

図1 賃金とリスクの関係

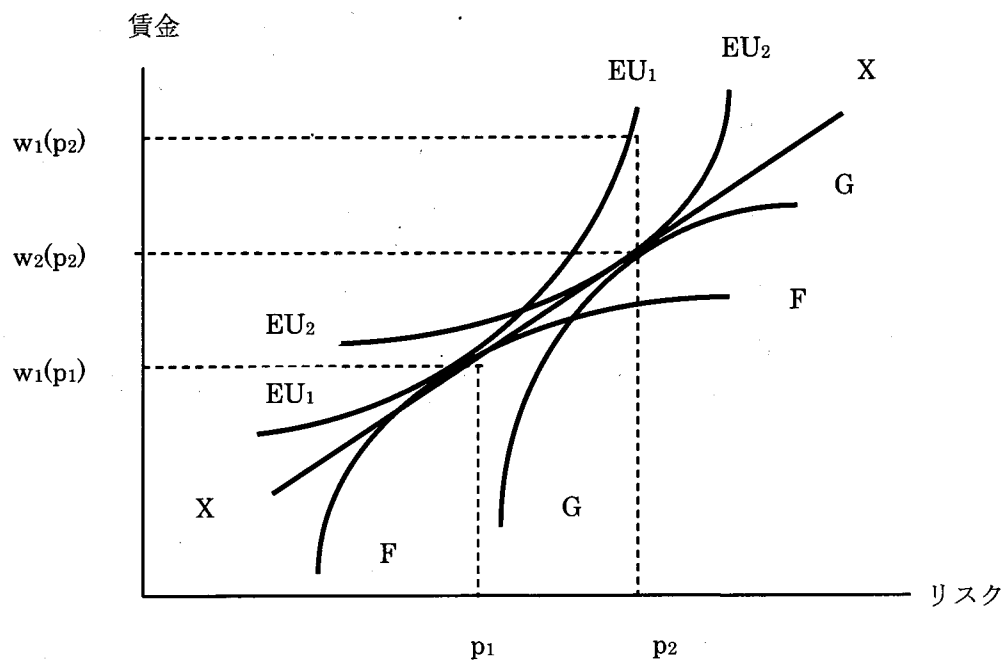


図2 死亡、従業員規模 100 人以上

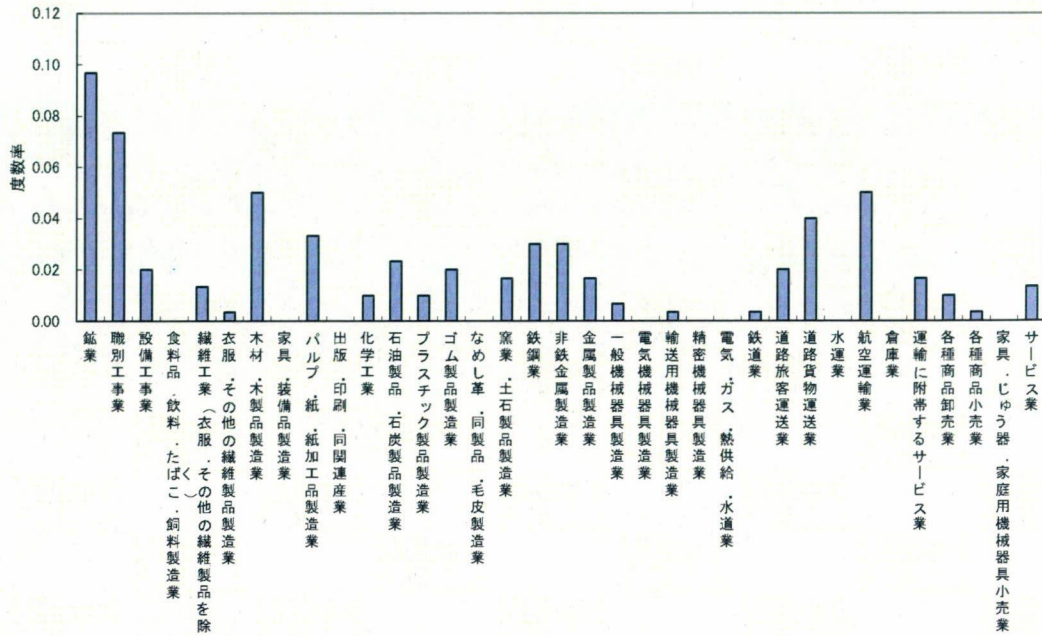


図3 永久一部労働不能、従業員規模 100 人以上

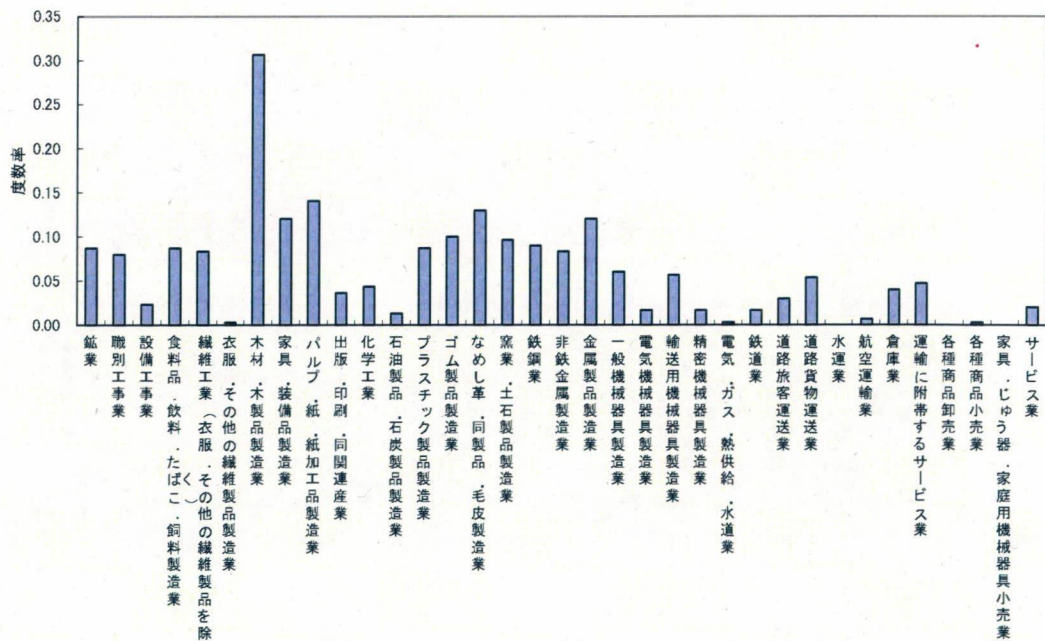


図4 一時労働不能、従業員規模 100 人以上

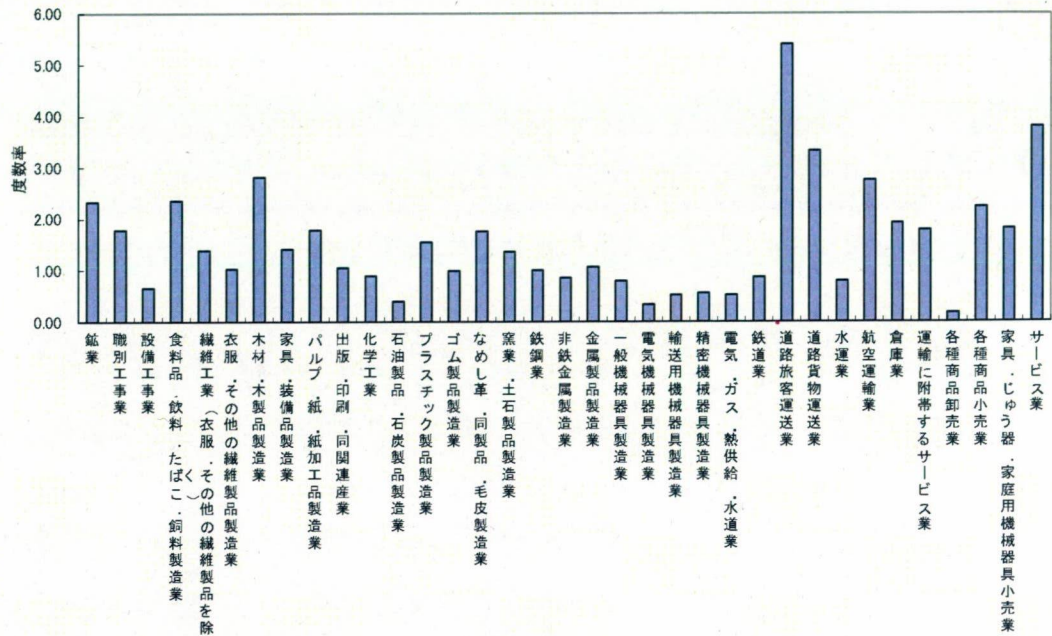


図5 死亡、従業員規模 30 人～99 人

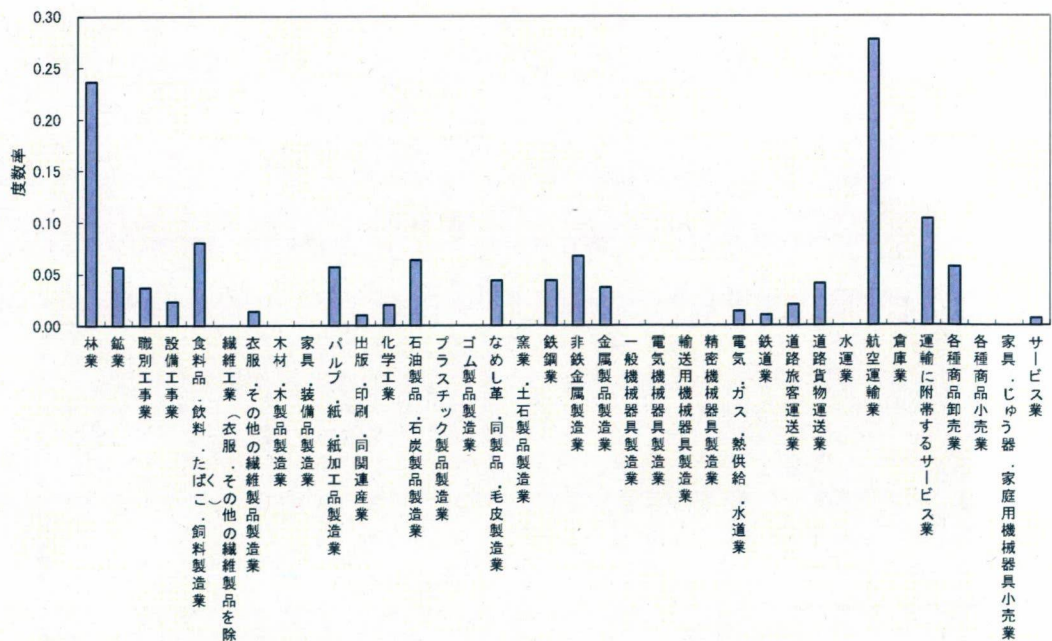


図6 永久一部労働不能、従業員規模 30人~99人

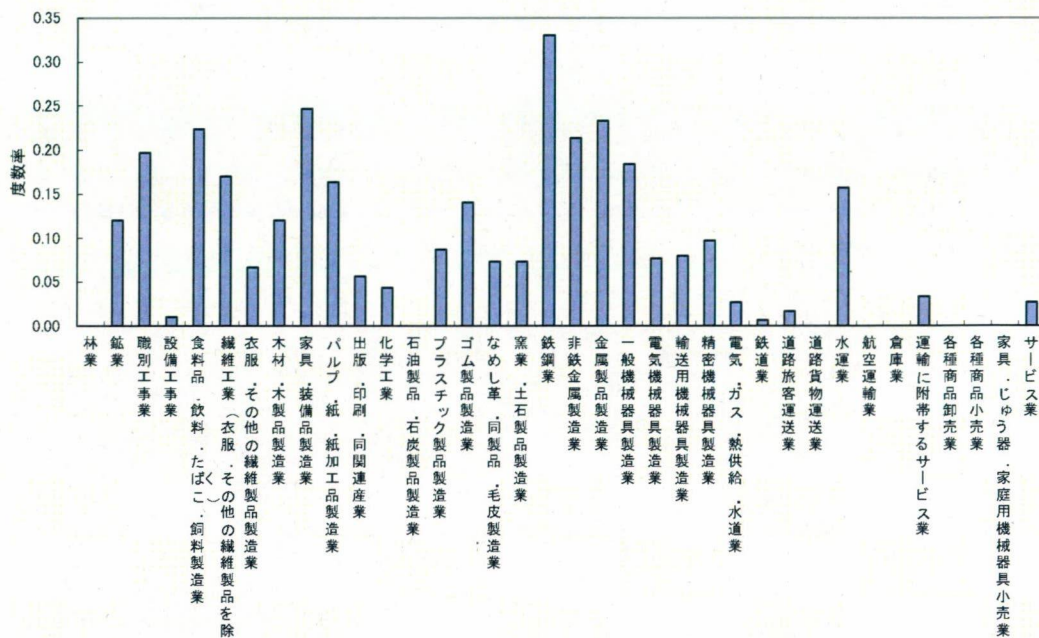


図7 一時労働不能、従業員規模 30人~99人

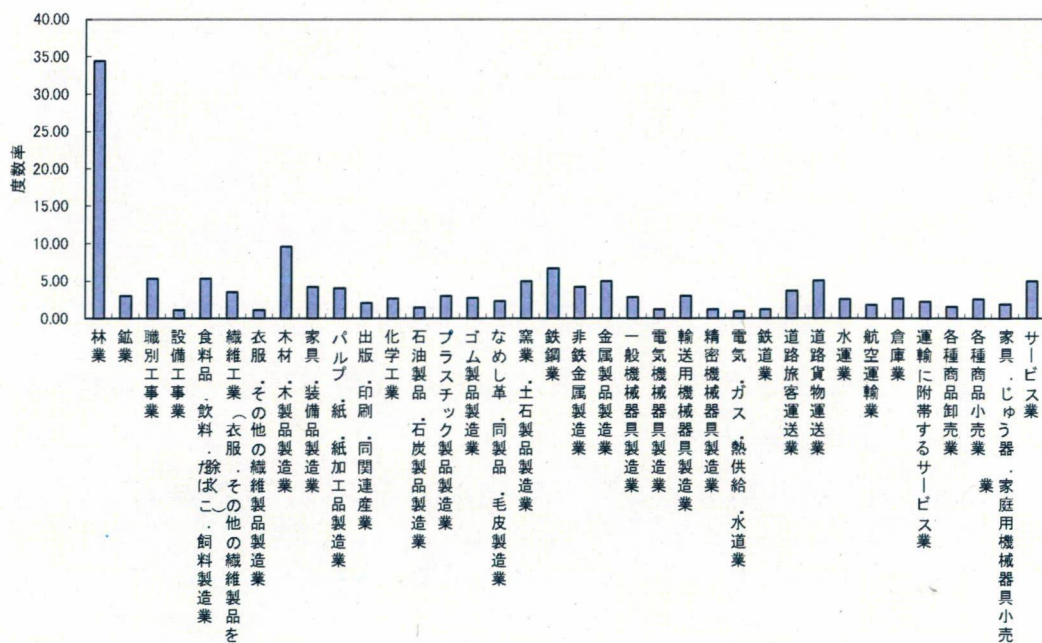


表1 『労働災害動向調査』と『就業構造基本調査』の対応表

『労働災害動向調査』	『就業構造基本調査(大分類、中分類)』
林業	○
鉱業	○
金属鉱業	
石炭・亜炭鉱業	
原油・天然ガス鉱業	
非金属鉱業	
建設業	
職別工事業	○
設備工事業	○
製造業	
食料品・飲料・たばこ・飼料製造業	○
繊維工業(衣服・その他の繊維製品を除く)	○
衣服・その他の繊維製品製造業	○
木材・木製品製造業	○
家具・装備品製造業	○
パルプ・紙・紙加工品製造業	○
出版・印刷・同関連産業	○
化学工業	○
石油製品・石炭製品製造業	○
プラスチック製品製造業	○
ゴム製品製造業	○
なめし革・同製品・毛皮製造業	○
窯業・土石製品製造業	○
鉄鋼業	○
非鉄金属製造業	○
金属製品製造業	○
一般機械器具製造業	○
電気機械器具製造業	○
輸送用機械器具製造業	○
精密機械器具製造業	○
武器, その他の製造業	○
電気・ガス・熱供給・水道業	○
運輸・通信業	
運輸業	
鉄道業	○
道路旅客運送業	○
道路貨物運送業	○
水運業	○
航空運輸業	○
倉庫業	○
運輸に附帯するサービス業	○
郵便業	
電気通信業	
卸売・小売業, 飲食店(飲食店を除く)	
卸売業	
各種商品卸売業	○
小売業	
各種商品小売業	○
家具・じゅう器・家庭用機械器具小売業	○
サービス業	○

注1)『就業構造基本調査』の鉱業には中分類レベルがないため、大分類レベルでマッチングさせた。

注2)『労働災害動向調査』のサービス業は洗濯業、旅館、ゴルフ場、自動車整備業、機械修理業、建物サービス業、廃棄物処理業のみである。その中で『就業構造基本調査』のサービス業中分類に対応するのは自動車整備業、機械等修理業、廃棄物処理業のみであるので、その3つだけをマッチングさせた。

表2 変数の説明

shotoku	年間所得(万円)
wage_h	時間当たり所得(万円)
lshotoku	個人所得の対数
lwage_h	時間当たり所得の対数
shuugyouni	年間就業日数
shuugyouji	週間就業時間
rosai_d	労働災害率(死亡)
rosai_a	労働災害率(永久全労働不能)
rosai_p	労働災害率(永久一部労働不能)
rosai_t	労働災害率(一時労働不能)
rosaic	rosai_a+rosai_p
sex	性別ダミー(男なら0、女なら1)
age	年齢
age2	age <sup>2</sup>
gakureki1	学歴ダミー(小学・中学)
gakureki2	学歴ダミー(高校・旧制中)
gakureki3	学歴ダミー(短大・高専)
gakureki4	学歴ダミー(大学・大学院)
keizoku	就業継続期間(月)
kibo5	従業者規模ダミー(30~49人)
kibo6	従業者規模ダミー(50~99人)
kibo7	従業者規模ダミー(100~299人)
kibo8	従業者規模ダミー(300~499人)
kibo9	従業者規模ダミー(500~999人)
kibo10	従業者規模ダミー(1000人以上)
dist_dum1	地域ダミー(北海道・東北)
dist_dum2	地域ダミー(関東)
dist_dum3	地域ダミー(北陸・東海)
dist_dum4	地域ダミー(近畿)
dist_dum5	地域ダミー(中国・四国)
dist_dum6	地域ダミー(九州・沖縄)
syokugyo1	職種ダミー(専門職・技術的・就業従事者)
syokugyo2	職種ダミー(管理的職業従事者)
syokugyo3	職種ダミー(事務従事者)
syokugyo4	職種ダミー(販売従事者)
syokugyo5	職種ダミー(サービス職業従事者)
syokugyo6	職種ダミー(保安職業従事者)
syokugyo7	職種ダミー(農林漁業従事者)
syokugyo8	職種ダミー(運輸・通信従事者)
syokugyo9	職種ダミー(技能工・採掘・製造・建設作業及び労務従事者)

注1) shotoku、shuugyouni、shuugyouji、keizokuは各カテゴリーの中央値を数値として用いている。

注2) 時間当たり所得はshotoku/(shuugyouni/7)で算出している。

表 3 記述統計 (従業員規模 100 人以上)

Variable	Obs	Mean	Std. Dev.	Min	Max
shotoku	48573	468.7959	274.7484	25	1500
wage_h	48573	0.334989	0.28374	0.011667	20
lshotoku	48573	5.970395	0.630582	3.218876	7.313221
lwage_h	48573	-1.28962	0.617755	-4.45102	2.995732
rosai_d	48573	0.010824	0.016307	0	0.39
rosai_a	48573	0.000599	0.003017	0	0.02
rosai_p	48573	0.042926	0.046334	0	0.37
rosai_t	48573	1.192333	1.235568	0	6.47
rosaic	48573	0.043525	0.046732	0	0.37
sex	48573	0.22986	0.420747	0	1
age	48573	41.29661	12.05935	15	80
shuugyouuni	48573	228.5755	26.68241	25	250
shuugyouji	48573	44.96454	8.693043	7.5	60
gakureki1	48573	0.11459	0.31853	0	1
gakureki2	48573	0.588599	0.492093	0	1
gakureki3	48573	0.096082	0.294707	0	1
gakureki4	48573	0.199658	0.399748	0	1
keizoku	48573	174.9175	122.7314	0.5	360
kibo7	48573	0.32376	0.467915	0	1
kibo8	48573	0.117967	0.322572	0	1
kibo9	48573	0.127067	0.333051	0	1
kibo10	48573	0.431207	0.49525	0	1
syokugyo1	48573	0.063616	0.244069	0	1
syokugyo2	48573	0.02419	0.153642	0	1
syokugyo3	48573	0.193667	0.395175	0	1
syokugyo4	48573	0.084697	0.278434	0	1
syokugyo5	48573	0.003171	0.056218	0	1
syokugyo6	48573	0.002923	0.05399	0	1
syokugyo7	48573	0.000597	0.024427	0	1
syokugyo8	48573	0.08095	0.272762	0	1
syokugyo9	48573	0.527515	0.499248	0	1
dist_dum1	48573	0.115702	0.319871	0	1
dist_dum2	48573	0.257633	0.437335	0	1
dist_dum3	48573	0.227802	0.419418	0	1
dist_dum4	48573	0.13979	0.346772	0	1
dist_dum5	48573	0.15173	0.358763	0	1
dist_dum6	48573	0.107344	0.309553	0	1

表 4 記述統計 (従業員規模 30 人~99 人)

Variable	Obs	Mean	Std. Dev.	Min	Max
shotoku	18995	343.6496	225.0924	25	1500
wage_h	18995	0.242707	0.219868	0.011667	7.2
lshotoku	18995	5.658394	0.611367	3.218876	7.313221
lwage_h	18995	-1.61705	0.594108	-4.45102	1.974081
rosai_d	18995	0.026792	0.050714	0	0.58
rosai_a	18995	0.000493	0.003655	0	0.04
rosai_p	18995	0.104772	0.108685	0	0.47
rosai_t	18995	3.747997	2.423158	0.69	37.44
rosaic	18995	0.105265	0.108611	0	0.47
sex	18995	0.280863	0.449433	0	1
age	18995	43.49387	13.05868	15	80
shuugyouni	18995	229.8802	31.50172	25	250
shuugyouji	18995	45.75017	9.053211	7.5	60
gakureki1	18995	0.227112	0.418977	0	1
gakureki2	18995	0.577573	0.493959	0	1
gakureki3	18995	0.084391	0.27798	0	1
gakureki4	18995	0.108713	0.311287	0	1
keizoku	18995	140.8377	116.0993	0.5	360
kibo5	18995	0.434483	0.495702	0	1
kibo6	18995	0.565517	0.495702	0	1
syokugyo1-	18995	0.019479	0.138204	0	1
syokugyo2	18995	0.04417	0.205477	0	1
syokugyo3	18995	0.132403	0.338938	0	1
syokugyo4	18995	0.061016	0.239366	0	1
syokugyo5	18995	0.001895	0.043494	0	1
syokugyo6	18995	0.001632	0.040366	0	1
syokugyo7	18995	0.002211	0.046972	0	1
syokugyo8	18995	0.139984	0.34698	0	1
syokugyo9	18995	0.566149	0.495618	0	1
dist_dum1	18995	0.164938	0.371135	0	1
dist_dum2	18995	0.204264	0.403174	0	1
dist_dum3	18995	0.216531	0.411891	0	1
dist_dum4	18995	0.118084	0.322716	0	1
dist_dum5	18995	0.165254	0.371419	0	1
dist_dum6	18995	0.130929	0.337332	0	1



表 5 推計結果 (従業員規模 100 人以上)

Ishotoku	(1-1)		(1-2)		lwage_h		(1-3)		(1-4)			
	Coef.	Std. Err.	Robust Coef.	Std. Err.	Robust Coef.	Std. Err.	Coef.	Std. Err.	Robust Coef.	Std. Err.		
rosai_d	0.697808	0.113682 ***	0.114494 ***	1.121598	0.115865 ***	0.12009 ***	0.163553	0.125459	0.12702	0.704367	0.127732 ***	0.126225 ***
rosaic	0.108623	0.045809 **	0.046223 **	0.089475	0.045678 ***	0.046147 ***	0.038693	0.050555	0.051356	0.014258	0.050356	0.050975
rosai_t				-0.03466	0.001974 ***	0.002115 ***				-0.04423	0.002176 ***	0.002361 ***
gakureki2	0.13702	0.005683 ***	0.006498 ***	0.134476	0.005666 ***	0.006478 ***	0.148161	0.006492 ***	0.007084 ***	0.144915	0.006467 ***	0.00705 ***
gakureki3	0.218233	0.008103 ***	0.008806 ***	0.21742	0.008078 ***	0.008788 ***	0.214633	0.008942 ***	0.00953 ***	0.213595	0.008905 ***	0.0095 ***
gakureki4	0.350177	0.007352 ***	0.007914 ***	0.345927	0.007332 ***	0.007894 ***	0.295315	0.008113 ***	0.008717 ***	0.289891	0.008083 ***	0.008676 ***
age	0.046741	0.001071 ***	0.001345 ***	0.04699	0.001068 ***	0.001341 ***	0.030672	0.001182 ***	0.001425 ***	0.03099	0.001177 ***	0.00142 ***
age2	-0.00057	1.25E-05 ***	1.63E-05 ***	-0.00057	1.25E-05 ***	1.62E-05 ***	-0.00032	1.38E-05 ***	1.73E-05 ***	-0.00032	1.38E-05 ***	1.72E-05 ***
sex	0.002264	1.93E-05 ***	2.46E-05 ***	0.00222	1.94E-05 ***	2.48E-05 ***	-0.46326	0.005024 ***	0.005386 ***	-0.46309	0.005002 ***	0.005379 ***
keizoku	0.048757	0.005891 ***	0.006043 ***	0.029786	0.005971 ***	0.006164 ***	0.063579	0.006501 ***	0.006724 ***	0.03937	0.006582 ***	0.006835 ***
kibo8	0.101415	0.005901 ***	0.005968 ***	0.071021	0.006132 ***	0.006221 ***	0.120086	0.006512 ***	0.006633 ***	0.081299	0.00676 ***	0.006901 ***
kibo9	0.185116	0.004956 ***	0.005203 ***	0.139614	0.005579 ***	0.005871 ***	0.227903	0.00547 ***	0.005667 ***	0.169836	0.00615 ***	0.006446 ***
kibo10	0.379881	0.012778 ***	0.014679 ***	0.388765	0.012748 ***	0.014544 ***	0.38632	0.014102 ***	0.017073 ***	0.397657	0.014053 ***	0.016859 ***
syokugyo2	-0.01829	0.007311 **	0.008678 ***	-0.00832	0.00731	0.006681	0.090989	0.008068	0.00765	-0.02181	0.008058 ***	0.007644 ***
syokugyo3	-0.10214	0.008415 ***	0.008238 ***	-0.09051	0.008415 ***	0.008224 ***	-0.09092	0.009287 ***	0.009169 ***	-0.07607	0.009277 ***	0.009159 ***
syokugyo4	-0.07404	0.03098 **	0.040832 *	-0.04558	0.030924	0.042018	-0.05505	0.034189	0.043307	-0.01873	0.034092	0.045384
syokugyo5	-0.20752	0.032269 ***	0.039532 ***	-0.19991	0.032171 ***	0.039371 ***	-0.15591	0.035612 ***	0.044706 ***	-0.1462	0.035465 ***	0.044517 ***
syokugyo6	-0.13357	0.009192 ***	0.008817 ***	-0.13357	0.009807 ***	0.009612 ***	-0.21287	0.007337 ***	0.0078982 ***	-0.18819	0.007021 **	0.0078258 **
syokugyo7	-0.16071	0.00611 ***	0.00618 ***	-0.15877	0.006092 ***	0.006151 ***	-0.21111	0.010145 ***	0.010238 ***	-0.13283	0.010811 ***	0.010672 ***
syokugyo8	-0.16099	0.006813 ***	0.006135 ***	-0.15692	0.006795 ***	0.006123 ***	-0.12981	0.007519 ***	0.007119 ***	-0.1246	0.007491 ***	0.007105 ***
syokugyo9	-0.13357	0.009192 ***	0.008817 ***	-0.13357	0.009807 ***	0.009612 ***	-0.18427	0.006743 ***	0.00697 ***	-0.18179	0.006716 ***	0.006939 ***
dist_dum1	-0.04191	0.004925 ***	0.004831 ***	-0.04481	0.004912 ***	0.004828 ***	-0.06876	0.005435 ***	0.005317 ***	-0.07246	0.005415 ***	0.005309 ***
dist_dum3	-0.01871	0.005658 ***	0.005778 ***	-0.01976	0.005664 ***	0.005765 ***	-0.02064	0.006244 ***	0.00634 ***	-0.02199	0.006218 ***	0.00632 ***
dist_dum5	-0.11364	0.005544 ***	0.00549 ***	-0.11451	0.005527 ***	0.005479 ***	-0.13009	0.006119 ***	0.00614 ***	-0.1312	0.006093 ***	0.006118 ***
dist_dum6	-0.16328	0.006235 ***	0.006418 ***	-0.15899	0.006221 ***	0.006391 ***	-0.18673	0.006881 ***	0.007081 ***	-0.18126	0.006858 ***	0.007046 ***
_cons	4.72366	0.022718 ***	0.026787 ***	4.772823	0.022819 ***	0.026691 ***	-2.33425	0.025071 ***	0.028541 ***	-2.27151	0.025156 ***	0.028746 ***
Number of obs		48573		48573		48573		48573		48573		48573
F		3546.59		3443.63		3374.13		2383.06		2416.53		2342.68
Prob > F		0		0		0		0		0		0
R-squared		0.6462		0.6484		0.6484		0.551		0.551		0.5548
Adj R-squared		0.646		0.6484		0.6484		0.5508		0.5548		0.5548

注) \*\*\*は1%有意水準、\*\*は5%有意水準、\*は10%有意水準で有意かどうかを示している。

表 6 推計結果 (従業員規模 100 人以上、男)

	(1-5)		(1-6)		(1-7)		(1-8)	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Ishotoku								
rosai_d	0.384228	0.119703 ***	0.900258	0.122341 ***	0.124408 ***	0.137832 **	0.138166 **	0.392349
rosai_c	-0.094863	0.049725 *	-0.16082	0.049624 ***	0.051043 ***	0.057255 *	0.058634 *	-0.19722
rosai_t			-0.03806	0.002046 ***	0.002254 ***			-0.03305
gakureki2	0.138686	0.006385 ***	0.135462	0.006358 ***	0.007314 ***	0.146382	0.008119 ***	0.141888
gakureki3	0.191011	0.009339 ***	0.191416	0.009296 ***	0.009948 ***	0.182011	0.011335 ***	0.182574
gakureki4	0.315637	0.007675 ***	0.311038	0.007644 ***	0.008588 ***	0.271759	0.009653 ***	0.265348
age	0.077106	0.001203 ***	0.077724	0.001198 ***	0.001563 ***	0.052243	0.001709 ***	0.053105
age2	-0.00086	1.37E-05 ***	-0.00086	1.37E-05 ***	1.87E-05 ***	-0.00051	2.03E-05 ***	-0.00051
sex								
keizoku	0.001781	2.09E-05 ***	0.001733	0.000021 ***	2.88E-05 ***	0.001633	0.00003 ***	0.001566
kibo8	0.04772	0.006415 ***	0.025791	0.006493 ***	0.006791 ***	0.056306	0.00774 ***	0.025739
kibo9	0.094841	0.006375 ***	0.060132	0.006614 ***	0.006891 ***	0.11268	0.00734 ***	0.064298
kibo10	0.205759	0.005448 ***	0.152744	0.006126 ***	0.006519 ***	0.238212	0.006273 ***	0.162314
syokugyo2	0.384249	0.012134 ***	0.394131	0.01209 ***	0.01421 ***	0.373088	0.013971 ***	0.386862
syokugyo3	-0.04241	0.007483 ***	-0.03136	0.007472 ***	0.006794 ***	-0.01824	0.016904 ***	-0.00284
syokugyo4	-0.05511	0.008645 ***	-0.0452	0.008622 ***	0.008235 ***	-0.07303	0.009954 ***	-0.05921
syokugyo5	-0.2487	0.047268 ***	-0.23258	0.04706 ***	0.074174 ***	-0.31876	0.054427 ***	-0.29629
syokugyo6	-0.24366	0.030488 ***	-0.23494	0.030352 ***	0.04047 ***	-0.18888	0.035106 ***	-0.17672
syokugyo7	-0.30831	0.073356 ***	-0.28877	0.073027 ***	0.100716 ***	-0.24064	0.010252 ***	-0.22802
syokugyo8	-0.16757	0.008903 ***	-0.10232	0.009532 ***	0.009326 ***	-0.10502	0.007688 ***	-0.14968
syokugyo9	-0.1348	0.00666 ***	-0.12873	0.006637 ***	0.006003 ***	-0.10502	0.007688 ***	-0.09656
dist_dum1	-0.15216	0.006634 ***	-0.14987	0.006604 ***	0.006666 ***	-0.15666	0.007638 ***	-0.15347
dist_dum3	-0.041	0.005202 ***	-0.04373	0.00518 ***	0.005078 ***	-0.06389	0.00599 ***	-0.0677
dist_dum4	-0.0093	0.005911	-0.01008	0.005884 *	0.005992 *	-0.01499	0.006806 **	-0.01608
dist_dum5	-0.10521	0.005848 ***	-0.10631	0.005821 ***	0.005707 ***	-0.11529	0.006734 ***	-0.11682
dist_dum6	-0.15442	0.006696 ***	-0.14985	0.00667 ***	0.006978 ***	-0.16631	0.00771 ***	-0.15994
_cons	4.087615	0.025447 ***	4.136959	0.025469 ***	0.030993 ***	-2.80905	0.029301 ***	-2.74027
Number of obs		37408		37408		37408		37408
F		1950.86		1903.95		1450.37		1431.65
Prob > F		0		0		0		0
R-squared		0.556		0.5601		0.4822		0.4891
Adj R-squared		0.5558		0.5598		0.4818		0.4888

注)\*\*\*は1%有意水準、\*\*は5%有意水準、\*は10%有意水準で有意かどうかを示している。

表7 推計結果 (従業員規模 100人以上、男、肉体労働者)

Ishotoku	(1-9)		(1-10)		lwage_h		(1-11)		(1-12)	
	Coef.	Std. Err.	Robust Coef.	Std. Err.	Robust Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
rosai_d	0.755613	0.141174 ***	0.140697 ***	0.124458	0.144348 ***	0.148653 ***	0.083281	0.161348	0.765663	0.164639 ***
rosai_c	-0.13551	0.057574 **	0.058818 **	-0.20788	0.057541 ***	0.059235 ***	-0.18018	0.065801 ***	-0.28118	0.065629 ***
rosai_t	0.114967	0.006903 ***	0.007758 ***	0.113077	0.006876 ***	0.007713 ***	0.118552	0.007889 ***	0.115914	0.007842 ***
gakureki2	0.161868	0.010684 ***	0.011293 ***	0.16422	0.010641 ***	0.011271 ***	0.156738	0.012211 ***	0.012862 ***	0.012137 ***
gakureki3	0.278603	0.009105 ***	0.010113 ***	0.275455	0.00907 ***	0.010063 ***	0.225498	0.010406 ***	0.221105	0.010344 ***
gakureki4	0.079781	0.001394 ***	0.001666 ***	0.080081	0.001388 ***	0.001666 ***	0.055714	0.001593 ***	0.056133	0.001584 ***
age	-0.00093	1.62E-05 ***	0.00002 ***	-0.00093	1.61E-05 ***	0.00002 ***	-0.00058	1.85E-05 ***	-0.00058	1.84E-05 ***
sex	0.001925	2.46E-05 ***	3.24E-05 ***	0.001875	2.47E-05 ***	3.28E-05 ***	0.001751	2.81E-05 ***	0.001681	2.82E-05 ***
keizoku	0.04443	0.007335 ***	0.007526 ***	0.024328	0.007427 ***	0.007675 ***	0.051613	0.008363 ***	0.023556	0.008471 ***
kibo8	0.100374	0.007392 ***	0.007576 ***	0.068152	0.007671 ***	0.007842 ***	0.122104	0.008449 ***	0.077133	0.008749 ***
kibo9	0.200616	0.006375 ***	0.006673 ***	0.149258	0.007219 ***	0.007647 ***	0.233736	0.007286 ***	0.162058	0.008234 ***
syokugyo2	-0.17728	0.047567 ***	0.072278 **	-0.17309	0.047372 ***	0.071843 **	-0.23366	0.054365 ***	0.055414 ***	0.054031 ***
syokugyo3	-0.1546	0.030851 ***	0.039477 ***	-0.15731	0.030724 ***	0.039344 ***	-0.08725	0.035259 **	0.045464 *	0.035043 ***
syokugyo4	-0.21442	0.073714 ***	0.104862 ***	-0.20788	0.073412 ***	0.102999 **	-0.14649	0.084248 *	0.095114	0.083731
syokugyo5	-0.11582	0.009731 ***	0.010588 ***	-0.0857	0.010254 ***	0.010916 ***	-0.17504	0.011121 ***	0.012078 ***	0.011696 ***
syokugyo6	-0.08918	0.007544 ***	0.008127 ***	-0.09254	0.007516 ***	0.008078 ***	-0.04264	0.008622 ***	0.009202 ***	0.008572 ***
syokugyo7	-0.15621	0.007697 ***	0.007794 ***	-0.15374	0.007668 ***	0.007774 ***	-0.16651	0.008797 ***	0.009073 ***	0.008745 ***
dist_dum1	-0.02629	0.006208 ***	0.006045 ***	-0.02892	0.006185 ***	0.006043 ***	-0.05149	0.007096 ***	0.006954 ***	0.007055 ***
dist_dum3	-0.00753	0.007199	0.007393	-0.00743	0.007169	0.007373	-0.01219	0.008228	0.008374	0.008177
dist_dum4	-0.09747	0.006944 ***	0.006784 ***	-0.09913	0.006916 ***	0.006779 ***	-0.11338	0.007936 ***	0.007805 ***	0.007888 ***
dist_dum5	-0.15096	0.007784 ***	0.008212 ***	-0.14623	0.007759 ***	0.008149 ***	-0.17276	0.008897 ***	0.009412 ***	0.008849 ***
dist_dum6	4.043267	0.028785 ***	0.033304 ***	4.102541	0.02894 ***	0.033237 ***	-2.87913	0.032899 ***	0.035551 ***	0.033008 ***
_cons										
Number of obs	26897		26897	26897	26897	26897	26897	26897	26897	26897
F	1383.83		1382.09	1342.02	1339.28	1339.28	1024.92	1048.02	1005.68	1026.1
Prob > F	0		0	0	0	0	0	0	0	0
R-squared	0.5195		0.5195	0.5235	0.5235	0.5235	0.4447	0.4447	0.4515	0.4515
Adj R-squared	0.5192		0.5192	0.5231	0.5231	0.5231	0.4443	0.4443	0.4511	0.4511

注)\*\*\*は1%有意水準、\*\*は5%有意水準、\*は10%有意水準で有意かどうかを示している。

表 8 推計結果 (従業員規模 30 人～99 人)

	(2-1)		(2-2)		(2-3)		(2-4)	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
lshotoku								
rosal_d	-0.03416	0.065945	0.066983	0.067129	-0.08879	0.071704	0.074271	0.073001
rosal_c	-0.07644	0.032941 **	0.032748 **	0.03374 ***	-0.044877	0.035818	0.036719	0.036691
rosal_t								
gakureki2	0.118982	0.008018 ***	0.008695 ***	0.0119795	0.008025 ***	0.008686 ***	0.00928 ***	0.009277 ***
gakureki3	0.171242	0.013136 ***	0.013617 ***	0.172644	0.013149 ***	0.014284 ***	0.015069 ***	0.015062 ***
gakureki4	0.272331	0.012359 ***	0.012918 ***	0.273685	0.012372 ***	0.013438 ***	0.014013 ***	0.014004 ***
age	0.050894	0.001553 ***	0.00199 ***	0.050908	0.001553 ***	0.00199 ***	0.0021 ***	0.0021 ***
age2	-0.0006	1.77E-05 ***	2.38E-05 ***	-0.0006	1.77E-05 ***	2.38E-05 ***	2.51E-05 ***	2.51E-05 ***
sex	-0.6267	0.007521 ***	0.007941 ***	-0.62524	0.007547 ***	0.007977 ***	0.008394 ***	0.008426 ***
keizoku	0.001629	3.14E-05 ***	3.48E-05 ***	0.001633	3.15E-05 ***	3.48E-05 ***	3.75E-05 ***	3.75E-05 ***
kibo6	0.1549	0.006404 **	0.006468 **	0.15421	0.006428 ***	0.006473 **	0.007045 ***	0.00706 ***
syokugyo2	0.627645	0.020319 ***	0.022874 ***	0.625526	0.020338 ***	0.022899 ***	0.026369 ***	0.026407 ***
syokugyo3	0.10782	0.016385 ***	0.015355 ***	0.105493	0.016414 ***	0.015413 ***	0.017627 ***	0.017686 ***
syokugyo4	0.058061	0.018266 ***	0.016795 ***	0.057139	0.018268 ***	0.016815 ***	0.019514 ***	0.019534 ***
syokugyo5	-0.13704	0.070798 **	0.096493	-0.13688	0.07079 *	0.09682	0.081888	0.081893
syokugyo6	-0.22161	0.076102 ***	0.071011 ***	-0.22063	0.076095 ***	0.071261 ***	0.092753	0.092764
syokugyo7	-0.19146	0.067222 ***	0.076958 **	-0.22668	0.074832 ***	0.089259 ***	0.065331	0.065378
syokugyo8	-0.11533	0.016223 ***	0.015174 ***	-0.12039	0.016371 ***	0.015436 ***	0.017247 ***	0.017526 ***
syokugyo9	-0.15025	0.014264 ***	0.013002 ***	-0.15124	0.014269 ***	0.013031 ***	0.01501 ***	0.015039 ***
dist_dum3	-0.16134	0.010083 ***	0.009762 ***	-0.16164	0.010083 ***	0.009761 ***	0.010913 ***	0.010918 ***
dist_dum4	-0.01265	0.009338	0.009365	-0.01289	0.009338	0.009366	0.01015 ***	0.010149 ***
dist_dum5	0.003105	0.011051	0.011594	0.002972	0.011105	0.011599	0.012503	0.012502
dist_dum6	-0.09642	0.010011 ***	0.009904 ***	-0.09657	0.01001 ***	0.009899 ***	0.010743 ***	0.010743 ***
_cons	-0.18907	0.010728 ***	0.01126 ***	-0.18968	0.01073 ***	0.011266 ***	0.012351 ***	0.012358 ***
	4.651484	0.035292 ***	0.040673 ***	4.642367	0.035512 ***	0.040833 ***	0.043297 ***	0.043436 ***
Number of obs		18995	18995	18995	18995	18995	18995	18995
F		959.01	912.17	919.48	599.99	574.96	554.98	531.87
Prob > F		0	0	0	0	0	0	0
R-squared		0.5376	0.5376	0.5377	0.4211	0.4211	0.4211	0.4211
Adj R-squared		0.5371	0.5371	0.5372	0.4204	0.4204	0.4204	0.4204

注) \*\*\*は1%有意水準、\*\*は5%有意水準、\*は10%有意水準で有意かどうかを示している。

表9 推計結果 (従業員規模 100人以上、男)

Ishotoku	(2-5)		(2-6)		lwage_h		(2-7)		(2-8)			
	Coef.	Std. Err.	Robust Std. Err.	Coef.	Std. Err.	Robust Std. Err.	Coef.	Std. Err.	Robust Std. Err.	Coef.	Std. Err.	Robust Std. Err.
rosal_d	-0.03085	0.075481	0.077624	-0.03154	0.077509	0.080806	-0.12479	0.083439	0.088306	-0.07111	0.085656	0.092842
rosal_c	-0.12707	0.036821 ***	0.036661 ***	-0.12736	0.037565 ***	0.037187 ***	-0.09087	0.040703 **	0.041857 **	-0.06821	0.041513 *	0.042451
rosal_t				6.79E-05	0.001731	0.001741				-0.00528	0.001913 ***	0.001872 ***
gakureki2	0.127137	0.009193 ***	0.010294 ***	0.127156	0.009206 ***	0.010281 ***	0.120988	0.010162 ***	0.010912 ***	0.119515	0.010173 ***	0.010912 ***
gakureki3	0.148652	0.015883 ***	0.016208 ***	0.148686	0.015908 ***	0.016166 ***	0.135773	0.017558 ***	0.017935 ***	0.133079	0.017581 ***	0.017899 ***
gakureki4	0.257363	0.013113 ***	0.014109 ***	0.257392	0.013134 ***	0.014094 ***	0.230774	0.014495 ***	0.015361 ***	0.228537	0.014514 ***	0.015351 ***
age	0.071974	0.001815 ***	0.002342 ***	0.071973	0.001816 ***	0.002342 ***	0.047855	0.002007 ***	0.002478 ***	0.047907	0.002006 ***	0.002478 ***
age2	-0.00082	2.04E-05 ***	2.78E-05 ***	-0.00082	2.04E-05 ***	2.78E-05 ***	-0.00048	2.26E-05 ***	2.93E-05 ***	-0.00049	2.26E-05 ***	2.93E-05 ***
sex												
keizoku	0.001479	3.47E-05 ***	3.95E-05 ***	0.001479	3.48E-05 ***	3.95E-05 ***	0.001171	3.84E-05 ***	4.27E-05 ***	0.001166	3.84E-05 ***	4.27E-05 ***
kibou	0.009923	0.007266	0.007302	0.009907	0.007278	0.0073	0.015081	0.008032 *	0.008104 *	0.016322	0.008043 **	0.008105 **
syokugyo2	0.640579	0.020534 ***	0.022949 ***	0.640536	0.020564 ***	0.022996 ***	0.634582	0.022698 ***	0.026168 ***	0.637958	0.022726 ***	0.026246 ***
syokugyo3	0.041213	0.018677 **	0.017296 **	0.04118	0.018696 **	0.017305 **	0.087233	0.020646 ***	0.020221 ***	0.089746	0.020662 ***	0.02021 ***
syokugyo4	0.064893	0.018658 ***	0.017059 ***	0.064873	0.018666 ***	0.017081 ***	0.063532	0.020625 ***	0.0201 ***	0.065086	0.020628 ***	0.020129 ***
syokugyo5	-0.25934	0.096469 ***	0.147722 *	-0.25934	0.096472 ***	0.147735 *	-0.18943	0.106639 *	0.131812	-0.18922	0.106613 *	0.130973
syokugyo6	-0.21842	0.075332 ***	0.069788 ***	-0.2184	0.075336 ***	0.069804 ***	0.078912	0.083274	0.093856	0.077495	0.083255	0.093358
syokugyo7	-0.15347	0.072097 **	0.088176 *	-0.15499	0.081843 *	0.100352	-0.01628	0.079698	0.071537	0.017408 ***	0.01847	0.090446
syokugyo8	-0.13179	0.016236 ***	0.015192 ***	-0.13189	0.016429 ***	0.015553 ***	-0.1722	0.017948 ***	0.017408 ***	-0.16457	0.018156 ***	0.017804 ***
syokugyo9	-0.11934	0.014357 ***	0.013001 ***	-0.11937	0.014374 ***	0.013049 ***	-0.06828	0.015871 ***	0.015082 ***	-0.0662	0.015885 ***	0.015136 ***
dist_dum1	-0.16264	0.011621 ***	0.011158 ***	-0.16265	0.011628 ***	0.011168 ***	-0.18284	0.012846 ***	0.012688 ***	-0.18164	0.01285 ***	0.012702 ***
dist_dum3	-0.01763	0.010658 *	0.010559 **	-0.01763	0.01066 *	0.010561 *	-0.02315	0.011782 **	0.011632 **	-0.02265	0.01178 *	0.011624 *
dist_dum4	0.014089	0.012392	0.012817	0.014083	0.012393	0.012821	0.014055	0.013698	0.014128	0.014501	0.013696	0.014113
dist_dum5	-0.09143	0.011408 ***	0.011129 ***	-0.09144	0.011409 ***	0.011288 ***	-0.10153	0.012611 ***	0.012387 ***	-0.10113	0.012608 ***	0.012383 ***
dist_dum6	-0.19707	0.012196 ***	0.012723 ***	-0.19708	0.0122 ***	0.012734 ***	-0.20646	0.013482 ***	0.014244 ***	-0.20554	0.013483 ***	0.014254 ***
_cons	4.20899	0.040641 ***	0.047126 ***	4.208825	0.040858 ***	0.047235 ***	-2.72846	0.044926 ***	0.05072 ***	-2.71567	0.045153 ***	0.05084 ***
Number of obs		13660	13660		13660	13660		13660	13660		13660	13660
F		448.12	420.08		428.61	401.82		326.42	289.42		312.71	277.48
Prob > F		0	0		0	0		0	0		0	0
R-squared		0.4196	0.4196		0.4196	0.4196		0.345	0.345		0.3453	0.3453
Adj R-squared		0.4187	0.4186		0.4186	0.4186		0.3439	0.3439		0.3442	0.3442

注) \*\*\*は1%有意水準、\*\*は5%有意水準、\*は10%有意水準で有意かどうかを示している。

表 10 推計結果 (従業員規模 30 人~99 人、男、肉体労働者)

Ishotoku	(2-9)			(2-10)			Image_h			(2-11)			(2-12)		
	Coef.	Std. Err.	Robust Std. Err.	Coef.	Std. Err.	Robust Std. Err.	Coef.	Std. Err.	Robust Std. Err.	Coef.	Std. Err.	Robust Std. Err.	Coef.	Std. Err.	Robust Std. Err.
rosal_d	0.045596	0.085716	0.091161	0.027535	0.087147	0.092904	-0.00455	0.094234	0.101572	0.021205	0.095803	0.104467	0.021205	0.095803	0.104467
rosal_c	-0.14022	0.041237 ***	0.041494 ***	-0.14992	0.042093 ***	0.042266 ***	-0.12865	0.045335 ***	0.047038 ***	-0.11483	0.046274 **	0.047512 **	-0.11483	0.046274 **	0.047512 **
rosal_t				0.002286	0.001992	0.002107			0.011549 ***	-0.00326	0.00219	0.002135	-0.00326	0.00219	0.002135
gakureki2	0.101213	0.009815 ***	0.010954 ***	0.101698	0.009824 ***	0.010946 ***	0.095779	0.01079 ***	0.01934 ***	0.095087	0.010799 ***	0.011557 ***	0.095087	0.010799 ***	0.011557 ***
gakureki3	0.126261	0.01762 ***	0.01792 ***	0.127342	0.017645 ***	0.017883 ***	0.113967	0.019371 ***	0.01934 ***	0.112425	0.019397 ***	0.019315 ***	0.112425	0.019397 ***	0.019315 ***
gakureki4	0.214177	0.015386 ***	0.016566 ***	0.214916	0.015399 ***	0.016571 ***	0.180569	0.016915 ***	0.017941 ***	0.179516	0.016929 ***	0.017944 ***	0.179516	0.016929 ***	0.017944 ***
age	0.08228	0.002078 ***	0.002459 ***	0.082267	0.002078 ***	0.002459 ***	0.055376	0.002285 ***	0.002646 ***	0.055395	0.002285 ***	0.002645 ***	0.055395	0.002285 ***	0.002645 ***
age2	-0.00097	2.38E-05 ***	2.95E-05 ***	-0.00097	2.38E-05 ***	2.95E-05 ***	-0.00059	2.62E-05 ***	3.14E-05 ***	-0.00059	2.62E-05 ***	3.14E-05 ***	-0.00059	2.62E-05 ***	3.14E-05 ***
sex															
keizoku	0.001545	3.85E-05 ***	4.35E-05 ***	0.001547	3.86E-05 ***	4.36E-05 ***	0.001244	4.24E-05 ***	4.63E-05 ***	0.001241	4.24E-05 ***	4.64E-05 ***	0.001241	4.24E-05 ***	4.64E-05 ***
kibo6	0.006148	0.007959	0.007947	0.00554	0.007976	0.007941	0.010333	0.008749	0.006884	0.011199	0.008768	0.008837	0.011199	0.008768	0.008837
syokugyo2															
syokugyo3															
syokugyo4															
syokugyo5	-0.28444	0.094573 ***	0.135559 **	-0.28388	0.094573 ***	0.135872 **	-0.223	0.103971 **	0.121558 *	-0.2238	0.103967 **	0.121102 *	-0.2238	0.103967 **	0.121102 *
syokugyo6	-0.24324	0.073937 ***	0.088135 ***	-0.24206	0.073943 ***	0.08832 ***	0.044626	0.081285	0.093135	0.042933	0.081288	0.092882	0.042933	0.081288	0.092882
syokugyo7	-0.21916	0.071627 ***	0.088668 **	-0.27091	0.084637 ***	0.108819 **	-0.09981	0.078745	0.072539	-0.02599	0.093043	0.08723	-0.02599	0.093043	0.08723
syokugyo8	-0.20159	0.016154 ***	0.016347 ***	-0.20433	0.016329 ***	0.016622 ***	-0.24613	0.017759 ***	0.018524 ***	-0.24222	0.017951 ***	0.01874 ***	-0.24222	0.017951 ***	0.01874 ***
syokugyo9	-0.18718	0.013927 ***	0.013719 ***	-0.18745	0.013929 ***	0.013722 ***	-0.13767	0.015311 ***	0.01587 ***	-0.13729	0.015313 ***	0.015874 ***	-0.13729	0.015313 ***	0.015874 ***
dist_dum1	-0.16127	0.012733 ***	0.01212 ***	-0.16171	0.012738 ***	0.012126 ***	-0.18534	0.013998 ***	0.013743 ***	-0.18471	0.014004 ***	0.013755 ***	-0.18471	0.014004 ***	0.013755 ***
dist_dum3	-0.01903	0.011732 ***	0.011716	-0.01929	0.011734 *	0.011722 *	-0.02326	0.012898 *	0.012796 *	-0.02289	0.0129 *	0.012792 *	-0.02289	0.0129 *	0.012792 *
dist_dum4	0.012448	0.013686	0.014338	0.012131	0.013688	0.014356	0.014351	0.015046	0.015626	0.014803	0.015048	0.01562	0.014803	0.015048	0.01562
dist_dum5	-0.08377	0.012549 ***	0.012324 ***	-0.08382	0.012549 ***	0.012325 ***	-0.09522	0.013796 ***	0.013645 ***	-0.09514	0.013796 ***	0.013642 ***	-0.09514	0.013796 ***	0.013642 ***
dist_dum6	-0.20576	0.013316 ***	0.013988 ***	-0.20613	0.01332 ***	0.014004 ***	-0.21525	0.014639 ***	0.015709 ***	-0.21472	0.014643 ***	0.015721 ***	-0.21472	0.014643 ***	0.015721 ***
_cons	4.135717	0.045632 ***	0.049985 ***	4.129447	0.045957 ***	0.05026 ***	-2.74735	0.050167 ***	0.055069 ***	-2.7384	0.050522 ***	0.055435 ***	-2.7384	0.050522 ***	0.055435 ***
Number of obs		10962	10962		10962	10962		10962	10962		10962	10962		10962	10962
F		289.81	288.14		275.39	273.8		179.18	175.84		170.35	167.5		170.35	167.5
Prob > F		0	0		0	0		0	0		0	0		0	0
R-squared		0.3348	0.3348		0.3348	0.3348		0.2373	0.2373		0.2375	0.2375		0.2375	0.2375
Adj R-squared		0.3336	0.3336		0.3336	0.3336		0.236	0.236		0.2361	0.2361		0.2361	0.2361

注) \*\*\*は1%有意水準、\*\*は5%有意水準、\*は10%有意水準で有意かどうかを示している。

表 11 Value of a Statistical Life の値

	推計式(1-1)	推計式(1-5)	推計式(1-9)
Value of a Statistical Life	22.28	12.27	24.13
単位:億円			

表 12 労働市場のデータを用いた海外の Value of a Statistical Life の値

著者(年)	Value of Life(100万ドル)
Viscusi, W.K. (1978)	4.1
Olson, C.A. (1981)	5.2
Garen, J. (1988)	13.5
Viscusi, W.K. and Moore, M.J. (1989)	7.6
Moore, M.J. and Viscusi, W.K. (1990)	16.2
Kniesner, T.J. and Leeth, J.D. (1991)	0.7
Gegax, D., Gerking, S. and Schulze, W. (1991)	1.6
Berger, M.C. and Gabriel, P.E. (1991)	8.6-10.9
Cousineau, J-M., Lacroix, R. and Girard, A-M. (1992)	3.6
Leigh, J.P. (1995)	8.1-16.8
Dorman, P. and Hagstrom, P. (1998)	8.7-20.3
Viscusi, W. K. and Aldy, J.E.. (2007)	6.4-9.0

## **Regional patterns of employment changes in Japan: Evidence from the 1990s\***

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## **Abstract**

We investigate changes in employment of less-educated men and women in Japan in the 1990s using aggregate data. From 1990 to 2000, the low-wage regions experienced a higher wage growth than the high-wage regions did. The employment data show that decline in employment of less-educated young men and women was concentrated in the low-wage regions. A fall in employment of men aged 40-59 occurred in the highest-wage regions that include large metropolitan areas. We find that higher wage growth in the low-wage regions is associated with large employment decline for those aged 25-39, but not for those aged 40-59.

JEL classifications: J21, R11

Keywords: Regional wage growth, Age-twist, Labor supply elasticity

## 1 Introduction

The Japanese economy experienced a severe recession in the late 1990s. During this period, labor force participation of less-educated men and women fell. Among junior high school graduate men aged 25-59, the employment-population ratio was 0.915 in 1990 but was 0.854 in 2000. The participation rates for junior high school graduate women declined from 0.623 in 1990 to 0.601 in 2000, in spite of the fact that participation of women with education of senior high school level or higher had been rising.

Regional wage growth showed a unique pattern of changes during the same period. Wage growth was higher in the low-wage regions than in the high-wage regions. For example, the growth rate of mean hourly wages for male full-time employees from 1990 to 2000 was 16.3 percent in the three prefectures with the highest wages (Tokyo, Kanagawa, and Osaka) and 24.1 percent in those with the lowest wages (19 prefectures for which the minimum wage rank was lowest (rank D) in 1990: Table A1 lists the names of these 19 prefectures).<sup>1</sup> As a result, regional wage differentials decreased from the early 1990s to the early 2000s.<sup>2</sup> Compression of regional wage differentials

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<sup>1</sup> This calculation is based on the data from the Basic Survey of Wage Structure (Ministry of Health, Labour and Welfare of Japan). The 47 prefectures in Japan are classified into 4 ranks (A to D) for the purpose of minimum wage setting according to the wage level of the prefecture.

<sup>2</sup> This fact is also reported by Abe and Tanaka (2007).

occurred for both mean full-time wages and mean part-time wages.

Based on these observations, we pose the following questions in this article:

Are there regional differences in the decrease in participation by less-educated men and women from 1990 to 2000 in Japan? The analysis reveals that such differences do exist.

Then we pose the second question: Can such regional differences be understood as responses to differential wage growth across regions? To answer these questions, we use aggregate data of participation and wages.<sup>3</sup>

We find changes in the regional employment differ between the young (aged 25-39) and the middle-aged (aged 40-59), which we call the “age twist.” Age twist is illustrated in Figure 1. On average, the employment-population ratio fell for men and rose for women, but the pattern of changes differs across regions and age groups. There was a lower growth (a larger fall for men and a lower increase for women) in employment for young men and women living in the low-wage than in the high-wage regions; for the older group there was a larger decline in employment in the high-wage than in the low-wage regions.

We then relate these changes in employment to the changes in average wages

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<sup>3</sup> It is desirable to use microdata because aggregate data have several limitations. The most significant limitation for the purpose of this research is that wage data by education and region are unavailable in aggregate data. Unfortunately, the use of microdata collected by the government for research purposes is still limited in Japan, and microdata that would allow us to derive education-specific regional wage measures were unavailable at the time of this study.

classified by sex, age, and region.<sup>4</sup> We find that higher wage growth in the low-wage regions is associated with large employment decline for those aged 25-39, but not for those aged 40-59. This result is in sharp contrast to many of the studies using United States (U.S.) data.

Understanding the causes of the fall in participation by less-educated men has important policy implications. If the decline in employment is understood as a labor supply response to falling wages, as in the case of studies using U.S. data (e.g., Juhn 1992), policies aimed at changing the after-tax wage rate for low-wage workers would be expected to raise participation. If, on the other hand, the decline in participation can not be understood as a supply response, factors from the labor demand side may have played a role. For instance, minimum wage policies in Japan during the 1990s could have been related to relatively high wage growth and employment loss for the young in the low-wage regions.

The article is organized as follows. In Section 2, background for the analysis is provided. In Section 3, the data used in the analysis are explained. Section 4 presents the results for regional wage growth patterns. In Section 5, employment patterns across regions from 1990 to 2000 are shown as raw tabulations. Regression results are reported

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<sup>4</sup> Although several studies have looked at the regional differences in unemployment in Japan in the 1990s (e.g., Ohta 2005; Yugami 2005), we are not aware of any research that examines the role of differential wage growth across regions on labor force measures.