

**Recommendation Value on an Emerging Market: the Impact of Analysts’
Recommendations on Stock Prices and Trading Volumes in Tunisia¹**

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Abstract

Financial analysts issue “buy”, “sell” or “hold” recommendation about stocks. Recommendations have value if investors trade upon them, which should affect prices and trading volumes. We use the methodology of event study to analyze price and volume reaction to the recommendation release. With a database of 2359 recommendations about 55 companies on the Tunisian Stock Exchange (BVMT) from 2005 to 2009, we show that prices and volumes react significantly to recommendations level. However, we only provide a weak evidence of reaction to changes in recommendations. We explain this result by a special feature of this market place: the systematic release of monthly recommendations, in contrast to developed markets where new recommendations are issued only if new information is available. This can focus investors on the confirmation of the recommendation, rather than on their revisions. We also confirm a special feature of emerging stock markets, which is that volumes are abnormally low following a “sell” recommendation, whereas in that case they are abnormally high in more liquid markets.

1. INTRODUCTION

The question of the contribution of financial analysts' recommendations to market efficiency is still unanswered. On the one hand, analysts produce a valuable service, in the sense that their recommendations help stock market investors to price the stock of a firm (Jacquillat and Solnik 1997). Analysts are supposed to reduce information asymmetries between firms' management and investors. On the other hand, analysts are considered as a pure marketing device (Easley, O'Hara, Paperman 1998), because they frequently revise their recommendations in order to entice investors to generate high volumes of trade, which in turn generates trading commissions for the brokerage house they belong to (Irvine 2001)². Moreover, analysts' recommendations can be biased by the relation between their brokerage house and its affiliated Investment Bank. When the Investment Bank is underwriting an IPO for example, analysts are pressured to tout the stock that is to be issued (Michaely and Womack 1999).

The value of recommendations is scrutinized by the lens of event studies. If a price or volume response to recommendations is detected in the data, recommendations are said to have value. Many articles have already shown that, although the response is brief (some days), prices and volumes react to recommendations.

But emerging markets have been much less studied. Furthermore, emerging stock markets are known to be less liquid than mature markets. Do recommendations have value in this special context? This paper addresses this question in the case of the Tunisian stock market (Bourse des Valeurs Mobilières de Tunis –BVMT).

Using a unique data set that covers recommendations released on the Tunisian stock market from 2005 to 2009, we find that the impact of recommendation is generally significant for prices and volumes around the recommendation's release date. However, recommendation level has much more impact than recommendation changes, on the 11-days event window that we study, suggesting a strong inertia to changes from investors. Investors wait for the revision to be confirmed in the subsequent periods. Interestingly, we find that in case of conflicting recommendations (simultaneous upward and downward revision from two analysts on the same firm), investors tend to follow the bad news rather than the good news, suggesting a high loss aversion among investors.

² Irvine (2001) shows that brokerage houses record significantly higher volumes for the firms that their analysts cover than for uncovered firms.

The literature addresses the impact of recommendation level and recommendation changes on prices, on volumes, and furthermore tests for characteristics that affect the magnitude of recommendation impact.

Although analysts generally release their recommendations on a 5-items scale³ (strong buy, buy, hold, sell, strong sell), earlier studies restrained on grouping “strong buy” and “buy” on one side, and “strong sell” and “sell” on the other side. Bjerring, Lakonishok and Vermaelen (1983) find a significant relationship between stock price and recommendation level from the main Canadian brokerage house. Elton, Gruber and Grossman (1986), using data with 720 analysts from 33 brokerage houses in the US markets in 1981-1983, show that firms with “buy” recommendations have an abnormal return during six months following the recommendation release. By analyzing 13 emerging countries in 1996-2005, Fariborz, Moshirian et al (2008) show that the price impact is significant at the day of release of the recommendation and also the subsequent days.

Consequently, investor can potentially earn “abnormal” return in excess of the market portfolio’s return by following the recommendation published, if they quickly react on the day of release.

Nevertheless, following recommendations seems much more valuable for investors when acting on recommendations changes. Womack (1996) shows that the proportion of “buy” or “strong buy” recommendations is much too important⁴ to be justified by the subsequent evolution of prices. The explanation is that analysts upward bias their recommendation, because of their reliance on the firms’ management to obtain information (Lim 2001), or because their brokerage house is affiliated to an investment bank currently underwriting some corporate finance operation concerning the firm they recommend (Michaely and Womack 1999). Stickel (1995) studies 16,957 recommendations from 1,510 analysts from 80 brokers in 1988-1991. He uses an 11-days window centered on the day of announcement. “Buy” recommendations are associated with an average +1.16% of prices, whereas “sell” recommendations are associated with a -1.28% average decrease. With 1573 recommendation changes for 822 firms in the US markets in 1989-1991, Womack (1996) finds that the post-announcement price drift following an upward revision is +2.4% and lasts one month, however, the impact is deeper for downward revision as the post announcement price drift is -9.1% and lasts six months. This result is interpreted in terms of “information

³ Throughout the paper we follow the usual numeric coding: *strong buy* = 5, *buy* = 4, *hold* = 3, *sell* = 2, *strong sell* = 1.

⁴ Around 7 buy recommendations for 1 sell recommendation.

content”: as the market reacts more on negative revision, we infer that they contain more information to investors than positive revisions.

In the same vein, Dhiensiri & al (2005) show that the revision of recommendations has less impact when there are simultaneous releases of diverging opinions. Barber & al (2001) extends the test to the aggregation of analysts’ recommendation (the “consensus” recommendation) and show that the strategy that buys following a favorable consensus revision and sells following an unfavorable consensus revision yields an abnormal return of 4% per year. We note the idea that the consensus contains information. As a consequence, a bold recommendation revision that would differ from the consensus is likely to be more informative than revisions that simply join up with the consensus.

Turning to the impact of recommendations on volumes of stocks traded, many studies show that the more numerous are the analysts following a firm, hence the more recommendation there are, the greater the volumes of stocks are traded (Irvine, 2003, Dhiensiri and Sayrak 2004). This is important because volumes are a determinant of the stocks’ liquidity, and as such, affect the firm’s cost of capital. Brennan and Subrahmanyam (1995) and Amihud and Mendelson (1986) showed that analysts influence liquidity and expected returns. Womack (1996) confirms the existence of abnormal volumes: a buy recommendation induce volumes that are 190% higher than in non-event periods, and a sell recommendation induce volumes 300% greater than in non-event times. Belcredi, Bozzi and Rigamonti (2003) confirm this result for the Italian market.

Nevertheless many factors can influence the size and significance of the recommendations’ impact. As seen above, the number of analyst covering a firm should increase the volume impact of a given recommendation. However, it means also that markets should be more efficient for these stocks: portfolios including the most covered stocks experience lower returns than portfolios including less covered stocks (Boni and Womack 2003, Dhiensiri & al 2005), suggesting that the price response is lower. Besides, the experience of an analyst is shown to affect the impact of recommendations. Sorin, Sorescu, Avanidhar and Subrahmanyam (??) provide evidence that recommendation changes from experienced analysts induce higher returns to investors than less experienced analysts, illustrating the greater capacity of experienced analysts to forecast future returns. Individual reputation is another variable that affect recommendation: Stickel (1992) shows that analysts from the “all-american research team” have greater impact on prices following an upward revision. Dhiensiri and al (2005) tests the reputation of the financial intermediary the analysts belong to, in both upward or down ward revisions, and shows that the market react more to

high-reputation brokers. Finally, the market place where trades take place seem to have a role to play. Given that there is generally less information available for firms listed on the Nasdaq, Grant (1980) and Atlase (1987) show that the Nasdaq, Amex and Nyse markets react differently to the same type of event (earnings announcement). Focusing on “buy” recommendations that initiate a coverage, e.g. for newly listed firms, Kim, Lin and Slovin (1997) show that it takes on average 5 minutes for a recommendation to have an effect on the Amex and Nyse, whereas it takes 15 minutes on average for firms listed on the Nasdaq (Kim and al, 1997). Although it suggests that decentralized markets are less efficient information processor when the firm is less known, we retain the idea that the impact of recommendation depends on the type of markets. Indeed, stock markets in merging countries are often considered as riskier than in developed countries, because of greater information asymmetries, and because of worse market liquidity. In such environments, financial analysts are supposed to have a great impact. Fariborz, Moshirian and al (2008) show that the abnormal returns following recommendations are significant in the 11 countries⁵ under study.

The paper proceeds as follows. Section 2 describes the data and methodology, and the effects that are expected. Section 3 describes the price and volume response to recommendation level and recommendation revisions. Section 4 concludes.

2. DATA AND METHODOLOGY

2.1 Recommendations on the Tunisian Stock Exchange (BVMT)

Our sample consists of recommendations from the four intermediaries for which data is publicly available: Amen Invest, Axis Capital, COFIB, Tunisie Valeurs. The recommendations about 55 firms listed on the BVMT are published each month. This is a particular feature of the Tunisian market, as in most other places, recommendations are published at any time, whenever the analysts thinks it is justified to publish one.

We ranked recommendations’ revisions according to the following scale: “2” means a positive revision, “1” means “no revision”, i.e. the recommendation is the same as the previous month, and “0” means negative revision.

Although systematically published on a monthly basis, recommendations may not necessarily be released on the same day of the month. This is why we study an 11-days event

⁵ Argentina, Brazil, China, Chile, Hungary, India, Indonesia, Israël, Korea, Mexico and South Africa.

window⁶, i.e. from $d-5$ to $d+5$. As in other studies, we admit that analysts can privately release their recommendations to some of their clients a few days before the public release.

2.2 Data

The initial data base consisted of 6 674 recommendations for 55 companies listed on the BVMT between January 2005 to December 2009. Several data filters were needed.

First we eliminated recommendations for stocks with an operation during the event window. Initial Public Offerings, Seasoned Equity Offerings, stock splits or dividends distribution dates were recorded. We withdrew 250 observations on that basis.

Second, there was the problem of multiple recommendations for the same firm on the same event window. If several recommendations are overlapping, but still published on different days, we retain the one with earlier date of release. If several recommendations have the same day of release, the selection depends on the level of recommendation. We eliminate diverging opinions, that we define as the levels (1,5) (1,4) (2,5) (2,4) (1,2) (2,3) (3,4) (3,5). It means that we retain only converging opinions: the “buys” (4 and 5) altogether, the “sells” (1 and 2), and the case of several hold (3) recommendations. Next, we treat converging opinions as follows. We retain converging recommendations when they are revised in the same direction (all are upgrades, or all are downgrades, or all are conservations), and remove them in the contrary. On that basis we withdrew 4065 observations, so that the final sample contains 2 359 observations.

2.3 Abnormal Returns and Volumes

Abnormal returns are the difference between the actual return and a certain norm for a “normal” or “theoretical” return. If the theoretical return, for stock i at time t , is $E(R_{it})$, the actual return is R_{it} , then the abnormal return AR_{it} is defined as :

$$AR_{it} = R_{it} - E(R_{it})$$

We estimate $E(R_{it})$, the “normal” return in the absence of an event, according to two methods. First, we use the market return R_{mt} , i.e. a large market index:

⁶ These are working days.

$$E(R_{it}) = R_{mt}$$

The second method uses the standard CAPM. First regress:

$$R_{it} - R_f = \alpha_i + \beta_i (R_{mt} - R_f) + \varepsilon_{it}$$

where β is the coefficient that measures the link between stock i and the market :

$$\beta_i = \frac{COV(R_i, R_m)}{\sigma_{R_m}^2}$$

and finally define the expected return:

$$E(R_{it}) = R_f + \beta_i (R_{mt} - R_f)$$

R_f and β are estimated for each stock one year before the first event as in Green (2006). Then we add daily abnormal returns on the 11 days of the event window. If τ is the general length of the window:

$$CAR_{i\tau} = \sum_{t=-5}^5 AR_{it}$$

Turning to abnormal volumes (AV_{it}), we define them as the scaled difference between actual volumes V_{it} and a normal volume K_{it} :

$$AV_{it}^7 = (V_{it} - K_{it}) / K_{it}$$

There are many possibilities to measure the “normal volume”, deriving it from a market model, using the average volume at the market level, or the average for stock i on the sample period. In the Tunisian case volumes can be very heterogeneous, that is why we retain the last solution:

$$K_{it} = \frac{1}{T} \sum_{i=1}^T V_{it}$$

⁷ Le volume anormal a été calculé en % d'évolution : $AV_{it} = (V_{it} - K_{it}) / K_{it}$

with T the “non-event” periods of time. We ran two analysis: one with T of 90 days, the other with T of 1 year, such that the last days is $d-6$. Finally, cumulated abnormal returns are the sum of abnormal volumes on the event window:

$$CAV_{it} = \sum_{t=-5}^5 AV_{it}$$

2.4 Expected Impacts of Recommendations on an Emerging Market

The Tunisian market being relatively poorly liquid, it seems consistent to analyze both prices and volumes reaction.

Concerning the returns, we expect positive returns following buy recommendations, and negative returns following sell recommendations. We expect “hold” recommendation to have no impact on returns. For recommendations changes, we expect a positive revision to have a positive impact on returns. Negative revisions are bad news and hence we expect them to be followed by negative returns. When the recommendation is unchanged (“conservation”), we expect that, prices having integrated all information, the returns will not react. Nevertheless the level toward which the recommendation is changed can have an effect. Revisions that do not change the general direction of the trade (4 to 5 or 5 to 4, etc.) are not expected to impact the returns. In the contrary, we expect that revisions that deeply change the direction of the trade (from sell to buy and reciprocally) will have an impact. Revisions starting from, or going toward, “hold” recommendations, should have a minor impact.

Concerning the volumes, one generally expects that volume will rise during event periods, i.e. around recommendations publications, whatever the level or the revision of the recommendation. But the Tunisian market has, as an emerging financial market, the following feature: investors are not sure to find a counterpart if they massively react to a sell recommendation. Hence they prefer to hold their assets until a good news will offset the bad one. That is why we expect a decrease in the trading volumes around negative recommendation (“sell” recommendation, or downward revision), but also for “hold” recommendation. We expect the usual increase in volumes for “buy” or upward revision, and no reaction when the recommendation is not revised (i.e. same recommendation repeated).

Turning to variable that can influence the impact of recommendation, we first expect the stock covered by numerous analysts to be less impacted by recommendations. In Tunisia, it is primarily the case for the financial sector. Financial companies have more liquid stocks, and better information disclosure than other sectors. Hence recommendation should bring less

new information to investors. Second, we have to control for the reputation of the broker that employs the analyst. Remember that our database only contains the brokers that publicly disclose their recommendation, whereas it exist other brokers with well-developed research department that do not disclose their recommendations, or even announce that they do not produce recommendations. Nevertheless, the four brokers of our database are commonly viewed as high-reputation intermediaries. Hence, our results are not biased by differences in the brokers' reputation. Third, the specificity of an emerging markets is that information asymmetries are supposed to be greater that on developed markets. In that context, analysts' recommendations are expected to have a great impact, because their information is precious to offset the usual lack of transparency of most firms on the BVMT.

3. THE PRICE AND VOLUME RESPONSE TO RECOMMENDATION AND RECOMMENDATION CHANGES

3.1 Recommendation Level

Results are generally corresponding to what was expected.

For recommendation with a "buy" level, positive abnormal returns are recorded. Appendix 3 shows for example a 0.11% daily abnormal return in d-1 for the CAPM model and 0.12% in d+3 for the market index model. Cumulated abnormal returns are also significant, with 0.71% excess return in d+5 according to the CAPM and 0.41% in excess of the market index. The "buy" level also generates abnormal volumes, from 26% to 63%, compared to non-event periods. Cumulated abnormal volumes reach +91% in d+1 compared to CAPM and +208% compared to market index volume.

"Sell" recommendation generate negative price reaction. The cumulated abnormal return is for example -1.02% in d+3 for the CAPM model. We confirm negative cumulated abnormal volumes around sell recommendation events.

"Hold" recommendation are followed by generally negative cumulated returns, although we record a positive reaction according the CAPM. This is not surprising as this recommendation can have a very different meaning depending on the previous recommendation level. Nevertheless, cumulated returns are -0.72% for the market index model. Volumes exhibit, either a negative value or no significant abnormal volumes. This is consistent with the nature of a "hold" recommendation.

3.2 Recommendation Changes

Contrarily to most of our hypothesis, from Appendix 4 it appears that recommendation changes often do not affect prices and volumes as expected. Nevertheless a weak evidence of impact is detected for some days. Globally, unchanged recommendations have more significant impact than other revisions. This is surprising because no revision should represent a *status quo* for investors. Abnormal returns are alternatively negative or positive; however abnormal volumes are generally negative. This means that analyzing revisions is not sufficient on an emerging market. Further analysis should distinguish upward revisions according to the initial level: Revision from 1 (strong sell) to 2 (sell) can have a different meaning to investors than revising from 4 (buy) to 5 (strong buy). This is done in appendix 5, 6 and 7.

Results in appendix 5 indicate that no impact on volumes is recorded for upward revisions reaching level 4 and 5, and a slight reaction is observed in d-3 for the CAPM model with 0.45% excess return. Upward revisions reaching level 3 (hold), indicate a negative – 1.04% abnormal return in d+5, and a negative -58% in d+1 for the volume. The most prominent impact concerns upward revisions reaching level 2 (sell). Cumulated abnormal returns are negative: -4.13% in d+3, and volumes are abnormally negative by -70%.

Turning to downward revisions in appendix 6, they also present weak evidence of impact. Recommendations reaching “buy” (level 4) exhibit a slight negative return reaction in day d, of 0.8%, and a negative reaction of -50% in d-5 is observed for the volumes. No reaction is recorded for downward revision reaching level 3 (hold), except form some days. When the downward revision reaches sell recommendations (level 2 or 1), exhibit negative abnormal returns in d-5 (-0.5%), but then positive in d and d+1. This suggests that some investors profit from the previous decrease in price. Indeed, cumulated returns are abnormally negative from d-5 to d.

When no revision takes place, i.e. when the same recommendation is posted from one month to another, investors seem to react more saliently (see appendix 7). The stocks which are maintained at a buy level show a positive cumulated return of +0.72% according to the CAPM. Abnormal volumes are also positive. When recommendations are unchanged at a sell level, cumulated abnormal returns are negative in d+5 at -0.9%. Cumulated abnormal volumes are deeply negative. Recommendations maintained at the “hold” level have less impact, albeit abnormal cumulated returns are negative from d+2 to d+5. We observe a weak negative reaction on abnormal volumes.

4. CONCLUSION

The results show that our hypotheses are partially verified. We show evidence of impact of recommendation level on prices and volumes, although recommendation changes exhibit a much weaker evidence of impact.

“Buy” recommendation generate positive abnormal returns and volumes. “Sell” recommendations generate negative returns and, consistently with the particular features of an emerging market, abnormally low trading volumes. “Hold” recommendations have a mitigated impact on returns and no effect on volumes.

In the contrary, upward revisions show very little impact, whereas we expected a positive reaction of prices and volumes. Also for downward revisions: the expected negative impact on prices and volumes is not observed. Only unchanged recommendations have an impact, especially on the volumes, with abnormally low volumes.

These results lead to at least four remarks on the value of analysts’ recommendation on the Tunisian market.

1– Investors react more on the level of recommendation than on recommendation changes. This is the contrary in developed stock markets, where revisions are considered as more informative.

2– Information is not processed in the same way in all markets. On the Tunisian market, it seems that an upward revision from “strong sell” to “sell” is not interpreted as good news, as the level is still interpreted as a negative opinion. Only the downward revision from “strong buy” to “buy” leads to a negative reaction –although very weak.

3– The particular features of systematic monthly release of recommendations give much weight on the repetition of the same recommendation. Unlike in most Market places, where a new recommendation is released only in case of new information underlying it, the signal is clearly interpreted differently in the case of systematic release, as in the Tunisian market. A stock confirmed at a buy (sell) level shows positive (negative) reaction of the market, whereas no revision leads to mitigated results.

4– We confirm that negative opinion generate abnormally low levels of trading volumes, whereas it is the contrary on mature markets. It seems that Tunisian investors postpone their decision when confronted to a negative opinion, waiting for a confirmation on the following month.

REFERENCES

Asquith P., Mikhail M., Andrea S., 2005, Information content of equity analyst reports, *Journal of Financial Economics* 75 (2005) 245–282

Barber, B., R. Lehavy, M. McNichols, and B. Trueman, 2001, Can investors profit from the prophets? Security analyst recommendations and stock returns, *Journal of Finance* 56, 531-563.

Barber, B.M., R. Lehavy, and B. Trueman, 2006, Comparing the Stock Recommendation Performance of Investment Banks and Independent Research Firms, *Journal of Financial Economics*, forthcoming.

Beneish D., 1991, Stock Prices and the Dissemination of Analysts' Recommendation, *The Journal of Business*, Vol. 64, No. 3 (Jul., 1991), pp. 393-416

Brennan, M., and A. Subrahmanyam, 1995, Investment analysis and price formation in securities markets, *Journal of Financial Economics* 38, 361-381.

Dhiansiri, Nont, Gershon Mandelker, and Akin Sayrak, 2005, The Information Content in Analyst Recommendations, Working Paper, University of Pittsburgh.

F. Moshirian, D. Ng, E. Wu, 2009, The value of stock analysts' recommendations: Evidence from emerging markets, *International Review of Financial Analysis*

Fama, E. F. and K. R. French, 1992, The cross-section of expected stock returns, *Journal of Finance* 47, 427-465.

Finger, C. A., and Wayne R. Landsman, 1999, What do analysts' stock recommendations really mean? University of Illinois and U.N.C. – Chapel Hill working paper, March.

Green T.C., 2006, « The value of client access to analyst recommendations », *Journal of Financial and Quantitative Analysis*, vol. 41, p. 1-24.

Jason L. Hall, Paul B. Tacon, 2010, Forecast accuracy and stock recommendations, *Journal of Contemporary Accounting & Economics*

Jegadeesh Narasimhan and Sheridan Titman, 1993, "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency." *Journal of Finance*, Vol. 48, No. 1, pp. 65-91.

Jegadeesh, Narasimhan , Joonghyuk Kim, Susan D. Kriische and Charles M. C. Lee,2004, Analyzing the analysts: when do recommendations add value?, *Journal of Finance* 59, 1083-1124.

Jegadeesh, N., Kim, W., 2006. Value of analyst recommendations: International evidence, *Journal of Financial Markets* 9, 274-309.

Jordi Blanes i Vidal, 2003, Credibility and Cheap Talk of Securities Analysts: Theory and Evidence, Social Science Research Network.

Joshua Huang Thien En, G. Mujtaba Mian, Srinivasan Sankaraguruswamy, 2009, The Value of Combining the Information Content of Analyst Recommendations and Target Prices, *Journal of Financial Markets*

La Porta, R., 1996, Expectations and the Cross-section of Returns, *Journal of Finance*, Vol. 51, No. 5, pp. 1715-1742.

Lim Terence, 2001, Rationality and analysts' forecast bias, *Journal of Finance* 56:369-385.

Mai H. and Tchameni E., ..., Etude d'évènement par les volumes : méthodologies et comparaisons, Cahier de recherche du CEREG, N° 9610

McNichols, M., and P. C. O'Brien, 1997, Self-selection and analyst coverage, *Journal of Accounting Research*, 35, 167-199.

Michaely Roni and Womack Kent, 1999, Conflict of interest and the credibility of underwriter analyst recommendations, *Review of Financial Studies* 12:653-686.

O'Brien, P. C., and Ravi Bhushan, 1990, Analyst following and institutional ownership, *Journal of Accounting Research* 28, 55-82.

OyaAltinkılıç, RobertS.Hansen, 2009, On the information role of stock recommendation revisions, *Journal of Accounting and Economics*

Ryan P. and Taffler R., 2004, Are Economically Significant Stock Returns and Trading Volumes Driven by Firm-specific News Releases?, *Journal of Business Finance & Accounting*, 31(1) & (2), January/March 2004, 0306-686X

Ryan P. and Taffler R., 2006, Do brokerage houses add value? The market impact of UK sell-side analyst recommendation changes, *Social Science Research Network*.

Sloan, Richard G., 1996, Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71, 289-315.

Sorin Sorescu and Avanidhar Subrahmanyam, 2004, The Cross-Section of Analyst Recommendations, *Social Science Research Network*.

Stickel, Scott E., 2007, Analyst incentives and the financial characteristics of Wall Street darlings and dogs, *Journal of Investing*.

Stickel, S. (1992). Reputation and performance among security analysts. *Journal of Finance*, 47, 1811–1836.

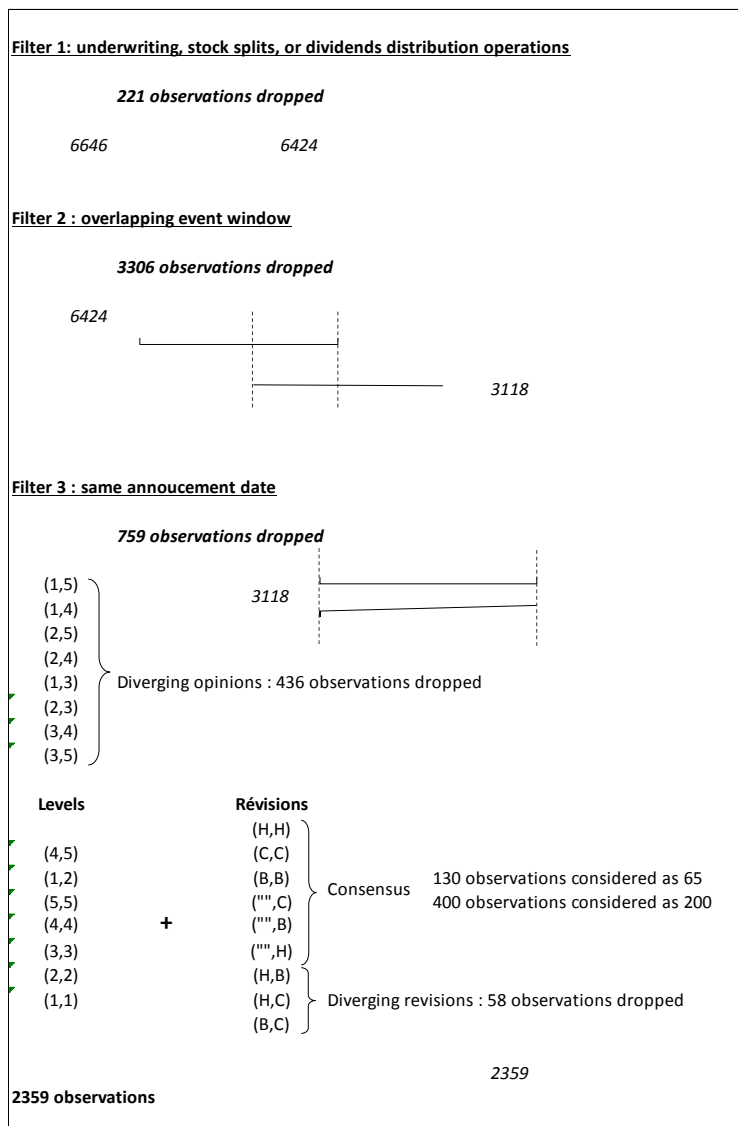
Stickel, S., 1995. The anatomy of the performance of buy and sell recommendations. *Financial Analysts Journal* 51, 25–39.

S. D. Krische and Charles M. C. Lee, 2000, The information content of analyst stock recommendations, *Social Science Research Network*.

Womack, K., 1996, Do brokerage analysts recommendations have investment value?, *Journal of Finance* 51, 137-167

APPENDIX

Appendix 1: Data filters



Appendix 2: expected correlations

Event		Descriptions	Expected sign				
Monthly disclosure of recommendations	REC	Monthly recommendations by every Broker on each of the 55 stocks, Scale: 1 = "strong sell", 2 = "sell", 3 = "hold", 4 = "buy", 5 = "strong buy"	Sell		Hold		Buy
			1	2	3	4	5
Market return of the stock							
	AR _{it}	Abnormal return of stock i at date t, centered on an 11-day event window	-				+
	CAR _{it}	Cumulated abnormal return of stock i at period T	-				+
Trading volume for the stock							
	AV _{it}	Abnormal volume of stock i at date t, centered on an 11-day event window	+/-		-		+
	CAV _{it}	Cumulated abnormal volume of stock i at period T	+/-		-		+
Event		Descriptions	Expected sign				
Monthly disclosure of recommendations	VRECO	Revision of the recommendations release by a broker, 2 = upward revision, 1 = conservation, no change, 0 = downward revision	Downward	Conservation	Upward		
			0	1	2		
Market return for the stock							
	AR _{it}	Abnormal return of stock i at date t, centered on an 11-day event window	-		+		
	CAR _{it}	Cumulated abnormal return of stock i at period T	-		+		
Trading volumes for the stock							
	AV _{it}	Abnormal volume of stock i at date t, centered on an 11-day event window	+/-		+		
	CAV _{it}	Cumulated abnormal volume of stock i at period T	+/-		+		

Appendix 3: Impact of the level of recommendations on the BVMT

Modèle (Ri-Rm) volume (m-3)	RECA								RECC								RECV							
	AR		CAR		AV		CAV		AR		CAR		AV		CAV		AR		CAR		AV		CAV	
Fenêtre d'evt	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	t-stat	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)
-5	0.0000853	0.8294	0.0000853	0.8294	0.3810358	0.0111	0.3810358	0.0111	0.0002063	0.6695	0.0002063	0.6695	-6.335473	0.3983	-6.335473	0.3983	0.0000414	0.9594	0.0000414	0.9594	-13.17095	0.2293	-13.17095	0.2293
-4	0.0006787	0.1325	0.000764	0.2302	0.0960006	0.2071	0.4770364	0.0075	-0.0003019	0.687	-0.0000956	0.92	-8.94081	0.222	-15.27628	0.2999	-0.0011782	0.1485	-0.0011368	0.3485	-13.46257	0.219	-26.63352	0.224
-3	0.0004598	0.2656	0.0012238	0.1277	0.8983379	0.1728	1.377235	0.0504	-0.0006919	0.1368	-0.0007876	0.4818	-2.24013	0.8197	-17.51641	0.4418	-0.0008818	0.2658	-0.0020185	0.1931	-12.89678	0.2392	-39.5303	0.2289
-2	0.0004128	0.3238	0.0016366	0.0656	0.09912	0.2666	1.478506	0.039	-0.0007073	0.1461	-0.0014949	0.2053	-7.447407	0.3211	-24.96382	0.4011	-0.0013041	0.0963	-0.0033226	0.0602	-13.14687	0.2287	-52.7049	0.2288
-1	0.0004897	0.2688	0.0021263	0.0301	0.1612298	0.1307	1.643532	0.0266	-0.0001959	0.6729	-0.0016908	0.2018	-9.719045	0.1754	-34.68287	0.3448	-0.0018169	0.0191	-0.0051396	0.0098	-6.268101	0.5942	-58.98503	0.2828
0	-0.0003996	0.3464	0.0017263	0.1133	0.224332	0.1864	1.871352	0.0193	-0.0005057	0.2678	-0.0021965	0.1206	-9.602672	0.182	-44.31698	0.3113	-0.0010306	0.1719	-0.0061702	0.0046	-11.01552	0.3198	-70.02341	0.2884
1	-0.0002493	0.575	0.0014778	0.2158	0.2143895	0.1773	2.089444	0.0128	-0.0008632	0.0794	-0.0030597	0.0457	-10.85327	0.1296	-55.17025	0.2776	-0.0022628	0.0023	-0.0084329	0.0004	-12.42572	0.2564	-82.47521	0.2833
2	0.0006539	0.1483	0.0020865	0.0996	18.80704	0.31	20.95781	0.2601	-0.001649	0.0008	-0.0047087	0.0043	445.675	0.3245	390.5047	0.3916	-0.0017077	0.0276	-0.0101407	0.0001	-12.47432	0.2541	-95.1485	0.2794
3	0.0012707	0.0034	0.00336	0.0146	0.3269274	0.0054	21.28603	0.2528	-0.0006194	0.1966	-0.0053281	0.0025	-9.269912	0.2023	381.2348	0.4039	-0.0000752	0.9327	-0.0102159	0.0003	-4.991138	0.6904	-100.1488	0.3121
4	0.0000168	0.9681	0.0034411	0.0175	0.3409547	0.0115	21.62991	0.2454	-0.0017386	0.0001	-0.0070667	0.0001	5.788259	0.744	387.0231	0.3981	0.0003398	0.6706	-0.0098762	0.0011	-11.9223	0.2761	-112.0961	0.3082
5	0.0006864	0.1166	0.0041134	0.0061	0.637041	0.0103	22.26087	0.232	-0.0001462	0.7354	-0.0072128	0.0002	-10.11822	0.1579	376.9049	0.4117	0.001481	0.0709	-0.0083952	0.0086	-12.13432	0.2689	-124.2559	0.3042

Modèle marché Volume (n)	RECA								RECC								RECV								
	AR		CAR		AV		CAV		AR		CAR		AV		CAV		AR		CAR		AV		CAV		
Fenêtre d'evt	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	t-stat	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	
-5	0.0001129	0.7763	0.0001129	0.7763	0.2297019	0.1732	0.2297019	0.1732	0.0006702	0.1672	0.0006702	0.1672	-0.1583205	0.9621	-0.1583205	0.9621	0.000125	0.8771	0.000125	0.8771	-25.51057	0.0082	-25.51057	0.0082	
-4	0.0008909	0.0447	0.0010038	0.1118	0.0405304	0.5452	0.2703552	0.1568	0.0003445	0.651	0.000993	0.3038	-2.422219	0.4267	-2.580539	0.6788	-0.0004746	0.56	-0.0003496	0.7727	-25.6552	0.0078	-51.16577	0.008	
-3	0.0008035	0.0501	0.0018072	0.0236	0.4015751	0.1831	0.6736789	0.0685	-0.0002677	0.5652	0.0007231	0.5239	8.939926	0.4758	6.359386	0.6702	-0.000019	0.9806	-0.0003685	0.8104	-21.43287	0.0152	-72.59864	0.0085	
-2	0.0008423	0.0409	0.0026496	0.0027	0.0279112	0.7472	0.7019794	0.0707	-0.0001313	0.7873	0.0006415	0.5902	-0.1411766	0.9748	6.21821	0.7124	-0.0005882	0.447	-0.0009567	0.5818	-21.61478	0.0143	-94.21342	0.0091	
-1	0.0011653	0.0086	0.0038148	0.0001	0.0550418	0.5022	0.7584701	0.0649	0.0006102	0.1824	0.001286	0.3312	-3.360389	0.2053	2.857821	0.8784	-0.0007359	0.3136	-0.0016927	0.3773	-8.720039	0.5298	-102.9335	0.0255	
0	0.0002704	0.5298	0.0040853	0.0002	0.0301077	0.7589	0.7869839	0.0756	0.0007391	0.0978	0.0020083	0.1528	-3.829742	0.145	-0.9719214	0.9623	0.0000828	0.911	-0.0016099	0.4424	-16.89258	0.0895	-119.826	0.0314	
1	0.0000218	0.9619	0.0041071	0.0007	0.1298539	0.3022	0.9137635	0.0583	-0.0003482	0.4754	0.0016261	0.2855	-4.451542	0.0864	-5.423464	0.8104	-0.0015906	0.0247	-0.0032005	0.1569	-21.05291	0.0171	-140.8789	0.028	
2	0.0010105	0.0266	0.0051175	0.0001	22.83092	0.3131	23.79256	0.2946	-0.0011371	0.0165	0.0004564	0.3131	0.7823	451.3701	0.3198	446.4269	0.3262	-0.0006783	0.3661	-0.0038788	0.1142	-21.38048	0.0153	-162.2594	0.0255
3	0.0009815	0.0245	0.0060991	0.000	0.2696018	0.0135	24.04702	0.2895	-0.0007183	0.1287	-0.0002863	0.8706	-3.744099	0.1532	442.6779	0.3304	-0.0003753	0.6674	-0.0042541	0.1144	-19.37019	0.0331	-181.6296	0.0253	
4	0.000272	0.5162	0.0063711	0.000	0.335525	0.0077	24.38064	0.283	-0.0009267	0.038	-0.0012157	0.5102	12.18307	0.4587	454.8741	0.3176	0.0005032	0.5239	-0.0037509	0.1968	-21.06498	0.0171	-202.6946	0.024	
5	0.0007482	0.0902	0.0071193	0.000	0.5650744	0.0121	24.94754	0.2721	-0.0000674	0.8752	-0.0012725	0.5055	-3.694225	0.157	451.1764	0.3217	0.0016518	0.0364	-0.002099	0.4945	-21.66737	0.0139	-224.362	0.0227	

Appendix 4: Impact of the change of recommendations on the BVMT

Modèle (Ri-Rm) volume (m-3) Fenêtre d'evt	VREC (2)									VREC (1)									VREC (0)																	
	AR			CAR			AV			CAV			AR			CAR			AV			CAV			AR			CAR			AV			CAV		
	Mean (%)	P (t)		Mean (%)	P (t)		Mean (%)	t-stat	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)				
-5	0.0010057	0.5894	0.0010057	0.5894	21.54821	0.3077	21.54821	0.3077	0.000144	0.633	0.000144	0.633	-6.052845	0.1358	-6.052845	0.1358	-0.0020399	0.5023	-0.0020399	0.5023	-0.5782817	0.1594	-0.5782817	0.1594	0.0011031	0.7227	-0.0009367	0.8635	-0.2628213	0.6144	-0.841103	0.3536				
-4	0.0015778	0.3854	0.0025835	0.3239	1.999547	0.0952	23.54776	0.2792	-0.0002532	0.525	-0.0001092	0.8351	-6.854951	0.0886	-12.9078	0.1096	0.0011031	0.7227	-0.0009367	0.8635	-0.2628213	0.6144	-0.841103	0.3536	0.0012071	0.5157	-0.0021439	0.7359	-0.3121351	0.4539	-1.153238	0.3637				
-3	0.0028591	0.1366	0.0064426	0.1349	2.031924	0.2147	25.57968	0.273	-0.0003424	0.2577	-0.0004516	0.4768	-3.341502	0.5045	-16.2505	0.1889	-0.0012071	0.5157	-0.0021439	0.7359	-0.3121351	0.4539	-1.153238	0.3637	0.0002153	0.9142	-0.0019286	0.7586	0.1768276	0.7513	-0.9764105	0.5642				
-2	-0.0014692	0.4855	0.0049734	0.2555	8.181808	0.2856	33.76149	0.2759	-0.0003486	0.2639	-0.0008002	0.2512	-6.284161	0.1239	-22.54234	0.1655	0.0002153	0.9142	-0.0019286	0.7586	0.1768276	0.7513	-0.9764105	0.5642	0.0029306	0.0507	0.001002	0.8799	0.0111105	0.9811	-0.9652998	0.645				
-1	-0.0009663	0.6214	0.0040072	0.3784	1.81163	0.1662	35.57312	0.2534	-0.0004116	0.1905	-0.0012118	0.1216	-5.66963	0.1635	-28.21882	0.1619	-0.0029306	0.0507	0.001002	0.8799	0.0111105	0.9811	-0.9652998	0.645	0.0029306	0.0507	0.001002	0.8799	0.0111105	0.9811	-0.9652998	0.645				
0	-0.0015373	0.4297	0.0024699	0.5963	2.223336	0.3142	37.79646	0.2314	-0.0005703	0.0603	-0.0017821	0.0384	-6.571318	0.0995	-34.81213	0.1487	-0.02022662	0.9968	0.0009939	0.8819	-0.3692709	0.4005	-1.334571	0.5954	0.0029306	0.0507	0.001002	0.8799	0.0111105	0.9811	-0.9652998	0.645				
1	-0.0023307	0.3204	0.0001392	0.9794	0.4896267	0.3576	38.28609	0.2264	-0.0009253	0.0039	-0.0027074	0.0041	-7.386594	0.0622	-42.21105	0.1321	-0.0010001	0.5463	-0.01541784	0.9993	-0.2923883	0.5166	-1.626959	0.5786	0.0029306	0.0507	0.001002	0.8799	0.0111105	0.9811	-0.9652998	0.645				
2	-0.0017361	0.3897	-0.0015968	0.795	57.76188	0.2978	96.04795	0.269	-0.0007026	0.0323	-0.00341	0.0008	205.3747	0.3146	163.5408	0.4294	-0.0035227	0.0262	-0.003529	0.5875	-0.0064862	0.9896	-1.633445	0.6267	0.0029306	0.0507	0.001002	0.8799	0.0111105	0.9811	-0.9652998	0.645				
3	-0.0013466	0.46	-0.0029434	0.6649	22.87084	0.2971	118.9188	0.2742	0.0003981	0.2306	-0.0030119	0.0065	-5.657423	0.1739	157.88732	0.447	-0.0023546	0.1346	-0.0058835	0.3572	-0.2706775	0.5158	-1.904123	0.6116	0.0029306	0.0507	0.001002	0.8799	0.0111105	0.9811	-0.9652998	0.645				
4	0.001081	0.6633	-0.0018624	0.811	0.5539002	0.1775	119.4727	0.272	-0.0006387	0.037	-0.0036506	0.0018	0.2369545	0.9773	158.1119	0.4481	-0.0004104	0.7877	-0.0062939	0.3631	0.8450622	0.462	-1.059061	0.8062	0.0029306	0.0507	0.001002	0.8799	0.0111105	0.9811	-0.9652998	0.645				
5	-0.0016953	0.4288	-0.0035577	0.682	1.109091	0.2174	120.5818	0.2682	0.0005383	0.0847	-0.0031123	0.0104	-6.830921	0.085	151.2647	0.4697	0.0009233	0.5246	-0.0053706	0.4506	-0.4555835	0.2919	-1.514644	0.7476	0.0029306	0.0507	0.001002	0.8799	0.0111105	0.9811	-0.9652998	0.645				

Modèle marché Volume (n) Fenêtre d'evt	VREC (2)									VREC (1)									VREC (0)																	
	AR			CAR			AV			CAV			AR			CAR			AV			CAV			AR			CAR			AV			CAV		
	Mean (%)	P (t)		Mean (%)	P (t)		Mean (%)	t-stat	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)	Mean (%)	P (t)				
-5	-0.0003049	0.8748	-0.0003049	0.8748	7.879838	0.2868	7.879838	0.2868	0.0003816	0.2048	0.0003816	0.2048	-4.773156	0.0483	-4.773156	0.0483	-0.0019041	0.5436	-0.0019041	0.5436	-0.5559275	0.2089	-0.5559275	0.2089	0.001659	0.5984	-0.0002451	0.9649	-0.4800655	0.2919	-1.035993	0.2385				
-4	0.0014583	0.3957	0.0011804	0.6508	0.8831241	0.0945	8.762961	0.2515	0.0002152	0.59	0.0005968	0.2556	-5.688248	0.0152	-10.46415	0.0266	0.001659	0.5984	-0.0002451	0.9649	-0.4800655	0.2919	-1.035993	0.2385	0.0009089	0.7418	0.0006957	0.2724	0.592465	0.9214	-9.870748	0.2557				
-3	0.0050476	0.0609	0.006228	0.1594	0.6804483	0.2006	9.44341	0.2429	0.0000989	0.7418	0.0006957	0.2724	0.592465	0.9214	-9.870748	0.2557	-0.0012509	0.5071	-0.001496	0.8192	-0.365835	0.4108	-1.401828	0.279	0.0001814	0.5579	0.0008771	0.2063	-3.839548	0.1483	-13.71391	0.1874				
-2	-0.0004064	0.8445	0.0058216	0.2007	2.012061	0.3319	11.45547	0.2587	0.0001814	0.5579	0.0008771	0.2063	-3.839548	0.1483	-13.71391	0.1874	0.0010766	0.5932	-0.0004194	0.948	-0.0030873	0.9953	-1.404915	0.4244	0.0004121	0.1813	0.0012891	0.0952	-2.516819	0.4135	-16.23297	0.1887				
-1	-0.0003169	0.8765	0.0055047	0.2478	0.6915089	0.2042	12.14698	0.2339	0.0004121	0.1813	0.0012891	0.0952	-2.516819	0.4135	-16.23297	0.1887	0.0034149	0.0285	0.0029955	0.6598	-0.3079899	0.5006	-1.712905	0.4332	0.0004726	0.1164	0.0017618	0.0377	-4.471713	0.0505	-20.70977	0.1478				
0	-0.0006043	0.7531	0.0049004	0.3075	0.7052206	0.4206	12.8522	0.2158	0.0004726	0.1164	0.0017618	0.0377	-4.471713	0.0505	-20.70977	0.1478	0.0006582	0.7441	0.0036537	0.5914	-0.3709586	0.4215	-2.083864	0.4279	-0.0021143	0.3946	0.0027861	0.619	0.1228673	0.6594	12.97507	0.2125				
1	-0.0021143	0.3946	0.0027861	0.619	0.1228673	0.6594	12.97507	0.2125	-0.0004584	0.1501	0.0013033	0.1609	-5.574395	0.0069	-26.29107	0.103	0.0005006	0.7654	0.0041543	0.53554	-0.4078874	0.3873	-2.491751	0.4174	-0.0004553	0.8348	0.0023308	0.7251	16.96248	0.2706	29.93754	0.2438				
2	-0.0004553	0.8348	0.0023308	0.7251	16.96248	0.2706	29.93754	0.2438	-0.0001306	0.6836	0.0011728	0.2447	213.2303	0.307	187.2504	0.372	-0.0031465	0.0413	0.0010078	0.8777	-0.0513627	0.929	-2.543114	0.4721	0.0001476	0.6519	0.0013204	0.2272	-5.048874	0.0168	182.187	0.3854				
3	-0.0020371	0.3045	0.0002937	0.9683	7.635237	0.2132	37.57278	0.2366	0.0001476	0.6519	0.0013204	0.2272	-5.048874	0.0168	182.187	0.3854	-0.0013509	0.3947	-0.000343	0.957	-0.4521291	0.3111	-2.995243	0.4501	0.0016174	0.51	0.0019111	0.8181	0.793727	0.1767	38.36651	0.2272				
4	0.0016174	0.51	0.0019111	0.8181	0.793727	0.1767	38.36651	0.2272	-0.000171	0.5745	0.0011494	0.3219	2.107015	0.7855	184.2956	0.3806	-0.0002231	0.8852	-0.0005661	0.9337	0.1168447	0.8729	-2.878398	0.5175	-0.0011116	0.6064	0.0007995	0.93	0.7389953	0.0978	39.1055	0.2235				
5	-0.0011116	0.6064	0.0007995	0.93	0.7389953	0.0978	39.1055	0.2235	0.000615	0.0465	0.0017644	0.1436	-5.197403	0.0118	179.0903	0.3947	0.0007089	0.6301	0.0001428	0.9839	-0.619082	0.1522	-3.49748	0.44712	0.000615	0.0465	0.0017644	0.1436	-5.197403	0.0118	179.0903	0.3947				

Appendix 5: Impact of upward revisions on the BVMT

Modèle (Ri-Rm) volume (m-3)	REC (4,5)									REC(3)						REC (2)									
	AR			CAR			AV			CAV			AR			CAR			AV			CAV			
	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	
Fenêtre d'evt																									
-5	-0.000872	0.6801	-0.000872	0.6801	0.7087141	0.2344	0.7087141	0.2344	0.0054944	0.2702	0.0054944	0.2702	87.61643	0.3331	87.61643	0.3331	0.0042562	0.0947	0.0042562	0.0947	-0.4081476	0.3573	-0.4081476	0.3573	
-4	0.0012408	0.5537	0.0003687	0.8984	0.8559894	0.3061	1.564704	0.2401	0.0022739	0.6043	0.007273	0.2739	5.966574	0.1831	93.58301	0.3148	0.0025176	0.7687	0.0067738	0.4333	-0.3153781	0.4747	-0.7235257	0.4097	
-3	0.0034278	0.0962	0.0037966	0.3692	0.4434748	0.5441	2.008178	0.3238	0.0100212	0.2715	0.0177894	0.1873	7.355522	0.2697	100.9385	0.3115	-0.0120709	0.1279	-0.005297	0.6397	-0.5766134	0.1433	-1.300139	0.3029	
-2	0.0009374	0.7193	0.004734	0.3241	0.7847252	0.3096	2.792903	0.2993	-0.0057307	0.193	0.0120587	0.3166	31.97252	0.3292	132.9111	0.3157	-0.0104818	0.0381	-0.0157789	0.1686	-0.7150022	0.0058	-2.015141	0.1487	
-1	-0.0008667	0.7131	0.0038672	0.4383	2.394568	0.2093	5.187471	0.2546	-0.0012751	0.772	0.0107836	0.3728	0.8455995	0.1474	133.7567	0.3137	-0.0009081	0.9097	-0.016687	0.3497	-0.4409	0.267	-2.456085	0.0911	
0	-0.0003043	0.8785	0.0035629	0.4868	3.08894	0.3384	8.276411	0.2857	-0.0075701	0.1703	0.0032136	0.804	0.6685195	0.431	134.4252	0.3139	0.006356	0.4372	-0.010331	0.4705	-0.7303449	0.0058	-3.18643	0.0542	
1	-0.0005095	0.8332	0.0030534	0.5832	0.9125799	0.2357	9.188991	0.2795	0.0012957	0.793	0.0045093	0.7648	-0.5807373	0.0015	133.8444	0.3158	-0.0314172	0.0216	-0.0417482	0.0254	0.0559923	0.9515	-3.1304038	0.1815	
2	-0.0012794	0.5589	0.001774	0.7682	3.769382	0.234	12.95837	0.2658	-0.00433	0.3456	0.0001793	0.9922	229.3225	0.3346	363.1669	0.3277	0.002356	0.8697	-0.0393922	0.1472	-0.379471	0.4508	-3.509909	0.1515	
3	-0.0001038	0.9508	0.0016702	0.7891	1.176401	0.1571	14.13477	0.2288	-0.0047933	0.4018	-0.004614	0.8348	91.71976	0.329	454.8866	0.328	-0.0019511	0.8307	-0.0413433	0.0405	-0.2146108	0.6222	-3.72452	0.1915	
4	-0.0007601	0.7793	0.0009101	0.8978	0.3017946	0.3151	14.43657	0.2225	0.0046604	0.4362	0.0000464	0.9986	1.258952	0.4059	456.1456	0.3266	0.0069378	0.6479	-0.0344055	0.1924	0.5944604	0.5804	-3.130059	0.3899	
5	0.0008227	0.6875	0.0017329	0.8285	1.397016	0.2815	15.83358	0.1862	-0.0104647	0.0326	-0.0104183	0.7082	0.728738	0.3038	456.8743	0.3264	0.0028838	0.8747	-0.0315217	0.4037	-0.3180688	0.1206	-3.448128	0.3416	

Modèle marché Volume (n)	REC (4,5)									REC(3)						REC (2)								
	AR			CAR			AV			CAV			AR			CAR			AV			CAV		
	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat
Fenêtre d'evt																								
-5	-0.0020979	0.339	-0.0020979	0.339	0.0742886	0.7932	0.0742886	0.7932	0.0044428	0.4116	0.0044428	0.4116	34.50875	0.3064	34.50875	0.3064	0.002485	0.1642	0.002485	0.1642	0.1944418	0.8159	0.1944418	0.8159
-4	0.008534	0.6694	-0.0012445	0.6597	0.3072469	0.444	0.3815355	0.4975	0.0028301	0.5154	0.007273	0.3279	2.809827	0.1627	37.31857	0.283	0.0034547	0.6804	0.0059396	0.5126	0.4298792	0.6328	0.624321	0.7162
-3	0.0045354	0.0351	0.0032909	0.4279	-0.1135041	0.6748	0.2680314	0.739	0.0118234	0.242	0.0190964	0.2077	3.397111	0.1226	40.71568	0.2671	-0.0104147	0.1094	-0.0044751	0.6816	-0.1254792	0.8512	0.4988419	0.8331
-2	0.0022932	0.3561	0.0055841	0.2488	-0.1338044	0.5833	0.1342269	0.8933	-0.0057013	0.2221	0.0133951	0.3273	9.434356	0.3172	50.15004	0.2761	-0.0101681	0.06	-0.0146431	0.1975	-0.4055719	0.1738	0.0932699	0.9683
-1	-0.0001717	0.9426	0.0054124	0.2781	0.7526007	0.3066	0.8868276	0.5955	-0.00106	0.8295	0.0123351	0.3827	0.6672191	0.4296	50.81726	0.2708	0.0005332	0.9529	-0.0141099	0.4463	0.1992798	0.8111	0.2925496	0.8996
0	0.0001995	0.919	0.005612	0.2819	0.8588376	0.4797	1.745665	0.5378	-0.0059645	0.2664	0.0063706	0.642	0.6189211	0.569	51.43618	0.2678	0.0078398	0.4595	-0.0062701	0.7417	-0.4568381	0.0943	-0.1642884	0.9455
1	-0.0001314	0.961	0.0054805	0.3658	0.2096831	0.5353	1.955348	0.5337	0.000806	0.884	0.0071765	0.6416	-0.5489248	0.0218	50.88725	0.2722	-0.0297122	0.0061	-0.0359823	0.077	1.335198	0.5404	1.170909	0.786
2	-0.000131	0.9546	0.0053496	0.4329	1.502317	0.2414	3.457665	0.429	-0.0028837	0.5838	0.0044928	0.8235	70.22838	0.3174	121.1156	0.2981	0.0037492	0.8144	-0.0322331	0.3159	0.1712396	0.8365	1.342149	0.7563
3	-0.0012154	0.5454	0.0041341	0.5816	1.312642	0.2595	4.770307	0.3034	-0.0047785	0.4318	-0.0004857	0.9831	29.45447	0.2884	150.5701	0.2961	-0.0016192	0.858	-0.0338523	0.1962	0.6615407	0.5077	2.003698	0.7048
4	-0.0009138	0.7353	0.0032203	0.7033	0.1472301	0.5374	4.917537	0.298	0.0072241	0.2419	0.0067384	0.7988	2.256604	0.3599	152.8267	0.289	0.0088442	0.4947	-0.0250081	0.3292	2.385192	0.3759	4.388882	0.5756
5	0.0011267	0.6157	0.0043471	0.6489	0.3013197	0.3908	5.218857	0.2739	-0.0104024	0.0462	-0.003664	0.8964	2.255382	0.1833	155.0821	0.2872	0.0054962	0.6965	-0.0195118	0.4702	0.2383338	0.3847	4.627215	0.5547

Appendix 7: Impact of repeated recommendations (no revision) on the BVMT

Modèle (Ri-Rm) volume (m-3)	REC (4,5)									REC(3)						REC (1,2)									
	AR			CAR			AV			CAV			AR			CAR			AV			CAV			
	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	
Fenêtre d'evt																									
-5	0.0001648	0.6943	0.0001648	0.6943	0.3114582	0.0292	0.3114582	0.0292	0.00004	0.931	0.00004	0.931	-8.209162	0.3097	-8.209162	0.3097	0.0003299	0.708	0.0003299	0.708	-14.93868	0.2246	-14.93868	0.2246	
-4	0.0003917	0.3616	0.0005565	0.3881	0.0572336	0.4265	0.3986918	0.0274	-0.0005376	0.4914	-0.0004976	0.5944	-9.837632	0.2182	-18.04679	0.26	-0.0010373	0.2334	-0.0007073	0.5937	-15.01331	0.2223	-29.95199	0.2234	
-3	0.0004251	0.322	0.0009816	0.2244	0.9712135	0.1843	1.37206	0.0766	-0.0008728	0.0597	-0.0013704	0.2056	-2.528625	0.8137	-20.57542	0.4069	-0.0008484	0.3236	-0.0015557	0.3608	-14.38014	0.2427	-44.33213	0.2296	
-2	0.0002546	0.5564	0.0012362	0.1636	0.085684	0.3541	1.460104	0.0626	-0.0005145	0.3131	-0.0018849	0.1069	-8.6642143	0.2906	-29.21756	0.367	-0.0013048	0.1114	-0.0028605	0.1386	-14.68104	0.2313	-59.04825	0.23	
-1	0.0003106	0.503	0.0015469	0.117	0.0619842	0.4484	1.524292	0.0553	-0.0001951	0.6862	-0.0020801	0.1142	-10.61898	0.1749	-39.83654	0.3195	-0.0024799	0.0033	-0.0053404	0.0139	-6.962452	0.5982	-66.02599	0.2844	
0	-0.0002391	0.5905	0.0013077	0.2399	0.1185477	0.3418	1.646332	0.0437	-0.0003343	0.4835	-0.0024144	0.0917	-10.47831	0.1821	-50.35513	0.2914	-0.0018227	0.0217	-0.0071631	0.0025	-12.24874	0.3245	-78.30357	0.2906	
1	-0.0003009	0.5291	0.0010069	0.4142	0.2122741	0.219	1.862709	0.0283	-0.0009407	0.0658	-0.0033551	0.0318	-11.8136	0.1306	-62.16873	0.262	-0.002263	0.0041	-0.0094262	0.0003	-13.85946	0.2596	-92.196	0.2856	
2	0.0007905	0.1027	0.0017974	0.174	20.71478	0.3137	22.65245	0.2729	-0.00167	0.0013	-0.0050252	0.003	482.945	0.3279	420.7762	0.3976	-0.0018302	0.0278	-0.0112563	0.0001	-13.9535	0.256	-106.4018	0.2816	
3	0.0015511	0.001	0.0033485	0.0211	0.3163567	0.0109	22.9702	0.2663	-0.0006446	0.1986	-0.0056697	0.0018	-11.50593	0.141	409.2703	0.4116	0.0001848	0.8473	-0.0110716	0.0003	-5.506375	0.6956	-111.91998	0.3147	
4	0.0003443	0.4289	0.0036928	0.0158	0.3031691	0.0122	23.27648	0.2601	-0.0019807	0.000	-0.0076504	0.0001	6.285207	0.7453	415.5555	0.4058	0.0001879	0.8252	-0.0108837	0.0009	-13.31987	0.2787	-125.2713	0.3107	
5	0.0006511	0.1607	0.004344	0.0059	0.6540738	0.0153	23.92387	0.2472	-0.0001367	0.7642	-0.0077871	0.0001	-11.0654	0.157	404.4901	0.4195	0.0017924	0.045	-0.0090913	0.0087	-13.50301	0.2734	-138.8065	0.307	

Modèle marché Volume (n)	REC (4,5)									REC(3)						REC (1,2)									
	AR			CAR			AV			CAV			AR			CAR			AV			CAV			
	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	Mean (%)	P (t)	t-stat	
Fenêtre d'evt																									
-5	0.0001897	0.6518	0.0001897	0.6518	0.2434928	0.189	0.2434928	0.189	0.0005978	0.1944	0.0005978	0.1944	-0.6205302	0.8634	-0.6205302	0.8634	0.0003311	0.7055	0.0003311	0.7055	-24.26486	0.014	-24.26486	0.014	
-4	0.0006329	0.1333	0.0008226	0.1981	0.0280462	0.6851	0.2716597	0.1919	0.0000691	0.9306	0.0000667	0.4807	-2.641675	0.4267	-3.262206	0.6304	-0.000391	0.6526	-0.0000599	0.964	-24.16917	0.0145	-48.43404	0.0142	
-3	0.0006866	0.1072	0.0015092	0.0609	0.4557541	0.1726	0.7294905	0.0731	-0.0004911	0.2896	0.0001759	0.8724	9.734024	0.4765	6.471818	0.6909	0.0000945	0.9108	0.0000346	0.9836	-19.43641	0.0284	-67.87044	0.0153	
-2	0.0006921	0.1047	0.0022013	0.0126	0.0489728	0.6048	0.7789482	0.0676	-0.0000407	0.9368	0.0001352	0.9091	-0.3065322	0.9499	6.165286	0.7374	-0.0004634	0.5652	-0.0004288	0.8197	-19.66615	0.0264	-87.5366	0.0165	
-1	0.0010011	0.0309	0.0032024	0.001	0.0140407	0.8551	0.7936073	0.0746	0.0005603	0.2415	0.0006955	0.5994	-3.646734	0.2075	2.518551	0.9015	-0.0012245	0.121	-0.0016533	0.4244	-5.198719	0.7276	-92.73531	0.0473	
0	0.0004788	0.2887	0.0036812	0.001	0.0073703	0.9366	0.7991538	0.0881	0.0009524	0.0415	0.0016479	0.2478	-4.164197	0.1462	-1.645645	0.9415	-0.0005999	0.4402	-0.0022532	0.3195	-14.34395	0.1616	-107.0793	0.0583	
1	-0.0000203	0.967	0.0036609	0.0035	0.1543354	0.2642	0.9501437	0.0622	-0.0003949	0.4365	0.0012529	0.4208	-4.804201	0.0897	-6.449847	0.7936	-0.0015726	0.0351	-0.0038258	0.116	-19.03825	0.0317	-126.1175	0.0521	
2	0.0011483	0.019	0.0048092	0.0003	25.246	0.3141	26.2553	0.2967	-0.0011428	0.0212	0.0001101	0.9483	491.2167	0.3207	485.3368	0.3277	-0.0007391	0.3556	-0.0045649	0.0848	-19.41623	0.0282	-145.5338	0.0474	
3	0.0012303	0.009	0.00600395	0.000	0.2473567	0.0216	26.48581	0.2925	-0.0007877	0.1097	-0.0006775	0.7088	-4.500824	0.1122	480.8297	0.3323	-0.0001945	0.8357	-0.0047594	0.1017	-17.13332	0.0623	-162.6671	0.0472	
4	0.0005428	0.2175	0.0065823	0.000	0.3437121	0.0086	26.82645	0.2865	-0.0011541	0.0139	-0.0018317	0.3345	13.24759	0.4599	494.0929	0.3195	0.0004124	0.6236	-0.004347	0.166	-19.05465	0.0317	-181.7217	0.0448	
5	0.0006652	0.155	0.0072475	0.000	0.6151804	0.0134	27.44187	0.2757	-0.0000399	0.9296	-0.0018715	0.339	-4.051851	0.1546	490.0369	0.3237	0.001949	0.0237	-0.002398	0.4709	-19.067016	0.0262	-201.3919	0.0424	