UNIVERSITÀ DEGLI STUDI DELL'AQUILA

TERRITORI APERTI

ersa 60th Congress
24>27 - 08 | 2021
VIRTUAL EDITION

FDI and labor productivity: New evidence for Italian regions

C. Di Stefano – University of L'Aquila
P.L. Iapadre – University of L'Aquila
M.G. Ladu – University of L'Aquila

PRESENTER:
Dr. Cristina Di Stefano
Post-doc Research Fellow
University of L'Aquila

DATE
25 August 2021

cristina.distefano@univaq.**it**

Agenda

- Introduction

- Literature review

- Research question

- Methodology

- Results

- Conclusion

Introduction

Foreign direct investment (FDI) is often considered a driver of economic development, since it is a vehicle of technology transfer and creation (Iammarino and McCann, 2013).

Given the rapid increase of FDI flows in the last decades, several authors have been investigating the topic in recent years and identified different channels through which knowledge and new technology spill over to domestic firms: competition, imitation, workers mobility, backward and forward and horizontal linkages (Blomström and Kokko, 1998).

Numerous empirical studies have investigated the relationship between FDI and economic growth at a micro and a macro level and results are mixed.

While the impact of FDI on economic growth of countries has been extensively analyzed, a limited number of authors explored the issue on a regional basis.
This scarce attention is probably due to the lack of data; however, spillovers mainly occur at a local level and analysis conducted at national one, that miss to capture regional effects, may lead to misrepresenting results (Hamida, 2013).

Research questions

The aim of this paper is to study the impact of **FDI** on **labor productivity growth** of Italian regions in the period between 1995 and 2018.

We decided to focus on labor productivity growth since FDI spillovers determine an increase in productivity in the first place and may stimulate economic growth as a consequence (see Barro and Sala-i- Martin, 2003; Coe, Helpman, and Hoffmaister, 1997; Grossman and Helpman, 1991; Romer, 1990, 1992 among others).

The connection between FDI and labour productivity is stronger than that between FDI and per capita GDP since the latter can also be influenced by other elements (i.e. employment rate and demographic change).

$$\frac{Y}{N} = \frac{Y}{E}\frac{E}{A}\frac{A}{N}$$

Literature review

Among the studies addressing the FDI-growth relationship on a sub-national level:

- Numerous analyze Chinese regions(Ram et al., 2017; Mitze and Özyurt 2014; Li and Haynes, 2012; Fu, 2008)
- Other authors consider the case of a developing country: i.e. Vietnam (Anwar and Nguyen, 2010) and India (Ramasamy et al., 2017)
- One study focuses on Russia (Ledyaeva and Linden, 2006)

Focusing the attention on Europe:

- Only two studies propose an analysis conducted at a European level (Völlmecke et al., 2016; Casi and Resmini, 2017)
- Other authors conducted a single country analysis
  - Spain (Bajo-Rubio et al., 2009)
  - UK (Driffield, 2004)
  - Czech Republic (Mallick and Zdražil, 2018)
  - Ukraine (Getzner and Moroz, 2020)

Most of the studies indicate that FDI enhance regional growth only when other factors such as institutions, human capital and absorptive capacity reach a minimum level.

Methodology

We use a dynamic panel data method to tackle potential endogeneity and reverse causality issues in the estimation of the relationship between labour productivity growth and FDI. In particular, we use a two-step SYS-GMM estimator.

We estimate the following equation:

$$LP_{git} = \beta_o LP_{it} + \beta_1 FDI_{it} + \beta_2 Z_{it} + \mu_i + \varepsilon_{it}$$, where i=1, 2,…n and t=2008, …2018

Where:

- the dependent variable, LP_{git}, is the labour productivity growth in region i in year t we measured through the following:

$$LPg_{it} = \frac{LP_{i,t+1} - LP_{i,t}}{LP_{i,t}}$$

- FDI
- Z_{it} is a set of control variables which include human capital, per capita physical capital stock, degree of openness and year dummies;
- μ_i represents unobserved region-specific effects and
- ε_{it} is random error and the
- β_s are the parameters to be estimated.

Methodology

Table 1 presents the list of variables

Variable	Description
Labor productivity growth (dependent variable)	Growth rate of GDP per person employed
FDI	Ratio of multinational firm's total sales to GDP
Physical capital stock	Estimated with the perpetual inventory method. Basic data: gross fixed capital formation
Human capital	Share of population aged 25 and over with completed secondary or tertiary education on total population aged 25 and over
Trade openness	Sum of export and import as a ratio of GDP

Results

Table 2. Labour Productivity Growth and FDI: Linear model

	(1)	(2)	(3)	(4)
Productivity_1	0.0777**	0.0104	0.0840**	0.0591
	(2.29)	(0.19)	(2.63)	(1.48)
FDI	-0.00607	-0.0114		
	(-0.83)	(-1.35)		
FDI_1			-0.00567	-0.0276***
			(-1.20)	(-2.91)
Human Capital	-0.00347	0.0121	-0.00655	0.0405
	(-0.08)	(0.29)	(-0.21)	(0.88)
Physical Capital	0.0584*	0.0210	0.0655**	0.0431
	(1.76)	(0.49)	(2.51)	(1.39)
Trade		0.0152		0.0243*
		(1.33)		(1.91)
Year dummies	yes	yes	yes	yes
Constant	3.950	-1.760	4.127*	-1.279
	(1.62)	(-0.80)	(1.94)	(-0.33)
N	260	180	260	180
p-value of AR(1) test	0.002	0.012	0.002	0.007
p-value of AR(2) test	0.088	0.263	0.092	0.248
p-value of Hansen test	0.521	0.261	0.426	0.117

*Note: All variables are represented in natural logarithms. Dependent variable is labour productivity growth. Estimation is by two-step system GMM; t statistics in parentheses ; * p < 0.10, ** p < 0.05, *** p < 0.01*

TERRITORI APERTI

UNIVERSITÀ DEGLI STUDI DELL'AQUILA

ersa 60th Congress 24>27 - 08 | 2021 VIRTUAL EDITION

Results

Table 3. Labour Productivity Growth and FDI: Interaction effect of human capital and trade openness

	(1)	(2)	(3)	(4)	(5)
Productivity_1	0.105*	0.00170	0.00764	0.0728	0.0805
	(2.08)	(0.04)	(0.25)	(1.44)	(1.11)
FDI	-0.0930**	-0.120*		0.00914	
	(-2.68)	(-1.82)		(0.70)	
FDI_1			-0.0697**		-0.00859
			(-2.41)		(-0.54)
Human Capital	0.00142	0.0677*	0.0420	0.00533	0.00571
	(0.04)	(1.88)	(1.52)	(0.13)	(0.10)
Physical Capital	0.0753	0.00232	-0.00584	0.0594*	0.0651
	(1.45)	(0.09)	(-0.34)	(2.07)	(1.20)
Trade		0.00777	0.00821	0.0782*	0.0467
		(1.37)	(1.34)	(1.99)	(0.88)
*FDI*human capital*	0.0373**	0.0435*	0.0228*		
	(2.71)	(1.82)	(1.79)		
*FDI*Trade*				0.0188*	0.00952
				(1.80)	(0.71)
Year dummies	yes	yes	yes	yes	yes
Constant	0.358	-5.465**	-4.035	-0.723	-1.811
	(0.18)	(-2.10)	(-1.62)	(-0.32)	(-0.59)
N	260	180	180	180	180
p-value of AR(1) test	0.002	0.012	0.013	0.017	0.015
p-value of AR(2) test	0.163	0.309	0.925	0.269	0.264
p-value of Hansen test	0.674	0.274	0.160	0.522	0.113

*Note: All variables are represented in natural logarithms. Dependent variable is labour productivity growth. Estimation is by two-step system GMM; t statistics in parentheses ; * p < 0.10, ** p < 0.05, *** p < 0.01*

TERRITORI APERTI

UNIVERSITÀ DEGLI STUDI DELL'AQUILA

ersa 60th Congress 24>27 - 08 | 2021 VIRTUAL EDITION

Results

Table 4. Robustness test using Total Factor Productivity Growth

	1	2	3	4
TFP_productivity_1	-0.167	-0.167	-0.143**	-0.167*
	(-0.66)	(-0.66)	(-2.41)	(-2.05)
FDI	-0.0119	-0.0119	-0.149**	0.0477**
	(-0.35)	(-0.35)	(-2.15)	(2.10)
Human Capital	0.0658	0.0658	0.0881	0.00777
	(0.42)	(0.42)	(1.29)	(0.15)
Physical Capital	0.0144	0.0144	-0.0192	0.00373
	(0.25)	(0.25)	(-0.51)	(0.09)
Trade	0.0445**	0.0445**	0.0243	0.0982**
	(2.18)	(2.18)	(1.22)	(2.60)
*FDI*human capital*			0.0614**	
			(2.59)	
*FDI*Trade*				0.0235**
				(2.46)
Year dummies	yes	yes	yes	yes
Constant	0.116	0.116	-6.809**	-0.797
	(0.01)	(0.01)	(-2.78)	(-0.18)
N	180	180	180	180
p-value of AR(1) test	0.082	0.082	0.010	0.015
p-value of AR(2) test	0.281	0.281	0.456	0.363
p-value of Hansen test	0.089	0.089	0.160	0.181

*Note: All variables are represented in natural logarithms. Dependent variable is TFP growth . Estimation is by two-step system GMM; t statistics in parentheses ; * p < 0.10, ** p < 0.05, *** p < 0.01*

TERRITORI APERTI

UNIVERSITÀ DEGLI STUDI DELL'AQUILA

ersa 60th Congress 24>27 - 08 | 2021 VIRTUAL EDITION

Results

Table 5. Robustness test using secondary enrolment for human capital

	(1)	(2)	(3)	(4)
Productivity_1	-0.00954	-0.00848	0.0738	0.0558
	(-0.10)	(-0.10)	(1.14)	(0.69)
FDI	-0.308*		0.00765	
	(-2.04)		(0.55)	
FDI_1		-0.0638**		-0.00554
		(-2.13)		(-0.50)
Human Capital	0.225**	0.0842**	-0.00707	0.0157
	(2.51)	(2.51)	(-0.09)	(0.24)
Physical Capital	-0.0163	-0.0154	0.0580	0.0424
	(-0.23)	(-0.24)	(1.25)	(0.70)
Trade	0.0120*	0.00387	0.0679	0.0373
	(1.73)	(0.71)	(1.38)	(0.92)
FDI*human capital	0.0812*	0.0159*		
	(2.06)	(1.83)		
FDI*Trade			0.0176	0.00764
			(1.29)	(0.65)
Year dummies	yes	yes	yes	
Constant	-4.387**	-3.230	-1.768	-2.310
	(-2.86)	(-1.64)	(-1.00)	(-1.65)
N	180	180	180	180
p-value of AR(1) test	0.012	0.013	0.016	0.015
p-value of AR(2) test	0.302	0.903	0.251	0.271
p-value of Hansen test	0.254	0.174	0.105	0.115

*Note: All variables are represented in natural logarithms. Dependent variable is TFP growth . Estimation is by two-step system GMM; t statistics in parentheses ; * p < 0.10, ** p < 0.05, *** p < 0.01*

TERRITORI APERTI

UNIVERSITÀ DEGLI STUDI DELL'AQUILA

ersa 60th Congress 24>27 - 08 | 2021 VIRTUAL EDITION

Conclusions

- Results do not indicate a significant and direct effect of current FDI on labour productivity growth while there is a negative and significant effect of the first lag of FDI after controlling for trade openness.
- Human capital has no significant direct effect on labour productivity growth; however, the interaction term (FDI*human capital) is positive and significant also after controlling for trade openness.
- This result confirms previous literature that considers human capital an important driver of productivity growth; in fact, educated and skilled workforce can absorb and assimilate changes produced by technology and knowledge embedded in the FDI inflows.
- Results hold also considering TFP
- The significance of the human capital interaction effect on FDI-labour productivity growth holds also using secondary enrolment ratio as a proxy for human capital while disappears the significance of the trade openness interaction effect.

UNIVERSITÀ DEGLI STUDI DELL'AQUILA

TERRITORI APERTI

ersa 60th Congress
24>27 - 08 | 2021
VIRTUAL EDITION

Thank you for the attention

FDI and labor productivity: New evidence for Italian regions

C. Di Stefano – University of L'Aquila
P.L. Iapadre – University of L'Aquila
M.G. Ladu – University of L'Aquila

Funding: This study was supported by Territori Aperti, a project funded by the Fondo Territori Lavoro e Conoscenza of the Confederazione Generale Italiana del Lavoro, the Confederazione Italiana Sindacati Lavoratori, and the Unione Italiana del Lavoro.

PRESENTER:
Dr. Cristina Di Stefano
Post-doc Research Fellow University of L'Aquila

DATE
25 August 2021

cristina.distefano@univaq.it