JOURNAL OF BUSINESS
UNIVERSIDAD DEL PACÍFICO

UNIVERSIDAD DEL PACÍFICO
FACULTAD DE CIENCIAS EMPRESARIALES

Political economy of China and US value chains in Latin America

Alberto J. Lebrón Veiga
Institute of International Polítical Economy – Peking University
alebron@pku.edu.cn

Abstract

In this paper, I aim to provide empirical evidence about how an efficient integration into global value chains can promote economic growth through industrial upgrading and prevention of external imbalances in Latin America (LATAM). I define US-China political economics in this region for the period from 1998 to 2015. The research uses TiVA raw data that I obtained from the UNCTAD-EORA database for the US, China, and nine major economies in LATAM.

The development of global value chains has brought unprecedented alternatives for commercial alliances and industrial strategies to developing countries. An effective integration of LATAM onto global value chains through forward linkages or increases in indirect value added (DVX) can strengthen both their industrial development and manufacturing industries to achieve the macroeconomic goal of long-term economic growth. China as the world's fastest growing economy when trade is measured by the value added has stimulated forward linkages and economic development throughout several developing countries within the ASEAN+3, EU -13, and LATAM since 1998. However, strategic competition with the US has prevented China from further expanding its value chain to LATAM. Therefore, the whole region endures a peripherical position in relation to global value chains, as it is still too reliant on lower value-added investments in extractive industries. Yet strengthening TiVA exchanges with China, along with the US, is critical to broadening the alternatives for a sound and sustainable economic development in LATAM.

KEYWORDS: Trade in Value Added (TiVA), US-China strategic competition, international production, Belt and Road Initiative, BRI.

Economía política de las cadenas de valor de China y EE.UU. en América Latina

Alberto J. Lebrón Veiga
Institute of International Political Economy – Peking University
alebron@pku.edu.cn

Resumen

Este documento provee evidencia empírica sobre cómo una integración eficiente a las cadenas de valor globales puede promover el crecimiento económico a través de la mejora industrial y a su vez la prevención de desbalances externos en Latino América (LATAM). Se definen las políticas económicas de Estados Unidos y China en la región para el periodo 1998-2015. La investigación usa datos primarios para calcular el TiVA, obtenidos de la base de datos de UNCTAD-EORA para Estados Unidos, China y nueve economías latinoamericanas.

El desarrollo de cadenas de valor globales ha traído alternativas sin precedentes en la creación de alianzas comerciales y estrategias industriales para países en vías de desarrollo. Una integración efectiva de LATAM a las cadenas de valor globales, a través de vínculos hacia adelante o incrementos en el valor agregado indirecto, puede fortalecer tanto el desarrollo industrial y manufacturero, lo que permite alcanzar el objetivo macroeconómico de crecimiento económico de largo plazo. China es la economía con mayor crecimiento a nivel mundial, lo que se mide en términos de valor agregado, que a su vez fue un estímulo para la constitución de vínculos hacia adelante y de desarrollo económico en numerosos países en vías de desarrollo de ASEAN+3, EU-13 y LATAM, desde 1998. Sin embargo, su competencia estratégica con Estados Unidos ha frenado la expansión de su propia cadena de valor en LATAM. Por lo tanto, la totalidad de esta región se circunscribe en una posición periférica en relación con las cadenas de valor globales, al mantenerse dependiente a inversiones de bajo valor agregado en industrias extractivas. El fortalecimiento del TiVA del comercio con China y Estados Unidos es crítico para el desarrollo económico y sostenible en LATAM.

Introduction

Global value chains constitute an essential driver for economic development which can be enhanced by spillovers from international trade. The fragmentation and distribution of tasks allow countries to better optimize their allocation of resources (Grossman and Rossi-Hanberg, 2008)[1]. Which" countries produce "what" determines growth and overall welfare within the borders of a given country. Therefore, countries have become unable to avoid the strategic competition aimed

[1] Grossman, G. and Rossi-Hansberg, E. Trading tasks: A simple theory of offshoring. American Economic

at the maximization of their own profits through global value chains and international trade. But, nevertheless, there is also some room for maneuvering to increase multilateral cooperation since international trade is not a zero-sum game. Increasing participation in global value chains and a continuous shifting towards higher value-added activities are both variables that have laid the foundation for sustained economic growth. China, for instance, has become the world largest source of intermediate goods and services that manifest in other countries` overall value in exports (a variable referred as DVX). Growing forward linkages in global value chains, or DVX, have also boosted Chinese total gross exports at an annual rate of 12.34% since 1998 (see Table 1). And since net exports (XM) equal the difference between national savings (S) and investments (I), 【 XM = S - I 】, forward linkages have stimulated economic growth[2]. In other words, if $\triangle XM > 0 \rightarrow \triangle (S - I) > 0$; longer term domestic investments will rise due to the fundamental principle of economic equilibrium. Yet unbalanced trade-in-value-added exchanges, or TiVA, induce a structural relationship between advanced "centers" and less developed "peripheries". Advanced centers, unlike the much less developed "peripheries", are prone to increase their external surpluses through DVX and a sustained growth in gross exports (EXGR). Thus, political economics between "centers" and "peripheries" becomes a creditor-debtor relationship that also means the consolidation of dominating-subordinating relationships.

Based on that thesis, I aim at assessing the TiVA linkages of nine Latin American countries with two major superpowers: China and US. I will elaborate the assumption that broadening forward linkages have led to a proportional growth in the exports of LATAM. I also argue that a more balanced distribution of TiVA shares amongst countries should prevent their external sector from going through financial difficulties, or even collapse, due to protracted trade deficits. Therefore, a greater degree of openness is preferred over strategic competition or trade protectionism, an assumption which also holds for China and the US in LATAM.

The studies about global value chains' positive effect on exports and economic development are many. And the literature about the power relationships between centers and peripheries through trade also includes some relevant references as well. This paper provides empirical evidence with regard to a positive statistical correlation between forward linkages in global value chains and the growth of exports. How these relationships contribute to stabilizing the external sector and to promoting a sustained economic development is discussed throughout this paper. Further, the strategic competition between China and the US in LATAM leads to trade interdependence and diversification, besides strengthening a country's external position via exports, that favor more balanced relationships between countries. Global value chains have become a new paradigm of international trade. Alongside technological development and commercial liberalization, global

---

[2] Review, 98(5), 2008, p.p.1978-97.
Being the economic model of general equilibrium:

(1)

$$S_a - I_a = XM_{aw}$$
$$\text{If } \triangle XM_{aw} > 0; \text{ then } \triangle(S_a - I_a) > 0$$

National savings (S) is renamed as the rent which is not consumed (Y - C - G):

(2)

$$(Y_a - C_a - G_a) - I_a = XM_{aw}$$
$$\text{If } \triangle XM_{aw} > 0; \text{ then } \triangle(Y_a - C_a - G_a) - I_a > 0$$

Rent grows in relative terms whenever there is an increase of net exports ($\triangle(Y_a - C_a - G_a) > 0 = \triangle(S_a) > 0$). Therefore, in order to restore the general equilibrium, private investments must also increase ($\triangle I_a > 0 \rightarrow \triangle(S_a - I_a) < 0 \rightarrow \triangle XM_{aw} < 0$). Therefore, if the trade surplus widens due to a relative increase in net exports, rent (Y_a) will grow and also private investments (I_a).

Value chains have spurred a model which is based on "trade in tasks" (Xing and Detert, 2011; Inomata, 2017; Xing, 2021). Fragmentation of production has led to a drastic reduction in overall costs. And such an increase in competitiveness has also boosted the volume of international trade (Baldwin and Lopez-González, 2015; Kwok, 2016; Feenstra, 1998). Despite some short-term distributional effects, like losses of manufacturing jobs after offshoring tasks to developing countries (Krasner, 1976; Topel, 1991; Jacobson et al., 1993; Neal, 1995; Parent, 2000; Kambourov and Manovskii, 2009; Utar, 2012), global value chains are not a zero-sum game (Krugman, 1996; Carluccio et al., 2015; Lu et al., 2019).

Despite the rapid expansion of global value chains,the overall trade volume has grown 238% between 1998 and 2015[3]. As mentioned, several authors have also established a direct relationship between domestic participation in global value chains and economic development (Baldwin and Lopez-Gonzalez, 2015; Gereffi and Fernandez-Stark, 2017; Vrh, 2017). The main logic behind this assertion is that further integration into global value chains, either through forward or backward linkages, increases overall productivity (Kreutzer and Berger, 2018; Dauth et al., 2014; Lurweg and Westermeier, 2010; Donoso et al., 2015 o Iodice et al., 2016).

Industrial upgrading which stems from subsequential productivity growth therefore boosts jobs and promotes sustained economic development (Montalbano et al., 2017; Shimbov et al., 2019). Indeed, in developing countries, reductions in tariffs are considered an optimal political choice since such measures have allowed them to increase TiVA exchanges of intermediate inputs and overall EXGR (Baldwin, 2006)[4]. Trade liberalization and the division of labor, along with technological innovation, all are considered critical factors to ensure an efficient integration into global value chains (Beverelli et al., 2019; Stollinger, 2016; Shimbov et al., 2019).

Besides strengthening forward linkages, there is a strong correlation between innovation-oriented policies and DVA increases, so external surpluses could ensure long-term economic development through the mechanism of greater investments (Landesman and Stollinger, 2018; Yu and Luo, 2018; Greenaway et al., 2002; Yi, 2003; Yeung, 2014; Hagemejer and Muagk, 2019; Tajoli and Felice, 2018; Naveed and Shabbir, 2006). State power, in terms of economics and trade, comes from these variables. Without a strong industrial sector, weaker or peripheral states are not well integrated into global value chains. When forward linkages are weak, DVA is not enough to create manufacturing jobs, therefore a country would become peripheral and borrow funds from more powerful countries.

Then these powerful countries deepen their hegemonic position while accounting for the biggest share of both traditional and TiVA flows. In order to perpetuate such schemes based on "central" and "peripheral" countries, hegemonic countries aim at dictating international rules which favor their core interests (Mann, 1997; Wang and Tao, 2014; Gereffi et al., 2005). Tang (2012) has determined that an ultimate purpose of "centers and peripheries" schemes is for the former countries to exploit both the natural and labor resources of the latter. These schemes also lead to strategic competition between countries that aim at holding a central position within the model (Wang and Zeng, 2020). By contrast to the dominating-subordinating commercial scheme, another model exists in which its core principles are founded on economic interdependence and mutual benefit among countries (Feng, 2014; Callahan, 2016).

The TiVA raw data used in this paper was obtained from the database of UNCTAD-EORA (DVX, DVA and EXGR)[5]. Other variables, such as the GVC index (both GVC_a and GVC_w), were

[3] Source: UNCTAD-EORA

[4] Baldwin, R. Multilateralising Regionalism: Spaghetti Bowls as Building Blocs on the Path to Global Free Trade. 2006. The World Economy, 29, 11, p. 1472.

[5] Lenzen, M., Moran, D., Kanemoto, K., Geschke, A. Building Eora: A Global Multiregional Input-Output Database at High Country and Sector Resolution. 2013. Economic Systems Research, 25:1, 20-49, DOI:10.1080/09535314.2013.769938

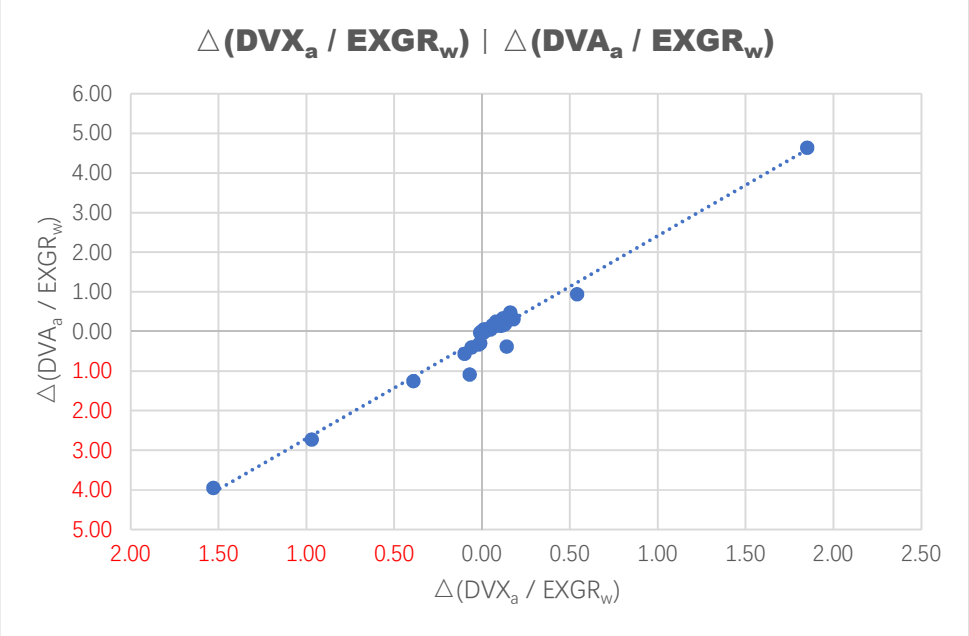
calculated from the UNCTAD-EORA database. Network analysis was performed using a GVC_w index or the total sum of the bilateral TiVA exchanges within the sample over world exports【$GVC_{(w)} = (DVX_{ab} + FVA_{ba}) / EXGR_w$】. The centrality analysis, therefore, is useful to determine whether TiVA exchanges in the sample follow a "central and peripheral" pattern or not[6]. Further, in order to assess the dominatting-subordinating relationships between countries, I use the bilateral GVC_a index for country A's overall exports as the main reference【$GVC_{(a)} = (DVX_{ab} + FVA_{ba}) / EXGR_a$】.

The paper's findings show that the US commercial relationship with LATAM is a scheme of "center-peripheries". Yet Brazilian or Chilean DVX contributions to China have overcome those to the US. Bilateral TiVA exchanges are more balanced between China-LATAM compared to LATAM-US. Even though further research is needed to disaggregate the nature of trade of intermediate inputs in LATAM, also with other major economies like China and the US, a first evident conclusion can be anticipated. Despite US efforts to weaken Chinese commercial ties across the region by using political tools such as USDFC, trade with China still remains a crucial factor for industrial and economic development in LATAM. Section 2 has a summary of some general laws and universal patterns that are attributable to TiVA. Section 3 has a test of the empirical evidence about the configuration of LATAM-US; LATAM-CHINA; and LATAM-LATAM value chains, which is consistent with theoretical framework outlined in section 2. And section 4 concludes.

Stylized facts on TiVA

As a main theoretical innovation, this paper presents an almost perfect correlation between DVX and DVA, with the latter also correlated to EXGR. Using a world sample of 31 countries and / or regions from the EORA-UNCTAD database, the main findings are plotted as follows:

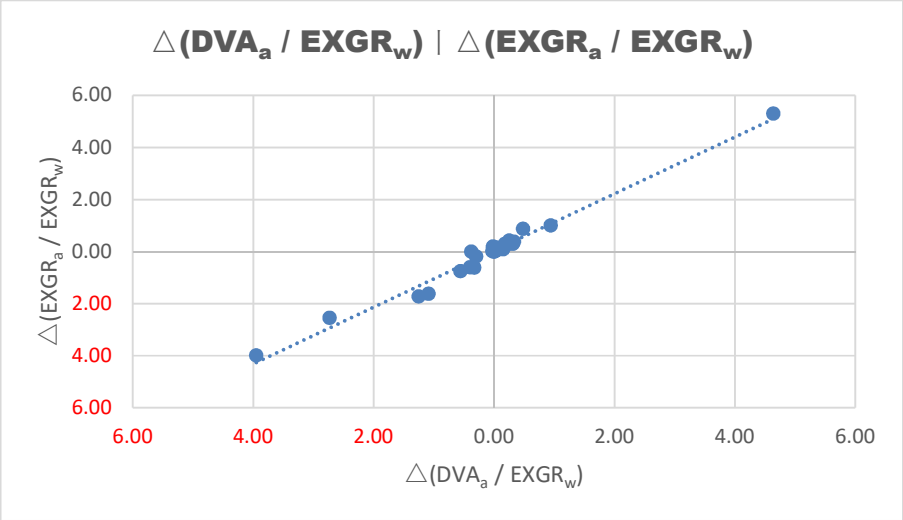
Figure 1 – Correlation between DVX and DVA



[6] A detailed description of this analytical technique can be found at: Zhang, J. and Luo, Y. Degree Centrality, Betwenness Centrality and Closeness Centrality in Social Network. Advances in Intelligence Systems Research, 2017, Vol. 132. Atlantis Press, p.p. 300-302.

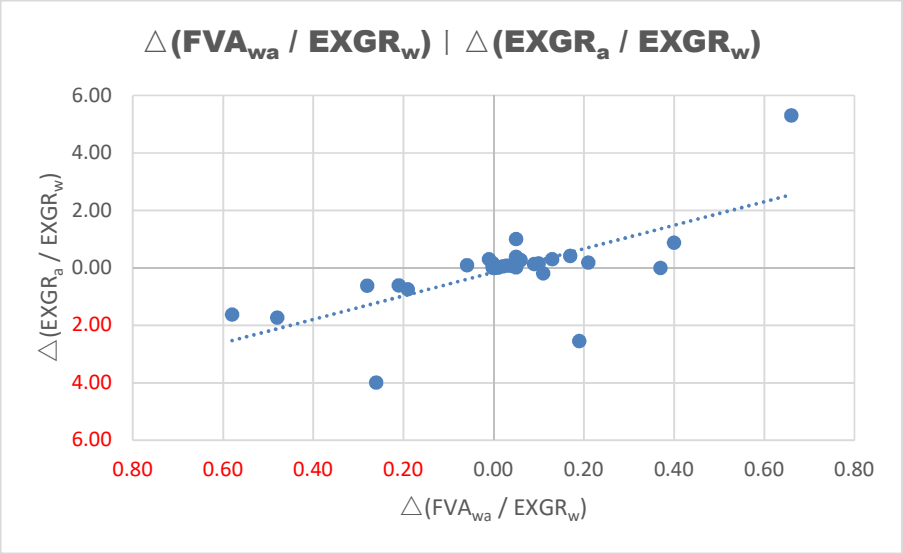
Source: EORA-UNCTAD, own elaboration.

Figure 2 – Correlation between DVA and EXGR



Source: EORA-UNCTAD, own elaboration.

Figure 3 – Correlation between FVA and EXGR



Source: EORA-UNCTAD, own elaboration

Table 1 – Correlations of DVA and EXGR, DVX and DVA; and FVA and EXGR

	DVA | EXGR	DVX | DVA	FVA | EXGR
Mean Y	0.07	0.10	0.07
Mean X	0.10	0.02	0.02
Cov XY	1.74	0.60	0.22
Var X	1.65	0.24	0.06
Slope	1.05	2.48	3.96
Correlation	**0.99**	**0.99**	**0.69**

Source: EORA-UNCTAD, own elaboration

According to data above, increased forward linkages in value chains have boosted DVA that is the main driver of EXGR. Decreased forward linkages, on the other hand, cause a reduction of both DVA and EXGR. Further, there is no significant correlation between FVA and EXGR. This is consistent with the increased DVX as the main driver of overall EXGR through DVA. Strategic competition between China and US, including in LATAM, is also connected to these variables. Chinese forward linkages over total DVX have registered the world's fastest growth rate between 1998 and 2015. The world's fastest DVA growth rate also corresponds to China. And overall exports, according to our theoretical predictions, have also grown the most in China.

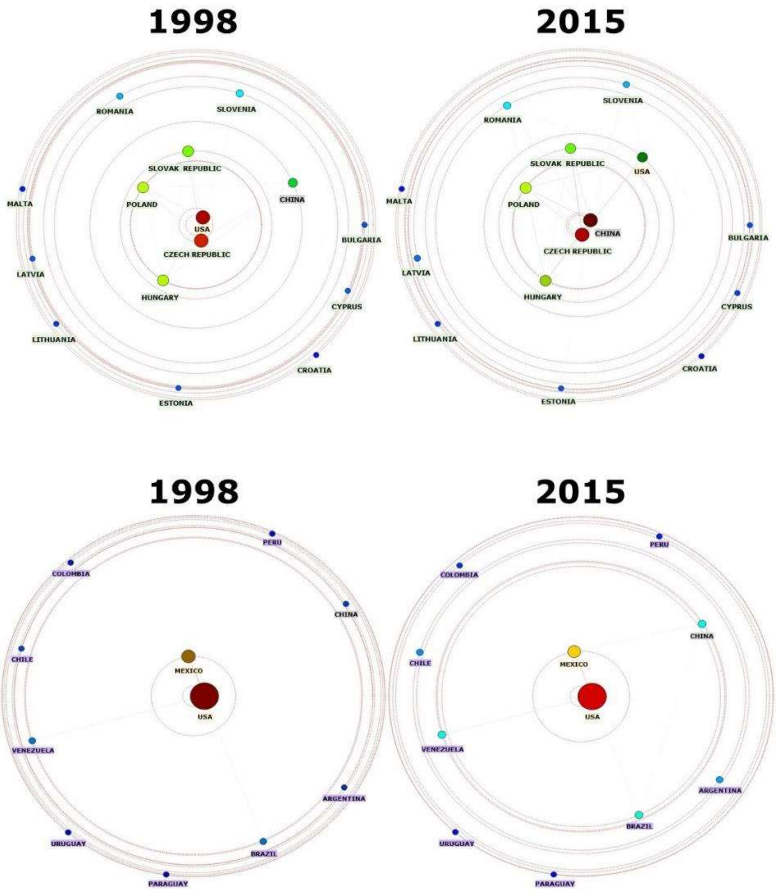
Table 2 – Difference of DVX and DVA over EXGR per country bloc, comparing 1998 and 2015

	DVX_{aw} / $EXGR_w$			DVA_a / $EXGR_w$			$EXGR_a$ / $EXGR_w$		
	1998	**2015**	**DIF**	**1998**	**2015**	**DIF**	**1998**	**2015**	**DIF**
EU-15	**11.06%**	**10.30%**	**-0.76%**	**28.70%**	**23.81%**	**-4.89%**	**43.05%**	**38.07%**	**-4.98%**
France	1.64%	1.39%	**-0.25%**	4.07%	3.10%	**-0.97%**	5.70%	4.52%	**-1.18%**
Germany	2.82%	2.49%	**-0.33%**	7.76%	6.66%	**-1.10%**	11.10%	10.38%	**-0.72%**
Italy	1.19%	1.07%	**-0.12%**	3.82%	3.00%	**-0.82%**	4.96%	4.22%	**-0.74%**
Spain	0.52%	0.61%	**0.09%**	1.52%	1.53%	**0.01%**	2.20%	2.25%	**0.05%**
UK	1.53%	1.42%	**-0.11%**	3.66%	2.92%	**-0.74%**	4.95%	3.99%	**-0.96%**
EU-13	**0.79%**	**1.09%**	**0.30%**	**1.71%**	**2.00%**	**0.29%**	**2.67%**	**3.45%**	**0.78%**
Czech	0.21%	0.32%	**0.11%**	0.42%	0.54%	**0.12%**	0.62%	0.87%	**0.25%**
Hungary	0.10%	0.14%	**0.04%**	0.22%	0.26%	**0.04%**	0.45%	0.58%	**0.13%**
Poland	0.24%	0.29%	**0.05%**	0.49%	0.50%	**0.01%**	0.65%	0.74%	**0.09%**
NAFTA	**4.89%**	**3.59%**	**-1.30%**	**15.73%**	**11.19%**	**-4.54%**	**19.09%**	**13.87%**	**-5.22%**
Canada	0.48%	0.51%	**0.03%**	2.99%	2.35%	**-0.64%**	4.45%	3.31%	**-1.14%**
Mexico	0.20%	0.22%	**0.02%**	1.38%	1.24%	**-0.14%**	2.10%	1.78%	**-0.32%**
USA	4.22%	2.86%	**-1.36%**	11.35%	7.59%	**-3.76%**	12.54%	8.77%	**-3.77%**
LATAM	**0.40%**	**0.58%**	**0.18%**	**1.49%**	**1.82%**	**0.33%**	**1.71%**	**2.16%**	**0.45%**
Argentina	0.07%	0.09%	**0.02%**	0.34%	0.34%	**0.00%**	0.38%	0.42%	**0.04%**
Brazil	0.20%	0.31%	**0.11%**	0.70%	0.97%	**0.27%**	0.79%	1.12%	**0.33%**
Chile	0.07%	0.10%	**0.03%**	0.22%	0.27%	**0.05%**	0.28%	0.36%	**0.08%**
Colombia	0.03%	0.04%	**0.01%**	0.14%	0.15%	**0.01%**	0.16%	0.16%	**0.00%**
Peru	0.03%	0.04%	**0.01%**	0.09%	0.09%	**0.00%**	0.10%	0.10%	**0.00%**
East Asia	**4.15%**	**5.43%**	**1.28%**	**13.36%**	**16.07%**	**2.71%**	**16.49%**	**20.59%**	**4.10%**
China	0.97%	2.98%	**2.01%**	3.73%	8.89%	**5.16%**	4.30%	10.31%	**6.01%**
HK SAR	0.18%	0.18%	**0.00%**	0.57%	0.52%	**-0.05%**	1.02%	1.22%	**0.20%**
Japan	2.08%	1.41%	**-0.67%**	6.18%	4.04%	**-2.14%**	6.92%	5.03%	**-1.89%**
Korea	0.40%	0.64%	**0.24%**	1.30%	1.99%	**0.69%**	1.92%	3.14%	**1.22%**
Chinese Taipei	0.52%	0.21%	**-0.31%**	1.58%	0.63%	**-0.95%**	2.33%	0.88%	**-1.45%**
ASEAN	**1.05%**	**1.70%**	**0.65%**	**3.10%**	**4.38%**	**1.28%**	**5.26%**	**6.87%**	**1.61%**
Indonesia	0.25%	0.50%	**0.25%**	0.71%	1.18%	**0.47%**	0.87%	1.33%	**0.46%**
Malaysia	0.30%	0.44%	**0.14%**	0.78%	1.00%	**0.22%**	1.30%	1.57%	**0.27%**
Philippines	0.09%	0.19%	**0.10%**	0.29%	0.45%	**0.16%**	0.55%	0.64%	**0.09%**
Singapore	0.18%	0.24%	**0.06%**	0.50%	0.67%	**0.17%**	1.39%	1.85%	**0.46%**
Thailand	0.17%	0.26%	**0.09%**	0.63%	0.86%	**0.23%**	0.90%	1.25%	**0.35%**
Others	**7.76%**	**11.84%**	**4.08%**	**23.07%**	**30.56%**	**7.49%**	**31.34%**	**41.24%**	**9.90%**
Morocco	0.04%	0.04%	**0.00%**	0.10%	0.09%	**-0.01%**	0.11%	0.11%	**0.00%**
New Zealand	0.06%	0.07%	**0.01%**	0.25%	0.30%	**0.05%**	0.30%	0.35%	**0.05%**
Russia	0.41%	0.92%	**0.51%**	0.84%	1.69%	**0.85%**	0.96%	1.85%	**0.89%**
South Africa	0.19%	0.20%	**0.01%**	0.47%	0.44%	**-0.03%**	0.55%	0.54%	**-0.01%**
Turkey	0.18%	0.14%	**-0.04%**	0.54%	0.38%	**-0.16%**	0.67%	0.55%	**-0.12%**

Source: EORA-UNCTAD, own elaboration

Stylized facts on US-China strategic competition from a TiVA perspective

Since GVC linkages determine the economic performance of all countries, a competition to have the biggest TiVA share has occurred. The US has had the worst performance with declining TiVA between 1998 and 2015. But, on the other hand, the highest TiVA indicators and best performance has been observed in China. Since global value chains determine the economic performance in the mid-long term and since the US views trade with China as a zero-sum game, there is a great deal of room for strategic competition to happen. China has displaced the US in the value chains of the EU-13. And, being aware of its growing presence, the US has found an incentive to prevent China from displacing it in LATAM value chains. South–south exchanges, which are beneficial for almost all the countries, find themselves conditioned and subordinated to the hegemonic will of the US[7].



[7] The United States Development Financial Corporation's portfolio investments across the region, aimed at interfering with Sino-LATAM commercial relations, has expanded eight-fold since the Chinese Belt Road initiative was announced in 2012. According to the US Code Title 22, Chapter 103, Item 9611; American policies are aimed at preventing Chinese expansion in LATAM, while labelling it as a "strategic competitor". See: https://uscode.house.gov/view.xhtml?path=/prelim@title22/chapter103&edition=prelim

Empirical analysis

LATAM–China forward linkages have grown, on average, at a faster rate than those between LATAM and the US ($\triangle DVX_{LAT\text{-}CHN} > \triangle DVX_{LAT\text{-}USA}$). DVX exports to China from countries such as Brazil or Peru have also surpassed those to the US–LATAM DXV. However, exports to the US have remained higher than those to China in absolute terms. This is also due to the greater shares of Venezuela and Mexico´s DVX contained in the overall exports to the US.

Table 3 – DVX by country, in millions of USD, from years 1998 and 2015

	DVX (1998)		DVX (2015)		DVX (1998-2015)	
	CHINA	**USA**	**CHINA**	**USA**	**CHINA**	**USA**
Argentina	28	237	483	744	1623%	213%
Brazil	229	801	4224	3640	1747%	354%
Chile	65	325	1344	1194	1975%	267%
Colombia	5	317	105	1408	1913%	344%
Mexico	56	3350	1401	13900	2395%	315%
Paraguay	1	7	17	29	1156%	294%
Peru	54	143	856	521	1479%	266%
Uruguay	5	13	58	26	962%	105%
Venezuela	35	4485	666	19690	1830%	339%
Total	478	9679	9152	41153	1813%	325%

Considering China and LATAM countries together, the TiVA exchanges have increased ten-fold within the period from 1998–2015. Moreover, DVX exports from China to LATAM have registered a growth of 2.315% that is the fastest rate on record. The DVX growth rate of the US, excluding TiVA exchanges with China, is the lowest. Therefore, a large part of the LATAM DVX growth must be attributable to TiVA exchanges with China, as shown in Table 4.

Table 4 – Total DVX (ex-USA) (ex-China)

1998-2015	Total DVX (ex-USA)	1998-2015	Total DVX (ex-China)
China	2315%	**Brazil**	587%
Brazil	940%	**Chile**	452%
Chile	917%	**Mexico**	424%
Mexico	874%	**Peru**	394%
Peru	775%	**Colombia**	371%
Colombia	545%	**Venezuela**	360%
Venezuela	520%	**Argentina**	344%
Argentina	458%	**Paraguay**	329%
Paraguay	384%	**Uruguay**	286%
Uruguay	356%	**USA**	196%
USA		**China**	
Total	**933%**	**Total**	**275%**

Furthermore, DVX exports have also encouraged growth in both DVA and EXGR across the region. Wider and more diversified forward linkages to global value chains favor a higher growth rate of DVA. And DVA has a stronger positive correlation with EXGR than FVA (as shown in Table 5).

Table 5 – EXGR VAR

DVX	VAR	DVA	VAR	EXGR	VAR
China	1485%	**China**	978%	**China**	712%
Brazil	714%	**Brazil**	466%	**Brazil**	382%
Chile	600%	**Chile**	364%	**Chile**	328%
Peru	549%	**Mexico**	336%	**Argentina**	276%
Colombia	437%	**Peru**	333%	**Venezuela**	249%
Argentina	418%	**Argentina**	331%	**Colombia**	246%
Paraguay	379%	**Colombia**	329%	**Peru**	240%
Mexico	361%	**Venezuela**	281%	**Paraguay**	199%
Venezuela	355%	**Paraguay**	260%	**Mexico**	188%
Uruguay	323%	**Uruguay**	159%	**USA**	137%
USA	280%	**USA**	131%	**Uruguay**	130%

LATAM–China backward linkages have also increased at the fastest rate on average between 1998 and 2015. The US, however, still remained the largest source of FVA in LATAM. The largest LATAM recipients of US FVA were Mexico, Brazil, Venezuela, and Argentina in 2015. But the fastest growth was registered with regard to Chinese FVA in Brazil, Argentina, Mexico, and Venezuela.

Table 6 – FVA 1998, 2015

FVA (1998)				FVA (2015)			
	ARG	**BRA**	**CHL**		**ARG**	**BRA**	**CHL**
China	42	68	116	**China**	1319	2598	1306
USA	296	1037	858	**USA**	1737	5079	2357
	COL	**MEX**	**PAR**		**COL**	**MEX**	**PAR**
China	15	445	10	**China**	267	11489	79
USA	255	15710	25	**USA**	690	43798	40
	PER	**URU**	**VEN**		**PER**	**URU**	**VEN**
China	10	7	14	**China**	158	98	273
USA	98	42	586	**USA**	365	103	1844

Table 7 – FVA (1998-2015)

FVA (1998-2015)			
	ARG	**BRA**	**CHL**
CHINA	3056%	3694%	1023%
USA	486%	390%	175%
	COL	**MEX**	**PAR**
CHINA	1626%	2481%	685%
USA	170%	179%	58%
	PER	**URU**	**VEN**
CHINA	1500%	1290%	1858%
USA	274%	143%	214%

According to the empirical evidence, the FVA variable has no significant correlation with the growth of exports. Yet it might be a significant source of technological transferences which stimulates DVX and DVA. Therefore, even though such a theoretical assumption does remain pending further research, the US has also retained its hegemonic position when trade is measured as in value added. The US was still the largest contributor of DVX to Mexico, Venezuela, Brazil, Colombia, and Peru in 2015. China, however, did catch-up as the second largest contributor of DVX to Mexico, Brazil, Colombia, and Peru. Furthermore, Chinese DVX used to account for less than 10% of the US DVX in countries such as Venezuela, Peru, Mexico, or Brazil but has risen to around half of the US DVX in Brazil or Peru in 2015 (see Table 8).

Table 8 –

1998					
Argentina		**Brazil**		**Chile**	
Argentina	1.53e+07	Brazil	3.30e+07	Chile	1.13e+07
USA	2.96e+05	USA	1.04e+06	USA	8.58e+05
Brazil	2.72e+05	Argentina	3.01e+05	Argentina	6.85e+05
Chile	5.13e+04	Venezuela	8.98e+04	Brazil	2.23e+05
China	4.18e+04	China	6.85e+04	China	1.16e+05
Mexico	2.23e+04	Chile	5.47e+04	Mexico	8.68e+04
Uruguay	1.98e+04	Mexico	4.49e+04	Paraguay	7.35e+04
Paraguay	1.49e+04	Uruguay	3.02e+04	Venezuela	4.79e+04
Venezuela	7.83e+03	Colombia	2.12e+04	Peru	4.30e+04
Colombia	4.32e+03	Paraguay	2.09e+04	Colombia	3.94e+04
Peru	4.09e+03	Peru	1.76e+04	Uruguay	1.01e+04
Total	7.35e+05	**Total**	1.69e+06	**Total**	2.18e+06
Total Lat	3.97e+05	**Total Lat**	5.80e+05	**Total Lat**	1.21e+06
Lat / Tot	54%	**Lat / Tot**	34%	**Lat / Tot**	55%
China		**Colombia**		**Mexico**	
China	1.58e+08	Colombia	6.63e+06	Mexico	5.49e+07
USA	2.83e+06	USA	2.55e+05	USA	1.57e+07
Brazil	2.29e+05	Venezuela	4.67e+04	China	4.45e+05
Chile	6.47e+04	Brazil	2.51e+04	Brazil	3.12e+05
Mexico	5.62e+04	Mexico	2.28e+04	Venezuela	1.70e+05
Peru	5.42e+04	China	1.55e+04	Chile	1.07e+05
Venezuela	3.45e+04	Chile	1.27e+04	Argentina	6.03e+04
Argentina	2.80e+04	Peru	8.53e+03	Colombia	5.43e+04
Uruguay	5.46e+03	Argentina	7.23e+03	Peru	3.48e+04
Colombia	5.19e+03	Uruguay	1.25e+03	Uruguay	8.97e+03
Paraguay	1.35e+03	Paraguay	3.04e+02	Paraguay	1.68e+03
Total	3.31e+06	**Total**	3.95e+05	**Total**	1.69e+07
Total Lat	4.78e+05	**Total Lat**	1.25e+05	**Total Lat**	7.49e+05
Lat / Tot	14%	**Lat / Tot**	32%	**Lat / Tot**	4%
Paraguay		**Peru**		**USA**	
Paraguay	1.43e+06	Peru	3.88e+06	USA	6.30e+08
Brazil	4.83e+04	USA	9.78e+04	Venezuela	4.48e+06
Argentina	3.34e+04	Brazil	1.88e+04	Mexico	3.35e+06
USA	2.53e+04	Venezuela	1.81e+04	China	1.95e+06

China	1.00e+04	Chile	1.80e+04	Brazil	8.01e+05
Uruguay	5.10e+03	Colombia	1.46e+04	Chile	3.25e+05
Chile	3.08e+03	Mexico	1.02e+04	Colombia	3.17e+05
Mexico	1.60e+03	Argentina	1.00e+04	Argentina	2.37e+05
Venezuela	7.88e+02	China	9.91e+03	Peru	1.43e+05
Colombia	4.16e+02	Uruguay	7.49e+02	Uruguay	1.28e+04
Peru	1.79e+02	Paraguay	6.74e+02	Paraguay	7.38e+03
Total	1.28e+05	**Total**	1.99e+05	**Total**	1.16e+07
Total Lat	9.29e+04	**Total Lat**	9.13e+04	**Total Lat**	9.68e+06
Lat / Tot	72%	**Lat / Tot**	46%	**Lat / Tot**	83%

Uruguay		**Venezuela**		**China / USA**	
Uruguay	1.97e+06	Venezuela	2.90e+07	**Argentina**	14%
Argentina	5.89e+04	USA	5.86e+05	**Brazil**	7%
Brazil	5.78e+04	Colombia	1.33e+05	**Chile**	14%
USA	4.23e+04	Brazil	9.30e+04	**Colombia**	6%
China	7.03e+03	Mexico	5.42e+04	**Mexico**	3%
Chile	5.63e+03	Chile	2.40e+04	**Paraguay**	40%
Venezuela	5.37e+03	Argentina	2.24e+04	**Peru**	10%
Mexico	3.32e+03	Peru	1.52e+04	**Uruguay**	17%
Paraguay	1.41e+03	China	1.39e+04	**Venezuela**	2%
Colombia	6.61e+02	Uruguay	3.50e+03		
Peru	4.71e+02	Paraguay	2.43e+03		
Total	1.83e+05	**Total**	9.48e+05		
Total Lat	1.34e+05	**Total Lat**	3.48e+05		
Lat / Tot	73%	**Lat / Tot**	37%		

2015					
Argentina		**Brazil**		**Chile**	
Argentina	6.59e+07	Brazil	1.87e+08	Chile	5.25e+07
Brazil	4.03e+06	USA	5.08e+06	Argentina	3.06e+06
USA	1.74e+06	China	2.60e+06	USA	2.36e+06
China	1.32e+06	Argentina	2.32e+06	Brazil	1.36e+06
Chile	5.16e+05	Chile	5.19e+05	China	1.31e+06
Mexico	2.32e+05	Venezuela	5.18e+05	Mexico	4.29e+05
Paraguay	1.88e+05	Mexico	4.32e+05	Venezuela	2.13e+05
Uruguay	1.04e+05	Colombia	2.29e+05	Peru	2.01e+05
Venezuela	7.55e+04	Paraguay	2.11e+05	Colombia	1.92e+05
Colombia	5.22e+04	Peru	1.46e+05	Paraguay	1.22e+05
Peru	3.68e+04	Uruguay	1.34e+05	Uruguay	2.36e+04
Total	8.29e+06	**Total**	1.22e+07	**Total**	9.26e+06
Total Lat	5.24e+06	**Total Lat**	4.51e+06	**Total Lat**	5.60e+06
Lat / Tot	63%	**Lat / Tot**	37%	**Lat / Tot**	60%

China		**Colombia**		**Mexico**	
China	1.71e+09	Colombia	2.85e+07	Mexico	2.39e+08
USA	2.66e+07	USA	6.90e+05	USA	4.38e+07
Brazil	4.22e+06	China	2.67e+05	China	1.15e+07

Mexico	1.40e+06	Venezuela	1.61e+05	Brazil	2.47e+06
Chile	1.34e+06	Brazil	1.41e+05	Venezuela	8.61e+05
Peru	8.56e+05	Mexico	1.06e+05	Chile	7.66e+05
Venezuela	6.66e+05	Chile	6.51e+04	Colombia	4.08e+05
Argentina	4.83e+05	Peru	3.54e+04	Argentina	3.60e+05
Colombia	1.05e+05	Argentina	3.19e+04	Peru	2.21e+05
Uruguay	5.80e+04	Uruguay	2.04e+03	Uruguay	4.82e+04
Paraguay	1.70e+04	Paraguay	1.56e+03	Paraguay	6.95e+03
Total	3.58e+07	**Total**	1.50e+06	**Total**	6.04e+07
Total Lat	9.15e+06	**Total Lat**	5.44e+05	**Total Lat**	5.14e+06
Lat / Tot	26%	**Lat / Tot**	36%	**Lat / Tot**	9%
Paraguay		**Peru**		**USA**	
Paraguay	5.15e+06	Peru	1.68e+07	USA	1.46e+09
Brazil	1.76e+05	USA	3.65e+05	China	2.48e+07
Argentina	9.99e+04	China	1.58e+05	Venezuela	1.97e+07
China	7.88e+04	Brazil	1.29e+05	Mexico	1.39e+07
USA	4.00e+04	Chile	1.09e+05	Brazil	3.64e+06
Chile	1.32e+04	Venezuela	9.86e+04	Colombia	1.41e+06
Uruguay	7.93e+03	Colombia	8.54e+04	Chile	1.19e+06
Mexico	5.29e+03	Mexico	6.31e+04	Argentina	7.44e+05
Venezuela	2.27e+03	Argentina	5.35e+04	Peru	5.21e+05
Colombia	1.40e+03	Paraguay	2.64e+03	Paraguay	2.91e+04
Peru	6.30e+02	Uruguay	2.05e+03	Uruguay	2.64e+04
Total	4.26e+05	**Total**	1.07e+06	**Total**	6.59e+07
Total Lat	3.07e+05	**Total Lat**	5.43e+05	**Total Lat**	4.11e+07
Lat / Tot	72%	**Lat / Tot**	51%	**Lat / Tot**	62%
Uruguay		**Venezuela**		**China / USA**	
Uruguay	5.11e+06	Venezuela	1.10e+08	**Arg**	76%
Brazil	3.13e+05	Usa	1.84e+06	**Bra**	51%
Argentina	2.37e+05	Colombia	6.87e+05	**Chl**	55%
Usa	1.03e+05	Brazil	4.59e+05	**Col**	39%
China	9.77e+04	China	2.73e+05	**Mex**	26%
Chile	2.51e+04	Mexico	2.58e+05	**Par**	197%
Venezuela	1.65e+04	Chile	1.11e+05	**Per**	43%
Mexico	1.55e+04	Argentina	8.96e+04	**Uru**	95%
Paraguay	6.11e+03	Peru	6.11e+04	**Ven**	15%
Colombia	3.22e+03	Paraguay	1.28e+04		
Peru	2.42e+03	Uruguay	8.39e+03		
Total	8.19e+05	**Total**	3.80e+06		
Total Lat	6.19e+05	**Total Lat**	1.69e+06		
Lat / Tot	76%	**Lat / Tot**	44%		

Intraregional TiVA trade has also increased between LATAM as a percentage of total exchange with China and US. Yet TiVA exchanges within LATAM without China and the US have remained well below half of overall commercial exchanges in Mexico, Brazil, and Venezuela. Taking into consideration the Global Value Chain index over national exports, or 【(DVX_{ab} +

FVA_{ba}) / $EXGR_a$】, both Mexico (16.8%) and Venezuela (18.5%) show an excessive dependence on their TiVA exchanges with the US.

Table 9 –

	2015	Argentina	Brazil	Chile
	Argentina		7.84%	4.41%
	Brazil	2.94%		0.87%
	Chile	5.22%	2.74%	
	China	0.09%	0.34%	0.13%
	Colombia	0.27%	1.18%	0.82%
	Mexico	0.17%	0.85%	0.35%
	Paraguay	5.00%	6.73%	2.34%
	Peru	0.48%	1.47%	1.66%
	USA	0.15%	0.52%	0.21%
	Uruguay	5.30%	6.96%	0.76%
	Venezuela	0.14%	0.84%	0.28%
	2015	**China**	**Colombia**	**Mexico**
	Argentina	2.22%	0.10%	0.73%
	Brazil	3.16%	0.17%	1.34%
	Chile	3.87%	0.38%	1.74%
	China		0.02%	0.65%
(DV X_{ab} + FV A_{ba}) / EX GR_a	**Colombia**	1.19%		1.65%
	Mexico	3.76%	0.15%	
	Paraguay	1.66%	0.05%	0.21%
	Peru	5.43%	0.65%	1.52%
	USA	3.05%	0.12%	3.42%
	Uruguay	2.42%	0.08%	0.99%
	Venezuela	0.81%	0.73%	0.96%
	2015	**Paraguay**	**Peru**	**USA**
	Argentina	0.36%	0.11%	3.06%
	Brazil	0.18%	0.13%	4.04%
	Chile	0.20%	0.45%	5.18%
	China	0.00%	0.05%	2.59%
	Colombia	0.01%	0.39%	6.72%
	Mexico	0.00%	0.08%	16.82%
	Paraguay		0.06%	1.20%
	Peru	0.02%		4.74%
	USA	0.00%	0.05%	
	Uruguay	0.22%	0.07%	2.01%
	Venezuela	0.01%	0.14%	18.52%
	2015	**Uruguay**	**Venezuela**	
	Argentina	0.42%	0.20%	
	Brazil	0.21%	0.45%	
	Chile	0.07%	0.47%	
	China	0.01%	0.05%	

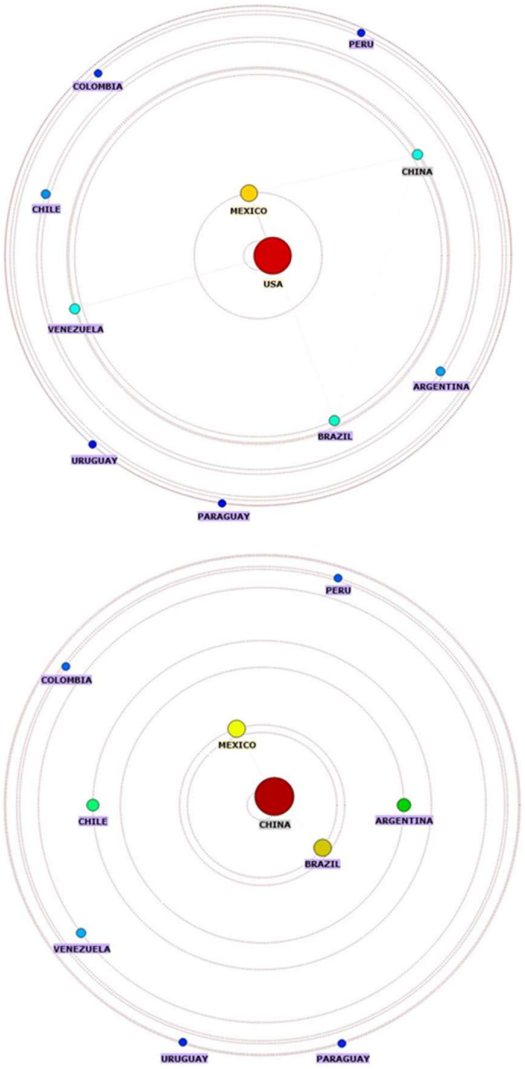
	Colombia	0.02%	2.72%
	Mexico	0.02%	0.33%
	Paraguay	0.24%	0.26%
	Peru	0.02%	0.85%
	USA	0.01%	1.28%
	Uruguay		0.39%
	Venezuela	0.02%	

These data show that the US weight over LATAM TiVA exchanges remains well above the regional average. Or, in other words, the US still plays a hegemonic role within LATAM value chains. The US and Mexico's combined share alone of total TiVA regional exchanges within LATAM were almost 70% in 2015. Yet, on the other hand, LATAM–China TiVA exchanges were more balanced and much less peripheral in their configuration (see figure 5 and table 9).

Table 10 –

1998	**TiVA / $EXGR_w$**	**%**	**2015**	**TiVA / $EXGR_w$**	**%**
USA	0.640	44.399	**USA**	0.505	40.035
ARGENTINA	0.047	3.253	**ARGENTINA**	0.073	5.755
BRAZIL	0.076	5.294	**BRAZIL**	0.116	9.191
PARAGUAY	0.005	0.318	**PARAGUAY**	0.005	0.383
URUGUAY	0.006	0.409	**URUGUAY**	0.006	0.444
VENEZUELA	0.087	6.031	**VENEZUELA**	0.131	10.372
CHILE	0.045	3.126	**CHILE**	0.059	4.644
COLOMBIA	0.019	1.298	**COLOMBIA**	0.022	1.773
MEXICO	0.506	35.149	**MEXICO**	0.335	26.523
PERU	0.010	0.723	**PERU**	0.011	0.880
1998	**TiVA / $EXGR_w$**	**%**	**2015**	**TiVA / $EXGR_w$**	**%**
ARGENTINA	0.036	14.889	**ARGENTINA**	0.069	13.047
BRAZIL	0.047	19.163	**BRAZIL**	0.106	20.036
PARAGUAY	0.004	1.741	**PARAGUAY**	0.005	0.938
URUGUAY	0.005	2.112	**URUGUAY**	0.006	1.084
VENEZUELA	0.016	6.341	**VENEZUELA**	0.024	4.490
CHILE	0.029	11.984	**CHILE**	0.054	10.180
COLOMBIA	0.009	3.645	**COLOMBIA**	0.013	2.528
MEXICO	0.050	20.279	**MEXICO**	0.102	19.217
PERU	0.007	2.811	**PERU**	0.012	2.222
CHINA	0.042	17.034	**CHINA**	0.139	26.257

Figure 5 – Countries relative positions



The total volume of US trade in value added exchanges with LATAM over world exports (or【$GCV_{USA\text{-}LAT} = (DVX_{ab} + FVA_{ba}) / EXGR_{w}$】) have diminished from 0.64% to 0.505% within the period from 1998-2015. The US accounted for 40% of total TiVA in 2015. Mexico and Venezuela, which are also dependent on the US value chain, accounted for an additional 36.8%. The GVC index between Mexico and the US under NAFTA represented 0.3% in 2015. Venezuela, because of its significant dependence on oil sales to the US, accounts for a DVX of 0.102% over world total exports. Indeed, Venezuela exported half of its total DVX to the US in 2015. However, shares of TiVA exchanges are more balanced when considering commercial ties between China and LATAM. And TiVA growth rates have grown faster in all LATAM countries when trading with China rather than the US.

According to Figure X, US commercial engagement in LATAM has become sort of "US-centered", but exchanges with China are a more balanced and diversified across the region. Both China and the US are at the center of total regional flows of TiVA. Yet growing commercial relations with China have increased TiVA flows within the region to a greater extent than the US. The US` de-coupling from Mexico ($\triangle DVX_{USA\text{-}MEX}$ (1998-2015) / $\triangle EXGR_{w}$ = - 0.182%), for instance, has been offset with greater TiVA exchanges with China. In 1998, China ranked as the

thirtieth destination for Mexican DVX. In 2015, however, China has become the sixth largest partner for Mexican DVX. Chinese DVX in Mexican exports has also grown from 0.022% to 0.060% between 1998 and 2015. Venezuela, due to its strong dependence on oil exports, still remains as a peripherical partner for both China and the US. That is also the case for Peru and Colombia even though their TiVA exchanges have grown at a faster rate with China compared to the US. Yet regional TiVA exchanges among Brazil, Peru, and Argentina altogether have reached 43% when considering the "LATAM + China" sample (but just 19.5% if the partner for the region as a whole is the US). Further integration of LATAM countries into the Chinese value chain has increased their TiVA exchanges, including DVX, more than the US. And this phenomenon has also taken place in a more balanced fashion for the TiVA exchanges with the US. Therefore, increasing TiVA exchanges with China has made a significant contribution to further mitigating the protracted external imbalances of most countries within LATAM.

Conclusion

The growing exchanges and diversification of trade have contributed to mitigating the chronic external imbalances in LATAM. Regional exports to China have increased overall trade in a significant manner. But low value-added intermediate exports are still far from supporting industrialization within the region[8]. Shifting to higher value-added DVX exports through vertical integration strategies at Chinese and US multinational corporations would increase the volume of EXGR. Increasing domestic savings that have been obtained as a result of consolidated external surplus could support greater levels of domestic investments that would enable the region to achieve long-term goals for economic growth through an outward shift of the Production Possibilities Frontier curve (PPF). Trade protectionism and / or excessive dependence on the US whose policies aim to isolate China would deprive LATAM of a potential driver for long-term economic growth through the "DVX – EXGR – S – I" mechanism. However, mutual economic reliance and a shift towards higher value-added commercial ties should improve perceptions on China across the region, where Chinese political capabilities to exert its influence still lag behind those of the US. Higher value-added trade could bring more benefits for all. Therefore, given the existence of relevant common interests, there are incentives for China and LATAM to reinforce their bilateral cooperation under multilateral and commercial initiatives such as BRI.

References

Baldwin R. and Lopez-Gonzalez, J. Supply Chain Trade: A portrait of Global Patterns and Several Testable Hypotheses. 2015. The World Economy, 2015, p. 1691 (1682-1721).

Beverelli, C. et al. Domestic value chains as stepping stones to global value chain integration. The World Economy 42:5, 2019, pp. 1467-1494.

Callahan, W. China' s Belt and Road Initiative and the New Eurasian Order. Norwegian Institute for International Affairs, 2016, p.3 (1-4)

Carluccio, J. et al. Trade, Wages and Collective Bargaining: Evidence from France. The Economic Journal 125:584, 2015, p. 815.

Dauth, W. et al. The Rise of the East and the Far East: German Labor Markets and Trade Integration. Journal of the European Economic Association 12:6, 2014, pp. 1643-1675.

Donoso, V. et al. Do Differences in the Exposure to Chinese Imports Lead to Differences in Local Labour Market Outcomes? An Analysis for Spanish Provinces. Regional Studies 49:10, 2015, p. 1748.

[8] Silva, M. Machinery Production Networks in Latin America: A Quantity and Quality Analysis. Latin American Economic Review 26:1. 2017, p.4.

Feenstra, R. Integration of Trade and Desintegration of Production in the Global Economy. The Journal of Economic Perspectives, Autumn, 1998, pp. 34 (31-50).

冯宗宪。中国向欧亚大陆延伸的战略动脉。人民论坛学术前沿，2014，（4）：第80页。

Grereffi, G. et al. The Governance of Global Value Chains, Review of International Political Economy, 2005, Vol. 12, No. 1, p. 97.

Gereffi G. and Fernandez-Stark K. Global Value Chain Analysis: A Primer. Center on Globalization, Governance & Competitiveness (CGGC), Duke University, North Carolina, USA, 2011, p. 33.

Greenaway, D. et al. Trade Liberalization and Growth in Developing Countries. Journal of Developments Economics, Vol. 67 (2002), p. 237.

Grossman, G. and Rossi-Hansberg, E. Trading tasks: A simple theory of offshoring. American Economic Review, 98(5), 2008, pp.1978-97.

Jacobson et al. Earnings Losses of Displaced Workers. American Economic Review, 1993, 83 (4), pp. 685-709.

Hagemejer, J. and Muagk, J. Export-led Growth and its Determinants: Evidence from CEEC Countries, doi: 10.1111/twec.12790, 2019, p. 19.

Inomata S. 全球价值链分析框架：综述，《全球价值链发展报告》，社会科学文献出版社，2017年，第22页。

Iodice, I. and Tomasi, C. Skill upgrading and wage gap: a decomposition analysis for Italian manufacturing firms. Economia Politica 33:2, 2016, p. 213.

Krasner, S. State Power and the Structure of Foreign Trade. World Politics 28(3), 1976, p. 319.

Krugman, P. Does Third World Growth Hurt First World Prosperity? Harvard Business Review, 1996, 72, p. 115.

Kwok, T.S. International trade and the division of labor. Review of International Economics 26:2, 2018, p. 335 (322-338).

Lu, Y. et al. Does global value chain engagement improve firms' wages: Evidence from China. The World Economy 42:10, 2019, p. 3079.

Mann, M. Has Globalization Ended the Rise and Rise of the Nation-State? Review of International Political Economy, 4(3) Autumn: 1997, pp. 472–96.

Montalbano, P. et al. Opening and linking up: firms, GVCs, and productivity in Latin America. Small Business Economics 50:4, 2018, p. 918.

Naveed, A. and Ghulam, Shabbir. Trade Openness, FDI and Economic Growth: A Panel Study. Pakistan Economic and Social Review, Vol. 44, No. 1, 2006, p. 151.

Neal, D. Industry-specific Human Capital: Evidence from Displaced Workers. Journal of Labor Economics, 1995, 13(4), pp. 653-677.

Parent, D. Industry-specific Capital and the Wage Profile: Evidence from the NLSY and the PSID, Journal of Labor Economics, 2000, 18 (2), pp. 306-323.

Shimbov, B. et al. Export Structure Upgrading and Economic Growth in the Western Balkan Countries. Emerging Markets Finance and Trade 55:10, 2019, pp. 2296-98.

Silva, M. Machinery production networks in Latin America: a quantity and quality analysis. Latin American Economic Review 26:1. 2017, p.4.

Stollinger, R. Structural Change and Global Value Chains in the EU, Empirica, 43, 2016, p. 803.

Tajoli, L. and Felice, G. Global Value Chains Participation and Knowledge Spillovers in Developed and Developing Countries: An Empirical Investigation. The European Journal of Development Research 30:3, 2018, p. 519.

Tang, X. How 'Little' Outsourcing Creates A Large Skill Premium: A Model of North-to-South Manufacturing Outsourcing. Pacific Economic Review 17:5, 2012, p. 646. (635-659).

Topel, R. Specific Capital, Mobility and Wages: Wages rise with Job Seniority. Journal of Political Economy, 1991, 99 (1), pp. 145-176.

Utar, H. When the Floodgates Open: "Northern" Firms' Response to Removal of Trade Quotas on Chinese Goods. American Economic Journal: Applied Economics 6:4, 2014, pp. 226-250.

Vrh, N. The convergence in domestic value-added of exports in the EU. Post-Communist Economies 29:3, 2017, pp. 424

Wang Z. and Zeng J, From Economic Cooperation to Strategic Competition: Understanding the US-China Trade Disputes through the Transformed Relations. Journal of Chinese Political Science, 25, 2020, p.p. 49-69.

王跃生和陶涛。《世界经济结构、全球经济 "双循环" 与中国经济转型》，《新视野》2014 年第 1 期。第55页。

Xing, Y. Processing trade, exchange rates and China's bilateral trade balances. 2012. Journal of Asian Economics 23:5, pp. 540-547.

Xing, Y. Factoryless Manufacturers and International Trade in the Age of Global Value Chains. 2021. GRIPS, Tokio, Japan.

邢予青和Detert，N. 国际分工与美中贸易逆差：以i-Phone为例。金融研究，2011年，第198-206页。

Yeung, H. Regional development in the global economy: A dynamic perspective of strategic coupling in global production networks. Regional Science Policy & Practice 7:1, 2015, p. 6.

Yi, K. Can Vertical Specialization Explain the Growth of World Trade? Journal of Political Economy, 111(1): 2003, p. 91.

Yu, C. and Luo, Z. What are China's real gains within global value chains? Measuring domestic value added in China's exports of manufactures. China Economic Review 47, 2018, pp. 263-273.