GVCs Effect of Twin Transition and Resilience on Small Firms in the Italian Setting

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Abstract

The aim of the paper is testing if, and the extent to which, the participation in Global Value Chains (GVCs) influences firm's competitiveness (i.e., the "GVC effect"). The empirical results show that the participation in GVCs moderates the relationship between small firms and performance from different points of view: digital transition, green transition, and resilience. Moreover, we found that participation in GVCs is influenced by management openness, Institutional openness, and business openness.

Keywords: Global Value Chain; GVCs; Industry 4.0; Digital Transition; Green Transition; Small Firms; Global Competition

1. Global Value Chains and Firm's Competitiveness

The Global Value Chains (GVCs) theory was developed in the mid-1990s (Gereffi, 1999) by studying the worldwide fragmentation of the activities behind the realization of final products. Indeed, Global Value Chains is defined as a sequence of activities where each stage (production, processing, R&D, design, marketing, transportation, distribution) adds value, and at least two stages take place in different countries (Gereffi & Fernandez-Stark, 2011). In the light of the rise of globalization, the role of GVCs has become greatly relevant: nowadays around 70-80% of world trade (OECD, 2020; Cambridge, 2022) concerns GVCs through the transactions of raw materials, intermediated goods, parts and components, services, etc., and often several times.

According to the literature, GVCs participation is a factor of a firm's competitiveness: working inside the GVCs allows reaching higher levels of efficiency (e.g., Brancati et al., 2017; Agostino et al., 2020), innovation (e.g., De Marchi e al., 2018), adoption of 4.0 technologies (e.g., Strange & Zucchella, 2017; Delera et al., 2022), environmental sustainability (e.g., Qu et al., 2020) as well as encompassing ethical and CSR issues (Musso & Risso, 2006; Brondoni & Pepe,

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2007; Pepe, 2007; Schlegelmilch & Öberseder, 2007; Apolloni et al., 2013), and more in general economic performances (e.g., Deyshappriya & Maduwanthi, 2020).

Italy is an ideal candidate to study this topic for at least two reasons. Firstly, Italy is one of the main countries primarily involved in the GVCs: it is the 9th ranking country worldwide according to the share of export linked to the GVCs, showing an increase in the last years from 43.6% in 2010 to 47.9% in 2019 (Fondazione Masi, 2022). Secondly, Italy is the 1st ranking EU country for the number of small firms (up to 49 employees: 3.6 million; Eurostat data), which represents the vast majority of the national entrepreneurial system (99.3% of the total firms; Eurostat data). The latter is a critical factor because if, on one hand, Italian small firms have a competitiveness gap compared to the medium and large ones, on the other, GVCs participation may play a key role in reducing this gap. This reasoning leads us to investigate if a GVCs participation may have a positive effect on small firm performances; considering, to our best knowledge, the few empirical studies focused on these types of enterprises.

Moreover, the originality of this paper relies on another two questions: the first one concerns the possibility of analyzing the economic resilience to the Covid-19 shock; the second one regards the possibility of studying firm performance from different perspectives by focusing on current critical topics of industrial policies, such as digital and green transition (European Commission, 2022, 2023).

To address both these matters, we use a dataset related to a survey carried out by the Centro Studi Guglielmo Tagliacarne (The Italian Research Centre of the Chambers of Commerce) and Unioncamere (The Italian Union of Chambers of Commerce) in 2019 on a representative sample of 3,000 Italian manufacturing firms having a number of employees between 5 and 499, enriched with balance sheet information to update data on economic performances.

2. Global Value Chains and Firm Performances

2.1 Literature Review

Literature has widely investigated the benefits produced by a firm's participation in GVCs. Some scholars (Yuhua & Bayhaqi, 2013) have grouped them in the following manner: i) enhancement of technical capacity; ii) optimization of the production capacity and improvement of production efficiency; iii) raising equity finance from foreign investors and acquisition of competent human resources.

These benefits are in large part produced by three types of effects generated by the participation in GVCs. The first one is the "positive scale effect": participation in GVCs favors scale economies (Feder, 1983), that both promote corporate innovation (Grossman and Helpman, 1994; Eaton and Kortum, 2001) and increase a marginal profit ratio also by lowering innovation marginal cost (Atkeson and Burstein, 2011; Bøler et al., 2015; Bloom et al., 2016). This encourages R&D and innovation activities, even in the environmental sustainability field (Qu et al., 2020). The second one is the "positive spillover effect": participation in GVCs allows firms to access overseas patents and to achieve technology spillover (OECD, 2012), as well as improving imitation efficiency and achieving technological progress, and supporting green growth (Schiff and Wang, 2004; Rafiq et al., 2016; Ho et al., 2018). The third

is the "positive competitive effect": participation in GVCs involves a greater competitive pressure (Qu et al., 2020) leading firms to invest in innovation and upgrading their technological level for consolidating their position (Aghion et al., 2009; Ponte et al., 2019); they have to compete with firms from abroad that often produce with a higher technological degree associated to a low cost.

According to the GVC approach (e.g., Gereffi and Korzeniewicz, 1994, Gereffi, 1999, and Humphrey and Schmitz, 2002), the complex international relationship along the GVCs generates a flow of managerial expertise and opportunities for learning and knowledge acquisition through the relations between buyers and suppliers (Faraoni & Petretto, 2009; Saliola & Zanfei, 2009; Alcacer & Oxley, 2014; Keijser et al., 2021). This compensates the relative weakness of domestic learning channels (Fu et al., 2011; Pietrobelli & Rabellotti, 2011; De Marchi et al., 2018).

This acquisition of knowledge and competencies generates several impacts: i) promotes R&D and innovation (Gereffi, 1999; Pietrobelli & Rabellotti, 2011) – also thanks to the creation of technological learning atmosphere driven by the information transfer on technologies (Gereffi et al., 2005; Antràs & Chor, 2013; Ponte et al., 2019); ii) supports industrial upgrading processes ((Humphrey and Schmitz, 2002; see section 3.2 for a detailed discussion Brancati et al., 2017); iii) opens new market opportunities (Maduwanthi & Ravindra Deyshappriya, 2020).

Recently, Maduwanthi and Ravindra Deyshappriya (2020) found that participation in GVCs has one direct impact on profit and one indirect impact (always on profit) via its influence on sales revenue and R&D activities.

Empirical studies for Italy show that participation in GVCs produces a premium in terms of efficiency, productivity, intensive and extensive margins of innovation and R&D, especially for the highly-capable "relational" firms (Brancati et al., 2017; Agostino et al., 2020)

These positive effects on innovation are reflected on digital and green transition: i) firms operating along the GVCs increasingly urged to adopt more sophisticated technologies (Andreoni & Anzolin, 2019). In this regard, Delera et al. (2022) found that the participation in GVCs positively affects the adoption of Industry 4.0 technologies (for an analysis on the impact of 4.0 technologies on GVCs, see Strange & Zucchella, 2017). With regards to green transition, Qu et al. (2020) found that GVCs support industry green growth.

2.2 Hypotheses Development

In line with all arguments explained above, we posit the following hypotheses:

Hp1a. Participation in GVCs has a positive effect on digital transition

Hp1b. Participation in GVCs has a positive moderator effect on small firms digital transition
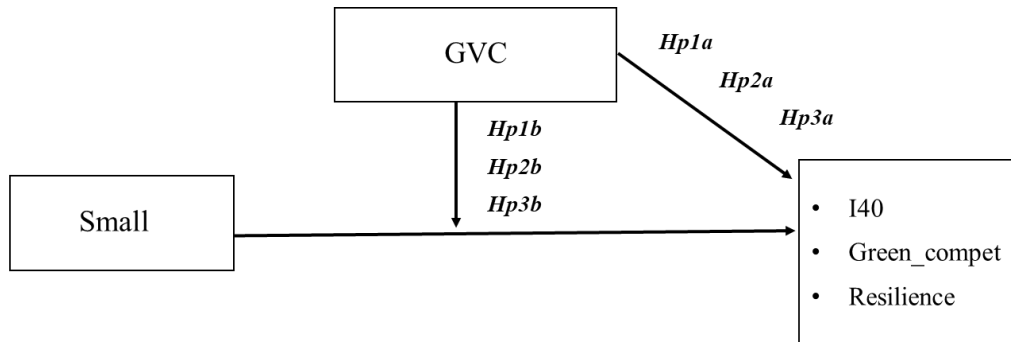
Hp2a. Participation in GVCs has a positive effect on green transition

Hp2b. Participation in GVCs has a positive moderator effect on small firms green transition

Hp3a. Participation in GVCs has a positive effect on resilience

Hp3b. Participation in GVCs has a positive moderator effect on small firms resilience

Figure 1: *Conceptual Framework*

3. Data and Empirical Strategy

3.1 Data

The data used comes from a survey carried out by the Centro Studi Tagliacarne-Unioncamere (The Italian Union of Chambers of Commerce) in 2019 with a representative sample of 3,000 Italian manufacturing firms having a number of employees between 5 and 499. The sample corresponds to 2.4% of the entire Italian population in terms of firms and 3.6% in terms of employees. Specifically, the sampling procedure ensured the statistical representativeness of the data following both an exhaustive and random sampling criteria. The stratification considered three dimensions of firms: i) industry (24 divisions of the section C manufacturing sector of the Nace Rev.2 classification); ii) size class in terms of employees (5-9, 10-49, 50-249, 250-499); iii) geographical location (North-West, North-East, Center, South). The survey was conducted by the CATI method (Computer-Assisted Telephone Interviewing) by a professional contractor with the aim of gathering both qualitative and quantitative information on firms; several preliminary briefings were held with the contractor aimed at explaining to interviewers the exact meaning of the issues of the questions. The dataset was enriched with balance sheet information (Aida database, Bureau van Dijk) to update data on economic performances.

3.2 Empirical Strategy

Since our dependent variable is binary, we use a probit model that is the suitable econometric model for this case (Wooldridge, 2010, pp. 453-459). Thus, through probit regression we model the conditional probability of registering the different types of performance according to the participation to GVCs. Specifically, our probit model is as follows:

$$\text{Prob}(Y = 1)_i = \Phi(\beta_0 + \beta_1 GVC_i + + \beta_2 C_i + \varepsilon_i) \tag{1}$$

where *Y* represents, according to different dependent variables, the probability of: i) investing in digital transition by adopting 4.0 technologies (*I40*); investing in green transition by focusing on environmental sustainability for competitiveness upgrading (*Green_compet*); exceeding in 2021 the revenue level of 2019 (pre-Covid year) (*Resilience*). C is a vector of control variable concerning the firm's size (*Small*), firm's age (*Age*), human capital in terms of share of graduated employees (*HC*) sector (*Food sector* as reference category, *P&H_sector* as Personal and household goods sector, *Mechanical sector*, *Other_sectors*), and geographical location (*North-West* as reference category, *North-East*, *Center*, *South*). Table A1 reports the summary statistics). Collinearity problems do not emerge since all values of Variance Inflation Factor (the values are available upon request[1]) are below of the critical value of 10 (Yoo et al., 2014). Φ is a standard normal cumulative distribution function. Finally, ε_i is the normally distributed random error with zero mean and constant variance $N(0, \sigma^2)$ that captures any other unknown factors. To know the effects of any explanatory variable on the response probability $P(Y = 1|\mathbf{x})$ we calculated the marginal effects (Average Marginal Effects). Marginal effect indicates «the effect on the conditional mean of Y of a change in one regressor, say, x_j» (Cameron & Trivedi, 2010, p. 343).

We control for potential endogeneity of participating in GVCs by using the instrumental variables approach. Since we are in the presence of an endogenous variable with a binary outcome, we use a bivariate probit model (Heckman, 1978; Maddala, 1983). Considering *GVC* endogenous, we can argue that the probability of participating in GVCs is likely to be determined by the following factors which are the instruments: i) the openness of management in terms of expertise through a variable (*Management*) taking value 1 if the managers of the firms have a foreign work/study experience; ii) the firm's relationship with Public institutions through a variable (*Public institutions rel*) valued 1 if the firm has a strong and enduring relationships with territorial institutions (Government agencies, Chambers of commerce, etc.); iii) the firm's relationship with other firms through a variable (*Firms rel*) valued 1 if the firms has strong and enduring relationships with other firms. We consider the follow bivariate probit model with specific reference to the Resilience:

$$\text{Prob}(Resilience = 1)_i = \Phi(\beta_0 + \beta_{21}\text{GVC} + \beta_{22}C_i + \varepsilon_i) \tag{2}$$

$$\text{Prob}(\text{GVC} = 1)_i = \Phi(\beta_0 + \beta_{21}I_i + \beta_{22}C_i + \mu_i) \tag{3}$$

where I_i is the vector of the instrumental variables corresponding to *Management*, *Public institutions rel*, and *Firms rel*. C_i is a vector of the control exogenous variables, and ε_i and μ_i are the normally distributed random errors with zero mean and constant variance $N(0, \sigma^2)$. Equations (2) and (3) constitute the bivariate probit model aimed at estimating the effect of participating in GVCs (*GVC*) on the probability of exceeding in 2021 the revenue level of 2019 (*Resilience*) controlling for the endogeneity of the *GVC*. Table 1 displays summary statistics.

Table 1: *Summary Statistics*

	Mean	Std. Dev.	Min	Max
I40	0.246	0.431	0	1
Green_compet	0.371	0.483	0	1
Resilience	0.522	0.500	0	1
GVC	0.232	0.422	0	1
Small	0.791	0.407	0	1
Age	36.675	12.481	4	115
HC	5.900	11.696	0	100
Food sector	0.184	0.388	0	1
P&H_sector	0.264	0.441	0	1
Mechanical sector	0.336	0.472	0	1
Other_sectors	0.216	0.411	0	1
North-West	0.334	0.472	0	1
North-East	0.310	0.463	0	1
Center	0.198	0.399	0	1
South	0.158	0.365	0	1

4. Results and Discussion

The results are reported in Tables 2-4. To test the hypotheses concerning the GVC effect on a firm's performance in terms of digital transition, green transition, and resilience, we contrast the firm's participating in GVCs with those that do not participate.

Concerning digital transition, we find that firms participating in GVCs are more likely to adopt 4.0 technologies than the others: the marginal effect (ME) of the variable *GVC* is positive and statistically significant ($p<0.01$) (Table 2, column A). Thus, Hypothesis 1a (*Hp1a. Participation in GVCs has positive effect on digital transition*) is confirmed. Moreover, we find a specific GVC effect for the small firms since the participation in GVCs plays a positive moderation role: namely, while for the small firms considered as a whole the probability of investing in 4.0 technologies is negative (ME: -0.272, $p<0.01$, Table 2, column B), for those that specifically operate within the GVCs this probability becomes positive (ME: 0.010, $p<0.05$, Table 2, column B). Thus, Hypothesis 1b (*Hp1b. Participation in GVCs has a positive moderator effect on the small firm's digital transition*) is confirmed. Our results corroborate that GVCs support the adoption of 4.0 technologies (e.g., Delera et al., 2022) and, at the same time, enrich the literature with the evidence that this effect is determinant especially for small firms.

As robustness check, we focus on the probability of investing in 4.0 technologies specifically driven by motivations of increasing the business efficiency and innovation (rather than e.g., to take advantage of the tax incentives, to meet the need of suppliers, etc.) (*I40_effic*). The results confirm both the GVC effect overall and the moderator role for the small firms (Table 2, columns C-D). Therefore, the results corroborate the positive effect of GVCs on a firm's efficiency improvement (Yuhua & Bayhaqi, 2013; Brancati et al., 2017; Agostino et al, 2020) and, in particular, underline that this effect is determinant for small firms.

Table 2: *GVC Effect on Digital Transition*

	I40	I40	I40_effic	I40_effic
	(A)	**(B)**	**(C)**	**(D)**
GVC	0.108***	0.044	0.078***	0.012
	(0.025)	(0.042)	(0.026)	(0.038)
Small	-0.241***	-0.272***	-0.177***	-0.207***
	(0.025)	(0.029)	(0.024)	(0.028)
Small*GVC		0.101**		0.099**
		(0.053)		(0.048)
+ controls				
Obs.	1,422	1,422	1,422	1,422
LR Chi2	173.18	176.81	127.51	131.67
Pseudo R2	0.103	0.105	0.085	0.088

Note: The dependent variable is reported at the top of the column. The table displays marginal effects of the probit. Standard errors in parentheses. Wald chi-square test of joint significance for all the explanatory variables is reported. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

With regards to green transition, we find a positive GVC effect on the firm's choice of investing in environmental sustainability for competitiveness upgrading (*Green_compet*). The firms in GVCs are more likely to invest on it than the others: the marginal effect (ME) of the variable *GVC* is positive and statistically significant ($p<0.01$) (Table 3, column A). Thus, Hypothesis 2a (*Hp2a. Participation in GVCs have a positive effect on green transition*) is confirmed. So, also in this case, GVCs are a push factor, they include a positive moderator role for small firms. In this respect, if in general small firms are less likely to invest in green transition (ME: -0.299, $p<0.01$, table 3, column B), in the specific case of those that participate in GVCs the probability becomes positive (ME: 0.185, $p<0.01$, Table 3, column B). Thus, Hypothesis 2b (*Hp2b. Participation in GVCs has a positive moderator effect on the small firm's green transition*) is confirmed.

Furthermore, further evidence that GVCs enhance efficiency, did not show any significant effect of GVCs participation on the probability of investing in green field for reasons driven by other motivation, such as regulation (*Green_regulation*) (Table 3, column 3). Overall, our results are in line with the strand of literature supporting the fact that GVCs participation is a lever for green growth (Qu et al., 2020), and we add that this is critical especially for small firms.

Table 3: *GVC Effect on Green Transition*

	Green_compet	Green_compet	Green_regulation
	(A)	**(B)**	**(C)**
GVC	0.126*** (0.028)	0.002 (0.049)	-0.060** (0.030)
Small	-0.244*** (0.028)	-0.299*** (0.032)	0.103*** (0.031)
Small*GVC		0.185*** (0.059)	
+ *controls*			
Obs.	1,422	1,422	1,422
LR Chi2	153.92	163.57	20.85
Pseudo R2	0.082	0.088	0.011

Note: The dependent variable is reported at the top of the column. The table displays marginal effects of the probit. Standard errors in parentheses. Wald chi-square test of joint significance for all the explanatory variables is reported. *** p < 0.01, ** p < 0.05, * p < 0.1.

Focusing on economic performances, we rely on the concept of resilience, defined as the capacity of production recovery after a shock, in our case the one due to the Covid-19 pandemic. Specifically, we used a variable (*Resilience*) taking value 1 if the firm has exceeded, in 2021, the revenue level of 2019 (pre-Covid year).

If in the first instance we did not find any effect of the participation in GVCs on a firm's resilience (ME of the variable *GVC* is not significant, Table 4, column A), when we control for potential endogeneity[2] − by applying the instrumental variable approach − of *GVC* we find a positive and statistically significant result (ME: 0.074***, p<0.01, Table 4, column D). Thus, Hypothesis 3a (*Hp3a. Participation in GVCs have positive effect on resilience*) is confirmed. Concerning the instruments, all are statistically significant (at 5% or 1%): this means that the presence of a management with foreign experience raises the likelihood of participating in GVCs, as well as having a strong and enduring relationship with other firms and Public institutions.

Small firms are less resilient (ME of *Resilience*: -0.185, p<0.01, table 4, column B), confirming the competitiveness gap suffered by these firms with respect to the medium-large ones. Nevertheless, when they operate in GVCs the likelihood of being resilient raises, so confirming the positive moderator effect played by GVCs. Thus, Hypothesis 3b (*Hp3b. Participation in GVCs has a positive moderator effect on a small firm's resilience)* is confirmed.

**Table 4:** *GVC Effect on Firm Resilience*

	Probit	Probit	Bivariate probit	
	Resilience	Resilience	GVC	Resilience
	(A)	(B)	(C)	(D)
GVC	0.024 (0.035)	-0.060 (0.056)		0.074*** (0.027)
Small	-0.146*** (0.035)	-0.185*** (0.040)		-0.066*** (0.023)
Small*GVC		0.136** (0.071)		
#Management			0.052** (0.024)	
#Firms rel			0.052*** (0.016)	
#Public institutions rel			0.048** (0.018)	
+ controls				
Obs.	1,040	1.040	1,040	1,040
LR Chi2	66.34	69.98	181.26	181.26
Exogeneity of instrumented variable: Wald-test ρ= 0 (Chi2)			2.872*	
Instruments relevance: F-test			12.111***	
Instruments exogeneity: Sargan test (Chi2)			2.000	

Note: The dependent variable is reported at the top of the column. The table displays coefficients and marginal effects of the probit and bivariate probit. Standard errors in parentheses. Wald chi-square test of joint significance for all the explanatory variables is reported. The symbol # indicates the instrumental variable. Exogeneity of instrumented variable: if we reject the Hypothesis the variable GVC is endogenous. Instruments relevance: F-test on IV-2SLS, significance, with a F-value > 10, means to reject the hypothesis of irrelevance of the instrumental variables, so the instruments are not weak. Sargan test for the overidentification restriction on IV-2SLS, no significance means to not reject the hypothesis of exogeneity of the instrumental variables.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.*

A final robustness check, regarding the GVC effect on innovation upgrading and resilience, we test if the firm's participating in GVCs are more prone to invest in the intangible assets. This because, according to the literature (for recent empirical study in the Italian case, Pini et al, 2023; Pini & Esposito, 2022), the intangibles are a potential determinant of a firm's performances. We find that the participation in GVCs positively affects (Figure 2) the likelihood of investing in intangible assets (variable *Intangibles* taking value 1 if the firm invests in R&D, ICT and training) while any significant effect emerges with respect the likelihood of investing in

tangible assets (variable *Tangibles* taking value 1 if the firm invests in machinery and equipment).

Figure 2: *GVC Effect on Intangible Assets*
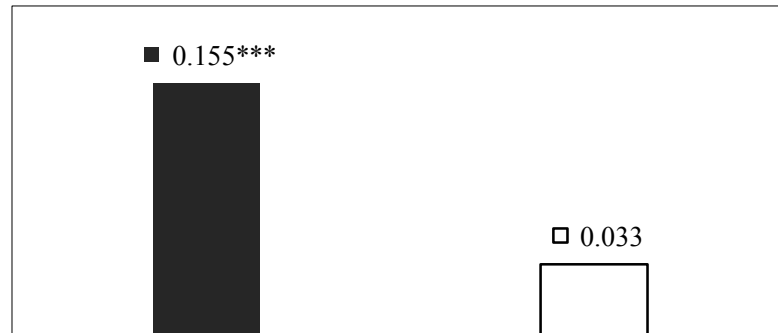
*Note: The figure reports the marginal effects (probability of investing in intangible assets and the probability of investing in tangible assets) of probit regression including control variables. Dependent variable is GVC. *** p < 0.01, ** p < 0.05, * p < 0.1.*

5. Conclusion

The Global Value Chains is an issue investigated by the literature starting from the first studies dating back to the 1990s (Gereffi, 1999). According to the literature, the participation in GVCs has a positive effect on a firm's performances (e.g., Brancati et al., 2017; Agostino et al., 2020; De Marchi et al., 2018; Strange & Zucchella, 2017; Delera et al., 2022; Qu et al., 2020; Deyshappriya & Maduwanthi, 2020). Nevertheless, to our best knowledge, few studies specifically focused on small firms as well as there is not any empirical contribute at the firm level on the effect of the GVCs participation on a firm's resilience after the Covid-19 shock (recently at macro level, OECD, 2023).

This leads us to investigate the GVC effect on a small firm's performances taking into account several indicators that currently are very critical for the industrial policies: digital transition, green transition, and resilience (European Commission 2022, 2023). In light of this, we focus on Italy for at least two reasons: i) Italy is a country very integrated in GVCs (Fondazione Masi, 2022); ii) there is a large presence of small firms.

Thus, we worked through econometric analyses a dataset related to a survey on 3,000 Italian manufacturing firms enriched with updated balance sheet data. The results show that the participation in GVCs plays a positive moderating role, for small firms: as a whole they are less likely to be resilient, to invest in digital and green transition, but when they participate in GVCs, all these probabilities become positive. Moreover, in deepening the potential problem of endogeneity, we found that behind the relationship of GVCs and performances there are some factors positively influencing the participation in GVCs: i) the openness of management in terms of expertise; ii) the openness of firms in terms of relationship with Public institutions and with other firms.

Several policy implications can be drawn by our results. Firstly, since the size is one of the most determinant of export activity (e.g., for the Italian case, Pini & Tchorek, 2022), smaller firms require a greater support from Public institutions in favoring their openness to foreign markets. Since the participation in GVCs permits overcoming many barriers for small firms in achieving high performances (such as digital and green transition, resilience, as shown by our results), policies favoring the entry into GVCs may help to mitigate the necessity of scaling-up for competitiveness upgrading. Thus, trade promotion organization play a key role. In Italy, the Chambers of Commerce have a dedicated function (defined by law) to sustain a firm's internationalization. For instance, the "Progetto SEI" ("SEI Project - Support to Export of Italy") operated by Unioncamere (The Italian Union of Chambers of Commerce) is aimed at increasing exporting firms (especially among those smaller) by focusing on the potential exporters, on one hand, and strengthening the presence of the sporadic exporters in foreign markets, on the other hand, through services of information, training, and assistance (e.g., check-up of a firm's needs, best market identification, strategy definition for entering the markets identified as targets, web mentoring, accompanied missions to export markets). In the same vein, the Unioncamere project "Camber Mentoring" has allowed to many firms to benefit of mentoring activities by export professionals.

Secondly, favoring the firm's relationship with other firms may help smaller firms in overcoming the barriers to export. The Italian policy concerning "Contratti di Rete" (Network Contracts) and "Contratti di Sviluppo" (Development Contracts) represent two important initiatives in sustaining the competitiveness of the smaller firms. In fact, Italy's National Recovery and Resilience Plan (NRRP) includes investments dedicated to a firm's internationalization, supply chains and competitiveness ("M1C2 Investment 5. Supply chains industrial policies and internationalization", Italian Government, 2021) also by leveraging on the firm's relationship through the "Contratti di Sviluppo".

Thirdly, policies should focus on management too. The new economic era characterized by disruptive changes – such as Fourth Industrial revolution, climate change and green transition, ESG, etc. – requires a new corporate culture able to address these new challenges. Thus, management skills play a key role in the innovation of business models (Petrone & Pini, 2023), that in turn support firms in their openness towards foreign markets (Pini et al., 2023), as well as by identifying the best point of where to fit in the GVCs. In this case, the combination of assistance through the Temporary Export Manager, on one side, and the incentive for training on managerial skills, on the other, may effectively support the entry into GVCs.

Finally, policies should be designed according to the different degree of *concentration* and *strategic importance* of the value chain, which can regard diversification through trade policies, industrial and innovation policies, stockpiling through regulatory policies, and government fiscal support (OECD, 2023).

This paper presents some limitations that can be addressed by future research. Firstly, the cross-sectional analysis does not allow to better study the cause-effect mechanism. Secondly, we did not consider the position of the firm along the GVCs. Thirdly, we analyzed the relationship with external actors (Public institutions) without considering the intensity and the typology of the relationship. Fourthly, we do not deepen the potential presence of place-based factors affecting the relationship between GVCs and performances.

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Notes

[1] The mean VIF is 1.74. Further details are available upon request.

[2] The results of the exogeneity of instrumented variable (Wald-test $\rho = 0$) indicates that the variable *GVC* is endogenous since we reject the hypothesis of exogeneity at 10%. Also by running the IV-linear regression the Wu-Hausman test (5.135**) confirms the endogeneity of the variable *GVC* since we reject the null hypothesis at 5%.