

Politics, trade, and economic growth: An analysis of the Latin American and Caribbean countries

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Abstract

This paper aimed to analyze the economic growth in Latin America and the Caribbean through new insights for the growth process, setting the focus on the politics and trade outcomes. Working with a dynamic panel of annual data from 1981 to 2018 for nineteen countries and applying three different techniques, results show that trade is a robust component of the growth in the region. Also, some evidence of a positive effect of being a democracy on growth was found, but being a democracy and an open economy implies a negative effect on growth, possibly by reflecting the instability of the region.

Key-words: Economic growth. Dynamic panel data. Trade. Politics.

Resumo

Este artigo teve por objetivo analisar o crescimento econômico dos países da América Latina e Caribe através de uma nova abordagem para o entendimento do processo de crescimento na região, com análise focada nos impactos de regimes políticos e comerciais. Trabalhando com um painel dinâmico com dados anuais de 1981 até 2018 para 19 países e aplicando três diferentes metodologias de estimação, os resultados sugerem que o comércio é um componente robusto do crescimento econômico da região. Os resultados também indicam um efeito positivo do país ser uma democracia sobre o crescimento, entretanto, a interação entre democracia e comércio identificou um efeito negativo destes dois regimes em conjunto sobre o crescimento.

Palavras-chave: Crescimento econômico. Painel Dinâmico. Comércio. Regimes políticos.

Área: Economia Internacional.

JEL: C23. O47

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1 Introduction

Since the Solow model, the economic growth process can be understood as a mix of labor and capital. Over time, other attributes were included in the model to better adapt it to the economic reality, and the most popular is the Mankiw, Romer and Weil model (MRW). In this way, many modifications have been done in the model aiming to reach a result more feasible to the theory, the reality, and the data.

As much as been highlighted in the economic literature, the post World War II had a significant increase in the economic relations between countries, either by bilateral or multi-country agreements. Therefore, the world has experienced a rise in economic integration, with countries showing themselves as extremely dependents on goods produced in other countries to make possible domestic production (KRUGMAN, 1979). At the same time, a rise in the growth rates was observed. Innumerable countries that have experienced this trade-openness process have shown relatively better performance in growth terms, with faster growth (WACZIARG; WELCH, 2008).

Also, in the late 1990's and early 2000s, the role of the institutions has been emphasized in the economic growth literature. Several papers, such as Alesina et al. (1996), and Aisen e Veiga (2013) noted that local institutions, political organizations and governors bias plays an important role in the growth process. Political stability, regime changes, and bureaucracy efficiency can affect the growth path, improving/or not the resources allocation, ability to absorb technology, and so on.

This paper aimed to investigate how the economic growth process can be affected by the trade dynamics and institutional nature, beyond the traditional determinants (MARTIN, 1997). We specifically look at Latin American and Caribbean Countries since many papers have studied this process at the country level but they did not study the region specifically, using some geographical dummies in an attempt to capture the regional differences. The papers that studied the growth process in Latin American are limited by period or sample. Therefore, it is important to understand the growth process in these countries, incorporating new dynamics and elements to understand why the differences were observed.

The results suggest that trade is an important instrument for local economic growth with open economies systematically getting higher rates of growth, around 4.6%. The growth of trade, our measure of trade openness and also technology absorption, suggests that an increment of 1% in the trade has an effect of 0.3% on growth. Being a democracy has a positive effect on growth, however, if a country is a democracy and an open economy we find conflictive results across the specifications.

This paper is organized as follows. Section 2 is the literature review about growth, trade, and politics, and empirical studies that focused on Latin America and Caribbean countries. Section 3 describes the database and the variables. Section 4 details the econometric approach that was applied, and also potential estimations problems. Section 5 shows the results and discussion. Last section concludes the study.

2 Background

As much highlighted in the literature, since the Industrial Revolution the world has experienced an astonishing growth process. Sometimes more accentuated, due to some environmental factors, and sometimes with a downward path, with similar reasons.

Complementary to this production growth, countries improved their diplomatic and commercial relations.

A lot of papers since [Barro \(1991\)](#) seminal work noted some robust determinants of the growth process. [Barro e Lee \(1993\)](#) investigate which countries grew more and which ones grew less, the losers and the winners of the growth process. They show that the GDP per capita in the lowest quantile falls around 23% from 1965-1985, while in the same period the GDP per capita of the highest quantile grew 163%. This large gap in the GDP per capita growth rate, even in a short period, creates conditions for increasing income inequality, as well as the living standards.

Altogether, five countries¹ in the lowest quantile belongs to Latin America and the Caribbean, they are: El Salvador, Guyana, Jamaica, Nicaragua, and Venezuela; while in the highest quantile only Brazil. Using the projected values for the average growth rates by quantiles is possible to see that the difference in the growth rates will fall, from 6.1% for 65'-85' decades to 2.5% for '85-'95 decade. But the gap remains since the authors include a regional dummy in the model, noted that the per capita growth rate for countries belonging to Latin America was 1% below the mean.

The persistence of this gap, in the long run, can explain some facts about the regional dynamics. Comparing the slowest growing and the fastest growing countries of Latin America, the authors verified that the main differences between 65'-75' come from the net convergence term and the black-market premium (used by the authors as a proxy of the market distortions). Between 75'-85' the differences come from the investment and government consumption (higher and smaller, respectively, among the fastest growers). Then, at the same time that the gap among regions remains over time, an inequality growth process occurs between countries of the same region.

[Martin \(1997\)](#) aimed to perform an extreme test to verify which variables were robust and which were not. As result he realized that some 'traditional' variables are critical to understanding the growth process, such as equipment investment, replacement of capital stock; how long a country has been an open economy, that is, a transition from a closed economy apart from the trade integration processes to an economy with commercial relation around the world; rule of law and political rights, indicating the importance of political regime; primary exports, and more interesting to see a Latin America dummy confirming the previous studies in the economic growth, showing a particularly dynamic growth path in this region.

Since the late 20th century, the international trade has been emphasized in the literature as a tool to achieve a higher degree of economic development. [Lee \(1993\)](#) noted that trade has a positive effect on growth, furthermore, trade policy can distort the effect of trade on growth. Trade tariffs and exchange negatively affect economic growth. [Wacziarg e Welch \(2008\)](#) show that the outcomes post-trade-liberalization have positively influenced the growth, such as investment and trade as a share of GDP. [Busse e Koeniger \(2012\)](#) found that more trade improves economic growth.

For Latin America, two articles looked at the trade effect on growth and both found different results and the opposite to the effect estimated by the literature. [De Gregorio \(1992\)](#) analyzed the sources of the growth process for twelve countries from 1950 to 1985 and found that the terms of trade and degree of openness of the economy do not affect growth. [Astorga \(2010\)](#) analyzed the six largest economies in Latin America over 105 years

¹ Following the authors, focusing the analysis on the Summers-Heston (1988) dataset.

and noted a negative correlation between trade openness and growth. By [ASTORGA](#), this can be associated with resource endowments and modifications in the diversification of the export.

Also, it is highlighted by the literature the country size as a factor that can be determinant both for growth and trade ([RAMONDO; RODRÍGUEZ-CLARE, 2010](#)). By the theory, closest countries tend to trade more, improving the relation between the countries and regional trade. But, actually it is possible to note that the distance not necessarily is an obstacle to trade. For instance, China is the the major trade partner of Latin America.

The role of political issues is well-defined in the literature. The regime nature or its stability received attention of many studies over time. ([BARRO, 1996](#)) found the relation between democracy and growth has non-linear characteristics, countries with an "average democracy" can boost growth better than other levels of democracy. [Perotti \(1996\)](#) does not found statistical evidence of the democracy effect on growth. [Alesina et al. \(1996\)](#) showed that more political instability² leads to a significant decrease in growth rates. More recently, [Aisen e Veiga \(2013\)](#) find that political instability affects negatively the economic growth. [Acemoglu et al. \(2019\)](#) finds that democracy has a substantial and causal effect on the long-run economic growth.

It is interesting to note that, despite no statistical evidence from [Perotti \(1996\)](#) results, from [Barro \(1996\)](#) to [Aisen e Veiga \(2013\)](#) the results indicated a negative effect of the democracy on growth. [Alesina et al. \(1996\)](#) argued that they did not find differences among democracies and non-democracies countries. However, [Acemoglu et al. \(2019\)](#) found a causal effect from being a democracy to growth. The contra-intuitive³ result for negative effect of democracy on growth is discussed by the authors, and some reasons are raised: *(i)* non-linear relation between democracy and growth; *(ii)* higher demand capacity on the locals in matters of income redistribution; *(iii)* economic populism, in such a way that the ruler focuses more on electoral outputs than the real needs of the economy.

Taking a special look at Latin America, [Alesina et al. \(1996\)](#) noted that Latin America had, for the period 1950-1980, the largest frequencies for government changes and military coups that evidences the traditional political instability in the region. [Gyimah-Brempong e Camacho \(1998\)](#), when looking at Latin America countries from 1970 to 1981, found that the increase in the political instability strongly affects negatively the economic growth. By the authors, an increment of one standard deviation in the political instability brings down economic growth growth just over 2%.

More recently, [Cervellati, Naghavi e Toubal \(2018\)](#) made an investigation about political and trade regimes and regime changes and their impact on technology adoption. In the steady-state, abstracting endogenous issues, the growth rate of the economy is equal to the growth rate of technological progress. So, improving their technological absorption, a country can improve its growth path. They found that it is not enough to just open the economy or become a democracy, the process has to be done jointly. They argue that only by opening the economy, the political elite can seize the gains, and just becoming a democracy does not ensure that there will have incentives to technological adoption. In other words: political and trade openness are complementary processes.

² By the authors, political instability can be manifested in many ways: political unrest, poor economic outcomes, corruption, and others.

³ As been highlight by [Acemoglu et al. \(2019\)](#), China and some countries of Persian Gulf (like Saudi Arabia) are clear counter-example of the expected negative effect of non-democracy on growth.

3 Data

Our sample is composed with nineteen countries of Latin America and Caribbean⁴ in a panel data set from 1980 to 2018. The data is obtained from Penn World Table v.10 (PWT). We also use data from previous works, such as [Wacziarg e Welch \(2008\)](#), [Boix, Miller e Rosato \(2013\)](#), and [Cervellati, Naghavi e Toubal \(2018\)](#). Table 1 shows the descriptive statistics about the variables.

Table 1 – Statistics for the sample data

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
eco_growth ³	722	0.0110	0.0411	-0.2007	0.1507
gdp_prd_pc ¹	741	8388.21	5270.67	378.24	29337.35
gov_share	741	0.1516	0.0643	0.0117	0.3453
inv_share	741	0.1940	0.0562	-0.0297	0.3731
trade_growth ³	722	0.0409	0.1069	-0.6749	0.4797
pop ² ³	741	0.8362	0.3291	-0.8803	1.5464
trade_lib	741	0.6964	0.4601	0	1
political_regime	741	0.7787	0.4154	0	1
demo_lib	741	0.5978	0.4907	0	1
trade_share	741	0.5275	0.3018	0.0745	1.7477
freedom_trade	711	6.2090	2.1492	0.8112	8.9382
political_stability	437	-0.3176	0.6477	-2.3745	1.0917

Notes: ¹ in mil. US\$. ² in millions. ³ Calculated as the difference in logarithms: $\ln_t - \ln_{t-1}$. *eco_growth*: real GDP growth rate; *gdp_prd_pc*: expenditure-side real GDP; *gov_share*: real government consumption as share of GDP; *inv_share*: real investment as share of GDP; *trade_growth*: growth of the sum of exports and imports; *pop*: population; *trade_lib*: dummy for open economy regime; *political_regime*: dummy for democratic regime; *demo_lib* dummy for democracy and open-economy; *trade_share*: trade as share of GDP; *freedom_trade*: Fraser Institute measure of freedom to trade internationally; *political_stability*: WGI measure of government stability.

As it is common in growth literature, some variables compose the basic structure of the model, such as capital, labor, human capital, and so on. The dependent variable is the real GDP per capita growth (*eco_growth*). As proxy of labor, we use the population growth (*pop_growth*). To capture the convergence effect among the countries, lagged GDP per capita is measured as the natural logarithmic of the expenditure-side real GDP per capita (*gdp_prd_pc*), then we are looking at differences in the initial productivity. To measure the government size we use the real share of the government consumption on GDP (*gov_share*). As a proxy of the saving rate, we use the real share of the investment on GDP (*inv_share*).

Following [Busse e Koeniger \(2012\)](#), our main measure of trade is the trade growth. By the authors, using this specification we are aiming to capture the expansion of trade and more access to foreign technology. Therefore, more open economies indicates greater access to new technology which can give a boost in the local productivity and growth ([KELLER, 2002](#); [BUSSE; KOENIGER, 2012](#)). The trade growth is calculated as the sum of the exports and imports of goods and services (*trade_growth*). Also, we will test the traditional measure of trade used in the literature measuring trade as a share of the GDP (*trade_share*).

To address the issue of political and trade regime, our main reference is the [CERVELLATI; NAGHAVI; TOUBAL](#) database - henceforth CNT. So, we have a variable dummy that assumes value 1 if the country is recognized as a democracy and 0 otherwise

⁴ table 7 shows the list of the countries in the sample

(*political_regime*). The original database has coverage from 1980 to 2000. In order to expand to 2018, we use two distinct databases. First, from 2001 to 2007, we use the data constructed by [Boix, Miller e Rosato \(2013\)](#) - henceforth BMR; and from 2008 on the Democracy Index⁵ - henceforth DI. Both data structure are limited, either by sample or periods.

Table 2 – Matching between the CNT, BMR and DI measurement of political regime

Data label	Frequency	Percent	2000 (%)
BMR = 0 & CNT = 0	37	14.12	
BMR = 1 & CNT = 1	185	70.61	84.62
BMR = 0 & CNT = 1	25	9.54	15.38
BMR = 1 & CNT = 0	15	5.73	
BMR = 0 & DI = 0	1	7.69	
BMR = 1 & DI = 1	11	84.62	
BMR = 0 & DI = 1			
BMR = 1 & DI = 0	1	7.69	

Notes: In all bases 0 represents a non-democracy assignment and 1 implies that the country is recognized as a democracy.

The BMR data, despite of a greater range of analysis has less observations than CNT, six countries are not in the sample⁶. But, we can complete our database with this data for the period 2001-2007. The upper panel in table 2 shows a comparison among the informations for the countries that belong to the two databases for the period 1980-2000. It is possible to note that in 84.73% of the data we have a match between BMR and CNT. In the other cases, it is feasible to say that the CNT is more conservative than BMR, to assign a country as democracy or autocracy. Looking only for year 2000 (column 3), the CNT also appears as a conservative measure of political regime. Given the high compatibility between BMR and CNT, for the countries that belong for both bases, we use the BMR to extend our set of information from 2001 to 2007, by keeping the year 2000 information from CNT. The six countries that remained without information for 2001-2007, we repeat the information observed in 2000 according to CNT.

To extend our political regime data from 2008, we use the democracy measure provided by the DI. Except for 2009, which we do not have found the document, from 2008 to 2018, we use the classification provided by the report to update the political regime variable. The DI gives us four types of regimes: Full democracies, flawed democracies, hybrid regimes, and authoritarian regimes. For our study purpose, to get value 1, a country should be classified as a flawed democracy, or full democracy. As before, in the year when we have no information for the political regime variable (2009) it is repeated the value from the previous year.

It is important to note that both BMR and DI have an overlay of observations for year 2007⁷. As showed in the lower panel of table 2, our definition of democracy in DI highly matches (92,62%) with the BMR. The only divergence is the Ecuador, that in DI is assigned as a hybrid regime ($DI = 0$), while in the BMR is assigned as a democracy. In this case, BMR is a measure more conservative, and we will keep it. For the six countries that are not in the BMR, but have informations for year 2007 from DI, we will not made

⁵ Published by The Economist Intelligence Unit's

⁶ See the notes of the table 7 in the appendix.

⁷ The 2006 report was not found to the DI.

changes to maintain the homogeneity and temporal consistency of the database.

Aiming to capture the effect from trade liberalization, we use Cervellati2018 database, which is build by [Wacziarg e Welch \(2008\)](#). We use a dummy that identifies if that year the country was recognized as an open (=1) or closed (=0) economy (*trade_lib*). For trade liberalization data we kept the original information from [WACZIARG; WELCH](#), which implies that the regime observed in 2000 is kept until 2018. Despite an arbitrary decision, this not implies in a major simplification since trade liberalization is a process more complex to reverse than political regimes.

To see that, just do a simply exercise: A country that comes out of a democracy to autocracy, still trading with countries that have some ideological alignment, but the scenario of a country that becomes a closed country and still a democracy is hard to postulate, since the shortage of products and an inflationary process can implode the economy and the government. Also, following the [Cervellati, Naghavi e Toubal \(2018\)](#) approach, we have an interaction between the dummies for trade and political regime (*demo_lib*) where the variable takes value 1 if the country is recognized as a democracy and an open economy, zero otherwise.

4 Econometric approach

As much highlighted in the literature, growth models usually suffers from endogeneity, that can come from simultaneity, classical measurement error, or omitted variable. In the presence of one of these an OLS estimator is inconsistent. In this case, the OLS is biased upwards and the fixed-effects is biased downwards ([BUSSE; KOENIGER, 2012](#)). To ensure that we are measuring the impact of the covariates on economic growth rate, and not the opposite, we follow [Bond, Hoeffler e Temple \(2001\)](#) applying the System GMM as a tool to solve this issue.

Our models will be estimated in three steps. First we analyze our trade measure, checking its capacity to explain the absorption of technology through trade growth and its impact on economic growth. In the second step, we focus on the political and trade regimes, verifying if the nature of political regime, be it a democracy or not, and the nature of the trade regime, open or closed economy, has an impact on the economic growth of the Latin America countries. The third step is a combination of step one and two.

For the third step, we use our main trade measure (*trade_growth*) and the political and trade regimes. Using this specification we do not incur in perfect or quase-perfect multicollinearity problem, because, as detailed in section 3, this alternative approach for trade allows to expansion of trade and access to foreign technology [Busse e Koeniger \(2012\)](#). If the traditional measurement for trade (*trade_share*) were used, both variables, trade as share of GDP and the dummy for trade regime, would represent the same thing theoretically, the degree of openness of an economy, one in continuous terms and the other binary.

To simplify, we want to estimate the following equation:

$$g_{i,t} = \alpha + \beta X_{i,t} + \lambda g_{i,t-1} + \epsilon_{i,t} + \mu_{i,t} \quad (1)$$

whereby g is the annual growth rate; α is a specific-time effect; X is the covariates set; the term $\lambda g_{i,t-1}$ is the dynamic effect; ϵ is the non-observed heterogeneity and $\mu_{i,t}$ is the idiosyncratic error. In the covariates set are all independents variables, endogenous and exogenous. The presence of the lagged dependent variable leads to verify whether there

is some persistence in the growth process, that is, past growth rates influencing present growth rates.

As a benchmark to our analysis, each model will be estimated by three different methods. Equations are estimated with fixed-effects (FE), Panel-correlated standard errors (PCSE), and the S-GMM (S-GMM). The FE provides us results with time fixed effects correction, addressing idiosyncratic issues, mainly due to unobserved heterogeneity bias and attrition, although the lower efficiency. The main problem with the fixed effects refers to the violation of the strict exogeneity assumption, because of the presence of a lagged depend variable in the model. The PCSE addresses the heteroskedastic and correlated error term across time.

The S-GMM is the main model. Applying the Arellano-Bover/Blundell-Bond (S-GMM) technique, we have endogenous and predetermined variables. As instruments the S-GMM uses the lagged levels and differences between two periods for the endogenous variables (BOND; HOEFFLER; TEMPLE, 2001). To set in which classification each variable will be put, we follow the growth literature and theoretical models implications. As exogenous, we have four variables: the lagged GDP per capita and the dummies for trade and political regimes. Investment, government consumption, and population will be treated as endogenous.

Almost all of the papers that discussed about economic growth and its relation to political issues, be it the regime nature or the stability, highlighted that this relation is possible as a two-way path. By Barro (1996) and Alesina et al. (1996), the bias of simultaneity can influence in our estimators' properties and decrease the confidence in their efficiency. Although these allegations, these papers worked with long-run datasets, looking for five, teen or twenty-years growth rate which is totally feasible that the nature of the regimes become endogenous. However, working with an annual dynamic panel data is also feasible to argue that the predominance of the effect is from the nature of the trade and political regimes to economic growth, instead of the opposite.

At the first glance it seems like a strong assumption, but going back to the region's past we can note that a poor economic performance did not imply a constitutional rupture. The ruptures observed along Latin America history started by political interest, be it local or external, such as Chile 1973, Paraguay (1954-1989), Argentina (1976-83), and Brazil (1964-85). Also, it is possible to cite the recent tendency observed in Venezuela since Chávez's rise to power. These ruptures has an impact on the long-term growth rate, but as we are looking at the annual economic growth rate it is feasible to assume that changes in political regimes does not have impact on the short-term growth rate, the objective of this paper.

Looking for the instruments matrix, initially it will generate a lagged value for each period, implying in a proliferation of instruments. As highlighted by Roodman (2009), this does not compromise the consistency of the estimator, but reduce the power of the Hansen Test and can overfit endogenous variables. To avoid this problem, our instrument matrix will be collapsed to reduce the number of instruments. Then, to get reliable instruments, the exogenous and endogenous variables will be lagged at least in one period, to get a valid instrument, and the number of maximum of instruments is six. This implies that the number of instruments will not be large relative to the sample. A test for model specification will be performed, as well the Sargan/Hansen Test of overidentifying restrictions, and the Arellano-Bond Test for autocorrelation.

5 Results and discussion

Table 3 shows the regressions outputs of the first model for the fixed-effects (FE), panel-correlated (PCSE), and the system GMM (S-GMM). The Arellano-Bond test for second-order, AR(2), rejects the hypothesis of the first-order serial correlation. The Sargan and Hansen tests confirm the joint validity of the instruments.

Table 3 – FE, PCSE and S-GMM estimates - trade and growth

Dependent variable	FE		annual growth rate PCSE		S-GMM	
	(I)	(II)	(III)	(IV)	(V)	(VI)
ln_gdp_prd_pc (-1)	0.0068 (0.0137)	0.0123 (0.0107)	0.0066 (0.0041)	0.0092*** (0.0026)	0.0108** (0.0046)	-0.0022 (0.0036)
inv_share	0.2528*** (0.0587)	0.1332** (0.0575)	0.2542*** (0.0499)	0.1056*** (0.0327)	-0.2386 (0.1715)	0.1184 (0.1441)
gov_share	-0.0767* (0.0432)	-0.0467 (0.0290)	-0.0105 (0.0416)	-0.0153 (0.0277)	-0.2677** (0.1236)	-0.0294 (0.1170)
pop_growth	-0.0050 (0.0273)	0.0114 (0.0151)	-0.0069 (0.0091)	-0.0075 (0.0052)	0.0018 (0.0254)	-0.0035 (0.0118)
trade_growth		0.2239*** (0.0230)		0.1980*** (0.0136)		0.2988*** (0.0430)
R-squared	0.1269	0.4718	0.0896	0.3911	-	-
Observations	722	722	722	722	703	703
Instruments	-	-	-	-	22	29
Arellano-Bond test						
AR(1) (p-value)	-	-	-	-	0.002	0.002
AR(2) (p-value)	-	-	-	-	0.182	0.455
Test of overidentified restrictions						
Sargan (p-value)	-	-	-	-	0.000	0.000
Hansen (p-value)	-	-	-	-	0.401	0.878

Robust (P-OLS, FE), Panel-correlated (PCSE), and Corrected (S-GMM) standard errors in parenthesis. * p<0.10, ** p<0.05, *** p<0.01. The PCSE standard error is not normalized and the model is specified as autocorrelation AR(1) with a single lag of the OLS residuals.

By the results shown in table 3 the effects can vary according to the specification. In the basic regressions (I to IV) the share of the real investment on GDP is statistically significant in the FE and PCSE estimations, with similar coefficients. In the S-GMM estimation, the effect of the *inv_share* is not statistically significant. The share of the real government consumption on GDP appears statistically significant in the FE and S-GMM estimations. Including our measure of trade in the estimations (II, IV, and VI), few changes are verified in the results, mainly in the S-GMM.

The expanded estimations show that our measure of trade are statistically significant in all estimations. The results suggests that an increase of 1% in trade means a rise of the growth rate between 0.2% to 0.3%. The magnitude is very close across the estimations. Also, the inclusion of the *trade_growth* reduces the effect of the *inv_share* in around 0.1% to 0.15%, while the *gov_share* loses its statistical significance. For the convergence effect, we do not observe robust statistical evidence, although columns III, and V suggest that the presence of conditional convergence is not verified. Our results go in the direction of the Busse2012a thesis, in which trade growth is a better measure to trade effects on growth,

beyond capturing the access to foreign technology, which in other ways will ultimately impact the economic growth rate.

With the results from table 3, we can argue that trade policies that aim to facilitate trade flows in the country affect the access to foreign technology through more import of goods and services from more developed countries with different degrees of technological progress. With that in mind, the absorption and incorporation of this technology in the production affects positively the local growth, raising the steady-state position, as well as the long-run growth rate.

In table 4 we are looking at trade and political regimes' effects on economic growth through the addition of the dummy variables for trade liberalization, political regimes, and both regimes (democracy and open economy). The Arellano-Bond test for second-order, AR(2), rejects the hypothesis of the first-order serial correlation. The Sargan and Hansen tests confirm the joint validity of the instruments.

With this specification, we can observe that we have a clear difference between the estimations. The FE and PCSE estimations go together, with the *inv_share* having very similar results across specifications. The government consumption shows statistical significance only in the FE estimations, but at the lowest significance level. In the S-GMM, only the dummies regimes are statistically significant. All the results of interest presents the expected coefficients.

The result for trade regime (columns I, IV, and VII) suggests that being an open economy has a positive effect on the growth rate, between 2.6% to 4.3% in comparison with closed economies. Columns II, V, and VIII show that the political regime is economically significant, in which a country recognized as a democracy has a differential between 1.72% to 2.43% on growth rate. The results for the dummy that captures the interaction between the political and trade regimes suggests that being a democracy and an open economy has a positive effect, from 1.5% to 3.5% on growth rate, compared to other types of regimes (open economy but non-democratic, closed economy but democratic, and neither democratic nor open economy).

Therefore, the results obtained from table 4 meet the previous findings in the literature, be the findings from Barro (1991) or the Alesina et al. (1996) study. In democratic and open countries, the policymaker acts in two directions: consolidate their political group in power and promote improvements in the individuals' standard of living. At each period, the government is subject to the voters' assessment, which provides more expectations about how the policies will be made. Any effort to break the democratic regime can be severely repudiated in the external community, which can affect the trade flows through trade barriers or sanctions in general. In non-democratic countries, the policymaker has no incentives to do specific policies to improve the local standard of living, in such a way that the ruler is more concerned with the continuity of his government, and how to protect him from any attempts to undermine their power. In this case, the ruler is not worried about how the external community will react.

If we adapt the Cervellati, Naghavi e Toubal (2018) theory designed for technology adoption to the economic growth process, our results go against their hypothesis. In their proposal, there are three scenarios starting from an autocratic and closed economy country: the country becomes a democracy, without trade liberalization; the country becomes an open economy, but remain an autocracy; the country becomes a democracy and open-economy country.

Table 4 – FE, PCSE and GMM estimates - Regimes and growth

Dependent variable	annual growth rate								
	FE			PCSE			S-GMM		
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)
ln_gdp_prd_pc (-1)	0.0019 (0.0124)	0.0055 (0.0133)	0.0041 (0.0130)	0.0018 (0.0040)	0.0036 (0.0041)	0.0023 (0.0041)	0.0002 (0.0064)	0.0071 (0.0066)	0.0021 (0.0061)
inv_share	0.2291*** (0.0545)	0.2541*** (0.0520)	0.2309*** (0.0507)	0.2415*** (0.0467)	0.2646*** (0.0477)	0.2485*** (0.0472)	-0.1601 (0.1832)	-0.1354 (0.2308)	-0.1050 (0.1892)
gov_share	-0.0559* (0.0302)	-0.0824* (0.0417)	-0.0726* (0.0348)	-0.0020 (0.0380)	-0.0192 (0.0401)	-0.0009 (0.0381)	-0.0851 (0.1374)	-0.1982 (0.1612)	-0.1010 (0.1281)
pop_growth	0.0184 (0.0272)	-0.0064 (0.0244)	0.0039 (0.0260)	0.0049 (0.0078)	-0.0066 (0.0086)	0.0002 (0.0082)	0.0315 (0.0351)	-0.0138 (0.0272)	0.0115 (0.0325)
trade_lib	0.0260*** (0.0058)			0.0259*** (0.0068)			0.0433*** (0.0198)		
political_regimes		0.0172*** (0.0040)			0.0222*** (0.0054)			0.0243*** (0.0109)	
demo_lib			0.0150*** (0.0030)			0.0200*** (0.0062)			0.0349*** (0.0134)
R-squared	0.1676	0.1530	0.1497	0.1233	0.1169	0.1157	-	-	-
Observations	722	722	722	722	722	722	703	703	703
Instruments	-	-	-	-	-	-	23	23	23
Arellano-Bond test									
AR(1) (p-value)	-	-	-	-	-	-	0.008	0.003	0.005
AR(2) (p-value)	-	-	-	-	-	-	0.086	0.094	0.072
Test of overidentified restrictions									
Sargan (p-value)	-	-	-	-	-	-	0.000	0.000	0.000
Hansen (p-value)	-	-	-	-	-	-	0.428	0.390	0.435

Robust (P-OLS, FE), Panel-correlated (PCSE), and Corrected (S-GMM) standard errors in parenthesis. * p<0.10, ** p<0.05, *** p<0.01. The PCSE standard error is not normalized and the model is specified as autocorrelation AR(1) with a single lag of the OLS residuals.

By the authors, just opening the economy or becoming a democracy does not guarantee greater adoption of technology because only opening the economy is expected that the local political elite will drain the earnings of international trade. While just changing the political regime, the new political elite (the workers) is no guarantee by itself that can occur changes in the production process, probably because they may want to protect their jobs from external competition.

Table 3 results, combined with table 4, suggest that trade is an important tool for the policymakers to change the country's growth path. As noted by [Busse e Koeniger \(2012\)](#), measuring trade in growth rates allows us to capture the technology absorption in an economy, mainly due to access to foreign goods and services with technology differentials. This can suggest that a process to become an open economy, even if not accompanied by a change to a democratic regime, can affect the economic growth rate. So trade distortions, like tariff and non-tariff barriers, can affect how the country will absorb and adapt foreign technologies to their production process, impacting the economic growth performance. This hypothesis is endorsed by the results of table 5.

Table 5 – FE, PCSE and GMM estimates - trade, regimes and growth

Dependent variable	annual growth rate		
	FE	PCSE	S-GMM
	(I)	(II)	(III)
ln_gdp_prd_pc (-1)	0.0098 (0.0102)	0.0049* (0.0026)	-0.0053 (0.0096)
inv_share	0.1409** (0.0548)	0.1235** (0.0313)	0.0278 (0.2730)
gov_share	-0.0398 (0.0261)	-0.0175 (0.0265)	-0.0888 (0.1276)
pop_growth	-0.0021 (0.0158)	-0.0010 (0.0050)	-0.0359 (0.0260)
trade_growth	0.2125*** (0.0225)	0.1886*** (0.0137)	0.3176*** (0.0713)
trade_lib	0.0191** (0.0090)	0.0236*** (0.0061)	0.0139 (0.0257)
political_regimes	0.0126** (0.0056)	0.0166*** (0.0054)	0.0260 (0.0206)
demo_lib	-0.0138* (0.0077)	-0.0130* (0.0069)	0.0252 (0.0214)
R-squared	0.4821	0.4190	-
Observations	722	722	703
Instruments	-	-	32
Arellano-Bond test			
AR(1) (p-value)	-	-	0.004
AR(2) (p-value)	-	-	0.673
Test of overidentified restrictions			
Sargan (p-value)	-	-	0.025
Hansen (p-value)	-	-	0.968

Robust (P-OLS, FE), Panel-correlated (PCSE), and Corrected (S-GMM) standard errors in parenthesis. * p<0.10, ** p<0.05, *** p<0.01. The PCSE standard error is not normalized and the model is specified as autocorrelation AR(1) with a single lag of the OLS residuals.

Table 5 estimations combine the models of tables 3 and 4, putting trade measure

(measured as the growth of trade) and regimes dummies in the same model. The Arellano-Bond test for second-order, AR(2), rejects the hypothesis of the first-order serial correlation. The Sargan test confirms the validity of the instruments. In general, the results maintain their qualitative interpretation, with marginal changes in the coefficients.

In this estimation, the real investment as share of GDP is statistically significant in FE, and PCSE estimations. Government consumption shows no statistical significance in any of the regressions. Trade growth still statistically significant across estimations. The variable for political and trade regimes are significant in the FE, and PCSE estimations. Trade regime and political regime keeps the previous results, while the dummies for open economy and democracy changes the signal. In this specification, the relation between democracy and free trade is more winding.

Robustness check

To check the consistency of our results, mainly for political and trade regime variables which is the focus of this paper, we conduct some robustness tests changing our measure of democracy and trade liberalization. It is necessary to highlight that our main measure of trade (*trade_growth*) is not a measure of trade openness, as discussed before. Therefore, the traditional measure of trade (*trade_share*) becomes a valid proxy for trade liberalization. Also, as a valid proxy for trade liberalization, we used the informations available at the Fraser Institute (FI) data. For political regimes a new dataset was explored, the Worldwide Governance Indicator (WGI). Some notes are required, mainly because in addition to the lack of data which addresses political and trade regimes, Latin America and Caribbean countries, in general, suffer with data shortage. By using alternative datasets to provide the robustness of the econometric results we may fall into losses of observation for some years, reducing the sample size. Table 1 also shows statistical information about the variables.

As discussed before, one of the proxies to check the robustness of the results is the *trade_share*, the traditional measure of trade openness. According to the literature, previous results and the theoretical models, this variable indicates that more economic openness is positively correlated with the economic growth. The second variable to be a proxy of trade regimes is the Freedom to Trade Internationally (*freedom_trade*), from the FI dataset. This variable varies in an interval [0, 10], which closer to 10 implies that freer to trade the country is. This variable captures informations about four dimensions: tariffs, regulatory trade barriers, black-market exchange rates, and control of capital⁸. It is important to note that this dataset is annually from 2000s, between 1980-2000 the data is calculated by five-year intervals, which means that few changes is necessary: the information observed in 1980, are replicated for 1980-84; 1985, replicated for 1985-89, and so on until 2000s.

⁸ See the Appendix available at the [Fraser Institute website](#)

Table 6 – FE, PCSE and GMM estimates - Robustness checks

Dependent variable	annual growth rate								
	FE			PCSE			S-GMM		
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)
ln_gdp_prd_pc (-1)	0.0087 (0.0025)	0.0101 (0.0023)	0.0175* (0.0033)	0.0094*** (0.0040)	0.0052** (0.0041)	0.0113*** (0.0041)	0.0019 (0.0045)	0.0012 (0.0057)	0.0024 (0.0044)
inv_share	0.1391** (0.0568)	0.1169* (0.0595)	0.0939 (0.0685)	0.0867*** (0.0316)	0.0917*** (0.0261)	0.0605* (0.0363)	0.0950 (0.1221)	-0.1246 (0.1309)	-0.0255 (0.1681)
gov_share	-0.0331 (0.0256)	-0.0477 (0.0284)	-0.0826** (0.0307)	-0.0196 (0.0262)	-0.0212 (0.0228)	-0.0746* (0.0426)	-0.1125 (0.1719)	-0.1303 (0.1973)	-0.1660 (0.1973)
pop_growth	-0.0048 (0.0132)	-0.0036 (0.0134)	-0.0027 (0.0108)	-0.0089* (0.0050)	-0.0016 (0.0047)	0.0086 (0.0060)	0.0065 (0.0109)	-0.0128 (0.0123)	0.0213 (0.0194)
trade_growth	0.2147*** (0.0254)	0.2290*** (0.0243)	0.2701*** (0.0223)	0.2005*** (0.0137)	0.2074*** (0.0132)	0.2499*** (0.0156)	0.3188*** (0.0361)	0.3128*** (0.0502)	0.2471*** (0.0611)
trade_share	0.0275*** (0.0106)			0.0142*** (0.0050)			0.0157* (0.0086)		
freedom_trade		0.0019* (0.0009)			0.0030*** (0.0007)			0.0030* (0.0016)	
political_stability			-0.0006 (0.0052)			0.0070*** (0.0025)			0.0103 (0.0090)
R-squared	0.4788	0.4874	0.6672	0.4041	0.4224	0.5990	-	-	-
Observations	722	694	437	722	694	437	703	675	418
Instruments	-	-	-	-	-	-	30	30	30
Arellano-Bond test									
AR(1) (p-value)	-	-	-	-	-	-	0.002	0.001	0.009
AR(2) (p-value)	-	-	-	-	-	-	0.478	0.941	0.917
Test of overidentified restrictions									
Sargan (p-value)	-	-	-	-	-	-	0.001	0.001	0.000
Hansen (p-value)	-	-	-	-	-	-	0.999	0.998	0.936

Robust (P-OLS, FE), Panel-correlated (PCSE), and Corrected (S-GMM) standard errors in parenthesis. * p<0.10, ** p<0.05, *** p<0.01. The PCSE standard error is not normalized and the model is specified as autocorrelation AR(1) with a single lag of the OLS residuals.

For political regimes, the WGI dataset was used to get informations about the quality of the institutions in each country. Based on the informations provided by the WGI⁹, we use the political stability measure (*political_stability*) as an alternative for political regimes. We go from a dummy variable for democracy or autocracy to a measurement which varies in a range of [-2.5, 2.5], whereby the closer to the upper limit, more stable is the local government. The literature widely accepted that the more unstable the government, the worse is the economic performance. This variable follows a pattern similar to the *freedom_trade*. Its measurement began in 1996, and only after 2000s become an annual data. Between the 1996-2002, we have information for 1996, 1998, and 2000, and following the previous approach, we repeat the data for the subsequent years: 1996-97, 1998-99, and 2000-01.

Table 6 presents some of the robustness checks conducted. As before, the table presents the information for the Arellano-Bond test AR(2), Sargan and Hansen tests. Qualitatively, the results for trade keeps its interpretation, with countries more open to international market having a growth differential. For the alternative measure for political regimes, only in the PCSE the *political_stability* show statistical significance between the other estimates. Also, it is necessary to highlight that the number of countries among the samples reduces considerably, by up to 300 observations. In a study that, by nature, already suffers from poor data availability, the loss of those informations affects directly our estimations results.

6 Concluding remarks

Working specifically with Latin America and Caribbean countries, we were able to verify local growth components and then confront them with previous findings in the general literature. A huge gap is verified in the literature, with these countries receiving only marginal treatment. This paper aimed to start a line of research focused on the Latin America and Caribbean countries, beginning by the potential drivers of the local growth.

We find that trade (measured as trade growth), political and trade regimes, are important to understand the local growth process. Trade turns out to be a strong policy tool. Increments in the growth of trade will raise the real GDP growth rate, fewer distortions through trade barriers can boost the local growth and increase technology absorption and adoption. Being an open economy is important to local growth, with positive and significant effects. Findings suggest that a democratic regime has a positive effect on economic growth, but being a democracy and an open economy has a negative and significant effect on local growth. The robustness checks also corroborate the thesis for trade effects on growth of the countries in the region, although was not possible to do the same with the alternative measure of political regimes, presenting conflictive results.

Some effects also needs attention, such as the real investment as share of GDP and the real government consumption as share of GDP. Despite some results with no significance, looking at the whole picture, it is possible to get some insights about the behaviour of these variables. By the other hand, population growth does not present statistical significance in the main estimations, as also the variable to capture the effect of income convergence among countries. The latter even presented a positive effect on growth, suggesting that the convergence phenomena may not be valid in studies for countries of the region.

⁹ See the documentation available at the [Worldwide Governance Indicators website](#)

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APPENDIX A – Complementary informations

Table 7 – Country sample

Argentina	Ecuador	Peru
Bolivia	Guatemala ¹	Paraguay ¹
Brazil	Honduras ¹	El Salvador
Chile	Haiti ¹	Uruguay ¹
Colombia	Mexico	Venezuela
Costa Rica ¹	Nicaragua	
Dominic Republic	Panama	

Notes: ¹ Do not belong to the BMR database.