FDI and migration: jobs and gender gap

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Meeting on Intl. Economics, 26-27 September 2019

If I were a country...

Population

1. China 1,366,900,000
2. India 1,249,620,000
3. United States 318,787,000
4. Indonesia 252,164,800
5. Brazil 203,188,000
6. Pakistan 188,020,000
7. Nigeria 178,517,000
8. Bangladesh 157,019,000
9. Russia 146,149,200
10. Japan 127,040,000
11. Mexico 119,713,203
21. UK 65,788,000

...

53. Australia 24,125,000

GDP (billions of $)

1. United States 18,036
2. China 11,065
3. Japan 4,383
4. Germany 3,363
5. United Kingdom 2,861
6. France 2,419
7. India 2,419
9. Italy 1,821
10. Brazil 1,804
11. Canada 1,553
12. Korea 1,378
13. Russia 1,366
14. Australia 1,339
15. Spain 1,193
16. Mexico 1,144

If I were a country.....would I be a big one?

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Gender differences

- According to United Nations' migration statistics, in 2017 almost 50% of the world's migrant stock are women.
  - In diverse countries such as United States, Italy, Russia Poland, Uruguay or Uganda the existing inward women migrant stock is above 50%.
- There are relevant differences between male and female migrants in terms of their participation in labor.

Table: Average unemployment and participation rate by gender at OECD countries in 2017

		Unemployment rate	Participation rate
Native	Male	6.5%	79.0%
	Female	7.0%	69.1%
Migrants	Male	9.5%	81.8%
	Female	11.0%	65.5%

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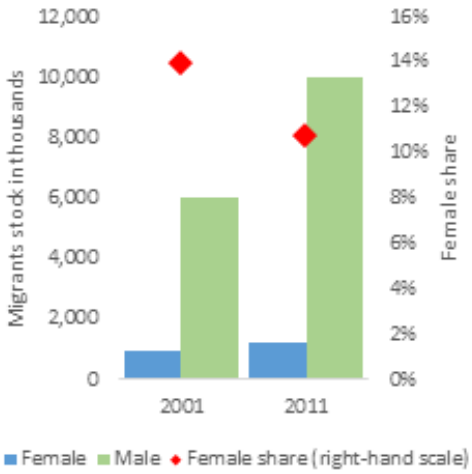
Mars and Venus

- Among employed migrants in OECD countries there are gender differences in terms of jobs.
- Although half of migrants are women, of the
  - 20% of migrants that work as managers, only 13% are women
  - 38% of migrants that work as professionals,only 34% are woman
  - 43% of migrants work as non-qualified, 55% are woman

Professional migrants



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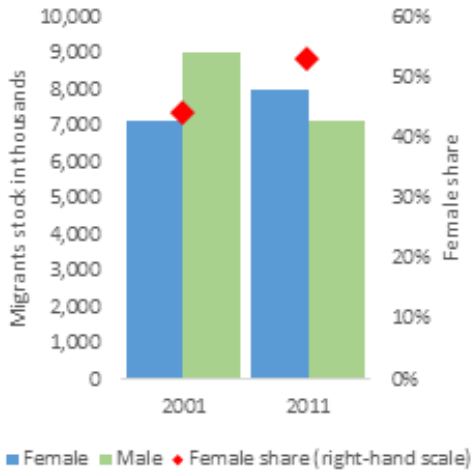

Non-qualified migrants

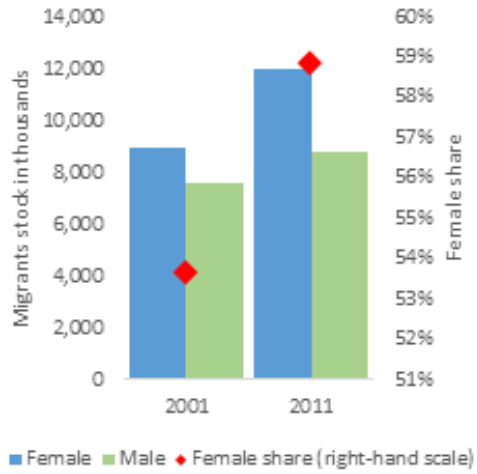

Table: Average share of female inward migrants stock by profession

	Manager	Professional	Non-qualified
Australia	21.7%	53.7%	54.9%
Austria	18.8%	49.5%	61.4%
Belgium	15.0%	52.2%	51.2%
Canada	21.0%	56.3%	57.6%
Chile	23.4%	48.0%	54.6%
Czech Republic	18.9%	43.4%	37.5%
Denmark	13.8%	53.3%	63.1%
Estonia	27.0%	40.9%	39.1%
Finland	11.3%	47.9%	50.6%
France	27.8%	57.0%	60.5%
Germany	21.9%	47.3%	53.4%
Greece	25.0%	48.0%	58.3%
Hungary	20.0%	47.1%	43.5%
Iceland	24.6%	53.4%	57.6%
Ireland	27.2%	47.1%	51.2%
Israel	13.6%	51.9%	68.7%

	Manager	Professional	Non-qualified
Italy	20.0%	53.6%	62.9%
Luxembourg	26.7%	54.2%	54.0%
Mexico	24.4%	43.2%	34.8%
Netherlands	29.7%	52.6%	56.8%
New Zealand	28.2%	53.5%	52.8%
Norway	13.1%	34.5%	79.4%
Poland	16.0%	49.0%	29.9%
Portugal	28.3%	52.4%	52.2%
Slovak Republic	24.6%	46.2%	39.1%
Slovenia	26.2%	52.4%	50.7%
Spain	19.5%	44.4%	54.1%
Sweden	11.4%	51.4%	66.1%
Switzerland	20.1%	57.3%	57.2%
United Kingdom	25.5%	54.7%	60.1%
United States	18.6%	54.8%	56.4%

Research question & contribution

- Skilled migrants promote trade (Iranzo & Peri, 2009, Bahar et al., 2018) & FDI (Kugler and Rapoport, 2007; Javorcik et al, 2011)
  More lit.
- Managers boost exports (Bloom et al., 2018; Martín-Montaner et al., 2014) & FDI (Cuadros et al., 2019)
- ¿What is the role of the gender gap in FDI-migraion link?
- We add a new channel by which migration fosters FDI.
  - We develop a model to explain the role of gender discrimination in firm's output and capital
  - We use the model's insights to design an empirical test to quantify the effect of migration on FDI by gender and job status.

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Outline

A few words about the model

- The model extends misallocation models (Restuccia and Rogerson, JEP 2017) with gender discrimination (Calvancanti & Tavares, EJ 2015) in the context of migration & FDI.
- Firms combine capital with labor to produce goods. Labor is composed of men and women, who are imperfect substitutes.
- Women suffer a discrimination due to a wedge between women's marginal productivity of labor and their wage.
  - Women receive a fraction $\phi < 1$of the labor wage rate: Misallocation of labor resources
  - The extent of efficiency loss depends on the elasticity of substitution of men and women (e.g.) tasks
  - Reducing the gender gap (e.g. woman's migration) increases efficiency: output and capital

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A simple model

- Consider N (foreign) producers of an homogeneous good. Producer i has the following production function:

$$x_i = A_i K_i^{\alpha} \left(M_i^{\frac{\varepsilon-1}{\varepsilon}} + W_i^{\frac{\varepsilon-1}{\varepsilon}} \right)^{\frac{\varepsilon(1-\alpha)}{\varepsilon-1}}, \tag{1}$$

where A is TFP, K is capital, M are men and W are women and ε is the elasticity of substitution between men and women.

- Profits of this firm are:

$$\pi_i = x_i - rK_i - \omega M_i - (1+\tau_i)\omega W_i \tag{2}$$

where w is the wage rate, r is the rental rate of capital, and $\tau_i \geq 0$ is a distortion that raises women's marginal product labor with respect to men's (and capital)

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Efficient Allocation

$$\max \pi_i = x_i - rK_i - \omega M_i - (1+\tau_i)\omega W_i \tag{3}$$

- First order conditions:

$$\underbrace{(1-\alpha)K^{\alpha}M^{\frac{\varepsilon-1}{\varepsilon}-1}\left(M^{\frac{\varepsilon-1}{\varepsilon}}+W^{\frac{\varepsilon-1}{\varepsilon}}\right)^{\frac{(1-\alpha)\varepsilon}{\varepsilon-1}-1}}_{\text{Men's } MPL} = \omega$$

$$\underbrace{(1-\alpha)K^{\alpha}W^{\frac{\varepsilon-1}{\varepsilon}-1}\left(M^{\frac{\varepsilon-1}{\varepsilon}}+W^{\frac{\varepsilon-1}{\varepsilon}}\right)^{\frac{(1-\alpha)\varepsilon}{\varepsilon-1}-1}}_{\text{Woman's } MPL} = \omega(1+\tau)$$

- Efficient allocation : $\tau_i = 0$ for all firms.
  - All firms employ labor in the same efficient proportion $W/M = 1$

Inefficient Allocation: gender gap

- Allocation is inefficient if $\tau_i \neq 0$ for some i.
  - $M'sMPL = \omega$ and $W'sMPL = \omega(1+\tau_i)$ jointly determine M and W.
  - Labor is not employed efficiently.
  - Suppose that $\omega*$ is the equilibrium wage in the absence of misallocation
- Now suppose that some firms are gender constrained, i.e., face higher costs to hire women ($\tau_i > 0$ for some i). Definition
  - Affected firms has inefficiently low W:

$$W'sMPL = (1+\tau_i)\omega^{GP} > \omega^*$$

    and ω^{GP} falls so that other firms absorbs all the woman (market clears)
  - So gender unconstrained firms choose

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Inefficient Allocation

- Recall the order conditions:

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$$\underbrace{(1-\alpha)K^{\alpha}W^{\frac{\varepsilon-1}{\varepsilon}-1}\left(M^{\frac{\varepsilon-1}{\varepsilon}}+W^{\frac{\varepsilon-1}{\varepsilon}}\right)^{\frac{(1-\alpha)\varepsilon}{\varepsilon-1}-1}}_{\text{Woman's } MPL}=\omega(1+\tau) \tag{5}$$

Now dividing (4) by (5) we obtain that

$$\frac{M^{-1/\varepsilon}}{W^{-1/\varepsilon}}=\frac{1}{1+\tau},$$

and we can define the woman to men ratio in a discriminatory market:

$$\psi\equiv\frac{W}{M}=(1+\tau)^{-\varepsilon}=\phi^{\varepsilon}\leq 1. \tag{6}$$

- Result: women to men ratio is a measure of the extent of gender gap (ϕ) for task where men an woman are imperfect substitutes. (think about when $\varepsilon=0$)

Effect of gendered migration

Proposition

$\frac{\partial x_{iz}}{\partial M} > 0$ *and* $\frac{\partial x_{iz}}{\partial W} > 0$. *(i.e. an exogenous increase in the number women and men migrants increases the firm's level volume output and capital).*

Corollary

The effect of an increase in men on FDI is larger than migrant woman if and only if there is a discrimination in women's salaries ($\tau > 0$).

Proof.

The ratio of an exogenous increase in men to women is:

$$\frac{\frac{\partial x_{iz}}{\partial M}}{\frac{\partial x_{iz}}{\partial W}} = \frac{\left((1+\tau)^{\varepsilon-1}+1\right)^{\frac{\varepsilon(1-\alpha)}{\varepsilon-1}}}{\left(\frac{1}{(1+\tau)^{\varepsilon-1}}+1\right)^{\frac{\varepsilon(1-\alpha)}{\varepsilon-1}}} > 0 \tag{7}$$

□

Effect of gender parity

- Let us re-arrange terms in equation (1):

$$x_{iz} = K^{\alpha}\left(\left(\frac{L}{1+\psi}\right)^{\frac{\varepsilon-1}{\varepsilon}} + \left(\frac{L}{1+1/\psi}\right)^{\frac{\varepsilon-1}{\varepsilon}}\right)^{\frac{\varepsilon(1-\alpha)}{\varepsilon-1}} \tag{8}$$

Proposition

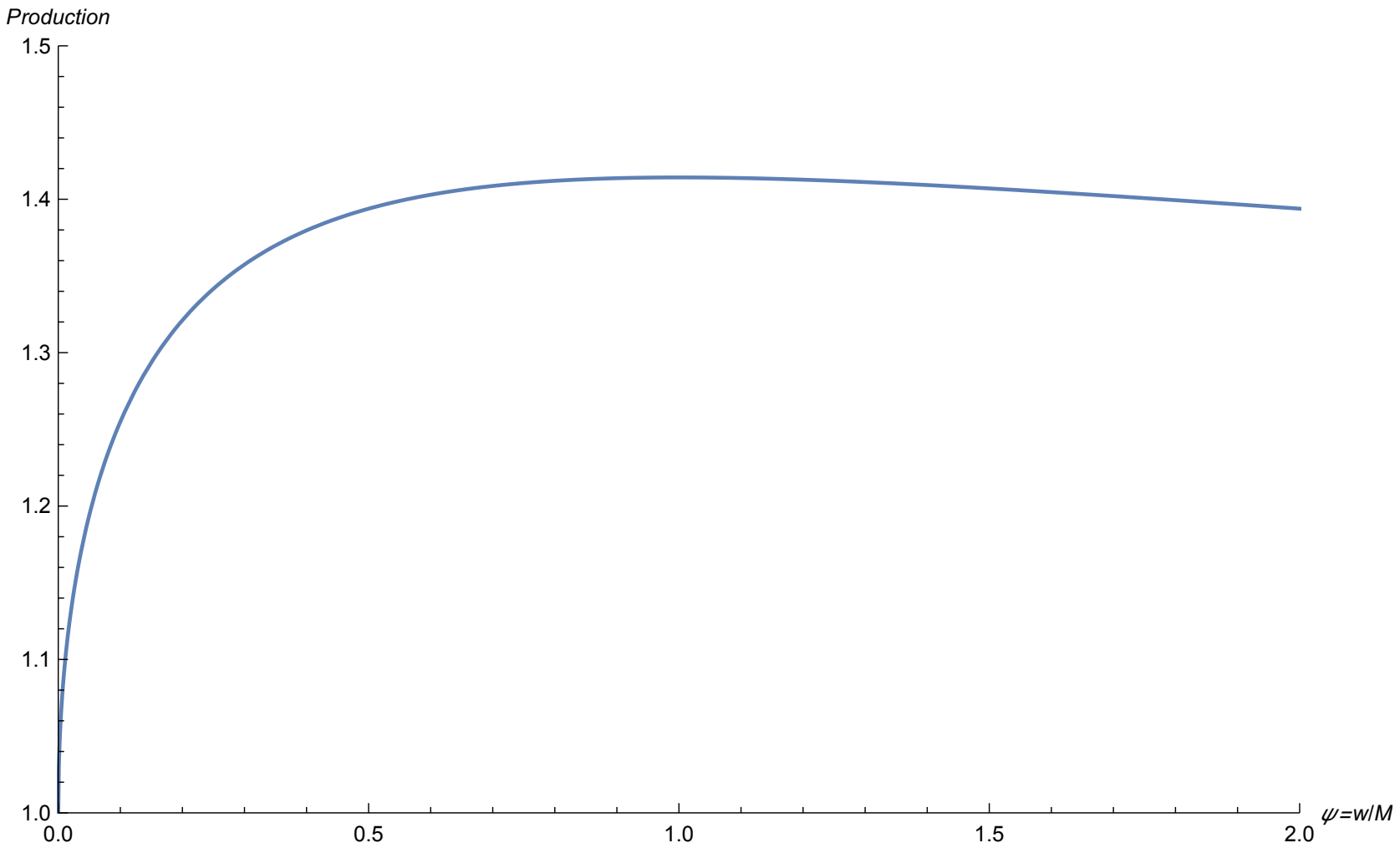
The optimal level of production is such that there is no gender gap.

Corollary

$\frac{\partial x_{iz}}{\partial \psi} > 0$. *An exogenous increase in the woman to no ratio has a positive effect on FDI if and only if there is a discrimination in women's salaries* $(\tau > 0)$. Proof.

Effect of gender parity

Figure: Production vs gender gap



Foreign capital and migration

- Profit maximization imposes that the marginal product of capital equals the rental rate of capital. More formally[1],

$$\alpha K^{\alpha-1}\left(M^{\frac{\varepsilon-1}{\varepsilon}}+W^{\frac{\varepsilon-1}{\varepsilon}}\right)^{\frac{(1-\alpha)\varepsilon}{\varepsilon-1}}=r \text{ and } K=\frac{\alpha x_{iz}}{r}$$

  - Assuming there is no misallocation of capital, the capital invested is linear with production.
- It is interesting to test the predictions of the model using foreign capital and migration. In line with Cuadros el al. (2019), migrants increase the talent pool from which firms can hire individuals with abilities that are country-pair specific (language, culture).
  - Bilateral FDI flows should respond to variations in gender migration. The effect should be positive in those tasks with $\psi < 1$ and more intense for task which are highly sustituible (e.g., mental work like managers).

[1] We assume that here is no capital misallocation, and the standard neoclassical condition equating the interest rate to the marginal product of capital holds.

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Extensive margin

- Main result: the larger the gender gap, the lower aggregate output for given aggregate inputs. Misallocation due to gender reduces aggregate capital and output.
- Misallocation also via the selection channel (extensive margin) via productivity.
  - Some gender constrained firms with A_i such that $A^{GP} > A_i \geq A_{min}$ will be forced to exit or will not enter.

Data

- FDIMarkets: covers firm level greenfield investments
- Source of greenfield investment for the UNCTAD & EIU.
  - 190 countries from 2003 to 2016
  - Firm-level data, that we aggregate by country (and activity)
    - 4500+ firms
    - 44000+ investments
  - FDIMarkets allows to use unidirectional FDI data (i.e, $FDI_{ij} \neq FDI_{ji}$)
    - intensive & extensive margins
- DIOC-E data for migration which gives information on job position (manager, professional, non-qualified by gender).
  - FDI data from 2004, 2008 and 2014 and migration data from 2001, 2005, 2011

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Empirics

- We use the the Pseudo-Poisson Maximum likelihood (PPML) estimator proposed by Silva and Tenreyro (2006) using Larch's et al. (2018) procedure:

$$FDI_{ijt} = \exp\left(\underbrace{\ln m_{jit}}_{\text{information channel}} + \underbrace{\sum \ln m_{ijt}^{\text{Job}}}_{\text{network channel}} + \underbrace{\text{Share}_{ijt}^{\text{Job}}}_{\text{ocupation channel}} + \underbrace{\psi_{ijt}^{\text{Job}}}_{\text{gender gap channel}} + \lambda_{it} + \lambda_{jt} + \chi_{iji} + \chi_{ij} \right) + e_{ijt}.$$

	(1) Capex	(2) extensive	(3) Capex	(4) extensive
RTA	-0.405	0.021	-0.554*	-0.058
	(0.31)	(0.13)	(0.31)	(0.13)
BIT	0.082	0.134	0.118	0.078
	(0.28)	(0.17)	(0.28)	(0.16)
Indist	-0.615***	-0.276***	-0.681***	-0.310***
	(0.19)	(0.09)	(0.20)	(0.09)
Common language	0.748**	0.572***	0.904***	0.692***
	(0.30)	(0.11)	(0.30)	(0.12)
Colonial relationship	-0.006	0.183	-0.126	0.114
	(0.31)	(0.12)	(0.31)	(0.12)
Common religion	1.399***	0.947***	1.366***	0.931***
	(0.45)	(0.21)	(0.44)	(0.20)
$\ln m_{ji}$	0.029	0.031	0.039	0.052
	(0.08)	(0.04)	(0.07)	(0.04)
$\ln m_{ij}$(Men)	0.050	0.111***		
	(0.09)	(0.04)		
$\ln m_{ij}$(Woman)			0.038	0.078**
			(0.08)	(0.04)
Observations	920	920	909	909
R^2	0.804	0.971	0.810	0.971

Robust standard errors in parentheses, clustered by country pair.

Home*year and host*year country fixed included.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) Capex	(2) extensive	(3) Capex	(4) extensive
$\ln m_{ji}$	0.010	0.033	-0.008	0.029
	(0.08)	(0.04)	(0.08)	(0.04)
$\ln m_{ij}$(Men)	0.033	0.187*	0.490*	0.308**
	(0.24)	(0.11)	(0.27)	(0.14)
$\ln m_{ij}$(Woman)	0.056	-0.070	-0.355	-0.180
	(0.22)	(0.09)	(0.26)	(0.12)
ψ_{ij}(Woman/Men)			0.337***	0.115*
			(0.12)	(0.07)
Observations	901	901	901	901
R^2	0.812	0.972	0.813	0.972

Robust standard errors in parentheses, clustered by country pair.

Home*year and host*year country fixed included.

Gravity control variables included and not reported

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) Capex	(2) extensive	(3) Capex	(4) extensive
$\ln m_{ji}$	0.039	0.036	0.051	0.036
	(0.08)	(0.04)	(0.08)	(0.04)
$\ln m_{ij}$(Men Manager)	0.454***	0.186***	0.474***	0.185***
	(0.16)	(0.06)	(0.14)	(0.07)
$\ln m_{ij}$(Men Professional)	-0.108	0.021	-0.087	-0.026
	(0.08)	(0.04)	(0.11)	(0.06)
$\ln m_{ij}$(Men Non-qual)	-0.182	-0.058	-0.106	-0.027
	(0.14)	(0.04)	(0.12)	(0.05)
$\ln m_{ij}$(Woman Manager)			0.247**	0.051
			(0.11)	(0.05)
$\ln m_{ij}$(Woman Professional)			-0.202	-0.007
			(0.16)	(0.07)
$\ln m_{ij}$(Woman Non-qual)			-0.131**	-0.012
			(0.06)	(0.02)
Observations	921	921	902	902
R^2	0.813	0.972	0.835	0.973

Robust standard errors in parentheses, clustered by country pair.

Home*year and host*year country fixed included.

Gravity control variables included and not reported

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) Capex	(2) extensive	(3) Capex	(4) extensive
$\ln m_{ji}$	0.059	0.047	0.096	0.065
	(0.07)	(0.04)	(0.07)	(0.04)
$\ln m_{ij}$(Men Manager)	0.181	0.064	0.586**	0.129
	(0.15)	(0.04)	(0.25)	(0.11)
$\ln m_{ij}$(Men Professional)	0.124	0.101*	0.035	0.118
	(0.14)	(0.06)	(0.17)	(0.07)
$\ln m_{ij}$(Men Non-qual)	-0.002	0.005	-0.225*	-0.054
	(0.10)	(0.04)	(0.13)	(0.06)
$\ln m_{ij}$(Woman Manager)	0.077	-0.010	-0.103	-0.056
	(0.10)	(0.05)	(0.14)	(0.08)
$\ln m_{ij}$(Woman Professional)	-0.077	0.025	0.174	0.074
	(0.12)	(0.03)	(0.16)	(0.09)
$\ln m_{ij}$(Woman Non-qual)	-0.094	-0.003	-0.230***	-0.038
	(0.07)	(0.02)	(0.06)	(0.02)
Manager share	4.276***	2.502***	2.300	2.253**
	(1.42)	(0.50)	(2.01)	(1.00)
ψ_{ij}(Woman/Men) Managers			0.664**	0.215
			(0.26)	(0.15)
Observations	901	901	865	865
R^2	0.833	0.974	0.845	0.975

Robust standard errors in parentheses, clustered by country pair.

Home*year and host*year country fixed included.

Gravity control variables included and not reported

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) Capex	(2) extensive	(3) Capex	(4) extensive
ln m_{ji}	0.078	0.040	0.070	0.035
	(0.07)	(0.04)	(0.08)	(0.04)
ln m_{ij}(Men Manager)	0.528***	0.189**	0.571***	0.186**
	(0.19)	(0.09)	(0.21)	(0.09)
ln m_{ij}(Men Professional)	-0.208	-0.041	-0.367	-0.071
	(0.16)	(0.09)	(0.23)	(0.11)
ln m_{ij}(Men Non-qual)	-0.053	-0.022	-0.025	-0.016
	(0.13)	(0.05)	(0.15)	(0.05)
ln m_{ij}(Woman Manager)	0.294***	0.055	0.326***	0.067
	(0.11)	(0.06)	(0.11)	(0.06)
ln m_{ij}(Woman Professional)	-0.268*	-0.011	-0.209	0.006
	(0.15)	(0.08)	(0.21)	(0.08)
ln m_{ij}(Woman Non-qual)	-0.109	-0.009	-0.131*	-0.014
	(0.07)	(0.03)	(0.07)	(0.02)
Professional share	1.267	0.122	0.253	-0.124
	(1.76)	(0.72)	(1.83)	(0.70)
ψ_{ij}(Woman/Men) Professional			-0.083	-0.043
			(0.08)	(0.04)
Observations	901	901	895	895
R^2	0.837	0.973	0.839	0.973

Robust standard errors in parentheses, clustered by country pair.

Home*year and host*year country fixed included.

Gravity control variables included and not reported

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1) Capex	(2) extensive	(3) Capex	(4) extensive
$\ln m_{ji}$	0.121	0.075*	0.107	0.088*
	(0.08)	(0.04)	(0.08)	(0.05)
$\ln m_{ij}$(Men Manager)	0.383***	0.151**	0.451**	0.083
	(0.13)	(0.06)	(0.20)	(0.07)
$\ln m_{ij}$(Men Professional)	-0.259**	-0.130**	-0.951***	-0.370**
	(0.12)	(0.07)	(0.33)	(0.15)
$\ln m_{ij}$(Men Non-qual)	0.127	0.083	0.060	0.241
	(0.10)	(0.05)	(0.34)	(0.16)
$\ln m_{ij}$(Woman Manager)	0.253**	0.055	0.161	0.042
	(0.11)	(0.05)	(0.10)	(0.06)
$\ln m_{ij}$(Woman Professional)	-0.249***	-0.016	-0.331***	-0.031
	(0.09)	(0.05)	(0.12)	(0.04)
$\ln m_{ij}$(Woman Non-qual)	-0.034	0.041	0.865***	0.218**
	(0.07)	(0.03)	(0.24)	(0.10)
Non-qual share	-3.899***	-2.201***	-8.622***	-4.173***
	(1.30)	(0.64)	(2.54)	(1.17)
ψ_{ij}(Woman/Men) Non-qual			-0.054	-0.001
			(0.09)	(0.04)
Observations	901	901	852	852
R^2	0.840	0.974	0.848	0.973

Robust standard errors in parentheses, clustered by country pair.

Home*year and host*year country fixed included.

Gravity control variables included and not reported

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Take-aways

- The paper adds a new gender gap misallocation channel to the FDI & migration link
  - In addition to the information, jobs/skills/tasks and network channels
- Gender discrimination reduces efficiency, firm output and capital investment. This depends on the elasticity of substitution (type of tasks).
- Estimates show that reducing the gender gap in migrant managers has a positive effect on FDI
  - But the effect is not significant for professionals or non-qualified jobs.

Related literature

STUDY	COUNTRY / PERIOD	MAIN RESULTS
Kugler and Rapoport (2007)	United States 1990 and 2000	Higher unskilled emigration in 1990 is associated with higher growth of total FDI inflows over the following decade.
Docquier and Lodigiani (2010)	Cross section 114 countries. Panel data/ 83 countries	Strong network externalities mainly associated with the skilled diaspora
Ivlevs and De Melo (2010)	1990-2000 103 migration-sending countries	If exports are low skill intensive, emigration of high-skilled labour leads to positive FDI
Flisi and Murat (2011)	Immigrant networks for France, Germany, UK, Italy and Spain	Skilled immigrants increase bilateral FDI in UK, France and Germany. In Italy and Spain, FDI is influenced by their emigrant diaspora network. Negative impact for unskilled migrants: substitution effect between low-skilled immigration and investment abroad
Javorcik et al. (2011)	United States 1990 and 2000	Outward FDI (stock) positively related with the presence of migrants in US (stock). Stronger effect for the share of tertiary educated migrants
Leblang (2011)	26 OECD reporting countries and 120 destination countries 2000 and 2001	Migrant networks encourage cross-border investments (FDI and portfolio). The effect on FDI is substantially larger. Stronger for migrants with tertiary education
Foad (2012)	50 US states, 10 source countries 1990 and 2000 for immigration	Presence of immigrants leads to new FDI from immigrants' native countries. This effect is stronger for skilled migrants and might take a few years to occur
Gheasi et al. (2013)	United Kingdom 2001-2007	FDI abroad positively related with the presence of migrants. More educated migrants have a higher positive effect on FDI.
Tomohara (2017b)	Japan 1996-2011	FDI inflows become more dominant compared to imports when skilled immigration flows increase and less dominant when unskilled immigration flows increase
Tomohara (2017a)	Japan 1996-2011	Contemporaneous negative relationship between low-skilled migration and FDI
Cuadros et al. (2019)	OECD 2004-2008	Positive effect of migrant managers

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Definition of a gender constrained firm

- Gender gap limits the availability of external talent for firms with profitable investments due to:
  - Fertility and mortality rates (Soares and Falcao 2008)
  - Gender bias in migration (Bang and Mitra, 2011; Dumont et al., 2007 ; Docquier et al., 2009)

"A gender constrained firm would like to hire men and woman equally, but cannot do so because it is either women labor is too scarce or has a higher a cost than men's." Back

Proof of proposisiton 2n

$$\frac{\partial x_{iz}}{\partial \psi} = \frac{(1-\alpha)\varepsilon K^{\alpha}\left(\frac{L(\varepsilon-1)\left(\frac{L}{\frac{1}{\psi}+1}\right)^{\frac{\varepsilon-1}{\varepsilon}-1}}{\left(\frac{1}{\psi}+1\right)^{2}\psi^{2}\varepsilon}-\frac{L(\varepsilon-1)\left(\frac{L}{\psi+1}\right)^{\frac{\varepsilon-1}{\varepsilon}-1}}{(\psi+1)^{2}\varepsilon}\right)\left(\left(\frac{L}{\frac{1}{\psi}+1}\right)^{\frac{\varepsilon-1}{\varepsilon}}+\left(\frac{L}{\psi+1}\right)^{\frac{\varepsilon-1}{\varepsilon}}\right)^{\frac{(1-\alpha)\varepsilon}{\varepsilon-1}}}{\varepsilon-1}$$

$$\frac{(1-\alpha)K^{\alpha}\left(\left(\frac{L}{\psi+1}\right)^{1/\varepsilon}-\left(\frac{L\psi}{\psi+1}\right)^{1/\varepsilon}\right)\left(\frac{L\left(\left(\frac{L}{\psi+1}\right)^{-1/\varepsilon}+\psi\left(\frac{L\psi}{\psi+1}\right)^{-1/\varepsilon}\right)}{\psi+1}\right)^{-\frac{(\alpha-1)\varepsilon}{\varepsilon-1}}}{(\psi+1)\left(\psi\left(\frac{L}{\psi+1}\right)^{1/\varepsilon}+\left(\frac{L\psi}{\psi+1}\right)^{1/\varepsilon}\right)}$$

The sign of the derivative is determined by the term $\left(\frac{L}{\psi+1}\right)^{1/\varepsilon}-\left(\frac{L\psi}{\psi+1}\right)^{1/\varepsilon}$. This term is zero when $\psi=1$, positive when $\psi<1$ and negative when $\psi>1$. Since $\psi=(1+\tau)^{-\varepsilon}$, the derivative $\frac{\partial x_{iz}}{\partial \psi}=0$ if and only of $\tau=0$ or $\varepsilon=0$. qdf.

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