Available online at www.elixirpublishers.com (Elixir International Journal)

Finance Management

Elixir Fin. Mgmt. 34 (2011) 2554-2556

ISSN: 2229-712X

Market dynamics: measuring P/E Ratio movements1

Joshua F. Dayanim
Market Dynamix, 328 Calvert Road, Merion Station, PA 19066 (610) 348-3269.

ARTICLE INFO

Article history:
Received: 18 March 2011;
Received in revised form:
23 April 2011;
Accepted: 28 April 2011;

Keywords
Market,
Dynamics,
Security,
Price,
Valuation,
Earnings,
P/E Ratio.

ABSTRACT
The recently introduced Market Dynamics method presents a new approach towards measuring security price movements and related indicators. The approach leads to a new formulation for measuring P/E ratio changes, and indicates clear linkages between the expected change in P/E ratio for a security and the corresponding changes in earnings and money flow. As such, money flow appears to play a key role in determining valuations of traded securities.

Introduction

The P/E ratio (PE) measures the price to earnings multiple investors are willing to pay for a share of a security. As such it is a measure of investor demand and market sentiment. The effects of external forces on a security's price are abstracted within the P/E Ratio, as is demonstrated by the recently introduced Market Dynamics method[1,2]. However, a question remains as to how best measure the P/E ratio and its expected change in the aftermath of a security or market related event.

A commonly used approach is to measure a Trailing P/E ratio by using historical prices and released earnings data for a security. The P/E ratio can be adjusted each quarter as new earnings are released, and may reflect actual measurements for selected historical time period such as the prior quarter or year. A Forward P/E ratio may also be determined using analysts' earnings estimates for the next quarter or future time period. However, historical or projected estimates while reasonably accurate may not prove reliable in face of changing market andeconomic conditions.

Therefore, a method for linking changes in P/E ratio to security or market events is desirable in order to provide a more accurate and current security valuation in the aftermath of such event. This paper explores two alternative options for measuring expected change in P/E ratio using the Gordon's Growth Model and the recently introduced Market Dynamics Method.

Gordon's Growth Model

The Gordon Growth Model[3] is a well-known variant of the Discounted Cash Flow (DCF) model and is commonly used to estimate the valuation of a company based on its future dividend payouts. The model assumes that dividend payments grow at a constant rate. The formulation relies on assumptions related to the growth rate (G), the security's rate of return or cost of capital (R), and the next period'sinitial dividend pay-out (D). The share price (P) can be determined as the sum of a constant growth mathematical series using the following formula:

$$P = \frac{D}{R-G} \qquad [1]$$

As an extension to this model, we may consider a company that distributes all its earnings to shareholders in the form of dividends. The resultant valuation may be written in terms of earnings as follows:

$$P = EPS_0 * \frac{1+G}{R-G} \qquad [2]$$

Where the first payment is calculated using the prior period's earnings data (EPS_0) by applying the period's growth factor (1+G).The model requires a stable and positive growth rate that is less than the cost of capital (0 < G < R). Using the relationship between price and earnings, the current P/E ratio may be measured as:

$$PE = \frac{1+G}{R-G} \qquad [3]$$

The formulation can now be used to calculate the expected change in P/E ratio (ΔPE) by applying a time derivative:

$$\Delta PE = \frac{\Delta G*(R-G) - (1+G)*(\Delta R-\Delta G)}{(R-G)^2} = \frac{\Delta G*(1+R) - \Delta R*(1+G)}{(R-G)^2} \qquad [4]$$

For the special case where the growth rate is constant ($\Delta G = 0$), the first term in the numerator may be eliminated resulting in:

$$\Delta PE = -\frac{\Delta R*(1+G)}{(R-G)^2} \qquad [5]$$

This model implies that P/E ratio moves in inverse relationship to the cost of capital (R). It also indicates that PE movements are more pronounced as G approaches R, that is, PE

Tele:
E-mail addresses: Josh.Dayanim@MarketDynamix.net

reacts sharply to changes in growth assumptions for securities with a higher earnings growth expectation.

The application of the above model requires an accurate projection of earnings growth rate, cost of capital, and their incremental changes over time. Cost of capital information is currently available from several sources including Morningstar Ibbotson® reports. However, the approach presents several shortcomings:

a.
ime values for R and G and their incremental changes may be difficult to accurately measure or predict into the future.

b.
he model works best for stable and moderate growth securities and does not support growth oriented companies where G > R.

c.
constant growth assumption may not accurately reflect market valuation of a security.

Market Dynamics

The Market Dynamics method[1,2] utilizes a differential method for determining the expected and target price of a security, and leverages a conservation of capital principle. The change in a security's target price is determined by a derivative of the price equation, that is:

$$\Delta P = EPS_0 * \Delta PE + PE_0 * \Delta EPS$$

which relies on a determination of the change in P/E ratio (ΔPE).The target price is measured by adding the expected price change to the starting price (P_0), that is:

$$P_T = P_0 + \Delta P \quad [7]$$

The change in PE is determined by rearranging equation [6] as follows:

$$\Delta PE = \frac{\Delta P - PE0 * \Delta EPS}{EPS0} \quad [8]$$

Using the relationship between price and market capitalization (MC), this can be restated as:

$$\Delta PE = \frac{\Delta MC/S - PE0 * \Delta EPS}{EPS0} \quad [9]$$

where S represents the number of outstanding shares in the security. The conservation of capital principle states that the change in capitalization must be supported by an equal change in money flow (MF) into or out of the security in order to achieve a stable and supported price level. Money flow, or alternatively investment or capital flow, accumulates over time as each buyer trades a block of shares at a higher per share price than the corresponding seller's purchase price. The change in money flow over a specified time period is calculated using:

$$\Delta MF(t) = \sum_{n=1}^{N} \{s(n) * \Delta P_n\} \quad [10]$$

where N is the number of completed trade transactions each involving s(n) shares, and:

$$\Delta P_n = P_{buyer\ cost} - P_{seller\ cost} \quad [11]$$

is the difference between the buyer and the seller's per share cost basis for transaction n. As new investment accumulates over time with each trade transaction, the expected change in PE at time t following an event may be restated using a time variant money flow, as follows:

$$\Delta PE_E(t) = \frac{\Delta MF(t)/S - PE0 * \Delta EPS}{EPS0} \quad [12]$$

Where ΔPE_E is the expected change in PE at time t measured from the onset of an event, and it reaches its full value as the accumulated money flow matches the change in market capitalization.

The above method may be utilized with some caveats:

a.
The approach requires a stable initial price point.

b.
The may be difficult to accurately measure the change in money flow as it is requires information about each individual trade transaction. However, several estimation methods are available.

c.
The expected change in PE lags behind its target value, as it requires accumulation of capital over time until a supported price level is reached.

A hybrid model can be used to remedy some of the above shortcomings. The approach utilizes trailing PE values in order to measure target price (P_T) using equations [6] and [7]. The Market Dynamics PE is subsequently calculated by dividing the target price by the current EPS value.

Figure 1. P/E Ratio Chart for Amazon, 3/1/2010 to 2/1/2011

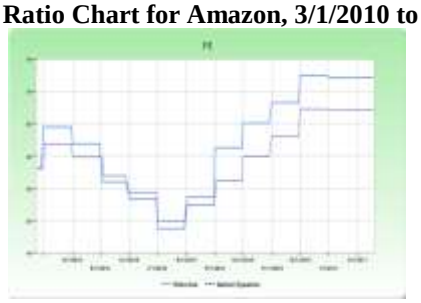
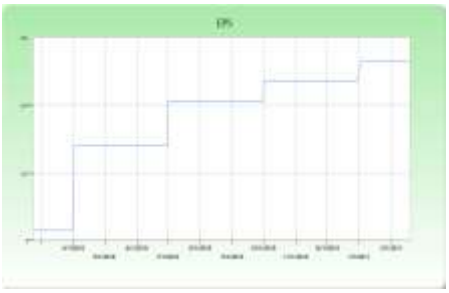


Figure 1 depicts this hybrid PE valuation alongside the 30 day historical or trailing PE values for Amazon.

Figure 2. Money Flow Chart for Amazon, 3/1/2010 to 2/1/2011

Figure 3. Earnings Per Share Chart for Amazon, 3/1/2010 to 2/1/2011



Figures 2, 3, and 4 depict movements of money flow, earnings, and security prices for the same time period.

As the P/E ratio chart demonstrates PE valuations are tightly coupled with changes in earnings as well as movements in money flow as anticipated from equation [12].

The Potential of Market Dynamics

Market Dynamics presents a new approach to measuring and forecasting price movements of traded securities and their related attributes.

Figure 4. Price Chart for Amazon, 3/1/2010 to 2/1/2011

The method can be applied to determining target prices and P/E ratio valuations in response to various security and market based events. In contrast to other methods currently in use, Market Dynamics can incorporate historical performance data, recent events, as well forward looking projections into its measurements. In doing so, the method avoids any assumptions related to future growth expectations, cost of equity, or other variables that can distort such measurements. Money flow thus emerges as a key determinant of a security's price movement and PE valuation.

Biography

Joshua Dayanim is the founder of Market Dynamix, a website dedicated to providing investor information and education on Market Dynamics. As an independent investor, he has studied various approaches to security pricing analysis and investment management. This eventually led to the development of Market Dynamics, providing a model for security pricing movements and formation of support and resistance levels. He holds Masters degrees in Business Administration and Electrical Engineering, with an undergraduate focus in Physics. He can be reached atJosh.Dayanim@MarketDynamix.net.

References

1. Joshua F. Dayanim (February 2011), *Market Dynamics: Bridging Security Price Movements and Classical Physics*. Journal of Mathematics Research, Vol. 3, No. 1.

2. Joshua F. Dayanim (October 2010). *Market Dynamics: Modeling Security Price Movements and Support Levels.* IFTA Journal 2011, pp. 50-53.

3. Myron J. Gordon (May 1959), *Dividends, Earnings, and Stock Prices*. Review of Economics and Statistics, XLI.