FINANCIAL CONTAGION AND FINANCIAL STATEMENTS DISCLOSURE RISKS

Bradut-Vasile Bolos

Abstract

Financial statements disclosure usually has an impact on market value of stocks. This impact is to some extent changed by market conditions. Financial contagion is seen as an excessive inter-market transmission of shocks, sometimes defined as herding behavior or excess co-movement. The hypothesis of this research is that during contagion outbreaks markets attention and behavior changes, and financial statements are seen in a different manner. The research is focused on stock prices changes when both financial statements and contagion are happening. We attempt to determine the change in market value during normal times and contagion times after financial statements are disclosed, and to draw some conclusions.

Key words: Financial contagion, Business epidemiology

JEL Code: G01, G02, G12

Introduction

Stock prices are studied by a great number of finance researchers, since the beginning of the stock market itself. Variations of prices can be triggered by a whole range of events starting from earthquakes, wars and ending to a trader behaving irrationally. Financial statements are designed to provide a comprehensive, comparable, fair view over a company, and provide most of the hard information regarding the foundation of stock value.

Either from a technical analysis, or a behavioral analysis, or a fundamental analysis point of view, the release of financial statements is an important moment when new information is added, providing market players' comprehensive data usable for pricing the stocks.

However, as financial tools have diversified, and as markets have Townsends of stocks, it is highly debatable if investors manage to be informed properly, or having the time to study the statements in-depth and really interpret their significance. Besides, having such a huge volume of data is creating a noise that may blend the new data significance. Even more

noise is generated by contagion, as high variability of prices, generate spectacular prices rise and fall, both attracting and distracting attention.

So, the impact of financial statements disclosure is not obvious, and despite the extensive research in this area, the rare circumstances of the crisis create a ground to challenge or perfect some of the theories in this field.

In 1996 Sloan observes that "stock prices are found to act as if investors "fixate" on earnings, failing to reflect fully information contained in the accrual and cash flow components of current earnings until that information impacts future earnings" (Sloan, 1996).

Financial contagion, the second issue of this research is mostly seen as a liquidity issue in the inter-bank market and a volatility issue on the stock and bond markets. The reason for using the contagion context for our research is best expressed by Adrian and Shin as follows: "The ferocity with which the crisis has unfolded raises important questions on the nature of financial contagion." (Adrian & Shin, 2008). The most quoted approach on financial contagion has been provided by Franklin Allen and Douglas Gale, studying the way a small shock can be propagated throughout the economy (Allen & Gale, 2000).

1 Fundamental analysis

1.1 Normal times

Fundamental analysis is important because it should be based on financial statements, so it should be the first to be influenced.

We use the CAPM model as an example,

$$E(Ri) = Rf + \beta i(E(Rm) - Rf) \quad (1)$$

Where E(Ri) is the expected return on capital asset, Rf is the risk free rate of interest arising from government bonds, βi is the sensitivity of expected market returns, and Rm is the rate of profitability of the market.

$$\beta i = \frac{Cov(Ri,Rm)}{Var(Rm)} \quad (2)$$

In this formula, the financial statements profits values are not included. However, there are three benchmark values that have to be compared with the profitability of the company, namely the Rf, Rm, and E(Ri).

The Sharpe and Lintner's CAPM model was criticized by Fama and French, (Fama & French, 1996). The model may not be good for individual portfolio assessment but it may be able to show a bubble formation as markets become apparently less riskier, thus generating a higher expected return on capital than E(Ri) should generate.

1.2 Financial contagion times

Financial contagion at inter-market level can be revealed by an increased volatility of the market, as recognized by In this case Var(Rm) has higher values compared to usual times, decreasing the relevance of the expected market returns, and increasing the relevance of the government bonds returns. However, as governments bonds rate of interest may be increased, the expected rate of return on capital assets is increased, thus generating disinvestment for companies with lower profitability.

So, if:

$$Rf_i > Rf_{i-1} \quad (3)$$

$$\beta_i < \beta_{i-1} \quad (4)$$

$$Var(Rm)_i > Var(Rm)_{i-1} \quad (5)$$

Then:

$$E(R_i) > E(R_{i-1}) \quad (6)$$

This suggests that the expected returns for investment in countries having financial problems are higher. This is simply obvious if we return to the basics of DCF, and consider a higher risk implies a higher discount rate (cost of capital).

Based on Bucharest Stock Exchange data, Todea observes: "investors are not particularly worrisome of upside risk, while downside risk is always a problem"(Todea, Tulai, & Plesoianu, 2009).

2 Behavioral analysis and financial statement disclosure

2.1 Behavior in normal times

In a behaviorist approach stock market players' is considered either less rational, or to complex to be rationalized. Such approaches are based on determining a statistical response to emotional triggers, as in the same situation people behave differently according to their individual characteristics.

As markets are operated by huge numbers of humans, with different individual choices, there are ways and means to determine group behavior using statistical means. This provides at least some probability of an expected response from a market to a certain information or stimulus.

Even during normal times, people's behavior is to some extent irrational, and unpredictable, but as an entropic system, the markets tend to have globally predictable decisions and a medium level of information to support-it.

People and groups exposed constantly to a certain risk tend to ignore the danger as a personal observation is creating a dangerous over-confidence. Multiplied by the number of players, the individual overconfidence during normal-times is the basis for ignoring obvious dangers and generating the crisis. If Townsends or millions of people belief is the same, the minority having a different belief is ignored, mocked, feared and marginalized.

As financial markets are a part of society, those general social rules do apply and create the same outcome. The ignored potential danger becomes reality and it triggers disbelief, panic, and shock.

Financial statements are sound information, however, due to either positive or negative overconfidence, may be ignored, as markets are focused and bound to their own expectations. During normal times, small losses, or diminished profits may be overlooked, as long as positive expectations are the general rule.

2.2 Behavior in contagion times

As Anghelache has observed, "currency and financial crisis have demonstrated the high degree of irrationality associated with investors behavior" (Anghelache, 2007).

Contagion is associated with herding behavior. A severe bearish market is seen as a contagion, despite the fact that bullish markets are just as well herding behavior. This has to do with the fact that we tend to see economic growth as healthy, and the economic decrease as unhealthy, thus associate-it with disease and as a consequence use contagion as term to describe-it. So, if growth is healthy, we assume all growth is healthy, and all companies are expected to grow, always. This is simply not possible, as some companies do not need to grow beyond an optimal size. As growth is the psychological demand, over-extension is the practical consequence. Over-extension triggers first inefficiency, than bankruptcy.

People expect growth, and when it does not happen as expected they consider this abnormal, triggering a crisis in their minds. The contagion of pessimism and negative expectations triggers a whole range of different decisions than usual.

In "contagion" times, all negative signals are more obvious, and more important to the pessimistic viewer. This is why in contagion times, negative signals are sought and decisions tend to be influenced mostly by them. It is a time for negative prophecies even if they are self-fulfilling.

Releasing financial statements during this time may have a different outcome on the market, as flaws and bad signals are seen, attracting more attention, as they confirm the pessimistic herd view, and positive signals are ignored.

During contagion times markets expect both layoffs as means to increase profitability, and employment growth in an obviously irrational logic. The same markets expect higher income from government bonds, for the governments seen as affected by contagion and decreased deficits, ignoring the fact that bond income is public expense, thus deficit. It's a type of flawed loss-loss logic fed by pessimism. As risk is increased by fear, so does the expected profitability expected both of new investments, thus diminishing the number of projects that qualify, thus decreasing job creation, and thus feeding pessimism. It is a fear-pessimism cycle that feeds on itself. In terms of existing investments, as consumption is diminishing because of pessimism, credit cost and prices growth, they are expected to generate a higher yield, the interest is higher, so it becomes harder and harder to obtain capital. Investors demand productivity increase, on a lower sales income, translating into layoffs, feeding pessimism and lower consumption. The spiral of fear and pessimism can go as low as it gets, until the mood changes to positive.

3 Technical analysis

3.1 Technical analysis in normal times

Based on historical data, technical analysis is based on past values of prices, and past similar situations, attempting to forecast the future values or at least ranges of values that have a high probability.

Founded on statistical tools such as average, minimum threshold, maximum threshold, trend analysis, seasonality, pattern recognition, this analysis could be to some extent linked to financial statements; however, it is not direct but as a consequence of the financial statement release seasonality.

3.2 Technical analysis in contagion times

Acatrinei and Caraiani conclude after a comprehensive study regarding Bucharest Stock Exchange "The recent financial crisis showed that there is always a risk that the market,

as well as the overall economy starts to move unexpectedly and with no connection the previous middle to long run trend" (Acatrinei & Caraiani, 2011).

As it is based on past circumstances and values and pattern recognition technical analysis is bound to fail to predict any new or improbable event. As contagion is not a frequent occurrence, and as time changes the nature and significance of values involved it is extremely unlikely that technical analysis could generate accurate forecasts of the future.

Patterns, as fractals, can be compared, but approximation is unavoidable, and as such markets are to some extent unpredictable.

Contagion itself can be triggered by decisions based on technical analysis, as the same tools used at roughly the same time may generate the same recommendation, thus generating herding behavior. Co-movement based on common criteria of decision and ignoring the facts behind the prices is feeding volatility, as the frequency of trading is increased beyond the fundamentals generation. Actually the market itself generates more information than financial statements, and attracts more attention also.

4 Financial statements as market behavior triggers

4.1 Financial statements values as risk factors

As behavioral analysis suggests, investors are not entirely rational, and they are behaving differently in normal times and in crisis times. There is a probability of such events happening, that can be measured using past events.

Using the Odd Ratio, an epidemiologic statistical tool (bio-statistics), we can measure the risk of declining stock values triggered by financial statements disclosure. "The odds are a way of representing probability, especially familiar for betting" (Bland & Altman, 2000). Adapting odds ratio method we obtain the occurence frequency of cases:

Table 1 Odd Ratio frequency table

Statement being released	Negative growth	Positive growth
Profit rate<Interest rate	A	C
Profit rate>Interest rate	B	D

- A is the frequency of cases when a company discloses financial statements with profit rates lower then interest rate and the stock value diminishes.

- B is the frequency of cases when a company discloses financial statements with profit rates lower then interest rate and the stock market diminishes.
- C is the frequency of cases when a company discloses financial statements with profit rates lower then interest rate and the stock market grows.
- D is the frequency of cases when a company discloses financial statements with profit rates higher then interest rate and the stock market diminishes.

After the table is tested using Fisher or Chi-square test, the influence of financial statements release on the stock market can be determined using the formula:

$$OR = \frac{A/C}{B/D} \quad (7)$$

OR values significantly higher than 1 suggest a risk factor, meaning negative profit rate information will generate the decline of stock values, if is close to 1 the information is irrelevant on the market. If OR is close to 0 than negative results have positive market impact.

This method can be applied on all items of the financial statement measuring impact of different values, and refined using intervals (fuzzy indicators).

Measuring and comparing OR during crisis times and during normal times, on various supposed risk factors may help measure the significant risk factors emphasized by various contagions. This can point out to some extent what prevention of contagion could be.

Conclusion

As behavioral analysis suggests some events trigger significant responses. It is hard to predict the outcome because humans and groups responses are not always rational, as they are influenced by a variety of factors.

As financial markets tend to use technical analysis, fundamental analysis, behavioral analysis, in an attempt to break the wall of the future, it is obvious that neither will nor should succeed. In the end, financial markets speculation should remain risky otherwise they may drain the capitals out of the economy. Any success in perfect financial forecasting would destroy the financial markets; however that does not mean markets should be totally random.

In my view, a healthy market should yield high values for OR for financial statements, suggesting a strong relationship between financial statements and stock values. Null values or close to 1 value mean unhealthy markets, which tend to be influenced more by other reasons than sound economic data.

Another value usable for health of the markets measurement is the E(Ri), based on CAPM measured for the whole stock exchange market, as the capital owners portfolio. This should provide values and trends comparable to national economic growth, as size and growth; otherwise the financial market behaves like a bubble, absorbing capitals from other businesses. Lower E(Ri) than economic growth related values indicate that stock exchange companies are not representative for the whole economy, or that stock market is weak and capital owners are not skilled enough to manage their own capitals.

Acknowledgment

This paper is a result of the project "Transnational Network for Integrated Management of Postdoctoral Research in Communication Sciences. Institutional building (postdoctoral school) and fellowships program (CommScie)" - POSDRU/89/1.5/S/63663, financed under the Sectoral Operational Programm Human Resources Development 2007-2013.

References

Acatrinei, M. C., & Caraiani, p. (2011). Modeling and forecasting the dynamics in Romanian Stock Market Indices using treshold models. *Romanian Journal of Economic Forecasting* , 42-54.

Adrian, T., & Shin, H. S. (2008). Liquidity and financial contagion. *Financial stability review* , 2.

Allen, F., & Gale, D. (2000). Financial Contagion. *Journal of Political Economy* , 1-33.

Anghelache, G. (2007). Unele aspecte privind sensibilitatea pieţei de capital. *România în Uniunea Europeană Calitatea integrării.Creştere. Competenţă. Ocupare* (pp. 73-80). Bucharest: AGER, AFER, ASE Bucuresti.

Bland, M. J., & Altman, D. G. (2000). The odds ratio. *BMJ* , 1468.

Fama, E. F., & French, K. R. (1996). The CAPM is Wanted, Dead or Alive. *The Journal of Finance* , 1947-1958.

Sloan, R. G. (1996). Do Stock Prices Fully Reflect Information in Accruals and Cash Flows about Future Earnings? *The Accounting Review* , 289-315.

Todea, A., Tulai, H., & Plesoianu, A. (2009). D-Capm: Empirical Results On The Bucharest Stock Exchange. *Theoretical and Applied Economics.* , 632-639.

Contact

Bradut-Vasile Bolos

Petru Maior University, Economic and Administrative Sciences Faculty, Accounting and Finances Department

N. Iorga no. 1 Targu Mures, Romania, 540088

bradut.bolos@ea.upm.ro