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Examining the impacts of conventional exports on GVC participation: Evidence from developing economies

Kalsoom Rafique

School of Foreign Languages, Tianshui Normal University, Tianshui 741000, Gansu, China.
Email: kalsoom210@outlook.com

Abstract

International trade is under dramatic changes, and production processes gradually involve a sequential, vertical trading chain extending across the borders of various countries. Each country specializes in a certain stage of production. The study aims to examine the impacts of conventional exports to China on participation in global value chains during 1992-2019 for developing countries. This study used an instrument variable method to analyze developing countries' GVC participation and export responses to China's massive demand shocks. The export flow of other developing countries to China is used as an instrument variable for analyzing the changes in GVC participation of sample countries' exports. The findings of the study reveal that the rise of China in the global economy caused significant gains in developing countries, both in participation in GVCs and exports. In the aggregate, the sample developing countries have caused some averaged 0.33% increase in the GVCs participation from 1992-2019, while their exports to China had an average annual growth of 3% over the same period, which indicates the importance of the relationship between GVCs and conventional exports. The growth rate of exports also suggests that China is an attractive export destination for developing countries, and these countries need to develop strong ties with China, as well as a large economy and consumer market.

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Export expansion
Global value chain.

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1. Introduction

Over the past decades, the rapid globalization of economic activity has substantially changed the stance of the global economy. International trade, production, and investments have become organized around the globe, and various stages of the production processes are positioned across multiple countries. Intermediate

input, including parts and components, often cross borders for the final product's production and assembly. Zhu, Liu, and Wei (2019) state that participating in global value chains may prolong export duration under a worldwide production network. Rising trade with China has recently led to substantial concern in the world markets, while organized trade in global value chains has become significant. Though the impacts of GVC participation remain less explored in theoretical and empirical studies, the welfare consequences of international trade have mainly been considered (Ignatenko, Raei, & Mircheva, 2019).

Although it is an essential and stimulating matter for policymakers, it remains less attentive to the researchers, and the existing literature is surprisingly limited. Moreover, previous studies have focused on China's import competition with developed countries like the United States (Autor, Dorn, & Hanson, 2013). They are not concerned with the impacts of China's demand shock on developing countries' participation in GVCs. Hence, the current study contributes to the flourishing literature that formally examines the connection between GVC participation and exporting to China, where exporting to China is the consequence of China's demand shocks for developing countries. A country's participation in GVCs, measured as a share of exports, competently evaluates the dependence of exports on GVCs. This perspective also indicates how much-expected damage to global value chains would occur if a country's exports were obstructed; alternatively, it signifies the susceptibility of the GVCs to shocks in the corresponding economy.

Given the increasing focus on China and the debate about China's growing prominence, there is a considerable research gap that we are trying to fill in. This study is inspired by the significance of understanding the mechanism of how China's massive demand shocks influence GVC participation in developing countries. Moreover, these countries are experiencing rapid economic development, boosted by increased exports. For instance, the average increase in exports to China for sample developing countries was about 239% from 1992-2019, making an average increase of 3% annually. Therefore, we correlate exporting to China and participation in GVCs and empirically examine the impacts to indicate a relationship that may significantly impact developing countries. Hence, we used two primary datasets and constructed GVC participation indicator following (Koopman, Powers, Wang, & Wei, 2010) from 1992-2019.

The findings show that exporting to China positively and significantly affects developing countries' participation in GVCs. Besides the primary variable of interest, we also check other socio-economic indicators, including per capita GDP, human capital, infrastructure, labor force, foreign direct investments net inflows and outflows, and growth rate for developing countries. These findings may help policymakers design policies to form better relations with China and capture the rising export opportunities leading to economic growth and development. To the best of our understanding and knowledge, this study is the first to focus on China shocks effect on participation in GVCs and thoroughly examines the impacts for an extended period of 28 years. Several studies prove that China shocks disrupt their local labor markets. Very few studies considered China's demand shocks from the perspective of emerging economies. Nevertheless, it remains a debatable question of the broad impacts on participation in GVCs and whether they are significant. Our robust results shed light on a different angle of China's rise for developing countries.

The rest of the study is organized as follows: Section 2 briefly describes the relative existing literature of the current study. The methodology, including data, model, and measures, are described in section 3. In section 4, we explore the findings and conclude the study in section 5.

2. Literature Review

The emergence of a global value chain created new opportunities for developing countries to assimilate into the world economy (Hollweg, 2019). Due to the reduced trade barriers and advanced information and communication technologies, countries gradually engage in global value chains (Ma, Liang, & Zhang, 2019). The goods produced within one country's boundaries are now fragmented and dispersed across global production networks. Global value chains result from production fragmentation and processing segments in many phases that occur in copious locations in various countries, generating and increasing interconnections among nations (Kersan-Škabić, 2019). It can boost exports, productivity, and the subsequent labor market impacts fluctuate significantly across less-developed countries. It has supported wages, jobs, and other spillovers that work through labor markets. However, in developing countries, GVC expansion is also linked to a greater relative demand for skilled employees (Farole, 2016).

Global value chains have recently gained prominence in the theoretical and empirical literature. A country's participation in GVCs is characterized by its engagement in a specific fragment of the production process, such as intermediary goods and services. Developing countries can benefit from GVC in different ways. For instance, Boffa, Santoni, and Taglioni (2018) state that China may offer competitive opportunities to other countries due to its cheaper intermediate goods from shared international production. However, they measured the impact of value-added and out-of-partners, where China has increased the import penetration of intermediate goods.

Meanwhile, Hollweg (2019) confirms that China's market penetration has been an opportunity instead of a threat for some developing countries. Similarly, Halpern, Koren, and Szeidl (2015) pointed out that growth and productivity spillovers can lead to developing countries joining GVCs. Access to economical or more diversified varieties and complementarities between domestic and imported inputs leads to increased

productivity, better than the direct benefits of reduced prices or superior quality of foreign inputs (Goldberg, Khandelwal, Pavcnik, & Topalova, 2010). Moreover, bilateral trade cannot be viewed in isolation while evaluating trade policies with the emergence of global production networks. Measuring the effect of trade shocks through value-added exports rather than gross exports delivers a clearer understanding of how trade rigidities could influence production (Huidrom et al., 2019). Likewise, Beltramello, De Backer, and Moussiegt (2012) state that to access the linkages of a country to GVCs, it is not sufficient to assess the export only since it accounts for value-added originating from different sources, which leads to an ambiguous measurement of participation of GVCs of a country. Moreover, globalization has transformed the structure of international trade through a reduction in trade costs and new communication technologies, meaning that global supply chains are now a universal feature of global trade (Baldwin, 2016; Hummels, Ishii, & Yi, 2001; Johnson & Noguera, 2017).

Until now, numerous studies have been conducted on the employment impacts of GVC, as the association between trade and labor markets can work through various channels that function in contrary directions. Banga (2016) scrutinizes the industry-level impact of GVC participation during 1995-2011 on employment growth. His findings illustrate that more backward linkages adversely affect employment growth, mainly in nonmanufacturing industries. In comparison, more forward linkages did not have any substantial statistical impacts on the employment of India. However, firms with global ties tend to hire more employees, pay higher wages, and employ skilled workers more than firms that work entirely with the local markets (Shepherd & Stone, 2013). Using the world input-output data table of 2016 for Turkey (dine, 2019) reveals that employment in manufacturing benefits most from GVC integration through backward linkages. Despite substantially declining labor intensity, South Africans find that GVC participation facilitated the rapid growth of exports and wages. However, wage growth happens mainly in the services sectors via backward linkages, having skilled bias (Cali & Hollweg, 2017).

This study uniquely links traditional trade's impacts to value-added trade. China's import competition has gained much attention from researchers from advanced countries, but there is a gap in analyzing this trend for developing countries' GVC participation. This study contributes to the rapidly increasing literature that formally formulates a hypothesis on the relationship between participation in GVCs and China trade shocks. The impact of China's trade shock has been understudied from the perspective of developing countries.

3. Research Methodology

3.1. Empirical Model

This study identifies the impacts of China's massive demand shocks on the participation of GVCs in the sample developing countries from 1992-2019 by estimating Equation 1.

$$Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 C'_{i,t} + \varsigma_t + \eta_i + \epsilon_{i,t} \quad (1)$$

Here, $Y_{i,t}$ represents the primary dependent variable participation in global value chains of developing country i during t, where t represents the years from 1992-2019. $Y_{i,t}$ is measured from Equation 2. The independent variable is exporting to China, denoted by $X_{i,t}$ and $C'_{i,t}$ denotes control variables. ς_t and η_i indicates year-fixed effects and country-fixed effects that allow for differential trends across countries. $\epsilon_{i,t}$ describes the error term of the model. $C'_{i,t}$ signifies per capita GDP (gdpc), the labor force (lforce), and human capital (Edu.) following (Peng, Kang, Liu, Cheng, & Ren, 2020) as control variables in the empirical estimation. Some socio-economic variables are significantly correlated with global value chains or export sophistication. Hausmann, Hwang, and Rodrik (2007) explain the importance of these variables in the estimations. Infrastructure facilities, including roads, rails, internet access, and telecommunications, are essential in international trade. Huang (2016) states that it is imperative for international cooperation and development. In the current study, infrastructure (Infra) is the World Bank's logistic performance index on a scale ranging from 1 to 5, representing very low to very high, and the scores are averaged across respondents.

Kersan-Škabić (2019) focuses on the importance of foreign direct investments (FDI), stating that it contributes to the value of participation in GVCs. Hence, we considered FDI to measure its influence in sample developing countries. We included net inflows of foreign direct investment as a percentage of GDP (Inflows) and net outflows of foreign direct investment as a percentage of GDP (Outflows). Further, in the analysis, we also considered GDP growth in annual percentage (Gro.) as another indicator of economic potential and the development level. Further, a dummy variable of BRI is added, representing 1 for developing country i covered by belt and road initiative and 0 otherwise.

In the empirical specifications, though, we have included year-fixed and country-fixed effects to control for various characteristics relevant to countries. The endogeneity issue becomes a challenge for empirical analysis, and selecting an appropriate instrument becomes crucial as weak instruments can lead to invalid and biased findings (Wooldridge, 2010). Therefore, China's imports from other developing countries from 1992-2019 were taken as an instrument for this study's sample following the method of Dauth, Findeisen, and Suedekum (2014). Hence, instead of ordinary least squares (OLS), the two-stage least squares (2SLS) method can assist in eliminating endogeneity, reducing biases, and ensuring consistency of the results (Basu, Coe, &

Chapman, 2018). Therefore, 2SLS is applied for the empirical analysis in this study. To ascertain the reliability of the selected instrument, such as overidentification (Sargan, 1958) is used.

3.2. Measuring GVC Participation

Using decompositions at the country level to estimate the scope of a country to which extent it participated in the global value chains, we have constructed an index for participation in GVCs following (Koopman et al., 2010) as in Equation 2. This index summarizes the importance of that country's global supply chain.

$$GVC_{Part\cdot i,t} = \left(\frac{IVA_{i,t}}{EX_{i,t}}\right) + \left(\frac{FVA_{i,t}}{EX_{i,t}}\right) \quad (2)$$

Here, $IVA_{i,t}$ is the indirect value-added in the exports of country i at time t, while $FVA_{i,t}$ represents the foreign value-added of the country i at time t. $EX_{i,t}$ signifies the gross exports of country i at time t. Participation in GVCs is the combination of forward linkages and backward linkages, where indirect domestic value-added export (IVA) describes forward linkages, which measures the export percentage used in the production by the alternative country to export to third countries. Forward linkages denote GVC penetration from the perspective of exporting. Indirect value-added (IVA) exports are a more precise indicator to describe a country's involvement in GVCs because they indicate the share of domestic value added (DVA) used by other industries as inputs in their countries, providing goods and services in third economies. It contrasts with the local value-added export accounting for the value added by the home country in producing its goods and services for exporting, both direct and indirect (dine, 2019). However, backward linkages, also identified as vertical specializations, are defined as the foreign value-added in exports (FVA).

3.3. Data and Variables

To fulfill the purpose of the study, we mainly used two data sources. Table 1 provides a detailed list of variables and data sources. The sample period is from 1992-2019, and balanced panel data at the country level is based on data availability. Further, Figure 1[1] illustrates the GVC participation of the top 30 developing countries for 1992. GVC participation in the selected countries appears to have grown over the analysis period. Figure 2 indicates that the participation in GVCs of 30 developing countries totaled $25.7 billion in 1992, which jumped to $227 billion in 2019. Among the top countries, the Russian Federation ranked number two in 1992, gaining first in 2019.

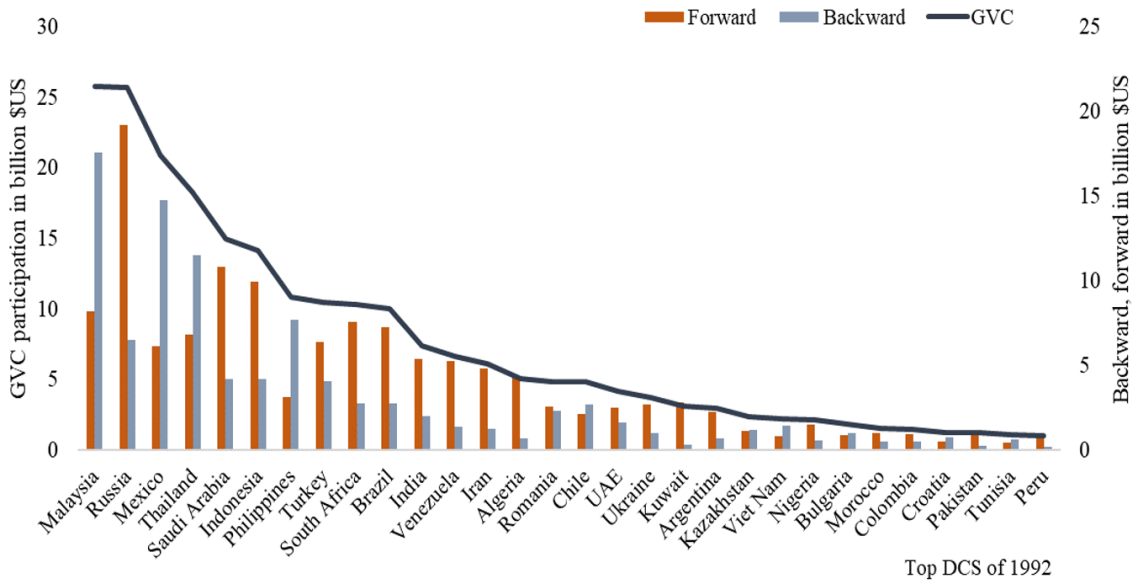

Figure 1. Top 30 developing countries GVC participation in 1992.

[1] In Figure 1 and 2, DCs selection is based on the maximum share of participation in GVCs of 2019 and 1992, respectively.

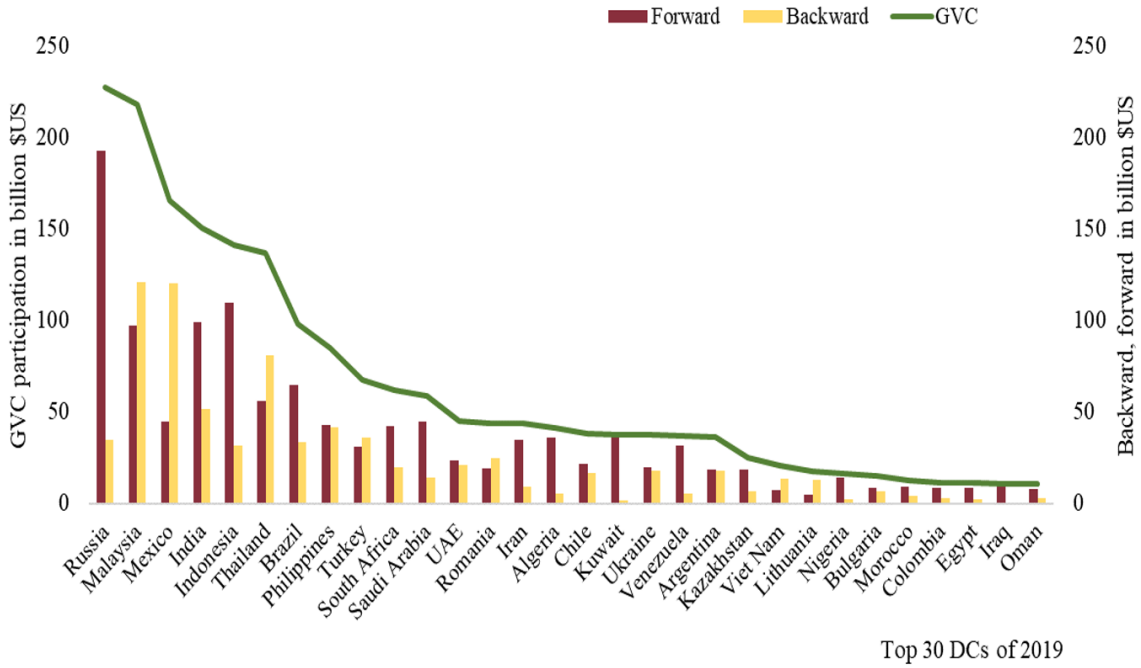

Figure 2. Top 30 developing countries GVC participation in 2019.

China is gaining more significance in developing markets. [2]From Figures 3 and 4, between 1992 and 2019, Russian exports to China grew from $3.38 to $59 billion, having an increase of 59% annually, and its share in total exports was 15% in 2019. Of Indonesia's total exports, China's share was 6% in 1992 to 17% in 2019. Many other countries share a decent number, including 12% of Peru, 5% of Chile, 9% of Romania, and 2% of Brazil, Argentina, and Malaysian exports went to China in 1992. China has been a significant export destination for many developing countries. Consequently, their exports continued to grow gradually over the period in 2019, with 19% of Malaysian exports, 17% of Vietnam, 16% of Thailand, 19% of Saudi Arabia, 42% of Brazil, 22%, 22.13% and 25% of South Africa, Philippines and Iraq went to China respectively. Therefore, such a rising share of developing countries in China makes sense that China contributes more to the developing economies' value-added trade.

Table 1. Variable's description and data sources.

Variables	Symbols	Description	Source
GVC participation	$GVC_{part.}$	Index	UNCTAD
Exporting to China	X	Total exports in 1000US$	WITS
Per capita GDP	gdpc	Per capita GDP (Constant 2010 US$)	WDI
Labor force	lforce	Total labor force	WDI
Human capital	Edu	Mean years of schooling	UNDP
Infrastructure,	Infra.	The logistic performance index- low to high (1 to 5).	WDI
Foreign direct investment	Inflows	Net inflows as a percentage of GDP	WDI
Foreign direct investment	Outflows	Net outflows as a percentage of GDP	WDI
GDP growth	Gro.	Annual % of GDP growth rate	WDI

[2] Author's calculations based on data from World Bank (WITS).

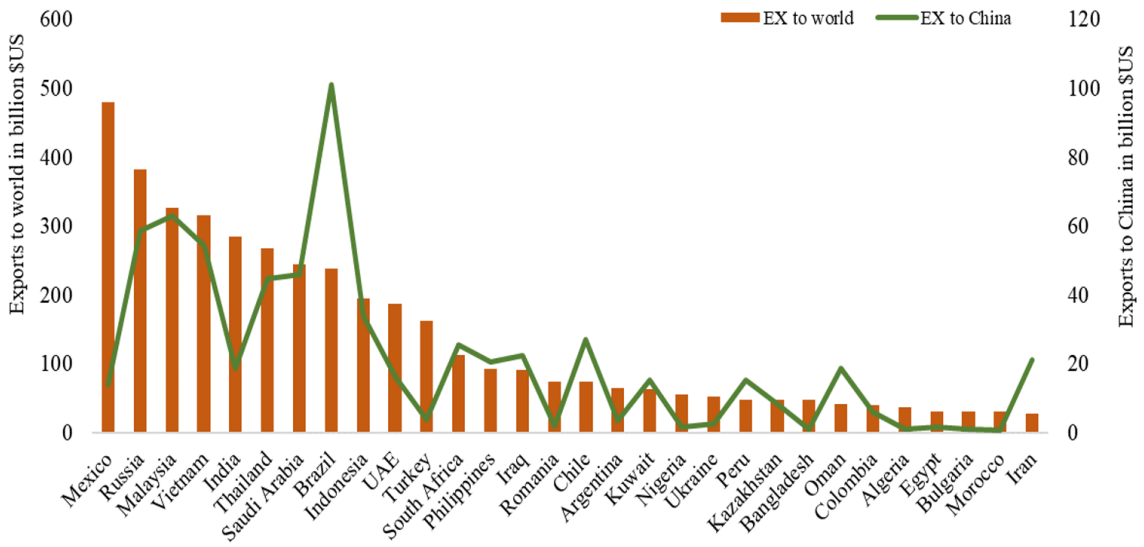

Figure 3. Top developing countries exports to the world and China during 2019.

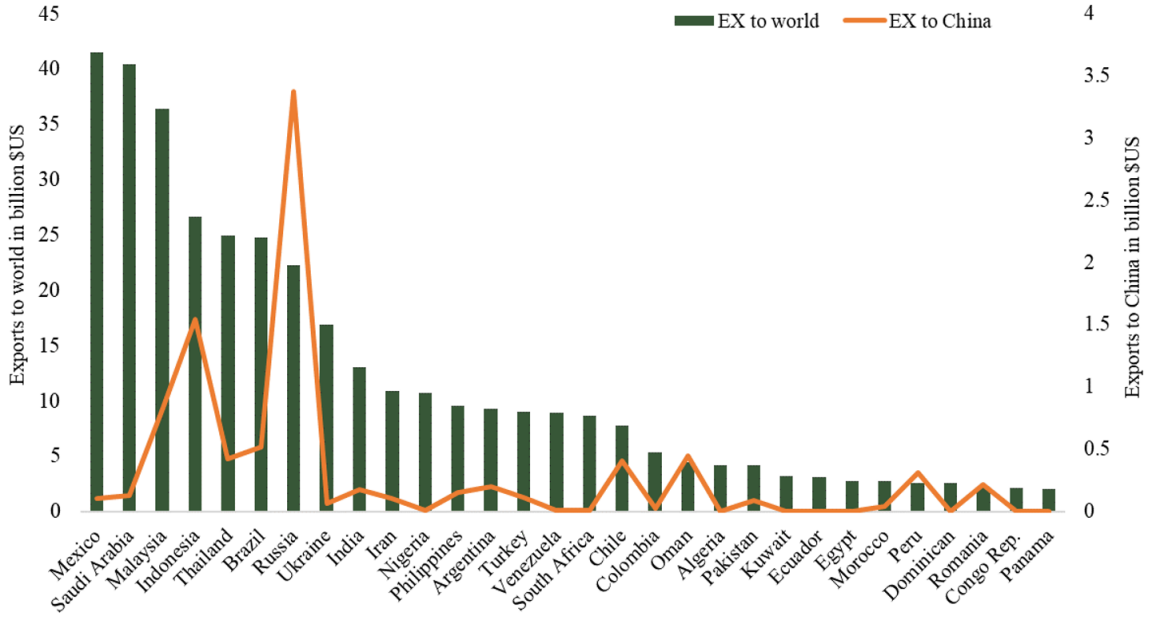

Figure 4. Top developing countries exports to the world and China during 1992.

3.4. Summary Statistics

Summary statistics of variables used in empirical analysis are in Table 2. The mean of participation in GVCs (LnGVC_(Part.)) is 21.51, and exporting to China (LnX) is 18.5. Standard deviation describes the dispersion of the data. The total number of 37 developing countries is in Appendix A (Table A1), and the total observations are 1,036. All variables are in natural logarithm except those that were not needed. The correlation matrix of the variables is in Table 3.

Table 2. Summary statistics.

Variables	Mean	Std.D.	Min.	Max.	Obs.
$LnGVC_{Part.}$	21.51	2.285	16.90	26.21	1.036
LnX	18.51	4.147	0	24.86	1.036
Lngdpc	8.048	1.517	0	11.08	1.036
Lnlforce	15.20	2.182	0	20.01	1.036
Edu.	7.244	3.321	0	12.80	1.036
Infra.	0.472	1.008	0	4.069	1.036
Inflows	3.472	5.200	-21.15	27.07	1.036
Outflows	0.810	2.543	-10.35	30.32	1.036
Gro.	4.212	5.227	-23.09	32.59	1.036

Table 3. Correlation matrix.

Variables	1	2	3	4	5	6	7	8	9
$LnGVC_{Part.}$	1.0000								
LnX	0.7410	1.0000							
Lngdpc	0.2664	0.1528	1.0000						
Lnlforce	0.6780	0.6462	-0.1383	1.0000					
Edu.	0.3074	0.3293	0.2108	0.0426	1.0000				
Infra.	0.2667	0.2692	0.0875	0.1300	0.1910	1.0000			
Inflows	-0.182	-0.150	0.0712	-0.2264	0.1904	-0.0002	1.0000		
Outflows	0.1871	0.1325	0.1996	0.0380	0.1867	0.1002	0.4207	1.0000	
Gro.	0.0200	0.0014	-0.0546	0.0263	-0.0188	0.0502	0.1667	0.1439	1.0000

4. Findings and Results

This study estimates the proposed relationship between exporting to China and participation in GVCs of developing countries from 1992-2019. Table 4 reports the results. As shown in column (1), GVC participation is significantly promoted by the rising exports to China due to massive demand shocks at the 1% level, with a coefficient of 0.039. The estimation results indicate that when an economy moves up along the rising opportunities from other markets like China, it ultimately affects its contributions in GVCs to be more sophisticated in trade. A positive impact on GVC participation by per capita GDP of 0.028 in column (1) confirms the existence of this relationship at a 1% significance level. Human capital mirrors this relationship significantly at the 5% level with a coefficient of 0.011. However, the labor force is negatively correlated with GVC participation. A significant coefficient of -0.021 indicates that the size of the labor force might induce labor-intensive technology and decrease participation in GVCs. The findings on the control variables are entirely consistent with the prevailing studies, for instance, (Ignatenko et al., 2019; Peng et al., 2020). The significant coefficient of 0.09 in the lower panel of column (1) depicts the first-stage results. It confirms the selected instrument is accurate and robust enough to explain the variable of interest.

The next column (2) includes the infrastructure variable while keeping other specifications the same. A 1% increase in infrastructure value improves GVC participation by 0.055 significant at the 1% level because infrastructure plays an essential role in international trade, including roads, rails, internet access, and telecommunications. The other variables remain robust, including per capita GDP, labor force, and human capital, with coefficients of 0.029, -0.024, and 0.011, respectively. All these are statistically significant at 1% and 5%. The results of the lower panel R-squared 0.96, and the coefficient of exports of other countries to China 0.091 at a 5% significance level support the findings and selection of instrumental variable (Hansen, 1982).

In columns (3) and (4), we include FDI net inflows, net outflows, and GDP growth rate. The measure of FDI inflows has weaker adverse impacts on participation in GVCs of sample countries, whereas FDI outflows positively impact the explained variable; a coefficient of 0.014 is statistically significant at a 1% level. Simultaneously, the growth rate has a positive but insignificant relationship with GVC participation over the analysis period. However, including these variables in the Equation did not affect the main findings. In columns (3) and (4), the coefficients 0.033 and 0.034 of exports are positive and significant at the 1% level, respectively. The findings of other variables like infrastructure and first-stage results remain consistent.

Next, column (5) adds a dummy variable of China's Belt and Road Initiative (BRI) to check the role of country heterogeneity across sample countries and an interaction term for the combined effects of BRI and exporting to China as LnX*BRI. According to Kang, Peng, Zhu, and Pan (2018) BRI represents sustainable and longstanding economic, institutional, and cultural integration with partner countries rather than transient policies. Moreover, its significance is elucidated as a free trade agreement and a substantial infrastructure-driven economic integration strategy (Du & Zhang, 2018). The coefficient of exports, 0.039, remained significant at the 1% level, explaining the enormous impact on the sample countries. However, the BRI dummy has adverse impacts on the primary dependent variable.

In comparison, the combined effects of the two predictors have insignificant positive impacts of 0.0026 on the GVC participation over the estimation period. The first-stage results in the lower panel explain the instrument's significance strength with a coefficient of 0.091 and R-squared 0.95. Overall, all the results remained consistent, even adding a dummy variable and the interaction term.

The diagnostic test of the models reported at the end of the lower panel of Table 4 pointed in favor of the hypothesis of proper identification. The instrument variables used in the model are not correlated with the error terms and are accurate to include in the empirical estimation. Besides the two-stage least square (2SLS) results, column (6) reports ordinary least squares (OLS) results. Yet, both techniques show a positive relationship between participation in GVCs and exports to China from 1992-2019. The comparison with 2SLS coefficients from column (4) describes that the estimates of OLS in column (6) for exports of developing countries are biased towards zero due to the measurement error and unobserved shocks. However, if we ignore the biased estimation, we get roughly the same impacts in both cases.

The findings and results of this study are by no means in favor of China's trade shocks, which contradicts recent studies on China's trade shocks in developed countries. We anticipate that developing countries would feel the effects of China's enormous demand shocks, not just supply shocks. However, the empirical findings suggest that more work is needed to understand the impacts of rising trade exposure on other countries' global value chains.

Table 4. Two-stage least squares (2SLS) results.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
LnX	0.039*** (0.011)	0.037*** (0.011)	0.034*** (0.011)	0.034*** (0.012)	0.039*** (0.011)	0.009 (0.006)
Lngdpc	0.028*** (0.010)	0.029*** (0.010)	0.029*** (0.009)	0.029*** (0.009)	0.028*** (0.009)	0.024** (0.008)
Lnlforce	-0.022** (0.009)	-0.024*** (0.008)	-0.028*** (0.009)	-0.024** (0.011)	-0.019** (0.008)	-0.015 (0.012)
Edu.	0.011** (0.006)	0.012** (0.005)	0.013** (0.005)	0.012** (0.005)	0.009* (0.005)	0.013** (0.005)
Infra.	-	0.055*** (0.018)	0.049*** (0.018)	0.049*** (0.018)	-	0.041* (0.018)
Inflows	-	-	-0.005* (0.003)	-0.005** (0.003)	-	-0.005** (0.002)
Outflows	-	-	0.014*** (0.005)	0.013*** (0.005)	-	0.014** (0.004)
Gro.	-	-	-	0.002 (0.002)	-	0.0007 (0.001)
BRI	-	-	-	-	-0.174*** (0.047)	-
LnX*BRI	-	-	-	-	0.003 (0.004)	-
Constant	17.66*** (0.151)	17.71*** (0.149)	17.83*** (0.163)	17.77*** (0.176)	17.65*** (0.151)	18.02*** (0.172)
Time-effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.98	0.99	0.99	0.98	0.99	0.92
Hansen J. test	1.408 (0.49)	1.779 (0.41)	1.835 (0.39)	1.964 (0.37)	1.441 (0.48)	-
LnX_{OC}	0.090* (0.048)	0.091** (0.046)	0.088* (0.047)	0.087* (0.047)	0.091*** (0.048)	
F-test excl. Inst.	134	146	142	135	134	
R-squared	0.95	0.96	0.95	0.96	0.95	

Note: Exporting to China from other developing countries variable in 2SLS is used as an instrument. All variables are treated as endogenous variables. ***, **, and * represent 1%, 5%, and 10% significance levels. Standard errors are in parenthesis ().

5. Conclusion

This study documents the impacts of increasing exports to China on participation in developing countries' global value chain (GVC) by reviewing the experience over a long period from 1992-2019. Following existing studies on China shocks, this study applies an instrument variable strategy on the datasets of developing countries to identify the impacts of massive demand shocks from China on participation in GVCs. We consider that China's demand shocks create more opportunities for trading partners to export. Therefore, we expect these rising exports to positively and significantly impact the global value chains of partner developing countries. The instrument variable strategy can correct the potential endogeneity for sample countries' exports, participation in GVCs, and other socio-economic variables in this simultaneous system. The findings show that increased export opportunities have a positive relationship with the participation in GVCs for developing countries from 1992 to 2019.

Meanwhile, we further explore the effects of per capita GDP, human capital, infrastructure, and foreign direct investment inflows and outflows on participation in GVCs. The results depict a unique correlation between participation in GVCs and per capita GDP, human capital, infrastructure, foreign direct investments, and growth rate. The empirical evidence presented in this study clearly explains the significance of increasing opportunities from China for sample trade partners and the importance of included variables for participation in GVCs. Therefore, we conclude that developing trading partners of China have benefited more from the

demand shocks of China, and our findings are significantly different from the effects of China's import competition for advanced countries' labor markets.

This study has recommendations based on the findings that developing countries take advantage of China's shocks by having trade agreements to improve their industrial structure, infrastructure, and human capital and attract more foreign direct investments inward and outward. Consequently, it would enhance international trade with China and improve participation in GVCs. It may also have implications for maintaining the export flows to China. The Belt and Road Initiative is a dynamic link to form a stable and closer bond with China, which would ultimately impact the GVCs of developing countries. Likewise, improving the quality of exports and increasing diversity in the products of developing countries might be achieved while trading with China.

We explain the possible directions for future research and limitations of the current study as final remarks. The relationship between conventional trade and GVC has not been thoroughly studied earlier, especially from the perspective of China shocks, and a limited number of countries was estimated in this analysis. Moreover, we performed all analyses based on country-level data for GVC participation. It calls for future research in several other directions. Thus, future researchers need to focus on industry-based datasets to explore the participation and positioning in GVCs for different sets of countries, including developing countries and the least-developed world.

References

Autor, D. H., Dorn, D., & Hanson, G. H. (2013). The China syndrome: Local labor market effects of import competition in the United States. *American Economic Review, 103*(6), 2121-2168. https://doi.org/10.1257/aer.103.6.2121

Baldwin, R. (2016). *The great convergence: Information technology and the new globalization.* Cambridge, MA: Harvard University Press.

Banga, K. (2016). Impact of global value chains on employment in India. *Journal of Economic Integration*, 631-673. https://doi.org/10.11130/jei.2016.31.3.631

Basu, A., Coe, N. B., & Chapman, C. G. (2018). 2SLS versus 2SRI: A ppropriate methods for rare outcomes and/or rare exposures. *Health Economics, 27*(6), 937-955.

Beltramello, A., De Backer, K., & Moussiegt, L. (2012). The export performance of countries within global value chains (GVCs).

Boffa, M., Santoni, G., & Taglioni, D. (2018). *From China with love.* Washington, DC: Mimeo, World Bank.

Cali, M., & Hollweg, C. H. (2017). *How much labor do South African exports contain?* World Bank Policy Research Working Paper, 8037.

Dauth, W., Findeisen, S., & Suedekum, J. (2014). The rise of the East and the Far East: German labor markets and trade integration. *Journal of the European Economic Association, 12*(6), 1643–1675.

dine, M. N. (2019). Impact of global value chains' participation on employment in Turkey and spillovers effects. *Journal of Economic Integration, 34*(2), 308-326. https://doi.org/10.11130/jei.2019.34.2.308

Du, J., & Zhang, Y. (2018). Does one belt one road initiative promote Chinese overseas direct investment? *China Economic Review, 47*, 189-205. https://doi.org/10.1016/j.chieco.2017.05.010

Farole, T. (2016). *Do global value chains create jobs?* Retrieved from IZA World of Labor:

Goldberg, P. K., Khandelwal, A. K., Pavcnik, N., & Topalova, P. (2010). Imported intermediate inputs and domestic product growth: Evidence from India. *The Quarterly Journal of Economics, 125*(4), 1727-1767. https://doi.org/10.1162/qjec.2010.125.4.1727

Halpern, L., Koren, M., & Szeidl, A. (2015). Imported inputs and productivity. *American Economic Review, 105*(12), 3660-3703.

Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica: Journal of the econometric society, 50*(4), 1029-1054. https://doi.org/10.2307/1912775

Hausmann, R., Hwang, J., & Rodrik, D. (2007). What you export matters. *Journal of Economic Growth, 12*, 1-25. https://doi.org/10.1007/s10887-006-9009-4

Hollweg, C. H. (2019). Global value chains and employment in developing economies. *Global Value Chain Development Report, 2019*, 63.

Huang, Y. (2016). Understanding China's Belt & Road initiative: motivation, framework and assessment. *China Economic Review, 40*, 314-321. https://doi.org/10.1016/j.chieco.2016.07.007

Huidrom, R., Jovanovic, N., Mulas-Granados, M. C., Papi, M. L., Raei, M. F., Stavrev, M. E., & Wingender, M. P. (2019). *Trade tensions, global value chains, and spillovers: insights for Europe.* Washington, D.C: International Monetary Fund.

Hummels, D., Ishii, J., & Yi, K.-M. (2001). The nature and growth of vertical specialization in world trade. *Journal of International Economics, 54*(1), 75-96. https://doi.org/10.1016/s0022-1996(00)00093-3

Ignatenko, A., Raei, F., & Mircheva, B. (2019). *Global value chains: What are the benefits and why do countries participate?* IMF Working Paper 19/18, International Monetary Fund, Washington, DC.

Johnson, R. C., & Noguera, G. (2017). A portrait of trade in value-added over four decades. *Review of Economics and Statistics, 99*(5), 896-911. https://doi.org/10.1162/rest_a_00665

Kang, L., Peng, F., Zhu, Y., & Pan, A. (2018). Harmony in diversity: Can the one belt one road initiative promote China's outward foreign direct investment? *Sustainability, 10*(9), 3264. https://doi.org/10.3390/su10093264

Kersan-Škabić, I. (2019). The drivers of global value chain (GVC) participation in EU member states. *Economic Research-Ekonomska istraživanja, 32*(1), 1204-1218. https://doi.org/10.1080/1331677x.2019.1629978

Koopman, R., Powers, W., Wang, Z., & Wei, S.-J. (2010). *Give credit where credit is due: Tracing value added in global production chains*. Cambridge, MA: National Bureau of Economic Research.
Ma, S., Liang, Y., & Zhang, H. (2019). The employment effects of global value chains. *Emerging Markets Finance and Trade, 55*(10), 2230-2253.
Peng, F., Kang, L., Liu, T., Cheng, J., & Ren, L. (2020). Trade agreements and global value chains: New evidence from China's Belt and Road Initiative. *Sustainability, 12*(4), 1353.
Sargan, J. D. (1958). The estimation of economic relationships using instrumental variables. *Econometrica: Journal of the Econometric Society*, 393-415. https://doi.org/10.2307/1907619
Shepherd, B., & Stone, S. (2013). Global production networks and employment: a developing country perspective.
Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. Cambridge, MA: MIT Press.
Zhu, X., Liu, B., & Wei, Q. (2019). Does participation in global value chains extend export duration? *Review of Development Economics, 23*(3), 1282-1308.

Appendix A

Table A1. List of sample developing countries.

Armenia	Azerbaijan	Bangladesh	Barbados
Bhutan	Fiji	Gabon	Georgia
Ghana	India	Indonesia	Iran
Iraq	Kazakhstan	Kuwait	Kyrgyzstan
Lebanon	Malaysia	Maldives	Mauritius
Mongolia	Myanmar	Nepal	Oman
Pakistan	Philippines	Russian Federation	South Africa
Sri Lanka	Tajikistan	Thailand	Trinidad and Tobago
Turkmenistan	United Arab Emirates	Uzbekistan	Vanuatu
Venezuela	-	-	-