

# 男女搭配,干活不累:异性效应 有利于提升生产效率吗

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摘要: “ ”

关键词:

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## 一、引言

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“ ” “

“ ”

Ronay von Hippel 2010  
huis Karremans 2012

Franken-

Becker 1971  
von Siemens 2015

“ ”

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作者简介: 1986

“ ” Apestegua 2012  
 Hoogendoorn 2013

1 von Siemens 2015 “ ”

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## 二、异性效应的理论基础

von Siemens 2015 “ ”

1 von Siemens 2015 “

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”

$N$

$h \quad l$

$\gamma(\gamma=h, l)$

$W$

$\chi(\theta, \gamma)$

$m$

$f$

$\theta(\theta=f, m)$

$\tau$

$\tau > 0 \quad \pi$

$\pi > 0$

$\varphi(\gamma)c(\tau)$

$\varphi(h) < \varphi(l)$

$c \quad x$

$c'(x) > 0$

$c''(x) > 0 \quad c'''(x) < 0$

$\lim_{x \rightarrow 0} c'(x) = 0 \quad \lim_{x \rightarrow \infty} c'(x) = +\infty$

$\phi(\tau) \in [0, 1]$

$$\pi\tau - \varphi(\gamma)c(\tau) + \phi(\tau)\omega(W) \tag{1}$$

$\tau$

$\omega \ W$

$\omega \ W > 0$   
 $\omega \ 0 = 0$

$\omega \ W$                        $W$

0                                      0

$$\pi - \varphi(\gamma)c'(\tau^*) = 0 \tag{2}$$

1                                       $\tau$

$\tau^*$

$$\pi\tau^* - \varphi(l)c(\tau^*) - \pi\tau + \varphi(l)c(\tau) - \omega(W) \geq 0 \tag{3}$$

$\tau = \tau^*$       3                      0                       $c \ x$

3

$\tau_s \geq \tau^*$                                        $\tau_s$

$$\Omega(\pi, W) = \max \{ \tau_s - \tau^*, 0 \}$$

$$E_{total} = E_m(\tau^*) + E_f(\tau^*)$$

$$E'_{total} = E_m(\tau^*) + E_f(\tau^*) + E_m[\Omega(\pi, W)]$$

$\tau^*$

$\omega \ W$                       3  $\tau_s$

$E_m[\Omega(\pi, W)]$        $W$

$$\sum_1^n E'_{total} = \sum_1^n \{ E_m(\tau^*) + E_f(\tau^*) + E_m[\Omega(\pi, W)] \} \tag{4}$$

$$= \sum_1^n E_m(\tau^*) + \sum_1^n E_f(\tau^*) + \sum_1^n E_m[\Omega(\pi, W)]$$

### 三、研究设计

1.

$$tfp_{it} = \alpha_0 + \alpha_1 female_{it} + \alpha_2 CV_{it} + f_i + f_t + \varepsilon_{it} \quad (5)$$

$tfp$                        $female$                        $i$                        $t$                        $CV$   
 $f_i$                        $f_t$

5

2.

1                       $tfp$                       2014                      SFA

$$\ln Y_{it} = \alpha_0 + \alpha_1 t + \frac{1}{2} \alpha_2 t^2 + \alpha_3 \ln K_{it} + \alpha_4 \ln L_{it} + \alpha_5 t \times \ln K_{it} + \alpha_6 t \times \ln L_{it} + \frac{1}{2} \alpha_7 \ln K_{it} \times \ln L_{it} + \frac{1}{2} \alpha_8 (\ln K_{it})^2 + \frac{1}{2} \alpha_9 (\ln L_{it})^2 + v_{it} - u_{it} \quad (6)$$

Y

K L

$$TE_{it} = \frac{E[f(\mathbf{x}_{it}, \beta) \exp(v_{it} - u_{it})]}{E[f(\mathbf{x}_{it}, \beta) \exp(v_{it} - u_{it}) | u_{it} = 0]} = \exp(-u_{it}) \quad (7)$$

u

$$u_{it} = u_i \exp[-\eta(t - T)] \quad u_i \sim N^+(\mu, \sigma_u^2) \quad \text{Battese}$$

Coelli 1995

$$\gamma = \sigma_u^2 / (\sigma_u^2 + \sigma_v^2)$$

0 ≤ γ ≤ 1                      γ

$$TFEG_{it} = TC_{it} + TEC_{it} + SE_{it} \quad (8)$$

TC

$$TC_{it} = \frac{\partial \ln f(\mathbf{x}_{it}, \beta)}{\partial t} = \alpha_1 + \alpha_2 t + \alpha_5 \ln K + \alpha_6 \ln L \quad (9)$$

TEC

$$TEC_{it} = \frac{\partial \ln TE_{it}}{\partial t} = \frac{\partial \ln \exp(-u_{it})}{\partial t} = -\frac{\partial u_{it}}{\partial t} \quad (10)$$

39.65%

35.77%

SE

$$SE_{it} = (RTS_{jit} - 1) \sum_j \lambda_{jit} \dot{x}_{jit} \tag{11}$$

$$RTS_{it} = \sum_j \varepsilon_{jit}$$

2 female

$$\varepsilon_j = \frac{\partial \ln Y}{\partial \ln j} \quad \lambda_{jit} = \varepsilon_{jit} / RTS_{it} \quad \dot{x}_{jit} \quad j = K, L$$

3. CV

1 Inui 2012

ci/monopoly

Aghion 2001

PCM Price-Cost Margin

$$lih = (VAI - LC) / Y \tag{12}$$

LC Y VAI 12  
2015

$$ci = 1 / lih \tag{13}$$

PCM

monopoly

2 kl 2009

3 exp Clerides 1998

4 rd Griliches 1964

$$tfp_{it} = \alpha_0 + \alpha_1 female_{it} + \alpha_2 ci_{it} + \alpha_3 kl_{it} + \alpha_4 exp_{it} + \alpha_5 rd_{it} + f_i + f_t + \varepsilon_{it} \tag{14}$$

1. 2003

2003–2012 “ ” “ ” “

”3

36 2008

2004 “ ”

2004–2012

2000

2. tfp

1 Y 2010

2 K 2011 =

+ 1- ×

Hall Jones 1999 Young 2003

3 L

14

14 2014

$$tfp_{it} = \alpha_0 + \chi tfp_{it-1} + \alpha_1 female_{it} + \alpha_2 ci_{it} + \alpha_3 kl_{it} + \alpha_4 exp_{it} + \alpha_5 rd_{it} + f_i + f_t + \varepsilon_{it} \quad (15)$$

15

#### 四、实证结果讨论

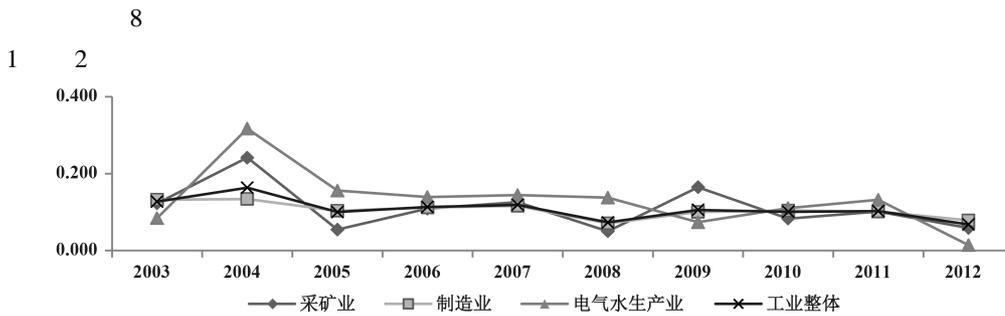


图1 中国工业行业大类全要素生产效率增长率

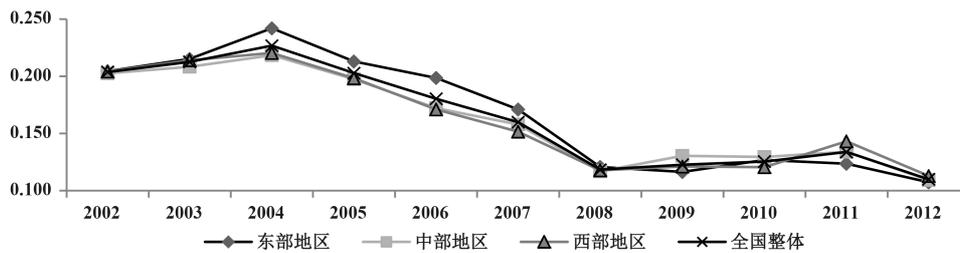


图2 中国区域工业部门全要素生产效率增长率

0

N

N

N

1 Arellano-Bond Sargan  
GMM

1.  
*tfp*

表1 基本估计结果

	FE		GMM		FE		GMM	
L.tfp	–		0.077 5***	0.021 3	–		0.611 7***	0.049 0
female	0.739 8***	0.175 5	0.141 6**	0.056 2	0.795 3***	0.147 9	0.181 4	0.106 8
ci/monopoly	0.018 4***	0.004 9	0.011 4***	0.003 2	–0.079 3	0.043 0	–0.073 7***	0.023 8
kl	–0.001 8**	0.000 8	–0.000 9***	0.000 3	–0.000 8**	0.000 4	–0.000 3	0.000 2
exp	0.021 0**	0.010 6	0.070 5**	0.037 1	0.446 7***	0.106 2	0.016 1	0.009 4
rd	0.025 7**	0.012 6	0.019 9**	0.008 9	2.078 0***	0.663 5	2.835 3***	0.844 3
	–0.243 6***	0.072 7	0.012 6	0.026 0	–0.216 0***	0.047 8	–0.021 8***	0.036 1
F	0.000 0		–		0.000 0		–	
Hausman	0.000 0		–		0.000 0		–	
	yes		yes		yes		yes	
AR 1 P	–		0.003 0		–		0.023 0	
AR 2 P	–		0.690 0		–		0.263 0	
Sargan P	–		0.257 1		–		0.325 6	
	–		29		–		26	
	360		324		279		248	
R <sup>2</sup>	0.225 0		–		0.465 5		–	

1% 5% 10%

\*\*\* \*\* \*

FE

GMM

2014

2.

*female*

Apesteguia 2012 Hoogendoorn 2013  
 “ ” von Siemens 2015

3.

*ci*

*monopoly*

*kl*

2009

*exp*

*rd*

2011

### 五、异性效应的进一步论证

segregation



$$tfp_{it} = \alpha_0 + \alpha_1 segregation_{it} + \alpha_2 ci_{it} + \alpha_3 kl_{it} + \alpha_4 exp_{it} + \alpha_5 rd_{it} + f_i + f_t + \varepsilon_{it} \quad (16)$$

segregation 2010  
 DS — IP  
 1. DS Gibbs 1965

$$DS = \frac{1}{2} \sum_{i=1}^3 \left| \left[ \frac{W_i/T_i}{\sum_{i=1}^3 (W_i/T_i)} \right] - \left[ \frac{M_i/T_i}{\sum_{i=1}^3 (M_i/T_i)} \right] \right| \times 100 \quad (17)$$

$T_i = W_i + M_i$   
 $W_i$   $M_i$   
 DS  
 1  
 2. — IP —

$$IP = \frac{1}{T} \sum_{i=1}^3 \left| (1-a) W_i - a M_i \right| \quad (18)$$

$a$   
 $M_i$  IP  $T$   $W_i$   $i$

2004-2012

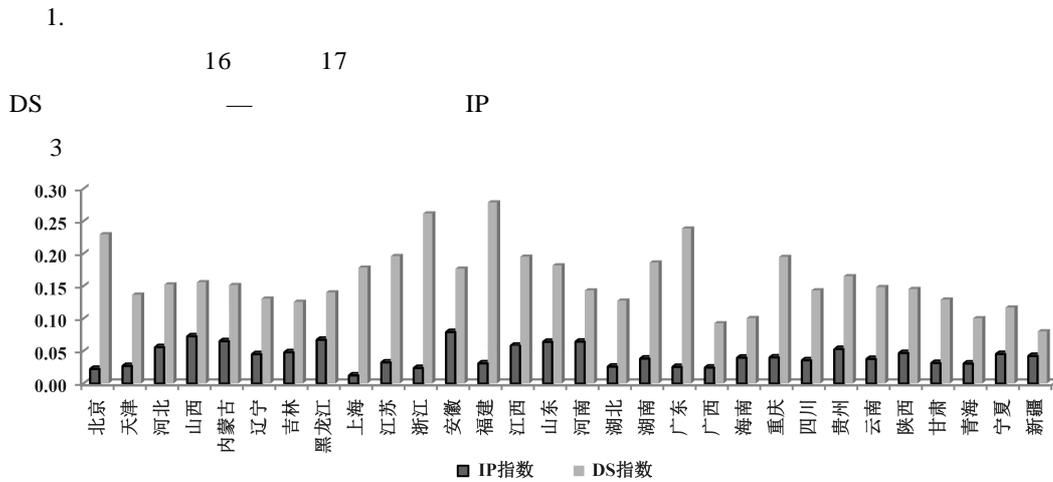


图3 中国各省份的职业性别隔离指数

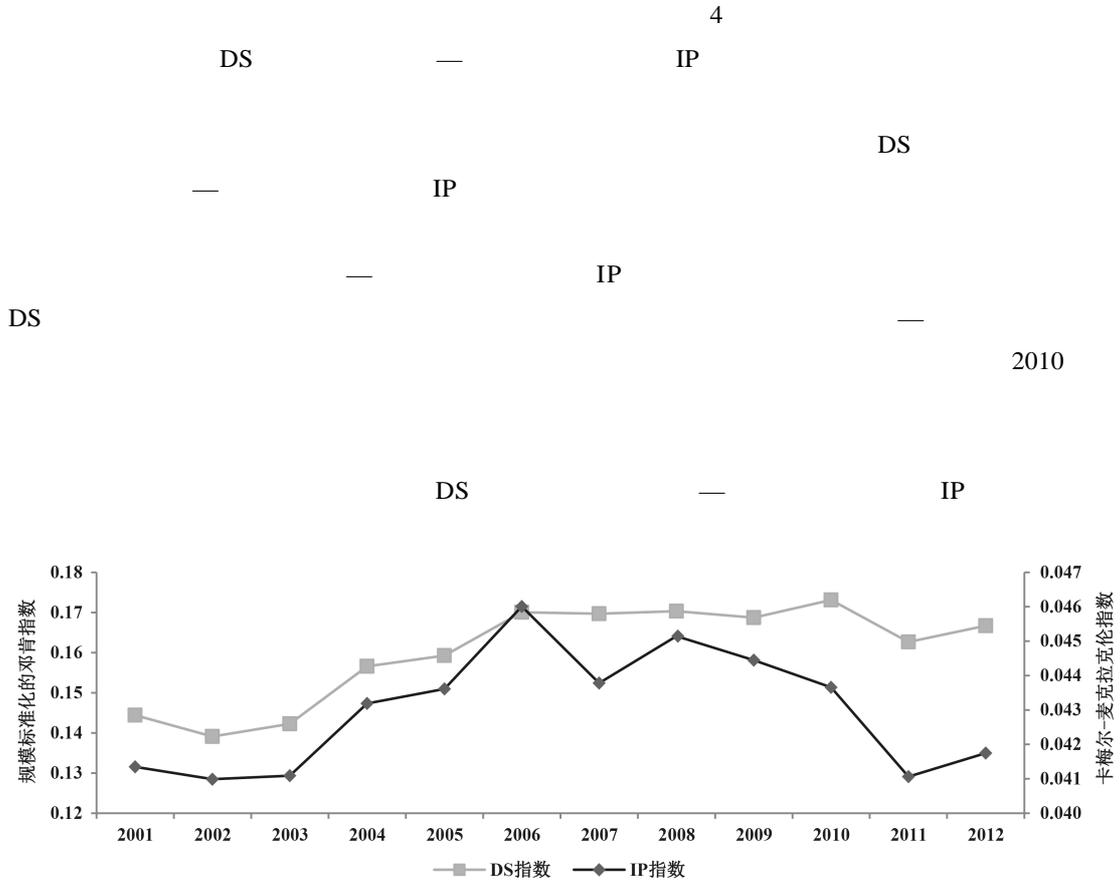


图4 中国工业部门职业性别隔离程度变化趋势

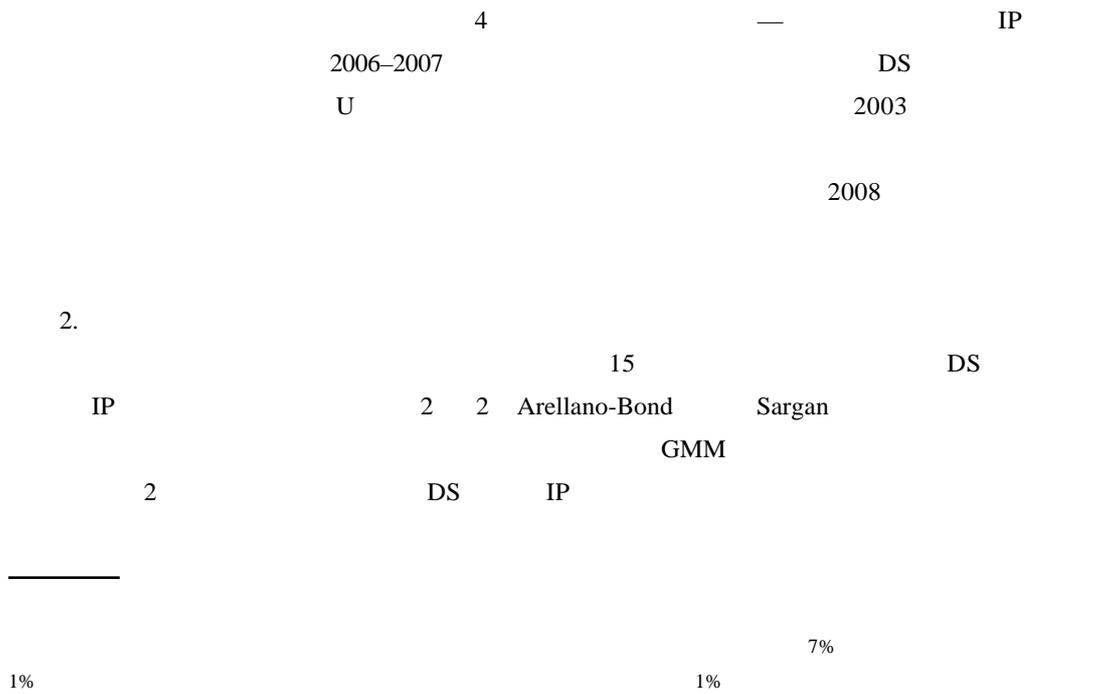


表2 论证的估计结果

	DS			IP		
			t			t
L.tfp	0.722 5***	0.026 2	27.55	0.790 8***	0.030 5	25.93
DS/IP	-0.268 6***	0.033 6	-8	-0.973 7***	0.103 9	-9.38
monopoly	-0.097 4***	0.020 3	-4.81	-0.125 0***	0.016 9	-7.4
kl	-0.000 3**	0.000 1	-2.5	-0.000 7***	0.000 1	-4.75
exp	0.239 5***	0.034 4	6.97	0.088 3**	0.042 3	2.09
rd	4.228 3***	0.304 8	13.87	4.309 9***	0.314 3	13.71
	0.056 2***	0.011 2	5.02	0.063 2***	0.010 8	5.84
		yes			yes	
AR 1 P		0.001 3			0.001 3	
AR 2 P		0.121 4			0.121 4	
Sargan P		0.211 9			0.211 9	
		26			26	
		279			279	

1% 5% 10%

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## 六、结论

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