

Imports and Economic Growth in Madagascar (1980-2020): A Differentiated Analysis Between Consumer Goods and Capital Goods

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Abstract: In Madagascar, imports play a significant role in the functioning of the economy, both to meet consumption needs and to support production activities. However, their effects on economic growth can vary depending on the nature of the imported goods. In this context, this study analyzes the impact of imports of consumer goods and capital goods on Malagasy economic growth between 1980 and 2020. The main objective is to assess the influence of imports on real gross domestic product. More specifically, the study seeks to determine the respective effects of imports of capital goods and consumer goods, as well as to examine the short- and long-term relationships between the selected macroeconomic variables. The analysis is based on annual data from the World Bank's World Development Indicators database and statistics from INSTAT Madagascar. The econometric approach is performed using Eviews10 with the ARDL (Autoregressive Distributed Lag) model. The results of the stationarity tests show that the variables are integrated of mixed order, thus justifying the use of this method. The cointegration test confirms the existence of a long-term relationship between the variables studied. The estimates reveal that imports of capital goods have a positive and significant effect on long-term economic growth, with an estimated coefficient of 0.64 ($p < 0.01$). Conversely, imports of consumer goods exert a negative and significant effect in the short term, with a coefficient of -0.21 ($p < 0.05$), reflecting competitive pressure on local production. The ECT error correction term (-1) is negative and significant (-0.74; $p < 0.01$), indicating that about 74% of short-term imbalances are corrected each year. However, the study has certain limitations. On the one hand, the analysis is based on aggregated data which do not make it possible to distinguish the sectoral effects of imports, on the other hand, certain important variables such as private investment, institutional quality or public expenditure have not been integrated into the model due to constraints linked to the availability of data.

Keywords: ARDL (econometric modeling), Differentiated imports, Economic growth, Foreign trade, Investment goods.

I. INTRODUCTION

In developing economies, foreign trade is an essential element of the economic growth process. Imports play a particularly important role in satisfying domestic demand, supplying production inputs and acquiring technologies. For many countries with a low level of industrialization, they represent a way to access the equipment, technical knowledge and innovations necessary for the modernization of the economy. In Madagascar, the gradual opening of the economy since the economic reforms of the 90s has led to an increase in foreign trade. However, the Malagasy economy remains highly dependent on imports, both for consumer goods and for goods for productive use. This dependence raises questions about the real effects of imports on the country's economic growth.

The impact of imports on economic growth remains a widely debated topic in the economic literature. On the one hand, imports of capital goods can promote the accumulation of productive capital, improve productivity and facilitate technology transfer. On the other hand, imports of consumer goods can weaken local industries by accentuating external competition and reducing national production capacity. In the case of Madagascar, the structure of imports is marked by a strong presence of imported consumer products, while local industrial capacities remain limited. This situation leads to questioning the nature of the effects of imports on economic growth: do imports really support economic development or do they strengthen the country's external dependence? The

classical theories of international trade, in particular that of comparative advantages developed by Ricardo (1817), consider foreign trade as a source of economic gains. The endogenous growth models, through the work of Romer (1990) and Grossman and Helpman (1991), place more emphasis on the role of technological imports in the dissemination of technical progress and the improvement of productivity.

On an empirical level, several studies show that imports of capital goods contribute positively to economic growth through improved productive capacities and technology transfer (Lee, 1995; Coe et al 1997). On the other hand, some research points out that imports of consumer goods can produce negative effects on developing economies by weakening local industries and accentuating trade imbalances (Rodrik, 2006; Olayiwola et al, 2020). Despite the existence of numerous works on the link between foreign trade and economic growth, few empirical studies devoted to Madagascar distinguish the effects of imports according to the nature of the imported goods. Most of the analyzes consider capital goods. This approach limits the understanding of the mechanisms by which imports influence Malagasy economic growth. The main objective of this research is to analyze the impact of imports on economic growth in Madagascar during the period 1980-2020.

More specifically, the study aims to : Evaluate the effect of capital goods imports on real gross domestic product ; Examine the impact of consumer goods imports on economic growth ; Analyze the short- and long-term results between the selected macroeconomic variables. This study is based on the following

assumptions: Imports of capital goods have a positive effect on economic growth; Imports of consumer goods have a negative effect on short-term economic growth. The empirical analysis is based on annual data covering the period 1980-2020, mainly from statistics from INSTAT Madagascar and the World Development Indicators database of the World Bank. The study uses an ARDL (AutoRegressive Distributed Lag) model estimated under Eviews10 in order to examine the short- and long-term relationships between the variables studied.

II. MATERIALS AND METHODOLOGY

A. Data sources

This study uses annual data covering the period 1980-2020; The information mainly comes from the World Development Indicators (WDI) database of the World Bank, supplemented by statistics from the National Institute of Statistics of Madagascar (INSTAT). This long period makes it possible to analyze the structural dynamics of foreign trade and economic growth in Madagascar. Description of the variables The study mobilizes five macroeconomic variables: Real Gross Domestic Product (GDP): dependent variable, used as an indicator of economic growth. Imports of capital goods (EMI): represent machinery, industrial equipment and goods intended for production. Imports of consumer goods (IMC): group the finished products intended for household consumption; Inflation (INF): measured by the consumer price index, it makes it possible to control macroeconomic stability. Real exchange rate (TCR): used to reflect the external competitiveness of the economy. In order to improve the stability of the series and reduce the problems of heteroscedasticity, the level variables were transformed into natural logarithms when necessary.

B. Description of the variables

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C. Model specification

The relationship between imports and economic growth is modeled as follows :

$$GDP = f(EMI, BMI, INF, TCR)$$

This model makes it possible to assess the impact of imports of capital goods and consumer goods on economic growth, while controlling for the effects of inflation and the real exchange rate. In a dynamic econometric form, the model is estimated in order to capture both short- and long-term effects.

D. Econometric approach

The empirical analysis is based on the ARDL model. This approach is particularly suitable when the variables are integrated of different order, without the need for them to all be stationary at the same level.

The econometric procedure consists of several stages :

Stationarity test of variables using the Augmented Dickey-Fuller test (ADF) ;

Cointegration test by the bounds method (Pesaran et al 2001 Bounds test) ;

Estimation of the ARDL model ;

Estimation of the error-corrected model (ECM) to analyze the adjustment dynamics.

E. Estimation software

The econometric estimates were carried out using the EViews10 software, which allows the implementation of the ARLD model, as well as the various stationarity and cointegration tests. Estimation software The econometric estimates were carried out using the EViews10 software, which allows the implementation of the ARLD model, as well as the various stationarity and cointegration tests.

III. RESULTS

A. Unitary root test and stationarity of variables

The analysis of the properties of the time series was carried out using the Augmented Dickey-Fuller (ADF) test.

TABLE I. Examination of the stationnarity of macroeconomic variables.

Variable	Level	1 st Difference	Stationnarity
PIB réel	-1.85	-4.90	I(1)
IME	-2.20	-5.12	I(1)
BMI	-1.90	-4.88	I(1)
INF	-3.78		I(0)
Exchange rate	-2.05	-5.01	I(1)

The results show that the majority of the variables studied are integrated of order I(1), with the exception of the inflation rate which is stationary at level I(0). The real gross domestic product, imports of capital goods, imports of consumer goods as well as the real exchange rate become stationary after the first difference. These results justify the use of the ARDL approach, which is appropriate in the case where the variables present mixed orders of integrations.

B. Analysis of the cointegration relationships

The Bounds Test of Pesaran, Shin and Smith (2001) indicates the existence of a long-term relationship between the variables of the mod

TABLE III. Assesment of cointegration among variables

F-statistics	Critical value (10%)	Critical value (5%)	Critical value (1%)	Conclusion
6.21	2.45	2.86	3.74	Cointégration confirmée (F>seuils)

The estimated F-statistic is 6.21; which is higher than the critical values at the thresholds of 10%, 5%, 1%.

This result confirms that there is a long-term equilibrium relationship between real GDP, imports of capital goods, imports of consumer goods, inflation and the real exchange rate.

C. Analysis of the results of the ARDLmodel

TABLE IIIII. The estimation of the ARDLmodel reveals differentiated effects according to the nature of imports

Variable	Short-term effect	Significance	Long-term effect	Significance
Imports of capital goods	0,12	Not significant	0.64	*** (p<0,01)
Imports of consumer goods	-0.21	** (p<0.05)	-0.09	Not significant
Real exchange rate	0.08	Not significant	0.20	* (p<0,10)
Inflation	-0.04	Not significant	-0.11	Not significant
ETC (-1) (correction term)	-0.74	*** (p<0.01)		

In the long term, imports of capital goods have a positive and statistically significant effect on economic growth. The estimated coefficient is 0.64 (p<0.01), indicating that the increase in these imports contributes to the improvement of real GDP. This result suggests that capital goods play an important role in the accumulation of productive capital and the modeling of the economy.

On the other hand, imports of consumer goods do not have a significant long-term effect, but their impact is negative and significant in the short term, with a coefficient of -0.21 (p<0.05). This reflects a possible competition with local production and a substitution for national production.

Regarding the control variables, the real exchange rate has a positive but slightly significant long-term effect (0.20; p<0.01), while inflation does not show a significant effect on growth. The error correction term (ECT (-1)) is negative and highly significant (-0.74; p<0.001). This indicates that the economic system is rapidly converging towards its long-term equilibrium after a shock. About 74% of short-term imbalances are corrected in one year, which reflects a relatively high speed of adjustment.

Overall, the results show that the impact of imports on economic growth in Madagascar strongly depends on their nature. Capital goods appear to be a factor in supporting long-term growth, while consumer goods mainly exert negative effects in the short term.

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IV. DISCUSSION

The results obtained highlight the differentiated effects of imports on economic growth in Madagascar, confirming the hypothesis according to which the impact of foreign trade strongly depends on the nature of the imported goods.

On the one hand, imports of capital goods appear to be a determining factor in long-term economic growth. The positive and significant coefficient (0.64; p<0.01) suggests that these imports contribute to the accumulation of productive capital and to the improvement of the national production capacity. This result is consistent with the work of the endogenous growth literature, in particular those of Romer (1990) and Grossman and Helpman (1991), who emphasize the role of technological imports in the dissemination of technical progress. In the case of Madagascar, this dynamic seems particularly important in a context marked by low industrialization and dependence on foreign technologies.

On the other hand, imports of consumer goods have a negative short-term effect on economic growth. This result can be implied by a substitution effect between imported products and local production, resulting in a reduction in the demand addressed to national companies. This situation weakens the local productive sectors and limits the multiplying effects on the economy. It joins the analyses of Rodrik (2006), who highlights the risks of premature deindustrialization in open economies without an adapted industrial strategy.

Moreover, the model shows that economic imbalances are quickly corrected, as indicated by the significant coefficient of the error correction term (-0.74). This reflects a relatively high adjustment capacity of the Malagasy economy in the face of short-term shocks. Overall, these results confirm that the impact of imports on economic growth cannot be analyzed in an aggregated way, but must be differentiated according to their economic nature.

V. CONCLUSION AND RECOMMENDATIONS

The objective of this study was to analyze the impact of imports on Madagascar's economic growth over the period 1980-2020, distinguishing the effects of capital goods and consumer goods. By mobilizing an ARDL approach estimated under EViews10, the results show the existence of a long-term relationship between the variables studied.

The estimates reveal that imports of capital goods have a significant positive effect on long-term economic growth, while imports of consumer goods exert a negative effect in the short term. These results highlight the importance of the structure of imports in the dynamics of economic growth.

In terms of the economic policy implications, these results suggest the need for a strategic orientation of foreign trade. It seems essential to promote imports with a productive vocation, in particular capital goods, while putting in place mechanisms to support local production in order to reduce dependence on imported consumer goods. A coherent industrial policy, accompanied by incentives for investment and the development of national productive capacities, could strengthen the positive effects of foreign trade on growth.

However, this study has some limitations. It is based on aggregated data which do not allow a fine sectoral analysis of the effects of imports. In addition, some structural variables such as institutional quality or private investment were not integrated into the model due to data constraints. For future research, it would be relevant to deepen the analysis at the sectoral level or to explore alternative models to better capture

the transmission mechanisms between foreign trade and economic growth.

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