



RE-EXAMINING THE IMPACT OF GLOBALISATION ON ECONOMIC GROWTH: EVIDENCE FROM SOUTH AMERICA

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ABSTRACT

This study aims to re-examine the relationship between globalisation and economic growth in nine South America countries using the new KOF globalisation index. The new improvement version of globalisation index contains 43 variables compare to only 23 variables in the Dreher (2006) version which is more precisely quantifies the all-encompassing concept of globalisation. The new index of globalisation includes both de facto and de jure measures that would influence economic growth differently in certain countries. The data spanning a 17-year period from 2002-2018. Our baseline pooled Ordinary Least Squares (OLS) regression model finds that globalisation is positively and significantly associated with higher economic growth. This suggests that globalisation improves growth in overall South America countries. Hence, our key findings are supported with a battery of robustness tests, namely Fama-MacBeth, quantile regression, and firm fixed effects.

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1. INTRODUCTION

Globalisation is not a new phenomenon that has surprised us, and its effects on numerous aspects of life, such as economics, social, and political issues that have long been felt in our globe. Siddiqui et al. (2019) assert that Latin America, including South America, has been involved in the globalisation process since the 1980s with multidimensional impact. Language, religion, culture, and trade are all multidimensional components. In Latin America, trade, production, labor market, and demographic improvement are positive effects of globalisation, however, negative effects include community divergence, increasing transitional, cross-border, and rural-urban migration.

This paper focuses on the impact of globalisation on economic growth in the context of South America countries because of their rapid urbanization. Since 1950, urbanization in Latin America has increased dramatically. According to BBVA research (2017), South America is the world's most urbanised region, with nearly 80% of its population living

in cities, compared to 74% for the European Union, and 50% for East Asia and the Pacific region. Despite the fact that all of these countries experienced rapid urbanisation, they might face numerous challenges in maintaining their sustainability in the years ahead. Their challenges include limited mobility, poor urban planning, pollution, increase vulnerability to natural disasters, inequality, and unemployment. Therefore, this paper re-examines whether globalisation has a positive or negative impact on growth in South America.

This study adds to the body of knowledge by employing the most recent revised version of the KOF globalisation index for South America countries (See Gygli et al., 2019). Dreher (2006) is the first to propose the KOF globalisation index, which has since been modified by Dreher et al. (2008). Their globalisation index only covers three aspects for each country in the world: economic, social, and political. In the new revised version of the KOF globalisation index, they have derived between de facto and de jure globalisation measures for three dimensions, particularly economic, social, and political components. De facto globalisation is measured based on the international flows and activities, whereas de jure globalisation measurement analysed policies and conditions, concepts, facilitate and promote international flows and activities. Therefore, the latter version of the KOF globalisation index contains 43 variables compare to only 23 variables in the previous version which is more precisely quantifies the all-encompassing concept of globalisation.

The rest of the sections is organized as follows. A survey of the literature is discussed in Section 2. The data and variable definitions are described in Section 3. Section 4 presents the empirical findings as well as a discussion. This study ends in the final section.

2. LITERATURE REVIEW

2.1 Globalisation and economic growth

Sardiyo and Dhasman (2019) examine the impact of globalisation on economic growth in ASEAN countries for the period 2012-2017. Their sample comprises 11 different countries which are Brunei Darussalam, Cambodia, East Timor, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. They use four indicators as a proxy for globalisation index, namely globalisation index, economic globalisation, social globalisation, and political globalisation. They use real gross domestic product and gross domestic product per capita to measure economic growth. They find a positive and significant relationship between all four globalisation indicators and economic growth. This suggests that globalisation provide a positive response in ASEAN countries. On the other hand, Hasan (2019) also find a similar positive relationship using the same globalisation indicators for South Asian countries over the 44-year period from 1971-2014. However, Olatunbosun and Basit (2018) report contradicting results that social globalisation has a significant impact on GDP, while, they do not find evidence that economic and political globalisation is driven by economic growth for the selected Asian countries.

2.2 Globalisation and Income Inequality

Zhou et al. (2011) examine the relationship between globalisation and distribution of income inequality in 60 developed, transitional, and emerging countries. In their study, two globalisation indices are created using Kearney's (2002, 2003, and 2004) data and principal component analysis. First, they measure globalisation index using an equally weighted index and the second index is derived from the principal component analysis.

The empirical evidence finds a negative relationship between both globalisation indices and income inequality, suggesting that globalisation reduces income inequality within countries. Bukhari and Munir (2016) further examine the impact of globalisation on income inequality in selected Asian countries. They use trade, financial, and technological measures to proxy for globalisation. Their findings show that trade and technological globalisation have a significant impact on reducing income inequality, whereas financial globalisation will cause income inequality to rise. Thus, they suggest that government should put more effort into lowering trade barriers, provide subsidies, increase in research and development, improve the financial system and education to reduce the distribution of income inequality. Moreover, Heimberger (2020) explores globalisation-inequality relationship around the world using a meta-analysis approach. Their results reveal that globalisation has a significant impact on income inequality, but it is not limited to other expected factors such as technology, labor market, and welfare state characteristics.

2.3 Globalisation and Covid-19 pandemic

Bickley et al. (2021) examine the relationship between globalisation and the Covid-19 pandemic for 185 countries over the January-October 2020 sample period. They adopt Gygli et al. (2019) KOF globalization index which includes 24 de facto and 20 de jure measurements to capture the overall globalization in terms of economic, social, and political dimensions. The findings of their survival analysis suggest that countries that have become more globalized are likely to adopt international travel restrictions policies after considering the country-specific timing of the virus outbreak. In contrast, countries with a high level of government efficiency and globalisation are more cautious when it comes to imposing travel restrictions, particularly through formalized political and trade policy integration processes. Furthermore, the authors discover that globalised countries tend to have a higher number of confirmed cases when the first travel restriction policy measure is implemented.

3. DATA AND VARIABLE DESCRIPTIONS

This paper assembles a sample of South America from nine countries over the period 2002-2018. The sample period starts at 2002 is based on the data availability. These 9 countries are Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, and Uruguay, respectively. The data are collected from two different sources. First, GDP per capita (lnGDPC), gross fixed capital formation (lnGFCF), the total labor force (lnLF), inflation (INF), and foreign direct investment (FDI) are sourced from World Bank. Second, the index of globalisation (KOFGI) obtains from KOF Swiss Economic Institute.¹ The control variables are chosen following earlier growth model research (Rao and Vadlamannati, 2011; Gurgul and Lach, 2014; Ghosh, 2017; Majidi, 2017). To reduce the influence of extreme values, we winsorized all dependent and explanatory variables at the top and bottom 1st percentiles. Table 1 presents a list of variables and their definitions.

¹ <https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html>.

Table 1: Definition of variables.

Variable	Definition	Source
lnGDPC	Natural logarithm of GDP per capita at constant 2010 in U.S. Dollars.	World Bank
KOFGI	Following Gygli et al. (2019), we used their new revised version of the KOF globalisation index to measure the overall three components of economic, social, and political dimensions for each country level.	KOF Swiss Economic Institute
lnGFCF	Natural logarithm of gross fixed capital formation at constant 2010 in U.S. dollars.	World Bank
lnLF	Natural logarithm of the total labor force contains people ages start from 15 and above who provide labor for the production of goods and services over a specific time period.	World Bank
INF	Inflation is measured by the annual percentage change in consumer prices.	World Bank
FDI	Foreign direct investment is the net inflows of investment, measured by the percentage of GDP.	World Bank

4. EMPIRICAL FINDINGS AND DISCUSSION

4.1 Descriptive statistics and correlation matrix

Panel A of Table 2 reports the descriptive statistics for all the variables. The mean value of KOFGI is 64.4766. This value is higher than those reported in Xu et al. (2021), who document a mean KOFGI of 57.9900 for the 45 Asian countries. This suggests that South America Countries are more globalized than Asian countries in the period from 2002 to 2018. Moving to Panel B of Table 2, KOFGI for Chile recorded a higher mean (median) of 75.7278 (76.5512), indicating that Chile is the most globalized country compare to other South America countries. Table 3 reports Pearson pairwise correlation coefficients between the dependent and explanatory variables. The correlation coefficient of KOFGI is positive and significantly correlated with economic growth at the 1% level. To ensure our results are free from multicollinearity, we then compute the Variance Inflation Factor (VIF) for each explanatory variable in our model (1). The results show that none of the explanatory variables have higher multicollinearity, while the highest VIF is 1.79. This implies that multicollinearity issues are not problematic influencing in our context.

Table 2: Descriptive statistics

Panel A: Descriptive Statistics of the Variables (2002-2018)								
	<i>N</i>	Mean	S.D.	Min	25 th Quartile	Median	75 th Quartile	Max
lnGDPC	153	8.7657	0.5917	7.3903	8.3879	8.7723	9.2733	9.6008
KOFGI	153	64.4766	6.3094	50.2874	60.0286	63.4333	68.8556	77.5198
lnGFCF	153	2.9636	0.1772	2.4816	2.8455	2.9845	3.0839	3.3037
lnLF	153	16.0877	1.1484	14.2674	15.2948	15.9337	16.7578	18.4625
INF	136	5.1043	3.0781	0.1931	2.9718	4.3023	6.83845	14.7149
FDI	153	3.2906	2.4220	-0.9089	1.7120	2.7134	4.3620	11.7430

Panel B: KOF Globalisation Index (2002-2018)

Argentina	17	67.5005	1.4566	65.8417	66.5886	67.3999	68.1517	71.3134
Bolivia	17	59.3232	1.5649	54.6910	58.7716	59.8369	60.3523	61.0290
Brazil	17	62.4364	2.9334	57.2402	60.1229	64.0184	64.6681	65.4839
Chile	17	75.7278	2.0066	69.9962	74.9855	76.5512	76.9326	77.5986
Colombia	17	58.6466	4.9222	48.7917	56.9880	59.7501	62.4444	63.6591
Ecuador	17	59.8597	2.0365	54.6970	59.2477	60.4988	61.1381	62.1474
Paraguay	17	59.6761	2.9059	53.9414	57.6693	61.0623	61.7011	63.4333
Peru	17	66.3813	3.7566	58.5954	64.2782	68.0227	68.9435	69.6347
Uruguay	17	70.6548	2.9075	63.9352	68.8556	71.6894	72.8054	73.6494

Notes: Panel A of Table 2 presents descriptive statistics of the variables in the model (1). Panel B presents KOFGI index for each country in South America. N denotes the number of firm-year observations. S.D. is the standard deviation.

Table 3: Pearson Correlation Matrix

Variable	lnGDPC	KOFGI	lnGFCF	lnLF	INF	FDI	VIF
lnGDPC	1.0000						
KOFGI	0.7048***	1.0000					1.79
lnGFCF	0.1332	0.1816**	1.0000				1.25
lnLF	0.2799***	-0.1054	0.0397	1.0000			1.12
INF	0.0657	-0.1360	-0.3611***	-0.1912**	1.0000		1.19
FDI	0.3869***	0.5612***	0.2823***	0.0106	-0.0988	1.0000	1.68

Notes: Table 3 presents pairwise correlations.

***, **, and * indicate 1%, 5%, and 10% significance levels.

4.2 Regression results

This paper uses pooled Ordinary Least Squares (OLS) regression to re-examine the relationship between globalisation and economic growth. The model is written as follows: $\ln\text{GDPC}_{it} = \phi_0 + \phi_1\text{KOF}_{it} + \phi_2 \ln\text{GFCF}_{it} + \phi_3 \ln\text{LF}_{it} + \phi_4\text{INF}_{it} + \phi_5\text{FDI}_{it} + \text{Year}_t + \varepsilon_{it}$ (1) \ln represents the natural logarithm of the respective variable. In this model specification, the dependent variable is gross domestic product per capita (GDPC) as a proxy for economic growth. KOFGI denotes aggregated globalisation index included economic, social, and political dimensions. Our control variables are: (1) GFCF is gross fixed capital formation measured at constant 2010 in U.S. dollars; (2) LF is total labor force derived from International Labor Organization; (3) INF is inflation calculated as the percentage change in consumer prices; and (4) FDI is foreign direct investment, net inflow of investment measured by the percentage of GDP. Year dummies are included to control the year effect.

Column (1) of Table 4 shows the baseline pooled OLS regression results with corrected robust standard errors double-clustered by firm and year. This is because Petersen (2009), Gow et al. (2010), and Thompson (2011) clarify that the OLS estimator will produce biased standard errors if we do not properly take account of within-cluster correlations.² The key independent variable of KOFGI is positive and economically

² The empirical findings remain robust using heteroskedasticity-adjusted standard errors in White (1980), firm-clustered, year-clustered, and double-clustered standard errors (See Appendix A).

significant at the 1% level.³ For example, one standard deviation increase in KOFGI would increase lnGDP by 7.63%. Our empirical findings are consistent with the studies of Samimi and Jenatabadi (2014), Maqbool-ur-Rahman (2015), Reeshan and Hassan (2017), Sardiyo and Dhasman (2019), and Xu et al. (2021). This posits that globalisation generates tremendous restructuring on an international, national, and subnational scale in South America countries. Turning to our interest control variables, we find that lnLF has a positive sign, indicating that a higher population would contribute to economic growth depends on the nature of their effects on GDP per capita (Peterson, 2017). On the other hand, we find that inflation is positively and significantly associated with economic growth. According to Malik and Chowdhury (2001), they argue that a moderate level of inflation is beneficial to the economy, and the sensitivity of inflation to changes in growth was greater than growth changes in inflation. Additionally, Bruno and Easterly (1998) hypothesize inflation requires growth, but too rapid growth may accelerate inflation.

Table 4: Globalisation and Economic Growth

	OLS (1)	Fama- MacBeth (2)	Quantile Regression			Firm Fixed Effects (6)
			25 th (3)	50 th (4)	75 th (5)	
KOFGI	0.0763*** (0.0188)	0.0859*** (0.0090)	0.0860*** (0.0105)	0.0652*** (0.0105)	0.0644*** (0.0079)	0.0155*** (0.0031)
lnGFCF	0.7912 (0.6731)	0.6656* (0.3621)	1.3241** (0.5355)	0.4455 (0.5622)	0.1996 (0.2865)	0.3044*** (0.0469)
lnLF	0.2115*** (0.0767)	0.2388*** (0.0348)	0.2462*** (0.0764)	0.1673*** (0.0450)	0.1625*** (0.0250)	-0.1831 (0.1258)
INF	0.0757*** (0.0223)	0.1197** (0.0458)	0.0830*** (0.0190)	0.0731*** (0.0178)	0.0584*** (0.0138)	0.0016 (0.0019)
FDI	-0.0063 (0.0273)	-0.0705 (0.0505)	-0.0057 (0.0364)	0.0008 (0.0236)	0.0194 (0.0171)	-0.0030 (0.0026)
CONSTANT	-2.0516 (3.3967)	-2.8025 (1.7256)	-4.8280** (2.0579)	0.2852 (2.4350)	1.3131 (1.4155)	9.5991*** (2.0274)
Year Dummies	Yes	No	Yes	Yes	Yes	Yes
No. of Countries	9	9	9	9	9	9
Observations	136	136	136	136	136	136
Adj. R ²	0.6684	0.8396	0.4648	0.5213	0.5643	0.9397

Notes: Table 3 presents globalisation and economic growth in the model (1). Double-clustered standard errors are reported in the parentheses.

***, **, and * indicate 1%, 5%, and 10% significance levels.

To ensure our results provide reliable predictions, we then conduct a couple of additional robustness tests. First, Column (2) of Table 4 presents Fama-MacBeth (1973) two-step procedure by running yearly cross-sectional regression, and then average the time-series of the estimated coefficients. This alternative estimation technique is designed to address a time effect. Second, Columns (3)-(5) present quantile regressions developed by Koenker and Bassett (1978) to examine the entire range of globalisation index conditional distribution correspond to gross domestic product per capita at the 25th, 50th, and 75th

³ Appendix B presents a univariate analysis of all nine South America countries. The results show that KOFGI is positively and significantly associated with growth, with the exception of Argentina which finds insignificant results.

quantiles. The power of the quantile regression estimator can overcome the shortcomings of OLS that only can capture the average relationship and the non-normality distribution of the dependent variable. The last column presents firm fixed effects to control unobserved time-invariant firm characteristics. However, the coefficient of KOFGI remains positive and highly significant across all three alternative robustness tests, namely Fama-MacBeth, quantile regression, and firm fixed effects. This concludes that our alternative estimators are consistent with baseline regression analysis that globalisation has a positive impact on economic growth in South America.

5. CONCLUSION

This study re-examines the relationship between globalisation and economic growth in South America countries. Using a pooled OLS regression model, we provide empirical evidence that more globalised countries are associated with higher economic growth. Our results are economically and statistically significant after controlling for other control variables. Additionally, our key findings are robust to alternative robustness tests such as Fama-MacBeth, quantile regression, and firm fixed effects. In terms of policy implications, government and monetary authorities need to modify their foreign exchange regulation policies to adjust the external environment, which is required to recover the value of the export market products by offsetting internal price and wage inflation. This is because globalisation allows international trade to become more open and accessible. Therefore, a country needs a strong exchange rate management system to sustain export competitiveness and ensure commodity supply at a competitive price in the global market.

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APPENDIX

Appendix A – Globalisation and economic growth.

	White	Firm-Clustered	Year-Clustered	Double-Clustered
KOFGI	0.0763*** (0.0067)	0.0763*** (0.0190)	0.0763*** (0.0060)	0.0763*** (0.0188)
lnGFCF	0.7912*** (0.2463)	0.7912 (0.6719)	0.7912*** (0.2495)	0.7912 (0.6731)
lnLF	0.2115*** (0.0233)	0.2115** (0.0794)	0.2115*** (0.0114)	0.2115*** (0.0767)
INF	0.0757*** (0.0120)	0.0757** (0.0217)	0.0757*** (0.0130)	0.0757*** (0.0223)
FDI	-0.0063 (0.0161)	-0.0063 (0.0256)	-0.0063 (0.0186)	-0.0063 (0.0273)
CONSTANT	-2.0516** (0.9577)	-2.0516 (3.4633)	-2.0516*** (0.6782)	-2.0516 (3.3967)
Year Dummies	Yes	Yes	Yes	Yes
No. of Countries	9	9	9	9
Observations	136	136	136	136
Adj. R ²	0.6684	0.6684	0.6684	0.6684

Notes: Appendix A presents baseline pooled OLS regressions with the corrected robust standard errors: White (1980), firm-clustered, year-clustered, and double-clustered standard errors to control the presence for within-cluster correlations (Petersen, 2009). Robust standard errors are reported in the parentheses. ***, **, and * indicate 1%, 5%, and 10% significance levels.

Appendix B – Univariate analysis.

	Argentina	Bolivia	Brazil	Chile	Colombia	Ecuador	Paraguay	Peru	Uruguay
KOFGI	0.0241 (0.0202)	0.0389** (0.0135)	0.0325*** (0.0016)	0.0561*** (0.0088)	0.0306*** (0.0017)	0.0438*** (0.0051)	0.0483*** (0.0045)	0.0566* (0.0045)	0.0693* (0.0073)

Notes: Appendix B presents univariate analysis between globalization and economic growth for all 9 countries in South America. Robust standard errors are reported in the parentheses. ***, **, and * indicate 1%, 5%, and 10% significance levels.