

BANCA D'ITALIA

EUROSISTEMA

Global Value Chain and the Great Recession: Evidence from Italian and German Firms

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BACKGROUND

- *Relevant structural change in the world economy in the last 20 years based on a strong international division of labor (Feenstra, 1998).*
- *The production of final goods is fragmented in several production stages in Global Value Chains (GVC).*
- *The production of a final good can be seen as a set of tasks that can be allocated to different production units, both home and abroad.*

Background

- *GVC are now pervasive: trade in intermediate goods account for 56%-73% of total trade (Miroudot e Ragoussis, 2009).*
- *Stronger interdependences proved the systemic importance of GVC during the 2008-09 crisis.*
- *Baldwin (2009): GVC were a channel of rapid transmission of real and financial shocks, thus amplifying national fluctuations in demand and generating the world trade collapse.*
- *Altomonte et al. (2012): GVC are not all alike; their internal organization matters a lot in the transmission of the crisis. Even firms' positioning is quite relevant (Bekes et al., 2011).*



This paper

- *GVC from a micro perspective. Firm characteristics and performance using the EFIGE dataset. Cross-national heterogeneity.*
- *Descriptive part 1: heterogeneity between final and intermediate firms in terms of size, productivity and performance during crisis.*
- *Descriptive part 2: heterogeneity in terms of strategies.*
- *Econometrics: positioning in a GVC, strategies, and performance during the crisis.*



Italy vs. Germany

The leitmotiv of the paper is the comparison between Italian and German firms during the crisis. Why?

1. Largest manufacturers and exporters in the Eurozone
2. Firms heavily involved in GVC
3. High share (especially in Italy) of intermediate firms.



The 2008-09 crisis

That crisis represents a very interesting shock under several point of view.

1. It was unexpected and exogenous to the IT and DE economic conditions as it originated from financial turbulences of a segment of the mortgage market in the US;
2. It was strong. GDP drop in 2008-09 was 4% in Germany and 7% in Italy;
3. GVC had a prominent role in the transmission of that shock.

Results

We confirm an “almost stylized” fact of the literature:

- *Intermediate firms are **on average** smaller and less productive than final firms;*
- *They were **hit harder** by the crisis.*

However **heterogeneity matters** for performance:

- *High human capital or innovative intermediate firms succeeded in limiting the damages of the crisis;*
- *Intermediate firms are usually less involved in such strategies.*

Differences in the positioning in GVC and strategies **explain a relevant portion of the IT-DE performance gap** during the crisis.

Literature review

- *Endogenous formation and organization of **GVC** with heterogeneous firms: Helpman (2006), Antras&Helpman (2004), Antras&Chor (2013).*
- ***Intermediate firms, clusters, and development:** Gereffi (1994); Gereffi&Korzeniewics (1994), Gereffi (1999), Humphrey&Schmitz (2002). The role for upgrading (Accetturo et al., 2011; Giunta et al., 2012; Accetturo et al., 2012).*
- *Involvement of **Italian and German firms in GVC** (Breda&Cappariello, 2012).*
- ***GVC and the great recession:** Alessandria et al. (2011); Escaith et al. (2010); Altomonte et al. (2012); Békés et al. (2011).*



Data

- *Microdata of the EU-supported EFIGE project.*
- *Sample includes: 3000 firms for FR, DE, IT, ES; 2000 for UK; 500 for AT and HU.*
- *High representativeness of the national industrial structure (Barba Navaretti et al., 2011). Information on: structure of the firm, labor force, technology, internationalization, financial and positioning on the market.*
- *EFIGE merged with balance sheets by Amadeus (Bureau Van Dijk).*



Our core variable

- *Measure of “how intermediate” is a firm is the share of total turnover made up by sales of produced-to-order goods to other private firms (SPTO).*
- *Cons: it does not allow to distinguish where, in a GVC, a firm is located with respect to the final consumer.*
- *Pro: a continuous measure of how much a firm is involved in a firm-to-firm interaction.*

Descriptive part 1

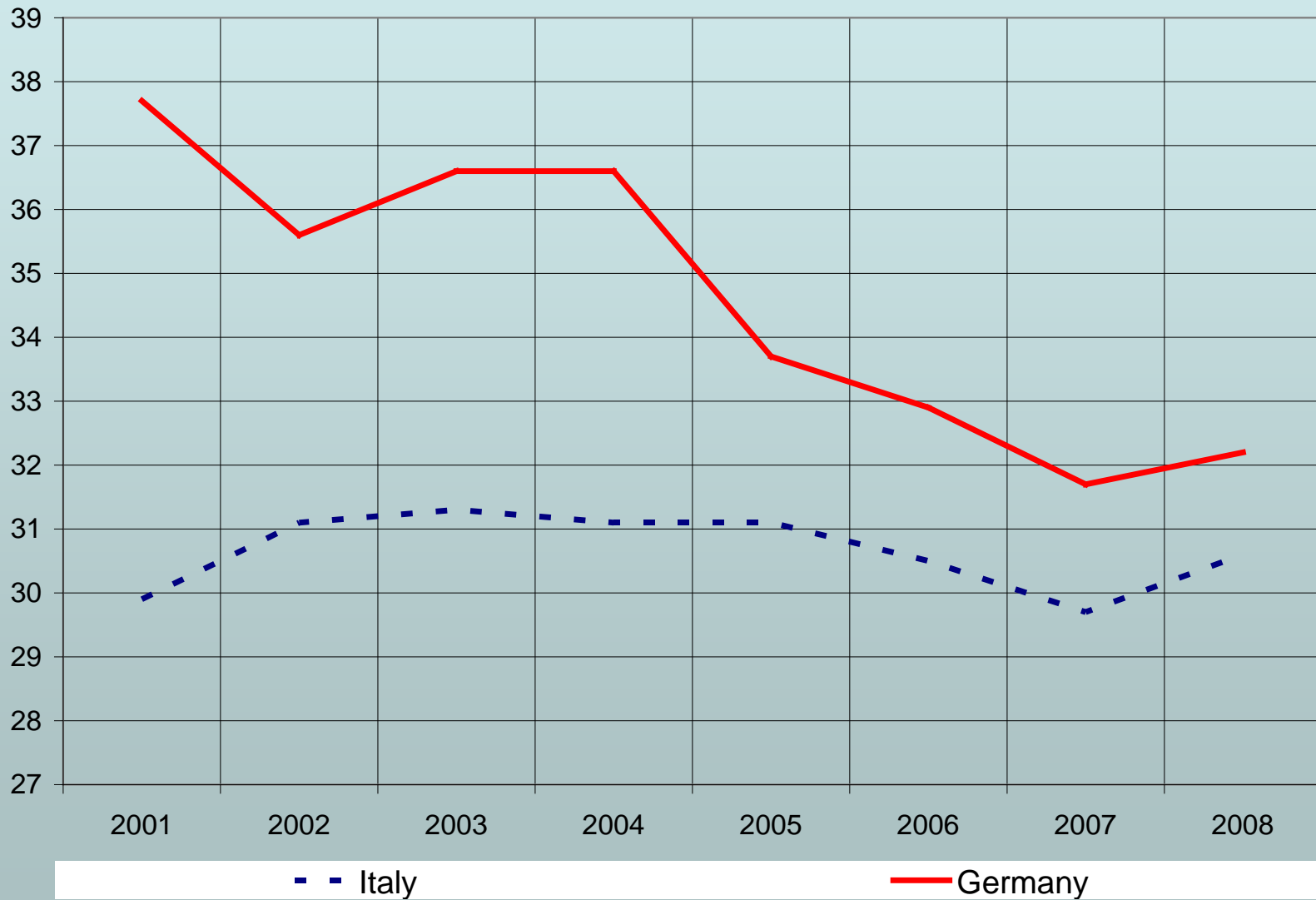


Result 1: high involvement in GVC, more intermediate firms in IT than DE

	Italy		Germany	
	SPTO	Purch./sales	SPTO	Purch./sales
Traditional	82.1	32.3	53.8	17.7
Chemical	76.9	38.0	65.6	17.0
Metals	84.7	34.1	69.5	16.9
Mechanics	81.1	33.5	62.7	21.7
Advanced mechanics	70.3	29.9	50.9	19.5
Automotive	78.9	36.8	60.8	22.1
Other	78.2	33.2	62.2	15.9
Total	80.9	33.7	62.9	18.2



Result 2: Italian firms more fragmented than German; but with convergence





Result 3: Intermediate worse than final (in both countries); IT worse than DE

	Intermediate	Final
Sales-2007	8,251	15,708
Empl.-2007	41.1	58.9
Lab. Prod.- 2007	50.4	58.0
Sales 2008- 09	-25.4	-17.0

	Italy			Germany		
	Interm.	Final	Total	Interm.	Final	Total
Sales-2007	8,005	14,798	10,377	9,191	17,038	13,777
Empl.-2007	35.6	43.6	38.3	62.4	81.4	73.5
Lab. Prod.- 2007	50.2	52.9	51.1	56.6	99.5	82.1
Sales 2008- 09	-30.2	-25.3	-28.4	-7.5	-4.9	-5.9 ¹⁴

Descriptive part 2

Heterogeneity

- *Heterogeneity among intermediate can be stronger than for the final (Accetturo et al., 2011; Giunta et al. 2012).*
- *Firms might be different in terms of :*
 - *Human capital*
 - *Internationalization*
 - *Innovation*
- *All these characteristics are frequently highly correlated. We resort to a PC analysis to extract latent variables.*

Heterogeneity

- *We consider these variables:*
 - *Share of employees with a tertiary education;*
 - *Share of employees in training;*
 - *Dummy for product innovation;*
 - *Dummy for process innovation;*
 - *Share of exports.*
- *We consider all the components with an eigenvalue greater than one:*
 - *Component Innovation&Trade correlated with innovation and exports*
 - *Component Human Capital (HC) correlated with tertiary education and training.*



Result 4: intermediate less involved in both strategies; IT gap for HC

	Interm.			Final		
Inno&Trade	-0.083			0.116		
	(1.195)			(1.200)		
HC	-0.073			0.103		
	(1.021)			(1.083)		

	Italy			Germany		
	Interm.	Final	Total	Interm.	Final	Total
Inno&Trade	-0.075	0.133	-0.002	-0.113	0.092	0.006
	(1.194)	(1.183)	(1.194)	(1.196)	(1.223)	(1.216)
HC	-0.216	-0.188	-0.206	0.471	0.529	0.505
	(0.944)	(0.975)	(0.955)	(1.116)	(1.090)	(1.101) _B

Econometrics: does this evidence
matter for firm performance?



Performance during the crisis

We estimate the following equation:

$$\Delta y_i = \alpha + \beta_1 SPTO_i + \beta_2 Strat_i + \beta_3 SPTO_i * Strat_i + \gamma X_i + \phi_1 D_s + \phi_2 D_c + \varepsilon_i$$



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↓
Log growth rate of sales between
2007 and 2009



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Share of produced to order sales



Performance during the crisis

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Strategies and their interaction with SPTO



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Firm level controls



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Sectoral and country dummies



Results

	(1)	(2)	(3)	(4)
SPTO	-0.034** (0.016)	-0.038** (0.016)	-0.035** (0.016)	-0.036** (0.016)
Log(empl)-2007	-	3.504** (1.421)	3.449** (1.420)	3.477** (1.417)
Log(sales)-2007	-	-4.074*** (1.104)	-4.245*** (1.165)	-4.170*** (1.162)
Inno&Trade	-	-	0.923* (0.564)	-2.282** (0.996)
HC	-	-	2.205*** (0.601)	3.555** (1.124)
Inno&Trade*SPTO	-	-	-	0.042** (0.012)
HC*SPTO	-	-	-	-0.016 (0.014)
R ²	0.13	0.14	0.15	0.15
No. Obs.	3,253	3,253	3,253	3,253



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How much GVC matter for the IT-DE gap?

- *By taking into account the explained variance in the performance gap between IT and DE:*
 - *5% sectors*
 - *37% firm characteristics*
 - *19% SPTO*
 - *35% strategies*
 - *5% interaction between strategies and SPTO.*

GVC explain roughly 25% of the total explained performance gap between the 2 countries.
- *There is, however, still an unexplained part. By taking into account the unconditioned gap, GVC still explain 4% of the total gap.*



Thanks for your attention!