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THE IMPACT OF TRADE OPENING ON ECONOMIC GROWTH IN MOROCCO

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Abstract:

The study analyzes the trade openness impact between Morocco and a group of East Asian countries on the economic growth of the Kingdom. Lately, the world has noticed the emergence of several Asian countries, whose growth has increased sharply in a short time. These countries have aroused the interest of several economists, like effect that openness can have on growth. This study is therefore interested in these two facts; the results are however far from being expected. By using the multiple regression correlation integrating in particular the growth of Gross Domestic Product, capital and labor along with the openness ratio, our results showed that trade openness between Morocco and the Asian countries taken into account can have an unfavorable impact on Morocco's growth. The benefits of trade are therefore not automatic. This result could be explained by Morocco's lack of competitiveness compared to Asian countries, especially China.

Keys words: Trade openness, Economic Growth, Morocco, Asian countries, correlation

JEL Classification : C22, F14, O40

Paper type: Empirical Research

Résumé :

L'étude analyse l'impact de l'ouverture commerciale entre le Maroc et un groupe de pays d'Asie de l'Est sur la croissance économique du Royaume. Dernièrement, le monde a remarqué l'émergence de plusieurs pays asiatiques, dont la croissance a fortement augmenté en peu de temps. Ces pays ont suscité l'intérêt de plusieurs économistes, comme l'effet que l'ouverture peut avoir sur la croissance. Cette étude s'intéresse donc à ces deux faits ; Les résultats sont cependant loin d'être attendus. En utilisant la corrélation de régression multiple intégrant notamment la croissance du Produit Intérieur Brut, du capital et du travail ainsi que le ratio d'ouverture, nos résultats ont montré que l'ouverture commerciale entre le Maroc et les pays asiatiques prise en compte peut avoir un impact défavorable sur la croissance du Maroc. Les avantages du commerce ne sont donc pas automatiques. Ce résultat pourrait s'expliquer par le manque de compétitivité du Maroc par rapport aux pays asiatiques, notamment la Chine.

Mots clés : Ouverture commerciale, Croissance économique, Maroc, pays asiatiques, corrélation

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1. Introduction

One of the oldest questions that has generated great debate among economists is whether open trade stimulates economic growth. This subject has required numerous researches generating an abundant theoretical and empirical literature. Adam Smith with his theory of absolute advantages then David Ricardo who extends his analysis through his theory of comparative advantages, were the pioneers of free trade after a long era of protectionism. Afterwards, many economists followed the movement, each one with his own theory and methods. The results have been diverse; most of the work has resulted in a positive impact of trade openness on growth but others have been able to record a negative or even zero effect.

On the other hand, the attention of economists has been increasingly drawn in recent years to a more recent topic: the emergence of newly industrialized countries. Developing countries

that have been able in a short time to achieve rapid and sustained growth to approach or even exceed the level of economic growth of many developed countries. Many of these emerging countries are in Asia, testifying to an industrialization that was able to spread by the flight of the wild goose. We can indeed cite the five baby tigers: Thailand, Malaysia, the Philippines, Vietnam and Indonesia. However, the BRICS stands for a more geographically diverse group, containing Brazil, Russia, China - which has become the second world power after the United States - and South Africa. Moreover, the four Asian dragons, namely South Korea, Hong Kong, Singapore and Taiwan, have been considered since the 1990s as developed countries after Japan which preceded them.

Considering in this article four of these Asian powers, namely, China, India, South Korea and Japan. This work will attempt to merge these two subjects with the aim of analyzing the trade openness impact between Morocco and these Asian countries on Morocco's growth. This developing country whose growth remains strongly linked to agriculture despite the various reforms put in place.

To do this, the article suggests to use the Pearson correlation with a multiple linear regression. However, before analyzing the results provided in the fourth section of the article, the first section will review the theoretical and empirical bibliography between trade openness and economic growth. A second part will present a descriptive analysis of the data used and a third section will define the estimation methods.

2. Review of the theoretical and empirical literature

2.1 Review of theoretical literature

The role that trade policy plays in economic growth has been a fundamental topic of debate in the growth literature. Most mainstream work on trade theory has found growth gains through openness, while others may find a negative effect of openness on growth. An old debate resulting much theory that started from the 16th century with Adam Smith who defended the idea of absolute advantages in the transactions of goods and services between nations. However, in this article we will mainly focus on theories relating to the relationship between openness and endogenous growth. Indeed, from the 90s, these two concepts have experienced a merger since both are based on the principles of increasing returns and imperfect competition, offering a new framework for relevant analysis of the effects of openness on economic growth.

Starting with Feenstra (1990), Grossman and Helpman (1990) who demonstrated the existence of two opposing results of link between openness and economic growth, one positive and the other negative. The first is that trade openness increases the size of the market, which encourages firms to invest and innovate; the second is that this increase in size increases the number of competitors, which could reduce the incentives to innovate. However, if the two trading countries are identical, these two effects cancel each other out; a doubling of the size of the market is compensated by a doubling of the number of competitors. In this case the opening has no effect on growth. In 1991, Grossman and Helpman returned to support the positive effect openness can have on economic growth. According to them, the more the country is open, the more it can experience a high level of growth and those following new technologies and the increase in national imports of goods and services. However, the authors defend the idea of using protectionism at first glance before opening up completely. This view is consistent with infant industry theory. Grossman and Helpman argued, in 1992, a country's use of protectionism (for encourage domestic investment) stimulate its growth. During the same year, Levine and Renelt demonstrated the role that investment can play in international trade in ensuring long-term growth. Nevertheless, international competition will risk leading to a decline in domestic investment. Fontagné and Guerin (1997) indicated that what determines the results of the opening of a country remains the internal conditions. Indeed, if the country has certain conditions (qualified human capital, good institutions, etc.), trade openness plays a catalytic role on growth by activating the economy in the face of external shocks. Rivera Batiz and Romer (1991) also encouraged openness, considering innovation as a source of growth. These authors demonstrated that the complete integration of two identical countries makes it possible to double their growth rates compared to those of autarky. However, reciprocal customs tariffs act negatively on growth insofar as they only encourage the activity of imitation that occupies part of the human capital which can be devoted to research and development, and consequently reduces the rate of economic growth. However, Batiz and Romer studied, within the framework of two developed and identical economies, the case of partial integration: exchange of technological knowledge or goods showing that the rate of growth does not vary and remains at its level autarky. However, in this case, there is simultaneous exchange of knowledge and goods. The two authors have shown that the growth rate is permanently higher and we find the same results as in the case of complete integration. When the two countries are not identical, Barro and Sala-I-Martin (1995) showed that the growth rate of the developing country depends on the cost of imitation of the

innovation of the developed country. If the cost of imitation is lower than that of innovation, the DC (developing countries) records a growth rate higher than the one of the developed country and we will therefore witness a phenomenon of convergence.

In the same context, Askenzy (1997) showed openness has a positive effect on the growth of the developed country since it leads to the displacement of its human capital towards the research and development sector which produces the innovations that are a source of growth. Contrary to these works, other authors like Krugman (1987), Young (1991), Lucas (1988), Rodriguez and Rodrick (2000); Acemoglu and Zilibotti (2001) and Banerjee and Newman (2004) showed that openness can have negative consequences for growth, especially for developing countries. The latter can be pushed to specialize in less productive sectors with an overall negative impact on growth. The initial endowments of countries, the use of learning-by-doing as a source of growth, the lack of financial development and the limited mobility of the factors of production are the main explanations for these results. In this context, openness can drive a small economy into underdevelopment.

2.2 Review of empirical literature

Empirical work analyzing the relationship between economic growth and openness began to be published in the 1970s. It mainly used cross-sectional regressions on a set of countries with simple correlation coefficients between export growth and GDP (gross domestic product) or correlation coefficients between, on the one hand, a set of indices representing the openness or even trade policies of countries and, on the other hand, long-term growth. These studies were presented in the work of Edwards (1989 and 1993) and generally concluded to a close link between openness and growth. Edwards (1998), as well as other authors such as Dollar (1992) found that distortions due to state intervention in trade led to low growth rates. Ben-David (1993) and Sachs and Warner (1995) demonstrated that it is only in open economies that unconditional convergence can be observed. These two authors estimated growth equations over the period 1970-1989 for 122 countries. Their results showed that developing countries with open policies grew at a rate of 4.49% per year in the 1970s and 1980s, whereas, relatively closed countries had a growth rate of only 0.69%. These two economists also showed, in the group of open economies, that developing countries have recorded higher growth compared to developed countries (4.49% against 2.89% per year). This positive relationship between openness and growth confirms the results of some previous empirical

work (Feder, 1983); (Balassa, 1985) and has been endorsed by more recent works such as Harisson in 1996. Harrison also arrived at similar conclusions using several methods of estimation. He found a positive link between the degree of openness and growth, although the significance differs depending on the indicator used. Indeed, the importance of this positive correlation changes from one indicator to another. These results have been confirmed in particular by the work of (Pritchett, 1996) who grouped together several indicators that were often found in the literature. He examined the correlation between these indicators and gets the result that most are not correlated with each other. He justifies his result by the fact that each of these indicators expresses only part of the concept of openness. They are therefore incomplete and do not allow an overall summary of an outward-looking trade policy. In 1998, Sébastien Edward tested the robustness of nine measures of trade openness on total factor productivity growth. Among these measures we can note the index of Warner Sachs, that of Edward Leamers and the trade distortion index formulated by the Heritage Foundation. He regressed these different measures of openness, calculating the ten-year average of total factor productivity for 93 developed and developing states. He obtains that six of the nine measures of openness were statistically significant and had the expected sign. However, the results of the work of this author, as well as three others, mentioned above: Dollar (1992), Ben-David (1993), Sachs and Warner (1995) were criticized by Rodriguez and Rodrik (1999) who established that the positive correlation between openness and growth found in these studies was not robust. Their methodologies were called into question since the indicators used to measure openness to trade could be heavily criticized and important control variables that could have a determining effect on growth were missing.

Lee (1993, 1994), proved that the relationship between trade openness and long-term growth is essentially based on imports. First of all, it shows that illegal market premiums and tariff rates, which interact with the estimated share of free trade imports, have significant negative effects on the growth rate of per capita income in a country. Then, it emphasizes state intervention to encourage a strategy based on investment to promote development.

Other authors have sought to identify indirect links between openness and growth. Some have shown that growth is driven by investment and induced by openness, such as Baldwin and Seghezza, 1996 who studied European integration and demonstrated that trade liberalization promotes growth by stimulating investment in physical capital. Frankel and Romer (1999) confirmed that international trade has an important and significant impact on growth using an instrumental variable method including geographical characteristics. Another work, realized

using cointegration techniques, has demonstrated that growth is driven by technology and induced by trade openness. Coe and Moghadam (1993) believed that trade and capital in the broad sense are responsible for almost all the growth recorded by the French economy over the past twenty years. Coe and Helpman (1995) showed, on a sample of 22 industrialized countries, that the total factor productivity (TFP) of a country depends not only on its own stock of capital in R&D (research and developement) but also on that of its trading partners. Thus the positive effect of foreign R&D on TFP (Total factor productivity) depends on the degree of openness of the country. In the same context, Brecher, Choudhri and Schembri (1996) tried to show the relationship between the externality of R&D and the growth of TFP in some sectors in Canada and in the United States. They demonstrated that between 1961 and 1991, the impact of R&D developed in the United States on Canadian productivity, tended to be at least as strong as the impact on the United States productivity.

According to L. Fontagné and J. L. Guerin (1997), a nation's opening depends on its internal circumstances.In fact, openness acts as a growth accelerator by triggering the economy's response to external shocks if specific conditions are met, such as qualified human capital.

Greenway et al, in 2002 argued that the diversity of liberalization indices used was responsible for the lack of clarity. The authors used three different liberalization indicators and found a positive result between liberalization and growth in developing countries with a certain delay. In 2003, Yanikkaya used two sets of openness measures - trade volume measures and trade restrictive measures - targeting a sample of more than 100 developed and developing countries from 1970 to 1997. In order to show that the relationship between trade liberalization and growth is not simple and that the presence of trade barriers has a positive effect on economic growth, especially for developing countries. Baldwin returned in 2003, observing that trade liberalization policies are never implemented in isolation. Thus, we cannot seek to identify the effect of trade liberalization alone on growth, so it would be wiser to assess the impact of a macroeconomic and fiscal economic policy program including trade liberalization. Along the same lines, Winters (2004) believed that in order for trade liberalization policies to have a long-lasting impact on growth, they must be coupled with additional measures that encourage investment and the development of human capital.

In their 2003 study, Caupin and Saadi-Sedik examined the effects of trade openness policies on the erratic nature of economic growth in 13 Middle Eastern and North African nations between 1960 and 1999. They demonstrated how less volatile nations are those with more liberal trade policies. In other words, the positive impact of openness on a country's resilience

balances the negative impact caused by increased vulnerability to foreign shocks. Noguer and Siscart (2005) carried out research on a sample of 98 nations and used geography as a marketing tool to show that there is a correlation between commerce and economic growth.

The impact of trade liberalization on the WAEMU (West African Economic and Monetary Union) countries' economic growth was examined by Akilou in 2006. By adopting a dynamic model on panel data and the generalized least squares (GMM) estimation method, it has led to the results that openness is not favorable to economic growth. These results can be explained by the absence of complementary policies allowing openness to raise growth. Indeed, the concentration of exports on primary products, for example in WAEMU countries, may not favor the beneficial impact of openness on economic expansion.

Wacziarg and Welch's (2008) research, which came after that of Sachs and Warner, found that, between 1950 and 1998, nations with open policies experienced average yearly growth rates that were 1.5 percentage points greater than they were before to liberalization.

The findings that liberalization increases growth in part by having an impact on the accumulation of physical capital are confirmed by the 1.5 to 2.0 percentage point increase in investment rates that occurred after liberalization. The average trade-to-GDP ratio rose by around 5 percentage points when people were more open, indicating that trade policy liberalization did raise people's actual levels of openness. Large differences between nations have also been obscured by these average effects. Gries and Redlin (2012) investigated the causal link between these two variables using panel cointegration tests, panel error correction models (ECM), and GMM estimates. For 158 nations between 1970 and 2009, the two authors looked at both the short- and long-term trends of GDP per capita growth and openness. The findings demonstrated that while openness is a good approach for long-term progress, it can also be harmful for economies undergoing temporary transitions until income levels rise. Thus, different effects of openness on economic growth can be observed depending on whether it is a question of high or low income countries. Berrached (2013), through a comparative study in the form of econometric tests of 80 countries, tested the impact of the trade openness policy on the economic growth of the South-East Mediterranean countries (SEMC) over the period 1980-2003. The study's findings suggested that there is some ambiguity in the relationship between openness and growth. In fact, the results of this study confirmed a positive relationship between human capital and openness to growth in developing nations and SEMCs in cross-section; but, in panels, the openness coefficient changes to a negative value. Matthias and Koeniger (2015) shown that although there is frequently a positive correlation between openness and economic growth, the conditions necessary for this positive association to materialize are typically not yet present in emerging nations. As a result, depending on the trade specification, the impact of openness on growth may be adverse in some nations.

3. Descriptive analysis

3.1 The openness between Morocco and a panel of Asian countries and the growth of Morocco

In order to better understand the effect Sino-Moroccan opening may have on Morocco's growth, the model used on board has been improved. Thus adding other growth variables: capital and labor as well as the inflation, unemployment, the HDI (Human development index) and extending the study period, adding the years from 2009 to 2015 and working on a panel of East Asian countries. This model also takes into consideration China, India, South Korea and Japan.

Table 1: Decomposition of GDP growth

	Growth			rate of participation %	
Years	GDP	Capital	**Labor**	Capital	Labor
2009	4.24	-2.67	**0.8**	35.05	50.1
2010	3.82	-1.74	**0.76**	34.07	49.61
2011	5.25	10.28	**0.8**	35.77	49.16
2012	3.01	-0.93	**0.09**	35.02	48.41
2013	4.54	5	**1.34**	34.67	48.31
2014	2.67	-2.19	**1.01**	32.54	48.06
2015	4.54	0.86	**0.32**	30.8	47.47
2016	1.06	8.73	**-0.5**	32.39	46.55
2017	4.25	4.14	**-0.73**	32.62	45.5
2018	3.15	5.75	**1.5**	33.4	45.45
2019	2.61	-0.44	**1.52**	31.94	45.44
2020	-6.29	-14.25	**-3.6**	28.45	43.15

Source: Produced by the author using statistics for capital and labor from the World Bank and Usherbrooke for GDP (+calculation of annual labor growth)

Over the period from 2009 to 2020, the accumulation of labor has constituted the dynamo of growth Its contribution to GDP growth is close to 50% over this period. Capital is also an important factor contributing more than 33% to growth.

Table 2: Other growth indicators

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Inflation rate *(%)*	1	1	0.9	1.3	1.9	0.4	1.6	1,6	0,8	2,4	0,2	0,7
Unemployment rate *(%)*	9	9.1	8.9	9	9.2	9.7	9.5	9.3	10.6	9,4	10,2	12.2
HDI value	0.61	0.616	0.63	0.64	0.65	0.65	0.66	0.66	0.67	0.68	0.69	0.67

Source: data on the unemployment rate and inflation rate from the World Bank and Usherbrooke for the HDI

Table 3: Opening data

Countries	Years	Import	Export	Commercial sale	Openness ratio
China	**2009**	20 610	1207	**-19403**	**0.12**
China	**2010**	24 993	2 058	**-22 935**	**0.15**
China	**2011**	23 313	1 588	**-21 725**	**0.12**
China	**2012**	25 559	2 406	**-23 153**	**0.13**
China	**2013**	26 535	2 874	**-23 661**	**0.14**
China	**2014**	29 496	2 273	**-27 223**	**0.13**
China	**2015**	30 682	2 375	**-28 307**	**0.15**
China	**2016**	37 324	2 239	**-35 085**	**0,19**
China	**2017**	39 561	2 973	**-36 588**	**0,2**
China	**2018**	47 285	2 540	**-44 745**	**0,22**
China	**2019**	49 816	2 725	**-47 091**	**0,23**
China	**2020**	51 495	2 479	**-49 016**	**0,26**
India	**2009**	3 198	5 851	**2 653**	**0.05**
India	**2010**	4 876	2 502	**-2 374**	**0.04**
India	**2011**	4 759	2 691	**-4 068**	**0.04**
India	**2012**	4 439	10 181	**5 742**	**0.07**
India	**2013**	5 306	6 444	**1 138**	**0.05**
India	**2014**	4 260	7 274	**3 014**	**0.05**
India	**2015**	3 892	8 558	**4 666**	**0.06**
India	**2016**	6 216	7 433	**1217**	**0.067**
India	**2017**	5 988	6 426	**438**	**0.058**

Source: Produced by the author using data from the Foreign Exchange Office

Table 4: Sum of indicators of openness between Morocco and the countries of East Asia during the period 2009-2020

Years	Import	Export	commercial sale
2009	31 826	8 784	-23 042
2010	37 877	6 093	-31 784
2011	35 031	6 104	-30 927
2012	40 767	15 875	-24 892
2013	37 967	12 280	-25 687
2014	40 264	12 354	-27 910
2015	41 525	13 309	-28 216
2016	56 291	12 366	-43 925
2017	55 248	12 373	-42 875
2018	61 727	15 564	-46 163
2019	69 715	13 944	-55 771
2020	64 479	15 911	-48 568

Source: Produced by the author using data from the Foreign Exchange Office

***** Import and export (M MAD)

These tables illustrate the opening data between Morocco and the panel of Asian countries. As usual Morocco's trade balance records a deficit with practically all the countries considered, except India. Transactions between Morocco and China remain more important compared to other East Asian countries. Moreover, the figures above are interesting since they show the opening between Morocco and this Asian giant.

It should be noted that the commercial exchanges that the Kingdom maintains with these Asian countries remain less important compared to those of other countries, particularly in Europe, with which Morocco has deeper relations.

3.2 Definition of the variables used

3.2.1 Endogenous variables

We use as an endogenous variable the growth of Morocco usually calculated, by most economists, through the average annual growth rate of GDP.

Thus will be taken into account the GDP of Morocco for the period from 2009 to 2020 where we will insert the capital, labor, inflation, HDI and unemployment of Morocco inspired by the Solow model.

3.2.2 Exogenous variables

a- The variables representing the opening

To assess the effects of the relationship between Morocco and China, India, South Korea and Japan on Morocco's economic growth, we have chosen to calculate trade openness through the absolute indicator most used in the literature, the openness ratio. Thus we use three variables for the opening of trade:

- RO= (Export + Import)/ GDP

- IMP (corresponding to total imports between Morocco and China from 2009 to 2020

- EXP (corresponding to total exports between Morocco and China from 2009 to 2020

It should be noted that the opening of a country is not limited to its international trade. It is also defined by its capacity to welcome foreign companies. Indeed, several authors have demonstrated the positive impact of FDI on economic growth, namely Blomstrom and Kokko and Borensztein, De Gregorio and Lee in 1995. Thus, it would have been preferable to take into consideration Chinese, Indian, Korean FDI and Japanese settled in Morocco; however the lack of statistics from these Asian countries, not being systematically disclosed or provided, hampered our interest. However, we spend the factors of production as exogenous data.

b- Factors of production

The two primary components of production that will support economic growth are labor and capital.

- **Capital :**

This element, which is connected to the growth in the capital stock, has been employed in empirical research as both an indicator of the efforts taken to build the fundamentals of the economic infrastructure and as one that directly contributes to the accumulation of

capital.According to the facts discovered in this study, it is calculated as the annual growth rate of gross fixed capital creation from 2009 to 2020.

- **Labor :**

This factor is linked to the active population of the country but also to the duration of work, the quality of work and the know-how accumulated by the worker. On the theoretical level, several authors have determined the positive effect of work on economic growth such as Lucas in 1988 or Autumn and Michet in 1993. However, it should be noted that at the empirical level the results were more diversified in addition to the positive effects determined by Barro, 1991 and Mankiw, Romer and Weil, 1992, there were negative results shown by Pritchett in 1996 or even an absent effect as Benhabib and Spiegel found in 1994. Coe, Helpman and Hoffmaister in 1996 explained how this highly qualified factor of production directly affects growth by improving worker productivity and indirectly by attracting FDI.

c- Other exogenous variables

To better analyze the impact of openness on Morocco's growth, other variables related to growth will be considered in this model, namely inflation, unemployment and the human development index.

4. Data sources used and estimation methods

4.1. Data sources used

We use multiple regression to calculate the correlation and keep a panel of five countries for the openness variables (China, India, Japan, South Korea, and their transactions with Morocco), spanning the years 2009 to 2020, in order to study the effect of Sino-Moroccan openness on Morocco's economic growth. These variables, presented beforehand, deemed relevant for our study are taken from different sources:

- Data on trade openings (Exports and Imports) are extracted from the last nine reports of the foreign exchange office, (report covering the period from 2010 to 2020); the last report (that of 2020) presenting only the statistics going from 2016 to 2020

- The second model in the Usherbrooke database verifies the Gross Domestic Product (GDP) and HDI statistics obtained from the International Monetary Fund (IMF)

- Data on capital, labor, inflation and unemployment are taken from the World Bank database

4.2 Estimation method

The empirical work presented above shows that the openness indicators used, do not exhaustively represent the openness policy of a given country. In our study, we will use a specification where several indicators of openness, in particular the openness ratio, will be highlighted in a growth equation.

In fact, the majority of authors who have examined the relationship between trade openness and economic growth rely on a panel of nations to examine the openness of the nations selected for the panel to the rest of the globe. In our article, we study the opening of Morocco to the fourth Asian countries considered in the model and its impact not on the growth of the two parts but we will only focus on that of Morocco.

To do this, we opt for the Pearson correlation which has been used by several economists to estimate the impact of different variables, not only that of trade openness on Morocco's growth.

Indeed, from the 1970s onwards, several works used the correlation coefficients either between the growth of exports and GDP, or between the indicators representing openness or even trade policies and long-term growth before they are not concentrated on the pathways of the impact of openness on growth - with the fusion between the theory of endogenous growth and the new theory of international trade - taking into consideration the formation of fixed capital, human capital or even the knowledge.

In this article, we will use a correlation model with a multiple linear regression influenced by the Solow model integrating into the growth equation the factors of production, inflation, unemployment and the HDI based on the degree of openness between Morocco and the selected Asian countries.

To carry out our correlation, we favored the R software. This software created by Robert Gentleman and Ross Ihaka in 1997, for its first version, offers several advantages. Aside from being free, one of its strengths lies in its logic of use, it is free software that allows you to view and interpret data quite easily.

The equation takes into consideration the growth rate of GDP along with several other variables namely, the growth rate of capital, the growth rate of labor, the rate of openness as well as inflation, unemployment and l 'HDI.

However, after using the stepwise regression method only labor, capital and openness will be retained for a more reliable model. In this context, a significance test will be performed to verify the reliability of the model. The F-test will be based on the Fisher statistics shown at the bottom of the R output. If the p-value is less than 1%, generally the model is significant. The Student test will also be used to test the significance of the coefficients. The quality of the regression will be measured by the coefficient of determination R^2 which is defined as the share of variation in the endogenous variable by variations in the exogenous variables. The closer the value of this coefficient is to 1, the stronger the match between the model and the observed data. The adjusted R^2 takes into account the number of explanatory variables included in the regression, so it is more correct.

4.2.1 Estimation results

Table 5: Correlation analysis between the different determinants

	GDP	CAPITAL	LABOR	OPENING RATIO	INFLATION	UNEMPLOYMENT	HDI
GDP	1	0.7	0.8290	- 0.6849	0.2172	-0.8134	-0.3509
CAPITAL	0.7000	1	0.5704	- 0.3236	0.4452	-0.6571	-0.005
LABOR	0.8290	0.5704	1	-0.5003	0.2066	-0.7803	-0.1673
OPENING RATIO	- 0.6849	- 0.3236	- 0.5003	1	-0.0624	0.7868	0.7957
INFLATION	0.2172	0.4452	0.2066	-0.0624	1	-0.4	0.0411
UNEMPLOYMENT	-0.8134	-0.6571	-0.7803	0.7868	-0.4	1	0.5654
HDI	-0.3509	-0.005	-0.1673	0.7957	0.0411	0.5654	1

Source: Produced by the author using R software

We can see that the correlation is negative between trade openness and growth. But before taking this result into consideration, a significance test was performed.

Following this test, and despite a level of significance that rises to more than 70%, and that the overall p-value is 0.04 which could mean a strong presumption against the null hypothesis, we can see that the p- value exceeds 10% for many indicators. To further ensure the reliability of this model, the stepwise regression method was used. This method will allow us to define the best subset, first by adding the most significant variables - Forward method (by addition): with a p-value of the coefficients of 10% - then, by removing the least significant variables - Backward method (by subtraction). The results are below:

Table 7: Forward method

Step	Variable entered	R-Square	Adj. R-square	C(p)	AIC	RMSE
1	Labor	0.6874	0.6561	3.7050	51.9115	1.7954
2	OP	0.7847	0.7368	2.0614	49.4363	1.5705
3	Capital	0.8523	0.7969	1.5291	46.9116	1.3796

Source: Produced by the author using R software

According to this method, the model suggested by the maximization contains the following variables: labor, capital and openness. The algorithm therefore eliminated, as shown below, the other variables, namely: inflation, HDI and unemployment.

Table 8: Backward method

Step	Variable removed	R-Square	Adj. R-square	C(p)	AIC	RMSE
1	Inflation	0.8659	0.7542	5.0194	49.7511	1.5178
2	HDI	0.8632	0.785	3.1219	47.9936	1.4195
3	UNEMPLOYMENT	0.8523	0.7969	1.5291	46.9116	1.3796

Source: Produced by the author using R software

Thus, the model suggested by maximization and the model retained contain the following variables: labor, capital and openness.

Table 9: Correlation analysis between the selected determinants

	GDP	CAPITAL	LABOR	OPENING RATIO
GDP	1	0.7000	0.8290	- 0.6849
CAPITAL	0.7000	1	0.5704	- 0.3236
LABOR	0.8290	0.5704	1	-0.5003
OPENING RATIO	- 0.6849	- 0.3236	- 0.5003	1

Source: Produced by the author using R software

Before interpreting the result, let's deal with the estimation of the results obtained. We found a level of significance exceeding 80%, adjusted we obtain R^2= 0.796 which means that the model is representative at 79.6%. Indeed, the determinants that we retain explain nearly 80% of the variability between the countries observed in the growth rates.

Another point to mention is that the F value is 0.1%, so it represents a rate well below the level of significance ($p < 0.85$). This is a good indicator of the validity of the results obtained. To this, it must be added that the coefficients are significant between 5 and 10%. These points thus justify the use of this model to evaluate the effects of the various determinants selected.

To interpret the results we will use the equation of the linear regression between the growth rate of GDP and the growth rates of capital, labor and the rate of openness below:

GDP growth = 6.02+ 0.14*capital_growth+ 1.02*labor_growth 21.92*opening_rate

First, we will try to understand what are the most significant determinants used in the model?

In this model, GDP is significant. Obviously, it corresponds to a datum of the past of which we cannot change anything.

The factors of production (capital and labor) taken into consideration are both significant, with different degrees. These variables are found in almost all empirical studies on growth, notably from Solow's neoclassical growth model. These production factors positively influence growth.

Regarding trade openness, this economic policy variable corresponds to one of the most studied variables in the empirical literature where the results have tended to conclude towards a positive correlation between trade openness and economic growth. In our model, this

variable is significant up to 5% and tends to have a negative impact on growth. Our result corresponds with part of the literature which claims that trade openness is only beneficial if the country reaches a level of economic development that allows it to face foreign competition. The study focuses on Morocco, a developing country which can justify this result.

Thus the result of this model means that the greater the rate of openness between Morocco and the Asian countries considered - China, South Korea, India and Japan -, the more the level of growth in Morocco tends to decrease.

5. Conclusion

The relationship between Morocco and Asian countries, particularly China, could have a negative effect on Morocco's growth. Openness does not always play the role of stimulating economic growth. Indeed, to take better advantage from an open relationship, each country must identify its strengths and weaknesses as well as the threats (in order to avoid them) and the opportunities that can derive from them, allowing it to better negotiate its openness.

The result of this study does not mean that Morocco should stop its relationship with these Asian powers. On the contrary it would rather focus more on its strengths and work on its weaknesses in order to allow itself to derive the best possible benefit from such a relationship; even though it has represented several threats up to now, in particular to its growth, despite the political support or even the economic aid that these countries, in particular the People's Republic of China, can offer.

The Cherifian Kingdom will then have to improve its competitiveness and reduce the unequal exchange generated by this relationship. The budget deficit, which is widening from year to year, is due in particular to fierce competition from these large Asian countries which have experienced rapid growth and which export products with high added value and import in particular primary products and intermediaries. Morocco will then have to ensure that it invests more in sectors with high added value while focussing on external demand in order to improve their export performance, which will allow it to rebalance the bilateral trade flow.

With this in mind, Morocco will have to attract even more foreign investors from these Asian countries. For many years, Morocco has embarked on reforms to improve the business environment. The country has also set up in 2009, the Moroccan Investment Development Agency (AMDI) aimed at achieving better coordination at the level of the various Moroccan organizations involved in this sector which undoubtedly plays an important part in the growth economy of the country. However, compared to investments in African countries with

significant energy resources – South Africa, Nigeria, Sudan, Zambia – Asian FDI (Foreign Direct Investment) and especially Chinese FDI are much lower in Morocco. The most important investment would be the one being made in the industrial zone of Tangier.

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