

The effect of US fundamentals on the Moroccan stock market pre- and post- FTA

Abdelmounaim Lahrech¹, Sami Alabdulwahab*² and Mounia Ammi³

¹ Assistant Professor of Economics and Statistics at School of Business Administration
Al Akhawayn University. P.O Box 104 Hassan II Avenue 53000 Ifrane, Morocco.

² Visiting Assistant Professor of Economics and Finance at School of Business
Administration, Al Akhawayn University. P.O Box 104 Hassan II Avenue 53000 Ifrane,
Morocco.

³ Master graduate from School of Business Administration
Al Akhawayn University. P.O Box 104 Hassan II Avenue 53000 Ifrane, Morocco.

ABSTRACT

The relationship between macroeconomics and the stock market in developed countries has been for many years the object of many studies and research. However, few studies have been conducted about emerging countries, and especially in the case of Morocco there is a lack of studies in this area. Therefore, this paper will be the first to analyze the impact of US fundamentals, including industrial production, real money supply, and the S&P 500 on Moroccan stock prices before and after the Free Trade Agreement (FTA) signature. This study enables us to reduce the gap between the theoretical framework and research conducted for other countries. Our results showed that US macro fundamentals have a slight impact on the Moroccan stock market after the signature of the FTA, and that US industrial production in particular highly influences the Moroccan index compared to the other variables studied.

Keywords: Trade Agreement; Stock Market; Emerging Countries.
JEL classifications: E44; F36; G15.

28 **1. Motivation and background**

29

30 Because the stock markets play a crucial role in the market based system, they should
31 reflect all the changes on the economy. In fact, financial markets serve as a conduit for the
32 flow of resources from savers to borrowers hence they are vital for economic development.

33 Fama (1970) states that stock price should incorporate all information and the future
34 predictions about the forthcoming performance of the company. However, the performance
35 of each company is strongly influenced by the level of the economy. Taking this influence
36 into consideration, policy makers should analysis the relationship between stock prices and
37 macroeconomics variables.

38 As globalization increases, financial markets become more integrated than before. First,
39 we will define the concept of integration. The integration of financial markets is the
40 harmonization of markets that can be boosted by free access to different markets and level
41 of capital mobility. The evolution of this process depends on the particular situation in each
42 individual country. According to Bekeart (1995), there are four different types of constraints
43 that can discourage investors from investing in emerging markets. Those four constraints are
44 legal constraints, differences in accounting standards, instability of the political situation and
45 economic policy. The growing trend toward integration is motivated by deregulation and
46 globalization. As a result of financial crises in recent days, central banks all over the world
47 are trying to improve the financial markets in order to be protected. Deregulation in emerging
48 markets has resulted in the removal of constraints on pricing of many financial assets.

49 However, it is appropriate to notice the difference between the concepts of liberalization
50 and integration. Stock market liberalization is the decision of a country's government which
51 gives the right to foreign investors to invest in that country's stock markets, according to
52 Henry (2000a). For example, a country can implement a law which stipulates the removal of
53 all the barriers to foreign investors. On the other hand, this liberalization cannot be efficient if
54 it does not ease market integration.

55 Market integration is very important to develop market efficiency and promote economic
56 growth. In addition, it is mainly used by government to communicate important price signals.
57 Also, it is a channel between domestic savings and domestic investment.

58 Recently, countries all over the world, including Morocco, have engaged in a policy for
59 economic integration and liberalization. In fact, Morocco officially liberalized and opened its
60 equity market to international investors in June 1988, and the first American Depositary
61 Receipt (ADR) was issued in April 1996. In the same year, Morocco established new capital
62 market laws which intend to encourage private investment and increase investor protection.
63 Furthermore, the laws improve the banks' role in stimulating and boosting capital markets by
64 the creation of mutual funds. In 2003, Morocco signed a free trade agreement with the
65 United States which came into force on January 1, 2006. The main objective of this
66 agreement was to encourage mutual economic, political and social relationships to help
67 Morocco to become one of the most developed countries in the Arab world.

68 Morocco is an emerging country situated in a strategic location between Africa and
69 Europe. Morocco is the first African and the second Arab country after Jordan to sign an
70 agreement with the United States. In 2003, Morocco traded 0.82 billion dollars with United
71 States. On the other hand, Morocco traded more than 15 billion dollars with the European
72 Union (EU) in 2003. In 2007, the total trade between Morocco and United States reached
73 2.19¹ billion dollars. Exports between Morocco and United states have not changed pre and
74 post the trade agreement. Imports increased from 0.57 billion dollars in 2003 to 1.8 billion
75 dollars in 2007. Furthermore, exports increased from 0.24 billion dollars n 2003 to 0.36
76 billion dollars in 2007. The exports consist mainly of agricultural products, such as processed
77 vegetables, olive oil, and essential oils

78 Morocco signed a free trade agreement (FTA) with many other countries, including the
79 Euro-Mediterranean free trade area agreement with the European Union, and the Agadir
80 Agreement that was signed with Tunisia, Jordan and Egypt. The objective of this trade

¹ Direction Of Trade (DOT) IMF data

81 agreement was to establish the Greater Arab Free Trade Area. Also, Morocco signed a free
82 trade agreement with Turkey.

83 Panagariya (2002) concludes that FTAs between industrial and emerging economies are
84 expected to have important effect on emerging economies in general. This can be explained
85 by the dependence of emerging economies on trade and less regulated markets. Since the
86 1960s, Morocco's industrial sectors have been very specialized, relying principally on goods
87 exported to the European market.

88 Moroccan exports to the United States have increased under the FTA. In 2008, exports
89 more than doubled compared to 2005 which increased from 0.27 billion dollars to 0.69 billion
90 dollars. However, the financial crisis has affected worldwide trade and has resulted in a
91 decrease of Morocco's US sales. On the other hand, Moroccan agricultural exports to the
92 US increased by 30 percent. The increase in the level of trade and investment between the
93 two countries will contribute to their respective economies and their financial markets. In
94 addition, there is a greater possibility that the countries will become more integrated. In
95 1960, Greek economist Béla Balassa developed a theory indicating that the increase in trade
96 between two or more countries will lead to an increase in their GDP and welfare.

97 98 **2. LITERATURE REVIEW**

99
100 In recent studies, the relationship between stock returns fluctuations and
101 macroeconomics variables has been proven by many research studies².

102 Chen, Roll and Ross (1986) used a multivariate arbitrage pricing theory (APT) to
103 analyze the relationship between the market returns and macroeconomic factors, especially
104 the impact of risk related to the different factors on the asset's return. Their study included
105 data of industrial production, the money supply, inflation, and interest rate and exchange rate
106 variables. They found a strong relationship between the market returns and those variables.
107 Also, McQueen and Roley (1993) studied the impact of economic news during different

² Fama (1981, 1990), French, Ruback and Schwert (1983), Geske and Roll (1983), Kaul (1987), Fama and French (1989), Barro (1989 and 1990), Schwert (1990), Balvers, Cosimano and McDonald (1990), Coshane (1991) and Lee (1992).

108 economic stages. They discovered that the reactions of the stock market depend mainly on
109 the state of the economy.

110 Diacogiannis et al. (2001) conducted a study to investigate the linkage between the
111 Greek stock market and 18 variables between 1980 and 1992. They found that there is an
112 important relationship between stock returns and 13 out of the 18 variables. Also,
113 Wongbangpo and Sharma (2002) studied the relationship between the stock returns and five
114 macroeconomic variables for the ASEAN-5, which includes Indonesia, Malaysia, the
115 Philippines, Singapore, and Thailand. Their result showed that money growth was the main
116 macroeconomic variable that impacted the Asian stock return in Malaysia, Singapore and
117 Thailand. Furthermore, Mukhopadhyay and Sarkar (2003) studied the linkage between
118 macroeconomic variables and the Indian stock market and to what extent the removal of
119 economic constraints impacted that linkage. They found that the main variables that
120 generated the changes in the Indian stock market are the NASDAQ-index, the foreign direct
121 investment and inflation. However, the results showed that the nominal exchange rate has
122 no impact on the Indian stock price during the period of post-liberalization, in respect to the
123 pre-liberalization period (1989-1995) where the nominal exchange rate had a major impact
124 on the Indian stock market.

125 In analyzing the effect of macroeconomic variables on stock market returns, studies
126 have been focusing on particular variables, for example the inflation and exchange rate.
127 Fama (1981) argued that most economic variables except inflation have a positive
128 correlation on stock returns. Furthermore, Abdullah and Haywarth (1993) found that inflation
129 and money supply are the two significant variables affecting stock returns in their study.
130 Also, Habbibullah et al. (1996) proved a positive relationship between money supply and
131 GDP on stock returns. De Santis, G. and Gerard, B. (1997), found that inflation is
132 fundamental among exchange rate, interest rates and money supply on affecting stock
133 returns in the Asian crisis. On the other hand, Ibrahim (1999) found that inflation has a
134 negative impact on stock returns. Other studies have proven the linkage and the importance

135 of macroeconomic variables on stock returns (e.g. Maysami and Koh (2000), Islam and
136 Watanapalachaikul (2003) and Pisedtasalasai, Gunasekarage and Power (2004)).

137 Studies also have shown that globalization and interaction among economies have been
138 increasing. Thus, stock markets are not only affected by their host country's
139 macroeconomics variables, but also by other economies' macroeconomics variables.
140 Arshanapal H and Doukas, (1993), found that European stock markets are more directly
141 influenced by changes in the US than in Japan economies. Yu (1997) found that changes in
142 the exchange rates of Japanese Yen and Hong Kong Dollars have an impact on stock
143 returns in the Singapore stock market. Li Lian Ong and H.Y.Izan (1999), have found that
144 French and Japanese exchange rates have a significant impact on US stock returns.
145 Furthermore, Song-zan-chiou-wei (2000) studied the linkage between macroeconomic
146 variables and Asian stock returns. He found that oil prices and inflation have a significant
147 impact on the Asian stock market. Lahrech (2009), explored the impact of both US and
148 Canadian macroeconomics variables on the Canadian stock returns. The results showed
149 that this impact is mainly explained by the business cycle.

150 However, there are studies which find either a minimal effect of macroeconomics
151 variables on stock returns or an insignificant effect. Wasserfallen (1989), examined the
152 relationship between stock indices and a number of macroeconomic variables (e.g.,
153 industrial production, money supply, interest rates, and exchange rates) for the UK,
154 Germany and Switzerland. The result showed that there were no very significant effects of
155 macroeconomics fundamentals on stock returns. Furthermore, Fung and Lie (1990) found
156 that the changes in money supply and domestic production have no impact on the stock
157 returns in Korea. Gay (2008) analyzed the impact of oil price and exchange rates for India,
158 Russia, China, and Brazil on the Indian stock returns. He found no significant linkage
159 between those variables and stock returns.

160 A Free Trade Agreement (FTA) can slant the economic activity toward a small economy
161 if this trade agreement has been signed between countries with a small and large economy

162 respectively³. Also, the integration of higher economies will spillover on markets integration⁴.
163 BenDavid (1993), showed that the trade agreements signed between members of the
164 European Union have had an impact on their economies. This impact can be expressed
165 through income convergence among those signed countries. Since a FTA will have an
166 impact on the macroeconomics variables, thus the stock market will be affected by that
167 impact. Maghyreh and AlZuobi (2005), analyzed the impact of the signature of the trade
168 agreement between Jordan and US. They found that the agreement has increased the
169 markets' linkage between the two countries. Other studies have argued that the strength of
170 linkage is different from one country to another, according to Darrat, Elkhal and Sam (2000).
171 Also, the free flow of capital between countries will result in the integration of emerging
172 markets. However, this integration lowers the opportunity of diversification among those
173 integrated markets. Syriopoulos (2004). Lahrech and Boujir (2008), studied the linkage
174 between the Moroccan and the US equity markets after the signature of the FTA in 2004.
175 Their results indicated that the US and Moroccan stock markets were not significantly related
176 at the moment of the signature and establishment of the free trade agreement. Therefore,
177 will US macroeconomics variables have an impact on the Moroccan stock market even if
178 there is no significant linkage between their stock markets? This question can be answered
179 by investigating the period before and after the FTA signature. If the result shows no change
180 in both periods, this will prove that the FTA has no effect on the Moroccan stock market.
181 Otherwise, the results will prove the effect, and investors can predict the direction of the
182 Moroccan stock market by paying attention to US economy.

183 **3. Model specification**

184 **3.1 Money supply**

185

³ Abou-Zaid and Alabdulwahab (2013).

⁴ Eun and Shim (1989).

186 The relationship between money supply and stock returns was developed by
187 Friedman and Schwartz (1963). They argued that an increase in prices can be explained by
188 the fact that money supply increases (M2). This will inject more money into circulation, and
189 thus the demand on securities will increase. Increasing the demand on securities will raise
190 the prices of those securities. However, Fama (1990) stated that an increase in (M2) will
191 result in an increase in the price level, and thus will raise the discount rate and stock returns
192 will decrease. Moreover, an increase in the price level will encourage investors to sell their
193 securities and other assets which explain the decline of securities and assets prices.
194 Furthermore, Kraft and Kraft (1977) and Hamburger and Kochin (1972) found an important
195 relationship between the stock return and price level. On the other hand, Cooper (1974) and
196 Nozar and Taylor (1988) in their study found no relationship between the variables stated
197 above.

198 **3.2 Industrial production**

199 There is a positive relationship between the industrial production and stock returns,
200 according to Tainer (1993). Moreover, an increase in industrial production will reflect the
201 increase in corporations' profit, growth of the economy and consequently a higher dividend
202 that will lead to an increase in share prices. Fama (1990) and Geske and Roll (1983), found
203 a significant relationship between industrial production and stock returns.
204

205 **3.3 Consumer Price Index**

206 Many studies have found a significant relationship between inflation and stock returns.
207 Moreover, the relationship between stock returns and inflation has been negative, according
208 to studies by Kryzanowski and Zhang (1992), Chan, Chen and Hsieh (1985) and Chen and
209 Jordan (1993).
210

211

212 4. Methodology

213

214 There are many methods to analysis the relationship between macroeconomics
215 variables and stock returns. One of these methods is Vector Autoregression (VAR). Dhakal,
216 Kandil, and Sharma (1993) used VAR to investigate the impact of a variation of the money
217 supply on a variation in the stock market index. This method has strength in analyzing the
218 effect of variable on other variable. Another method is Vector Error Correction Model
219 (VECM). Mukherjee & Naka (1995), used VECM to analyze the association between the
220 inflation, money supply, exchange rate, real economic activity, long-term government bond
221 rate and the Japanese stock market. This method can be used to find the deviation of the
222 relationship from long-run state. Another method is Autoregressive Conditionally
223 Heteroscedastic (GARCH). Lahrech and Boujir (2008), used (GARCH) to study the linkage
224 between the Moroccan and the US equity markets after the signature of the free trade
225 agreement in 2004. This method will model the variation in one variable to spillover to other
226 variables. Finally, from these three methods we will use Johansen and Juselius (1990)
227 because it will give us more relevant estimators of cointegrating vectors. Also, in this paper
228 we will use Johansen's test where all variables are transformed into (5) VECM and takes the
229 form of

$$230 \Delta Y_t = C + \Pi Y_{t-k} + \Gamma_1 \Delta Y_{t-1} + \Gamma_{t-2} \Delta Y_{t-2} + \dots + \Gamma_{k-1} \Delta Y_{t-k+1} + \varepsilon_t \quad (1)$$

231 Where:

$$232 Y_t = C + \sum_{i=1}^k B_i Y_{t-i} + \varepsilon_t, \quad t=1,2,\dots \quad (2)$$

233

234 And:

$$235 \Gamma_i = \sum_{j=1}^i B_j - I_p, \Pi = \sum_{i=1}^k B_i - I_p, \quad (3)$$

236 In addition, we have:

237 I: the identity matrix

238 Δ : difference operator

239 Johansen suggests two tests statistics for cointegration: the maximum eigenvalue
240 and the trace statistics

241 The maximum eigenvalue's equation

$$\lambda_{\max}(r, r+1) = -T \ln(1 - \hat{\lambda}_{r+1}) \quad (4)$$

243 The maximum eigenvalue's hypothesis

244 HO: There are r cointegrating vectors

245 H1: There are r+1 cointegrating vectors

246

247 The trace statistics's equation

$$\lambda_{\text{trace}}(r) = -T \sum_{i=r-1}^p \ln(1 - \hat{\lambda}_i) \quad (5)$$

249

250 The trace statistic's hypothesis

251 HO: The number of cointegrating vectors is less or equal to r

252 H1: The number of cointegration vectors is superior to r

253 In this section of the paper the Augmented Dickey-Fuller (ADF) is used in order to
254 find the order of integration of the time series.

255 **5. Data**

256

257 We will use monthly data from January 2000 to December 2009. Data on money
258 supply, industrial production, and price level are available on www.EconStats.com. Also, we
259 need the Moroccan stock market price index which is available on the Casablanca stock
260 exchange website⁵. In addition, the US stock index (S&P500) can be found on EconStats.
261 All variables are in natural logarithm form. The logic behind taking the sample period
262 between 2000 and 2009 is that on 2004 the free trade agreement between the US and
263 Morocco was signed, and we want to evaluate the impact of this agreement. Thus, we will
264 use data before and after 2004.

⁵ <http://www.casablanca-bourse.com/bourseweb/en/index.aspx>

265 **6. Empirical results**

266

267 Taking into consideration the important impact of the signature of the FTA on the
268 economy of Morocco, the objective of this study is to investigate the degree of the impact of
269 US fundamentals on Moroccan stock markets before and after June 15, 2004 which
270 represents the date of the conclusion of the FTA.

271 The first step is to perform unit root test using ADF (Augmented Dickey-Fuller) which is
272 applied on the variables in levels and first differences in order to find out the order of
273 integration of the variables and to ensure that they are integrated in the same order.

274 Table 1 presents the findings for the unit root tests. The analysis is carried over the sub-
275 periods of pre-FTA and post-FTA.

276 From Table 1, we can conclude that all variables are non-stationary since the ADF
277 statistics are not statistically significant. Then we perform the test on first difference to make
278 sure that all variables are integrated in level one. The results generated from this test show
279 that all variables are stationary and integrated of order one. Since we are using the
280 cointegration procedure, all variables need to be integrated of the same order, which here is
281 order one.

282 **6.1 Cointegration**

283

284 The long run equilibrium relationships represent an important component of the
285 economic theory. In fact, the majority of those econometric studies involving time series are
286 based on the assumption of stationary. In order to attain this assumption two conditions are
287 necessary. First, all trends should be removed and eliminated from the data. Second, all
288 stationary series must have a constant mean and variance. Another important concept of
289 cointegration is the attractor, which stipulates that two variables can diverge in the short run,
290 but in long run they should converge to a specific area called the attractor region.

291 Moreover, cointegration simply stands for the correlation between variables whereas
292 spurious regression stipulates that actually there is no correlation among variables. For

instance, if there are two variables and there is a linkage between them, then the series of residuals in the short and long run will be the same. Thus, the two variables are considered cointegrated. However, if the residuals follow a random path, then the two variables are not cointegrated.

In this section we use the method proposed by Johansen (1988, 1991) and Johansen and Juselius (1990) to test for the existence of the cointegrating vector for the two variables of the Moroccan composite index MASI and the US composite index S&P 500 in the pre-FTA subperiod. All cointegration tests contain an intercept and a linear trend.

Both the Trace and the Max-eigenvalue tests indicate no cointegrating equation in the pre-FTA period. We conclude that in the pre-FTA period there is no cointegration between MASI and S&P500.

Table 1 Unit root tests using ADF (Null hypothesis: Unit root) Pre FTA

Masi	Money Supply	CPI	S&P 500	Industrial Production
ADF-Level				
-0.94	-1.33	-0.13	-1.69	-2.43
ADF-First Difference				
-3.20**	-3.02	-3.59	-3.98**	-3.41**

Note: The MacKinnon critical values at 1%, 5% and 10% levels are : -3.48;-2.88;-2.57 .Significance at a 1% and 5% level is denoted by ** and *, respectively

Table 2 Unit root tests using ADF (Null hypothesis: Unit root) Post FTA

Masi	Money Supply	CPI	S&P 500	Industrial Production
ADF-Level				
-1.81	-0.66	-1.21	-2.20	-2.11
ADF-First Difference				
-4.03**	-3.17	-3.99	-3.33**	-2.82**

Note: The MacKinnon critical values at 1%, 5% and 10% levels are : -3.48;-2.88;-2.57 .Significance at a 1% and 5% level is denoted by ** and *, respectively.

6.1.1 Cointegration between MASI and S&P500

Table 3 Trace statistic Pre FTA

Trace statistic				
Null Hypothesis	Alternative Hypothesis	t-Statistic	Critical Value at 5%	Critical Value at 1%
None	$r \geq 1$	5.23	15.14	20.04
At most 1	$r \geq 2$	0.00034	3.76	6.65

Table 4 Maximum eigen value tests Pre FTA

Maximum eigen-value				
Null Hypothesis	Alternative Hypothesis	t-Statistic	Critical Value at 5%	Critical Value at 1%
None	$r \geq 1$	5.24	14.07	18.63
At most 1	$r \geq 2$	0.00034	3.76	6.65

Table 5 Trace statistic Post- FTA

Maximum eigen-value				
Null Hypothesis	Alternative Hypothesis	t-Statistic	Critical Value at 5%	Critical Value at 1%
None	$r \geq 1$	21.80	15.14	20.04
At most 1	$r \geq 2$	3.41	3.76	6.65

Table 6 Maximum eigen value tests Post- FTA

Maximum eigen-value				
Null Hypothesis	Alternative Hypothesis	t-Statistic	Critical Value at 5%	Critical Value at 1%
None	$r \geq 1$	18.39	14.07	18.63
At most 1	$r \geq 2$	3.41	3.76	6.65

6.1.2 Cointegration between MASI and US macroeconomic fundamentals

In this section we will check whether there is a long-run association between MASI and US macroeconomic fundamentals in the post-FTA period. Specifically, we want to analyze the impact of US macroeconomic fundamentals on the MASI after the signature of the free trade agreement.

334 **Table 7 Trace statistic Post- FTA (Cointegration between MASI and US fundamentals)**

Trace statistic				
Null Hypothesis	Alternative Hypothesis	t-Statistic	Critical Value at 5%	Critical Value at 1%
None	$r \geq 1$	15.85	15.41	20.04
At most 1	$r \geq 2$	0.68	3.76	6.65
At most 2	$r \geq 3$	24.93	29.68	35.65
At most 3	$r \geq 4$	10.77	15.41	20.04
At most 4	$r \geq 5$	2.82	3.76	6.65

335

336 **Table 8 Maximum eigen value tests Post- FTA (Cointegration between MASI and US**
337 **fundamentals)**

Maximum eigen value				
Null Hypothesis	Alternative Hypothesis	t-Statistic	Critical Value at 5%	Critical Value at 1%
None	$r \geq 1$	53.97	33.46	38.77
At most 1	$r \geq 2$	22.81	27.07	32.24
At most 2	$r \geq 3$	14.15	20.97	25.52
At most 3	$r \geq 4$	7.95	14.07	18.63
At most 4	$r \geq 5$	2.822	3.76	6.65

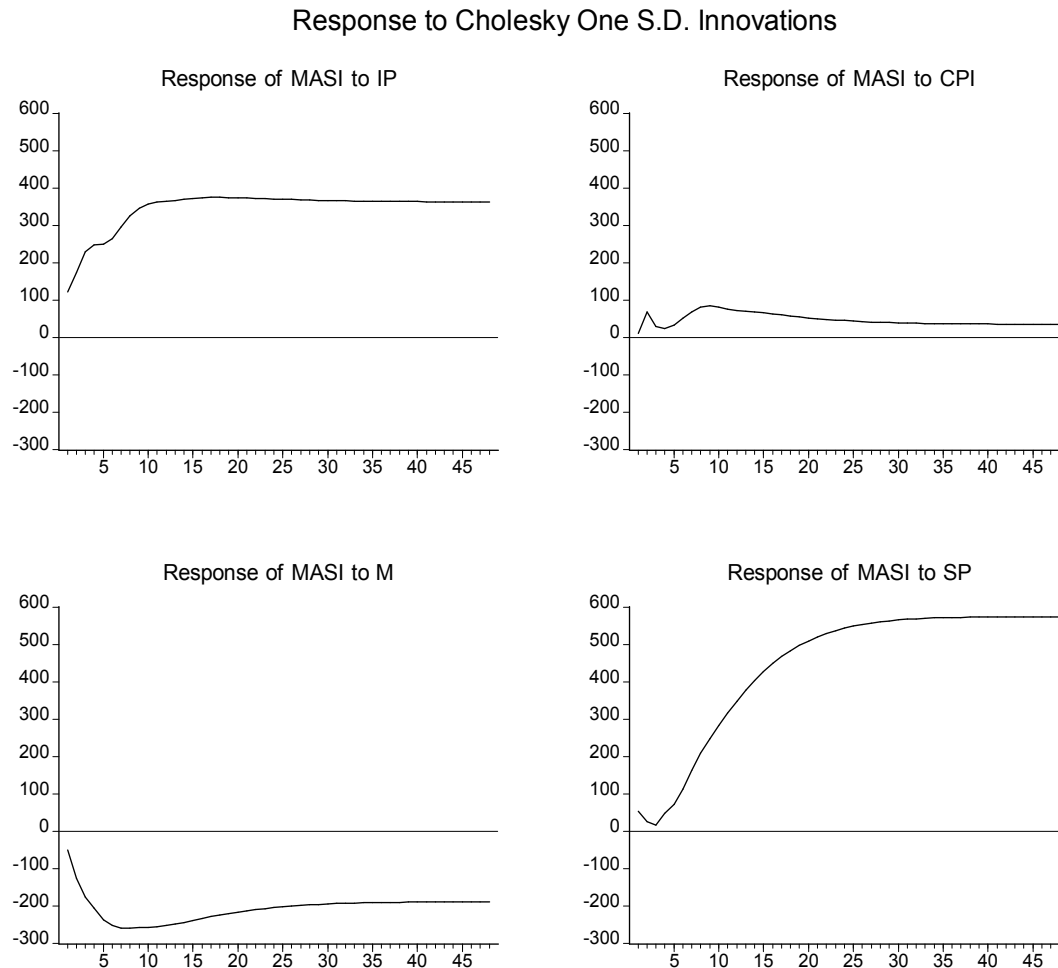
338

339 The Trace test indicates two cointegrating equations at the 5% level and one
340 cointegrating equation at the 1% level. The Max-eigenvalue test indicates two cointegrating
341 equations at the 5% level and one cointegrating equation at the 1% level. These results
342 clearly show that there are long-run relationships between the Moroccan stock price MASI,
343 and US macroeconomic fundamentals, namely industrial production, consumer price index,
344 money supply, and the US stock market.

345

346

347 **6.1.3 Impulse responses in the post-FTA period**
 348



349 **Figure 1** Presents the impulse responses of the Moroccan stock price to shocks in US
 350 macroeconomic fundamentals over the post-FTA period. The impulse responses are calculated
 351 from a 2⁶ lag-vector error correction model (VECM (2)) with one cointegrating equ
 352

353 Before starting to analyze the results of the impulse responses we will present some
 354 reasons that explain the impact of foreign fundamentals on domestic stock price. According
 355 to Nasseh and Strauss (2000) two major models can explain this impact:

356 “Canova and De Nicolo (2002) employed ‘The general equilibrium multicountry
 357 model’ which stipulates that domestic production is impacted by foreign production”.

358 “The consumption-based model developed by Balvers *et al* (1990) shows that stock
 359 prices are influenced by income. Thus, according to these two propositions
 360 domestic stock price is mainly influenced by foreign production”.

⁶ Based on AIC criteria.

Since trade share between Morocco and the US has increased in the post-FTA period, we suppose that US production will affect Moroccan production and so affect the Moroccan stock price. We observe that Moroccan stock price is influenced by US industrial production shocks in the post-FTA period. The Moroccan stock price reacts positively to consumer price index shocks and S&P500 shocks. One explanation of this is that both an increase in CPI and S&P 500 may signal an increase in demand in the US market which positively affects the US industrial production and hence the Moroccan industrial production. From the results we also observe that the Moroccan stock price reacts negatively to money supply shocks. One explanation of this is that an increase in money supply will decrease the short-term interest rate which leads to an increase in stock price and hence the Moroccan stock price.

6.1.4 Variance decomposition in post-FTA period

In this section we analyze variance decompositions for the Moroccan stock price after the signature of the FTA. The main objective of variance decomposition is to provide the information each variable participates to the other. In other words, what are the US fundamentals that particularly affect Moroccan stock price?

Table 9 Variance decomposition for the Moroccan stock price for 6, 12, 24, 36, and 48-month-ahead forecast error variance

Months	S.E	Industrial Production	Consumer Price Index	Money Supply	S&P 500	MASI
6	2.24	11.11	0.36	8.16	0.90	79.45
12	5.12	14.09	0.62	8.69	6.48	70.09
24	10.22	13.87	0.31	6.37	16.92	62.39
36	14.02	13.14	0.31	5.18	21.75	59.61
48	17.03	23.99	0.25	4.61	12.75	58.38

The above table gives the variance decomposition for the Moroccan stock price for 6, 12, 24, 36, and 48-month-ahead forecast error variance. Results from 48-month-ahead forecast error variance shows that about 58.38% of the Moroccan stock price variation is due to its own shocks and about 4.62% is explained by US macroeconomic fundamentals in the post-FTA period. Moreover, industrial production explained about 24% of the variation in the Moroccan stock price and only 12.75 % of the variation is explained by S&P500⁷. This clearly explains that it is the US real economic activities, not the financial system, that mostly

⁷ The correlation between S&P 500 and MASI for per days of trade in monthly data is 0.34 which is low and that explains the minimal effect of S&P 500 on MASI.

387 affect the Moroccan equity market in the long-run, which really makes sense since the
388 Moroccan financial market is not well integrated in the world financial market.

389 **7. Conclusion**

390
391 This study has analyzed the effect of four macroeconomic fundamentals, specifically
392 industrial production, consumer price index, money supply and finally S&P500 on the
393 Moroccan Stock Exchange. The paper was based on data from the period 2000 until
394 2009. Since we are dealing with time series data, the first step was to test for stationarity.
395 According to the ADF test, all the first differences are stationary and integrated of order
396 one. Moreover, we used cointegration analysis, especially the VAR Johansen's protocol in
397 order to investigate the long-run relationship between US fundamentals and the Moroccan
398 Stock Market Index (MASI). The result shows at first the existence of a cointegration vector
399 between MASI and S&P 500 after the signature of the FTA. On the other hand, during the
400 period pre-FTA there was no cointegration between those two indexes. Furthermore, we
401 have conducted a cointegration test between US macroeconomics variables (e.g. money
402 supply, industrial production and price level) and the Moroccan stock index, and the result
403 shows a positive relationship among MASI and US macroeconomics variables. Thus, we
404 can notice that our findings are similar to Hess (2004) who found that German
405 fundamentals have an important effect on the Switzerland market, and moreover Lahrech
406 (2009) who suggested that US fundamentals' impact on the Canadian stock markets was
407 closely influenced by the stage of the business cycle. Nevertheless, this finding can be
408 explained by table 10. The total trade between US and Morocco has increased doubly
409 post-FTA relatively to pre-FTA. Increasing the trade will increase the linkage between the
410 two economies. Thus the macroeconomics variables in the two economies will be affected
411 by each other. In our case, Morocco's economy will be affected the most since Morocco's
412 economy is a small economy in comparison to the US economy.

413

414 **Table 10 Total Trade between Morocco and USA (Billions of dollars)⁸**

Years	1980-	1985-	1991-	1995-	2000-	2005-	2010-
	1984	1990	1994	1999	2004	2009	2012
Total Trade	1.820	2.137	3.186	3.900	4.274	9.836	11.589

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416 However, in order to gain better insight into what specific macroeconomic variable
417 among the four has the highest impact, we analyzed variance decompositions for the
418 Moroccan stock price index in the post-FTA period. From variance decomposition we can
419 conclude that MASI reacts positively to all variables except money supply. Moreover,
420 industrial production explained about 24% of the variation in the Moroccan stock price, and
421 only 12.75 % of the variation is explained by S&P500.

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⁸ Direction of Trade DOT-IMF eLibrary

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608 **Appendix A**

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610 **A 1 Trade Statistic between Morocco and USA in 2005**

Month	Exports	Imports	Balance
January 2005	50.2	39.8	10.4
February 2005	91.7	34.9	56.8
March 2005	71.7	28.3	43.4
April 2005	43.0	49.0	-5.9
May 2005	23.9	44.3	-20.4
June 2005	32.4	52.5	-20.1
July 2005	21.2	36.3	-15.1
August 2005	16.8	34.7	-18.0
September 2005	22.7	31.3	-8.7
October 2005	44.8	27.6	17.2
November 2005	34.0	28.5	5.5
December 2005	28.4	38.7	-10.3
Total	480.8	445.8	35.0

611 * Source of the data is DOT-IMF.

612

613 **A 2 Trade Statistic between Morocco and USA in 2006**

Month	Exports	Imports	Balance
January 2006	40.5	38.7	1.8
February 2006	54.6	30.5	24.1
March 2006	83.8	45.0	38.8
April 2006	83.6	39.0	44.5
May 2006	53.2	40.6	12.7
June 2006	141.0	42.5	98.5
July 2006	58.2	50.0	8.1
August 2006	77.5	38.2	39.3
September 2006	74.1	46.3	27.8
October 2006	46.4	52.8	-6.4
November 2006	49.3	33.7	15.7
December 2006	75.7	64.0	11.7
Total	837.9	521.4	316.6

614 * Source of the data is DOT-IMF.

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624 **A 3 Trade Statistic between Morocco and USA in 2007**

Month	Exports	Imports	Balance
January 2007	65.7	47.8	17.8
February 2007	130.5	42.8	87.8
March 2007	119.1	50.8	68.3
April 2007	91.4	49.6	41.8
May 2007	85.3	42.1	43.2
June 2007	67.6	48.1	19.5
July 2007	65.8	69.9	-4.0
August 2007	101.0	52.2	48.9
September 2007	141.6	47.9	93.7
October 2007	162.4	80.0	82.4
November 2007	151.2	37.4	113.8
December 2007	112.5	41.3	71.2
Total	1,294.2	609.9	684.2

625 * Source of the data is DOT-IMF.

626
627 **A 4 Trade Statistic between Morocco and USA in 2008**

Month	Exports	Imports	Balance
January 2008	121.4	54.5	66.9
February 2008	161.3	79.5	81.7
March 2008	192.4	98.6	93.8
April 2008	119.4	65.8	53.6
May 2008	55.7	62.2	-6.6
June 2008	150.2	69.5	80.7
July 2008	89.8	66.5	23.3
August 2008	147.5	104.3	43.2
September 2008	82.2	76.7	5.5
October 2008	94.0	69.1	24.9
November 2008	83.5	65.2	18.4
December 2008	138.4	66.8	71.6
Total	1,435.9	878.7	557.1

628 * Source of the data is DOT-IMF.

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630 **A 5 Trade Statistic between Morocco and USA in 2009**

Month	Exports	Imports	Balance
January 2009	81.8	43.8	38.1
February 2009	114.7	31.9	82.7
March 2009	128.1	51.4	76.7
April 2009	172.4	42.4	129.9
May 2009	148.6	34.7	113.9
June 2009	86.9	35.9	51.0
July 2009	170.3	33.8	136.6
August 2009	138.7	44.8	93.9
September 2009	142.1	29.6	112.4
October 2009	129.6	39.7	89.9
November 2009	161.2	37.9	123.3
December 2009	155.9	42.0	113.9
Total	1,630.3	468.0	1,162.3

631 * Source of the data is DOT-IMF.