

Do Multinational Firms Transfer Culture?

Evidence on Female Employment in China

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Introduction

- ▶ Gender inequality is widespread across the world.
- ▶ Despite the obvious merits and benefits of empowering women, eliminating gender biases has been difficult.
 - ▶ prejudices against certain groups in society are often related to deep cultural and historical roots (Roland, 2004; Alesina, Giuliano, Nunn, 2014; Jayachandran, 2014).
- ▶ Can multinational firms help close the gender gap?

What we do in this paper?

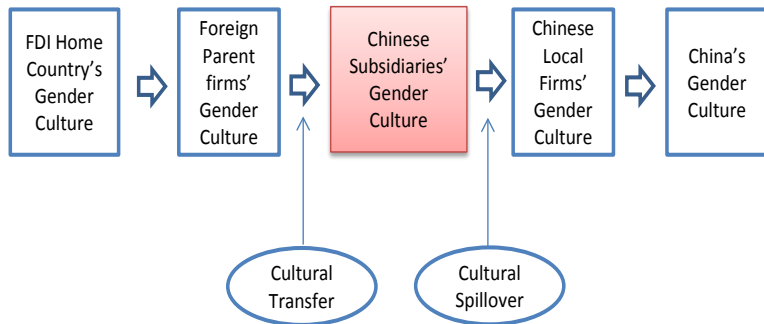
- ▶ Study the effects of foreign direct investment (FDI) on the gender gap in labor markets.
- ▶ Theoretically and empirically examine whether and how foreign-invested enterprises (FIEs), based on their home countries' overall attitude towards women, shape preferences for female employment in their affiliates, and eventually among local firms.
- ▶ Using a comprehensive manufacturing firm-level data from China over 2004-2007, find evidence that foreign firms transfer corporate culture of employing women to their affiliates (**transfer**) and other local firms (**spillover**).
- ▶ Develop a multi-sector task-based model, which features firm heterogeneity in productivity and biases towards women to rationalize some facts.

Results

- ▶ Foreign invested enterprises (FIEs) from countries that have lower gender inequality
 1. tend to hire more female workers.
 2. more likely to appoint women as CEO/ managers of the firms.
- ▶ Female employment is positively correlated with firm measured TFP (after controlling for firm fixed effects) and profits.
- ▶ Domestic firms in industries and cities that have a larger presence of foreign firms tend to hire more female workers and female managers (i.e., evidence of spillover of corporate culture, in addition to technology spillover.)
- ▶ This cultural spillover effects are stronger:
 1. from FIEs whose home countries are less biased against women.
 2. in sectors in which females have a comparative advantage.

The Empirical Framework

Figure 1: An Empirical Framework of Gender Cultural Diffusion



FDI Cultural Transfer (Within Multinational Firms)

- ▶ Foreign parent firm's management practices that embody home country culture could be transferred to host country subsidiaries through
 - ▶ Standardized policies across all subsidiaries (e.g. Multinational firms like Coca Cola and Walmart, among many others, have explicit policies to maintain a certain fraction of female workers (World Economic Forum, 2007)).
 - ▶ Expatriate managers.

FDI Cultural Spillover - Mechanisms

- ▶ Why would Chinese local firms learn about and adopt gender-related management practices?
- ▶ Bottom line: profit-driven.
 - ▶ Competition and survival (Becker, 1957);
 - ▶ Imitating profitable technology (gender-biased);
 - ▶ Information that reduces both statistical and taste-based biases.
- ▶ Why didn't they adopt the profit-maximizing policies before? Uninformed, prejudices, misguided beliefs, etc (Alesina, Giuliano, Nunn, 2013).

Why is China an interesting case to study gender inequality?

- ▶ Before 1949, the Chinese traditional society was based on Confucius culture: physical and social oppression of women.
 - ▶ In the traditional Chinese patriarchal society, males were viewed as superior.
 - ▶ Confucians believed that the strict obligatory role for women was a cornerstone for social order and social stability.
- ▶ Mao's era (1949-1977): more equal status for women.
 - ▶ Marriage law, land reforms (women won right to own property and land), voting rights, etc.
 - ▶ 1958: 7 million women employed, ten times more than 1949, with more equal pay
 - ▶ 1966: Rapid growth of women leaders in government and model workers

Why is China an interesting case to study gender inequality?

- ▶ Gender wage gap has widened at the beginning of the reform era in the early 80s. (Cai, Zhao and Park, 2008)
- ▶ More recently, there have been some signs of improvement of female labor market outcomes, relative to men's.
- ▶ Trade and foreign investment liberalizations, since mid 90s and sped up after China's WTO accession in Dec 2001.
- ▶ Gender prejudices have been shown to be related to China's macroeconomic imbalances, such as saving, investment, economic growth, and housing prices (e.g., Du and Wei, 2012; Wei and Zhang, 2011).

Related Literature

- ▶ Economics of Discrimination
 - ▶ Eliminating biases against women is hard, as prejudice against certain groups in society often have their deep historical roots. (Roland, 2004).
 - ▶ Competition effect: Becker's theory (1957), Kawaguchi (2007), Siegal et al. (2014).
 - ▶ Recent economics research examines the macroeconomic cost of discrimination (Motvik and Spant, 2005; Cavalcanti and Tavares, 2007; Hsieh et al., 2013).
 - ▶ Hsieh et al. (2013) estimate the contribution of decreasing discrimination against black and women to the U.S. productivity growth.

Related Literature

- ▶ Sociology and Anthropology
 - ▶ National culture could determine internal culture of an organization (Hofstede 1980; Kashima and Callan, 1994).
 - ▶ Sociologists have long studied cultural diffusion and convergence across countries (Robertson, 1992; Pieterse, 2003; Hopper, 2007).
- ▶ Economic integration and convergence
 - ▶ Large economics literature on FDI and technology transfer and spillover (e.g., Aitken and Harrison, 1997; Javorcik, 2004).
 - ▶ Black and Brainerd (2004): import competition is associated with lower gender wage gap in the same US industries, confirming Becker (1957).
 - ▶ Juhn et al. (2013, 2014): trade liberalization in Mexico, due to male-biased technological change (e.g., automation) worsened the gender wage gap.
 - ▶ Studies of cross-country cultural diffusion through trade and migration (Fisman and Miguel, 2007; Maystre et al., 2014).
 - ▶ Virtually no study relating FDI with cultural convergence.

Related Literature

- ▶ Gender Inequality in China
 - ▶ Growing economics literature on gender inequality in China (e.g., Qian, 2008; Kuhn and Shen, 2013; Chen et al., 2013; Edlund et al., 2013; Rosenzweig and Zhang, 2014).
 - ▶ The gender prejudice has been shown to have significant impact on China's macroeconomic outcomes, such as saving, investment, economic growth, and housing prices (e.g., Du and Wei, 2012; Wei and Zhang, 2011).

Model Setup

- ▶ We build a multi-sector model based on the task-based approach proposed by Acemoglu and Autor (2011).
- ▶ 4 layers: sectors, firms, workers (by gender); tasks
 - ▶ The economy is endowed with an equal amount of female and male labor supply, with female workers having a comparative advantage in skills.
 - ▶ Sectors differ in their reliance on skill-intensive versus brawn-intensive tasks (assumed by Levchenko et al. (2014)).
 - ▶ A continuum of tasks, which can be completed using skill or brawn (Pitt, Rosenzweig and Hassan, 2012).
 - ▶ Firms differ in productivity and taste-based biases against women.
- ▶ Monopolistically competitive goods market.

Firm Equilibrium

- ▶ A firm maximizes its objective function by choosing male (m) and female (f) employment as follows:

$$\pi = \max_{f,m} \left\{ A^{\frac{1}{\sigma}} (\varphi \mu y (\gamma, f, m))^{1-\frac{1}{\sigma}} - w_f f - w_m m \right\}$$

where γ is the biased perception about female labor productivity, μ is a sector-specific parameter, σ is the elasticity of substitution between varieties in the goods market.

$$y = \left((a_f \gamma f)^{\frac{\kappa-1}{\kappa}} + (a_m m)^{\frac{\kappa-1}{\kappa}} \right)^{\frac{\kappa}{\kappa-1}}$$

- ▶ Firms' maximization yields the following female-male employment ratio:

$$\frac{f}{m} = \left(\frac{w_f}{w_m} \right)^{-\kappa} \left(\frac{a_f}{a_m} \gamma \right)^{\kappa-1}$$

$\frac{f}{m}$ is increasing in the comparative advantage of women of the sector $\left(\frac{a_f}{a_m} \right)$.

Female Employment with Prejudice

Hypothesis

Foreign firms from countries that are less biased against women have a higher female-to-male employment ratio within a sector. The relationship is more pronounced in sectors in which female workers have a comparative advantage.

Hypothesis

All else being equal, firms that are more biased against women have smaller measured profits.

Cultural Spillover

- ▶ Prior belief:

$$\gamma \sim N(\bar{\gamma}, v_\gamma).$$

- ▶ Updated belief:

$$\bar{\gamma}^{post}(n, \bar{\gamma}_f) = \delta \bar{\gamma}_f + (1 - \delta) \gamma,$$

where δ is the weight the firm puts on $\bar{\gamma}_f$ when updating its belief. According to Degroot (2004):

$$\delta(n, v_\gamma, v_z) = \left(1 + \frac{1}{n} \frac{v_z}{v_\gamma}\right)^{-1}.$$

- ▶ The conditional variance of $\bar{\gamma}^{post}$, given n , v_z , and v_γ , can be expressed as

$$v_\gamma(n, v_\gamma, v_z) = \left(\frac{1}{v_\gamma} + \frac{n}{v_z}\right)^{-1}.$$

Cultural Spillover

- ▶ Simple comparative static shows that

$$\frac{\partial \ln \gamma(n, \bar{\gamma}_f)}{\partial n \partial \bar{\gamma}_f} > 0.$$

- ▶ The stronger the female comparative advantage in the sector is, the larger the spillover effect:

$$\frac{\partial \left(\frac{f}{m}\right)}{\partial \left(\frac{a_f}{a_m}\right) \partial \bar{\gamma}_f} > 0.$$

Hypothesis

Domestic firms' female employment ratios are increasing in the prevalence of FDI in the same sector or city. For the same level of FDI, the spillover effect will be stronger if the gender gap between Chinese firms and foreign firms is larger, or in sectors where female comparative advantage is stronger.

Data

- ▶ China National Bureau of Statistics (NBS) above-scale firm data 2004-2007
 - ▶ 270,000 - 330,000 manufacturing firms each year; 28,000 foreign invested firms each year (excluding Hong Kong, Macau and Taiwan's firms).
 - ▶ 2004 data provides employment breakdown by gender and education level.
 - ▶ 2005-2007 data provides emp breakdown only by gender.
- ▶ China's Ministry of Commerce (MOFCOM) Foreign Invested Firms Survey database (several waves)
 - ▶ Foreign firms' country of origin information.
 - ▶ We merge these two datasets using firm name and other contact information.
 - ▶ About 52% of 2004 foreign invested firms (excluding HKMT) can be merged.

Data - Measures of Country Gender-Related Culture

- ▶ UNDP Gender Inequality Index (GII) in 2012
- ▶ A composite measure which captures the loss of achievement due to gender inequality.
- ▶ Three dimensions: reproductive health, empowerment, and labor market participation.
- ▶ A higher value indicates greater gender inequality.
- ▶ 149 countries.

Data - Measures of Country Gender-Related Culture

- ▶ World Value Surveys (2005 wave)
 - ▶ Question V44: Men should have more right to a job than women.
 - ▶ Question V61 On the whole, men make better political leaders than women do.
 - ▶ Question V63: Men make better business executives than women do.
- ▶ The country WVS score is the mean of the three scores. Higher value indicates lower gender discrimination.
- ▶ Only 53 countries.

Countries' Gender Inequality Indices

Table 1: Countries with Lowest and Highest UNDP Gender Inequality Index and World Value Survey Score

Country	Gender Inequality Index	Country	Gender Inequality Index		
Panel A: UNDP Gender Inequality Index					
<u>Top 5 (Most Equal)</u>		<u>Bottom 5 (Least Equal)</u>			
1	Sweden	0.065	1	Iraq	0.799
2	Denmark	0.068	2	Yemen	0.782
3	Netherlands	0.077	3	Afghanistan	0.746
4	Norway	0.083	4	Niger	0.729
5	Switzerland	0.084	5	Mali	0.707
Panel B: World Value Survey Score					
<u>Top 5 (Most Equal)</u>		<u>Bottom 5 (Least Equal)</u>			
1	Sweden	0.876	1	Egypt	0.373
2	Norway	0.875	2	Jordan	0.423
3	France	0.815	3	Mali	0.438
4	Finland	0.797	4	India	0.446
5	Canada	0.792	5	Iran	0.497

Note: Higher gender inequality index or lower World Value Survey score implies greater gender inequality. Source: United Nations and World Value Survey.

Data - Manager/ CEO

- ▶ Are FIEs from countries with greater gender equality more likely to hire women as managers?
- ▶ No info on the gender of a firm's general manager (legal representatives).
- ▶ Use the last character of the Chinese name of a firm's legal representative to "estimate" his/her gender.
 - ▶ more feminine names and more masculine names.
- ▶ We use a random sample of 2005 1% population survey.
 - ▶ 2.5 million names (35-65 years old) in 2005
- ▶ For each Chinese character, we calculate its female name probability:

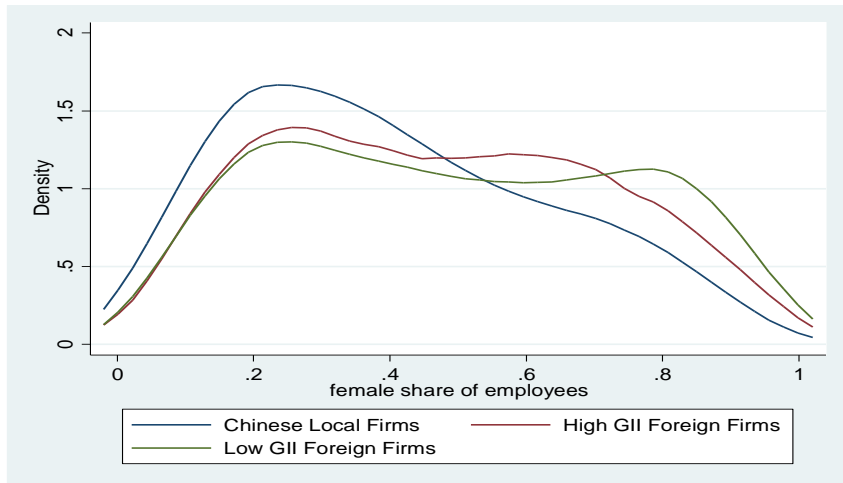
$$female_prob = \frac{frequency_female}{frequency_female + frequency_male}$$

Data Summary

Summary Statistics of the 2004 Data

Variable	N	Mean	St Dev.
Country Level			
Gender inequality index	137	0.42	0.20
World Value Survey score	58	0.65	0.12
ln(GDP per capita)	137	8.06	1.67
Industry Level (Four Digit Industry Code)			
Female comparative advantage	482	0.27	0.11
FDI presence (4-digit industry)	482	0.34	0.22
Herfindhal index	482	0.05	0.08
City Level (Four Digit Geographic Code)			
FDI presence (city)	345	0.16	0.18
Firm Level			
Female Employee Share			
Domestic firms	202,536	0.39	0.24
Foreign Firms	28,450	0.48	0.26
Hong Kong, Macau and Taiwan firms	28,031	0.49	0.24
Fractions of firms that have female CEOs/ managers			
Domestic firms	170,501	0.24	0.28
Foreign Firms	23,243	0.26	0.27
Female name probability Hong Kong, Macau and Taiwan firms	23,436	0.25	0.28

Distribution of Firm Female Employment Shares



Note: A country is considered a high (low) GII country if its GII value is higher (lower) than the median GII value of all countries.

FDI Premium on Female Employment

FDI Premium in Female Share of Employment and Female Probability of Legal Person Representatives (2004-2007 Panel)

	(1)	(2)	(3)
Panel A: Female Share of Employment			
FDI dummy	0.077 (25.29)***	0.025 (10.18)***	0.020 (19.18)***
Year FE	No	Yes	Yes
Industry (4-digit) FE	No	Yes	No
Provincial FE	No	Yes	No
Firm FE	No	No	Yes
N	982,219	982,219	982,219
Panel B: Female Probability of Legal Person Representative			
FDI dummy	0.007 (7.54)***	0.001 (0.88)	0.009 (5.33)***
Year FE	No	Yes	Yes
Industry (4-digit) FE	No	Yes	No
Provincial FE	No	Yes	No
Firm FE	No	No	Yes
N	805,990	805,990	805,990

Notes: t-statistics based on standard errors clustered at the four-digit industry are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Gender Inequality and Productivity

Female Share, Productivity and Profit - 2004-2007 Panel Regressions

	(1)	(2)	(3)	(4)
Sample:	All firms	Local firms	Foreign firms	All firms
Dependent Variable:	ln(TFP)	ln(TFP)	ln(TFP)	Profit Rate
Female share	0.142 (4.98)***	0.195 (7.20)***	0.023 (2.12)**	0.003 (5.06)***
R&D intensity	-0.006 (-1.31)	-0.007 (-1.20)	-0.003 (-1.05)	-0.000 (-0.60)
ln(capital intensity)	-0.112 (-15.52)***	-0.121 (-16.56)***	-0.069 (-8.41)***	-0.006 (-5.13)***
ln(wage rate)	0.035 (6.09)***	0.03 (4.70)***	0.053 (6.95)***	0.0006 (4.37)***
ln(firm age)	0.004 (1.34)	0.004 -1.26	0.002 -0.34	-0.002 (-3.37)
ln(output)	0.784 (88.09)***	0.792 (85.87)***	0.767 (56.64)***	0.013 (117.4)***
Ownership FE	No	No	No	No
Year FE	Yes	Yes	Yes	Yes
Industry (4-digit) FE	No	No	No	No
Firm FE	Yes	Yes	Yes	Yes
N	1,032,532	805,990	226,533	1,031,362
adj. R-sq	0.813	0.817	0.803	0.365

Notes: t-statistics based on standard errors clustered at the four-digit industry are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Estimate Gender Cultural Transfer

- ▶ To control the confounding factors, we include
 - ▶ industry and location dummies in the regression.
 - ▶ a set of firm-level technology and productivity control variables.
 - ▶ home country's $\ln(\text{GDP per capita})$.
- ▶ If FIEs have higher technology, they should have smaller share of female labor since there is a clear negative relation between technology and female share of employment.

Evidence: FDI Cultural Transfer

- ▶ We estimate the following firm-level equation using 2004 data:

$$S_{ij} = \beta_0 + \beta_1 GII_j + \beta_2 income_j + X'_{ij}\gamma + \{FE\} + \epsilon_{ij}$$

- ▶ where S_{ij} is the share of female workers or female probability of legal person representative of firm i with foreign country of origin j ;
- ▶ GII_j is a measure of gender inequality for country j .
- ▶ $income_j$ is $\ln(\text{GDP per capita})$ of country j . \mathbf{X}_{ij} is a vector of firm i 's characteristics.
- ▶ Sample includes all foreign invested firms, but exclude local firms.

FDI Cultural Transfer - 2004 Regressions

	(1)	(2)	(3)	(4)	(5)
	Female share in total employment	Female share in unskilled employment	Female share in skilled employment	Probability of female manager	Female share in total employment
Gender Inequality Index	-0.099 (-6.17)***	-0.113 (-4.89)***	-0.073 (-4.04)***	-0.123 (-1.78)*	
World Value Survey score					0.072 (2.09)**
ln(gdppc)	0.003 (0.95)	0.006 (1.57)	0.001 (0.37)	0.005 (0.82)	0.005 (1.22)
Computer intensity	-0.00073 (-1.84)*	-0.049 (-4.27)***	-0.00057 (-1.27)	-0.032 (-4.46)***	-0.0009 (-1.73)*
R&D intensity	-0.018 (-1.81)*	0.013 (0.86)	-0.017 (-1.47)	-0.009 (-4.98)***	-0.008 (-1.30)
ln(TFP)	-0.028 (-13.25)***	-0.021 (-6.40)***	-0.027 (-8.02)***	-0.026 (-12.47)***	-0.023 (-18.53)***
Skill intensity	0.029 (0.29)	-2.156 (-7.24)***	0.248 (2.31)**	-0.032 (-0.65)	-0.298 (-5.54)***
ln(capital intensity)	-0.040 (-24.83)***	-0.036 (-15.40)***	-0.026 (-14.70)***	-0.087 (-9.84)***	-0.031 (-28.34)***
ln(output)	0.020 (11.72)***	0.012 (4.37)***	0.014 (7.54)***	0.014 (7.69)***	0.016 (16.33)***
ln(wage rate)	-0.023 (-8.25)***	-0.026 (-6.30)***	-0.014 (-4.48)***	-0.084 (-8.32)***	-0.031 (-12.34)***
ln(firm age)	0.004 (2.36)**	0.003 (1.03)	0.003 (1.56)	0.004 (1.88)*	0.006 (8.76)***
Industry (4-digit) FE	Yes	Yes	Yes	Yes	Yes
Provincial FE	Yes	Yes	Yes	Yes	Yes
N	11,504	10,416	11,465	7,884	9,365
adj. R-sq	0.568	0.463	0.363	0.156	0.546

Notes: t-statistics based on standard errors clustered at the four-digit industry are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Evidence: FDI Cultural Spillover

- ▶ Use the empirical framework from the FDI productivity spillover literature.
- ▶ Estimate the following firm level equation using 2004 data:

$$S_{ik} = \alpha_0 + \alpha_1 FDI_presence_k + Z'_{ij} \delta + \{FE\} + \eta_{ik}$$

- ▶ where S_{ik} is the share of female workers or female probability of legal person representative of firm i in four-digit industry k ;
- ▶ $FDI_presence_k$ is the FDI share in industry j 's or city's total output.
- ▶ Sample includes all local firms, but exclude foreign firms.

Estimate FDI Gender Cultural Spillover

- ▶ FDI could affect female share of Chinese local firms through different channels:
 - ▶ competition
 - ▶ imitation of gender-biased technology
 - ▶ imitation of taste (cultural spillover - change of people's value)
- ▶ We try to control for competition effect or technology effect by including Herfindhal index and R&D variables.
- ▶ Our results support model Predictions 3 and 4.

FDI Gender Cultural Spillover

Gender Cultural Spillover Effect

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample:	2004	2004-2007	2004	2004	2004	2004	2004-2007
Dependent Variable:	Female share in total employment	Female share in total employment	Female share in unskilled employment	Female share in skilled employment	Probability of female manager	Female share in total employment	Female share in total employment
FDI in industry	0.315 (23.44)***	0.035 (5.34)***	0.349 (14.33)***	0.223 (10.75)***	0.048 (11.90)***		
FDI in city						0.213 (21.22)***	0.062 (8.99)***
Herfindhal Index	-0.112 (-5.43)***	-0.032 (-2.11)**	-0.132 (-4.56)***	-0.081 (-5.87)***	0.023 (-0.76)	-0.151 (-8.98)***	-0.053 (-3.03)***
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Provincial fixed effects	Yes	No	Yes	Yes	Yes	No	No
Year fixed effects	No	Yes	No	No	No	No	Yes
Firm fixed effects	No	Yes	No	No	No	No	Yes
N	187,885	800,907	177,860	185,193	155,717	187,885	765,457
adj. R-sq	0.138	0.754	0.125	0.087	0.046	0.033	0.445

Notes: All regressions include R&D intensity, ln(TFP), ln(capital intensity), ln(output), ln(wage rate) and ln(firm age) as control variables. The 2004 regressions include additional control of skill intensity. t-statistics based on standard errors clustered at the four-digit industry are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

FDI Gender Cultural Spillover - Heterogeneous Effect

Sample:	2004-2007			
Dependent Variable:	Female share in total employment			
FDI in industry	0.047 (4.17)***	-0.011 (-1.34)	-0.014 (-2.01)**	0.038 (8.28)**
FDI in industry* average GII	-0.052 (3.23)***			
FDI in industry* average WVS	0.063 (3.82)***			
FDI in industry* female comparative advantage	0.174 (8.03)***			
FDI in industry * Herfindhal Index	-0.171 (-3.29)***			
Herfindhal Index	-0.054 (-3.72)***	-0.053 (-3.82)***	-0.032 (-2.89)***	-0.027 (-2.14)**
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
N	800,907	800,907	800,907	800,907
adj. R-sq	0.794	0.753	0.793	0.616

Notes: All regressions include R&D intensity, ln(TFP), ln(capital intensity), ln(output), ln(wage rate) and ln(firm age) as control variables. t-statistics based on standard errors clustered at the four-digit industry are reported in the parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Concluding Remarks

- ▶ Using comprehensive Chinese manufacturing firm data, we find evidence of cultural diffusion through FDI.
 - ▶ Within multinational firms and then to local firms.
- ▶ FDI transfers culture across countries, in addition to knowledge and technology transfer.
 - ▶ FDI can overturn the long-run prejudice against women via economic forces.
 - ▶ It is above and beyond the competition effect proposed by Becker (1957).
- ▶ Work in progress:
 - ▶ Estimate the aggregate productivity effects (discrimination is a form of market distortion).
 - ▶ Use industry-specific FDI liberalization policies to establish stronger causal effects.