

Migration and the Structure of Manufacturing Production. A view from Italian Provinces

Elizabeth J. Casabianca*, **Alessia Lo Turco**◇, Daniela Maggioni♣
* Prometeia; ◇ Università Politecnica delle Marche; ♣ Università di Venezia

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Motivation and Research question

Motivation

- production specialisation matters for growth perspectives (Hausmann et al., 2007)
- large inflow of migrants from low to high income economies
- migration affects the labour markets of the receiving countries

Research question

What is the impact of immigration on the product mix of the host economy?

Migration and Production: why should there be a link

- Rybczynski effect
- Other effects, according to foreign workers' skills and tasks:
 - ▶ Low skilled migration
 - ★ the access to cheap migrant labour may relax production constraints, release resources, thus stimulating investments/innovation
 - ▶ Highly educated and skilled migration
 - ★ transfers of new capabilities and skills (Bahar and Rapoport, 2017)

Underlying mechanisms

- Reshuffling of resources across products
- Offshoring/migration substitutability
- Creation of new firms in relatively more/less labour/skill intensive industries

The Literature

- Literature on the factor mobility and countries' product specialisation (Harding and Javorcik, 2012; Swenson and Chen, 2014; Bahar et al., 2013)
- Migration and Innovation/Knowledge Flows (Bosetti et al., 2015; Bahar and Rapoport, 2017; Bratti and Conti, 2017).
- Migration and Production: effects on capital intensity and productivity (Kangasniemi et al., 2012; Orefice et al., 2017; Lewis, 2011); within- and between industry adjustments (Card and Lewis, 2005; Gonzalez and Ortega, 2011; Dustmann and Gritz, 2008; Gandal, 2004; Bratsberg et al. 2018);
 - ▶ For Italy: Bettin et al., 2014; De Arcangelis et al., 2015.

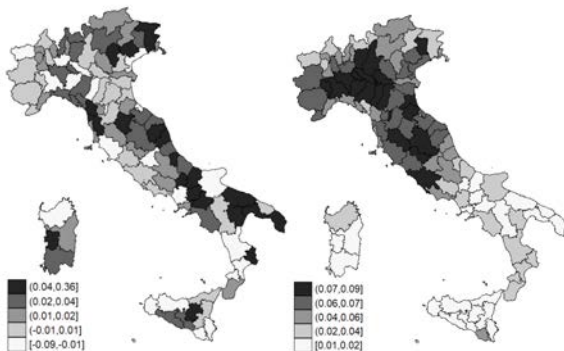
Our Contribution

- Delve into the changes brought about by migrants to the manufacturing product mix
 - ▶ we inspect whether migrants heterogeneously affect the production of goods according to their capital (skill/sophistication) intensity regardless of the industry they belong to
- Work in progress:
 - ▶ we explore some underlying mechanisms: substitution of imports, new firms' creation
- Focus on Italy, a peculiar developed country: marginal role for high skilled migration and important share of labour intensive productions

Why Italy?

- Growing flows of migrants in the 90s and 2000s. From 2.7% in 2003 to around 7.5% in 2011
- In 2011, about 95% of migrants are from low and middle income countries.

Changes in Capital Intensity (left) and Migration (right) across Italian Provinces (2003-2011)



Why Italy? Some Flagships of Italy's Manufacturing Production



Anecdotal Evidence - Making a Shoe I

Figure: Making Soles




Anecdotal Evidence - Making a Shoe II

Figure: Making Uppers



Migration Data

- resident population by nationality 2003-2011. ISTAT GeoDemo, demographic balances 

Data for computing province capital intensity and other product level indicators:

- Exports (proxy for production) at province-product (HS4d) level. Source: ISTAT COE dataset
- goods' capital (and skill) intensity: UNCTAD HS1996, year 1998 (and 2002);
- goods' PRODY (Hausmann, Hwang and Rodrik, 2007): trade by country and HS96 from BACI and countries' per capita GDP from World Bank WDI

$$K_{pt} = \sum_c \frac{\frac{X_{cp}}{X_c}}{\sum_c \frac{X_{cp}}{X_c}} \times \frac{CapitalStock_c}{Workers_c}$$

NUTS2 and NUTS3 Level Control Variables: ISTAT and Eurostat

Product/Sector Definition: more than 1,000 4-digit HS products

Geographical Dimension: 103 Italian NUTS 3 regions (provinces)

Period of the Analysis: 2003-2011

Empirical Model

$$K_{p, t} = \alpha + \beta \text{Migrants}_{p, t-1}^{\text{share}} + \gamma X_{p, t-1} + \delta_p + \lambda_t + \epsilon_{pt}$$

- $K_{p, t}$: weighted average capital intensity of province p at time t
- $\text{Migrants}_{p, t-1}^{\text{share}}$: share of migrants resident in province p at time $t - 1$ over total population. Total and split by country of origin
- $X_{p, t-1}$: time-varying regional and provincial covariates
- δ_p : province fixed effects
- λ_t : year fixed effects

Estimation: Fixed effects and IV (Altonij&Card, 1991; Card, 2001) over the period 2003-2011

$$IVperm_{94} = \sum_{c=1}^N w_{pc}^{1994} * \frac{\text{Migrants}_{ct}}{\text{Population}_p^{1994}} \quad (1)$$

w_{pc}^{1994} share of residence permits released to migrants from country c in province p in 1994 over the total permits released in the province

Baseline Results

	[1]	[2]	[3]	[4]	[5]
	OLS	FE	FE cluster	IV-FE	
				Second	First
$Migrants_{p, t-1}^{share}$	-1.318*	-1.754***	-1.754***	-2.571**	
	[0.675]	[0.529]	[0.503]	[1.009]	
$IVperm_{94}$					0.352***
					[0.066]
Controls	yes	yes	yes	yes	yes
Observations	927	927	927	927	927
R-squared	0.077	0.134	0.134	0.039	
# of NUTS3		103	103	103	103
Shear2					0.252
F-test					28.49

Economic Magnitude of the Effect

A one standard deviation increase of the presence of migrants within a province would reduce the capital intensity of local manufacturing production by 0.042 which corresponds to 1/3 of the capital intensity overall standard deviation and 95% of its within standard deviation.

The Effect of the observed Migration Increase on the Production Structure

HS 6506: Other headgear . Kp=11.313



HS 6505: Other headgear . Kp=9.76



HS 6404 footwear with outer soles of rubber and uppers of textile material. Kp=10.06



Anecdotal Evidence: back to uppers with 3% \uparrow in migration

HS 640620. Kp=11.11



HS 640610. Kp=10.11



Alternative IVs

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Second	First	Second	First	Second	First	Second	First
$Migrants_{p, t-1}^{share}$	-2.683** [1.119]		-2.798* [1.430]		-1.966** [0.981]		-2.109** [1.002]	
$IVperm_{91\ 94}$		0.319*** [0.067]						
$IVperm_{91}$				0.153*** [0.051]				
$IVperm_{94}^{EU12}$						4.484*** [0.949]		
$IVperm_{91\ 94}^{EU12}$								4.842*** [0.904]
$IVperm_{91}^{EU12}$								
Controls	yes	yes	yes	yes	yes	yes	yes	yes
Observations	927	927	927	927	927	927	927	927
R-squared	0.036		0.033		0.050		0.048	
# of NUTS3	103	103	103	103	103	103	103	103
SheaR2		0.218		0.0885		0.149		0.152
F-test		22.68		9.23		22.32		28.71

Alternative Second Stage Indicators

	Prody		Skill Intensity		Capital Intensity 2002	
	[1] IV-FE	[2] FE	[3] IV-FE	[4] FE	[5] IV-FE	[6] FE
<i>Migrants^{share}</i>	-3.897** [1.558]	-1.980*** [0.600]	-0.669** [0.310]	-0.372** [0.167]	-2.276** [0.013]	-2.195** [0.577]
Controls	yes	yes	yes	yes	yes	yes
Observations	927	927	927	927	927	927
R-squared	0.003	0.073	0.005	0.121	0.043	0.128
# of NUTS3	103	103	103	103	103	103
Shear2	0.252		0.252		0.252	
F-test	28.49		28.49		23.49	

Long Differences - $\Delta K_{2011-2003}$

	OLS	IV	
	[1]	Second [2]	First [3]
$\Delta Migrants_{p,2011-2002}^{share}$	-2.758*** [0.830]	-3.377*** [1.097]	
$\Delta IVperm_{94}$			0.340*** [0.077]
Controls	yes	yes	yes
Observations	103	103	103
R-squared	0.266		
SheaR2			0.247
F-test			19.66

Split by Country of Origin

	FE	[1]	[2]	[3]
		Second	IV-FE	First
			<i>Migrants</i> ^{share} _{High}	<i>Migrants</i> ^{share} _{Low}
<i>Migrants</i> ^{share} _{High}	9.506	9.546		
	[6.986]	[18.053]		
<i>Migrants</i> ^{share} _{Low}	-1.835***	-2.442**		
	[0.543]	[1.101]		
<i>IVperm</i> _{94 High}			0.419***	-0.764
			[0.129]	[1.393]
<i>IVperm</i> _{94 Low}			0.000	0.0364***
			[0.003]	[0.064]
Controls	yes	yes	yes	yes
Observations		927	927	927
R-squared		0.035		
# of NUTS3		103	103	103
SheaR2 _{High}			0.2	
F-test _{High}			7.44	
SheaR2 _{Low}				0.224
F-test _{Low}				15.95
Cragg Donald				85.895

Province-Product Level Evidence

	FE	IV-FE	
		Second	First
	[1]	[2]	[3]
$K_g * Migrants^{share}$	-2.622*** [0.884]	-3.469*** [1.257]	
$K_g * IVperm_{g4}$			0.358*** [0.057]
Observations	505520	505520	505520
R-squared	0.853		
Fixed Effects			
NUTS3*year	yes	yes	yes
HS4*year	yes	yes	yes
NUTS3*HS4	yes	yes	yes
Shear2			0.237
F-test			131

K_g : capital intensity of HS4d product g

Further Robustness

- Brain drain
- Local financial development
- Capital Intensity of Imports
- Tertiary Education
- Excluding top three main migration origins from province export flows
- Dynamic panel data model
- Spatial lag
- Area-year dummies
- Exclusion of consumption goods
- HS-6digit product level indicators
- Industry level indicators - no effect
- Exclusion of crisis/Sub-period estimates

Effect mainly driven by

- District Areas
- Provinces with initial low immigration

Further Results

- no effect on the level of exports
- no effect on the distribution of the capital intensity of products
- no effect on the emergence of new comparative advantage export products
- strengthening of extant comparative advantage in export products

In search of the underlying mechanisms: Import Substitution - Province-Product Level

Dependent Variable: $(Imports/VA)_{gpt}$; Sample: goods produced in 2002

	Migrants			Migrant Firms		
	FE	IV-FE		FE	IV-FE	
		Second	First		Second	First
$K_g * Migrants^{share}$	0.001 [0.001]	0.003** [0.001]		0.000 [0.000]	0.002** [0.001]	
$K_g * IVperm_{94}$			0.348*** [0.007]			0.506*** [0.020]
obs	502,740	502,740	502,740	502,740	502,740	502,740
R-squared	0.847			0.825		
ShearR		0.228			0.0748	
F-test		2525			651.9	
Fixed Effects						
NUTS3*year	yes	yes	yes	yes	yes	yes
HS4*year	yes	yes	yes	yes	yes	yes
NUTS3*HS4	yes	yes	yes	yes	yes	yes

K_g : capital intensity of HS4d product g

Conclusions and Work in Progress

Concluding remarks

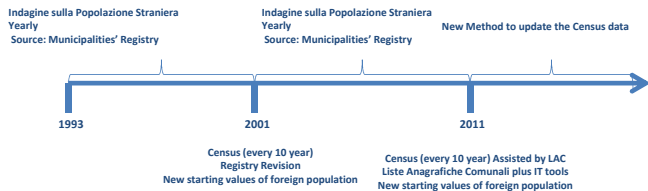
- Migration reduces the capital intensity of provincial manufacturing production. The effect is driven by migrants from LMI countries, by district areas and by provinces with initially low levels of immigration
- Mechanisms:
 - ▶ the presence of migrants eases the maintenance/reintroduction of production of labour intensive goods

Work in progress

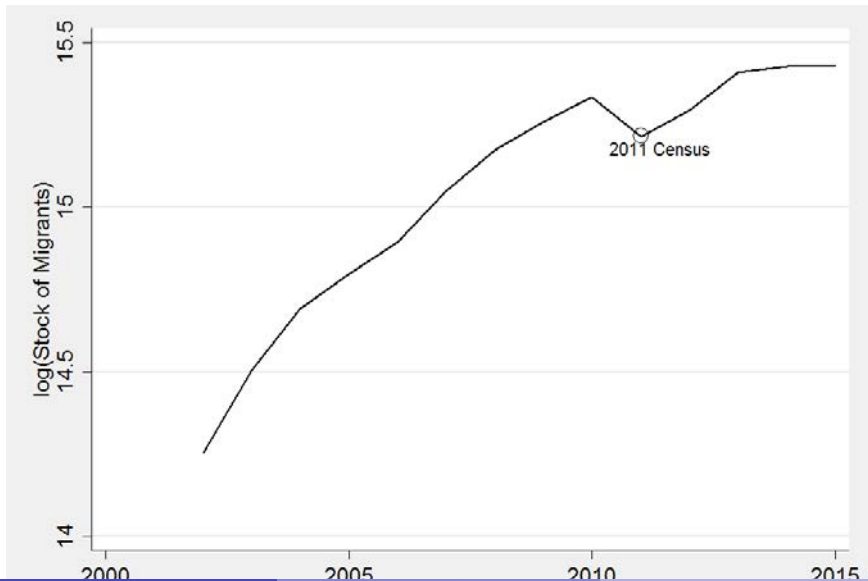
- creation of new firms

Thank You

Changes in Statistical Methods for Detecting Foreign Residents



Changes in Statistical Methods for Detecting Foreign Residents



Arrivals by boat Italy

