Do Economic Relations with China Affect Income Distribution and Poverty Levels in Latin America? An Empirical Analysis of Sixteen Latin American Countries

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Abstract: In tandem with China's national strategy of the Belt and Road Initiative, China has emerged as a key player in Latin America buttressed by its economic relations with the region in trade, foreign direct investment (FDI), and loans. At the same time, a critical issue in the development of Latin America has been its historically high levels of income inequality, which has underlined the social, political, and economic instabilities in the region. While the development model of China has contributed to income inequality within its borders, it will be equally important to explore whether the new economic relationship between China and Latin America, particularly within the context of the Belt and Road Initiative, have had an impact on inequality and poverty in the region. The central thesis in this study is around the effects of China's economic engagement with Latin America on its income distribution and poverty levels. This study used data from sixteen Latin countries from 2000 to 2018 to investigate if economic relations with China change income inequality and poverty in Latin America. To account for economic relations with China, we consider imports from China, exports to China, Chinese FDI, and Chinese loan commitments. Additionally, for comparative analysis, we examine the effects of FDI, exports, and imports from United States to Latin America. Both sets of data are controlled for the same variables to ensure consistency and accuracy in our findings. Our study yields some findings that link China's and United States' economic relations with Latin America to reductions in income inequality and poverty in the region as well as the presence of China in Latin America as a challenge to the influence of the United States in Latin America.

Keywords: China, Latin America, Income Distribution, Poverty Reduction

I. Introduction

China has become a key player in Latin America's economic development due to its economic relations with the region in trade, foreign direct investment (FDI), and loan commitments. At the same time, a critical issue in the development of Latin America is its historically high levels of income inequality, which has

underlined the social, political, and economic instabilities in the region. Considering findings from studies that identify globalization as a factor influencing income distribution, it will be interesting to investigate whether the new growing economic relationship between Latin American countries and China has influenced income inequality and poverty levels in the region. Our central thesis in this study is around the effects of China's engagement with Latin America on its income distribution and poverty levels. Specifically, we combine the China factor with the unique ideological spectrum of Latin American countries to study their effects on income distribution and poverty in the region. Moreover, our investigation compares the corresponding indicators in the US data to test if similar results hold.

The organization of the essay is as follows. The next section overviews trade, investment, and loans between China and Latin America with different perspectives about this South-South relationship. Sections 3 and 4 describe the data used as well as the model specification and operationalization. We also explain the motivation for the variable treatment and the methodological techniques implemented in the model. Section 5 analyzes the statistical results. The last section provides concluding remarks and suggests further research in the field.

II. Economic Relations with China: Trade, Investment, and Loans

Studies on the impact of China's involvement in Latin America fall in the broader literature on the consequences of South-South interactions. Opinions on China's economic influence diverge. Optimism indicates that China constitutes a new and alternative driver of trade and investment for developing countries, while detractors express skepticism and serious concerns about China's economic influence and political motives.

Trade Relationships

Investigations comparing different developing economies and emerging markets among Eastern Europe, Asian countries, and Latin America indicate that the latter is the least affected by Chinese imports (Blázquez-Lidoy, Rodrýìguez, & Santiso, 2006; Meller, 2003; Devlin, 2006). However, when scholars focus exclusively on China and Latin America trade relations, discussions over predictions and economic impact become specific. Data shows that primary commodities and natural resource-intensive manufactures comprise most exports from Latin America to China. In contrast, imports from China to Latin America mainly consist of highly-skill and medium-skill manufactures (Dahi, 2017). The

trading pattern described above suggests a cycle of increasing deindustrialization and primarization in Latin America, threatening the region's industrial development (Dahi, 2017; Harris & Arias, 2016; Lo Brutto & González, 2015).

Contrary to the previously mentioned, the growing imports of manufactured goods have helped contain inflationary pressures and have broadened access to consumer goods for the most disadvantaged population segments (CEPAL, 2015). In the case of highly-skill goods, China has broadened the range of suppliers available to companies in the region, thereby improving the competitiveness of local firms (CEPAL, 2015). However, the positive effects of Chinese imports are limited to few countries (mainly Mexico and, to a lesser extent, Central America) and specific industrial sectors (Lederman, 2006).

Moreover, the growth of the Latin American economies has depended on the commodity boom driven by the increase in demand spurred by the development in China (Lo Brutto & González, 2015). Different authors see this commodity boom as a potential risk instead of an opportunity. After 2011, exports to China have notably declined, causing an asymmetric relation rather than a mutually beneficial one (Slipak, 2014). Latin American countries could be at risk of falling into the trap of commodity specialization characterized by strong price volatility. As exports to China continue its increase trend, the region can become more exposed to the Chinese economy (Blázquez-Lidoy, Rodrýìguez, & Santiso, 2006; Porzecanski, 2012).

However, a different set of scholars argue that thanks to the high Chinese demand for commodities, raw materials price has increased, improving the terms of trade for net exporters of natural resources (CEPAL, 2015; Harris & Arias, 2016). In addition, ongoing Chinese demand for primary commodities and natural resources has helped the region avoid the worst effects of the financial crises and has provided additional revenue for welfare programs aimed at addressing poverty and inequality (Watts, 2013; Harris & Arias, 2016).

Thus, our aim is to understand the implications of this South-South interaction in welfare. Though generally China may have a positive effect on Latin America's welfare, sectors such as textiles and those with labor-intense manufactures will experience losses, due to competitive prices offered to the final consumer by the Chinese firms (Blázquez-Lidoy, Rodrýìguez, & Santiso, 2006; Di Giovanni, Levchenko, & Zhang, 2014). Regarding inequality, the growth in Chinese demand for commodities has created an increase in wages in industries producing relevant materials, which may subsequently lead to a reduction in wage inequality over time (Costa, Garred, & Pessoa, 2016; Helpman, Itskhoki, Muendler, & Redding, 2017).

Table 1: Change in Trade between China and LA

Country	Exports to China			Imports from China		
	2000-2005	2005-2010	2010-2017	2000-2005	2005-2010	2010-2017
Argentina	74.7%	45.6%	-34.1%	24.3%	80.0%	37.9%
Bolivia	72.1%	90.5%	53.8%	57.4%	79.2%	67.8%
Brazil	84.1%	77.8%	35.2%	77.2%	79.1%	6.3%
Chile	81.6%	71.7%	8.3%	70.1%	67.9%	36.2%
Colombia	87.6%	88.0%	1.6%	78.0%	70.5%	37.4%
Peru	76.2%	65.8%	53.2%	72.7%	79.4%	42.0%
Uruguay	25.1%	66.5%	75.4%	53.7%	78.4%	33.7%

Source: World Integrated Trade Solutions (2019)Authors' calculations.

Investment Relationships

Since the beginning of 2000, there has been a noticeable increase of Chinese FDI to Latin America, driven in part by the search for natural resources, raw materials, and energy. Additionally, as several researchers have demonstrated, these investments also seek to explore new markets for offering and producing goods (Kuwayama, 2012; Soria, 2015; Porzecanski, 2012).

The most optimistic investigations regarding the role of China in Latin America argue that the country has promoted South-South cooperation in the region, becoming a fundamental driver in advancing a multipolar world. This prioritizes economic ties over political and ideological affinities. For instance, Arrighi (2008) suggests that underdeveloped countries would gain space while advancing a cooperative paradigm promoted by China; while Cardenal & Araujo (2012) point out that in Latin American, Caribbean, African, and Asian regions, access exists to a series of infrastructures, technologies, machinery, and consumer products at very competitive prices, which is an unprecedented situation compared to other historical periods.

On the other hand, environmental and labor issues highlight criticisms of and concerns about Chinese investment overseas. Some studies suggest that international competition, profit maximization, and political pressures are common characteristics of Chinese corporations operating in countries with similar economic features to Latin America, dispatching environmental and labor considerations into a second order (Cardenal & Araujo, 2012; Ramos Martin, 2012).

Moreover, Chinese investment projects seem to seek additional coverage of raw materials or natural resources (Blázquez-Lidoy, Rodrýìguez, & Santiso, 2006; Hogenboom, 2014). Instead of creating a new company, it is frequent for Chinese firms to acquire existing firms or make agreements to access part of an existing

business in the host country. In the few cases where a new company emerges, there is no technological transfer to host countries. Additionally, in cases where infrastructure projects are the subject, it is usually mandatory to hire firms of Chinese origin to supply inputs and complete stages that involve greater value added (Slipak, 2014).

Loan Commitments

Chinese banks have financed Latin American countries that have stopped turning to the World Bank, the Inter-American Development Bank, or North American and European banks. Venezuela, Argentina, Brazil, and Ecuador, which do not have easy access to the global financial system, have been the primary recipients of Chinese loans (Brautigam, 2014; Myers, 2021; Gallagher & Myers, 2021). For instance, between 2004 and 2019, China provided over 141 billion in financing to Latin American countries, with more than half of this amount allocated to Venezuela.

Most Chinese loans in the region have been for energy (65%), followed by infrastructure (18%) and mining (2%). The primary lender has been the China Development Bank (CDB), which has granted around 76% of the loans to the region. The primary beneficiary has been Venezuela, with almost 60% of the funds loaned to finance 15 projects, followed by Brazil and Ecuador, each receiving about 22% and 14% of the loans made in the region. See Figure 1 for further detail.
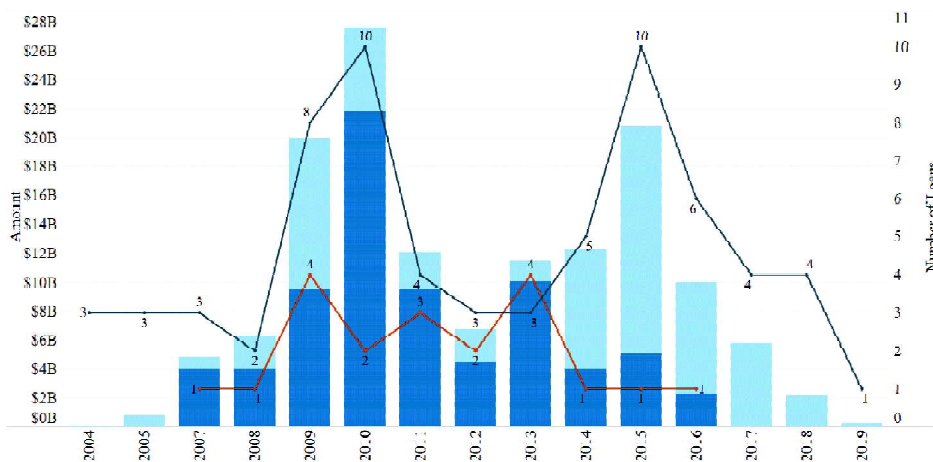

Figure 1: Chinese finance to Latin America by year

Author's calculations. Source: China-Latin America Commercial Loans Tracker; China-Latin America Finance Database.

Even though Chinese credit to Latin America may be stricter than Western credits, Chinese banks do not impose political conditions (Gerede, 2021; Nacht, 2013). Loan commitments require repayment or collateralization with natural resources, minerals, petroleum, oil or some investment policy that includes participation and involvement of Chinese companies. While China presents itself as a country seeking win-win outcomes and mutual benefit, the links are highly asymmetrical (Slipak, 2014). Mainly because most of the loans that China is currently offering to Latin American countries are towards investing in agricultural, mining, and energy sectors, rather than supporting technology development, China is considered a latent risk for Latin America to be trapped in primary production and extraction, resulting in the dispossession of the most vulnerable communities (Noyola Rodríguez, 2015).

On the other hand, Chinese loan supporters argue that loans are critical for South-South cooperation. It is a mutually beneficial form of collaboration where loans provide no evidence of Sino-hegemony or Sino-dependency (Harris & Arias, 2016). Chinese investments and loans have helped to shore up Venezuela and Ecuador oil-export-based economies, which suffered from the sharp decline in international oil prices (Tiezzi, 2016). Moreover, scholars explain that there is no evidence that Chinese loans and investments have given the Chinese government, enterprises and investors undue influence over the governments and economies. Although Chinese companies have heavily invested in oil and mining extraction in Latin America, they are not among the largest transnational corporations in the region, nor do they dominate any particular industry or country (Chen, 2014; Hogenboom, 2014).

III. Data Description

Since this study aims to assess the effects of Chinese and Latin American economic relationship on poverty and income inequality, our theoretical variables are imports from China to Latin American countries, exports to China from Latin America, Chinese loan commitments, and Chinese FDI in the region. Moreover, we include a set of control variables considered relevant for poverty and income inequality. Below we discuss these variables in the context of Latin America.

This study uses the data from sixteen Latin American countries from 2000 to 2018 to investigate if economic relations with China changes income inequality and poverty in Latin America. We choose this period to exclude the non-typical economic patterns caused by Covid-19 which started in the latter half of 2019 and continued into 2020, ravaging the world for the ensuing two years before abating in 2023.

Our control variables encompass factors relevant for understanding shifts in income inequality and poverty levels. Employing a multivariate approach necessitates their inclusion in our analysis of the China factors. Excluding these variables could lead to potentially misleading or biased findings, as any observed effects attributed to China might simply be a reflection of these control variables if they are correlated with variables related to economic relations with China. By including these control variables, our analysis seeks to ascertain whether China's influence remains significant when other factors are held constant. This comprehensive approach enables an empirical assessment of the impact of China's economic factors.

Left-wing Regimes

In the new arrangement of the world geopolitics, Latin America assumes its role derived from the "turn to the left," followed by the rising dissatisfaction of neo-liberal policies (Cornia, Martorano, & others, 2012). Experience from this turn has called into question the US hegemony in the region. Thus, when considering that both China and Latin America have increased their interactions, scholars attribute a more cooperative chemistry with leftist and center-left regimes and somewhat less harmonious relations with countries led by more conservative or pro-US governments (Harris & Arias, 2016; Lo Brutto & González, 2015). Nevertheless, this does not imply China's preference for leftist regimes; on the contrary, China has signed free trade deals with Chile, Peru, and Costa Rica (Svampa & Slipak, 2015).

A vast body of literature has focused on the role of left-wing regimes in addressing inequality and poverty in developing countries. Among the studies that focus on Latin America, Huber et al. (2004) show that in regions where left wing parties have maintained a long-term legislature presence, social security spending, particularly, in health and education tends to have a significant impact on reducing inequality. Moreover, Cornia G. A. (2012) explains that redistributive policies under left-center regimes contribute to the decline of income inequality in Latin America. In addition, Remmer (2012) concludes that positive economic performance under left-populist regimes boost their support. Backed by these previous findings, we hypothesize that left-leaning governments have a negative effect on income inequality and poverty.

Education

Empirical studies indicate that high levels of education contribute to the reversal of income inequality. Overall, in Latin American countries with higher inequality

are the ones with less secondary school enrollment ratio (Cruces, Domench, & Gasparini, 2014; Gregorio & Lee, 2002). By contrast, Cornia (2014) finds that years of education have been steadily rising since 1990. Those increases were not enough to translate into a substantial decrease in income inequality until the 2000s. Scholars explained that market-oriented reforms, technological changes, international prices, and weak labor policies lead to an unbalanced educational upgrading. It was not until the next decade when increases in education started to impact income distribution, mainly due to a pattern of education upgrading among the poor segment of the population. Our study uses the secondary school enrollment ratio as an index for education and hypothesizes an adverse effect of education on income inequality and poverty.

Gross Domestic Product per capita

We use GDP per capita to control the level of economic development of the country. The Kuznets curve indicates an inverted U-shape relationship between economic development and income inequality. Initially, in the early stage of economic development, acceleration in economic activities increases income inequality, but eventually, income inequality will decrease as the society becomes more prosperous. In our hypothesis test, we expect ambiguous effects of GDP per capita on income inequality.

Inflation

Inflation is also an essential factor with direct implications for our tested variables. Morley (2001) and Huber et al. (2006) find inequality increases in Latin America and Caribbean countries during periods of high inflation. According to Morley (2001), labor markets have a quick reaction to moderate inflation rates; that is to say, nominal wages adjust relatively well to inflation. However, when there are episodes of hyperinflation, wages adjust with a lag, leading to a decrease in real wages, with a pronounced adverse effect on the real income of those who earn the minimum wages and resulting in an increase in income inequality.

Economic Globalization

Different studies have assessed the impact of globalization on income inequality. Most studies agree that globalization tends to worsen income distribution in developing and emerging markets (Atif, 2012; Bergh, 2010). We use the globalization index (KOF) as a globalization measure. KOF is an indicator that measures three dimensions of globalization: economic, social, and political (KOF Swiss Economic Institute, 2020). KOF uses sub-indices of trade flows, economic

restrictions, social globalization, personal contact, information flows, cultural proximity, and political globalization (Dreher A. , 2006; Dreher A. a., 2008).

Government Expenditure

Although there is no generic theory that associates public spending with inequality, several empirical studies adopt proxy variables for different countries and levels of the economy (Berg, 2018). Most of them include some factors that have to do indirectly with investment and human capital (Alesina A. a., 1996; Galor, 2004). However, there is no consensus for or against this relationship. For Anderson et al. (2017), in low- and middle-income countries, the relationship between public spending and the problems of poverty and inequality reveal no consistent evidence of the direct impact from public expenditure on decreasing income inequality or poverty. However, various empirical studies identify an association between inequality and different variables related to public spending (Piketty, 2018; Heathcote, 2017; Jackson, 2016).

Domestic Credit

The primary function of the financial system is to capture the surplus resources of economic agents to channel them towards investment and consumption activities. This financial intermediation allows generating a greater production of goods and services, which will increase the demand for employment, energize the economy, and result in greater well-being for all members of society. However, according to research by Pino (2017) and Gomez Rodriguez (2019), for the case of Latin America, their studies suggest that the relationship between financial development and income inequality is positive, that is, the higher the financial development, the higher level of inequality.

Investment

Poverty and inequality are distinct but related phenomena. In general, higher inequality tends to imply higher levels of poverty. On the other hand, given a rate of economic growth, higher inequality can slow the pace of poverty reduction. In this sense, studies that investigate determinants of inequality include gross domestic investment to account for economic growth. Some analyses have concluded that gross domestic investment has an important influence on inequality and poverty.

Democratization

Democracy results in reduction in income inequality (Feng, 2005). In our study, we use the political rights data from Freedom House as a measure of degrees of

democracy. For the convenience of expression, we transform the original 1-7 score into a 0-1 scale, with zero indicating the least political free and one the freest. The average of political freedom for Latin American countries is 0.46 with a large variance of 0.5.

IV. Econometric Investigation

Using annual data, our econometric estimation employs an unbalanced panel data set with observations from 16 Latin American countries: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, El Salvador, Honduras, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela. The data span from 2000 to 2018, for which we include mostly recent data up to the Covid-19 crisis. We adopted two dependent variables. Income inequality and poverty rate within countries; they were available for varying numbers of time points. The empirical specification in the following equation describes the base of our research approach.

$$Inequality_{it} = \beta_0 + \beta_j \, ChinaVar_{jit} + \beta_1 \, PP_{it} + \beta_{jit} \, Z_{jit} + \varepsilon_{it}$$
$$(i=1,\ldots n; t=1,\ldots T)$$

$$Poverty_{it} = \beta_0 + \beta_j \, ChinaVar_{jit} + \beta_1 \, PP_{it} + \beta_{jit} \, Z_{jit} + \varepsilon_{it}$$

Where *Inequality* is the Gini Index as a proxy measure of inequality for country *i* at time *t*. $Poverty_{it}$ is Poverty Gap Index for country *i* at time *t*. $ChinaVar_{jit}$ is a vector of variables indicating China's influence: exports to China, imports from China, Chinese FDI to the Latin American country, and Chinese loan commitments to the country. PP_{it} is a dummy variable for partisan politics, one indicates a left-wing ideology of the office party and zero otherwise. Z_{jit} is a vector of other control variables that vary across time and countries. Last, ε_{it} is the classical error term. Given the specific relations between China and Venezuela, we also create a dummy variable for Venezuela.

Inequality: The World Income Inequality Database (WIID) of the United Nations University (2020) contains information on income inequality (measured by the Gini coefficient) for developing, and transition countries.[1] Since the Gini coefficient is valued in the [0-1], using ordinary least squares (OLS) regression could be problematic. The predictions generated from the model might fall outside of the [0,1] interval. To avoid this, we transform the Gini coefficient into an unbounded measure using the formula $\log\left[\dfrac{Gini}{100-Gini}\right]$, where log denotes the natural logarithm, and Gini the Gini coefficient.

Poverty: Poverty gap index serves as a representation of poverty. This index is the average difference between the expenditures of the poor and the poverty line, in percentage of the latter. This measure of poverty expresses the average income needed to bring the poor to the poverty line given as a ratio to the poverty line. This measure of poverty takes into account the distribution of the poor. As in the case of the Gini Index, we transform the poverty gap index into an unbounded measure using the formula *log[PGI]*, where log denotes the natural logarithm and PGI the Poverty Gap Index.

For our policy variables, we use the percentage of imports from China, exports to China, and FDI from China adjusted by the host country's GDP. With respect to Chinese loans, we resize our dataset to account for the countries that have received loans from China.[2] Last, the left ideology of the office party is a dummy variable coded as one when the political-economic policies of the governing parties were left or center-left, and zero otherwise. The Appendix provides the definitions and details of variable sources in Table A1 Definitions and Sources of Data and Table A2 Summary Statistics.

V.   Empirical Evidence

First, we examine the correlations among these variables we have identified earlier (See Table A3 in the Appendix). The correlation between income inequality and poverty is 0.70 in Latin America indicating feed upon each other. Gini, as a measure of general inequality in income, does not always mean an increase in the population under the poverty line as defined by the United Nations. Even if everyone is above the poverty line in the country, still it may suffer from a relatively high level of income inequality within its society. However, in Latin America, inequality and poverty go hand in hand. A higher degree of income inequality is associated with a higher degree of poverty and vice versa. This dilemma indicates a double challenge in reducing the population below the poverty line and in fighting income inequality. Second, the left wing governing party shows a negative correlation with inequality at -0.42 and with poverty at -0.38, which is consistent with the literature we reviewed earlier, as the left-wing party is supposed to anchor a political base characteristic of the lower social economic strata of the population. All the China factors – imports to Latin America, exports from Latin America, outward FDI to Latin America, and loans to Latin America – are negatively associated with inequality and poverty in the region, though the negative correlation is stronger in trade than FDI and loans, and in particular, between trade and poverty reduction. While exports to China and poverty are negatively correlated at -0.27, imports from China and poverty

are negatively correlated at -0.33. Chinese FDI correlates with Chinese loans at 0.2, potentially suggesting an underlying pattern of mutual dependence, lending support to the argument that the allocations of Chinese loans were to finance China's FDI projects in Latin America.

Next, we use a multivariate model to investigate China as a factor in the reductions of inequality and poverty in the region. Regressions in Table 2 use only imports from China as our theoretical variable. We find a negative effect of China's imports on income inequality and poverty levels in Latin America, statistically significant at the 5% error level. The evidence suggests that consumer consumption of Chinese imports can reduce levels of income inequality and poverty. Potentially due to the relatively low prices of Chinese imports, implying an improved purchasing power for the low-income segments of the population in the region.

Table 2. Regression Analysis: Imports from China

	1	*2*
	Gini	*Poverty*
Imports from China	-0.008**	-0.045**
	(-2.44)	(-2.26)
Office Party: Left Ideo	-0.030*	-0.194**
	(-2.11)	(-2.37)
GDP per Capita (log)	-0.017	-1.015***
	(-0.26)	(-2.51)
Domestic Credit	0.079*	0.352
	(1.95)	(1.20)
Government Expenditure	-0.002	0.017
	(-0.30)	(0.67)
Political Freedom	-0.032	-0.028
	(-0.87)	(-0.16)
Economic Globalization	-0.001	-0.023*
	(-0.89)	(-1.85)
Investment	0.003	0.024
	(1.37)	(1.53)
Education	-0.066	-0.997
	(-0.71)	(-1.66)
Inflation	-0.012	-0.374
	(-0.10)	(-0.69)
Venezuela	-0.133**	0.743***
	(-2.42)	(2.86)
Intercept	0.115	5.452***
	(0.44)	(3.39)
N	212	175
R-sq	0.473	0.675
adj. R-sq	0.444	0.653

*p<0.1; **p<0.05; ***p<0.01. t statistics in parentheses.

Among the control variables, we find that the left-wing party in office is more capable of reducing both income inequality and poverty than the right-wing governing party, consistent with the findings in the earlier literature review. Between income inequality and poverty, left-wing party is more effective in reducing the poverty levels. GDP per capita and economic globalization both have a statistically negative effect on poverty.

Table 3 presents results from expanded models, namely, exports to China, FDI from China, and Chinese loans. Keeping all other variables the same, Chinese imports appear to have a negative effect on both income inequality and poverty, remaining statistically significant at the 5% error level (Model 7 and Model 8 in Table 3). These results further indicate the robustness of the negative impact of

Table 3. Regression Results. Exports and FDI

	1	2	3	4	5	6	7	8
	Gini	Poverty	Gini	Poverty	Gini	Poverty	Gini	Poverty
Imports from China							-0.008**	-0.044**
							(-2.39)	(-2.18)
Exports to China	0.009	0.059					0.008	0.059
	(1.16)	(1.03)					(1.01)	(0.91)
FDI from China			-0.009*	-0.034			-0.01**	-0.041*
			(-2.00)	(-1.52)			(-2.20)	(-1.81)
Chinese Loans					-0.007***	-0.031*	-0.006***	-0.027*
					(-3.20)	(-2.04)	(-3.00)	(-1.86)
Office Party: Left Ideo	-0.048***	-0.340***	-0.042***	-0.304***	-0.04***	-0.298***	-0.0332*	-0.230**
	(-3.14)	(-3.78)	(-3.18)	(-3.82)	(-3.20)	(-3.69)	(-2.09)	(-2.29)
GDP per Capita (log)	-0.019	-0.983***	-0.030	-1.077***	-0.025	-1.024***	-0.034	-1.060***
	(-0.31)	(-2.88)	(-0.45)	(-2.67)	(-0.39)	(-2.53)	(-0.56)	(-3.00)
Domestic Credit	0.024	-0.018	0.068	0.227	0.074*	0.207	0.071	0.190
	(0.43)	(-0.06)	(1.50)	(0.73)	(1.83)	(0.66)	(1.62)	(0.67)
Government Expenditure	0.002	0.044	-0.000	0.030	-0.000	0.032	-0.000	0.029
	(0.39)	(1.68)	(-0.05)	(1.10)	(-0.06)	(1.16)	(-0.18)	(1.15)
Political Freedom	-0.031	-0.034	-0.027	-0.005	-0.025	-0.003	-0.030	-0.030
	(-0.85)	(-0.22)	(-0.68)	(-0.03)	(-0.66)	(-0.01)	(-0.96)	(-0.20)
Economic Globalization	-0.001	-0.030*	-0.002	-0.024*	-0.002	-0.024*	-0.002	-0.026*
	(-0.86)	(-1.78)	(-1.10)	(-1.93)	(-1.27)	(-1.93)	(-1.45)	(-1.96)
Investment	0.001	0.019	0.001	0.019	0.001	0.018	0.003*	0.029
	(0.74)	(1.14)	(0.73)	(1.12)	(0.73)	(1.10)	(1.83)	(1.74)
Education	-0.093	-1.143*	-0.049	-0.788	-0.054	-0.864	-0.066	-1.137*
	(-1.21)	(-1.80)	(-0.53)	(-1.21)	(-0.61)	(-1.35)	(-0.81)	(-1.82)
Inflation	-0.003	-0.379	-0.012	-0.403	0.031	-0.338	-0.000	-0.411
	(-0.02)	(-0.67)	(-0.10)	(-0.71)	(0.25)	(-0.60)	(-0.00)	(-0.79)
Venezuela	-0.105*	0.880***	-0.103*	0.959***	-0.09*	0.911***	-0.117**	0.733***
	(-2.09)	(4.67)	(-1.89)	(3.85)	(-1.77)	(3.61)	(-2.39)	(3.89)
Intercept	0.122	5.231***	0.161	5.471***	0.155	5.323***	0.191	5.656***
	(0.48)	(3.37)	(0.60)	(3.42)	(0.60)	(3.28)	(0.81)	(3.62)
N	212	175	212	175	212	175	212	175
R-sq	0.424	0.658	0.418	0.65	0.43	0.65	0.52	0.691
adj. R-sq	0.393	0.635	0.386	0.626	0.399	0.627	0.486	0.664

*p<0.1; **p<0.05; ***p<0.01. t statistics in parentheses.

China's imports in its role of reducing income disparities and lowering poverty levels in Latin America.

At the same time, exports to China lean toward an increase in income inequality and poverty levels (Models 1,2; Model 7,8 in Table 3), though such effects are not statistically significant. Unlike imports from China, it is plausible that exports to China benefit only a limited segment of population, meaning the richer and more resourceful socioeconomic strata, while low-price Chinese imports benefit much wider society.

Meanwhile, Chinese investment in Latin America appears to reduce income inequality and poverty levels, and is statistically significant at the 5% error level in Model 7 and at the 10% error level in Model 3 and 8 in Table 3. Similarly, Chinese loans show a negative effect on both income inequality and poverty levels (Models 5-8 in Table 3); this negative effect is statistically significant at the 1% error level for income inequality (Models 5 and 7) and at the 10% error level for poverty (Models 6 and 8). Between income inequality and poverty, imports, FDI and loans from China seem to have larger negative effects on the latter than the former. In other words, FDI and loans from China are more effective in reducing poverty levels than income disparities: imports. Based on the magnitude of the parameter estimate, we can conclude that given a one-unit increase in imports, FDI, and loans from China, the percentage reduction in poverty levels is far more than the percentage reduction in income inequality. This contrast suggests that economic relations with China result in a higher reduction rate in poverty than in income inequality, because they not only raise the income of the poor, but also the income of the rich, although proportionately and relatively speaking, the increase in the income of the poor is more than the income of the rich.

In conclusion, most of the forms of economic relations between China and Latin American countries appear to reduce income inequality and poverty in the region. Imports from China, China's outward FDI, and China's loans contribute to income equality and poverty remediation. At the same time, exports to China tend to alleviate neither income disparities nor poverty.

Among the control variables in the expanded, three stand out: partisanship, levels of development, and globalization. Left-wing party in office has a negative and statistically significant effect on both income inequality and poverty (Models 1-8 in Table 3). GDP per capita has a negative and statistically significant effect on poverty (Models 2, 4, 6, and 8 in Table 3); its effect on income inequality is negative, but is not statistically significant (Models 1, 3, 5, and 7 in Table 3). The globalization index has a negative and statistically significant effect on poverty levels (Models 2,

4, 6, and 8 in Table 3); its effect on income inequality is negative but is not statistically significant (Models 1, 3, 5, and 7). Keeping other factors the same, Venezuela demonstrates a lower level of income inequality and of poverty.

Next, to compare the effects of the China factor, we include the imports from, and exports to, the United States. While our previous results in Table 3 indicate that exports to China do not have a statistically significant effect on income inequality and poverty, exports to the US do contribute towards reducing both inequality and poverty at an error level of 10% and 1%, respectively (Models 3 and 4 in Table 4). In contrast with China, imports from the US do not seem to help decrease inequality and poverty as Chinese imports do; the effect of imports from the US on income inequality and poverty is negative but is statistically insignificant (Models 1 and 2 in Table 4). We can conclude that the prices of the imports from the U.S. are relatively high, compared to those of China, not benefiting a large cross-section of the population in Latin America in terms of reductions in income inequality and poverty. Meanwhile, the exports to the US might engage a larger and more diversified labor force than those of China, helping to reduce income inequality and poverty in the country. Furthermore, FDI from the US is conducive to decreasing income inequality and poverty, though it is highly statistically only for the latter (Models 6, Table 4). Which, by comparing with the China case, suggests that while FDI from U.S. reduces the population of poverty, the relative increase in the income of the poor, compared to that of the rich, is not as large as in the case of the China factor that shows a double negative effect on both poverty and income inequality.

Among the control variables, GDP per capita, as in the case of China, is statistically significant across all the model specifications and maintains a negative effect on both income inequality and poverty (Table 4). Regarding the left ideology office party, the sign remains consistent as when Chinese variables were tested. Nevertheless, the left office party is statistically significant for poverty models only where imports or exports are included (Models 2 and 4 in Table 4). In addition, economic globalization appears to increase both income inequality and poverty levels. Such effects are statistically significant (Models 1-6, Table 4). Finally, investment appears to increase income inequality with a statistically significant effect at a 5% error level (Models 1, 3, and 5 in Table 4) and education has a negative and statistically significant effect on income inequality (Models 1, 3, and 5 in Table 4). While the former result regarding investment supports the first-stage of the Kuznets curve (economic growth initially leads to income inequality), the latter result about education is consistent with the argument that education opportunities result in better income equality.

Table 4: Regression Results: United States

	1 Gini	2 Poverty	3 Gini	4 Poverty	5 Gini	6 Poverty
Imports from US	-0.001	-0.015				
	(-1.384)	(-1.355)				
Exports to US			-0.001	-0.021		
			(-1.807*)	(-4.166***)		
FDI from US					-0.002	-0.029
					(-1.225)	(-4.624***)
Office Party: Left Ideo.	-0.003	-0.063	-0.005	-0.068	-0.004	-0.065
	(-0.691)	(-1.680*)	(-0.91)	(-1.685*)	(-0.98)	(-1.634)
GDP per Capita (log)	-0.507	-3.035	-0.511	-2.954	-0.502	-3.031
	(-11.577***)	(-8.915***)	(-12.566***)	(-9.996***)	(-11.077***)	(-8.980***)
Domestic Credit	-0.000	-0.001	-0.000	-0.001	-0.000	-0.000
	(-0.808)	(-0.169)	(-1.001)	(-0.307)	(-0.705)	(-0.101)
Government Expenditure	-0.002	-0.033	-0.002	-0.042	-0.001	-0.02
	(-1.273)	(-1.917*)	(-1.141)	(-2.232**)	(-0.835)	(-1.271)
Political Freedom	-0.002	-0.05	-0.003	-0.129	-0.002	-0.054
	(-0.262)	(-0.331)	(-0.573)	(-0.969)	(-0.22)	(-0.335)
Economic Globalization	0.001	0.009	0.001	0.007	0.001	0.011
	(2.531**)	(2.658***)	(2.679***)	(1.857*)	(2.571**)	(3.615***)
Investment	0.001	-0.000	0.001	-0.000	0.001	-0.003
	(2.237**)	(-0.013)	(2.319**)	(-0.028)	(2.002**)	(-0.827)
Education	-0.001	-0.002	-0.001	-0.001	-0.001	-0.004
	(-2.503**)	(-0.98)	(-2.346**)	(-0.609)	(-2.918***)	(-1.790*)
Inflation	-0.0002	-0.002	-0.0001	-0.001	-0.0002	-0.003
	(-1.185)	(-0.552)	(-0.861)	(-0.345)	(-1.356)	(-0.846)
Obs.	212	175	212	175	212	175
RMSE	0.013	0.126	0.013	0.122	0.013	0.121
R squared adj	0.849	0.7561	0.849	0.77	0.85	0.773

*p<0.1; **p<0.05; ***p<0.01. t statistics in parentheses.

VI. Concluding Remarks

This study used data from sixteen Latin countries from 2000 to 2018 to investigate whether economic relations with China change income inequality and poverty in Latin America. To account for economic relations with China, we use imports from China, exports to China, Chinese FDI, and Chinese loan commitments as theoretical variables. Following previous studies about income inequality and poverty determinants, we incorporate GDP, domestic credit, government expenditure, political freedom, economic globalization, investment, education, and inflation into our econometric models.

In general terms, our findings indicate that China plays a positive role in mitigating both inequality and poverty in Latin America through loans, imports, and FDI. In the case of imports, the data suggest that instead of posing a competitive threat, they have the potential to increase profits for Latin American manufacturers by providing access to relatively inexpensive equipment,

intermediate inputs, and parts and components (Jenkins, 2012). More importantly at the same time, a large segment of the population benefit from the low priced Chinese imports; consumers are the ones that stand to gain financially from these imports since the large portions of Chinese imports are industrial products with medium or high technological content such as electrical appliances, machines, product parts, and automobiles. Similarly, both FDI and loans from China appear to reduce inequality and poverty; like the case of imports, their effect of reductions is more salient on poverty than on income inequality. By contrast, imports from the US have a negative, though statistically insignificant, effect on poverty and inequality in Latin America, but exports to the US help decrease inequality and poverty in the region. At the same time, the FDI from the US to Latin America appears to reduce poverty, but not so much on income inequality. In the context of international power politics, the operation of China in Latin America poses a challenge to the influence of the United States in the region. The erosion of the historical US presence there has been in motion, partly due to China's economic relations with Latin America. This momentum may accelerate in tandem with the dynamics of electoral politics in various Latin American countries where politicians take advantage of the China factor, which appears in this study to help reduce both income disparities and poverty that have plagued the region for centuries.

Our findings have other important implications for poverty and income inequality in Latin countries. There has recently been a clear decrease in the tendency to invest between China and Latin America. To our best knowledge, no record indicates that new loans from China arrived to the region in 2020, probably resulting from Covid-19, when domestic projects were discontinued or slowed down in both parts of the world. In addition, several countries experienced governments that turned out to be more pro-U.S. than pro-China, such as Brazil and Ecuador. Now, with the return to office of left-wing political parties across Latin America (e.g. Brazil, Chile, Peru, and Mexico), it warrants further investigation of any improvements of economic relations between China and Latin America.

Further investigation needs to employ the long-term economic relations with China on income disparities and poverty; such studies would involve aggregate data over a long period. In addition, investigation needs to compile disaggregated data of China's trade, investment, and loans in Latin America so that we can differentiate the nuanced effects of variegated types of activities. Last, some Latin countries deserve further and in-depth study that have had complex relations with China in the past, such as Venezuela, Ecuador, or to

some degree, Argentina, where economic as well as domestic political uncertainty may all play an intervening role in affecting the political relations, and subsequently economic engagement, with China.

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Appendix (Tables A1-A3)

Table A1: Definition of variables and data sources.

Variable	Definition	Source
Poverty	Poverty Gap Index	WB[1]
Gini	Gini Index of 0: Perfect equality, of 1: Perfect Inequality	WIID
Exp China	Percentage of Exports from China to Latin America (% of GDP)	WITS[1]
Imp China	Percentage of Imports to China from Latin America (% of GDP)	WITS[1]
FDI China	Foreign Direct Investment from China to Latin America (% of GDP)	WITS[1]
Loans China	Loan Commitments from China to Latin America	Loans[1]
Left Office	Average Years Percentage of the Right Opposition Party.	MOV[2]
Gov Expnd.	General government final consumption expenditure (% of GDP)	WB
Credit	Domestic credit to the private sector (% of GDP)	WB
GDP	Log of Gross Domestic Product per Capita in constant 2010 price	WB[1]
PF	Freedom House Index (converted to scale 0–1, higher means more democratic	FH
Inflation	Inflation, GDP deflator (annual %)	WB
Investment	Gross capital formation (formerly gross domestic investment)	WB
KOF	Globalisation Index	KOF
Education	Average years of schooling per capita for people over 25	WB

Notes: FH: Freedom in the World Dataset (2020)KOF: KOF Swiss Economic Institute (2020), "KOF Index of Globalization", Zurich.WIID: University World Income Inequality Database (2020)WITS: World Integrated Trade Solutions (2019)MOV: Data for government ideology was mainly obtained from Murillo, Oliveros, & Vaishnav (2010) dataset and crosschecked by the World Bank Database in Political Institutions (2017) and World Political Leaders (2020).WB: World Bank (2020)Loans: Dataset for Chinese loan commitments was build using three different sources: Bartering Globalization: China's Commodity backed Finance in Africa and Latin America; China-Latin America Commercial Loans Tracker; China-Latin America Finance Database. [1] Authors calculations[2] Authors coding

Table A2. Summary Statistics

Variables	Mean	SD	Min	Max
Inequality	46.06	3.99	35.90	53.30
Poverty	3.04	3.09	0.02	17.50
Office Party: Left	0.61	0.49	0.00	1.00
Exports to China	0.79	1.47	0.00	8.03
Imports from China	2.81	2.99	0.00	17.43
FDI from China	0.28	0.87	0.00	7.14
Loans from China	0.18	0.80	0.00	8.16
Exports to US	5.22	5.93	0.00	26.91
Imports from US	5.67	5.33	0.00	22.32
FDI from US	4.92	5.90	0.00	54.68
Government Expenditure	13.21	2.78	7.00	20.38
Investment	22.13	5.80	10.85	44.31
Domestic Credit	38.02	22.45	8.91	116.64
Assistance	330.20	306.81	-169.64	1679.44
GDP per Capita	3.72	0.31	3.11	4.18
Political Freedom	0.46	0.50	0.00	1.00
Inflation	7.58	8.09	-7.71	45.94
Economic Globalization	53.70	11.66	27.55	78.57
Education	81.67	17.93	30.39	121.18

Table A3: Correlations

	Inequality	Poverty	Office Party: Left	Exports to China	Imports from China	FDI from China	Loans from China
Inequality	1						
Poverty	0.7080	1					
Office Party: Left	-0.4227	-0.3897	1				
Exports to China	-0.2096	-0.2794	0.3269	1			
Imports from China	-0.2985	-0.3376	0.3073	0.1505	1		
FDI from China	-0.1146	-0.0901	0.1217	0.0904	0.0132	1	
Loans from China	-0.1519	-0.1267	0.1724	0.0510	-0.0549	0.1967	1
Govt Expenditure	-0.0128	0.1473	0.3309	-0.0027	-0.1744	0.0915	0.2887
Investment	0.0776	-0.0676	0.0466	-0.0108	0.4300	0.1398	-0.0735
Domestic Credit	-0.0566	-0.1059	0.2361	0.4959	0.2484	0.1074	0.0099
GDP per Capita	-0.3431	-0.6392	0.1951	0.3997	0.0360	-0.0333	0.1591
Political Freedom	-0.3310	-0.3099	0.1441	0.3594	-0.0634	-0.0492	0.0877
Inflation	-0.1016	-0.0867	0.0769	-0.0395	-0.1373	-0.0789	0.1383
Economic Globalization	-0.1025	-0.0044	0.0372	0.2534	0.3113	-0.1161	-0.3186
Education	-0.3826	-0.4781	0.3592	0.4044	-0.0118	0.1646	0.1771

	Government Expenditure	Investment	Domestic Credit	GDP per Capita	Political Freedom	Inflation	Economic Globalization	Education
Govt Expenditure	1							
Investment	-0.1456	1						
Domestic Credit	0.1927	0.3263	1					
GDP per Capita	0.0715	0.0289	0.2324	1				
Political Freedom	0.1679	-0.0311	0.2708	0.5963	1			
Inflation	0.0922	-0.1749	-0.3349	0.1496	0.0968	1		
Economic Globalization	-0.2594	0.4847	0.5580	-0.0242	0.2636	-0.3433	1	
Education	0.3880	-0.0652	0.0872	0.6572	0.3768	0.1693	-0.1268	1