How does openness affect the growth of economies? The spotlight on different dimensions of the financial channel

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Abstract

The economic performance of countries is influenced by several factors, including financial and trade openness. However, the impact of a country's financial and commercial profile on its economic growth remains a subject of debate in the literature. To provide new insights into this relationship, our paper uses parametric panel estimation to assess how commercial and various dimensions of financial openness affect long-term economic growth in 167 economies from 1960 to 2019. The results show that the relationship between financial openness and economic growth varies not only with a country's level of development, but also with the specific aspect of financial openness considered. The ratio of total foreign assets and liabilities to GDP has a negative impact on growth in high- and low-income countries, while the ratio of portfolio equity assets and liabilities to GDP is positively correlated with growth in middle-income economies. Also for this group, a reduction in capital controls is associated with a decline in growth, while there is some evidence of a positive relationship between a reduction in controls and growth for the high-income group. Trade openness suggests a positive relationship with growth for the whole sample and for high-income countries, but is more ambiguous for low- and middle-income countries. Moreover, a negative correlation between real appreciation and growth seems to be statistically robust, especially when financial openness indicators are included for the case of low and middle-income countries.

Key words: Economic growth; Financial openness; Trade openness; Economic policy.

1 Introduction

The impact of financial openness on economic growth is a topic that has been extensively researched. However, the results obtained in empirical studies are heterogeneous, and no consensus has been reached. In this regard, the present paper seeks to make a contribution to the existing literature on the relationship between financial openness and economic growth. As outlined in the literature, openness measures can be classified into two main categories: real or financial, and *de jure* or *de facto* (Garita, 2009; Estrada et al., 2015; Steiner and Saadma, 2016; Gräbner et al., 2021). The terms "real" and "financial" differentiate between the types of international flows. The terms *"de jure"* and *"de facto"* pertain to the sources utilized in composing the openness indicator. As stated by Gräbner et al. (2021), *de facto* measures are aggregates of economic statistics, whereas *de jure* indicators represent assessments of the institutional foundations of economic openness, such as legal restrictions to trade or financial transactions. 'Hybrid' measures incorporate information of both types (real and financial; or *de jure* and *de facto*). With respect to financial openness, *de facto* financial indicators evaluate outcomes, such as the amount of foreign direct investment (FDI) inflows/outflows, or foreign financial assets/liabilities. Furthermore, *de jure* financial measures denote a country´s legal restrictions imposed on its cross-border capital transactions.

In a growth regression framework, the use of alternative indicators leads to the generation of non-homogeneous outcomes, given that they represent disparate aspects of economic integration. For

instance, Quinn et al. (2011), conducted a review of various financial openness indicators and found that the use of *de jure* and *de facto* measures yielded disparate effects on economic growth. Therefore, the goal of the researcher should not be to identify the optimal indicator of openness, but rather to facilitate a constructive discourse and interpretation of the insights offered by each indicator, and to ascertain the implications for growth. Furthermore, it is valuable to examine whether economic or technological levels are responsible for the observed disparities in implications across countries.

The objective of this study is to examine the impact of distinct openness aspects on economic growth at varying levels of development. To this end, the sample was divided into three income-level subgroups, enabling a disaggregated analysis. This approach allows for the formulation of more precise economic policy recommendations tailored to the specific characteristics of the economies under study. The following section presents a review of the relevant literature. Section 3 outlines the methodology and data, with particular attention to the openness indexes. Section 4 provides the results of the estimations. Finally, Section 5 discusses the implications and conclusions of the paper.

2 Background

There is a large body of empirical research examining the effects of financial liberalisation on economic growth (Kraay, 1998; Levine, 2001; Quinn and Toyoda, 2008; Garita, 2009; Obstfeld, 2009; Kose et al., 2011; Quinn et al., 2011), while another group of studies focuses on the effects of financial development on growth (Levine and Zervos, 1998; Beck et al., 2004; Fisman and Love, 2004; Bekaert et al., 2005; Estrada et al., 2015; Guru and Yadav, 2019). Despite the extensive empirical literature, the results obtained are heterogeneous and vary depending on the indicators used, control variables, sample countries, time horizon of the analysis, among other factors.

Several studies primarily focus on the development of a country's financial system and how it can affect growth. In this line of analysis, Levine and Zervos (1998) find that stock market liquidity and a developed banking system drive economic growth, capital accumulation, and productivity increases for a sample of 47 countries over the period 1976-1993. Beck et al. (2004) conduct an empirical analysis of the impact of stock markets and banks on economic growth in a sample of 40 countries for the period 1976-1998. They conclude that stock markets and banks have a positive effect on economic growth. Bekaert et al. (2005) find that stock market liberalisation has, on average, a positive effect of 1% on annual per capita output growth. These results suggest that financial openness can facilitate better resource allocation and promote productive investments. Moreover, their results are robust.

Kraay (1998) does not find robust effects of capital account liberalisation on economic growth, suggesting that other factors may moderate this relationship. Garita (2009) analyzes the channels through which financial openness can affect economic growth and finds that, in developing economies, greater inflows of FDI encourage domestic investment and economic growth, while in developed economies only portfolio investments stimulate the attraction of capital. Abd Latib and Mohamad (2023) conduct a meta-analysis of papers studying the relationship between financial openness and growth. The authors find that most of the reviewed studies show a positive relationship between financial liberalisation and economic growth; however, the effects are not uniform and may vary depending on the country's level of development and the quality of financial and economic institutions. Countries with more robust financial systems and effective regulations tend to benefit more from financial liberalisation in terms of economic growth. Similar results are found by Bijlsma et al. (2018) and Bumann et al. (2013).

Bussiere and Fratzscher (2008) focus their analysis on a time-varying relationship between openness and growth, where countries gain in the short term after capital account liberalisation but do not experience long-term growth. The authors find evidence in favor of this temporal variability for 45 industrialized and developing economies. Quinn and Toyoda (2008) find that capital account liberalisation is positively associated with growth in both developed and developing countries.

Studies such as Kim et al. (2012) focus on the dynamic effects of financial integration and FDI on economic growth and macroeconomic uncertainty. Estrada et al. (2015) study the importance of financial development and openness for economic growth. The authors conclude that it is not the development of particular components of the financial system (such as banks or stock markets) that contributes to growth but rather the development of the financial system as a whole. Additionally, this positive effect on growth is greater in developing economies than in developed ones. The results obtained are mixed depending on the type of financial openness indicators used.

On the other hand, a group of studies evaluate the relationship between trade and financial openness on economic growth (Adeel-Farooq et al., 2017; Aremo and Arambada, 2021), or examine the relationships between trade openness, financial development, and growth (Yucel, 2009; Mohamed Sghaier,

2023). Additionally, Beck et al. (2004) analyse whether financial development helps reduce poverty and, based on the results obtained, argue that financial development tends to reduce income inequality as it disproportionately raises the incomes of the poor. In particular, the authors find that having a developed financial system leads to the incomes of the poor growing faster than average per capita GDP and that poverty rates decline rapidly. Levine (2001) evaluates whether international financial liberalisation accelerates growth. His main conclusion is that such financial liberalisation can promote economic development by fostering the domestic financial system, as greater stock market liquidity resulting from financial liberalisation promotes productivity growth. This is further supported by the increased presence of foreign banks, which improve the efficiency of the domestic banking system.

Rodrik and Subramanian (2009) argue that external financing exacerbates the investment and savings constraint in developing countries by appreciating the real exchange rate and reducing the profitability of the tradable goods sectors, with consequent adverse effects on growth.

The literature review highlights the lack of consensus on a univocal relationship between financial openness and economic growth. The relationship and causality between the two variables differ according to the type of economy, the methodology and the indicators used. A necessary corollary of this paper is the interpretation of these dissimilar results from the various spheres of financial openness.

3 Methodology and data

3.1 General aspects

A panel comprising 167 developed and developing countries was constructed based on the availability of data for the period 1960-2019. The data were extracted from the World Development Indicators (WDI) of the World Bank and the International Monetary Found (IMF), as well as the database proposed by Gräbner et al. (2021), from which different measures of financial openness were used. Descriptive statistics and econometric estimates were performed using STATA16 software. With regard to the explanatory variables of economic growth employed in this study, with the exception of the measures of financial openness, the majority were selected in accordance with the contributions of Rojas et al. (2019) and Rojas et al. (2021). The endogenous variable is the annual growth rate of real GDP per capita (expressed as a percentage). The control variables (with the exception of the openness variables) are as follows:

- *initial GDP*, defined as the logarithm of real GDP per capita lagged by one period;

- the *investment*, as gross fixed capital formation as a percentage of GDP;

- *public expenditure*, defined as the government's final consumption in relation to GDP;

- *population growth*, expressed as a percentage;

- *human capital* as the logarithm of life expectancy at birth [1];

- *corruption*, as the variable "control of corruption" adjusted by standard error;

- *inflation* measured by the consumer price index;

- *real effective exchange rate or REER*, expressed as index 2010=100.

The sample was divided according to the level of gross national income (GNI) in current US dollars, following the Atlas method, as a proxy variable for the level of development of a country. This was done with reference to the World Bank criteria for income levels for the 2019 fiscal year. Despite the World Bank's classification system comprising four income groups (low, lower-middle, upper-middle, and high-income), it was decided that low- and low-middle-income countries would be considered together. Accordingly, economies are classified into three groups: low-income countries are defined as those with an annual gross national income of less than US\$ 4,045 in 2019, medium-income countries are those with an income ranging between US\$ 4,046 and US\$ 12,535, and high-income countries are those with an income equal to or greater than US\$ 12,536.

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[1] It is important to highlight that, although human capital has two fundamental dimensions, health and education, due to the controversy generated around this last dimension (Rojas et al., 2019), it was decided to use an identifying variable of the health dimension.

3.2 Methodology

Due to the objective of this paper and the data detailed in the previous section, parametric panel models are estimated. As is well known, when working with panel data estimates, Pooled Ordinary Least Squares models, known as Pooled, models with random effects and models with fixed effects can be estimated. The pooled models assume that the estimation coefficients are constant, ignoring the possibility of heterogeneities among the observation units. If such differences existed and were omitted, then the error term would be affected by this error and the estimators would be inconsistent and biased. Fixed effects models, on the other hand, admit the existence of heterogeneities (each observational unit will have its own ordinate at the origin) but the cost of this incorporation is to have coefficients that are not of minimum variance.

Random-effects estimation is an intermediate situation between pooled models and fixed-effects estimation: the existence of heterogeneities among observational units is recognised, but these are contained within the disturbance term. This error term, in random-effects estimation, is composed of a randomly distributed error term and an idiosyncratic term. One of the problems faced by random effects models is the possibility of generating biased and inconsistent estimators if there is correlation between the random effects and any of the explanatory variables.

In order to find out which method is most appropriate, a series of tests are used. First, the restricted F-test is used to consider the fixed effects versus the pooled model. In other words, it allows us to compare the pooled OLS model with the fixed effects model, since the pooled model is just a restricted model of the fixed effects model (the latter considers a different ordinate at the origin for each country). The null hypothesis of this test assumes that all the coefficients of the slopes are statistically equal to zero. If rejected, the coefficients would be statistically different from zero and the correct model to estimate would be with fixed effects. Secondly, the Lagrange multiplier test of Breusch and Pagan (1980) allows a comparison of the pooled model with the random effects model. From this test, the existence of random effects can be verified. If random effects are present, then the variance of the idiosyncratic term of the model is non-zero. The null hypothesis assumes zero variance, so if the null hypothesis is rejected, it would be appropriate to estimate Pooled models since there is no evidence to support the presence of random effects. Otherwise, there are unobserved heterogeneities and there are random effects. The third step consists of estimating the Hausman (1978) test allows a comparison of the fixed-effects and random-effects models. The null hypothesis of this test indicates that the fixed and random effects estimators are approximately equal and, if this hypothesis is true, the appropriate model is the random effects model (the estimators will be consistent and efficient). Conversely, if the null hypothesis is rejected, the fixed effects model should be used, since the random effects estimators are likely to be inconsistent due to endogeneity. Finally, the existence of first-order serial autocorrelation and heteroscedasticity is verified in order to satisfy the Gauss-Markov assumptions and thus obtain the Best Linear Unbiased Estimators (BLUE). The errors must be homoscedastic and independently distributed from each other. To verify this, the Wooldridge (Wooldridge, 2002) and Wald modified (Greene, 2002) tests were implemented. In the case of the Wooldridge test, the null hypothesis indicates the absence of first-order autocorrelation, AR(1), while the alternative hypothesis indicates the opposite. For the detection of heteroscedasticity, the Modified Wald test is implemented, whose null hypothesis indicates homoscedasticity, contrary to the alternative hypothesis. To correct for these problems, robust models known as Panel Corrected Standard Errors (PCSE) can be estimated.

The empirical exercise in this paper followed the sequence detailed in the previous paragraph, estimating pooled, fixed-effects and random-effects models and performing the series of tests described above. It was decided to estimate the model by fixed effects (FE), since, when carrying out the Hausman (1978) test, the null hypothesis was rejected in all cases. Additionally, the fixed effects were not significant according to the restrictive "F" test. In order to obtain the Best Linear Unbiased Estimators (BLUE) and meet the Gauss-Markov assumptions, the existence of first-order serial autocorrelation and heteroskedasticity was tested, using the Wooldridge and Modified Wald tests, respectively. It was concluded to reject the null hypothesis, so the robust PCSE model was estimated. The following regression model was estimated:

$$\gamma_{it} = \alpha_i + \beta_1 Financial\ openness + \beta_2 X_{it} + \varepsilon_{it} \tag{1}$$

Where γ_{it}, represents the growth rate of GDP per capita; *Financial openness* represents the degree of financial openness reflected in the different indicators used; X is a vector of control variables.

3.3   Financial and trade openness measures

As previously noted, the heterogeneity of the results obtained is due, among other factors, to the wide variety of existing indicators to measure financial openness, each with its advantages and disadvantages (Quinn et al., 2011). It bears repeating that *de facto* indicators are those that quantitatively reflect the degree of tangible financial integration (in fact) of an economy with the rest of the world, whereas *de jure* indicators are based on the institutional foundations of economic openness, that is, legal restrictions on financial transactions. In other words, the latter are oriented towards the evaluation of the legal framework of a nation (Gräbner et al., 2021).

In the context of trade, the former indicator is represented by the conventional and widely accepted measure of trade volume relative to GDP (exports plus imports to GDP). Despite the fact that trade-to-GDP is one of the most commonly used variables in growth literature, it does, however, present a number of weaknesses. These include, for example, a tendency to produce results that are biased towards larger economies, concerns about endogeneity, and variations that are more dependent on GDP than on trade. An alternative measure that could be regarded as a 'hybrid' is the second trade openness variable. In line with the approaches set forth by Loayza et al. (2005), Chang et al. (2009) and Vujakovic (2010), the intensity of trade indicator is regressed against a set of geographical and demographic control variables that predetermine trade volume. The residual of the regression is treated as a measure of "net trade openness", which is free of economy-size bias or geographical preconditions. Net trade openness is considered a hybrid measure because it is not directly derived from aggregate economic statistics. Instead, it represents the trade component that could depend on both measurable flows and institutional forms, such as commercial strategies, legal frameworks, and foreign trade policies.

$$Trade\ openness = \beta_1 Population + \beta_2 Surface + \beta_3 Oil + \beta_4 Coastline + \beta_5 Agricultural\ land + \epsilon_{it} \quad (2)$$

$$\hat{\epsilon}_{it} = Trade\ openness - \hat{\beta}_1 Population - \hat{\beta}_2 Surface - \hat{\beta}_3 Oil - \hat{\beta}_4 Coastline - \hat{\beta}_5 Agricultural\ land \quad (3)$$

Where *Trade openness* is the ratio of the sum of total imports and exports to GDP in percentage; *Oil* is a dummy variable that takes the value of one if the country is an oil exporter and zero otherwise; *Coastline* is also a dummy variable that takes the value of one if the country has no sea outlet; *Population* is the logarithm of the total population for each country; the variable *Surface* is the logarithm of the land area in square kilometers for each country; finally, *Agricultural land* refers to the proportion of land area dedicated to permanent crops and permanent pastures (in percentage). By controlling for variables that are exogenous to economic policy decisions and affect international trade, the residual obtained from this regression is closer to the openness produced by economic policy measures and idiosyncratic factors, as it controls for geographical factors and productive specialization in the case of oil.

Keeping in mind that the focus is mainly on financial openness, three *de facto*, one *de jure*, and one hybrid financial openness variables are identified. The financial openness index and the equity-based financial integration index are incorporated from the Lane and Milesi-Ferretti (LMF) database. The financial openness index is defined as the volume of a country's foreign assets and liabilities relative to its GDP. The equity-based financial integration index express the sum of portfolio equity assets and liabilities stocks as percentage of GDP. The third *de facto* indicator is derived from the UNCTAD database and represents the total stock of foreign direct investment (FDI) as a percentage of GDP. This indicator is calculated as the sum of inward and outward FDI stocks. The *de jure* indicator is the Chinn-Ito index, which is based on data concerning the restrictions on cross-border financial transactions from the IMF AREAER report (Chinn and Ito (2006; 2008)). The Chinn-Ito index considers the existence of multiple exchange rates, restrictions on current account transactions, restrictions on capital account transactions and the requirement of the surrender of export proceeds. The hybrid measure is represented by the Financial Globalization dimension of the KOF index (Gygli et al., 2019). This is a weighted composite index based on the Chinn-Ito index, investment restrictions from the WEF Global Competitiveness Report and the number of international investment agreements.

De facto measures are taken in natural logs within the estimations, whereas *de jure* and hybrid measures are considered in levels. Further details on the financial variables are provided in Table 1.

Table 1. Financial openness measures used

Variable	Type	Description
LMF_OPEN_GDP	*De facto*	Sum of Total Foreign Assests and Total Foreign Liabilities in % GDP.
LMF_EQ_GDP	*De facto*	Sum of Portfolio Equity Assets and Liabilities (stocks) in % GDP.
UNC_FDI	*De facto*	Sum of inward and outwarf FDI stocks in % of GDP. The inward FDI stock represents the value of foreign investors' equity in and net loans to enterprises resident in the reporting economy. The outward FDI stock represents the value of the resident investors' equity in and net loans to enterprises in foreign economies.
KAOPEN	*De jure*	The Chinn-Ito-Index, is an index measuring a country's degree of capital account openness. It is based on the four binary dummy variables reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). Includes the presence of multiple exchange rates, restrictions on current account transactions, restrictions on capital account transactions and the requirement of the surrender of export proceeds. The index takes values from -1.90 to 2.37.
KOF_finance	*Hybrid*	It measures a country's openness to international financial flows and investments through the openness of a country's capital account. The most widely used index based on AREAER reports is included: the Chinn-Ito index (Chinn and Ito (2006; 2008)). The second variable measures investment restrictions based on the WEF Global Competitiveness Report. The components of this variable are: investment restrictions (21.7%) and capital account openness (78.3%).

Source: own elaboration.

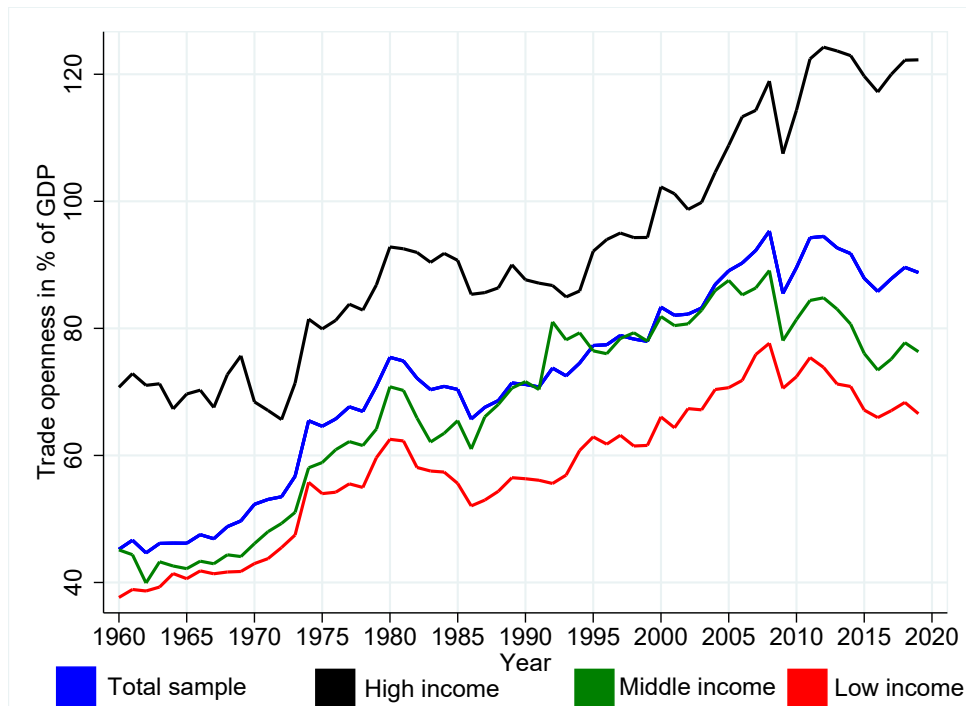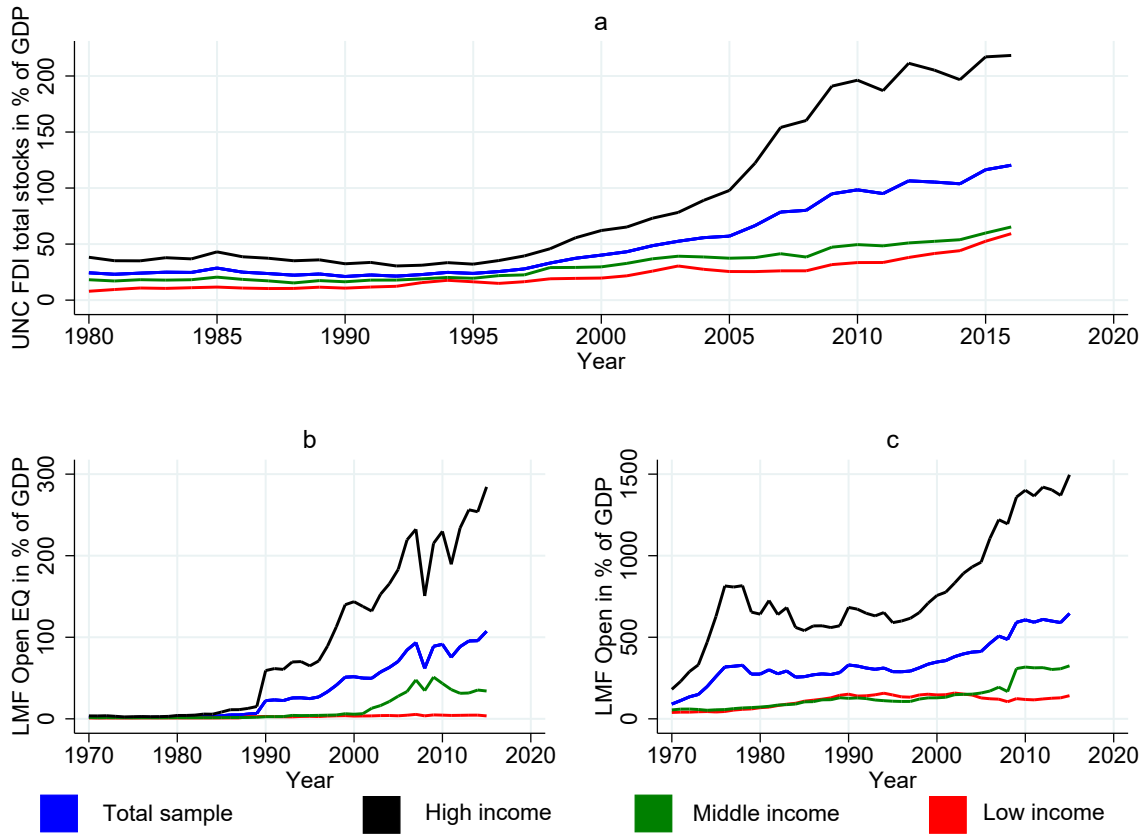Figure 1: Evolution of the traditional trade openness index.

Figure 2: Evolution of financial openness indicators: panel a) shows the sum of inward and outward FDI stocks in percentage of GDP; panels b) and c) exhibit LMF openness indicators evolution.
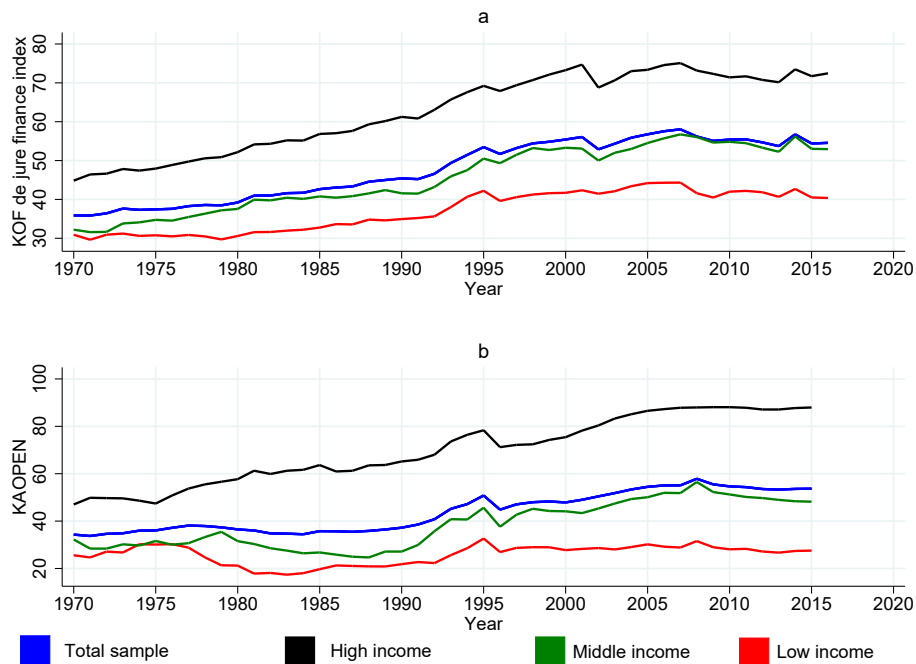

Figure 3: KAOPEN and KOF finance hybrid index by country income level.

The Table 2, shows the summary statistics for the overall sample. The variables considered present

a wide dispersion which may be due to the long period of time analysed and the variability through out countries. Among the variables that show the greatest dispersion are inflation, the real exchange rate, and traditional trade openness, while the standard deviations of the financial openness indicators are relatively lower. In turn, the average growth rate worldwide during the period was 2.12%, reflecting a favorable trend for growth. It may be interesting to observe that the KAOPEN *de jure* index presents a relatively higher variation compared to other financial *de facto* measures, as one would expect greater stability from indicators that depend on institutional factors.

On the other hand, Figure 1, panel a), shows the evolution of the UNC FDI variable, i.e. the inwards and outwards of FDI. Although it has shown an upward trend since the mid-nineties, this trend has been driving primarily by the highest-income countries. Panels b) and c) depict the evolution of the financial openness de facto indicators developed by Lane and Milesi-Ferretti (2007; 2017), as well as the sum of inward and outward FDI stocks in percentage of GDP, both for each country group and for the overall sample. The LMF Open indicator shows a positive trend globally over the period, with an increasing trend in high-income countries since the mid-nineties. In turn, in low-income countries the indicator has remained relatively stable since the end of the last century. The LMF Equity indicator shows rapid growth in high-income countries since the late eighties, while in middle-income countries this behaviour has been observed since the beginning of this century, followed by a negative trend since 2009. In relation to low-income countries, the indicator is stable and at levels much lower than those of the rest of the economies. Similarly, Figure 3 shows the temporal evolution of the KAOPEN and KOF finance indicators considered. Once again, a rising trend is observed, led by developed countries.

Table 2. Summary statistics for the overall sample

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Growth rate	8,061	2.123	6.103	-64.425	140.48
Initial GDP	8,013	8.255	1.458	4.811	11.679
Investment	6,804	22.166	8.160	-2.424	93.547
Trade openness	7,434	75.880	50.704	0.020	442.62
Net trade openness	7,233	-0.000	39.47	-105.62	289.96
Corruption	3,482	-0.206	6.092	-11.399	17.535
REER	3,131	115.33	103.45	20.28	3,053.58
Inflation	7,224	26.047	355.542	-17.640	23,773.13
Human capital	9,996	4.145	0.194	2.484	4.444
Public expenditure	7,286	15.991	8.065	2.047	147.735
Population growth	9,852	1.740	1.604	-27.722	19.052
lnLMF_OPEN	6,150	4.855	1.013	1.530	10.510
lnLMF_EQ	6,169	1.175	1.583	-0.249	9.125
UNC_FDI	4,102	3.201	1.235	-1.774	7.867
KOF_finance	6,971	48.490	21.018	1	98.310
KAOPEN	6,110	45.009	35.746	1	101

Source: own elaboration.

4   Results

The results of the estimation exercises, based on the net trade openness variable and, alternatively, the five financial openness measures, are presented in Tables 3 to 6. Tables 7 to 10, which can be found in the appendix, present the results of regressions with the trade-to-GDP indicator.

Net trade openness suggests a positive relationship between openness and growth for the whole sample and for high-income countries, although it only reaches statistical significance in a few regressions for low and middle-income countries. The trade-to-GDP ratio confirms most of these observations, except for middle-income countries, where the picture is more ambiguous. Traditional trade openness seems to show some evidence of a negative (rather than positive) relationship with growth.

The real effective exchange rate (REER) is the ratio between the value of a currency in terms of a weighted average of several foreign currencies, divided by a price deflator. This implies that an increase (decrease) in the REER signifies a real appreciation (depreciation) of the domestic currency. Prior research has indicated that real exchange rate overvaluation impedes long-term economic growth through various channels, particularly in developing countries (Eichengreen, 2007; Rodrik, 2008; Levy-Yeyati et al., 2013). Tables 3 and 7 demonstrate some evidence that aligns with the aforementioned hypothesis. A high REER value indicates a more appreciated local currency in real terms and a lower growth rate. Indeed, it is noteworthy that this relationship is not statistically significant for high-income countries.

In low-income countries (i.e. low and middle-income countries), a negative correlation between real effective exchange rate (REER) and growth is observed when financial openness indicators are included in the model, with the exception of KOF_finance. Furthermore, the coefficient's significance is consistently high (Tables 4 and 8).

Estimates for middle-income countries demonstrate a more heterogeneous pattern, with REER exhibiting a negative association with growth when net trade openness is considered, but not reaching statistical significance for the traditional trade openness model. Additionally, the coefficients exhibit a change in significance in some cases upon the introduction of financial openness, at a minimum level of 10%.

The interaction between *de facto* financial openness and growth appears to be influenced by the behaviour of the high-income country group. The analysis of tables 3, 6, 7 and 10 reveals a negative correlation between the natural logs of LMF_OPEN_GDP (total foreign assets and liabilities to GDP) and UNC_FDI (inward plus outward FDI to GDP) and economic growth for the whole sample and the high-income group. Notably, LMF_EQ_GDP (portfolio equity assets and liabilities to GDP) is not statistically significant for both samples, by using alternatively net trade openness and trade-to-GDP.

A different behaviour is observed for low-income and middle-income countries when the *de facto* measures of financial openness are taken into account. For low-income countries (Table 4 and 8), only the coefficient of LMF_OPEN_GDP is significant, indicating a negative correlation with growth and an elevated value of the coefficient. It is worth to highlight that trade openness becomes significant (and positively related to growth) when LMF_OPEN_GDP is considered. In contrast, the group of middle-income countries is the only sample for which LMF_EQ_GDP is positively correlated with economic growth.

In terms of *de jure* measures, the Chinn-Ito-Index (KAOPEN) is only significant in the context of middle-income countries, where a reduction in capital controls is associated with a decline in economic growth. Finally, the hybrid variable of financial openness yields mixed results. While KOF_finance correlates positively with growth in the case of the entire sample and high-income countries, the coefficient is not statistically significant for low-income countries and is significant at the 10% level for middle-income countries in the model with the net trade openness variable. In this case, KOF_finance is inversely related to growth.

Furthermore, the remaining control variables demonstrate the expected behaviour. The integration of two trade openness measures reinforces the reliability of the findings pertaining to financial openness measures. The presentation of alternative models was not feasible within the scope of the paper; however, a number of estimations were conducted to ensure the robustness of the results.

Table 3. Estimations for the total sample

Explanatory variables	(1)	De facto measures			De jure measures	
		(2)	(3)	(4)	(5)	(6)
Initial GDP	-1.308***	-0.688***	-0.871***	-0.729***	-0.878***	-0.972***
	(0.246)	(0.230)	(0.248)	(0.229)	(0.232)	(0.216)
Investment	0.154***	0.160***	0.178***	0.176***	0.178***	0.169***
	(0.023)	(0.028)	(0.028)	(0.027)	(0.028)	(0.027)
Public expenditure	-0.163***	-0.159***	-0.151***	-0.166***	-0.154***	-0.143***
	(0.025)	(0.028)	(0.028)	(0.032)	(0.028)	(0.027)
Population growth	-0.839***	-0.718***	-0.765***	-0.786***	-0.775***	-0.777***
	(0.115)	(0.140)	(0.142)	(0.135)	(0.139)	(0.135)
Corruption	0.115***	0.137***	0.112***	0.127***	0.123***	0.094**
	(0.034)	(0.041)	(0.041)	(0.042)	(0.042)	(0.040)
Net trade openness	0.006**	0.011***	0.006*	0.009***	0.006*	0.005**
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
REER	-0.011*	-0.022***	-0.023***	-0.025***	-0.023***	-0.009
	(0.006)	(0.005)	(0.005)	(0.004)	(0.005)	(0.008)
Human capital	6.178**					
	(2.482)					
Inflation	-0.016***					
	(0.004)					
lnLMF_OPEN_GDP		-0.151***				
		(0.155)				
lnLMF_EQ_GDP			0.040			
			(0.133)			
lnUNC_FDI				-0.372**		
				(0.169)		
KAOPEN					0.0005	
					(0.004)	
KOF_finance						0.017**
						(0.008)
Constant	-11.294	12.914***	11.428***	12.002***	11.583***	10.069***
	(9.452)	(2.120)	(2.332)	(2.272)	(2.253)	(2.220)
R^2	0.1572	0.1406	0.1313	0.1485	0.1337	0.1264

Note: ***, ** and *: statistically significant at 1%, 5% and 10%, respectively. Standard errors in parentheses. Source: own elaboration.

Table 4. Estimations for low-income countries

Explanatory variables	(1)	*De facto* measures			*De jure* measures	
		(2)	(3)	(4)	(5)	(6)
Initial GDP	-1.670**	-0.986	-0.330	-0.994	-0.354	-0.196
	(0.800)	(0.777)	(0.723)	(0.866)	(0.705)	(0.687)
Investment	0.203***	0.135*	0.169**	0.274***	0.166**	0.156*
	(0.073)	(0.080)	(0.080)	(0.089)	(0.078)	(0.040)
Public expenditure	-0.152***	-0.097*	-0.129*	-0.166***	-0.110**	-0.107*
	(0.044)	(0.050)	(0.053)	(0.073)	(0.051)	(0.079)
Population growth	-0.360	0.189	0.321	-0.290	0.152	0.224
	(0.470)	(0.555)	(0.563)	(0.569)	(0.557)	(0.280)
Corruption	0.272**	0.328**	0.236	0.284	0.273*	0.183
	(0.117)	(0.149)	(0.147)	(0.185)	(0.146)	(0.089)
Net trade openness	0.012	0.030**	0.026*	0.009	0.015	0.019
	(0.012)	(0.015)	(0.015)	(0.020)	(0.014)	(0.006)
REER	-0.0004	-0.023***	-0.021***	-0.026***	-0.020***	0.008
	(0.010)	(0.006)	(0.006)	(0.006)	(0.006)	(0.018)
Human capital	7.584*					
	(4.339)					
Inflation	-0.022***					
	(0.006)					
lnLMF_OPEN_GDP		-2.079**				
		(0.943)				
lnLMF_EQ_GDP			-0.634			
			(0.410)			
lnUNC_FDI				0.004		
				(0.481)		
KAOPEN					-0.004	
					(0.011)	
KOF_finance						-0.010
						(0.019)
Constant	-17.266	20.782**	5.705	9.961	5.651	1.651
	(15.729)	(9.916)	(6.326)	(6.949)	(6.221)	(5.543)
R^2	0.1119	0.0925	0.0809	0.1224	0.0756	0.0582

Note: ***, ** and *: statistically significant at 1%, 5% and 10%, respectively. Standard errors in parentheses. Source: own elaboration.

Table 5. Estimations for middle-income countries

Explanatory variables	(1)	*De facto* measures			*De jure* measures	
	(1)	(2)	(3)	(4)	(5)	(6)
Initial GDP	-1.037*	-1.007*	-1.796***	-1.142*	-0.530	-0.666
	(0.540)	(0.599)	(0.642)	(0.624)	(0.654)	(0.687)
Investment	0.162***	0.162***	0.179***	0.174***	0.179***	0.176***
	(0.037)	(0.042)	(0.041)	(0.040)	(0.040)	(0.040)
Public expenditure	-0.436***	-0.400***	-0.403***	-0.447***	-0.488***	-0.501***
	(0.062)	(0.067)	(0.065)	(0.072)	(0.071)	(0.079)
Population growth	-1.453***	-1.360***	-1.175***	-1.353***	-1.745***	-1.585***
	(0.222)	(0.268)	(0.258)	(0.297)	(0.297)	(0.280)
Corruption	0.270***	0.258***	0.211**	0.293***	0.290***	0.309***
	(0.074)	(0.091)	(0.089)	(0.093)	(0.090)	(0.089)
Net trade openness	0.030**	0.002	-0.009	-0.003	-0.002	-0.001
	(0.006)	(0.008)	(0.006)	(0.007)	(0.006)	(0.006)
REER	-0.023***	-0.034*	-0.027	-0.029*	-0.033*	-0.033*
	(0.015)	(0.017)	(0.018)	(0.017)	(0.017)	(0.018)
Human capital	-0.425					
	(3.093)					
Inflation	-0.015					
	(0.020)					
lnLMF_OPEN_GDP		-1.111				
		(0.691)				
lnLMF_EQ_GDP			0.599***			
			(0.203)			
lnUNC_FDI				-0.189		
				(0.364)		
KAOPEN					-0.025***	
					(0.009)	
KOF_finance						-0.033*
						(0.019)
Constant	20.932	24.136***	23.578***	20.696***	17.277***	19.115***
	(12.566)	(6.223)	(5.819)	(5.749)	(5.764)	(5.543)
R^2	0.3446	0.3094	0.3003	0.2944	0.3174	0.3185

Note: ***, ** and *: statistically significant at 1%, 5% and 10%, respectively. Standard errors in parentheses. Source: own elaboration.

Table 6. Estimations for high-income countries

Explanatory variables	(1)	*De facto* measures			*De jure* measures	
		(2)	(3)	(4)	(5)	(6)
Initial GDP	-1.475***	-1.033***	-1.583***	-1.447***	-1.630***	-1.686***
	(0.315)	(0.341)	(0.393)	(0.308)	(0.369)	(0.309)
Investment	0.110***	0.142***	0.161***	0.128***	0.161***	0.126***
	(0.035)	(0.038)	(0.038)	(0.037)	(0.039)	(0.037)
Public expenditure	-0.067**	-0.078**	-0.060	-0.061*	-0.056	-0.071**
	(0.031)	(0.036)	(0.037)	(0.034)	(0.037)	(0.034)
Population growth	-0.442***	-0.419***	-0.486***	-0.420***	-0.466***	-0.393***
	(0.128)	(0.158)	(0.156)	(0.145)	(0.152)	(0.145)
Corruption	0.101***	0.063	0.090**	0.120***	0.101**	0.071*
	(0.036)	(0.044)	(0.044)	(0.041)	(0.046)	(0.042)
Net trade openness	0.010***	0.015***	0.011***	0.017***	0.011***	0.008***
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
REER	-0.012	-0.008	-0.009	-0.006	-0.008	-0.009
	(0.009)	(0.011)	(0.011)	(0.010)	(0.011)	(0.010)
Human capital	-9.275**					
	(4.432)					
Inflation	-0.058					
	(0.037)					
lnLMF_OPEN_GDP		-0.480***				
		(0.161)				
lnLMF_EQ_GDP			0.018			
			(0.178)			
lnUNC_FDI				-0.618***		
				(0.190)		
KAOPEN					-0.0007	
					(0.006)	
KOF_finance						0.021**
						(0.010)
Constant	57.029***	14.067***	16.004***	17.333***	16.358***	16.540***
	(18.663)	(3.324)	(16.004)	(3.231)	(3.570)	(3.282)
R^2	0.1536	0.1652	0.1547	0.1616	0.1547	0.1456

Note: ***, ** and *: statistically significant at 1%, 5% and 10%, respectively. Standard errors in parentheses. Source: own elaboration.

5 Final Remarks

The main objective of this paper was to examine the impact of different aspects of openness on growth for different levels of development. To achieve this objective, a panel dataset covering 167 countries for the period 1960-2019 was used. The sample was subdivided into three income levels, following the World Bank's criteria, to carry out the disaggregated analysis: low-, middle- and high-income countries.

First, the results obtained allow us to disaggregate the impact of trade and financial openness. However, in both cases, the empirical exercises carried out show different effects depending not only on the phenomenon being analysed but also on the indicator and the level of development of the countries.

Regarding the effect of trade openness, it is found that a higher degree of openness promotes the growth of developed economies. However, a significant and robust relationship between trade openness and the growth of middle- and low-income countries is not found. A relevant aspect is that this logic of relationships between both variables is sustained when changing the trade openness indicator used (traditional and generated by PSCE). The results are in line with those found by Romero Stéfani et al. (2024) and Kim and Lin (2009), Astorga (2010), Kim (2011) and Abbas (2014). Kim and Lin (2009) find that greater openness to international trade positively influences economic growth in high-income economies, while it has a negative impact on low-income economies. Similarly, Kim (2011) shows that increased trade openness has significantly beneficial effects on growth and real income for developed countries but detrimental effects for developing countries. Abbas (2014), analysing a group of developing countries, identifies a negative impact of trade liberalisation on economic growth, though exports have a positive effect. Astorga (2010) discovers a negative correlation between these variables in a sample of Latin American countries. Finally, Ulaşan (2015), does not find a significant relationship between growth and trade openness.

According to the results found, real exchange rate appreciations harm the economic performance of lower-income countries. Thus, there is a negative and significant relationship between the REER variable and the growth rate for developing countries, but a robust and significant relationship is not found for developed countries. Even the behavior is more robust in the lowest income group in relation to the middle-income group. In low- and lower-middle-income economies, the negative relationship is observed when the financial openness indicators are incorporated (except KOF_finance) and in only some of the estimates for middle-income economies. This interaction should be further explored, because it could be in line with what Rodrik and Subramanian (2009) pointed out, regarding the fact that greater financial openness produces an appreciation of the exchange rate and this is, ultimately, what negatively affects growth in less developed economies. Our results could be the evidence that supports this indirect channel found by the authors.

As mentioned, one of the central objectives of the work was to study different channels through which financial openness affects the growth of countries. Thus, *de facto*, *de jure* and hybrid measures were perfomed. The results found differ depending on the dimension of financial openness being analyzed.

- The results for the *de facto* measures show great heterogeneity and, in some cases, are particular.

  - When the effect of financial openness is analysed using the variable that captures total foreign assets and liabilities, a negative effect on growth is found for low-income economies. Taking into account that the low-income group comprises low- and middle-low economies, this result is one of the outstanding contributions, as this aspect of financial openness has hardly been studied in the literature on developing countries.

  - A result that seems counterintuitive at first sight and should be further investigated is that the variables capturing the effect of Total external assets and liabilities to GDP and Inward plus outward FDI to GDP have a negative effect on the growth of developed economies. Despite some evidence supporting the idea that capital account liberalisation does not imply long-term growth in developed countries (Kraay, 1998; Bussiere and Fratzscher, 2008), the study needs to be deepened. It is important to stress that the variables mentioned above would take into account financial openness in a broad sense, taking into account the inflow and outflow of financial flows as a whole. Perhaps this result may be difficult to interpret when analyzing inflow and outflow jointly, as well as different types of flows. Therefore, it is proposed as an exercise to strengthen the results to disaggregate the flows and, in turn, analyze them in different time periods.

  - For middle- income countries, the dimension of financial openness that seems to promote economic growth is portfolio equity assets and liabilities to GDP.

- The *de jure* and hybrid measures show that in middle-income economies a reduction in capital controls is associated with lower growth (KAOPEN), while in high-income economies it is associated with higher growth (KOF_finance). These results align with the conclusions of the work of Abd Latib and Mohamad (2023), who find that the effects of liberalization are not uniform across countries and that the positive effect will depend on robust financial systems and effective regulations, weak institutional issues in many developing countries.

In conclusion, our results could show that from the point of view of economic policy (financial and commercial), it is necessary to analyze not only the level of development of the economies, but also to investigate which channels promote and which ones harm the growth of the economies. In other words, there is no universal recipe on what position or measures economies should take with respect to opening up to the world, in commercial and financial terms, given that depending on the level of income, the stability of their institutions and the structure of the market, the effect of opening up to the world can be very different.

Future lines of research, which will help to strengthen the results found, consist of working with each group of countries separately and investigating the interaction of each openness variable with various control variables. On the other hand, due to the differential behavior and the diverse history of movements of greater and lesser openness, it is planned to work on the periodization of the time period analyzed and work with different time frames (for the complete sample and for the group of countries). Finally, due to the differential behavior of the different dimensions of financial openness for each group of countries, the existence of non-linear behaviors and threshold effects will be evaluated.

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6   Anexo

Table 7. Estimations for total sample with traditional trade openness measure

Explanatory variables		*De facto* measures			*De jure* measures	
	(1)	(2)	(3)	(4)	(5)	(6)
Initial GDP	-1.285***	-0.662***	-0.901***	-0.742***	-0.885***	-0.971***
	(0.243)	(0.229)	(0.243)	(0.226)	(0.231)	(0.214)
Investment	0.155***	0.157***	0.180***	0.176***	0.180***	0.170***
	(0.023)	(0.028)	(0.027)	(0.026)	(0.028)	(0.027)
Public expenditure	-0.163***	-0.156***	-0.149***	-0.166***	-0.153***	-0.142***
	(0.025)	(0.027)	(0.028)	(0.032)	(0.028)	(0.027)
Population growth	-0.855***	-0.747***	-0.788***	-0.817***	-0.793***	-0.789***
	(0.115)	(0.138)	(0.141)	(0.134)	(0.138)	(0.135)
Corruption	0.113***	0.134***	0.108***	0.127***	0.125***	0.092**
	(0.034)	(0.040)	(0.041)	(0.041)	(0.042)	(0.039)
Trade openness	0.004**	0.009***	0.003	0.006**	0.003	0.003*
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
REER	-0.012**	-0.023***	-0.024***	-0.026***	-0.024***	-0.10
	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)	(0.008)
Human capital	6.027**					
	(2.464)					
Inflation	-0.016***					
	(0.004)					
lnLMF_OPEN_GDP		-0.587***				
		(0.171)				
lnLMF_EQ_GDP			0.085			
			(0.129)			
lnUNC_FDI				-0.381**		
				(0.172)		
KAOPEN					0.0005	
KOF_finance						0.019**
						(0.008)
Constant	-11.057	12.498***	11.349***	11.759***	11.399***	9.801***
	(9.404)	(2.108)	(2.316)	(2.264)	(2.257)	(2.208)
R^2	0.1563	0.1411	0.1310	0.1481	0.1330	0.1258

Note: ***, ** and *: statistically significant at 1%, 5% and 10%, respectively. Standard errors in parentheses. Source: own elaboration.

Table 8. Estimations for low-income countries with traditional trade openness measure

Explanatory variables	(1)	De facto measures			De jure measures	
		(2)	(3)	(4)	(5)	(6)
Initial GDP	-1.631**	-1.064	-0.346	-0.994	-0.316	-0.144
	(0.792)	(0.793)	(0.716)	(0.840)	(0.705)	(0.704)
Investment	0.204***	0.154**	0.190***	0.268***	0.175**	0.170**
	(0.067)	(0.073)	(0.190)	(0.077)	(0.072)	(0.073)
Public expenditure	-0.169***	-0.127**	-0.140**	-0.150**	-0.124**	-0.121*
	(0.047)	(0.054)	(0.057)	(0.071)	(0.055)	(0.064)
Population growth	-0.428	-0.013	0.142	-0.334	0.052	0.085
	(0.436)	(0.532)	(0.526)	(0.523)	(0.518)	(0.490)
Corruption	0.258**	0.320**	0.226	0.300	0.271*	0.185
	(0.116)	(0.151)	(0.148)	(0.182)	(0.146)	(0.143)
Trade openness	0.017	0.034**	0.022	0.019	0.014	0.018
	(0.012)	(0.016)	(0.014)	(0.019)	(0.014)	(0.015)
REER	0.0008	-0.023***	-0.021***	-0.025***	-0.020***	0.008
	(0.010)	(0.006)	(0.006)	(0.006)	(0.006)	(0.016)
Human capital	7.507*					
	(4.277)					
Inflation	-0.023***					
	(0.006)					
lnLMF_OPEN_GDP		-2.312**				
		(1.017)				
lnLMF_EQ_GDP			-0.563			
			(0.382)			
lnUNC_FDI				-0.106		
				(0.454)		
KAOPEN					-0.006	
					(0.012)	
KOF_finance						-0.013
						(0.027)
Constant	-18.229	20.494**	4.280	9.528	4.651	0.419
	(15.660)	(10.204)	(6.551)	(7.056)	(6.466)	(6.788)
R^2	0.1147	0.0931	0.0788	0.1260	0.0753	0.0576

Note: ***, ** and *: statistically significant at 1%, 5% and 10%, respectively. Standard errors in parentheses. Source: own elaboration.

Table 9. Estimations for middle-income countries with traditional trade openness measure

Explanatory variables		*De facto* measures			*De jure* measures	
	(1)	(2)	(3)	(4)	(5)	(6)
Initial GDP	-1.174**	-1.150*	-1.843***	-1.440**	-0.701	-0.849
	(0.540)	(0.623)	(0.642)	(0.646)	(0.673)	(0.700)
Investment	0.162***	0.171***	0.177***	0.177***	0.180***	0.179***
	(0.035)	(0.040)	(0.039)	(0.039)	(0.039)	(0.039)
Public expenditure	-0.443***	-0.408***	-0.413***	-0.456***	-0.483***	-0.497***
	(0.063)	(0.068)	(0.065)	(0.072)	(0.070)	(0.078)
Population growth	-1.405***	-1.302***	-1.124***	-1.240***	-1.655***	-1.506***
	(0.217)	(0.263)	(0.252)	(0.295)	(0.295)	(0.276)
Corruption	0.294***	0.286***	0.231**	0.0304***	0.305***	0.330***
	(0.076)	(0.096)	(0.091)	(0.094)	(0.091)	(0.091)
Trade openness	-0.009**	-0.006	-0.008	-0.010*	-0.007	-0.009*
	(0.004)	(0.007)	(0.005)	(0.005)	(0.005)	(0.005)
REER	-0.023	-0.032*	-0.025	-0.026	-0.032*	-0.031*
	(0.015)	(0.018)	(0.018)	(0.017)	(0.017)	(0.018)
Human capital	-0.895					
	(2.922)					
Inflation	-0.016					
	(0.021)					
lnLMF_OPEN_GDP		-0.587				
		(0.748)				
lnLMF_EQ_GDP			0.496**			
			(0.209)			
lnUNC_FDI				0.060		
				(0.392)		
KAOPEN					-0.023**	
					(0.009)	
KOF_finance						-0.030
						(0.018)
Constant	24.654**	23.158***	24.753***	22.963***	18.876***	20.842***
	(12.026)	(5.9825)	(5.803)	(5.836)	(5.879)	(5.619)
R^2	0.3444	0.3088	0.3000	0.2967	0.3193	0.3210

Note: ***, ** and *: statistically significant at 1%, 5% and 10%, respectively. Standard errors in parentheses. Source: own elaboration.

Table 10. Estimations for high-income countries with traditional trade openness measure

Explanatory variables		*De facto* measures			*De jure* measures	
	(1)	(2)	(3)	(4)	(5)	(6)
Initial GDP	-1.454***	-0.947***	-1.735***	-1.487***	-1.749***	-1.670***
	(0.315)	(0.338)	(0.396)	(0.306)	(0.363)	(0.308)
Investment	0.102***	0.123***	0.152***	0.113***	0.154***	0.117***
	(0.035)	(0.038)	(0.038)	(0.037)	(0.039)	(0.037)
Public expenditure	-0.074**	-0.085**	-0.068*	-0.064*	-0.065*	-0.079**
	(0.031)	(0.036)	(0.037)	(0.034)	(0.037)	(0.034)
Population growth	-0.447***	-0.424***	-0.501***	-0.435***	-0.453***	-0.391***
	(0.130)	(0.155)	(0.156)	(0.144)	(0.154)	(0.147)
Corruption	0.109***	0.073*	0.102**	0.143***	0.121***	0.075*
	(0.109)	(0.042)	(0.043)	(0.041)	(0.044)	(0.041)
Trade openness	0.006***	0.010***	0.005**	0.011***	0.005**	0.005**
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
REER	-0.014	-0.011	-0.012	-0.009	-0.010	-0.011
	(0.009)	(0.010)	(0.011)	(0.010)	(0.011)	(0.010)
Human capital	-8.923**					
	(4.437)					
Inflation	-0.055					
	(0.038)					
lnLMF_OPEN_GDP		-0.552***				
		(0.181)				
lnLMF_EQ_GDP			0.122			
			(0.179)			
lnUNC_FDI				-0.653***		
				(0.202)		
KAOPEN					0.001	
					(0.006)	
KOF_finance						0.025**
						(0.010)
Constant	55.318***	13.634***	17.359***	17.558***	17.347***	16.236***
	(18.751)	(3.268)	(3.764)	(3.209)	(3.515)	(3.257)
R^2	0.1465	0.1592	0.1474	0.1561	0.1480	0.1414

Note: ***, ** and *: statistically significant at 1%, 5% and 10%, respectively. Standard errors in parentheses. Source: own elaboration.