SCIENTIFIC MOBILITY AS A BRIDGE BETWEEN TWO WORLDS

Analysing the impact of foreign-educated PhDs on academic upgrading in Mexico

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Preliminary results

CONCEPTUAL FRAMEWORK

GRADUATE MOBILITY

- Large public and private investments to promote graduate mobility
- + 114 % internationally-educated students worldwide between 2000-12 (OECD, 2015)

RESEARCH COLLABORATION

- Over 90% of world articles are co-authored
- Over 25% of world articles are internationally co-authored (National Science Board, 2014)

FOREIGN-EDUCATED PHDS

- Ideally placed to develop professional social capital, to tap into international knowledge and to plug other local researchers into wider global scientific pools upon return to their home countries (e.g. Barnard et al., 2015)

RESEARCH QUESTION

Do foreign-educated researchers from Mexico contribute to local upgrading or do they disengage from their local scientific systems? Is there a local/global trade-off in knowledge creation in the Mexican scientific system?

DATA

We use data on rated researchers from the Mexican *Sistema Nacional de Investigadores (SNI)*

CONACYT SNI Sistema Nacional de Investigadores

SNI facilitates the ranking of Mexican researchers through a peer review process of their research outputs.

4678
SNI affiliated researchers in 2013

36265
ISI Web of Science (WoS) publications in the period 2008-2012

0 Candidate
1 National researcher level 1
2 National researcher level 2
3 National researcher level 3

METHOD

- We build a **co-authorship network** of SNI researchers
- In order to measure to which extent a researcher is important in bringing knowledge into Mexico, we develop a **gatekeeping index**

$$\text{GATEKEEPING} = \text{EXTERNAL WEIGHT} \times \text{AVERAGE WEIGHTED REACH}$$

BRIDGING COMPONENT

$$\sum \textit{(weighted) papers with foreign scholars}$$

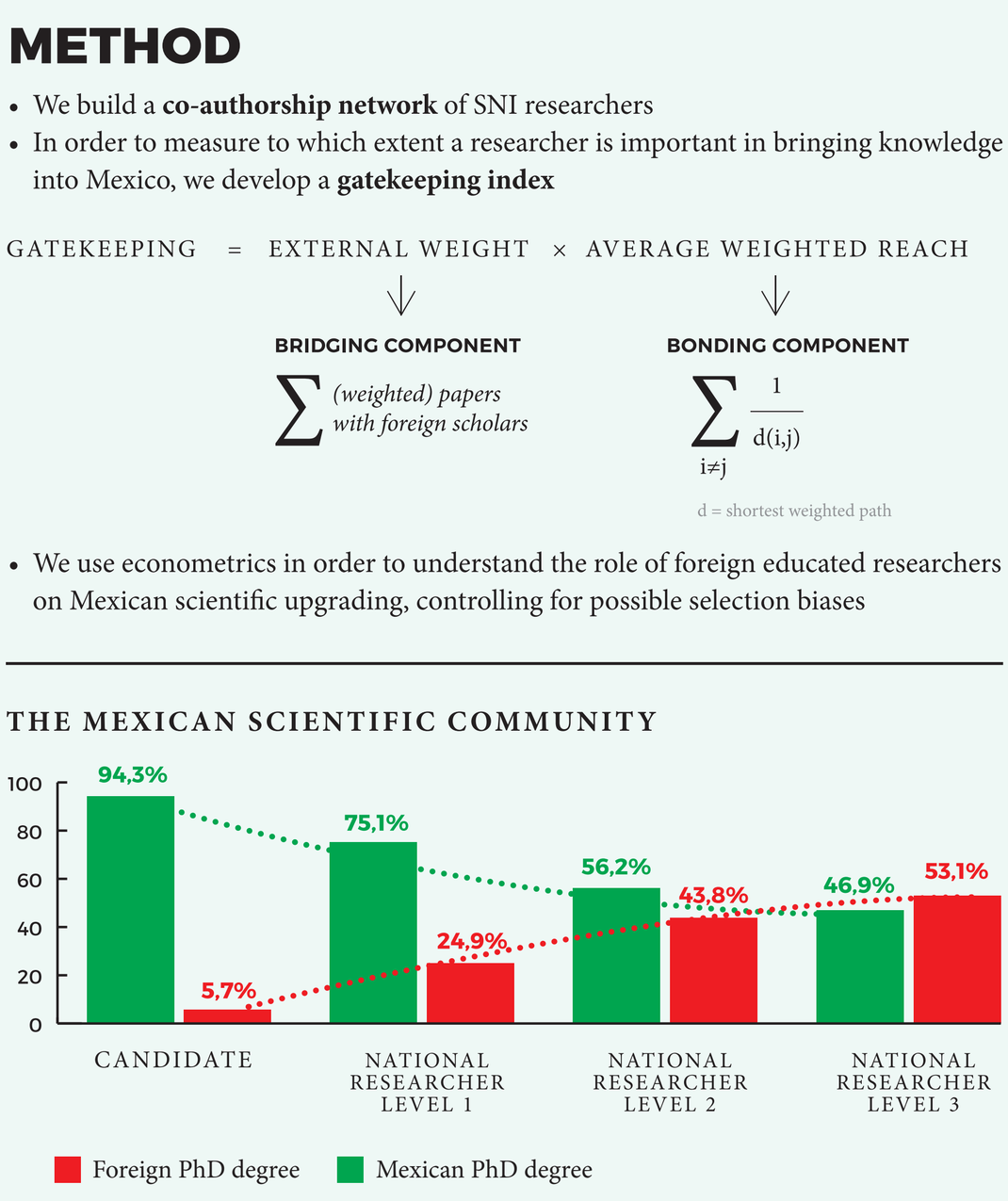
BONDING COMPONENT

$$\sum_{i \neq j} \frac{1}{d(i,j)}$$

d = shortest weighted path

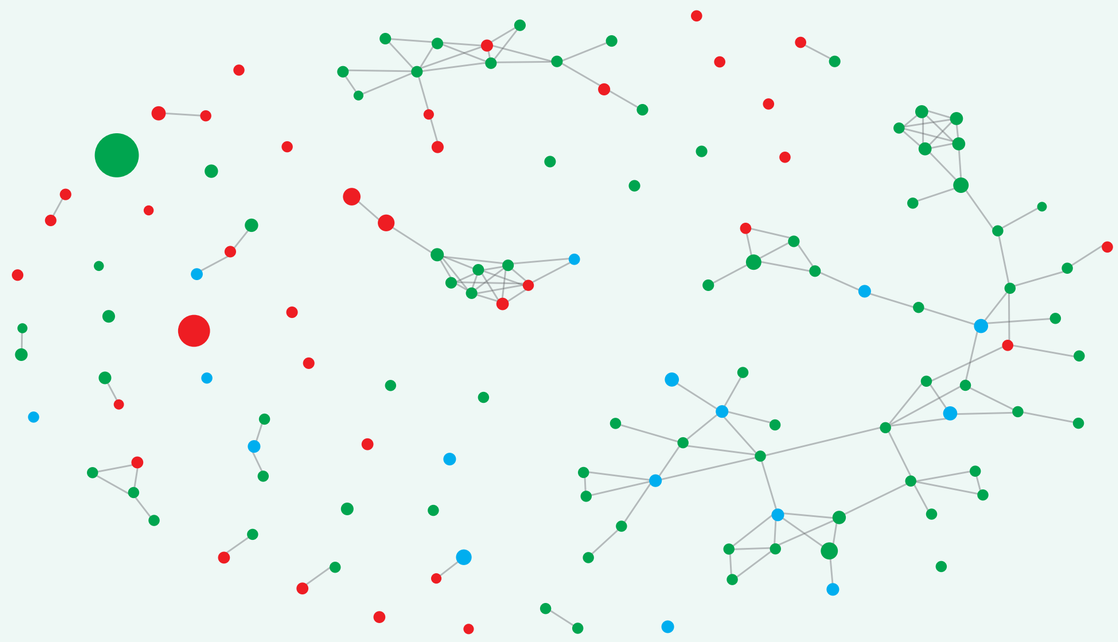
- We use econometrics in order to understand the role of foreign educated researchers on Mexican scientific upgrading, controlling for possible selection biases

THE MEXICAN SCIENTIFIC COMMUNITY



AVERAGE NO. OF CO-AUTHORS

Mexican PhD degree	Mexican co-authors	19.03
	Foreign co-authors	5.90
Foreign PhD degree	Mexican co-authors	20.29
	Foreign co-authors	10.71



Network of SNI co-authors with gatekeeping scores > 1.5
Size of the node is proportional to his/her gatekeeping score.

Foreign PhD degree · Mexican PhD degree · No info on the origin of the degree

Table 1. Linear regression with endogenous treatment effects on gatekeeping.

	MODEL 1		MODEL 2	
	Outcome equation	Selection equation	Outcome equation	Selection equation
	DV = gatekeeping	DV = Foreign PhD	DV = ln(gatekeeping)	DV = Foreign PhD
FOREIGN PHD	0.364***		0.568***	
	(0.018)		(0.172)	
YEARS SINCE PHD	0.003***		0.011***	
	(0.001)		(0.002)	
LIFE SCIENCES	-0.056***	0.117*	-0.070	0.127
	(0.017)	(0.0686)	(0.061)	(0.078)
MEDICINE & HEALTH SC.	0.117***	-0.483***	0.364***	-0.455***
	(0.020)	(0.088)	(0.074)	(0.099)
SCIENCE & TECHN. ST.	-0.092***	0.321***	-0.010	0.352***
	(0.018)	(0.074)	(0.070)	(0.084)
EARTH SCIENCES	-0.141***	0.474***	-0.294***	0.505***
	(0.026)	(0.104)	(0.100)	(0.118)
MATHS	-0.080	0.447***	-0.043	0.495***
	(0.050)	(0.194)	(0.181)	(0.214)
CHEMISTRY	-0.025	0.008	0.058	-0.008
	(0.022)	(0.091)	(0.080)	(0.105)
MALE		0.298***		0.393***
		(0.041)		(0.052)
CONSTANT	0.116***	-0.874***	-2.108***	-0.970***
	(0.017)	(0.072)	(0.073)	(0.084)
ATHRHO	-0.819***		-0.302***	
	(0.039)		(0.100)	
N	4440		3704	

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. STEM disciplines only. Baseline category: Physics and Astrophysics

FINDINGS

- Studying abroad seems to increase the international connectivity of Mexican researchers *without* significantly reducing their engagement with the local peers → internationally-educated researchers as key conduits of new knowledge
- Researchers with higher gatekeeping scores do not cluster only among them, but also with colleagues with lower scores, potentially favoring knowledge transmission
- After controlling for selection biases, foreign-PhD education – through potentially better training - seems to allow researchers to advance faster in their careers

Are you interested in this research?
Contact the authors!

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