

The Impact of Profit Warnings on Casablanca Stock Market

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Abstract

This research paper looks at the impact of the announcement of profit warnings by Moroccan companies on their stock prices. The sample used in this study consists of 71 profit warnings from 35 companies listed in the Casablanca Stock Market. The paper uses the market model from the simple event study methodology in order to look at the fluctuations of companies' abnormal returns, cumulative abnormal returns. From the analysis of five different variables, dummy, and control, we look at the relationship and the behavior of the stock prices using a regression model. This paper, using the event study methodology, looks at the efficiency of the Moroccan market and measures its significance using a t-test. Our research is considered to be a first for the topic of profit warnings in the MENA region and Morocco.

Keywords: Profit warnings; Event study; Abnormal returns; Morocco

Introduction

On a yearly or quarterly basis, listed firms in the Moroccan Stock market publish their financial statements. These statements give details and insights to stakeholders, especially investors about their numbers. This is a requirement and an obligation to all firms as this gives these investors the fairness of looking at the statements and making their decisions as to invest or not. In addition to the financial statements of the company, the AMMC (L'Autorité Marocaine du Marché des Capitaux) has made it obligatory for the listed companies to publish any other document: Additional Paid in Capital Announcement, press releases about the general assemblies, and especially profit warnings. The announcements that the profits of the company will be lower than expected should be done, in Morocco, as soon as the company discovers of the discrepancies between the estimates and its actual returns.

Many studies, and as discussed in the next sections, have looked at this topic from different angles. The research areas vary from, the impact of profit warnings on stock prices, to the effects of time-varying betas on stock prices. However, very little research was done about this in Morocco.

Since we're looking at how one specific event impacts the prices of companies' stock prices in Morocco, the most suitable methodology to adopt for this test would be the event study methodology. The market model, the most used, looks at the actual returns of the company's securities and a certain market index. It is used to represent the difference between the security's returns on a day (inside the event window) and the average return. This change is the effect that happens to the company because of the occurrence of the event and in our case the announcement of the profit warning.

The lack of research about this area of study in the MENA region hinders the possibility for any type of estimation. However, based on one specific research conducted in some similar macro environment as

Morocco, we can safely predict the inefficiency of the Moroccan stock market and therefore unproductive regulation of the prices to the information disclosed by the companies in their profit warning announcements.

Literature Review

Our paper draws basis from several research areas and papers. For the entirety of the MENA Region and the African continent, only two articles were found that tackle the issue of profit warnings. Announcements of profit warnings, although very present in Arab and African countries, is very rarely discussed in literature work or researched in studies. This is definitely not the case for the other parts of the world, especially Western Europe and North America.

Anderson W and Chang A have researched how disclosures of financial distress (profit warnings and suspension notices) influence stock prices. They used a simple event study model to analyze this specific event that is related to the company. Their model uses the daily trading return R_{it} (for any company i for the day t) that they get by using a simple OLS regression over a 250-days estimation. Their model is based on two variables (alpha and beta). They then move into using their previous findings in order to derive the abnormal returns (AR_{it}) and the cumulative abnormal returns (CAR_{it}). This research uses the simplest model of the event study methodology to test four different hypotheses.

In such studies, the famous literary work done by Fama et al [1] is the most commonly used reference. They introduced a revolutionary methodology for studies that were mainly looking at the fluctuations and reaction of security prices around events such as finance laws changes, profit announcements, regulations/deregulations, and money supply announcements by the central banks. This exact methodology is very relevant to our study as it will be applying the market return model and look at the impact that the event of disclosing the profit warnings has on the stock prices of Morocco's stock market.

In order to include a time range that surrounds the event, we had to look for previous work that would be focusing on an event window

that puts the day of the disclosure in the middle. Church M and Donker H [2] used the same methodology introduced above in order to investigate the influence of the information content of profit warnings that are published by companies on their abnormal returns. They measured the market model returns for every security i and used it to find AR_{it} . They then fixed an event window in days around the day of the disclosure. They picked a 20-day window interval and run their process that uses the cumulative average abnormal returns. The results of their event study concluded that the abnormal returns decrease around $t=0$ (The day of the publishing of the profit warning). This research used six different independent variables that go in detail about the company releasing the profit warning. Some of their variables also relate to the popularity of the company to the investors and to the public in general. That is because this exact topic looks at whether the total honesty and openness of companies regarding their profit warnings will be eventually rewarded by the market in the type of a less aggressive reaction.

Once we were set on the type of study methodology we were going to follow, we needed to find out how we will be proceeding? when it came down to the choice of independent variables that would be relevant to both our topic and to the context we chose to conduct our research in. Most of the journals and articles that we read, were relating their independent variables to the company itself and not to the market. The key independent variable used in every research study about the issuance of profit warnings was the type of the profit warning. There are only two types: Qualitative and quantitative profit warnings. This variable is used as a dummy that refers to whether the company chooses to disclose numbers and details in its profit warning (quantitative) or only to inform the public of the potential discrepancy from the previously estimated numbers (qualitative). In "Stock Returns Following Profit Warnings: Evidence from the Dutch Stock Market", Heesters M [3] explains how this variable is a must for every research done about profit warnings. In their paper "Profit Warnings and Timing", Jackson and Madura [4] showcased how larger firms experienced smaller market reactions. That is due to the fact that investors perceive larger firms as less risky and therefore the market deviation is smaller. For the second control variable that is used as well, Elayan and Pukthuanthong [5] explained in their 2009 paper that the risk increases if a firm needs to issue a profit warning, implying that there should be a negative relationship between the leverage level of a company and their stock returns. Raymond AK Cox et al [6] have put forward in their paper "The Bad, the Boom and the Bust: Profit Warnings over the Business Cycle" another dummy variable that regulates the number of times one company has issued profit warnings. This variable looks directly and once again at the popularity of the company: it forecasts the likelihood for the company to re-issue a profit warning. Spohr J [7] introduced in his paper "Can Analysts Forecast Profit Warnings?" one other independent variable closely related to the company in his research. His study focuses more on the ability of analysts to forecast profit warnings based on a variety of variables. The choice of the return on assets ratio as a control variable was backed up, in his article, by the assumption that analysts like bigger firms: firms with a higher return on assets.

After looking at the variety of variables that were used by different researchers in different topics, we had to structure our research and focus on the Moroccan context. Taking into consideration that this topic of profit warnings is hardly ever discussed, we had to find papers and articles that were conducting research about this topic in a region close to Morocco or relatively similar to the Moroccan macro conditions. We looked at Eunice Wambi Maina's [8] paper "The Effect

of Profit Warnings on Stock Returns at the Nairobi Securities Exchange" in the hopes to find information that would be relevant and directly related to the Moroccan context. The first thing she discusses in her paper is the efficiency of the market. She argues that financial markets are efficient information wise and that the fluctuations of the traded securities normally reflect the known information and so there shouldn't be any reason for us to think that the current prices would be too high or too low. She, after conducting the study, concluded that there is a weak form of market efficiency in Kenya. The paper also gives evidence of inefficient adjustment of stock prices to information contained in profit warning announcements. It is safe to say, that similar results should be expected for the study that will be conducted about Morocco.

At this stage, we have the appropriate methodology to use for the study, a relevant selection of variables to test, and an appropriate assessment of what the findings may convey at the end of the study based on the applied contextual conditions. When we go deep into the event study methodology, we find multiple variations of the same model. In their paper, Yin S et al [9] looked at the role of time-varying betas in the estimation of abnormal returns around the announcement of important news in the stock market. In their calculations of abnormal returns, average abnormal returns, and cumulative abnormal returns, they used different betas that changed every day of the event window.

The authors explain that all the previous work done on this subject was based on conventional and simple event study methods that ignore completely the possible impact that news might have on betas. Investors' expectations and decisions are based on the information available at any particular point in time and so a study that bases its model on time-varying betas gives more accurate results to the conditions of a very efficient market. With that being said, it is hard to conduct such a study over the Moroccan market their study used a sample of 200 of the largest S and P firms over the period 1962-1985. Their study is based on a very important assumption that the surprising big daily price fluctuation is likely due to the conduct of noise traders and leakage instead of the arrival of the news. For the case of the Moroccan market, it is hard to be sure of the impact, if any, of the leakage or the noise traders.

Most of the research that we've studied as part of our literature review goes in depth into the reaction of the stock prices as a response to the disclosure of profit warnings by a certain company. In other words, it gives the behavior of stock prices relative to the information that is disclosed by firms. As we've seen already, most of these papers, if not all, test the same variables: ROA, size, Market Capitalization, type of profit warning, leverage and so on. These variables, as previously discussed, are all related to the corporation itself and not really to the market nor the country's macro situation. Jonas Spohr [10] used his paper "The Share is Down 8% after the profit warning, is it Time to Buy?" to explore the other side of this topic. The paper tries to explain the market's response using a framework of surprise and risk to the profit warnings (both positive and negative). The sample of the research uses a total of 474 profit warnings that were gathered from Nasdaq OMX Nordic. The independent variables used are the same as the ones we've already discussed from previous studies. However, Spohr [10] added one more variable to his list and it's the unexpected development extended beyond the quarter of the issuance of the profit warning. This variable was chosen to represent the surprise factor of the market. The research concluded that the riskier the firm and the

more surprising the profit warning announcement is, the more aggressive the response of the market will be.

Data Collection

The sample used for this study consists of all the existent profit warnings' announcements of firms listed in Casablanca Stock Exchange (CSE) that are available on the CSE and the Autorité Marocaine du Marché des Capitaux (AMMC) websites. To be noted that it is not rare to find different dates of publication for the same profit warning or in other words, one website publishes a profit warning one or two days after the other website did; therefore, the profit warning with the earliest announcement date was selected. Then, the profit warnings of companies that are delisted from the Casablanca Stock Exchange and the ones that were issued during the liquidation of the company are removed from the sample. An overview of the profit warnings collected is shown in Table 1.

Year	Number of Profit warning issued
2009	1
2010	1
2011	3
2012	13
2013	5
2014	4
2015	21
2016	14
2017	9
Total	71

Table 1: Number of profit warnings in the sample.

The accounting figures were taken from the concerned companies' financial statements that are available in the CSE and AMMC websites. In most of the cases, the weekly stock returns and returns of the market are retrieved directly from the website Investing.com. In the other cases, the weekly or daily stock returns of some companies are not available so the daily stock prices of the specific company and of the MASI index are gathered from cdgcapitalbourse.ma. In order to find the weekly returns, the daily stock prices and the daily MASI index prices have to be date-adjusted, then computed in order to find the percentage changes that served as daily returns. We then proceed into averaging every five days daily returns in order to find the approximate weekly returns.

Methodology

The three most used models in event-study research are Mean-Adjusted Returns Model, Market-Adjusted Returns Model, and Market Model. According to Thomas Dyckman [11] in their Journal of Accounting Research, there's a slight tendency for researchers to prefer using the Market Model. Using this model suggests that we should be measuring the market model return by estimating the abnormal returns associated with the profit warning. In addition, most

of the event studies that are mentioned in the literary review use this model.

Abnormal returns for each security *i* in the period *t* is computed as follow:

Where:

AAR_{it} is the abnormal return of company *i* at day *t*

R_{it} is the actual return for company *i* at day *t*

$E(R_{it})$ is the expected return for company *i* at day *t*

Then an Ordinary Least Square regression (OLS) is conducted for each security to estimate α_i and β_i from weekly returns from a three-year window that ends ten days before the profit warning announcement which corresponds to the beginning of the event study window. Using weekly returns instead of daily ones is more relevant in the Moroccan context. Indeed, several companies that trade in CSE do not trade several days a year and the daily stock price may not change for several consecutive days; so using daily returns might bias α and β greatly.

This is done in order to find the expected return for company *i* at day *t* and it is calculated with the following formula:

Where: R_{mt} is the Moroccan All-Share Index (MASI) return at day *t*.

Then, *t*-tests are done to evaluate the statistical significance of the abnormal returns and the cumulative abnormal returns for each day in the window period, (Event Study Methodology, p.3).

The hypotheses are the following:

H01: The average abnormal return is equal to 0

H11: The average abnormal return is different from 0

And the *t*-statistic t_{AR} is computed as follow.

$$t_{AR} = \frac{AAR_t}{\sigma_{AR} / \sqrt{n}}$$

Where: AAR_t is the average abnormal return at day *t*, *n* is the sample size and σ_{AR} is the standard deviation of the abnormal returns

H02: The cumulative abnormal return is equal to 0

H12: The cumulative abnormal return is equal to 0

And the *t*-statistic t_{CAR} is computed as follow

$$t_{CAR} = \frac{CAAR_t}{\sigma_{CAR} / \sqrt{n}}$$

Where: $CAAR_t$ is the cumulative abnormal return at day *t*, σ_{CAR} is the standard deviation of the cumulative abnormal returns and *n* is the sample size.

In the cross-sectional analysis, several variables are used in a multi-variable regression to explain how they affect the abnormal returns around the date of the profit warning publication. The regression model is as follow:

is the independent variable. It is the cumulative abnormal returns for the event window $[t_0-n, t_0+n]$ where t_0 is the date of the profit warning publication.

SIZE_i is the natural logarithm of the market capitalization of the firm a day before the profit warning announcement. The choice of this variable is due to the fact that typically the larger the company is, the stronger it is to deal with the punctual negative event [6].

LEVi: Total debt divided by the book value of total assets reported before PW. Our interest in this variable is due to the fact that the higher the risk, the lower the ability of the firm to recover from the impact of profit warnings [6].

However, since the sample of this study concerns Moroccan companies, the financial statements are done according to the Moroccan generally accepted principles (GAAP) that is different from the U.S GAAP and the International Financing Reporting Standards (IFRS). The corresponding ratio for leverage is 'Ratio d'endettement' that is obtained by subtracting 'Capitaux Propres' from 'Total Actifs' and then dividing it by 'Total Actifs'. This could be translated as the total assets minus shareholder's equity divided by total assets which are the debt over equity.

ROAi: Return On Assets of the firm announced before the profit warning. Profitability is another important factor to take into consideration when considering the impact that negative events have on stock prices [6].

Again, since it is a Moroccan context, the ratio 'Rentabilité économique' is used as it is the equivalent of the return on asset. It is computed by dividing 'Résultat Net' by 'Total Actif' which is the equivalent for dividing Net income by Total Assets in an IFRS or U.S GAAP context.

TYPi is a dummy variable that takes the value of 1 if the profit warning issued contains quantitative information and 0 if it contains only quantitative information. Using this variable is relevant since it has been shown that disclosing important information can have a significant impact on the abnormal returns [2].

MULTIi is a dummy variable that equals one if previous warnings have been announced within the same year and zero otherwise. One reason why this is an important variable to take into consideration is that there's a possibility for the deviation in stock prices to be explained by the fact that the market has already absorbed some previous negative news for firms with multiple announcements [6].

Results and Interpretation

Table 2 shows the result of the t-tests. For the abnormal returns, only AR0 (-2.89%) was significantly different from 0 which means that the stock market reacts negatively to a profit warning the day of its announcement at $t=0$.

As for the Cumulative abnormal return, we can see that null hypothesis H02 is rejected during the window $[0;+9]$ which means that the stock market needs 9 days after the event to fully recover from the profit warning impact.

In addition, the abnormal returns in the window $[-10;-1]$ are insignificant. That would imply that in the Moroccan context, we cannot talk about the leakage of information and noise traders.

Day		Abnormal Return	Cumulative Abnormal Return	Day		Abnormal Return	Cumulative Abnormal Return
-10	Mean	-0,22%	-0,22%				
	t-stat	-0,60237	-0,60237				
-9	Mean	-0,03%	-0,24%	1	Mean	-0,58%	-4,34%
	t-stat	-0,06625	-0,52643		t-stat	-0,84462	-2,61,941
-8	Mean	-0,07%	-0,31%	2	Mean	-0,53%	-4,87%
	t-stat	-0,13214	-0,38478		t-stat	-0,87010	-2,58,691
-7	Mean	-0,78%	-1,09%	3	Mean	0,43%	-4,44%
	t-stat	-1,82,843	-1,32,229		t-stat	1,10,231	-2,68,551
-6	Mean	1,08%	-0,01%	4	Mean	-0,16%	-4,60%
	t-stat	1,58,695	-0,01158		t-stat	-0,46503	-2,65,650
-5	Mean	-0,01%	-0,02%	5	Mean	0,27%	-4,33%
	t-stat	-0,02054	-0,01816		t-stat	0,51440	-2,68,174
-4	Mean	-0,15%	-0,17%	6	Mean	-0,14%	-4,46%
	t-stat	-0,25180	-0,12846		t-stat	-0,31878	-2,96,248
-3	Mean	-0,10%	-0,27%	7	Mean	0,19%	-4,27%
	t-stat	-0,18116	-0,21956		t-stat	0,46263	-3,08,400
-2	Mean	-0,25%	-0,52%	8	Mean	0,10%	-4,17%
	t-stat	-0,59304	-0,39578		t-stat	0,22075	-2,80,067
-1	Mean	-0,35%	-0,87%	9	Mean	0,39%	-3,77%
	t-stat	-0,57702	-0,72460		t-stat	0,96117	-2,65,601
0	Mean	-2,89%	-3,76%	10	Mean	0,06%	-3,72%
	t-stat	-3,06,492	-2,24,777		t-stat	0,13686	-2,48,539

Table 2: Abnormal returns and cumulative abnormal returns during the event window.

The model used in this study was obsolete; the F test was insignificant ($F > 0.005$). In addition, all variables used were insignificant with p-values greater than 0.05. The same model, using the same variables and testing the same hypotheses yielded different results, a significant F test and significant variables [2].

This difference in the results might originate from the OLS regression; the betas might be biased because the stock market is not very liquid (Tables 3-7).

Descriptive statistics

	TYP	MULTI	SIZE	ROA	LEV	CAR
Mean	0,6197	0,0986	87,351	0,0245	0,6189	-3,72%
Standard Error	0,0580	0,0356	0,0900	0,0117	0,0321	0,0150
Median	1	0	85,433	0,0154	0,6270	-2,95%
Mode	1	0	82,415	0,0789	0,1546	#N/A
Standard deviation	0,4889	0,3002	0,7580	0,0986	0,2708	0,1261
Sample Variance	0,2390	0,0901	0,5746	0,0097	0,0733	0,0159
Kurtosis	-17,975	57,313	-0,9817	1,39,478	-0,0664	28,996
Skewness	-0,5039	27,515	0,4089	23,753	-0,5581	0,5003
Range	1	1	28,859	0,8078	11,722	75,91%
Minimum	0	0	74,227	-0,2305	0,0127	-35,34%
Maximum	1	1	1,03,087	0,5773	11,849	40,57%
Sum	44	7	62,01,918	17,361	4,39,423	-263,9%
Count	71	71	71	71	71	71
Confidence Level (95,0%)	0,115723404	0,071064382	0,179415986	0,023346687	0,064101326	0,029851709

Table 3: Descriptive statistics of each variable.

Multivariable correlation

	TYP	MULTI	SIZE	ROA	LEV	CAR
TYP	1					
MULTI	-0,03289758	1				
SIZE	-0,11958952	0,00855782	1			
ROA	-0,02791344	0,04091463	0,2190101	1		
LEV	0,02161369	-0,17208039	0,00222075	-0,4910556	1	
CAR	0,20604405	0,09887856	-0,16236512	0,10842683	-0,0929046	1

Table 4: Results of the multivariable correlation.

Regression summary output

Regression Statistics	
Multiple R	0,3144432
R Square	0,0988746
Adjusted R Square	0,0295572
Standard Error	0,1242404
Observations	71

Table 5: Regression statistics.

ANOVA

	df	SS	MS	F	Significance F
Regression	5	0,11008765	0,022018	1,42,64,042	0,22660938
Residual	65	10,03,31,972	0,015436		
Total	70	11,13,40,737			

Table 6: ANOVA results.

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95%	Upper 95%
Constante	0,1656	0,1802	0,9188	0,3616	-0,1943	0,5255	-0,1943	0,5255
TYP	0,0480	0,0307	15,598	0,1237	-0,0134	0,1094	-0,0134	0,1094
MULTI	0,0469	0,0501	0,9362	0,3526	-0,0531	0,1470	-0,0531	0,1470
SIZE	-0,0305	0,0204	-14,929	0,1403	-0,0713	0,0103	-0,0713	0,0103
ROA	0,2429	0,1781	13,637	0,1774	-0,1128	0,5986	-0,1128	0,5986
LEV	0,0386	0,0630	0,6122	0,5426	-0,0873	0,1645	-0,0873	0,1645

Table 7: T-test results.

Conclusion

Although both the data and the research are very limited when it comes to the topic of profit warnings in Morocco and the MENA region in general, it is very important to conduct such studies and retrieve conclusions about it. The issuance of profit warnings or any information from a company into the market has always been a very sensitive subject. It always comes down to how this information will impact and influence the trading and the behavior of the stakeholders towards these securities. The basic assumption is that any announcement of a negative profit warning by a company will negatively impact its stock prices and therefore the firm will eventually be punished by the public. However, based on the different research done in this field, it seems like the quicker the company discloses any discrepancies between its estimates and actual numbers, the less hostile the response of the market will be and so it ends up benefiting the firm.

So in order to answer the question of our research, and to fulfill the aim of our study, we had to look at how these prices do actually fluctuate in the event of the disclosure of a profit warning. For our event study, we had to conduct multiple maneuvers in order to find the average abnormal returns and the cumulative abnormal returns. The final result showed that the recorded abnormal return happened at the exact day of the announcement of the profit warning ($t=0$) and that CAR showed that the abnormal returns spread throughout the eight following days after the PW [0;9]. In contrast to what was found in the literature review, these results show that there is no effect from any potential leakage of information or noise traders that would actually show in the days before the event. Our tests show no correlation between any of the independent and dependent variables. And the model used for the regression ends up with a very insignificant R square percent.

The most imperative restrictions that we have met when running the tests and collecting the data for this were the lack of information about this subject in Morocco. Many maneuvers needed to be done

before running the process in order to get as simple as the weekly returns of certain stocks. We also needed to manually compute as a basis as the leverage ratio for every company relative to every profit warning.

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