**EGADE Business School**
Tecnológico de Monterrey

# Test of Market Efficiency in the Mexican Market – Mergers and Acquisitions

## Daniel Morales, M. Dena, E. Chávez

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**Abstract**

The purpose of this study is to test investor's ability to earn a positive abnormal return on the basis of a merger and acquisition announcement. We will analyze the effects of SORIANA-COMERCI merger announcement on Soriana's and Comercial Mexicana's stock prices risk adjusted rate of return from July 31th 2014 to July 28th 2015.

This will therefore be a test of the Market Efficiency theory on the Mexican stock market, to see how quickly the stock prices of both firms react to the merger announcement made in January 28th 2015.

*Keywords: Mergers and Acquisitions; Market Efficiency*

## 1. Introduction

Mexican retailer organization Soriana SAB reached an agreement, on January 28th 2015, to buy 160 stores (at the beginning) from COMERCI for $39,193 million MXN equivalent to 36.09 MXN per share, bolstering its position as the second largest retail chain behind Wal-Mart Mexico accumulating a 18.2% market share with this transaction. This acquisition was completed and final until July 11th 2016.

Both companies made emphasis that this acquisition did not contemplate City Market, Fresko, Sumesa and some other stores, which will be still operated by Comercial Mexicana.

Soriana acquired from Comercial Mexicana a total of 143 stores due to regulations from Federal Economic Competition Commision (COFECE), 1,849 retail spaces, 3 distribution centers and 51 non-strategic assets, plus the rights to use some successful promotional campaigns, for example, "Julio Regalado" and system platforms used by Comercial Mexicana. The most important synergies of this transaction were the cost reductions and the leverage benefits, calculating the value of this synergies in $900 million MXN, it is important to mention that Soriana also acquired a know-how respecting suppliers and distribution channels. Finally Soriana calculates that the result of this transaction will increase EBIT margin by 30 bps.

## 2. Market Efficiency Test: Methodology

For the main purpose of the methodology it is important to consider that both companies traded in BMV (Bolsa Mexicana de Valores) and that the acquisition occurred on January 28th, 2015.

This study will apply the following methodology:
1. The announcement date of the acquisition will be used as Day Zero (January 28th 2015)

2. The time Period from Day -30 to day 30 is referred as to the event period (December 29th 2014 till February 27th 2015)
3. The Pre-event period covers from Day -180 to Day -31 (August 01st 2014 till December 28th 2014)
4. All the information about the stock price and market price within the duration of -181 days to +30 days is attained.
5. The holding period return for Soriana (R) and the market (Rm) will be calculated by using the following formula:

$$R = \frac{(\text{Current day close price } - \text{ Previous day close price})}{\text{Previous day close price}}$$

$$Rm = \frac{(\text{Current day market close price } - \text{ Previous day market close price})}{\text{Previous day market close price.}}$$

Then a regression analysis will be performed comparing the actual daily return of each company to the Market daily return. The return on the firm is the dependant variable and the IPC return is the independent variable. The regression will cover the pre-event period to find the intercept alpha and the standardized coefficient beta.

1. The Risk-Adjusted method was used to get the normal expected returns. The expected returns for each stock, for each day during the event period was calculated using the following formula: **E(R)= alpha + Beta(Rm)**, Rm is the return on the market.
2. The Excess Return (ER) was calculated using: **ER= the Actual return (R) - Expected Return (E(R))**

The next hypothesis we will use in order to test the level of Market Efficiency, that is Strong, Semi-Strong or Weak.

$H_{10}$: The Risk Adjusted Return of the stock price of Soriana is not significantly affected by the announcement of the acquisition on January 28th 2015

$H_{11}$: The Risk Adjusted Return of the stock price of Soriana is significantly affected in a positive way by the announcement of the acquisition on January 28th 2015

$H_{20}$: The Risk Adjusted Return of the stock price of Soriana is not significantly affected by the announcement of the acquisition around January 28th 2015, as defined by the event period (July 31th 2014 to July 28th 2015)

$H_{21}$: The Risk Adjusted Return of the stock price of Soriana is significantly affected in a positive way by the announcement of the acquisition around January 28th 2015, as defined by the event period (July 31th 2014 to July 28th 2015).

## 3. Quantitative Test and Results

In order to analyze a defined event, one must identify abnormal behavior in a time series, in this case a stock closing price time series. The abnormal returns are defined as:

$$\epsilon_{it}^* = R_{it} - E[R_{it} \mid X_t]^*$$

Where we just subtract the expected return of the stock from the actual return, then we should expect that the result must be significantly similar to zero, otherwise we would know that the event indeed had an impact on the stock price.

Hence our hypothesis tests:

$H_0$: The difference between the actual stock price and the expected stock price is significantly and statistically similar to zero, thus **the event did not influence the stock.**

$H_1$: The difference between the actual stock price and the expected stock price is significantly and statistically different from zero, in that case **the event did indeed influence the stock.**

In order to calculate the latest assumptions, we can follow two models:

a) Constant mean returns
b) Market returns

The first model assumes a constant fluctuation and it compares the stock returns with the past information, it validates whether the abnormal returns are or are not the same size as the past stock price. The second model compares the stock with an index, assuming that the individual assets must follow the market trend.

*3.1. SORIANA*

We first plot Soriana's Stock and the IPC index in order to visually check whether there is an event or not.
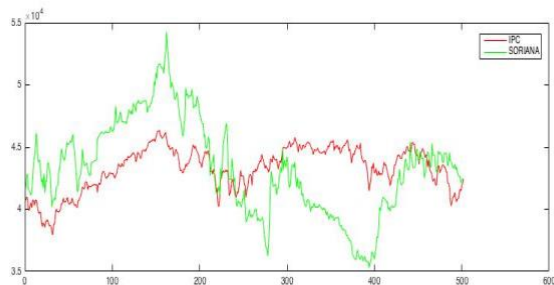


In the X-axis we have the observations, started on January 2014 and finalizing on January 2016. We clearly see an abnormal behaviour in the stock starting on observation 241 or 14/January/2015, just two weeks before the M&A announcement. The event seems to end in observation 440, or October 28th 2015.

Then we will follow the calculations for the Market Returns model for which we use Matlab (details of the program and calculations are available in the Appendix).

The results are the following:

Statistic value: 14.0456
F-Critical Value: 1.24971
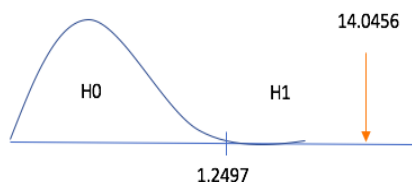


As the statistical result falls in $H_1$ region, we can then reject $H_0$ hypothesis with a 95% confidence level and conclude that the event did indeed influence on the stock price of Soriana since the difference between the real stock returns and the expected returns are statistically different from zero.

We can also graphically see that the stock was negatively affected by the event, as the stock returns start to fall in a constant trend. Thus we can reject $H_{11}$ and $H_{21}$ stated in the Methodology section of this paper.

*3.2. COMERCI*

We first plot Comerci's Stock and the IPC index in order to visually check whether there is an event or not.
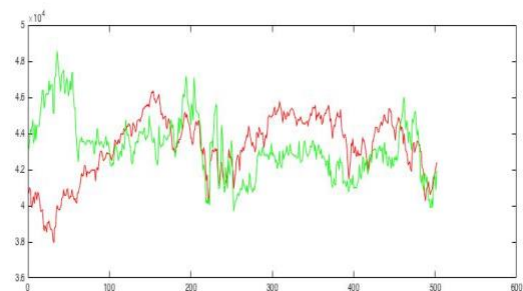


In the X-axis we have the observations, started on January 2014 and finalizing on January 2016. We clearly see an abnormal behaviour in the stock starting on observation 251 or 28/January/2015, just the exact date of the M&A announcement. The event seems to end in observation 418, or September 28th 2015.
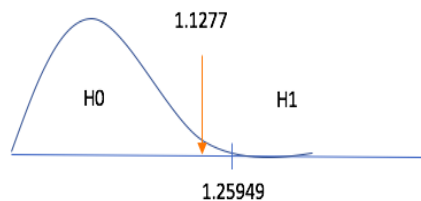
In this case, not only do we see a delay on the market reaction, but also a shorter event compared with Soriana's Stock.

Then we will follow the calculations for the Market Returns model for which we use Matlab (details of the program and calculations are available in the Appendix).

The results are the following:

Statistic value: 1.1277
F-Critical Value: 1.25949

In this case, the statistic test falls in $H_0$ region, thus we can conclude with a 95% confidence level that the event did not influenced Comerci's Stock as the abnormal returns are not statistically significant. The stock just follows almost a normal behavior after the announcement. However, the stock almost falls in $H_1$.

## 4. Conclusions

Soriana expected to increase its market share with the acquisition of Comercial Mexicana with stores located in states where they did not have presence before. Revenues, EBIT and stock prices were estimated in forecasts with a positive growth, however during the event period and day 0 the effect on the stock price did not have a positive effect as investors and the market had anticipated.

The acquisition of Comercial Mexicana by Soriana had a relevant impact on the stock prices of both companies, however, after testing the abnormal returns, we conclude that the event only had a significant impact on Soriana's stock, the buyer, and it was also negatively impacted by the merger. This abnormal behaviour started a few weeks before the announcement, so our theory that states than an M&A announcement does impact on the financial markets has been demonstrated.

As for Comercial Mexicana, the company had an impact but the abnormal returns turned out to be insignificant and even shorter than in Soriana. Interestingly enough, Comercial Mexicana has a bigger P/E ratio than their peers, which can mean that the company is overvalued, but there was no sign of adjustment in the stock price on the market even with this announcement.

## References

[1]  Campbell, Lo, MacKinlay; "The econometrics of Financial Markets", Princeton, New Jersey

[2]  Websites: Wall Street Journal, Forbes, El economista, Bolsa Mexicana de Valores, El financiero and Reuters

## *APPENDIX*

## THE COMPANIES

SORIANA
ORGANIZACIÓN SORIANA, S.A.B de C.V.
TICKER: SORIANA B
PRICE (March 2018) $38.09 MXN

The company has its origins in a fabric family business opened in 1905, later on, the founders Francisco and Armando Martín Borque opened their first store with the hypermarket format in Torreón, Coahuila in 1968. During the 1970's this company grew in several northern states of Mexico including Nuevo León, Durango, Chihuahua, etc. In 1979 they started a diversification of their business activities with the integration of restaurants, tailoring, transportation lines and agricultural activities.

To achieve its institutionalization and acquire resources for growing goals Soriana made their IPO in 1987, with this Soriana accomplished, through the 90's, an expansion nationwide, diversifying their portfolio of products and capturing value in other market segments. Until 2001 the "hypermarket" format was the only one operated by this company, in 2002 they launched City Club, and in 2003 they started operating some stores under the "mercado Soriana" format.

As of today Soriana has presence in more than 208 cities in Mexico, has more than 606 stores operating in five different formats, and 81,880 employees.  It commercializes with food products, clothes, etc. in wholesale and retail formats. Soriana's CEOs are Ricardo Martín Bringas and Francisco Javier Martín Bringas, its main competitors are Wal-Mart Mexico, La Comer, Chedraui and HEB.

Its current financial information is presented below:

| *Información por Acción: | |
| --- | --- |
| - Serie: B | |
| *Índice de Bursatilidad: | 7.806/MEDIA |
| *Valor en Libros: | 32.5802 |
| *Precio/Valor en Libros: | 1.1796 |
| *Utilidad por Acción: | 2.5446 |
| *Precio/Utilidad por Acción: | 15.1026 |
| *Estadísticas de Sensibilidad**: | |
| - Beta: | 0.22198 |
| - Coeficiente de Correlación: | 0.146058 |
| - Coeficiente de Determinación: | 0.021333 |
| *Volúmen Operado: | 237,760 |
| *Última Cotización: | $ 38.09 |
| *Máximo Ult. 12 meses: | $ 46.00 |
| *Mínimo Ult. 12 meses: | $ 37.53 |

| INFORMACIÓN FINANCIERA | |
| --- | --- |
| *Ejercicio: | IV 2017 |
| *Activo Total: | $ 129,317,142.00 |
| *Activo Circulante: | $ 37,847,591.00 |
| *Pasivo Total: | $ 70,442,481.00 |
| *Capital Contable Consolidado: | $ 58,874,661.00 |
| *Ventas Acumuladas Ultimo Trimestre: | $ 153,636,986.00 |
| *Utilidad Operación Acumulada Ultimo Trimestre: | $ 2,964,188.00 |
| Nota: Cifras en miles de pesos | |

COMERCIAL MEXICANA
CONTROLADORA COMERCIAL MEXICANA S.A.B de C.V.
TICKER: COMERCIUBC
PRICE (March 2018)  $31.5 MXN

Founded in 1930, Comercial Mexicana started as a fabric seller in Mexico City, later in 1962 the company opens up "Comercial Mexicana Insurgentes" which was the first one with a more accessible format for consumers with an extensive variety of products, following this store they opened 3 branch stores across the city.
In 1981 Comercial Mexicana acquired "Supermercados S.A." that integrated the restaurants "California" to Comercial Mexicana's portfolio and in 1991 Comercial Mexicana creates a joint venture with Costco Wholesaler from which it stepped out in 2012, in 1993 a creation of a new larger store format called "Mega Comercial Mexicana".
By 2006 Comercial Mexicana had more than 170 stores mostly in the center part of Mexico and they create a new concept that targets a premium segment of population called City Market followed by the creation of "Fresko" situated in areas where there is medium to high income per capita.

In January 2015 Comercial Mexicana's Stock Holders agree to sell to Soriana, 143 stores of the formats Mega, Tiendas, Bodega and "Al Precio" for $39,193 million MXN. Comercial Mexicana kept the stores with "Fresko", "City Market", "Su Mesa"  formats and some other stores in which they expected to create a new format call "LA COMER", in total they sum up 54 stores across the country but mostly in the center area of Mexico.

In January 2016 with those 54 stores they make their IPO with the ticker name LaComer and full name La Comer S.A.B de C.V. Its new CEO is Santiago García García.

Its current financial information is presented below:

| *Información por Acción: | |
|---|---|
| - Serie: UBC | |
| *Índice de Bursatilidad: | 7.75/MEDIA |
| *Valor en Libros: | 19.1871 |
| *Precio/Valor en Libros: | 0.9908 |
| *Utilidad por Acción: | 0.7203 |
| *Precio/Utilidad por Acción: | 26.3918 |
| *Estadísticas de Sensibilidad**: | |
| - Beta: | 0.700468 |
| - Coeficiente de Correlación: | 0.306635 |
| - Coeficiente de Determinación: | 0.094025 |
| *Volúmen Operado: | 3,239,219 |
| *Última Cotización: | $ 19.01 |
| *Máximo Ult. 12 meses: | $ 20.25 |
| *Mínimo Ult. 12 meses: | $ 13.45 |

| INFORMACIÓN FINANCIERA | |
|---|---|
| *Ejercicio: | IV  2017 |
| *Activo Total: | $ 24,584,506.00 |
| *Activo Circulante: | $ 5,777,132.00 |
| *Pasivo Total: | $ 3,747,300.00 |
| *Capital Contable Consolidado: | $ 20,837,206.00 |
| *Ventas Acumuladas Ultimo Trimestre: | $ 16,635,479.00 |
| *Utilidad Operación Acumulada Ultimo Trimestre: | $ 285,548.00 |
| Nota: Cifras en miles de pesos | |

## MARKET MODEL

Nasdaq defines the market model as "*the return on a security depends on the return on the market portfolio and the extent of the security's responsiveness as measured by beta. The return also depends on conditions that are unique to the firm.*"

The market model is based on the assumption of a constant and linear relation between individual asset returns and the return of a market index.

For Market model we used the following formula:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}$$
$$E[\epsilon_{it}] = 0 \qquad \text{Var}[\epsilon_{it}] = \sigma^2_{\epsilon_i},$$

Where:
$R_{it}$ = return in time t in i
$R_{mt}$ = market return
$\epsilon_{it}$ = the error term
$\alpha_i$, $\beta_i$ and $\sigma^2_{\epsilon i}$ = parameters of the model

**How to measure and analyze the abnormal returns**

We are based on the following vector:

$$
\begin{aligned}
E[\hat{\epsilon}_i^* \mid \mathbf{X}_i^*] &= E[\mathbf{R}_i^* - \mathbf{X}_i^* \hat{\theta}_i \mid \mathbf{X}_i^*] \\
&= E[(\mathbf{R}_i^* - \mathbf{X}_i^* \theta_i) - \mathbf{X}_i^*(\hat{\theta}_i - \theta_i) \mid \mathbf{X}_i^*] \\
&= 0.
\end{aligned}
$$

The abnormal return of the vector has an expected return of zero which would demonstrate that there is no trend or correlation with other parameters.

Analyzing the daily data of the returns for the stocks for Comercial Mexicana and Soriana during the event windows or periods established in our methodology. We used the closing price for this event study. The abnormal return is calculated per each day of the closing stock price.

$$\hat{\epsilon}_i^* \sim \mathcal{N}(0, \mathbf{V}_i).$$