

# Effects of Information Channels across Skill and Product Quality Groups: Evidence from Trade-Migration Nexus

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## Abstract

This paper examines the empirical linkage between immigrant driven ethnic networks on bilateral trade across different skill groups of immigrants and quality levels of commodities. Using a panel dataset of 19 high-income OECD countries and 99 low-income countries over the period of 1990-2005 and a newly available export quality index, we test for both direct and indirect effects of migrant networks on their host country trade. We establish a one-to-one casual linkage between migrants' skill level and export product quality controlling for potential endogeneity and unobserved heterogeneity.

## Introduction

- ▶ Migration in OECD countries increased by more than 50% between 1990 to 2015. Exports increased from 19.6% to 29.5% as a percentage of world GDP.
- ▶ Information Channel: Increase in the number of immigrants would increase the source country information in the destination country and hence in general should increase bilateral trade.
- ▶ High-skilled migrants sync in better in the high quality product industry and low-skilled migrants should have an advantage in low quality product industry.
- ▶ Shifts towards a complex pattern of immigration could mean that one ethnic group can act as a complement to another ethnic group.

## Basic Contribution

- ▶ Export-quality index to measure product quality (High, Medium or Low) instead of unit value series (volatile, may reflect production costs, or pricing strategies).



Figure: Quality Index vs Unit Value (Korea) Figure: Quality Index vs Unit Value ((Japan)

- ▶ One-to-one linkage between migrants skill level and product quality.
- ▶ Additional indirect network effect due to an increasing migration diversification in terms of both origin and destination as opposed to only destination countries.

## Methodology

- ▶ We depart from EK assumption of homothetic preference to propose that there can be different types of goods which may differ in demand and technology.
- ▶ Country  $j$  produce a continuum of goods  $l_k \in [0, 1]$  of quality  $k$  with goods specific productivity in country  $j$ :  $z_j(l_k)$ . Cost of producing good  $l_k$  in country  $j$  is  $\left(\frac{c_j}{z_j(l_k)}\right)$ . Individuals of any country  $i$  have the following type of CES utility:

$$U_i = \sum_{k=1}^K \left[ \int_0^1 Q_i(l_k)^{\frac{\sigma_k-1}{\sigma_k}} dl_k \right]^{\frac{\sigma_k}{\sigma_k-1}} \quad (1)$$

where  $\sigma_k > 1 \forall k$  is the elasticity of substitution across same quality goods.

- ▶ Productivity in country  $j$  follows a Frechet  $(T_j, \theta_k)$  distribution:

$$F_{jk}(z) = P(z_j(l_k) < z) = e^{-T_j z^{-\theta_k}} \quad (2)$$

- ▶ By calculating the probability that country  $j$  is the lowest cost producer of good  $l_k$  to country  $i$ ,  $\pi_{ij}$ , the gravity expression can be expressed as the imports of country  $i$  from country  $j$  relative to country  $i$ 's domestic consumption:

$$\frac{X_{ij}^k}{X_{ii}^k} = \frac{\pi_{ij}}{\pi_{ii}} = \frac{T_j (w_j d_{ij})^{-\theta_k}}{T_i (w_i)^{-\theta_k}} \quad (3)$$

- ▶ Taking log of the previous equation, and collecting indicators of cultural and geographical proximity along with a bilateral trade policy indicator, direct and indirect measure of ethnic network under the dyadic term,  $d_{ij}$ , we get our equation for empirical estimation:

$$\ln X_{ijt}^k = S_{it} + S_{jt} + \theta_k \ln M_{ijt} + \theta_k IM_{ijt} + \theta_k \ln \text{Distance}_{ij} + \theta_k \text{Contiguity}_{ij} + \theta_k \text{Common Language}_{ij} + \theta_k \text{Colony}_{ij} + \theta_k \text{RTA}_{ijt} + \varepsilon_{ijt} \quad (4)$$

Here  $M_{ij}$  denotes direct ethnic network (stock of immigrants from country  $i$  to country  $j$ ).  $IM_{ij}$  denotes indirect network variable where  $IM_{ij} = D_{ik} D_{jk}$ , with number of emigrants from country  $i$  in excess of country  $j$  is denoted by  $D_{ik} = \sum_{k \neq j} M_{ik}$  and number of immigrants residing in country  $j$  in excess of country  $i$  is denoted by  $D_{jk} = \sum_{k \neq i} M_{jk}$ .

## Data

This paper uses Center for International Data (Robert Feenstra), UN Comtrade Data, IAB Brain Drain Database, CEPII Gravity Database and IMF Quality Index.

## Results: Pooled OLS and Instrumental Variable Estimation

- ▶ We only report High and Low-skilled migrants for now as the distribution of migrants are usually bi-modular in nature.

Variables	(1) OLS	(2) OLS	(3) OLS	Variables	(1) TSL	(2) TSL	(3) TSL
All Migrants	0.045*** (0.013)			All Migrants	0.095*** (0.025)		
H-Skill Migrants		0.292*** (0.025)		H-Skill Migrants		0.333*** (0.030)	
L-Skill Migrants			0.247*** (0.024)	L-Skill Migrants			0.282*** (0.029)
Observations	4,387	4,387	4,387	Observations	4,387	4,387	4,387
R-squared	0.815	0.830	0.828	R-squared	0.814	0.829	0.828
Control	YES	YES	YES	Control	YES	YES	YES
Exp-Yr FE	YES	YES	YES	Exp-Yr FE	YES	YES	YES
Imp-Yr FE	YES	YES	YES	Imp-Yr FE	YES	YES	YES

- ▶ Migrant networks have a positive and significant effect on bilateral trade across all skill level with high-skilled migrants having higher effect.
- ▶ Potential Endogeneity bias: 15 year lagged Migration as Instrument.
- ▶ Estimates are not different in ranking or direction.

## Results: First Difference Estimation

- ▶ Allowing for Different Product Quality and introducing Indirect Network Effect.
- ▶ Controlling for unobserved Heterogeneity and test for strict Exogeneity.

All Products				High Quality Products			
Variables	(1) FD	(2) FD	(3) FD	Variables	(1) FD	(2) FD	(3) FD
All Migrants	0.034* (0.020)			All Migrants	0.032 (0.025)		
H-Skill Migrants		0.132*** (0.037)		H-Skill Migrants		0.128** (0.055)	
L-Skill Migrants			0.075* (0.044)	L-Skill Migrants			-0.039 (0.071)
Indir Effect (All)	0.043** (0.019)			Indir Effect (All)	0.07** (0.033)		
Indir Effect (High)		0.006 (0.018)		Indir Effect (High)		0.043* (0.024)	
Indir Effect (Low)			0.026* (0.017)	Indir Effect (Low)			0.048* (0.026)
Exogeneity Test (P Value)	0.444	0.40	0.84	Exogeneity Test (P Value)	0.78	0.45	0.90

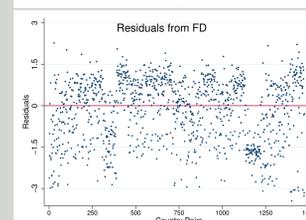
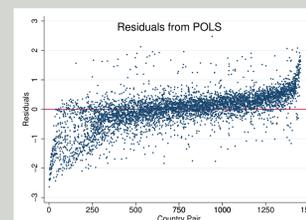


Figure: Controlling for Heterogeneity

## Low Quality Products

Variables	(1) FD	(2) FD	(3) FD
All Migrants	0.059* (0.030)		
H-Skill Migrants		0.099** (0.045)	
L-Skill Migrants			0.110* (0.057)
Indir Effect (All)	0.101*** (0.024)		
Indir Effect (High)		0.047** (0.022)	
Indir Effect (Low)			0.102*** (0.022)
Exogeneity Test (P Value)	0.47	0.16	0.50

## Conclusion

- ▶ High-skilled ethnic networks have a stronger direct impact.
- ▶ High-skilled ethnic networks trigger more high quality trade than low-skilled ethnic networks and vice versa.
- ▶ On average one additional low-skilled immigrant can create \$2068 of additional export earning that might help to offset much talked about welfare losses.
- ▶ There is advantages of a diversified immigrant portfolio as this paper finds a positive indirect effect of secondary ethnic network.

## References

- Eaton, J. and Kortum, S. (2002). Technology, geography, and trade. *Econometrica*, 70(5):1741-1779.
- Fieger, A. C. (2011). Nonhomotheticity and bilateral trade: Evidence and a quantitative explanation. *Econometrica*, 79(4):1069-1101.
- Giovannetti, G. and Lanati, M. (2017). Do high-skill immigrants trigger high-quality trade? *The World Economy*, 40(7):1345-1380.
- Henn, C., Papageorgiou, C., and Spatafora, M. N. (2013). *Export quality in developing countries*. Number 13-108. International Monetary Fund.