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Information efficiency on an emerging market: analysts' recommendations in Tunisia

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Abstract

We use a unique database, collected by aggregating analysts' reports on the Tunisian Stock Exchange. We study the price impact and the excess returns following analysts' recommendations. Results are qualitatively in line with the literature. However, although often significant, the results are not as bold as one expects in a frontier market. We hypothesize that the market is not liquid enough for trades to fully convey the information content of recommendations. Moreover, we find that reiterated recommendations have more impact than revised recommendations. Studying reiterated recommendations provides original results. This is important, as it suggests that it could be more profitable for investors to follow reiterations on emerging markets.

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1. Introduction

Most financial analysts employed by brokers disclose recommendations to "buy", "hold" or "sell" stocks. To deliver this advice to investors, they gather public and private information about the financial health, management strategy, sector analysis and economic conditions of the firm under study (see Brown *et al.*, 2015). The brokerage houses provide them with resources dedicated to financial research and with contacts on both sides of the market: issuing firms and stock investors. By synthesizing information and delivering it in the form of recommendations, the analysts can reduce information asymmetries between firms and investors. By helping investors conduct information-relevant trades, do analysts improve the efficiency of stock markets?

The value of the recommendations is measured using an event studies method. Following analysts' recommendations, if a significant price response is detected in the data, the recommendations are said to have value. The greater the price impact, the greater the perceived effectiveness of the recommendation (see, e.g., Green *et al.*, 2014), the greater its contribution to reducing information asymmetries and to enhancing efficiency.

However, recommendations on emerging markets have not been studied as extensively as those in developed markets. Compared to the vast literature scrutinizing US data (e.g., Womack 1996, Barber *et al.* 2001, Li *et al.* 2015 among many others), much less information is available for other G7 countries or large emerging markets (Jegadeesh and Kim 2006, Moshirian *et al.* 2009). The evidence is even scarcer for small to medium emerging markets (see, e.g., Erdogan *et al.* 2011 or Farooq and Id Ali 2014). To the best of our knowledge, there are no articles that include Tunisian data.

Nevertheless, emerging markets are known to have weaker information disclosures and governance mechanisms than those of mature markets (see Lang *et al.*, 2004). However, it is on these markets that analysts' contributions have an important impact on improving efficiency. In a context where scarce knowledge about the economic health of firms is publicly available, analysts' recommendations should provide valuable information to investors. Do recommendations really have value in this special context? This paper addresses this question with regard to the Tunisian stock exchange.

This article adds to the literature by using a unique data set, collected by aggregating analysts' reports, which contain recommendations concerning the Tunisian Stock Exchange (Bourse des Valeurs Mobilières de Tunis –BVMT) from 2005 to 2009.

We find that the impact of recommendations is generally significant for prices, and in some cases, investors can earn excess returns when following recommendations. When we compare our results to those in the literature, we find that excess returns in Tunisia are medium-sized. These findings are consistent with many, but not all, emerging markets. We hypothesize that the low level of liquidity of the Tunisian Stock market might prevent the information in recommendations from being transmitted to stock prices. Moreover, we find that reiterated recommendations have more impact than revised recommendations. Studying reiterated recommendations provides original results. This is important, as it suggests that it could be more profitable for investors to follow reiterations on emerging markets. Hence, helping investors make informed trading decisions helps improve stock market efficiency.

In the remainder of the article, section 2 presents the data and method, section 3 studies the price impact and section 4 examines the abnormal returns. Section 5 summarizes our conclusions.

2. Data and Methodology

Our sample consists of 6646 recommendations for 55 companies listed on the Tunis Stock Exchange (BVMT) between January 2005 to December 2009. The recommendations come from the four intermediaries for whom data are publicly available[1]. Recommendations from these brokers are published each month. This is a particular feature of the Tunisian market: in most places, recommendations are published any time the analysts feel justified in publishing them (see the discussion in Lo, 2012). Although the recommendations are systematically published on a monthly basis, they are not necessarily released on the same day of each month. Therefore, to prevent the overlap of event windows across the months, we retain an 11-day event window[2], i.e., from *t-5* to *t+5*. Returns are computed using the closing prices. Hence the return in *t* is the log of the closing price on the recommendation announcement day *t*, compared to the closing price in the prior day *t-1*.

First, concerning the distribution of recommendations, "strong sell" and "sell" occur less frequently than other responses (resp. 374 and 835, total 18%). There are 2592 "hold" recommendations (39%), while "buy" and "strong buy" (1435 and 1410 obs.) sum up to 2845 (43%). The above figures are in line with those available for other countries[3].

Second, to analyse any changes in recommendations, we compare a given recommendation with the previous one for the same firm and the same broker.

Table 1

This table reports the number of recommendations reaching a certain level that are dependent on the preceding level. The Data consist of 6433 recommendations about stocks listed at the BVMT (Tunisian Stock Exchange) from January 2005 through December 2009.

Recommendations evolution

	To…					
From…	Strong sell	Sell	Hold	Buy	Strong Buy	
Strong sell	342	7	7	0	1	357
Sell	11	746	52	4	2	815
Hold	8	50	2370	79	19	2526
Buy	0	4	61	1255	40	1360
Strong buy	3	1	21	53	1297	1375
	364	808	2511	1391	1359	6433

By design, the total in the above table does not take into account the first recommendation for a given firm-broker nor the initiation of coverage; it only takes into account the ones that have a previous record. As demonstrated in Barber & al. (2001, table II) only with greater frequency, the most frequent case is indeed the reiteration of the "hold" recommendation (37% of the total against 20% in Barber & al, 2001). Reiterations of "strong buy" recommendations are the second most frequently observed change.

Third, besides the price impact which merely analyses the actual return following a recommendation, the value of a recommendation is measured by "abnormal" or "excess" returns, i.e., the difference between the actual return and a certain "normal" or "theoretical" return. When comparing it to the market index, the *market-adjusted abnormal return* (AR^M_{it}) is:

$$AR^M_{it} = R_{it} - Rm_t \qquad (1)$$

[1] Amen Invest, Axis Capital, COFIB, Tunisie Valeurs.
[2] These are working days.
[3] See for example Jegadeesh and Kim 2006, Farooq and Id Ali 2014.

Where R_{it}, is the actual return for stock i at day t, and Rm_t is the market return[4]. When comparing it to the return predicted by the standard CAPM, the *risk-adjusted abnormal return* (AR^R_{it}) is:

$$AR^R_{it} = R_{it} - E(R_{it}) \quad (2)$$

Where $E(R_{it})$ is the return predicted by the model for stock i at day t. This is computed as follows:

$$E(R_{it}) = Rf + \beta_i (Rm_t - Rf) \quad (3)$$

Where Rf is the risk-free rate[5], and β_i the coefficient that measures how much the stock of firm i contributes to the market risk. Hence, given the risk of the stock, risk-adjusted returns measure the return in excess of the expected reward. Conventionally[6], the *beta* for firm i is the coefficient obtained by regressing R_{it} on Rm_t. The *beta* is estimated using the data for the two years preceding the event window for each stock.

To measure the return that an investor can earn by holding the recommended stock for several days within the event window, we compute the *Cumulative Abnormal Returns* (*CAR*) as follows:

$$CAR_{i,t-5+\tau} = \sum_{\tau=0}^{\tau} AR^N_{i,t-5+\tau} \quad (4)$$

Where $N = \{M, R\}$. This is, for stock i, the sum of daily abnormal returns between t-5 and τ days after t–5, with τ ranging from 0 to 10.

Fourth, we address the problem of conducting event studies on small stock markets, as emphasized by Bartholdy *et al.* (2007)[7].

On small stock exchanges, many stocks do not trade every day. In this case, stock exchanges generally list the last observed transaction price as the price of the stock on non-trading days. This practice yields zero returns for non-trading days and the method of computing records is referred to as "lumped returns". A greater number of recorded zero returns indicates a low variance of returns, which is likely to bias the test statistics of abnormal returns.

Table 2 shows that these "thin" and "medium" traded stocks comprise a minority of our sample (contrary to the case of Denmark shown in Bartholdy *et al.*, 2007).

Table 2

Stocks are divided into trading groups based on trading frequency (*Thick*: traded more than 80% of days per year, *Medium*: traded between 40% and 80% of days per year, *Thin*: traded less than 40% of days per year). Frequency is calculated using working days (approximately 260 days per year). A trading day is a day with a positive volume of exchange. Stocks may move between groups, exit, or enter the market through the years. The stocks in this table are those listed on the Tunindex, the main market index from the BVMT (Tunisian stock exchange) from January 2005 to December 2009.

[4] In our case it is the *Tunindex*.

[5] A money market barely exists in Tunisia. After interviewing several Mutual Fund managers, it appears that they use well-identified bond funds as the lowest-risk assets. We then use the average return of these funds as the risk-free rate after controlling for the variance, which is sufficiently low (0.000046% for 2005-2009).

[6] See e.g. Green (2006) for details.

[7] For brevity, we set aside the full justification of using Student t-tests in our sample. This discussion is available in a longer version of our paper.

Trading frequency for different trading groups

Year	Thick			Medium			Thin			Total Nb. stocks
	Nb. stocks	Average Nb. Days between trades	Average trading frequency (%)	Nb. stocks	Average Nb. Days between trades	Average trading frequency (%)	Nb. stocks	Average Nb. Days between trades	Average trading frequency (%)	
2005	22	0.08	93.07	11	0.42	71.14	4	1.76	36.57	37
2006	30	0.07	93.87	9	0.55	66.45	2	2.31	31.30	41
2007	31	0.07	93.96	13	0.75	60.40	0	-	-	44
2008	36	0.04	96.71	9	0.78	58.33	2	2.04	33.73	47
2009	37	0.04	96.25	9	0.82	56.62	0	-	-	46

We also test for correlation between returns and volume: we find that the coefficient is positive (0.1015) and significant (at the 10% level). Hence, small volumes imply small price changes. In this case, zero returns on non-trading days are a reasonable estimate of the true unobserved return on that day. Hence "the bias in the lumped return may not be too large" (Bartholdy et al, 2007, footnote 4). Thus, we retain the lumped return adjustment in the remaining of the paper.

3. The Price Impact of recommendations and its characteristics

The following table shows that following publication, many recommendations do have an impact on price.

Table 3

The table reports the average of the log of price changes surrounding the recommendation disclosure day *t*. The 1-day return is the price change between the closing price of the day before *t* and the closing price at day *t*, i.e., for *t* on *t-1*. The 2-days return is for *t+1* on *t-1*. Returns are multiplied by 100 to express a percentage. We test whether returns differ from zero. Statistical significance is measured using t-statistics, significance is indicated at the 1% (***), 5% (**) or 10% (*) levels. The data consist of 6646 recommendation levels (1410 strong buy, 1435 buy, 2592 hold, 835 sell, 374 strong sell) on stocks listed at the BVMT (Tunisian Stock Exchange) from January 2005 through December 2009. When compared to the previous recommendations, this yields 6433 recommendation evolution. From Table 1, we obtain 2552 "reiterated buy" (the sum of diagonal terms for 1297 strong buy and 1255 buy), 2370 reiterated hold, 1088 "reiterated sell" (the sum of diagonal terms for 342 strong sell and 746 sell), 211 upgrades (the sum of terms in the upper triangle) and 212 downgrades (the sum of terms in the lower triangle).

Price Impact Depending on the Level or Change of Recommendation

	Recommendation Levels								
	Strong Buy		Buy		Hold		Sell	Strong Sell
1-day return	0.17647	***	0.13742	***	0.18338	***	-0.01839	0.08428
2-days return	0.23757	***	0.11940	*	0.226	***	-0.11871	-0.02283
	Recommendation Evolution								
	Upgrades		Reiterated buy		Reiterated hold		Reiterated sell	Downgrades
1-day return	0.19629		0.17016	***	0.17050	***	0.02009	0.00760
2-days return	-0.01540		0.1957	***	0.20571	***	-0.08618	0.22410

Concerning recommendation levels, buy and hold recommendations have a greater impact on prices than sell recommendations.

We note significant stock price increases following "strong buy" (0.18% 1-day return and 0.24% 2-days return) and "buy" (respectively, 0.14% and 0.12%) recommendations. These findings are similar to the 1-day return found in Farooq and Id Ali (2014) of 0.17% for

aggregated "buy and strong buy" recommendations on average for Middle-East and North African (MENA) countries[8]. "Hold" recommendations deliver 0.18% and 0.23% returns: their impact is similar to the "buy" recommendations. Reactions to sell and strong sell recommendations are mostly negative but not significant. This means that a negative signal does not entail significant negative returns. However there is a strong positive trend on the Tunis Stock Exchange for the period[9]: hence, when compared to a high market return, a slightly positive return can still be interpreted as a bad result. Again, the magnitude is similar to the –0.10% 1-day return following "sell and strong sell" recommendations in the MENA countries in Farooq and Id Ali (2014).

Now we turn to recommendations evolution. We note that unchanged (i.e., reiterated) recommendations have a greater impact on price than those characterized by several revisions. Upward and downward revisions do not have a significant impact on prices. We explain this finding through the broadness of our definition: for example, downgrades to "buy" or "hold" may blur the impact of downgrades to "sell" or "strong sell"[10]. Unchanged recommendations present a significant and positive impact in the case of maintaining « buy » and « hold » recommendations in the 2-day window, with price increases of 0.20% and 0.21%, respectively.

As a whole, the price reactions we observe vary from –0.11% to 0.24%: while similar to other MENA countries, these findings are less pronounced than those on developed stock markets. Green (2006) shows that the mean price response over the two-day event horizon is 5.74% following upgrades and –8.81% following downgrades; Womack (1996) shows that the mean three-day return for added-to-buy recommendations is 3.3%, while the return for added-to-sell recommendations is –4.3%. Rejoining the comments of Farooq and Id Ali (2014) for MENA countries, we explain the lower impact by the relatively low level of participation in the Tunisian the market (which we illustrate in Table 2).

Next, we explore the factors which might affect the impact of recommendations on stock price. We restrict our study to cases for which a significant price impact has been shown ("strong buy", "buy" and "hold"). Following Green (2006), the main conventional factors that we suspect have an influence on the price impact are: recommendations about a firm concerned about corporate action (stock splits, dividend distribution, stock issues…) during the event window (4% of recommendations); the reputation of the broker (according to our definition, 75% of recommendations are disclosed by the two reputed brokers in our database, while the remaining 25% are by the other two brokers); whether there are multiple recommendations about the same firm in the event window (whereas 90% of recommendations have another recommendation for the same firm in the 11-day window, 20% of recommendations have another recommendation for the same firm in the 1-day window); and the size of the firm (market capitalization). We then add two factors which seem relevant for the Tunisian case: whether the firm is in the financial sector (43% of the recommendations of our sample are about firms in the financial sector[11]) and; the foreign participation in domestic firms' capital. Tunisian financial firms and firms with higher

[8] The data exclude Tunisia. It includes Morocco, Egypt, Saudi Arabia, United Arab Emirates, Jordan, Kuwait, Qatar, and Bahrain (1999-2010).

[9] The yearly growth rates of the stock market index are, from 2005 to 2009 : 21.27%; 44.33%; 12.14%; 10.65%; 48.38%, respectively. The index is multiplied by 3 on the whole period. Hence the Global Financial Crisis did not yet reach Tunisia during our sample period. Source: Reports of the BVMT (Tunis Stock Exchange)

[10] We verified that restricting to downgrades to « Sell or Strong Sell » leads to a negative -0.13% 1-day return, which is more logical, however there are too few up- and downgrades in our sample (around 200 each) to implement consistent tests for sub-categories of downgrades or upgrades.

[11] This is in line with the share of the financial sector among firms listed in the stock exchange (Source: Reports of the BVMT 2008-2009). Farooq and Id Ali (2014) confirm that it is the most covered industry in eight MENA countries.

foreign participation are known for having higher information disclosure standards. Hence, there should be fewer agency problems and recommendations should bring less new information to investors. Table 4 summarizes the results[12].

At a glance, we note that the 1-day price impact is far less affected by those factors than the 11-day price impact: the different factors about the event of a recommendation are integrated more slowly than those in developed markets[13].

The role of the broker reputation is not clear-cut. The factor is rarely significant (and signs alternate). As Booth *et al.* (2014) and Fang and Yasuda (2014) find in the US case, the market reaction increases with the broker reputation. Therefore, we remain cautious as our dummy variable may not be a sufficient proxy for reputation.

Small firm size impacts prices for "hold" levels and "hold" reiterations at 1-day, and "strong buy" and "buy" reiterations for the longer horizon. The last two reiterations are viewed as negative, indicating that investors are sceptical when a positive signal concerns a small firm. While this finding concurs with those of Farooq and Id Ali (2014), which finds that the size factor is not significant for most panels, and that the signs alternate when significant.

Belonging to the financial sector is not as important as expected: it only increases the price impact at long horizons, especially for "strong buy".

In contrast, implementing a corporate action at the time of the recommendation seems to strengthen the price impact, as the coefficient of the regression is significantly positive in most cases (this result confirms the findings of Li *et al.* (2015) regarding U.S. firms). Because the occurrence of a corporate event only impacts 4% of our sample, it may not have a significant impact on our results.

Firms with significant foreign ownership react less dramatically than others. (We observe negative coefficients seven times on eight significant cases). We can conjecture that the presence of foreigners might strengthen governance and disclosure practices, and thereby reduce the need for analysts. In contrast, it illustrates that analysts are more important when the firm is purely domestic.

Table 4

This table shows the results of the regressions of firm and recommendation characteristics on the price impact around the recommendation disclosure day *t*. The 1-day return is the price change between the closing price of the day before t and the closing price at day *t*, i.e., for *t* on *t – 1*. The 11-day return is for the entire event window, i.e., *t + 5* on *t – 5*. The *Financial Sector* is 1 if the firm is classified as "Financial" by the BVMT (Tunisian Stock Exchange), and 0 otherwise. *Corporate Action* is a dummy variable that is 1 if the firm increases its share capital (SEO), splits stocks, and distributes dividends within the 11-day event window surrounding the recommendation date *t*, and 0 otherwise. *Broker Reputation* is 1 for the two brokers which have a long historical background in the market place (Tunisie Valeur and Amen Invest) and 0 for the two other brokers (Axis Capital and Cofib), which are more recently created and of smaller size. *Multiple Reco* is a dummy variable that refers to more than one recommendation for the stock made at day *t* for the 1-day return, and for the 11 days around *t* for the 11-day return. *Small Firm* is 1 if the firm has a capitalization under the sample median. *Foreign Part* is 1 if the foreign participation in capital is more than 1% (the sample median). Statistical significance is measured using t-statistics and is indicated at the 1% (***), 5% (**) or 10% (*) levels. The data consist of 1410 strong buy, 1435 buy, 2592 hold recommendation levels on stocks listed at the BVMT (Tunisian Stock Exchange) from January 2005 through December 2009. For recommendation evolution, we consider 2552 "reiterated buy" (the sum of diagonal terms for 1297 strong buy and 1255 buy in Table 1), 2370 reiterated hold, 211 upgrades (the sum of terms in the upper triangle in Table 1).

[12] Although rather low, the adjusted R2 is similar to the values in Green (2006). Furthermore, the aim here is not to build a strong explanatory model, but to detect the factors affecting the price impact. As a robustness check, we implement Table 4 with risk-adjuste abnormal returns and find similar results (available from authors upon request).

[13] Factors are more often significant in Green (2006, table IV) on a *t-1;t+2* window.

Characteristics Affecting the Price Impact of Recommendations

	Recommendation Levels					
	1-day price impact			11-days price impact		
	Strong Buy	Buy	Hold	Strong Buy	Buy	Hold
Nb. of obs.	1410	1435	2592	1410	1435	2592
Adjusted R^2 (%)	0,68%	-0,25%	0,20%	2,96%	1,12%	1,34%
Coefficients						
Constant	.00291 **	.00114	.00102 **	.00083	.10661 ***	-.00464
Financial Sector	.00145	.00009	.00065	.00955 ***	.00150	.00634 **
Corporate Action	.00442 **	.00033	.00162	.02135 ***	.02462 ***	.02292 ***
Broker Reputation	-.00057	-.00086	.00081	.00822 **	-.00505 *	.00105
Multiple Reco	-.00127	-.00051	.00080	.01155 ***	-.08888 **	.01522 ***
Small Firm	-.00112	.00039	.00064 *	-.00775 **	-.00305	.00048
Foreign Part	-.00208 **	.00099	.00062 **	-.01771 ***	-.00600 *	-.01133 ***

	Recommendation Evolution					
	1-day price impact			11-days price impact		
	Upgrade	Reiterated buy	Reiterated hold	Upgrade	Reiterated buy	Reiterated hold
Nb. of obs.	211	2552	2370	211	2552	2370
Adjusted R^2 (%)	1,96%	0,05%	0,33%	4,05%	1,15%	1,74%
Coefficients						
Constant	.00223	.00253 ***	.00231 **	.00828	.00776	-.00466
Financial Sector	-.00130	.00066	.00000	-.00221	.00601 ***	.00610 **
Corporate Action	.01003 *	.00103	.00192	.07212 ***	.01744 ***	.02589 ***
Broker Reputation	.00188	-.00058	-.00095	-.03236 **	.00103	.00262
Multiple Reco	.00707 **	-.00150 **	-.00004	.03269	.00835 *	.01585 ***
Small Firm	-.00272	-.00049	.00147 **	-.00038	-.00548 **	-.00190
Foreign Part	-.00301	-.00057	-.00134 **	-.00259	-.01064 ***	-.01300 ***

The case of multiple concurrent recommendations is more complex. In the study of Green (2006), this factor is only significant in the case of downgrades. At the 11-day window, the impact is alternated: positive for strong buy, negative for buy, positive for hold. We interpret this result to mean that multiple recommendations bring noise to the market place. However, with recommendations for all firms being produced every month, it is not surprising that an 11-day window includes many conflicting signals to investors (90% of the cases). The 1-day window shows a weaker impact of the multiplicity of recommendations: it only increases the impact of upgrades and slightly decreases the impact of "buy" reiterations. This does not dramatically alter the results of the following section.

4. Excess Returns Caused by the Recommendations

We have shown that most recommendations have an impact on prices, as well as the factors affecting this impact. We now assess whether the recommendations generate abnormal returns[14].

In Table 5, recommendations with a "buy" level exhibit positive risk-adjusted returns for at least three days before (which could be the consequence of information leakage, as in

[14] For comparison purposes, we group "strong buy" and "buy" recommendations as "buy", and "strong sell" and "sell" recommendations as "sell". This change does not modify the main results.

Choi *et al.* 2015), and five days after the recommendation. A strategy of buying at the start, and selling at the end of the event window would generate a significant 0.33% excess return. This is an intermediate finding between, for example, the higher returns in Moshirian *et al.* (2009, emerging countries) and the lower returns found in Barber *et al.* (2010, US data) or in Guagliano *et al.* (2013, small Italian firms).

"Sell" recommendations generate negative and significant returns most of the time. The cumulated abnormal, risk-adjusted return, is –0.29% in *t+5*, and –0.87% when market-adjusted (rounded figures). Again, this result is lower than the findings of Moshirian *et al.* (2009), but higher than those of Barber *et al.* (2010.)

Table 5

This table reports abnormal returns, i.e., the mean difference between actual returns and returns from the Market Index or from the CAPM prediction; around the recommendation announcement day *t*. Returns are multiplied by 100 to express a percentage. The Market Index is the Tunindex from BVMT. The return from the CAPM model is calculated on a period of 2 years before *t*. Cumulative Abnormal Returns are the sum of abnormal returns across the event window. The t-statistics are calculated and stars indicate if abnormal returns are significantly different from zero at the 1% (***), 5% (**) or 10% (*) levels. The data consist of 6646 recommendation levels: 1410 Strong Buy and 1435 Buy recommendations grouped as "Buy", 2592 Hold recommendations, 835 Sell and 374 Strong Sell recommendations grouped as "Sell", on stocks listed at the BVMT from January 2005 through December 2009.

Abnormal returns, cumulative abnormal returns and recommendations level

	"Buy" Recommendations				"Hold" Recommendations			
	Market-adjusted		Risk-adjusted		Market-adjusted		Risk-adjusted	
	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return
t – 5	-0.01766	-0.01766	-0.00334	-0.00334	-0.02763	-0.02763	0.03246	0.03246
t – 4	0.00634	-0.01133	0.04506 *	0.04173	-0.0348	-0.06243	0.06172 *	0.09342 *
t – 3	0.01232	0.09421	0.04578 *	0.08751 *	-0.08387 ***	-0.1463 **	-0.03119	0.06215
t – 2	0.02065	0.02164	0.06421 **	0.15172 ***	-0.0426	-0.18892 ***	0.01689	0.08093
t – 1	0.02667	0.0483	0.07671 ***	0.22843 ***	-0.04446	-0.23335 ***	0.02921	0.11139
t	-0.00636	0.04194	0.02999	0.25843 ***	-0.00673	-0.24175 ***	0.07429 **	0.18508 **
t + 1	-0.01484	0.02714	-0.01115	0.24727 ***	-0.0719 **	-0.31363 ***	-0.03462	0.14922
t + 2	-0.00321	0.02241	0.02194	0.26922 ***	-0.10593 ***	-0.41714 ***	-0.06898 **	0.0791
t + 3	0.03717	0.05964	0.01326	0.28248 ***	-0.01467	-0.43235 ***	-0.01077	0.06749
t + 4	0.02923	0.09113	0.04375	0.32623 ***	-0.0779 ***	-0.5116 ***	-0.01726	0.05019
t + 5	0.00455	0.09518	0.00347	0.32969 ***	-0.03614	-0.54651 ***	-0.01531	0.03526

	"Sell" Recommendations			
	Market-adjusted		Risk-adjusted	
	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return
t – 5	-0.04896	-0.04896	-0.00817	-0.00817
t – 4	-0.1234 ***	-0.17236 ***	0.0399	-0.04806
t – 3	-0.03988	-0.21223 **	0.03193	-0.01613
t – 2	-0.08171 *	-0.29394 ***	-0.01767	-0.0338
t – 1	-0.17062 ***	-0.46456 ***	-0.06822	-0.10202
t	-0.13626 ***	-0.60082 ***	-0.05765	-0.15967
t + 1	-0.18149 ***	-0.78231 ***	-0.14034 ***	-0.30001 **
t + 2	-0.12924 ***	-0.91155 ***	-0.06684	-0.36685 **
t + 3	-0.01077	-0.92232 ***	-0.019	-0.38585 **
t + 4	0.03356	-0.88876 ***	0.05956	-0.32629 *
t + 5	0,02161	-0,86715 ***	0,04095	-0,28534

When significant, the returns following "hold" recommendations are mostly negative. Instead, "hold" returns are not significant in Barber *et al.* (2010). We interpret this to mean that "hold" can have a very different meaning depending on the previous recommendation level. Therefore, we must analyse recommendation evolutions to learn more. Nevertheless, cumulated returns are –0.54% when market-adjusted. Given that the sample period has a strong upward market trend, this could indicate that "hold" is interpreted as an unfavourable signal in that context.

We also compare the abnormal returns for financial vs non-financial firms[15]. There are no sharp differences between the two groups, but some nuances are noticeable. The significant risk-adjusted returns from "buy" recommendations in the whole sample seem mostly driven by financial firms, whereas the significant returns from "hold" and "sell" recommendations are in the contrary mostly driven by non-financial firms. Interestingly, it is related to the distribution of recommendations in those two sub-groups. There are more "buy" recommendations for financial firms (53% vs 37% for non-financial), but less "hold" (34% vs 43%) and "sell" (14% vs 20%) recommendations. We confirm Farooq and Id Ali (2014, Table 3 Panel A): analysts in MENA countries are more positive with financial firms. In addition, we show that this differential treatment has an impact on returns. Future research could investigate whether it is a profitable strategy for investors to put more weight on a "buy" recommendation when it concerns a financial firm, and more weight on "hold" or "sell" recommendation when it concerns a non-financial firm.

Let us turn to recommendation evolutions in Table 6. At first glance, returns seem to react as expected: they are positive around upgrades, or reiterated "buy" (0.46% and 0.06% cumulated market-adjusted returns at t+5), and negative for reiterated "sell", or downgrade recommendations (resp. –0.87% and –0.54%). Negative returns around reiterated "hold" recommendations clearly indicate that this evolution is interpreted as bad news by investors. Jiang *et al.* (2014) find a greater impact for a set of Chinese firms in 2007-2011: the market-adjusted abnormal return is +1.67% on *t+1* after an upgrade and –1.14% after a downgrade. It is lower in the four emerging Asian countries studied in Farooq (2013), with market-adjusted returns in *t+14* being at most 0.031% (in the particular context of the 1997-98 crisis). Farooq and Ahmed (2013) also find low recommendation value in Pakistan. Erdogan *et al.* (2011) find, with different panels, at most 0.14% returns following upgrades and –0.27% following downgrades in Turkey, with no return being significant.

Comparing our results with international studies (Jegadeesh and Kim, 2006, Moshirian *et al.*, 2009) confirms the intermediate position of Tunisia. To give some examples, market-adjusted CARs following upgrades and downgrades in *t+1* (resp. 0.24% and –0.43%) are close to those in Germany (0.21% and –0.33%), France (0.38% and –0.48%), or South Africa (0.20% and –0.30%). They are superior to those in Hungary (0.11% and –0.15%), Indonesia (0.15% and –0.17%) and Israel (0.09% and –0.12%), and inferior to those in Brazil (1.43% and –2.05%), India (1.51% and –1.95%), Japan (0.74% and –0.71%) and the US (2.10% and –3.38%).

However, a closer look at table 6 indicates that the negative returns following downgrades are not significant and that positive returns are only slightly significant following upgrades. On the contrary, when no revision takes place, i.e., when the same recommendation is posted from one month to the next, investors seem to react more saliently in the sense that returns are largely significant in at least one of the two models. A reiterated "buy" entails +0.31% cumulated abnormal return in *t+5*, a reiterated "hold" yields –0.61%, and a reiterated "sell" gives –0.87%.

[15] Available from authors upon request. We thank an anonymous referee for suggesting this analysis.

Although we must remain cautious given the discrepancy in the total number of observations for upgrades and downgrades compared to reiterations, these findings indicate that investors seem to adopt a "wait and see" attitude towards revisions of recommendations.

This interesting result is a distinguishing feature of our study. Indeed, as far as we know, the literature cited above does not explicitly analyse "reiterations" and focuses almost exclusively on revisions. In Tunisia, contrarily to what happens in mature stock markets (see the discussion of Lo, 2012), brokers send their recommendations every month at the same time, generally at the beginning of the month. We conclude that this informational context is likely to encourage a sort of "confirmatory bias" (see Rabin and Schrag, 1999): when one broker "moves" and changes a recommendation, investors prefer to wait for a confirmation by other brokers during the current and/or following month.

Table 6

This table reports abnormal returns, i.e., the mean difference between actual returns and returns from the Market Index or from the CAPM; around the recommendation announcement day *t*. Returns are multiplied by 100 to express a percentage. The Market Index is the Tunindex from BVMT. The return from the CAPM model is calculated on a period of 2 years before *t*. Cumulative Abnormal Returns are the sum of abnormal returns across the event window. The t-statistics are calculated and stars indicate if abnormal returns are significantly different from zero at the 1% (***), 5% (**) or 10% (*) levels. The data consist of 6433 recommendation evolution. From Table 1, we obtain 2552 "reiterated buy" (the sum of diagonal terms for 1297 strong buy and 1255 buy), 2370 reiterated hold, 1088 "reiterated sell" (the sum of diagonal terms for 342 strong sell and 746 sell), 211 upgrades (the sum of terms in the upper triangle) and 212 downgrades (the sum of terms in the lower triangle)., on stocks listed at the BVMT from January 2005 through December 2009.

Abnormal returns, cumulative abnormal returns and evolution of recommendations

	Upgrade Recommendations				Reiterated "Buy" Recommendations			
	Market-adjusted		Risk-adjusted		Market-adjusted		Risk-adjusted	
	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return
t – 5	0.03267	0.03267	-0.02139	-0.02139	-0.01151	-0.01151	0.00967	0.00967
t – 4	0.10409	0.13676	0.16812	0.14673	-0.01369	-0.0252	0.02044	0.03011
t – 3	0.18105	0.31782	0.25449 **	0.40122 *	0.01313	-0.01207	0.04483 *	0.07494
t – 2	0.11857	0.43638 *	0.20019	0.60141 **	-0.00274	-0.01481	0.04195	0.11689 **
t – 1	0.05043	0.48682	0.12755	0.72896 **	0.01627	0.00146	0.06853 **	0.18541 ***
t	0.02875	0.51557	0.08356	0.81252 **	0.00393	0.00539	0.04022	0.22563 ***
t + 1	-0.27111 **	0.24446	-0.29195 **	0.52057	-0.01083	-0.00543	-0.00814	0.21749 ***
t + 2	-0.07167	0.17279	-0.04004	0.48053	0.01598	0.01055	0.03910	0.25659 ***
t + 3	0.02822	0.20102	-0.04347	0.43706	0.04521	0.05576	0.02611	0.28271 ***
t + 4	0.17038	0.37140	0.22702	0.66409	0.01962	0.07539	0.03317	0.31587 ***
t + 5	0.09080	0.46220	0.08807	0.75216	-0.00737	0.06801	-0.00534	0.31053 ***

	Reiterated "Hold" Recommendations				Reiterated "Sell" Recommendations			
	Market-adjusted		Risk-adjusted		Market-adjusted		Risk-adjusted	
	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return
t – 5	-0.03069	-0.03069	0.03533	0.03533	-0.05262	-0.05262	-0.01202	-0.01202
t – 4	-0.04681	-0.07749	0.05436	0.08969 *	-0.09718 *	-0.1498 *	-0.01237	-0.02439
t – 3	-0.09812	-0.17562 ***	-0.04793	0.04176	-0.03548	-0.18527 *	0.04416	0.01977
t – 2	-0.03658	-0.2122 ***	0.01949	0.06125	-0.05826	-0.24353 **	0.01141	0.03119
t – 1	-0.04458	-0.25678 ***	0.02359	0.08484	-0.18018 ***	-0.42371 ***	-0.07529	-0.04411
t	-0.01774	-0.27452 ***	0.0663 **	0.15114 *	-0.13202 ***	-0.55573 ***	-0.05226	-0.09637
t + 1	-0.07724 **	-0.35175 ***	-0.03631	0.11483	-0.18741 ***	-0.74313 ***	-0.146 ***	-0.24237
t + 2	-0.11098 ***	-0.46274 ***	-0.07844 **	0.03639	-0.1568 ***	-0.89993 ***	-0.0944 *	-0.33677 **
t + 3	-0.01916	-0.4819 ***	-0.0131	0.02329	-0.00631	-0.90625 ***	-0.01012	-0.34688 **
t + 4	-0.08646 ***	-0.56835 ***	-0.02542	-0.00212	0.02114	-0.8851 ***	0.05261	-0.29427
t + 5	-0.03791	-0.60626 ***	-0.01573	-0.01785	0.01146	-0.87364 ***	0.03146	-0.26280

	Downgrade Recommendations			
	Market-adjusted		Risk-adjusted	
	Abnorm. Return	Cumul. Abnorm. Return	Abnorm. Return	Cumul. Abnorm. Return
t – 5	-0.09180	-0.0918	-0.10938	-0.10938
t – 4	-0.02989	-0.12169	0.03379	-0.07559
t – 3	-0.13070	-0.25238	-0.14878	-0.22437
t – 2	-0.11085	-0.36323	-0.05199	-0.27637
t – 1	0.01503	-0.3482	0.05496	-0.2214
t	-0.12749	-0.47569	-0.07525	-0.29665
t + 1	0.03843	-0.43726	0.12715	-0.1695
t + 2	-0.06748	-0.50474	-0.02946	-0.19896
t + 3	-0.02876	-0.53350	-0.05915	-0.2581
t + 4	-0.00681	-0.54032	-0.01329	-0.27139
t + 5	-0.00545	-0.54577	-0.04155	-0.31294

Moreover, we conclude the insignificant impact of downgrades relative to upgrades is related to the prohibition of short sales in Tunisia, as it entails that negative information cannot be immediately incorporated in prices. Jiang *et al.* (2014) find the same result in China and attribute it to short sale restrictions, whereas Blau and Wade (2012) illustrate that,

in the U.S., short sales are an important source of profit when short-selling on recommendations.

We again compare the evolutions of financial vs non-financial firms[16]. We confirm that upgrades are not significant in both cases. There are some differences for reiterations though. The significant returns from reiterated "buy" are mostly driven by financial firms (+0.57% cumulated abnormal return in t+5 vs +0.01% for non-financials), whereas reiterated "hold" are mostly driven by non-financials (-0.79% vs –0.24% for financials), just as reiterated "sell" (–1.14% vs -0.38% for financials). We also find a slight significance for non-financials following a downgrade, however there are only 127 observations and thus we remain cautious on that point. The difference between the sub-groups can again be related to the distribution of evolutions: there are 49% of reiterated "buy" for financials (vs 34% for non-financials), but only 31% reiterated "hold" (vs 41%) and 13% reiterated "sell" (vs 18%). The proportion of up- and downgrades are more similar. The analysts tend to favour financial firms, and this has an impact on abnormal returns. However, further analysis is needed to verify whether a profitable strategy can be implemented from these results.

5. Conclusion

The results show that recommendations add some value to the Tunisian stock market, which indicates that analysts enjoy moderate success in reducing information asymmetries. More specifically, when results are qualitatively in line with the literature, the magnitude of the price impact and abnormal returns is intermediate when compared with that of other countries. Although often significant, the results are not as bold as one expects in a frontier market. We explain this phenomenon with the low level of participation we observe in this market: the market is not liquid enough for trades to fully convey the information content of recommendations.

Interestingly, we show that excess returns following reiterations are superior to those following revisions (upgrade or downgrade). We also note that the impact is different depending on the industry (financials vs non-financials). As the articles on the subject focus on revisions and do not specifically analyse reiterations, we cannot ascertain that our results converge with, or diverge from, what happens in other countries. However, this leads us to encourage future research to re-examine this point when studying other countries. This is of great importance to foreign investors who endeavour to invest in emerging or frontier markets, as more profitable investments may stem from following reiterated recommendations rather than following upgrades and downgrades.

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