

Exports, Terms of Trade and Economic Growth: Evidence from Countries with Different Level of Openness

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Abstract: This paper explores the effects of the ratio exports/GDP and the terms of trade on growth among countries with different level of development and openness. These effects vary among subgroups of countries with different openness and per development level. Nonetheless, in general the evidence seems to support the hypothesis stated in this research. In less developed or better endowed for export countries one or both of the explanatory variables mentioned above encourage for economic growth. Specifically, in advanced economies only the ratio exports/GDP is growth promoting when these are open, and have high per capita but small global GDP and/or relative advantages to be growth export-led. In turn, exports or and the terms of trade trends to promote growth in lower middle income countries. Unfortunately, the surprising results came from the poorest countries. They do not are benefited from a more favourable foreign environment. On the contrary, exports are not significant while an improvement in the terms of trade diminishes their growth.

Keywords: Economic growth, degree of openness, developed level.

1. INTRODUCTION

The discussion on the positive effects of openness on growth is still in debate. It is reasonable to think that this idea should be more plausible in small countries, because these have a little domestic market and then need to expand their production from an increasing insertion in the world market. Nonetheless, the literature on this topic presents mixed evidence. Yanikkaya (2003), by using a large number of openness measures for a cross section of countries, shows that openness favors economic growth, with similar effects in both developed and developing countries. Wang (2003) presents evidence indicating that both Foreign Direct Investment (FDI) and trade affect positively economic growth, but trade promotes growth in all country groups while FDI has positive effects only in those countries with moderate development. Similarly, Sakyi *et al.* (2015a) state that the interaction of FDI and exports has been a key factor to foster economic growth in Ghana during the 1970-2011 period, while Pegkas (2015) shows that FDI is a key factor to impulse economic growth in the Eurozone countries. In the same sense, the evidence presented in Brueckner and Lederman (2016) indicates that trade openness has a significant and positive effect on economic growth in Sub-Saharan Africa, while Bakari and Krit (2017), in a study for Mauritania during the 1960-2015 period, show that exports has a positive effect on growth, but imports affects negatively the

economic performance. Also Chen and Feng (2000) find that international trade leads to higher economic growth in 29 provinces, municipalities and autonomous regions of China. Meanwhile, according to Gundlach (1997) openness has a strong positive effect on economic growth, in particular in developing countries. Similarly, Edwards (1992) claims that more open economics grow faster than those with trade distortions. And once again Edwards (1998), in a comparative analysis for 93 countries, shows that more open countries exhibit higher productivity growth. In the same sense, the evidence presented in Karras (2003) for a wide sample of countries indicates that trade openness affects positively and permanently economic growth. Meanwhile, according to the empirical research carried out by Mercan *et al.* (2013) for the BRIC countries and Turkey during the 1989-2010 period, trade openness favors growth. Interestingly, Vogiatzoglou and Nguyen (2016), in a study of the five founding member countries of the Association of Southeast Asian Nations (ASEAN) over the 1980-2014 period, find that export-led growth is the most important economic growth factor in most countries. Finally, Dao (2014) shows a positive impact of trade liberalization on economic growth for a sample of 71 developing and developed countries during the 1980-2009 period, while Tahir and Azid (2015) find that the trade openness-economic growth relationship is positive and significant in developing countries.

On the contrary, Jin (2000), for a sample of fast economic growth East Asian economies states that both fiscal policy shocks and foreign price impulses

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have greater impacts on economic growth than the shock of openness. Moreover, recently Hye and Lau (2015) for India show that trade openness affects negatively economic growth in the long run. Meanwhile, Ulaşan (2015) in a panel analysis, by using several openness indicators, shows that the openness is not related with growth. Previously, Kim *et al.* (2012) show a positive effect of trade on economic growth in high-income, low-inflation, and nonagricultural countries. Besides, the effect is negative in agricultural countries with low income and high inflation. Similarly Menyah *et al.* (2014), in a panel data analysis for 21 African countries, find that attempts of trade liberalization do not seem to have made a significant impact on growth.

In turn, empirical evidence is eclectic for Latin America, a region that is composed by developing countries. In fact, De Gregorio and Jong-Wha (1999) show that both high inflation and inward looking development strategy are the main responsible of the low growth in the region. Similarly, Taylor (1998) finds that this strategy provoked distortions that had profound effects on many aspects of the growth process. Meanwhile, Awokuse (2008) re-examines the trade-economic growth relationship for Argentina, Colombia, and Peru, and states that the import-led growth is particularly favorable for growth, while Astorga (2010) shows a negative conditional correlation between trade openness and growth, but a positive link via investment.

In short, even though in most cases the literature suggests a positive openness-economic growth relationship, the evidence differs among different regions and countries. In turn, there would be some links connecting both variables, which were not explored. Intuitively, increasing foreign demand or an improvement in the terms of trade (TOT) should promote local investment in physical and human capital, and then economic growth. In fact, Delbianco *et al.* (2016) found a robust and positive effect of openness on growth through investment for a wide sample of 111 developing countries during the 1980-2013 period.

Finally, recent contributions in this topic are Keho (2017), who presents evidence indicating that trade openness has positive effects on both capital formation and economic growth for the case of Cote d'Ivoire, and the work of Zahonogo (2018), in which the results show an interesting promising role of globalization and economic growth for the Sub-Saharan Africa, i.e. a region that is mainly composed by low per capita

income countries. Similarly, for a sample of East African countries Kelly (2016) finds that FDI promotes growths, but only if they have a developed financial sector. In turn, recently Trinh and Quoc (2017) present evidence for the growth process of Vietnam, a clear example of an opening of market-oriented country which went of having a slow to a fast economic growth during the recent years. The authors argue that this change is explained by several factors, but particularly by a misallocation of resource and the sectoral development policies. In fact, they suggest a more adequate economic structure that allow achieve a more efficient allocate resources and then a sustainable development.

In short, even though higher openness should promote economic growth, the literature has not arrived to a clear consensus on this topic. Thus, this seems to deserve more investigation, in particular in less developed economies, because of these have a small domestic market and then depend more crucially from the rest of the world to expand their economies. In this frame, the objective of this work is to investigate the economic effects of openness for more and less open countries and at different stages of development, i.e. with different per capita income level. The hypothesis is that good external conditions, like more favourable terms of trade and an increasing share in the world market (specially related to higher exports dynamics) should impulse local consumption and investment that expand the domestic production, and then economic growth. In turn, this effect should be especially relevant for two kinds of countries. Firstly, for less developed countries, because they have small domestic markets and then their production is more dependent of good external conditions (i.e. favourable terms of trade and a sustained foreign demand depending). In second place, a favourable external environment should play a key role on the economic performance in countries whose resources endowment allow have a competitive level. This facilitate that these can take advantages of better terms of trade and higher demand of their exports.

The investigation includes a wide sample of countries, which were extracted from the World Bank database. In order to consider the main particularities of each group of countries, the total sample was divided among those with different levels of development and openness. The former is approximated by means of the per capita income level. This is a kind of measure of the domestic market size, which should give an idea on the capability on the

dependence of foreign markets to achieve a sustained growth. Lower purchasing power would imply higher necessity of good external conditions for the local production, and vice versa. In second place, following the traditional consensus, openness is approximated by the ratio of exports plus imports on GDP. This is introduced to capture the current share of each group of countries in the world market. The idea is that lower level of economic openness can indicate higher potential to expand the participation in external markets or, on the contrary, sever difficulties for an increasing dynamics of exports, and then lower capacity to import.

To resume, the empirical study is carried out separately for advanced and developing countries, with different openness levels. Hence, the total sample is divided in four groups of economies according to their per capita income level. In turn, into each group they are separate between higher and lower openness levels.

The variables of openness used here are similar to those usually used in the literature. First, instead to include the share of exports plus imports on GDP, here is only included the ratio exports/GDP. This should be a better measure to capture the effects of an increasing external demand, in particular in lower income countries, which have smaller domestic markets and then are more dependent on the external demand. In fact, a higher level of exports as share of GDP seems a good indicator of the insertion of emerging economies in the world market.¹ The other variable is the TOT. The idea is that more favourable terms of trade should encourage investment in the exportation sector and then economic growth, because of higher relative prices of exports becomes more profitable its production. Additionally, higher availability of foreign exchange facilitates the importation of inputs for the local production. Both factors should be growth-promoting.

The contribution of this paper is to shed some light on the effects of openness on growth in countries with different economic features, in particular among economies with different level of openness and development, which was not deeply previously analyzed in the literature.

The evidence found here indicates that closed advanced economies are less dependent on the

external conditions to achieve sustained growth. In fact, in average values, they present a higher growth rate than the more open high income countries. On the contrary, taken together, less developed and more open countries have grown, on the average, significantly faster than those with closer economies. Besides, the estimation results indicate that only in the case of high income open countries openness (in particular exports) is growth promoting. Differently, in the total subsample of less developed economies, open and closed, in most cases both variables of openness positively affect growth.

Nonetheless, at a more disaggregated level the evidence is disparate, in special when the total sample is divided among set of developing countries according to both their levels of openness and per capita income. There the results differ between developing countries with low and high middle income, as well as the degree of openness. In some cases the exports/GDP share is favorable for growth, while in other the terms of trade is relevant. In turn, in poorest low income countries only the last variable is significant, but with the unexpected sign: more favorable terms of trade reduce economic growth. Possible explanations for this surprising result are presented below in section 4.

The next section presents the data and methodology that we use in the empirical study. Section 3 illustrates the average values of both the openness level and the economic growth among countries with different per capita income level. Section 4 shows and gives an interpretation of the estimation results, and finally section 5 presents the conclusions and some policy recommendations.

2. DATA AND METHODOLOGY

This investigation is carried out in base to a large sample of 157 countries, which gives as a result the largest possible database, with an unbalanced panel but with no missing data for any country in the variables used in the analysis (38 countries are developed and 119 are developing economies), for the 1980-2016 period.² The total sample was divided in for groups of countries of high, middle high, middle low and low per capita income, respectively. These were obtained following the World Bank classification of 2017. The idea of this division is to capture the

¹In this sense, supporting this argument Ramanayake and Lee (2015) find that export growth is the more robust measure of trade openness to explain economic growth.

²The list of the countries under study was not included in this work, but this is disposable upon request.

dependence on both the domestic market and the foreign demand to achieve a sustained growth. The intuition is that the last should be more relevant in less developed and lower income economies,

In order to avoid missing data and distortion effects of short run cycles the empirical work uses five years' averages data, and applies a simple estimation of economic growth. In turn it follows the parsimony principle, which allow obtain a more comprehensive analysis, instrumental variables are not included, assuming no lags affecting between the average values of quinquennial observations. The model estimated in this work is a fixed effects panel, because when we compare the coefficients of fixed versus random effects, the Hausman and the Lagrange tests rejects the null hypothesis of no bias in the case of random effects.

In the regressions economic growth is explained by the level of openness, which is approximated by mean of both the ratio export/GDP and the terms of trade as it was mentioned above. Besides, the control variables are the investment/GDP ratio, which is suggested as robust to explain growth in the famous paper of Levine and Renelt (1992), and the income inequality level, by means of the Gini coefficient. This last allows

approximate the effect of the increasing inequality recently observed at global level by Milanovic (2015) on the economic performance. And more important, this intent to represent the factor behind the habitual situations of social unrest, and the economic and instability underwent in the particular case of less developed countries.

3. THE AVERAGE EVOLUTION OF OPENNESS AND ECONOMIC GROWTH AMONG COUNTRIES WITH DIFFERENT PER CAPITA INCOME LEVEL

This section presents a first approach of the openness-growth relationship by means of their average evolution among countries with different levels of openness and per capita income level.

Table 1 indicates both a positive association between the levels of income and openness, and that the difference between the lower and higher openness, roughly approximated by the range of dispersion, is higher in more developed countries. In turn, the evidence observed in Table 2 in general shows that more open economies have had an average better performance. The exception is the group of high income countries, even though the test of mean differences is no significant. In any case, this can be explained because of the great size of their local

Table 1: Average Values of the Openness among Different Per Capita Income Level Countries

Per Capita Income Level/Openness	Total Sample	High Openness	Low Openness
High Income	94.2	124.8	44.2
Middy High Income	82.6	109.6	41.1
Middle Low Income	81.0	103.4	46.1
Middle High and Low Income	81.7	106.1	44.0
Low Income	55.7	94.8	41.6
Developing Countries	73.9	104.3	42.9

Note: The last line only includes the total subsample of developing countries (the same is valid for the next table).

Table 2: Average Economic Growth Rate According to the Income and Openness Levels

Income Level/Openness	High Openness	Low Openness	p-value
High Income countries	1.6	2.0	0.24
Middle High Income	3.0	2.3	0.16
Middle Low Income	2.3	2.1	0.64
Middle High and Low Income	2.6	2.2	0.21
Low Income	2.0	1.2	0.06 *
Total Developing Countries	2.2	1.8	0.02 **

Note: The last column shows the p-value of applying the test of difference means.

market, which should imply that their growth dynamics depends more on their domestic economic than the foreign environment. On the contrary, the total subsample of less developed countries shows that the average economic growth is also positively related with the level of openness. Even though the results between high and less developed countries seem to be opposed, they are not contradictory. The intuition is that developing economies, due to their smaller domestic market, are more dependent on the external demand of their production, as well as their capabilities to satisfy it. Interestingly, in these countries there is a positive association between the average levels of growth and openness, but the significance of the means difference decreases with the level of per capita income levels. Thus, in countries with lower income, and then a smaller economy, openness, and then their external conditions that they face, seems to be more relevant for their possibilities of grow. Differently, countries with higher income level and then larger size of domestic markets are less dependent on the rest of the world and in these cases growth should be more related to the their local economic situation.

4. THE EFFECT OF OPENNESS ON GROWTH: A DISAGGREGATED EMPIRICAL STUDY

In order to determine the influence of the openness measures selected here, i.e. the X/GDP ratio and the terms of trade on economic growth, in this section the estimation results between them are presented by

dividing the total sample among countries with different level of development and economic openness. This allows point out such influence from a more disaggregated analysis, by taking into account the particular situation of development and openness of different countries under study.

For robustness we show the results of the Pooled OLS model in the Table 4. The results between Panel Data and POLS are in general similar. Only in two cases the results are different. First, only in total low openness developing countries and high openness middle income countries the ratio X/GDP is not significant by applying the POLS methodology, while it was in the within model. Secondly, in the last group of countries the terms of trade lost significance with POLS.

Given the last result and the F-test that indicates the presence of fixed effects, we will continue the analysis with Table 3. In relation to the control variables, as expected the investment generally shows a positive effect on growth. Besides, the Gini coefficient presents dissimilar results. In developed countries it favours growth in open economies, which is compatible with the classical approach. The idea is that the saving rate increases with wealth. Therefore, given that inequality increases the income of the richer and thrifty population, this should promote higher global saving, capital accumulation, and then economic growth. On the contrary, in the group of developing-middle income countries income inequality is harmful for the economic

Table 3: Regressions Results of Openness and Economic Growth by for Groups of Countries with Different Levels of Per Capita Income and Openness Using Fixed Effects

Group of Countries/Explanatory Variables	X/GDP	TOT	I/GDP	Gini
High income countries with high openness	0.01**	NS	0.10**	0.08**
High income countries with low openness	NS	NS	0.19**	NS
Total developing countries with high openness	0.03**	0.01*	0.08	-0.08**
Total developing countries with low openness	0.06**	NS	0.15	NS
High middle income countries with high openness	NS	NS	0.15**	-0.12**
High middle income countries with low openness	0.10*	NS	NS	NS
Low middle income countries with high openness	0.04**	0.02*	0.08***	-0.08*
Low middle income countries with low openness	NS	0.01*	0.21**	-0.07*
Total middle income countries with high openness	0.04**	0.01**	0.09**	-0.09*
Total middle income countries with low openness	0.09**	NS	0.16**	NS
Low income countries with high openness	NS	-0.02**	NS	NS
Low income countries with low openness	NS	-0.01**	0.15**	NS

Note: X/GDP indicates the ratio between exports and GDP, TOT are the terms or trade, I/GDP is the share of investment on GDP and Gini is the income inequality index. In turn, *, ** and *** denotes the 10, 5 and 1% level of significance, respectively.

Table 4: Regressions Results of Openness and Economic Growth by for Groups of Countries with Different Levels of Per Capita Income and Openness Using Pooled Ordinary Least Squares

Group of Countries/Explanatory Variables	X/GDP	TOT	I/GDP	Gini
High income countries with high openness	0.01**	NS	0.10***	0.079**
High income countries with low openness	NS	NS	0.17***	NS
Total developing countries with high openness	0.023*	0.01**	0.08***	-0.07**
Total developing countries with low openness	NS	NS	0.16***	NS
High middle income countries with high openness	NS	NS	0.12**	-0.099**
High middle income countries with low openness	0.10**	NS	NS	NS
Low middle income countries with high openness	NS	NS	0.09**	-0.059*
Low middle income countries with low openness	NS	0.017**	0.07**	-0.07**
Total middle income countries with high openness	0.027**	0.013**	0.097**	-0.080**
Total middle income countries with low openness	0.06*	NS	0.16**	NS
Low income countries with high openness	NS	NS	NS	NS
Low income countries with low openness	NS	NS	0.17***	NS

Note: X/GDP indicates the ratio between exports and GDP, TOT are the terms or trade, I/GDP is the share of investment on GDP and Gini is the income inequality index. In turn, *, ** and *** denotes the 10, 5 and 1% level of significance, respectively.

performance. Thus, in less development economies the predictions of the socio-political unrest approach seems to prevail. In these situations the instability provoked by the social discontent could discourage investment and then growth, which is intuitively acceptable. Finally, the Gini coefficient is not significant in the case of poorest economies, which should indicate that other variables of instability could be better to represent the usual economic volatility and socio-political unrest proper of these cases. All in all, these results are compatible with the findings presented by Delbianco *et al.* (2014) for sample of twenty Latin American countries. There in general inequality is harmful for growth, except in the upper tail of the richer countries' income distribution, where it becomes favourable.

Fortunately, the study of the effects of both X/GDP and the terms of trade on growth by classifying the countries in groups with different per capita income level and open allow obtain more detailed evidence than panel data study for the total sample, because the former considers the particular external situation and development level in each case. The results vary among countries with different openness and development level, but in general these favours growth in countries with higher per capita income. In fact this is verified in the cases of high income open and, into the total sub sample of developing countries, in most cases of middle income level. In the case of developed countries, only the ratio X/GDP promotes growth and

just when these are open. This result indicates that the level of openness matters, and that the push of external demands plays a key role on the economic performance of these countries. In turn, this suggests that in general the push of external demands is the key openness variable to promote growth in this sub sample. In turn, the fact that exports are significant only into this group can be due to that in general it includes cases of economies that either have a relatively low global GDP level, like the cases of Montenegro, Estonia, Czech Republic and Serbia, of or because their economic structures are clearly growth export-led. The formers should depend of foreign markets to expand the local production, while the last are cases of countries with a large domestic market and, more important, clear relative advantages to export thanks to the relative resources endowment, like the case of Taiwan, South Korea, Singapore and more countries of the South East Asian region, as well as Netherlands and the Scandinavian economies. Differently, but not contradictory, the most developed countries with a large domestic markets, like the cases of U.S. and some of the largest west European economies, seem to depend more of their local situation than the external markets.

Besides, the estimations into the subgroups of developing countries allow find additional evidence. While for the total set of them in most cases openness affects positively economic group, the results clearly differ between middle and low income countries. In the

formers in most cases, and particularly in low middle economies, openness promotes economic growth. This seems to support the idea that those cases with a small domestic markets depend crucially of the rest of the world to achieve a sustained growth. However, in the sub sample of poorest countries only the terms of trade is significant, but with the unexpected (negative) sign. This surprising result can have two possible interpretations. First, other factors could promote growth in periods that despite these countries faced worse external conditions. For example, in the case of the known as high indebtedness poor countries (HIPCs), in order to endure such adverse conditions these could have achieved certain transitory economic growth contracting high levels of debt. Alternatively, better terms of trade could have generated civil wars between different sectors that struggled to obtain resources whose prices had improved internationally. Examples of this can be war for diamonds or the current struggle for cobalt in Sudan, which clearly should have damaged economic performance. In turn, in this group of countries the ratio exports/GDP is not significant, perhaps unfortunately to the fact that they lack of economic resources to achieve a successful insertion in the world market that allow them achieve a sustained growth in the long run.

Finally, also into the subsample of developing countries the evidence is different between high and low middle income economies. In the formers only exports promotes growth in closer countries, while in the last group openness is favourable, mainly thanks to the effect of the terms of trade. These results are compatible with those presents in Table 2. In countries with lower per capita income (but not absolutely poor) growth seems to depend more on the foreign demand that they face than their local situation, in particular because of they have small domestic markets.

In short, the evidence on the effect of openness on growth is not conclusive. However, this presents some interesting regularities. In this sense, the disaggregated study carried out here allows to obtain some additional evidence with respect to the presented previously in the literature. In general the beneficial effects of economic openness depend crucially of the particularities of the countries. This can promote growth either through the exports or the terms of trade. The formers are growth promoting in open advanced economies, while in the case of middle income countries the favourable effect of both exports and the terms of trade depend clearly in of their openness degree. Finally, the surprisingly result comes from the

low income countries. There exports are not significant, while the terms of trade negatively affects economic growth. As it was explained above, this result would represent the HIPCs, which in times of a worsening of the terms of trade could have kept certain level of growth from foreign indebtedness.

In general terms, a positive effect of the exports/GDP ratio on growth should indicate that a push of the external demand impulse the aggregate production, as the cases of advanced and middle income countries with different degree of openness. Nevertheless, in the cases of advanced and once again middle income countries with different levels of openness this is not significant, which could have two main interpretations. For the formers the intuition is that their economic performance depends mainly on their large domestic market. In low middle income economies, this can be explained to the fact that these are in the frontier of production of exportable goods. There mainly better terms of trade can promote economic growth, which are the cases of low middle income countries. In turn, in low middle income countries X/GDP impulse growth when they present high levels of openness, so that these can improve the economic performance by means of a higher insertion of their tradable production in the world market. This seems to be the cases of the fast growth of China and several some South East Asian countries.

Therefore, with the exception of poorest countries, in general the results found here seem to general confirm the hypothesis of this work. The openness variables used here, i.e. the ration exports/GDP and the terms of trade, are more relevant to encourages economic growth in developing countries, as well as in high income economies whose resources endowment allow have a competitive level from which these can take advantages of better terms of trade and higher demand of their exports.³

5. CONCLUSIONS

This study presented some evidence on the effects of X/GDP and the terms of trade on economic growth in

³On the other hand, in order to determine if the effect of exports and the terms of trade on the economic growth should be explored by considering the total size of the countries, i.e. their global more than the per capita income, regressions presented in table 3 was replicated by dividing the total sample following this criterion. Unfortunately, there was not a significant relationship between them, so that these were not included here (but they are disposable upon request). Hence, it seems to indicate that the purchasing power, i.e. the per capita income and then in same way the level of development, is the relevant aspect to take into account to evaluate such relationship.

a wide sample of countries. In order to take into account some particularities of them, the total sample was divided following two criteria. These are the degree of openness and development, which were approximated by the ratio of exports plus imports on GDP and the per capita income level, respectively. The empirical results are not conclusive. Such effects vary among subgroups of countries with different openness and per development level. Nonetheless, in general the evidence seems to support the hypothesis stated in this research. In less developed or better endowed for export countries one or both of the openness variable used here, i.e. X/GDP and the terms of trade, are favourable for economic growth.

To resume, in advanced economies only the ratio X/GDP is growth promoting when these are open, which either low global GDP or relative advantages to be growth export-led. In turn, exports or and the terms of trade trends to promote growth in lower middle income countries. Unfortunately, the surprising results came from the poorest countries. They do not seem to be benefited from a more favourable foreign environment. On the contrary, exports are not significant while an improvement in the terms of trade diminishes their growth.

The results presented above allow infer some economic policy recommendations, particularly focused in developing countries, and into them in promoting exports in high middle closed and low middle open economies. This should facilitates that these can achieve a better performance and in the long run accelerate the catch up to advanced countries. Differently, in those cases that mainly the terms of trade positively affect growth, their policy should be oriented to improve the internal competitive levels. In fact, the other factors influencing such terms, like the international prices of their tradable costs and production do not depend on themselves, but on the world market situation. In turn, in the cases of low income economies seems to be necessary a more substantial external aid, so that these reach higher and sustained economic growth and then get out the poverty they are.

Finally, possible extensions of this research should be focused mainly in developing countries, because of their smaller domestic markets implies that growth should be mainly related to a higher insertion in the world market. In addition, following the evidence presented in Trinh and Quoc (2017) for Vietnam mentioned above, an interesting line of investigation is

to point out the effects of the productive structure of led export developing countries on the long run sustained growth. Besides, from the findings presented in Kelly (2016) for a sample of East Africa countries detailed in the introduction, another promissory extension is to consider FDI as a measure of openness, in order to explore its effects on the economic performance of developing countries. An alternative can be to include other criteria of openness previously used in the literature, different to the traditional ratio of $(X+M)/GDP$, in order to divided the subsamples of countries at different stages of development. Similarly, an option is to include like explanatory variables other openness other variables previously used in the literature, like the foreign direct investment. Both alternatives should allow determine the robustness of the evidence found here.

In turn, the investigation on the openness-economic growth relationship needs to be done at a more disaggregated level. In first place, it is relevant to determine what type of exportations is more favorable for growth at different development levels. This extension should allow a more precise specification of the topic under study. Moreover, a promissory extension is to verify if sophisticated and technologically advanced services play a key role in richest countries. Differently, industrial and primary production may be more relevant into the exports of developing economies. In this sense, industrial exports should be the main component into the total exportation in most middle income countries, in particular those of the Southeast Asian zone. Meanwhile, primary goods could play an important role in the poorest regions like the Sub-Saharan Africa.

On the other hand, given that de endowment of resources differs among different regions, instead of dividing the total sample according the per capita income level, another interesting extension is to carry out the study of the openness following a geographical criterion, i.e. to approach this topic for Latin America, the South Asian countries, western countries of Northern Europe, etc. In parallel, a promissory research could be to carry out a more disaggregated work at sectoral level. This would allow point out what are the activities with larger potential to reach can be more relevant to achieve a faster exporter dynamic and thus higher economic growth.

Finally, two other areas clearly interesting are the less successful cases of Africa and Latin America. The former in general includes countries with low income

per capita level, which in most cases are associated with low endowments of economic resources, while other countries need to increase either physical and particular human capital, as well as to achieve an institutional development in order to reduce their chronic social and political instability. In turn, Latin America is composed by high and low middle income per capita countries. The first set has economies with certain relative advantages related to primary resources. For example, Argentina is a land rich country with a clear competitive agricultural sector, while Chile has a highly developed miner sector, in particular with abundant endowment of copper. Secondly, the low middle income cases have less endowment of resources, as well as physical and human capital. In sum, both regions generally have presented a poor long term performance and closed economies during the last decades. Hence, a challenge is to carry out a more exhaustive analysis in order to detect what possibilities can exist to improve those situations. Both regions include developing economies with a small internal market, so that their alternatives should come from the potential to achieve a sustained increasing of the exportations.

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