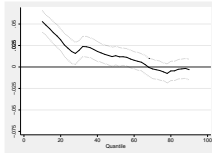
Bargaining Regime



Firm Characteristics

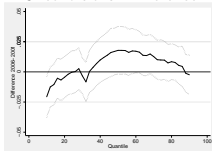


Personal Characteristics

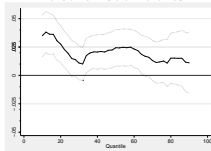


Sequential decomposition of Δ GWG

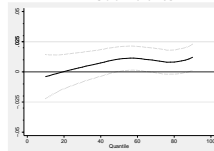
Unconditional Difference



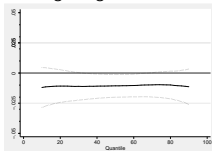
Personal Coefficients



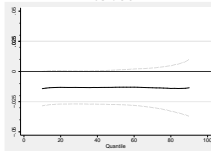
Firm Coefficients



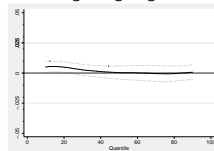
Bargaining Coefficients



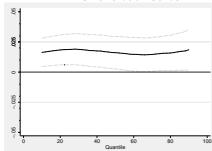
Residual



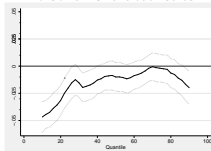
Bargaining Regime



Firm Characteristics



Personal Characteristics



Conclusions I

Sharp decline of collective bargaining coverage

- ▶ 2001: ca. 30% not covered
- ▶ 2006: ca. 50% not covered
- ▶ Firm-level bargaining also declines
- ▶ Decline stronger for females
- ▶ Almost exclusively within sectors

- ▶ Contributed to the increase in wage dispersion...
- ▶ ... but not to the development of the GWG

Conclusions II

Increase in wage dispersion

- ▶ Stronger real wage losses in the lower part
- ▶ Driven by returns to firm characteristics ...
- ▶ ... which are driven by sector coefficients
- ▶ Smaller contributions from firm characteristics and from personal coefficients
- ▶ Counteracted by personal characteristics

Conclusions III

Gender Wage Gap

- ▶ Increases in the middle of the distribution
- ▶ Small decreases in the lower part
- ▶ Labor demand effects tended to raise the GWG
- ▶ Individual-specific characteristics would have improved the relative position of women, had not other components counteracted this tendency

Thank you

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Literature

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- ▶ DiNardo, J., Fortin, N., and Lemieux, T. (1996). Labor Markets Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach. *Econometrica*, 64:1001-1044.
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- ▶ Fitzenberger, B., Kohn, K., and Wang, Q. (2006). The Erosion of Union Membership in Germany: Determinants, Densities, Decompositions. *IZA Discussion Paper, 2193*.
- ▶ Machado, J. and Mata, J. (2005). Counterfactual Decomposition of Changes in Wage Distributions using Quantile Regression. *Journal of Applied Econometrics*, 20(4):445-465.
- ▶ Melly, B. (2006). Estimation of counterfactual distributions using quantile regression. *Unpublished manuscript, University of St. Gallen*.

Econometric Approach

- ▶ Wage equations via quantile regressions
- ▶ Decomposition:

$$\hat{q}_{male}(\tau) - \hat{q}_{female}(\tau) = \underbrace{[\hat{q}_{male}(\tau) - \hat{q}_{\beta_f, x_m}(\tau)]}_{\text{Coefficient effect}} + \underbrace{[\hat{q}_{\beta_f, x_m}(\tau) - \hat{q}_{female}(\tau)]}_{\text{Characteristics effect}}$$

- ▶ $\hat{q}_{\beta_f, x_m}(\tau)$: estimated counterfactual quantile function
- ▶ Melly (2006), Chernozhukov, Fernandez-Ival, Melly (2008)

Sequential Decomposition

P = Personal, i.e. individual-specific characteristics

F = Firm, i.e. establishment-specific characteristics

B = Bargaining regime, i.e. sectoral, firm or no collective bargaining

$$\Delta_{\tau}^{06/01} = q_{\tau}^{06}(\alpha_P^{06}, \alpha_F^{06}, \alpha_B^{06}, \bar{\alpha}_0^{06}, B^{06}, F^{06}, P^{06}) \\ - q_{\tau}^{01}(\alpha_P^{01}, \alpha_F^{01}, \alpha_B^{01}, \bar{\alpha}_0^{01}, B^{01}, F^{01}, P^{01})$$

$$= \underbrace{\underbrace{\Delta_{\tau}^1}_{\text{Personal}} + \underbrace{\Delta_{\tau}^2}_{\text{Firm}} + \underbrace{\Delta_{\tau}^3}_{\text{Coverage}}}_{\text{Coefficients}} + \underbrace{\Delta_{\tau}^4}_{\text{Time-trend}} + \underbrace{\underbrace{\Delta_{\tau}^5}_{\text{Coverage}} + \underbrace{\Delta_{\tau}^6}_{\text{Firm}} + \underbrace{\Delta_{\tau}^7}_{\text{Personal}}}_{\text{Characteristics}}$$

Sequential Decomposition

$$\Delta_{\tau}^1 = q_{\tau}^6(\alpha_P^6, \alpha_F^6, \alpha_B^6, \bar{\alpha}_0^6, B^6, F^6, P^6) - q_{\tau}^6(\alpha_P^1, \alpha_F^6, \alpha_B^6, \bar{\alpha}_0^6, B^6, F^6, P^6)$$

$$\Delta_{\tau}^2 = q_{\tau}^6(\alpha_P^1, \alpha_F^6, \alpha_B^6, \bar{\alpha}_0^6, B^6, F^6, P^6) - q_{\tau}^6(\alpha_P^1, \alpha_F^1, \alpha_B^6, \bar{\alpha}_0^6, B^6, F^6, P^6)$$

$$\Delta_{\tau}^3 = q_{\tau}^6(\alpha_P^1, \alpha_F^1, \alpha_B^6, \bar{\alpha}_0^6, B^6, F^6, P^6) - q_{\tau}^6(\alpha_P^1, \alpha_F^1, \alpha_B^1, \bar{\alpha}_0^6, B^6, F^6, P^6)$$

$$\Delta_{\tau}^4 = q_{\tau}^6(\alpha_P^1, \alpha_F^1, \alpha_B^1, \bar{\alpha}_0^6, B^6, F^6, P^6) - q_{\tau}^6(\alpha_P^1, \alpha_F^1, \alpha_B^1, \bar{\alpha}_0^1, B^6, F^6, P^6)$$

$$\Delta_{\tau}^5 = q_{\tau}^6(\alpha_P^1, \alpha_F^1, \alpha_B^1, \bar{\alpha}_0^1, B^6, F^6, P^6) - q_{\tau}^6(\alpha_P^1, \alpha_F^1, \alpha_B^1, \bar{\alpha}_0^1, B^1, F^6, P^6)$$

$$\Delta_{\tau}^6 = q_{\tau}^6(\alpha_P^1, \alpha_F^1, \alpha_B^1, \bar{\alpha}_0^1, B^1, F^6, P^6) - q_{\tau}^6(\alpha_P^1, \alpha_F^1, \alpha_B^1, \bar{\alpha}_0^1, B^1, F^1, P^6)$$

$$\Delta_{\tau}^7 = q_{\tau}^6(\alpha_P^1, \alpha_F^1, \alpha_B^1, \bar{\alpha}_0^1, B^1, F^1, P^6) - q_{\tau}^1(\alpha_P^1, \alpha_F^1, \alpha_B^1, \bar{\alpha}_0^1, B^1, F^1, P^1)$$

Helicopter Counterfactuals

Real log wage distributions and gender differentials

τ	2001		2006		Δ 2006-2001		GWG		Δ GWG
	Overall		Male	Female	Male	Female	2001	2006	
	Male	Female	Male	Female	Male	Female			
10%	2.41	2.18	2.33	2.12	-0.08	-0.06	0.23	0.21	-0.02
25%	2.58	2.39	2.54	2.35	-0.04	-0.04	0.19	0.19	0.00
50%	2.79	2.61	2.80	2.60	0.01	-0.01	0.18	0.20	0.02
75%	3.05	2.85	3.08	2.88	0.03	0.02	0.20	0.21	0.01
90%	3.33	3.08	3.37	3.12	0.03	0.04	0.25	0.24	0.00

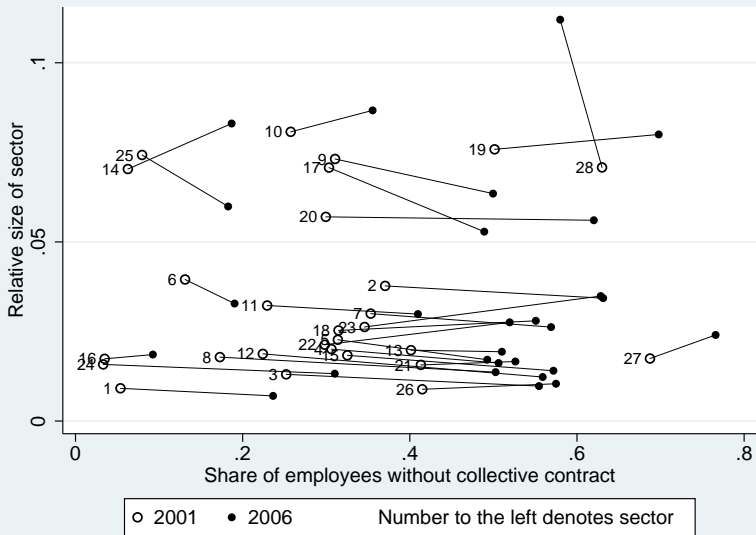
GWG by bargaining regime

τ	2001		2006		Δ 2006-2001	
	No Coll.	Sectoral	No Coll.	Sectoral	No Coll.	Sectoral
	Barg.	Barg.	Barg.	Barg.	Barg.	Barg.
10	0.20	0.22	0.18	0.21	-0.02	-0.01
25	0.20	0.19	0.17	0.17	-0.03	-0.02
50	0.17	0.18	0.17	0.18	0.00	0.00
75	0.18	0.19	0.20	0.18	0.02	-0.01
90	0.24	0.25	0.25	0.23	0.01	-0.02

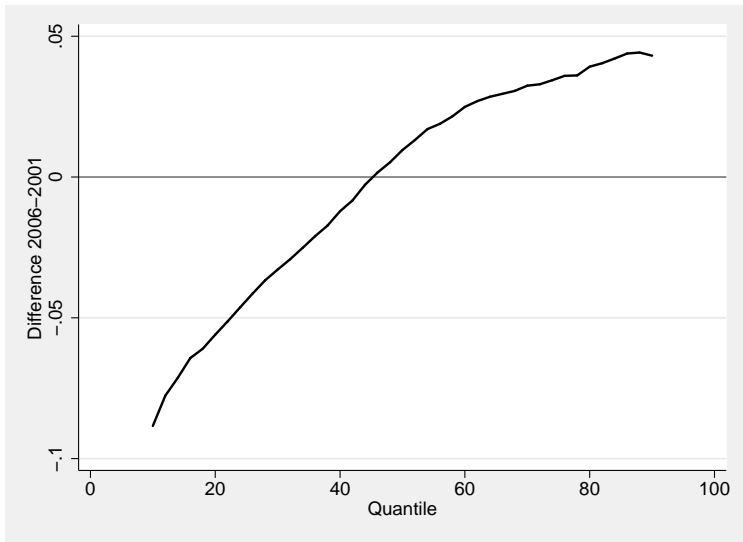
Wage distributions and GWG by bargaining regime

	2001		2006		Δ 2006-2001		GWG	Δ GWG		
	Male	Female	Male	Female	Male	Female				
No Collective Bargaining										
10%	2.28	2.08	2.25	2.07	-0.03	-0.01	0.20	0.18	-0.02	
25%	2.45	2.25	2.44	2.27	-0.01	0.02	0.20	0.17	-0.03	
50%	2.65	2.48	2.67	2.50	0.02	0.02	0.17	0.17	0.00	
75%	2.94	2.76	2.99	2.79	0.05	0.03	0.18	0.20	0.02	
90%	3.27	3.03	3.32	3.07	0.05	0.04	0.24	0.25	0.01	
Sectoral Bargaining										
10%	2.49	2.27	2.43	2.22	-0.06	-0.05	0.22	0.21	-0.01	
25%	2.64	2.45	2.63	2.46	-0.01	0.01	0.19	0.17	-0.02	
50%	2.83	2.65	2.87	2.69	0.04	0.04	0.18	0.18	0.00	
75%	3.08	2.89	3.11	2.93	0.03	0.04	0.19	0.18	-0.01	
90%	3.34	3.09	3.38	3.15	0.04	0.06	0.25	0.23	-0.02	
Firm Bargaining										
10%	2.50	2.30	2.50	2.15	0.00	-0.15	0.20	0.35	0.15	
25%	2.65	2.48	2.70	2.42	0.05	-0.06	0.17	0.28	0.11	
50%	2.85	2.66	2.99	2.73	0.14	0.07	0.19	0.26	0.07	
75%	3.12	2.90	3.25	3.02	0.13	0.12	0.22	0.23	0.01	
90%	3.38	3.14	3.48	3.26	0.10	0.12	0.24	0.24	0.00	

Employment shares and coverage by sector

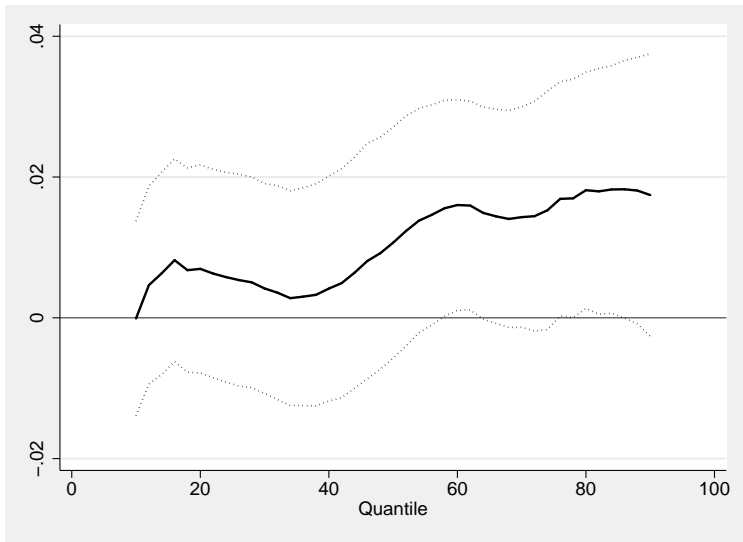


Unconditional Difference: Males



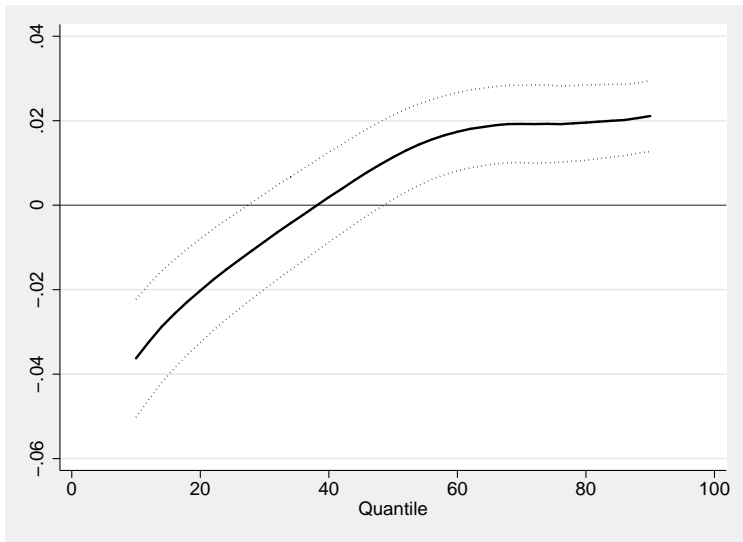
Return

Personal Coefficients: Males



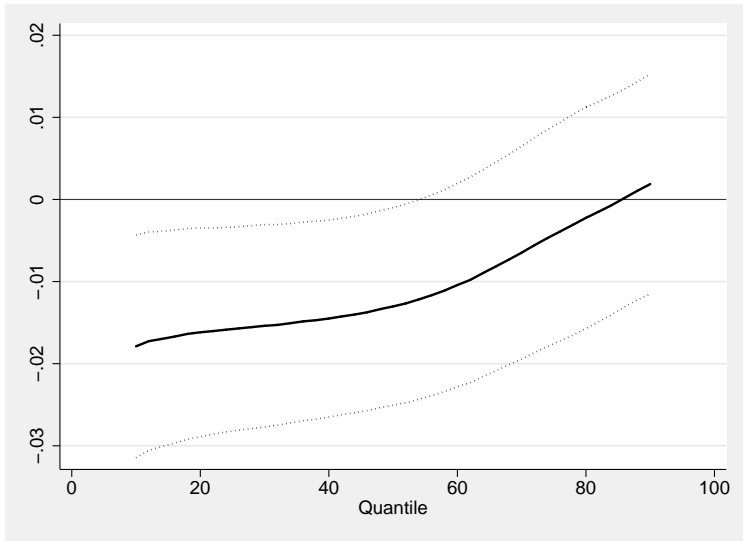
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Firm Coefficients: Males



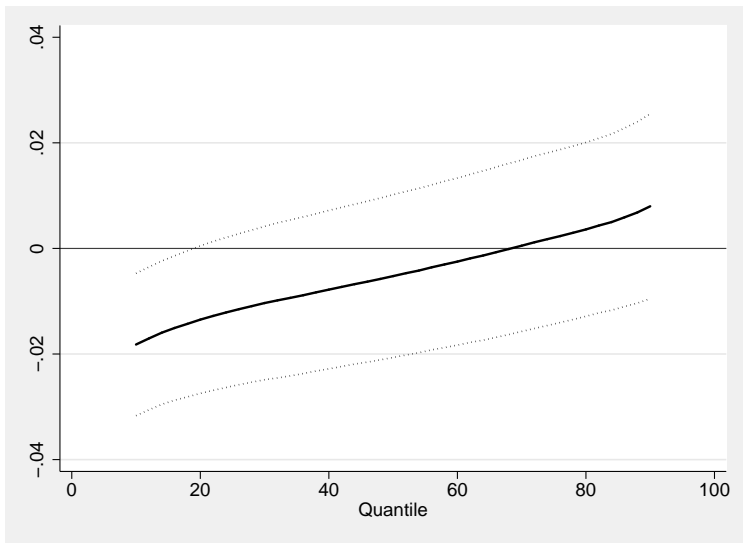
Return

Bargaining Coefficients: Males



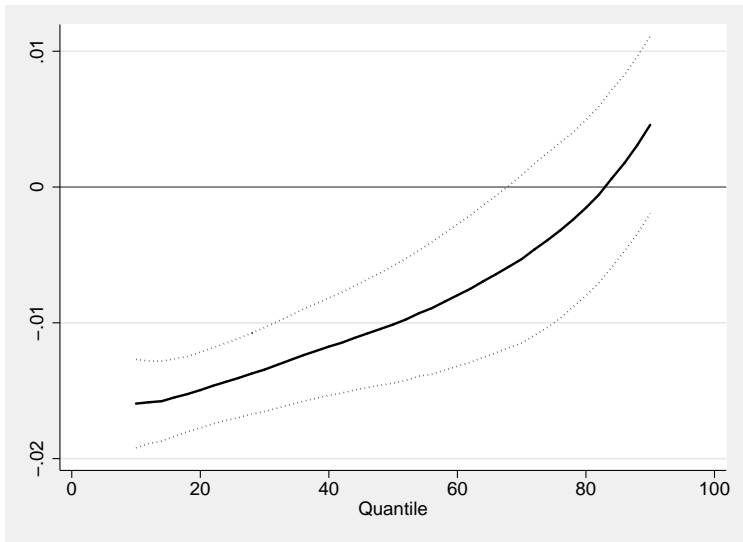
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Residual: Males



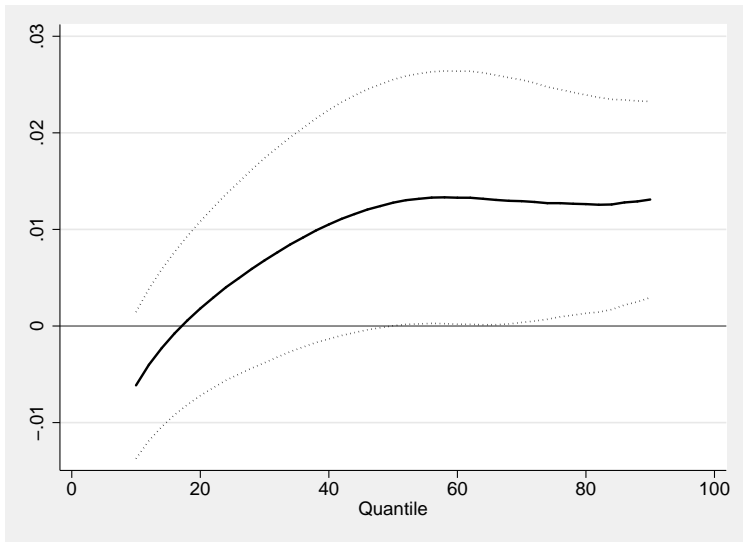
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Bargaining Regime: Males



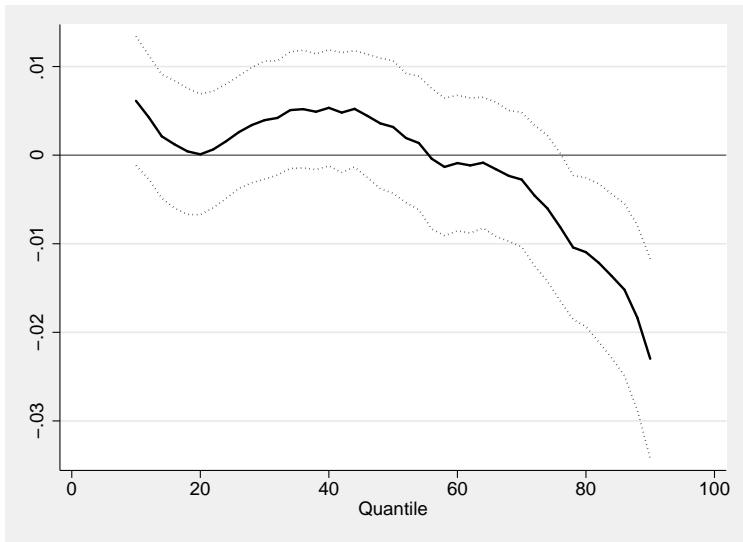
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Firm Characteristics: Males



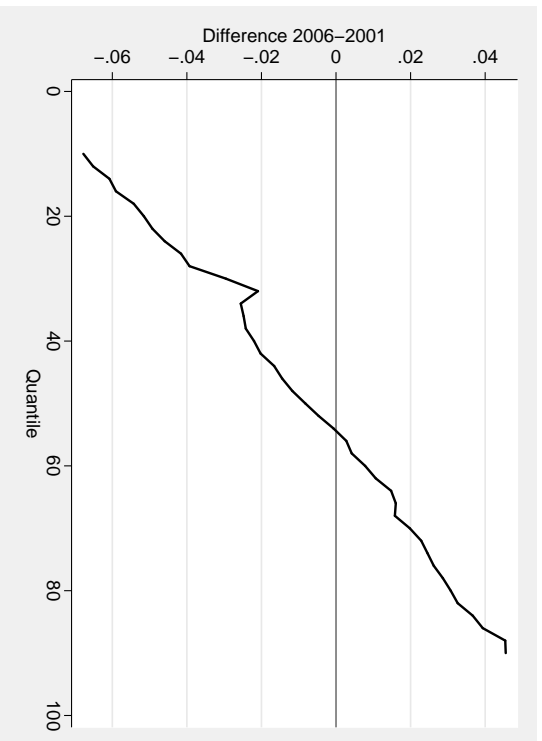
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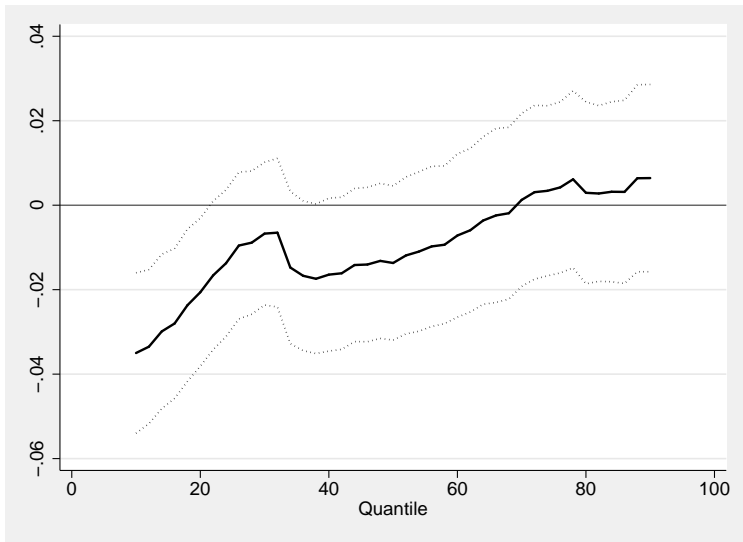
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Unconditional Difference: Females



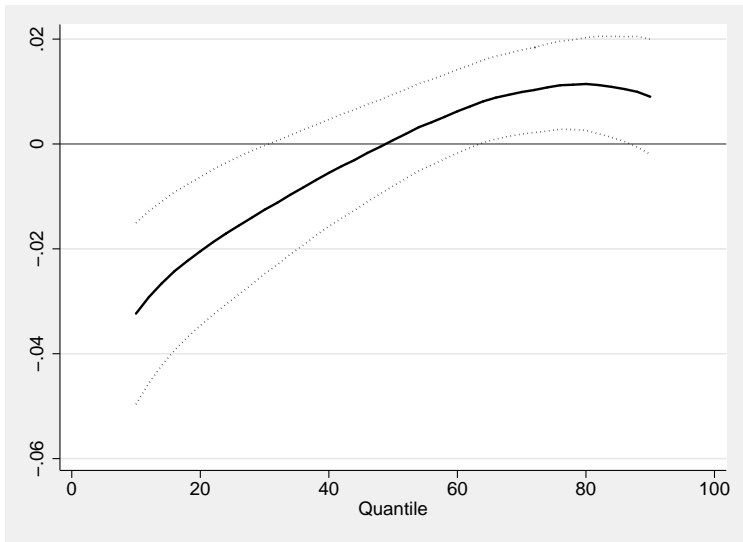
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Personal Coefficients: Females



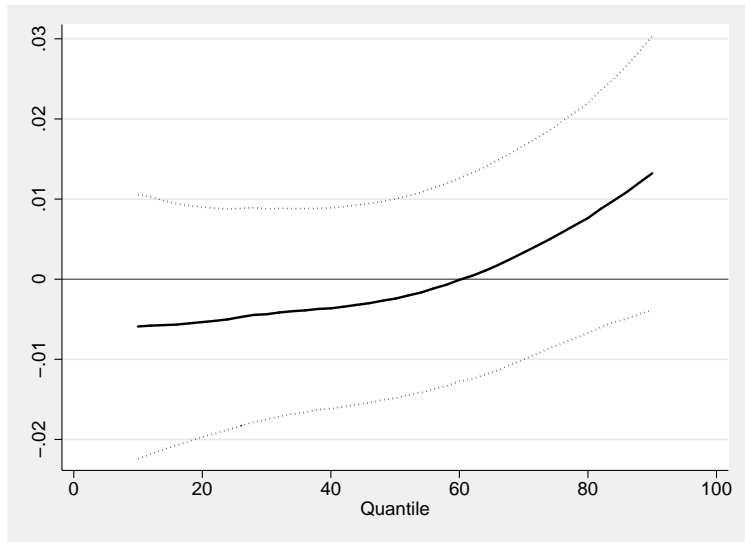
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Firm Coefficients: Females



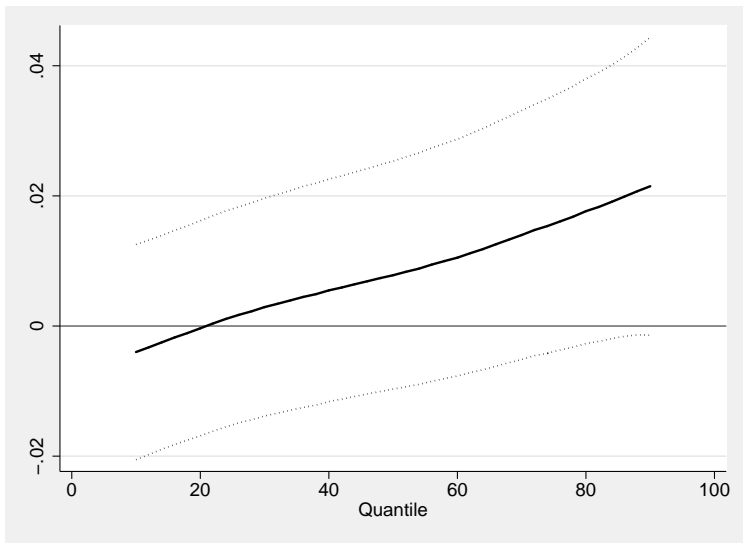
Return

Bargaining Coefficients: Females



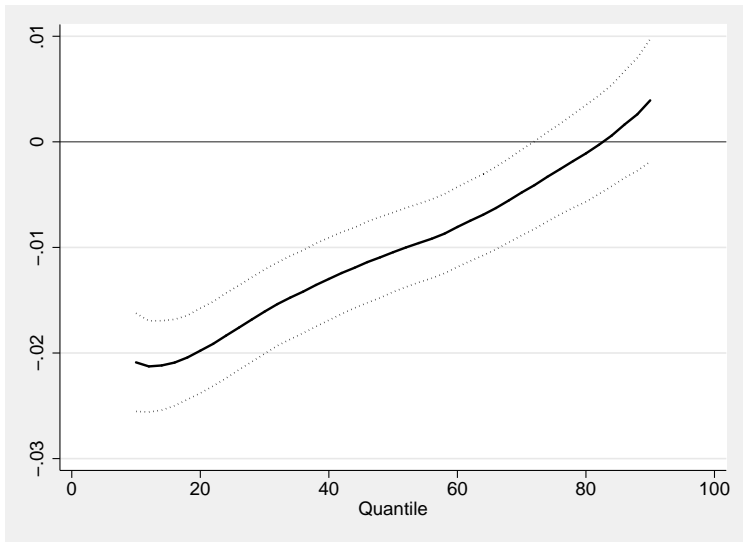
Return

Residual: Females



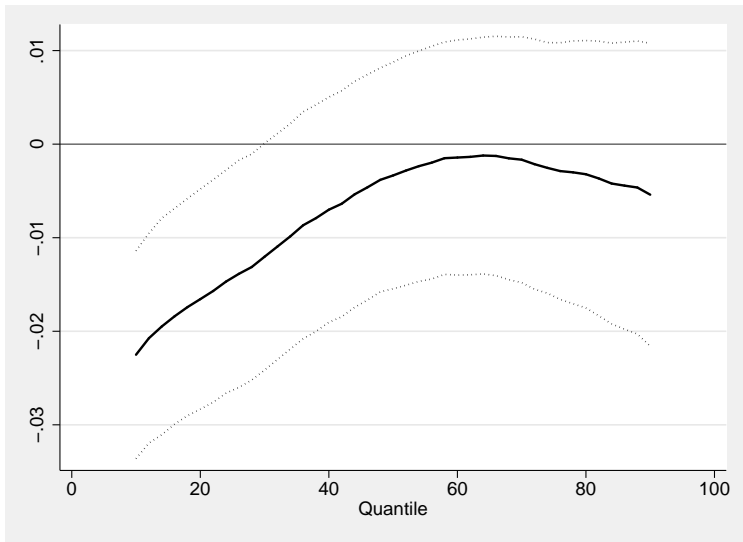
Return

Bargaining Regime: Females



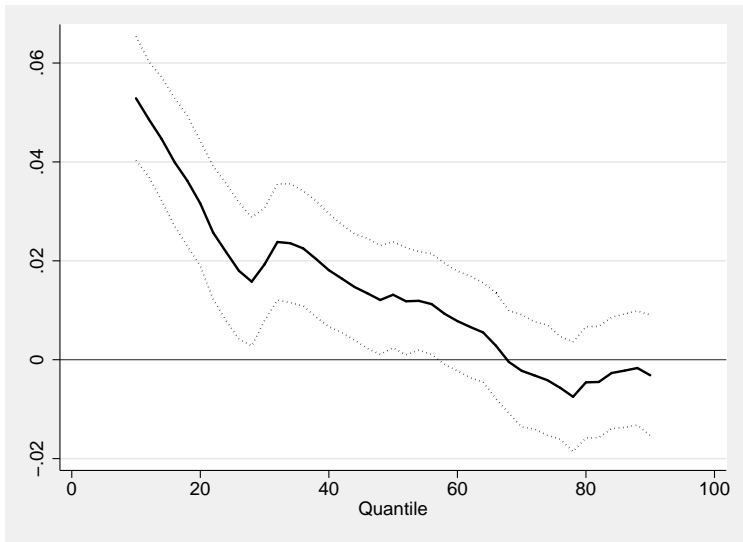
Return

Firm Characteristics: Females



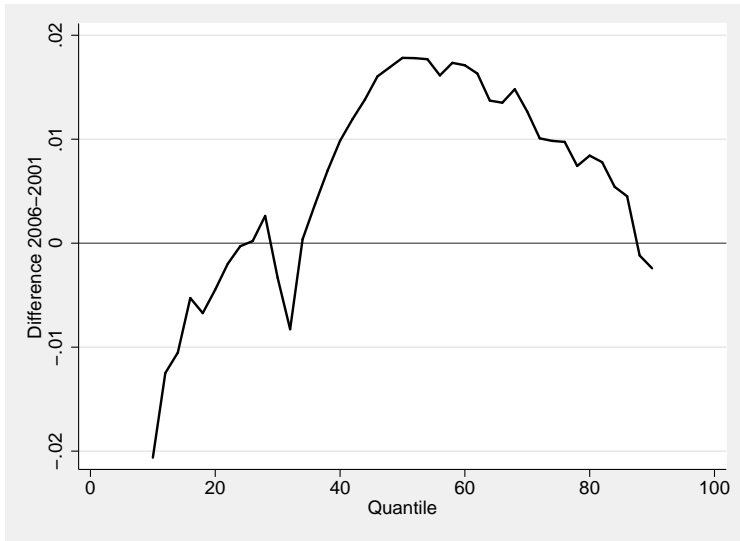
Return

Personal Characteristics: Females



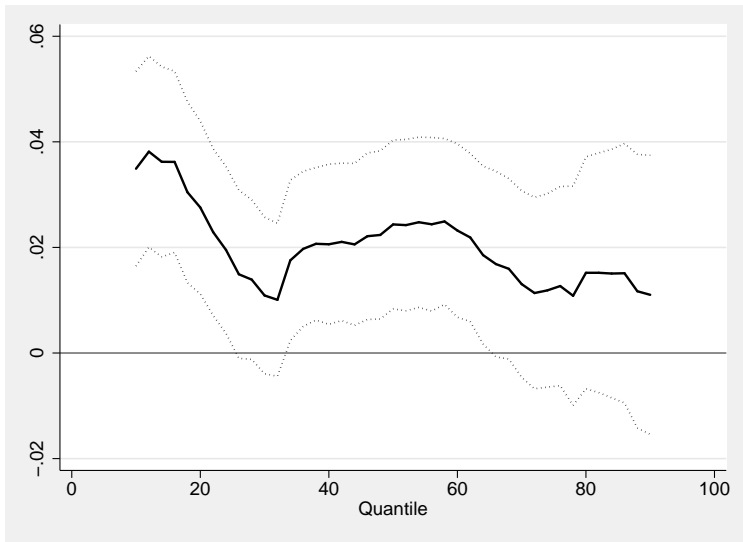
Return

Unconditional Difference: GWG



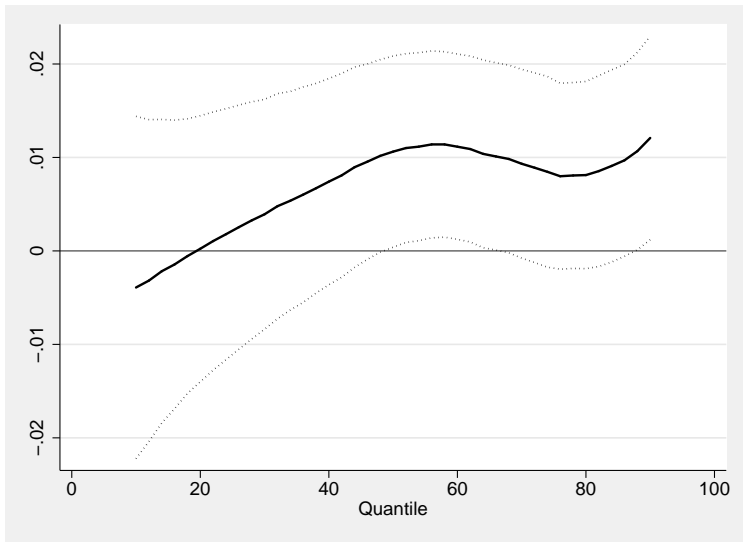
Return

Personal Coefficients: GWG



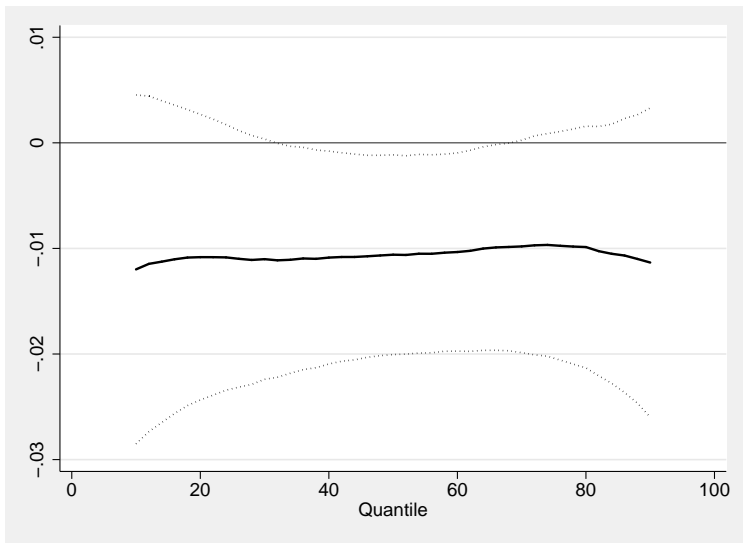
Return

Firm Coefficients: GWG



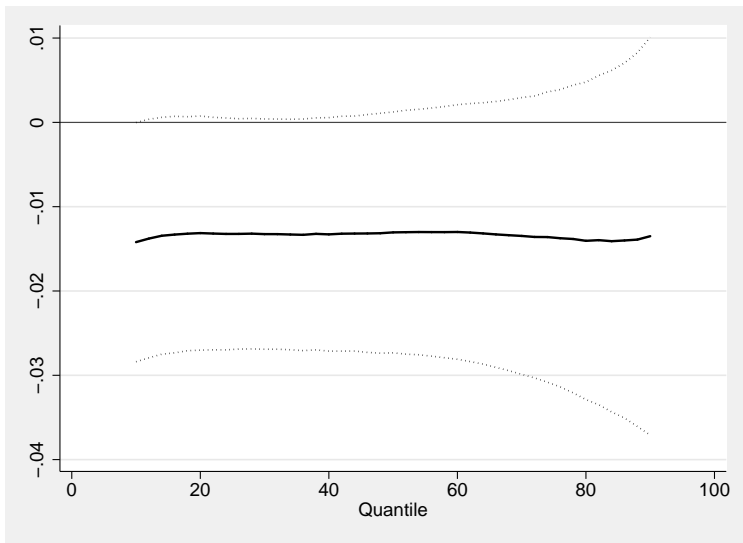
Return

Bargaining Coefficients: GWG



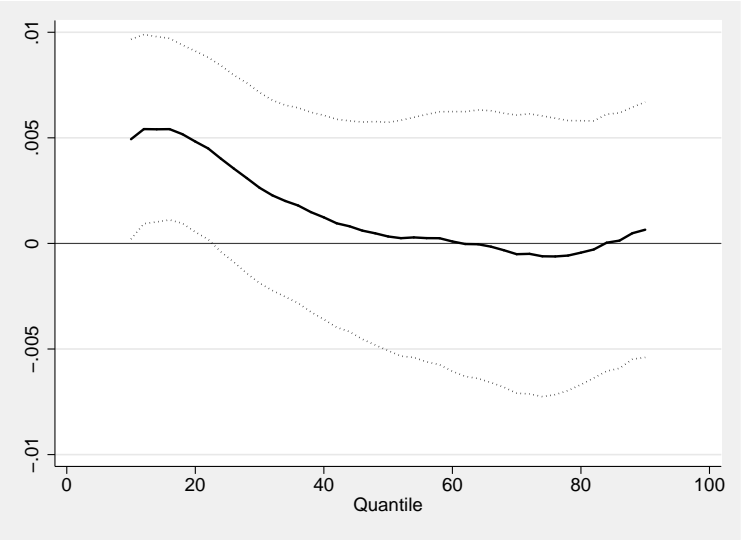
Return

Residual: GWG



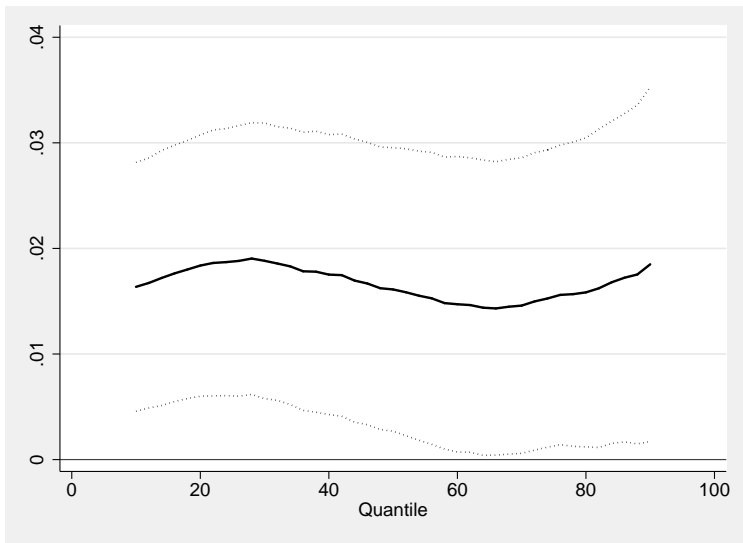
Return

Bargaining Regime: GWG



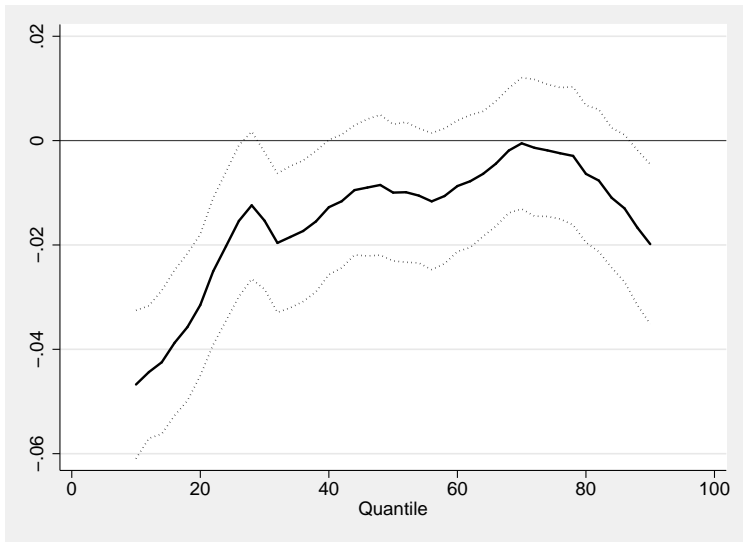
Return

Firm Characteristics: GWG



Return

Personal Characteristics: GWG



Return