

Relationship of the trade and financial opening with the economic growth of Peru, period 2000-2019

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Abstract

The objective of the study was to determine the relationship between commercial and financial openness with the economic growth of Peru, period 2000-2019; using econometric analysis. The research was explanatory - correlational, longitudinal and non-experimental. There is the presence of a direct relationship between the variable trade openness and economic growth; and an indirect or inverse relationship between financial openness and economic growth. By contrasting the general hypothesis, it was confirmed that there is an important relationship between the variables of the specified model, with an indirect relationship between the variable financial openness and economic growth. According to the specific hypothesis, the trade openness variable does not have a high relationship with the economic growth variable; It also has a coefficient of 0.232060, which implies that the effect is not significant. The regression coefficient indicates that 66.15% of the fluctuation in economic growth is explained by the independent variables.

Keywords: Economic growth; opening; commercial; financial; relationship

JEL classification: E01-F13

Introduction

After the discovery and conquest, via colonization, of the American and Asian continents comes a process of trade liberalization based on the ideas spread by the classics of liberal economics. It was the beginning of the 19th century, when it broke with the pragmatism of protectionism, which promoted

exports from rich countries; This is how commercial, productive and financial globalization will spread, which provides the foundations of capitalism, in which some regulations on international trade and international finance are still maintained.

For this reason, globalization is not a new phenomenon, because since the middle of the 19th century there have been at least two episodes of globalization. Since between the First World War (1914 - 1918), the crisis of 1929 and the Second World War (1939-1945) the world economy fell, reducing world exports and imports, as well as the mobilization of capital. In Peru from 1990 to the present, with the implementation of Alberto Fujimori's economic policy, tariffs were reduced, the economy was dollarized, and investment foreign facilities were granted, dozens of public companies were privatized, several bilateral and multilateral trade agreements have been made, etc., which meant greater economic growth and sustainable economic development for Peruvian society.

Thus, then, when we address these issues of trade liberalization or trade openness and financial liberalization or financial openness related to economic growth, we refer to issues that have been discussed for many years in politics and academia, since there are theories of economic policies that disagree. with the supposed relationship and / or incidence that these factors have with economic growth (Ossa, 2002; Salas, 2017). For Torres (2008) there is still no single consensus on the relationship or association between these macroeconomic variables. However, trade liberalization has a relative relationship with economic growth, but institutional and location variables are more relevant in this association and must be considered in the analysis and theoretical discussion (Nguyen et al., 2018).

The impulse of financial globalization comes from financial liberalization or opening, and in Peru it seems that this opening depends on the institutional level and trade openness. This may be due to the low institutional quality and the reduced development of the financial market. Calderón and Kubota (2009), carry out a research work in which they compile annual information on the development of the financial market, financial openness and other related variables; and they mention that the increase in financial openness increases private credit and other financial variables, but that this increase may depend on the institutional variable, the level of trade openness and the security that investors have (Khalid et al., 2021).

Then, a relationship is observed between trade openness and financial openness because companies or organizations that export and import need financing or credit to carry out their international operations; although there may be unconventional operations or barter. In the Peruvian case, it is concluded that there are financial limitations that affect companies in the industrial sector, which means that there is a negative relationship between these limitations in the financial sector and exports (Arcaya, 2018).

There are also academic discussions regarding what type of openness has greater, lesser, positive, negative or no impact or relationship with economic growth, and in line with this, Valdez (2018) concludes that trade liberalization has an important impact on growth. Peruvian economy in the period 2007-2016, and explains around 66% the variability of this growth. The results of the estimation of some economic variables, such as inflation over total factor productivity in Latin America, indicate that the variables financial intermediation and trade openness were not significant. This last variable is not significant because there are countries like Peru that export raw materials and are not competitive. And that in times of financial crisis, the development or financial intermediation variable has a negative relationship with total factor productivity (Ramírez & Aquino, 2006; Alvarado, 2019).

In this sense, we have that, on the one hand, the capital market does not contribute significantly to economic growth and, on the other hand, banking organizations remain first in financing the Peruvian economy but are not the driver of economic growth (Cortez, 2010; Landa, 2019). Thus, it seems, there

would be a consensus that trade openness positively drives growth, but not in the case of financial openness or financial development, at least in less advanced countries such as Peru (Ramírez et al., 2020).

In Peru, the indicator or degree of trade openness (exports + imports / GDP or trade as a percentage of GDP) was 35.54% in 2000; 51.68% in 2010 and 47.12% in 2019. Which shows that there has not been an important or significant variation in trade openness in the last 10 years; bearing in mind that in the last decade many international trade agreements have come into operation, as well as various facilities for productive sectors such as agro-industry and the service sector. In its conclusions, Campana (2017) mentions that the Peruvian economy is very sensitive to external shocks because it still maintains an economy that depends on exports of traditional products; although it has been beneficial for the domestic economy to promote trade openness (Robles, 2021).

In a study of 110 countries (Molero et al, 2020) they state that trade openness has a reduced impact on economic growth, taking into account cross-sectional regressions, therefore, it agrees with the global empirical evidence that it is heterogeneous. But the relationship between the two variables is positive, stable in the long term, and significant, although the econometric model suggests that trade openness is one more component of economic growth.

As for the indicator of financial liberalization or openness, which is domestic credit to the private sector, this was 26.34% in 2000, 30.26% in 2010 and 45.02% in 2019; which shows a growing trend in the share of domestic credit to the private sector in the Gross Domestic Product. Apparently, there would be greater financial development or financial intermediation due to the capital flows that arrived in Peru, the oligopolistic power of large banks and the bankarization of various financial products such as the fund my home, among others. Thus, we have that bank credit granted to private companies in Latin American countries increased an average of 9% annually in the period 2004-2011. It is appreciated that due to their greater participation, national banks have contributed more than foreign banks in the growth of loans, especially in loans directed to households (Hansen & Sulla, 2013; Castro-Lugo & Aguilera-Fernández, 2017).

The expansion of international trade and credit to the private sector is also due to increasing returns to scale and product diversity (Luo & Zhi, 2019). This is supported by the new theory of international trade, because on the one hand, as there are companies with economies of scale, these will eventually be few companies in the global market that will satisfy world demand; On the other hand, international trade, by influencing economies of scale, will increase the diversity of products and lead to lower costs (Hill, 2007; Banda-Ortiz & Tovar-García, 2018).

The economic growth rate in Peru was 2.69% in 2000, 8.33% in 2010 and 2.15% in 2019. Having an average annual growth in the period 2000-2019 of 4.76%; which has been important but has decreased in recent years, leading to a decrease in GDP per capita. Consequently, as discussed in this study, the objective of this study is to determine the relationship between two variables that represent trade liberalization and financial liberalization with the economic growth of Peru in the period 2000 - 2019, in order to contribute to the academic debate empirical evidence on this relationship of variables and having adequate instruments in the management of international economic policy.

Methodology

The research is explanatory - correlational and non-experimental because it describes and explains the relationship that exists between the variables of trade and financial liberalization with the variable

of economic growth in Peru. Statistical and econometric techniques were used, as well as the econometric View (E-View) software. It is of a correlational type, because the behavior of a variable is known through the behavior of other related variables; Therefore, with the value of other related variables, the value of the studied variable will be estimated (Hernández & Mendoza, 2018).

The following linear equation was proposed according to the following expression:

$$Y_t = a + bX_t + Z_t \quad (1)$$

Therefore, the specification of the simple linear model is:

$$Y = a + bX_1 + cX_2 + u \quad (2)$$

Where: Y = Economic Growth

X1 = Commercial Opening

X2 = Financial Opening

Regarding the specification of the variables, we have the following:

Y = Economic Growth (% variation of GDP per capita)

X1 = $\frac{\text{Exports} + \text{Imports}}{\text{Gross Domestic Product}}$ = (% variation of trade with respect to GDP)

X2 = $\frac{\text{Internal credit to the private sector granted by banks}}{\text{Gross domestic product}}$ = (% variation)

a = parametric constant to estimate.

b and c = Coefficients of the explanatory variables (i = 1,2)

u = stochastic disturbance term.

Results

Table 1
Per capita GDP growth, Merchandise trade and Domestic Credit

Years	GDP growth per capita (annual%)	Merchandise trade (% of GDP)	Internal credit to private sector (% of GDP)
2000	1.213135854	27.91201086	26.34167756
2001	-0.656163165	27.5397968	23.44780788
2002	4.279639615	27.93504864	22.20204829
2003	3.132750648	29.65365886	19.98574116
2004	4.000778546	34.31248894	17.91023992
2005	5.362300567	39.27069666	19.06642161
2006	6.626215977	44.15641797	20.81316402
2007	7.633650272	47.43229205	24.60707369
2008	8.250627366	50.57738768	29.76396075
2009	0.287068446	40.36916849	30.01452903
2010	7.455358648	44.62416197	30.26168715
2011	5.467384491	48.97659689	32.3092275
2012	5.267528821	46.69404311	34.04374682
2013	4.90257197	43.00349994	37.71992918
2014	1.305704682	40.72560024	40.89962682

2015	1.963317088	38.13744752	43.86793145
2016	2.422901295	38.051004	42.80902535
2017	0.829119681	40.4285	42.41461431
2018	2.205617031	41.5817	44.01025619
2019	0.512493735	39.6587	45.02342244

Source: World Bank.

Table 1 shows that at the end of the second government of Alberto Fujimori, GDP per capita, merchandise trade and financial development (financial intermediation) decreased; It is from the year 2002 that the GDP per capita begins to recover, reaching 4.3% growth and the merchandise trade or trade openness index that came to represent 27.9% of the GDP. While the index of financial openness or financial intermediation would recover only from the year 2008, when there were high volumes of economic resources mainly from the mining sector, but the world economic crisis originated in the United States of N.A.

During the second government of Alan García Pérez (period 2006-2011), the GDP per capita increased rapidly until 2008 due to the growth of the GDP of the mining sector because the terms of trade were favorable; It is from 2009 that it begins to decrease, sustaining until 2012 that it grows 5.26%. Regarding merchandise trade, which adds exports and imports, these increased significantly until reaching a maximum in 2008, since they represented 50.6% of GDP. While the degree of financial openness grows steadily throughout the period.

In the period 2012-2019, GDP per capita falls steadily, reaching its lowest peak in 2019, with an increase of 0.51%. Merchandise trade decreases with respect to GDP, due to the fact that the terms of trade of the main commodities fall, political instability begins in the country and due to the recession in many countries, such as Europe. The lowest level was in 2016 when the sum of exports and imports represented 38% of GDP; This despite the fact that Peru already had many trade agreements with various countries and China became its main trading partner.

And regarding financial openness, the internal credit provided by the financial sector to the private sector increases steadily since in 2012 it represented 34% of GDP and in 2019 it came to represent 45% of GDP; This increase is due to the stimulus that the construction sector has with real estate credit programs and the construction of transportation infrastructure. But this sector is the one that will bring the highest levels of corruption in the country; Likewise, this shows the increase in concentration levels in the financial sector. We then have that, while per capita GDP decreases steadily, credit from the financial sector to the private business sector increases steadily, thus increasing the degree of financial openness.

Table 2
Contrasting the General Hypothesis: " The relationship between the
opening commercial and financial with the economic growth of Peru
Is direct. "

Variable Dependiente: Y

Method: Least Squares (Gauss-Newton / Marquardt steps)

Date: 04/16/21 Time: 10:34

Sample: 2000 2019

Included observations: 20

$$Y=C(2)*X1+C(3)*X2$$

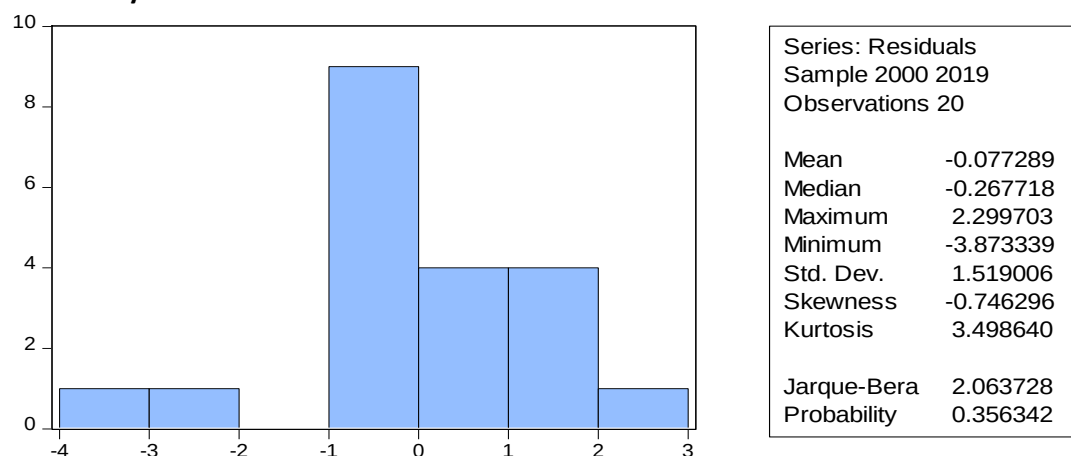
	Coefficient	Std. Error	t-Statistic	Prob.
C(2)	0.244990	0.031182	7.856747	0.0000
C(3)	-0.190895	0.038280	-4.986824	0.0001
R-squared	0.679340	Mean dependent var		3.623100
RcudradoAjustado	0.661526	S.D. dependent var		2.686136
S.E. of regression	1.562755	Akaike info criterion		3.825417
Sum squared resid	43.95965	Schwarz criterion		3.924990
Log likelihood	-36.25417	Hannan-Quinn criter.		3.844855
Durbin-Watson stat	2.887394			

Source: self made

$$Y=0.244990*X1 - 0.190895*X2 \quad (3)$$

Table 3

Normality Test



Source: self made

Table 4

Autocorrelation test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.961331	Prob. F(2,16)	0.0805
Obs*R-squared	5.403232	Prob. Chi-Square(2)	0.0671

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 04/16/21 Time: 10:55

Sample: 2000 2019

Included observations: 20

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C(2)	-0.018883	0.029943	-0.630629	0.5372
C(3)	0.023471	0.036766	0.638401	0.5322
RESID(-1)	-0.606926	0.249489	-2.432677	0.0271
RESID(-2)	-0.289732	0.252889	-1.145688	0.2688
R-squared	0.268173	Mean dependent var		-0.077289
Adjusted R-squared	0.130955	S.D. dependent var		1.519006
S.E. of regression	1.416056	Akaike info criterion		3.710485
Sum squared resid	32.08344	Schwarz criterion		3.909631
Log likelihood	-33.10485	Hannan-Quinn criter.		3.749360
Durbin-Watson stat	1.937246			

Source: self made

Table 5

Summary of the econometric model test: General Hypothesis

Source: self made

No Autocorrelation	No Multicollinearity	Homocedasticity	normal	Null hypothesis
Durbin -Watson = 2.88739	R cuadrado = 0.661526	P = 0.8053	P= 0.3563	You accept
Breusch-Godfrey Test = 1.937246				

According to table 2, the estimation of the multiple regression is given by the equation:

$$Y = 0.244990 \cdot X_1 - 0.190895 \cdot X_2$$

Where: Y = Economic growth

X1 = Trade opening

X2 = Financial opening

We then have that, analyzing the regression coefficients: On the one hand, if the contribution of trade openness (exports plus imports / GDP) increases by 1% per year, keeping financial openness constant, economic growth would increase by 0.245%; and, on the other hand, if the contribution of financial openness (internal credit to the private sector / GDP) increases by 1% per year, keeping trade openness constant, economic growth would decrease by 0.191%.

It is observed that the probability of the statistical t is 0.00 for both explanatory variables, therefore, the model is correctly specified. The Normality Test shown in table 3 indicates a probability that is greater than 0.05, therefore, the null hypothesis of normality is accepted. Thus, as a summary, in table

5 we have the different indicators of the econometric test. There is no probability of the F statistic because the model has no intercept.

The adjusted R squared regression coefficient is equal to 0.661526, which indicates that variables trade openness and financial openness explain 66.15% of the annual fluctuation of Peruvian economic growth. This means that there is an important relationship between the variables of the specified model. From the result it follows that the null hypothesis is accepted, since the relationship between the independent and dependent variables is not direct, because the coefficient of the financial openness variable has a negative sign.

Table 6

Testing Specific Hypothesis 1: " The relationship between trade openness and economic growth in Peru is direct but not significantly important. "

Variable Dependiente: Y

Method: Least Squares (Gauss-Newton / Marquardt steps)

Date: 04/16/21 Time: 11:15

Sample: 2000 2019

Included observations: 20

Y=C(1)+C(2)*X1

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-5.555359	2.884506	-1.925931	0.0701
C(2)	0.232060	0.071865	3.229121	0.0047
R-squared	0.366804	Mean dependent var		3.623100
Adjusted R-squared	0.331627	S.D. dependent var		2.686136
S.E. of regression	2.196027	Akaike info criterion		4.505816
Sum squared resid	86.80559	Schwarz criterion		4.605389
Log likelihood	-43.05816	Hannan-Quinn criter.		4.525254
F-statistic	10.42722	Durbin-Watson stat		1.459240
Prob(F-statistic)	0.004655			

Source: self made

$$Y = -5.555359 + 0.232060 \cdot X_1 \quad (4)$$

Table 7

Summary of the econometric model test: Specific Hypothesis 1

No Autocorrelation	No Multicollinearity	Homocedasticity	Normal	Null hypothesis
Durbin-Watson =1.459240	R cuadrado = 0.331627	P = 0.6418	P= 0.48982	Denies
Breusch-Godfrey Test = 2.31841				

Source: self made

In table 6, the estimation of the simple linear regression is given by the equation:

$$Y = -5.555359 + 0.232060 * X1$$

Where: Y = Economic growth

X1 = Trade opening

Analyzing the regression coefficient, it is found that, if the contribution of trade liberalization or opening (exports plus imports / GDP) increases by 1% per year, economic growth would increase by 0.232%; then its incidence is relatively important and direct on economic growth. The probability of the statistical F is equal to 0.004655, being less than 0.05; Furthermore, it is observed that the probability of the statistical t of the independent variable is equal to 0.0047, therefore, the model is correctly specified.

The summary of the contrast of hypothesis 1 shown in table 7 shows that the probability observed in the normality test is greater than 0.05, therefore, the null hypothesis of normality is accepted. Thus, the Durbin-Watson and Breusch-Godfrey tests indicate that there is no autocorrelation. The adjusted R squared regression coefficient is equal to 0.331627, which indicates that the trade openness variable explains 33.16% of the annual variation in Peruvian economic growth. This expresses that there is a relative relationship between the variables of the specified model.

Table 8
Contrasting Specific Hypothesis 2: " The relationship between openness financial and economic growth of Peru is direct but not relevant"

Dependent Variable: Y

Method: Least Squares (Gauss-Newton / Marquardt steps)

Date: 04/16/21 Time: 12:27

Sample (adjusted): 2002 2019

Included observations: 18 after adjustments

$$Y = C(1) + C(2) * X2(-2)$$

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	9.760524	1.692578	5.766662	0.0000
C(2)	-0.192736	0.054414	-3.542039	0.0027
R-squared	0.439502	Mean dependent var		3.994724
Adjusted R-squared	0.404471	S.D. dependent var		2.549340
S.E. of regression	1.967340	Akaike info criterion		4.295681
Sum squared resid	61.92681	Schwarz criterion		4.394611
Log likelihood	-36.66113	Hannan-Quinn criter.		4.309322
F-statistic	12.54604	Durbin-Watson stat		2.410364
Prob(F-statistic)	0.002712			

Source: self made.

$$Y=9.76052358942 - 0.192736395016 \cdot X_2(-2) \quad (5)$$

Table 9

Summary of the econometric model test: Specific Hypothesis 2

No Autocorrelation	No Multicollinearity	Homocedasticity	Normal	Null hypothesis
Durbin-Watson =2.410364 Breusch-GodfreyTest =1.98457	R cuadrado = 0.404471	P = 0.2751	P= 0.62843	Accept

Source: self made

In table 8, the estimation of the simple linear regression is given by the equation:

$$Y = 9.76052358942 - 0.192736395016 \cdot X_2 (-2)$$

Where: Y = Economic growth

X₂ = Financial opening

Analyzing the regression coefficient, it can be seen that, if the contribution of financial liberalization or opening (internal credit to the private sector / GDP) increases by 1% per year, economic growth would decrease by 0.1927%; then its impact is not very important on economic growth. The probability of the statistical F is equal to 0.002712, being less than 0.05; Furthermore, it is observed that the probability of the statistical t of the independent variable is equal to 0.0027, therefore, the model is correctly specified considering that it has been estimated with two lags or delays.

According to the summary shown in Table 9, it is observed that the probability of the normality test is greater than 0.05, therefore, the null hypothesis of normality is accepted. Thus, the Durbin-Watson and Breusch-Godfrey tests indicate that there is no autocorrelation. The adjusted R squared regression coefficient is equal to 0.404471, which shows us that the financial openness variable explains 40.45% of the annual variation in economic growth. This means that there is a relative but indirect relationship between the variables of the specified model.

Discussion and Conclusions

The result of the testing of the general hypothesis shown in table 2 indicates that the trade openness variable has a direct relationship with economic growth, but the financial openness variable has an indirect or inverse relationship; therefore, the null hypothesis is accepted. This evidence is corroborated in the specification of the simple regressions of specific hypotheses 1 and 2. It is estimated that 66.15% of the annual variability of economic growth is explained by the independent variables, which means that there is an important relationship between the variables of the specified model.

Theoretically, the results are not as expected because the indicator of the financial liberalization or openness variable which is the internal credits granted to the private sector, should promote growth, but in this case it is not; that is, there must be a linear relationship. In this case there is evidence of this type of paradoxical results, as explained by (Ramírez & Aquino, 2006; Sheng & Gu, 2018) who argue that the variables that represent financial intermediation and trade openness are not relevant or do not have statistical significance in their research work that relates the price level increase with total

factor productivity in Latin America. Likewise, they mention that the financial intermediation variable has positive impacts on economic growth, but that in times of financial crisis this relationship becomes negative, and the trade openness variable is not significant because generally Latin American countries have been characterized as exporters of raw materials and have an uncompetitive industry. Likewise, our results agree with (Cortez, 2010; Ali et al., 2019) who states that financial intermediaries are not drivers of economic growth and that the capital market does not have sufficient resources to increase gross domestic product. In this sense, considering that there is dependence between the export sector and the financial sector, the results of this research are consistent with those of Arcaya (2018), who concludes that the credit restrictions of the financial system have a negative influence on industrial and export companies in Peru. In other words, in times of financial crisis, there is generally a shortage of credit or financial repression, benefiting only some companies, especially larger ones such as business corporations. The international crisis that originated in the United States in 2008 lasted for many years and spread to several countries such as Europe, this has led to a greater financial concentration in Peru, to the detriment of the per capita GDP of its citizens.

Table 6 shows that the adjusted R squared is equal to 0.331627 or 33.16%; which shows that the trade openness variable does not have a high relationship with the economic growth variable; it also has a coefficient of 0.232060, which implies that the effect is not significant. This agrees with (Molero et al, 2020), which conclude that there is a low effect of trade openness on economic growth, but a positive and stable relationship is evidenced in the long term. And in table 8, it is observed that the adjusted R squared regression coefficient is equal to 0.404471 or 40.45%, showing that the financial openness variable has an important relationship with the economic growth variable, but that this relationship is indirect or inverse.

In summary, 66.15% of the fluctuation of economic growth or the growth of per capita GDP in Peru in the period 2000-2019 is explained by the variables of trade openness and internal credit granted to the private sector. Being significantly important as a whole, but the greatest contribution is made by financial liberalization or openness. It should be noted that the trade openness variable, represented by merchandise trade among GDP, has a positive influence and the financial openness variable has a negative impact on economic growth.

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