



## Econometric Analysis of the influence of market capitalization on economic growth in Morocco

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**ABSTRACT:** This paper present an economic analysis of the influence of market capitalization on economic growth in Morocco. Indeed, we are trying to diagnose the effect of market capitalization on Gross domestic product, on national consumption of households, on the exchange rate, on the unemployment rate, and on the deficit of the trade balance. The evidence shows that market capitalization at Morocco does not influence national household consumption, nor gross domestic product. This econometric result is also confirmed in the long term. However, no causal relationship is found in between gross domestic product does and stock market capitalization in short and long run. at the level of national household consumption, the absence of any kind of causality with market capitalization, As for the relationship of Gross domestic product with market capitalization, the absence of any kind of short and long term relationship.

**Key Words:** ARDL, economic growth, market capitalizationm, stock market.

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### 1. Introduction

The influence of market capitalization on economic growth is of great interest to many academics and researchers, as they play a vital role in the economy. Nevertheless, the literature in this area seems to be unsuitable and the interactions between economic growth and market capitalization are still not clear.

In recent years, financial systems admitted as a main determinant of economic stability and growth. Market capitalization is an unabridged part of the financial system of the economy. It plays an important role to lead the economic growth, thriftiness and investment in the country. Empirical results show the significant positive impact of stock market development on economic growth of specific economies. [15] a rogues that an increase in the stock prices leads to increase in the individual wealth holdings simultaneously which leads to higher consumption or savings. The continuous development and stability of stock market is very indispensable for economic growth and cannot be ignored in any economy. Augury of stock market performance through macroeconomic variables is a important concern of both professionals and academicians.

The relationship between market capitalization and economic growth has been a key study concern in the literature. A number of papers, including [9], have study impact of interest rate differentials on market capitalization in Pakistan. In [12] study evaluates the performance of large market capitalization shares using a performance model that is adjusted to risks due to the COVID-19 outbreak. Philip C. [19] study the interest Rates Affect Market Capitalization Growth Rates in the US. in [16] investigates how interest rates affect the market capitalization growth rate of individual companies in the US. In [8]

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study the evolution of stock market size resembles a hockey stick. The stock market cap to GDP ratio was stable for more than a century, then tripled in the 1980s and 1990s. In [11] examines the effect of interest rates on the stock market capitalization rate in Amman Stock Exchange (ASE) over the period 1999-2008. Based on the multiple linear regression model and simple regression model.

For instance, the relationship between stock market capitalization rate and interest rates investigated by [5]. In his study, he investigated the long run relationship between stock market capitalization rate and interest rates in Turkey over the period 1998-2012, he found that there is long-run relationship between stock market capitalization rate and interest rates. [17] analyzed the relationship between corporate payout policy and market capitalization with a different statistical techniques of correlation, regression, fixed effect and random. He found that measures of corporate payout policy, dividend yield and payout ratio has strong negative correlation with market capitalization. In addition, his results point out that the corporate payout policy has significant impact on market capitalization in Pakistan. [18] examined the causal linkage between stock stock market capitalization and economic growth for Saudi Arabia for the period 1985-2012 employing a Vector Autoregressive Model. The study reveals the existence of relationship between economic growth and stock market capitalization

The growth performance of Morocco over the last one and a half decades along with the stock market development evokes the influence of market capitalization on economic growth. The study investigates the time series evidence of the influence of market capitalization on growth of Morocco economy for the period 2000-2020 employing ARDL Bounds testing approach and finds market capitalization has direct influence on economic growth both in the short-run together with Trade balance, Urban unemployment and exchange rate and infirm any kind of long-term causation. Granger causality tests confirm a causal relationship between market capitalization and Trade balance, Urban unemployment and exchange rate except National household consumption and Gross domestic product.

The main objective of this study is to examine the influence of market capitalization on economic growth in Morocco by using 10 years annual data from 2000 to 2020 and applying more rigorous economic technique. The rest of paper is organized as follow: Sect. 2 reviews the empirical literature on the relationship of market capitalization on economic growth . Section 3 discusses the modeling framework; Sect. 4 shows estimations and results, Sect. 5 analyze the causal relationship between considered variables and the final section conclude the study and provide some policy implications

## 2. Literature review

In this section, some selected literature has been reviewed on the relationship between GDP, national consumption of households, exchange rate, unemployment rate, deficit of the trade balance and stock market capitalization.

Li Liu et al. [13] investigate the causal relationship between Shanghai stock market and CNY/USD exchange rate by using the time series data from the period of 2005, 2011. Results of linear and nonlinear Granger causality tests indicate the no causal between stock prices and exchange rates during the period before the recent financial crisis. Results also indicate the after the financial crisis, a unidirectional causality behavior running from exchange rates to stock index is present. Some research studies find negative relationships [4,6,22]. Although some find positive links between exchange rates and stock returns [3,4,21], other studies show insignificant links between the two variables [2].

Takashi Miyazaki et al. [20] investigate the causal relationships between gold return and stock market performance by using the annual data from the period of 4 January 2000 to 28 April 2011. Nonuniform weighting cross-correlations has been used. Results indicate the unidirectional causality in mean from stock to gold and no causality in variance between the two.

Ho Yong Kima et al. [10] investigate the relationship between fund performance and stock market in Korean by using the data from the 2001 to 2013. Results indicate the significant positive impact of exchange rate, oil prices and gross domestic production on stock prices,

while, negative and significant relationship is found between interest rate and stock prices. The results of money supply and inflation are found insignificant.

Abdullahil Mamun et al. [1] investigate the the influence of stock market development on growth of Bangladesh economy for the period 1993-2016. The ARDL Bounds testing approach has been used. Results indicate the stock market development has direct impact on economic growth both in the short-run as well as in the long run together with financial depth, interest rate spread and real effective exchange rate. Results of Granger causality test indicate a bidirectional causal relationship between stock market development and economic growth.

Deng-Kui Si et al. [7] investigate the causal relationship between stock market cycle and business cycle in Chin a by using the quarterly time series data from 1992Q1 to 2018Q1. Wavelet analysis results indicate the stock market cycle tends to lead the business cycle in expansion periods whereas the business cycle tends to lead the stock market in recession periods, Results also suggest that there are substantial time- and frequency-variations in the co-movement and causal relationship between the two cycles in China.

Mourad Mroua et al. [14] investigate simultaneously the causality and the dynamic links between exchange rates and stock market indices and identify the short- and long-term effect of the US dollar on major stock market indices of Brazil, Russia, India, China and South-Africa (BRICS) nations. Panel generalized method of moments model and the panel auto-regressive distributed lag (ARDL) techniques have been used. results indicate existence of a causal short-/long-run relationships and dynamic dependence among all stock market returns and exchanges rates changes of BRICS countries. Results indicate the exchange rate changes have a significant effect on the past and the current volatility of the BRICS stock indices. Besides, ARDL estimations reveal that exchange rate movements have a significant effect on short- and long-term stocks market indices of all BRICS countries.

### 3. Empirical framework

In this study, 20 years annual data of Morocco country have been used from 2000 to 2020. All data are acquired from official websites of Bank al Maghrib and Casablanca Stock Exchange of Morocco country. All variables are in logarithm form.

Table 1: The variables of the econometric model.

Variables	Entitled	Source
MC	Market capitalization	Stock Exchange
ER	Exchange rate	Usherbrook perspective
NHC	National household consumption	Bank al Maghrib
TB	Trade balance	Bank al Maghrib
GDP	Gross domestic product	Bank al Maghrib
UUM	Urban unemployment in Morocco	Bank al Maghrib

### 3.1. Descriptive statistics

Table 2: Descriptive statistics.

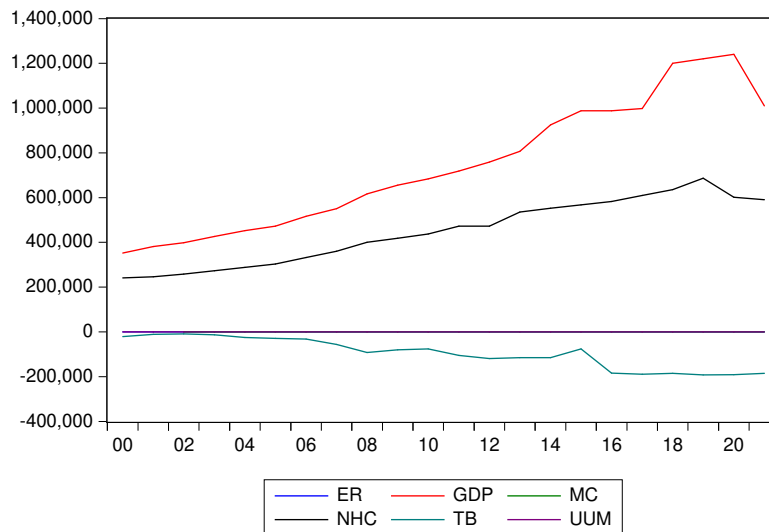
	Mean	Median	Stan. Dev	J-B	Kur	Max	Min	Obs
ER	8.93	8.83	0.82	1.53	3.10	11.02	7.75	20
GDP	$7.81 \times 10^5$	$7.38 \times 10^5$	$2.75 \times 10^5$	1.37	1.81	$1.24 \times 10^6$	$3.99 \times 10^5$	20
MC	57.72	52.75	19.81	1.38	3.45	106.46	21.82	20
NHC	$4.69 \times 10^5$	$4.73 \times 10^5$	$1.35 \times 10^5$	1.46	1.70	$6.87 \times 10^5$	$2.58 \times 10^5$	20
TB	$-1.03 \times 10^5$	$-9.88 \times 10^4$	1.54	1.46	1.66	$-9.39 \times 10^3$	$-1.92 \times 10^5$	20
UUM	15.28	14.70	1.80	4.70	2.97	19.30	13.40	20

Source : generated by the authors based on results from Eviews.9

From this descriptive analysis which summarizes the data on the variables studied in the Moroccan case, for the period 2000 to 2021, we find that:

The ER variable recorded an average evolution of 8.93 with a standard deviation of 0.81 over the period from 2000 to 2001. The variable follows a normal distribution (Jarque-Bera statistic is greater than 5%) with a flattened distribution.

With regard to the other remaining variables, we find almost the same results. Indeed, all variables follow a normal law (probability greater than 0.005) with a highly flattened distribution for the MC variable, moderately flattened for the UUM variable and weakly flattened for the NHC and TB variables.



### 3.2. Stationary test

After presenting the variables that will be the subject of our study, we now turn to the analysis of the stationarity of the different series. We use Augmented Dickey-Fuller (ADF) and Phillips-Perron unit root tests to check the stationary properties.

Table 3: Stationary test results.

Variables	Stationarity test		Stationarity order	
	PP	ADF	PP	ADF
MC	ST	ST	I(0)	I(0)
ER	NST	NST	I(1)	I(1)
NHC	NST	NST	I(1)	I(1)
TB	NST	NST	I(1)	I(1)
GDP	NST	NST	I(1)	I(1)
UUM	NST	NST	I(1)	I(1)

Source Authors' estimation.

Table 3 represents the results of stationary tests. First, these tests are applied on level of variables then on their first difference.

Results of Table 3 show that all variables are not stationary and integrated at first difference except the variable MC is stationary. This implies that the series of variables may show a valid long run relationship.

From the different stationarity tests, we notice that the different variables have a different degree of integration and less than 1. Therefore, the most suitable econometric model in this situation is ARDL.

### 3.3. ARDL bound testing approach

The ARDL cointegration technique is used with the help of unrestricted vector error correction model in determining the long run relationship between series with different order of integration (Pesaran and Shin, 1999, and Pesaran et al. 2001). The reparameterized result gives the short-run dynamics and long run relationship of the considered variables.

From the different stationarity tests, we notice that the different variables have a degree of integration different from and less than 1. Therefore, the econometric model more suitable in this situation is the ARDL.

The ARDL, or the autoregressive model with staggered delays, makes it possible to estimate the relationship between variables with a different level of integration and less than 1. Indeed, this model also allows you to test short-term and long-term relationships. In a way In general, the ARDL model is presented as follows:

$$Y_t - \beta_0 + \sum_{i=1}^p \beta_i Y_{t-i} + \alpha_0 X_t + \sum_{i=1}^q \alpha_i X_{t-i} + \varepsilon_t$$

with

$p$ : delays of the variables to be explained,

$q$ : lags of the explanatory variables,

$\beta_1 - \beta_p$ : coefficients of the error correction model,

$\beta_1 - \beta_q$ : Long-term relationships,

$\Delta$ : first differences.

Therefore, the model to be estimated looks like this:

$$\begin{aligned} \Delta MC_t &= \beta_0 + \sum_{i=1}^p \beta_{1i} MC_{t-i} + \sum_{i=1}^q \beta_{2i} ER_{t-i} + \sum_{i=1}^p \beta_{3i} NHC_{t-i} + \sum_{i=1}^q \beta_{4i} GDP_{t-i} \\ &+ \sum_{i=1}^q \beta_{5i} UUM_{t-i} + \alpha_1 UUM_{t-1} + \alpha_2 ER_{t-1} + \alpha_3 NHC_{t-1} + \alpha_4 GDP_{t-1} \\ &+ \alpha_5 UUM_{t-1} + \lambda_t, \end{aligned}$$

where  $\lambda_t$  is white noise error term and  $\beta_0$  is constant, the error correction dynamics is indicated by

summation sign as the second part of the equation answers to long run relationship. Schwarz Bayesian Criteria (SBC) has been used to identify the optimum shift of model and each series. In ARDL model we first estimate the F-statistics value by using the suitable ARDL models. Secondly, the Wald (F-statistics) test is used to explore the long run relationship amongst the series. The null hypothesis of the cointegration is that ( $H_0 = \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = 0$ ). The null hypothesis of no cointegration is rejected if the calculated F-test statistics outstrips the superior critical bound value. The results are said to be inconclusive if the F-test statistics autumns between the upper and lower critical bound. Lastly, the null hypothesis of no cointegration is accepted if the F-statistics is under the lower critical bound.

The results of the econometric model are grouped together in the following table:

Table 4: Estimation of short-term and long-term relationships.

<b>Short-term relationships</b>	
$Y_i$	MC
$ECM_{t-1}$	-0.822966* (0.0136)**
UUM	-7.997046 (0.0091)
NHC	-0.000000 (0.9883)
GDP	-0.000017 (0.4168)
TB	0.000444 (0.0405)
ER	-20.980008 (0.0069)
<b>Long-term relationships</b>	
$Y_i$	MC
UUM	-12.059672 (0.0536)
NHC	0.000003 (0.9883)
GDP	-0.486935 (0.5631)
TB	0.000849 (0.1583)
ER	-33.266247 (0.5631)
C	-7.955639 (0.0598)

*Source* : constructed by the author from EViews.9

Note: \* Coefficient of variables \*\* (.) Probability at the 5% level.

#### 4. Analysis and results

By referring to the various results obtained, we can draw three main conclusions.

First, from a short-term economic perspective, market capitalization in Morocco does not influence national household consumption, nor gross domestic product. This econometric result is also confirmed in the long term.

Indeed, at the level of national household consumption, the absence of any kind of causality with market capitalization is explained by the low contribution of the Moroccan stock exchange in the creation of income and therefore in the consumption of Moroccan households. .

With respect to gross domestic product, the model indicates that it does not represent any cause-and-effect relationship with short- and long-term market capitalization. This result is explained by the weak contribution of market capitalization in the creation of wealth at the national level consisting mainly of agricultural and industrial products and services (tourism, etc.).

Then, the econometric results confirm a significant cyclical causality for the variables ER, UUM and TB and invalidate any kind of long-term causality.

This cyclical significance result should be treated with caution given the smallness of our sample (20 observations). Thus, the relationship between market capitalization and the unemployment rate is always part of a medium and long term perspective, the capital requires a certain time for it to be transformed into an investment, then a period for it to be declined. In terms of trade policy, profit and finally account, a revitalization of the labor market (UUM) and export (TB).

On the other hand, the cyclical significance observed between the variable MC and ER has no empirical basis. Indeed, Morocco has always practiced a fixed exchange rate policy, which inhibits any relationship mechanism between the MC variable and ER.

Finally, the econometric results invalidate any kind of long-term causality between all the variables studied and market capitalization.

This result coincides perfectly with the Moroccan economic structure. Indeed, according to official statistics, Morocco has more than 500,000 companies (OMPI, 2019), 80% of which are SMEs (HCP, 2019). However, the Moroccan stock exchange has only 75 companies (BVC, 2020).

Indeed, the worsening of the trade balance in Morocco is caused by the nature of Moroccan imports of high added value and Moroccan exports of low added value. Therefore, market capitalization has no effect on the Moroccan external balance.

As for the relationship of GDP with market capitalization, the absence of any kind of relationship in the short and long term can be explained in particular by the composition of GDP. Thus, the 5th Moroccan gross domestic product with its three components, primary, secondary and tertiary does not show any avenue for improvement that could be generated by the market capitalization in Morocco (BAM 2019).

With regard to domestic consumption, the absence of any kind of long-term causality with market capitalization is explained by the sources of household income which have no cause and effect relationship with stock market activity. Indeed, in Morocco the main sources of income come from agriculture, industry and services. However, market capitalization has no impact on household income in Morocco and consequently on national consumption.

For the exchange rate, the econometric results invalidate any kind of causality between market capitalization and the long-term exchange rate, this result is still explained by the discretionary exchange rate policy in Morocco.

## 5. Conclusion

This paper examines the causality and the influence between the market capitalization on growth of Morocco economy for the period from January 2000 to February 2020. A methodology has been applied through the ARDL method to measure the short- and long-term relationships. The results show that the market capitalization has direct influence on economic growth both in the short-run together with Trade balance, Urban unemployment and exchange rate and infirm any kind of long-term causation. Granger causality tests confirm a causal relationship between market capitalization and Trade balance, Urban unemployment and exchange rate except National household consumption and Gross domestic product.

In the end, our results have a great contribution for public authorities in Morocco and for international investors.

For public authorities, the virtual absence of the influence of market capitalization on economic growth is a sign of structural dysfunction in the Moroccan economy. Indeed, the public authorities should establish conjunctural and structural policies in order to encourage the introduction of companies to the stock market which would further encourage economic growth.

For international investors, the absence of any cause and effect relationship between the exchange rate and market capitalization is a guarantor of low risk for any international financial investor. Indeed, the

embryonic financial centers available to Morocco (casa finance city, etc.) would constitute a favorable opportunity for these international investors.

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Dependent Variable: MC  
 Method: ARDL  
 Date: 03/09/21 Time: 13:33  
 Sample (adjusted): 2003 2015  
 Included observations: 13 after adjustments  
 Maximum dependent lags: 1 (Automatic selection)  
 Model selection method: Akaike info criterion (AIC)  
 Dynamic regressors (0 lag, automatic): UUM NHC GDP TB ER  
 Fixed regressors: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
MC(-1)	0.343153	0.271355	1.264590	0.2529
UUM	-7.921360	3.768442	-2.102025	0.0803
NHC	1.87E-06	0.000122	0.015259	0.9883
GDP	-1.13E-05	1.83E-05	-0.617396	0.5597
TB	0.000558	0.000318	1.756001	0.1296
ER	-21.85084	12.66923	-1.724716	0.1353
C	397.4738	151.6879	2.620340	0.0396

R-squared	0.890957	Mean dependent var	62.40928
Adjusted R-squared	0.781913	S.D. dependent var	21.76370
S.E. of regression	10.16359	Akaike info criterion	7.779234
Sum squared resid	619.7918	Schwarz criterion	8.083438
Log likelihood	-43.56502	Hannan-Quinn criter.	7.716707
F-statistic	8.170667	Durbin-Watson stat	1.707426
Prob(F-statistic)	0.010937		

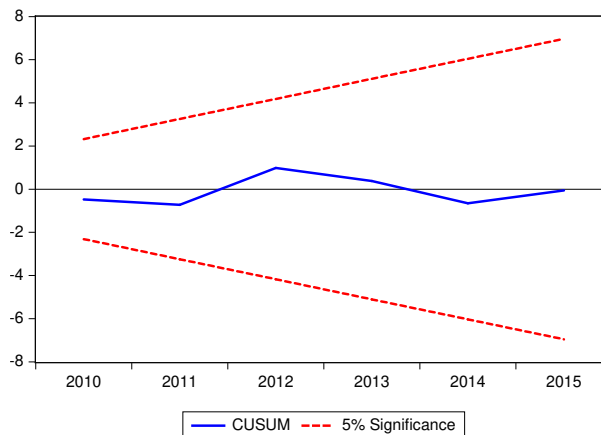
\*Note: p-values and any subsequent tests do not account for model selection.

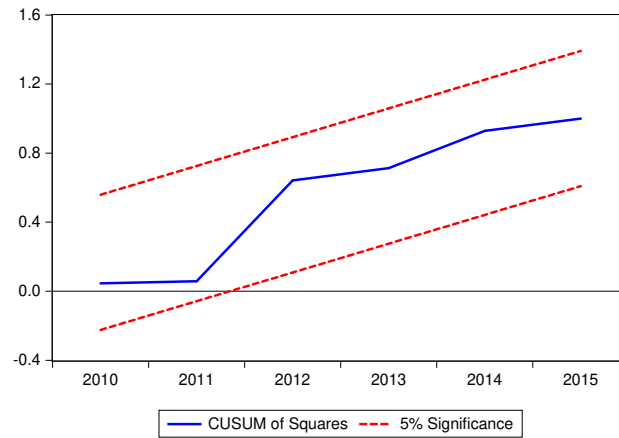
ARDL Cointegrating And Long Run Form  
 Dependent Variable: MC  
 Selected Model: ARDL(1, 0, 0, 0, 0, 0)  
 Date: 03/09/21 Time: 17:26  
 Sample: 2000 2019  
 Included observations: 13

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(UUM)	-7.997046	2.110939	-3.788384	0.0091
D(NHC)	-0.000000	0.000092	-0.002712	0.9979
D(GDP)	-0.000010	0.000011	-0.871842	0.4168
D(TB)	0.000444	0.000171	2.602270	0.0405
D(ER)	-20.980008	5.202238	-4.032881	0.0069
CointEq(-1)	-0.822966	0.238294	-3.453573	0.0136

Cointeq = MC - (-12.0597\*UUM + 0.0000\*NHC -0.0000\*GDP + 0.0008\*TB -33.2662\*ER + 605.1238 )

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
UUM	-12.059672	5.033345	-2.395956	0.0536
NHC	0.000003	0.000186	0.015260	0.9883
GDP	-0.000017	0.000028	-0.611842	0.5631
TB	0.000849	0.000527	1.610845	0.1583
ER	-33.266247	14.368507	-2.315220	0.0598
C	605.123801	136.174151	4.443749	0.0044





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