

Incorporating technical analysis in undergraduate curricula

Michael R. Melton and Xuan (Susan) Nguyen
*Center for Advanced Financial Education (CAFE),
Mario J. Gabelli School of Business, Roger Williams University,
Bristol, Rhode Island, USA, and*

Michael Simeone
UBS AG – The Bedford Group, Stamford, Connecticut, USA

Abstract

Purpose – The purpose of this paper is to introduce instruction of technical analysis on the undergraduate level that can coincide with traditional teachings of fundamental analysis.

Design/methodology/approach – Through examples using the latest in security analysis technology, this paper illustrates the importance of technical security analysis.

Findings – This research illustrates how technical analysis techniques may be used to make more significant investment decisions.

Originality value – Kirkpatrick and Dahlquist define technical analysis as a security analysis discipline for forecasting future direction of prices through the study of past market data primarily price and volume. This form of analysis has stood in direct contrast to the fundamental analysis approach whereby actual facts of the company its industry and sector may be ignored. Understanding this contrast, much of academia has chosen to continue to focus its finance curricula on fundamental analysis techniques. As more universities implement trading rooms to reflect that of industry, they must recognize that any large brokerage trading group or financial institution will typically have both a technical analysis and fundamental analysis team. Thus, the need to incorporate technical analysis into undergraduate finance curricula.

Keywords Portfolio management, Charting, Student managed funds, Technical analysis

Paper type Technical paper

Introduction

Mostly ignored throughout undergraduate investment classrooms today, technical analysis forecasts future direction of prices through the study of past market data – primarily price and volume. As [Murphy \(1999\)](#) states, technical analysts or chartists seek to identify price patterns and trends in financial markets and attempt to exploit those patterns. This form of analysis stands in direct contrast to fundamental analysis, whereby the intrinsic value of a company or market is determined by examining related economic, financial and other qualitative and quantitative factors. Fundamental analysts attempt to study everything that can affect the security's value, including macroeconomic factors, such as the overall



economy, sector and industry conditions, as well as company-specific factors like financial condition and management.

One reason why technical analysis has been overlooked in the classroom is that finance textbooks still place a major focus on the Efficient Market hypothesis (EMH). Fama (1970) defined an efficient financial market as one in which security prices always fully reflect any available information and any new information will be quickly and instantaneously reflected in prices. Given the random and unpredictable nature of news, the market must follow a random walk. In support of the EMH, Alexander (1964); Granger and Morgenstern (1963); Mandelbrot (1963); Fama (1965); Fama and Blume (1966); Van Horn and Parker (1967); and Jensen and Benington (1970) produced research supporting the random walk hypothesis. However, since the seminal work by Brock *et al.* (1992) (BLL), technical analysis has won more support from both practitioners and academicians. In this paper, the authors analyzed 26 technical trading rules using 90 years of daily stock prices from the Dow Jones Industrial Average. Testing long moving averages of 50, 150 and 200 days with short averages of 1, 2 and 5 days, the authors concluded that results were consistent with technical rules having predictive power.

Over the past two decades, other research has applied BLL's moving average and trading breakout rules across stock markets globally, finding support for technical trading rules. For example, Bessembinder and Chan (1995) conclude that moving average and breakout rules are successful in predicting stock price movement in Japan, Hong Kong, South Korea, Malaysia, Thailand and Taiwan. Hudson *et al.* (1996) apply the moving average and trading breakout rules to the UK's Financial Times Industrial Ordinary Index and concludes moving average and trading range breakout rules have predictive ability if sufficiently long series of data are considered. Rodriguez *et al.* (1999) find similar support for predictability of stock price movements on the Madrid Stock Exchange using simple forms of technical analysis as variable moving average, fixed moving average and trading range breakout. Metghalchi and Chang (2003) apply various moving average rules to the Italian stock index and conclude the profitability of technical trading over the buy and hold strategy. Wong *et al.* (2003) extend the role of technical analysis to focus on signaling the timing of stock market entry and exit. Using Singapore data, their results indicate that the moving average and the relative strength index (RSI) can be used to generate significantly positive return. Vasiliou *et al.* (2008) examine the Athens Stock Exchange [FTSE/ASE-20 Index]. By applying six rules with buy-sell method over two models, the authors show that technical analysis overwhelmingly supports a strong increase in trading performance over time. Lastly, Metghalchi *et al.* (2008) applied various moving average variations to the Swedish stock market, concluding that even when accounting for data snooping and transaction costs, moving average rules can beat the buy and hold strategy.

Given such academic support, there obviously is a need to introduce technical analysis into today's investment classes/undergraduate curricula. As such, this paper will introduce instruction of technical analysis on the undergraduate level that can coincide with traditional teachings of fundamental analysis. Through examples using the latest in security analysis technology, this paper illustrates the importance of technical security analysis and how it may be used in conjunction with fundamental analysis to make more significant investment decisions.

Incorporation of technical and fundamental analysis

Incorporation into industry

As the world is in the continuing growing age of technology, markets and trade strategies continue to evolve with it. Heading back to an age of no computers, technical analysis was

done by hand, trending out stocks and looking for areas of support and resistance (price memory) that a stock may reach now or in the future. Innovation of technology has brought along ways that stocks are bought and sold in the market, through the internet and computerized trade systems which chart out prices. This allowed for a change in how market participants are able to analyze stocks. Participants are now able to use technical analysis on all types of time frames easily throughout the market trading day because of computer innovation. As fundamentalists believe their analysis is able to price out the growth of an investment and justify it over a longer period, it is still important to incorporate stop orders and know whether the investment is out of favor now or will be in the future, which can compromise an investor's position. This is why it is important not to use each type of analysis alone. Instead both fundamental and technical analyses play a complimentary role together to provide a bigger picture. With technical analysis, a market participant is able to see whether the stock is trending and in which direction[1]. In addition, this will also help even fundamental analysts find low-risk/high-reward entry and exit levels within a given security.

Incorporation into academia. Similar to fundamental analysis, technical analysis can be taught from a book, but there is a major drawback to this method of teaching. Although it can convey the major themes and basic theory of technical analysis, it cannot incorporate real-time, up-to-date analysis on different stocks. Like industry, academia is fortunate today because of the real-time market data available at its disposal. Most business schools today provide state-of-the-art trading rooms, providing the most sophisticated financial analysis platforms similar to those used in industry[2]. If a school does not provide a real-time financial platform for students to watch continuously, students can still track delayed price movements using such providers as Yahoo Finance, Google Finance, Finviz.com or BarChart.com. In either event, the best way to get students involved and to learn how the analysis is completed is actually to give out supplemental videos along with readings. The authors post technical supplement videos on YouTube for all to see and send the links to the students. This allows students to see how price and other indicators are coming together to tell the technical story of the security and to see how each story is going to play out. Although questions from students do arise from this, it takes out the main doubt of teaching from past charts, which is, "that already happened and the data you are looking at is old so the story from the past was told and the old technicals are used to justify it". Visual aids are the most important part of the curriculum because technical analysis is done 100 per cent visually.

In any curriculum, the research recommends the incorporation of nine technical indicators. The first four are the most important technical indicators that the authors call PPTS (or Points). The other five indicators build off of the main PPTS. Often students will be overwhelmed when all indicators are presented at once. When each indicator is taught, each student is made well aware that each indicator is a small chapter in a story. If students can understand how each indicator works on its own, it is easier when they begin to look at the chapters together to tell the whole story[3]. Students can either talk out loud about what each indicator is telling them or create a checklist to come to their conclusion.

Technical analysis in the classroom

PPTS (points)

PPTS represents Price, Pattern, Time, Support/Resistance. These are the four major indicators in the price that will give the best read on a security[4]. All other indicators that are incorporated build off the main strategy of PPTS. One must remember that not all technical indicators will align at the same time and that some indicators will give a positive signal while another will seem negative. PPTS are used in teaching to help students filter out some of the conflicting signals for a clearer view of the technical trend. Most examples

throughout this paper will build off of globally well-known equities in which actual trades were taken based on the technical indicators incorporated into our curriculum. Technical indicators will build to tell the “story” of the stock[5].

Price. Price is the most important technical indicator. The price of a stock will change but never tell a lie. It has memory (support and resistance) and it will dictate the moves of most indicators. Most technical indicators are lagging and will give “textbook” buy and sell signals that can be true or false. Unfortunately, this will happen days after the stock price has already moved. Reading price action is very similar to tape reading, where you will see whether or not the security is moving up or down[6]. This will allow the reader of the price action to actually anticipate the movements in other technical indicators such as Stochastic, Moving Average Convergence-Divergence (MACD), RSI and Moving Averages which are discussed further in this paper. Price gives an advantage of an earlier entry, later exit and lowers the chances of being whipsawed by a false signal generated by other technical indicators[7].

Price is also one of the two ways that stock prices correct. It is important to teach students that stocks do not move in straight lines. If a security is in an uptrend, it is safer to buy when the price corrects or on a pullback rather than buying into strength. This can be easily identified by asking four simple questions when you look at a chart. Where was the stock yesterday, last week, last month and last year? Much of this is based on the classic notion in the market of “buying low and selling high”.

An example of a price reading entry is Apple, Inc. (AAPL) on March 27 and March 28, 2015. At this point, AAPL was trading around the \$123 level since 12:00 PM. As market opens up the next day, the price action began to continue its trend to the upside, backed by an intraday pickup in the volume the day before, and with that the first price movement indicator triggered. Refer to highlighted area below in Figure 1. Here the green line in volume signals heavier trading (buying) than that of earlier times.

Pattern. Patterns formed by price show up every day in the stock market and on all types of time frames. To help keep things simple for students, one should teach two reversal patterns and two different continuation patterns. Each pattern can be formed with slight variations, yet have the same major concept. Pattern recognition can be taught through



Figure 1.
Five-minute intraday price action of Apple, Inc.

Notes: Intraday trading for AAPL using candlestick pattern with corresponding volume. Highlighted area signals heavier trading (buying) volume

readings; yet without visual aid, it has little backing and is harder for students to grasp the concept. Pattern recognition is 100 per cent visual; so as part of any curriculum, one must show students multiple charts of these patterns rather than readings. This gives the students a basis for what patterns look like, so they are able to visually grasp the concept and can apply them to their stock analyses in the future.

The two reversal patterns that must be taught are mirror images of each other and have high probability of trend reversals. The topping pattern is called a Head and Shoulders, and the bottoming patterning is called an Inverted Head and Shoulders. Below in Figure 2 is a chart of the Head and Shoulders topping pattern on General Electric. An inverted head and shoulders is a mirror image of this but will happen at the bottom of a move rather than the top.

In addition, there are two continuation patterns that should be taught that are also mirror images, and have high probabilities of a continuation of the current trend. The names of these patterns are a Bull Flag, which has a high probability of a continuation trend to the upside, and a Bear Flag, which has a high probability of trend continuation to the downside. Below in Figure 3 is a chart of AAPL. The highlighted area shows the Bull Flag. A Bear Flag is a mirror image of a Bull Flag except that it is flipped upside down.

Time. Time is a key component of technical analysis and relates directly to the time frame of investment and price. Before choosing an investment or trade, a time frame needs to be decided upon. Faculty should teach their students what timeframes to look at depending on how long they want to be in the trade. For example, if they were looking to invest in Company XYZ for six months looking to gain off cyclical of their earnings, they would look at monthly, weekly and daily charts. There would be no need to micro-manage a six-month investment on a 1 min or a 5 min time frame. These short-term time frames should only be looked at for short-term trades on companies with good fundamentals that set up with positive behavioral and technical indicators. The longer an individual's holding period, the longer the term of the charts that they would look include in their analysis.



Figure 2.
General electric –
head and shoulders
pattern

Notes: Monthly trading for GE using candlestick pattern with corresponding volume. Head and Shoulders Pattern indicated by the curved lines above



Notes: Weekly trading for AAPL using candlestick pattern with corresponding volume. The pole (or flagstick) of the Bull Flag is represented by the vertical line and the flag is designed with AAPL reaching higher lows

Figure 3.
Example of a Bull Flag for Apple, Inc. (AAPL)

As talked about earlier in the price section, one way in which stocks make market corrections is through price, while the other is through time. A timed correction can be seen on a chart as sideways to down action after a stock has exhausted its prior uptrend. If the stock can still hold its elevated levels for a period long enough to attract new buyers and the fundamentals still support the price, it should continue higher[8]. Again, faculty should tie this concept into the curriculum using visual aids. It is easy enough to explain but the visual concept will allow for memory of prior time corrections to set a precedent of spotting a future one and preventing growth or dead money in an actively managed portfolio. Below in Figure 4 is a chart of Nike, Inc. (NKE) which had gone through a correction period over the months of September 2013 to September 2014. The correction is highlighted.

Support and resistance. Support and resistance act as horizontal areas of price memory for stocks and markets. These horizontal levels are called areas because they are not exact, but will act like Jell-O for the price[9]. These areas can be broken as spikes as the market looks to take out stops but regained shortly after investors are taken out of their trade. Once a level of support is broken and is confirmed by closing prices on the candlesticks, it then becomes resistance. Once a level of resistance is broken and confirmed by closing prices on candlesticks, it then becomes support.

As a stock nears an area of support, it is said that sellers will begin to slow their sales and buyers will begin to buy. When a stock approaches this area because of the laws of supply and demand, the prices will begin to decelerate to the downside, slowing the fall. If the buyers in this area are sufficient enough to stop the fall, the price should bounce off this area and move to the upside.

As a stock's price nears an area of resistance, the opposite may happen – meaning that buyers will begin to slow their buying and sellers will begin to sell. When a stock approaches this area, it will begin to decelerate to the upside, slowing the rise. If there are

enough sellers in this area to stop increase in price, the stock should bounce off this area and begin to sell.

Before computerized charting was available to the masses, many investors practiced technical analysis using a writing utensil, ruler and a paper chart. Before students are released out into the computerized environment of charting, they should run through a few exercises in charting. Faculty must explain the concept of how support and resistance work while showing students how to find levels on the charts. Once completed, faculty should then give out a connect-the-dots picture. The dots represent the stock price and the lines that connect them represent the levels that come into play. Faculty must do this to get the students enthusiastic about charting. Faculty should proceed to give each student charts and have them draw the levels of support and resistance with a highlighter or crayon. These hand drawn lines are intended to be thick and not to be exact, which helps convey the concept of support and resistance area as it acts in the market.

Below in Figure 5 is a chart of Macy's (M) showing areas of support and resistance of the stock. Please refer to how the stock reacts to these levels.

Other indicators

While teaching PPTS is important, other indicators such as the Full Stochastic Oscillator, MACD, RSI, Moving Averages and Volume will also help the students to time and gauge investor sentiment about the security. Faculty must remember when using these tools, they are all calculated off the price movement of the stock. So, if one can read price, they will have a general idea where these indicators are going before they actually move and can rely on these indicators to help confirm price movements in the stock. Faculty should teach students to use these indicators in conjunction with the PPTS when looking for technical entries on stocks. If it is possible to line up multiple PPTS with any of the following indicators, then a technical low-risk, high-reward entry would be found. To a full understanding of each



Figure 4.
Price correction in
Nike, Inc. (NKE)

Notes: Weekly trading for NKE using candlestick pattern with corresponding volume. The highlighted area represents levels of support (lower bound) and resistance (upper bound). Nike's correction is indicated by the price movement breaking through the level of resistance



Notes: Daily trading for M using candlestick pattern with corresponding volume. Lower two lines represent levels of support (lower bound) and resistance (upper bound). Macy's new levels of support (lower bound) and resistance (upper bound) are represented by the top two lines

Figure 5. Macy's (M) chart showing support and resistance levels

indicator, students should examine each one of these indicators separately and then put them all together.

Full stochastic oscillator. The Full Stochastic Oscillator can be used as a timing indicator. Although it is important to know how this indicator is calculated, at the undergraduate level, it is more beneficial to understand how to use the indicator since charting packages will do all of the calculations for the individual. In the implementation of the Full Stochastic Oscillator, it is recommended to use the settings of 14, 3, 3, because of the reliability to reduce false signals. When the Stochastic reads over 80, the security is considered overbought, while a reading under 20 is considered oversold. Faculty must stress that having a Stochastic move into these areas does not allow for a buying or selling opportunity. When the Stochastic is in either the oversold or overbought area for more than three days, it is considered to be embedded. Embedded in the overbought area would signal that there is continuing strength and buying pressure in the underlying security. Embedded in the oversold would signal that there is continuing weakness and selling pressure in the underlying security. As indicated in Figure 6 below, the highlighted area is an example of what Full Stochastic looks like when it is embedded in the overbought area above 80.

There are two different ways to use the Full Stochastic Oscillator as an indicator to help time price movements of stocks. First is a typical textbook entry, shown in Figure 7 below. This occurs when the per cent K line (below in green) crosses over the per cent D line (below in red). When the per cent K line crosses above the per cent D line, the Full Stochastic generates a buy signal (as seen below in the blue highlighted area). When the per cent K line (below in green) crosses below the per cent D line (below in red), the Full Stochastic will generate a sell signal. These signals are not the most reliable because they can lead to false signal or whipsaws (as seen below highlighted in yellow).

Moving Average Convergence-Divergence. The MACD is an indicator that shows the relationship of two exponential moving averages (EMAs). For this example, the setting of 12, 26, 9 on a closing basis is used. The standard MACD is the 12-day EMA less the 26-day



Figure 6.
Full stochastic oscillator

Note: Monthly Stochastic Oscillator indicating an overbought position when greater than 80 (highlighted area) an oversold position when less than 20

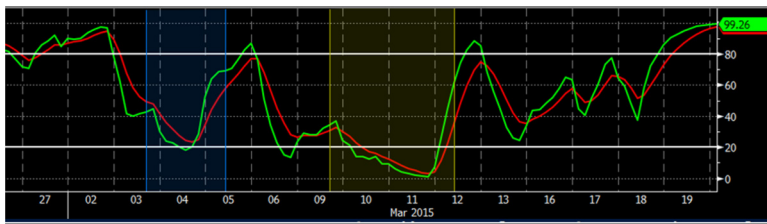


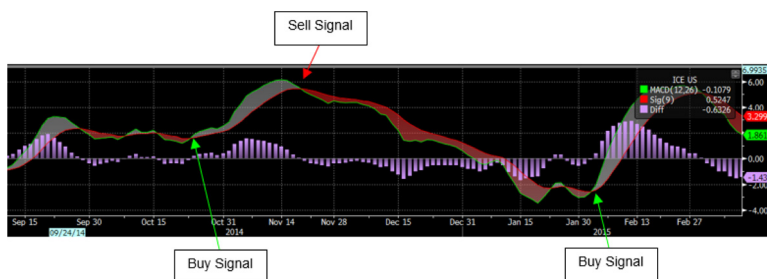
Figure 7.
Buy and sell signals from the stochastic oscillator

Note: Daily Stochastic Oscillator indicating buy signals in highlighted areas when the company is in an oversold position (<20) and the short-term “green” line %K crosses the long-term “red” line %D from below

EMA. Closing prices are used to form the moving averages so MACD is based on closing prices. A nine-day EMA of MACD is plotted alongside to act as a signal line to identify turns in the indicator. The MACD histogram represents the difference between MACD and its nine-day EMA, the signal line. The histogram is positive when MACD is above its nine-day EMA and negative when MACD is below its nine-day EMA.

The MACD histogram as plotted behind the MACD line (green line) and signal line (red line) shows the upward and downward momentum in the stock as a calculation of spread between the MACD line and the signal line. Just like the Full Stochastic, crossovers in these lines create buy and sell signals. The MACD can be used as a divergence indicator with the price of the underlying security. Because MACD can show false signals, faculty should use this alongside of the PPTS system to help find any false signals[10]. Figure 8 below provides a snapshot of the MACD buy (green) and sell (red) signals (marked with arrows). Notice the pink histogram shows the spread between the MACD line (green) and the nine-day EMA (red).

Relative Strength Index (RSI). When incorporating the RSI, two things must be looked at. First is that the RSI compares recent gains to recent losses in the underlying security. RSI works as a momentum indicator on a scale of 0-100. Over 70 on the scale will signal that the stock is overbought, and fewer than 30 signals that the stock is oversold in the near term. It is important to remember that the RSI is calculated just off of price movements. When a student learns about Price, the first P in PPTS, the RSI can easily be gauged by just looking at recent price action. Figure 9 below provides a snapshot of the RSI indicator.

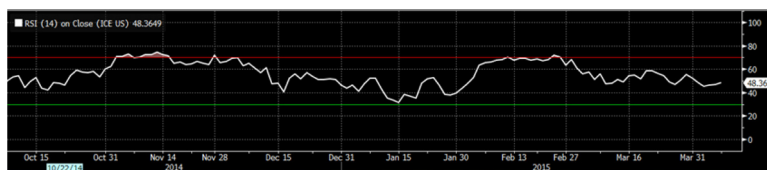


Notes: Weekly Moving Average Convergence and Divergence (MACD) indicating buy signals when the short-term “green” line crosses the long-term “red” line from below. A sell signal occurs when the short-term “green” line crosses the long-term “red” line from above

Figure 8.
Intercontinental exchange MACD

The second way to incorporate relative strength is visually. A student can compare the stock to the market itself. If the stock is showing good relative strength, a student will see it trade up, sideways or slightly down when the market pulls back. This shows that there are underlying buyers that are coming into the stock and this will hold the price up even as the market pulls back. Stocks that are showing good relative strength during a market pullback often will pop upward more so when buyers come into the market. Faculty should teach their students to look for this type of relative strength in the stock rather than the RSI because this strength helps show demand from buyers. Below is an example of intraday relative strength, shown on AAPL vs the S&P500 Index. Figure 10 illustrates a specific highlighted area. When the market pulls back, AAPL moves sideways to down and advances higher when buying comes into the S&P500. From the time when the market made an intraday high to the low at the close the market lost 0.17 per cent, AAPL gained 1.04 per cent on the day (March 23, 2015).

Moving averages. Faculty should really only focus on one type of moving average in their curriculum. It is the simple moving average (SMA) rather than the EMA because the EMA tends to move faster and is directed more toward short-term trading. Students should use the 20, 50 and 200 SMAs to identify short-, intermediate- and long-term trends in the stock’s price action. The three ways to incorporate the SMAs are:



Note: Weekly Relative Strength Index (RSI) indicating an overbought position when greater than 70 (above the red line between Oct 31 and Nov 14) and an oversold position when less than 30

Figure 9.
First way to incorporate the Relative Strength Index (RSI)



Figure 10.
Comparison of Apple, Inc. (AAPL to the S&P500 using RSI)

Notes: Intraday RSI of AAPL with candlestick price comparison against the S&P 500. RSI of AAPL in highlighted area indicates an oversold position, justifying the significant increase the following day

- (1) When a stock is trending higher, look for a pullback into a “Zone” of the 20/50 SMA. This will be an area where buyers should come into the market.
- (2) When moving averages are moving sideways or have crossovers, there is indecision in the market. When moving averages show indecision in the market place, one would then look to fundamentals to see if they support the price. If the price is supported, then looking for correction through time is the next step[11].
- (3) When moving averages cross over each other and the 20 and 50 begin to exhibit a negative slope, the trend may be over.

Below in [Figure 11](#) is a chart of Walt Disney, Corp. (DIS). Looking at the first five arrows, Disney is trending higher and the 20/50 is acting as an area where buyers are stepping in. Now look at the price movement over the period of time highlighted in white. The moving averages are moving sideways. Here one can see crossovers, but neither the 20 nor 50 SMAs show a negative slope at the same time.

Volume. Volume is the amount of shares traded in the underlying security over a given period. Faculty must look at Volume for two reasons. The first reason is to see if there is any abnormal trading volume during the day on a 5-min basis. If there is an increase of volume in a stock and the volume continues to come in, it may signal one of the following:



Notes: Monthly candlestick price chart for Walt Disney, Corp. (DIS). The lower yellow line represents the 200 day moving average. The 50-day (green line) and 20-day (light blue line) are the focus in the highlighted area indicating positive trends

Figure 11.
Twenty- and 50-day simple moving averages for Walt Disney, Inc. (DIS)

- (1) news;
- (2) technical breakout; and
- (3) large institutional funds buying or selling.

Faculty should have students check for these items in the order listed. News is the first order of business because it is one item that can change the path of the underlying security for the good or bad. Technical breakout comes next because technical analysis helps get low-risk high-reward entries. If a breakout occurs and it is missed, it will skew the risk/reward of the entry. Finally, fund buying or selling is checked last on the time and sales. The reason for this is that funds cannot buy or sell their whole position in the market at once due to the severity of how such an action will affect the supply and demand of the underlying security.

The second use of volume is to see how much conviction there is behind the move in the underlying security and whether it is to the upside or downside. The more shares traded during the day signals the more investors that participated behind the stocks move. If a stock moves higher on more than average volume, it signals that funds could be buying and also that the demand for the stock is picking up. Bringing back the AAPL 5-min chart from the section on Price (Figure 12), one can see the pickup in volume, and the change of sentiment around AAPL as investors started to buy into the position as closing bell approaches.

Putting the “Pieces” or indicators together

Not all technical indicators will align for the perfect trade. The incorporation of multiple indicators from PPTS is a must. If two or more of these align faculty and students should then look to other indicators to help determine a trade. Illustrated in Figure 13 is a chart of

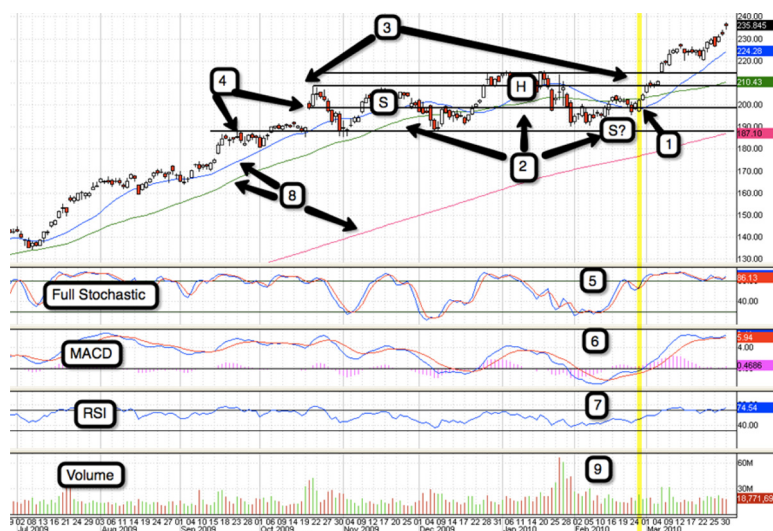


Figure 12.
Volume of Apple
Inc.'s share traded

Notes: Intraday trading for AAPL using candlestick pattern with corresponding volume. Highlighted area signals heavier trading (buying) volume as investors started to buy into the position as closing bell approaches

AAPL. Highlighted is the entry point of the example used throughout this paper as well as reference to where APPL was traded on March 30, 2010. Tying all technical analysis together provides a roadmap illustrating how aligning multiple indicators can lead to a low-risk, high-reward entry. Just as students walk through each indicator independently, they should now be able to piece together the chapters to tell a story. The highlighted area shows the indicators as of the close on the date of entry February 25, 2009.

- *Price signals buy.* The price opened up lower and proceeded to increase throughout the day. Price began increasing significantly after 1:00 pm.
- *Pattern signals sell.* There could be a possible Head and Shoulders Pattern on the daily chart which would be confirmed if price moves under 189.
- *Time signals buy.* AAPL has been trending higher previously. Fundamentals still support price at this level. AAPL looks to be in a time correction for four months but the correction may be nearing the end.
- *Support Resistance signals buy.* AAPL has been sitting at the 200 level of resistance for the two days prior, it looks to be holding, confirmed by price. Next level of support is 189. The position should stop out beneath this level as Head and Shoulders top may have formed.
- *Stochastic signal buy.* Stochastic looks to generate a buy signal if price action continues higher and will embed in overbought area showing continuing buying pressure.
- *MACD signal buy.* MACD has not generated a sell signal.
- *RSI signal indecision.* RSI is not overbought or oversold.
- *Moving Averages signal indecision.* Moving averages are moving sideways, stock price is moving between the 20 and 50 SMA.
- *Volume signal buy.* Market is witnessing the largest volume in two weeks coming into the stock. Larger volume coming in intraday confirms price action. This should continue.



Notes: Monthly trading for AAPL using candlestick pattern with corresponding volume. Included are all significant technical indicators to include moving averages, RSI, MACD and the Stochastic Oscillator

Figure 13. Summary of technical indicators leading to a buy decision

Shown in Figure 13, from each of PPTS and indicator readings, when put together as a whole, one should see an overwhelming number of buy signals being generated.

Conclusion

The purpose of this paper is to introduce instruction of technical analysis on the undergraduate level that can coincide with traditional teachings of fundamental analysis. The examples incorporated in this paper should provide a foundation for finance faculty to introduce the most basic of technical analysis techniques into the classroom. The merger of two distinct analysis techniques, technical and fundamental, should only enhance any school's undergraduate finance curriculum. The examples given in this paper are presented to provide support for investment decision-making with the understanding that no one technical analysis technique should ever stand alone. Only when used with other technical indicators – in conjunction with fundamental analysis – can a student come to an accurate buy or sell decision.

Notes

1. When speaking of a market participant, this individual could either be a fundamental analyst or a technical analyst (chartist).
2. Examples of such platforms would include Bloomberg, Quodd Equity+, Money.NET, etc.
3. It is important that technical analysis is taught in the framework of a book, knowing that each chapter builds upon itself to tell a complete story.
4. From this point on the term security is synonymous with stock because most examples given in an undergraduate investments class are directly related to equity investments.

5. The trade mentioned refers to the management of a real dollar portfolio in FNCE 450 – Portfolio Analysis.
6. Tape reading refers to the “old school” method of ticker tape reporting of stock prices.
7. A whipsaw is condition where a security’s price heads in one direction but then is followed quickly by a movement in the opposite direction. The origin of the term is derived from the push and pull action used by lumberjacks to cut wood with a type of saw with the same name.
8. Fundamental analysis is now officially merged with technical analysis.
9. For “lack” of a better term, Jell-O is used.
10. Video analysis of MACD and Stochastic Divergence can be viewed at: www.youtube.com/watch?v=2gGYAx1Vcd8
11. This signals another time when fundamental and technical analyses are merged.

References

- Alexander, S. (1964), “Price movements in speculative markets: trends or random walks”, *Industrial Management Review*, Vol. 2, pp. 25-46.
- Bessembinder, H. and Chan, K. (1995), “The profitability of technical trading rules in the Asian Stock Markets”, *Pacific-Basin Finance Journal*, Vol. 3 Nos 2/3, pp. 257-284.
- Brock, W., Lakonishok, J. and LeBaron, B. (1992), “Simple technical trading rules and the stochastic properties of stock returns”, *Journal of Finance*, Vol. 47 No. 5, pp. 1731-1764.
- Fama, E. (1965), “The behavior of Stock market prices”, *The Journal of Business*, Vol. 38 No. 1, pp. 34-105.
- Fama, E. (1970), “Efficient capital markets: a review of theory and empirical work”, *Journal of Finance*, Vol. 25 No. 2, pp. 383-417.
- Fama, E. and Blume, M. (1966), “Filter rules and stock market trading profits”, *The Journal of Business*, Vol. 39 No. 1, pp. 226-341.
- Granger, C. and Morgenstern, O. (1963), “Spectral analysis of New York Stock market prices”, *Kyklos*, Vol. 16 No. 1, pp. 1-27.
- Hudson, R., Dempsey, M. and Keasey, K. (1996), “A note on weak form of efficiency of capital markets: the application of simple technical trading rules to UK Stock Prices — 1935 to 1994”, *Journal of Banking and Finance*, Vol. 20 No. 6, pp. 1121-1132.
- Jensen, M. and Benington, G. (1970), “Random walks and technical theories: some additional evidence”, *Journal of Finance*, Vol. 25 No. 2, pp. 469-482.
- Mandelbrot, B. (1963), “The variation of certain speculative prices”, *The Journal of Business*, Vol. 36 No. 4, pp. 394-419.
- Metghalchi, M. and Chang, Y. (2003), “Profitable technical trading rules for the Italian Stock market”, *Rivista Internazionale Di Scienze Economiche e Commerciali*, Vol. 4, pp. 433-450.
- Metghalchi, M., Chang, Y. and Marcucci, Y. (2008), “Is the Swedish Stock Market efficient? Evidence from some simple trading rules”, *International Review of Financial Analysis*, Vol. 17 No. 3, pp. 475-490.
- Murphy, J. (1999), *Technical Analysis of the Financial Markets*, New York Institute of Finance, New York, NY.
- Rodriguez, F., Sosvilla, S. and Andrada, J. (1999), “Technical analysis in the Madrid stock exchange”, *FEDEA*, Vol. 99, pp. 1-29.

Van Horn, J. and Parker, G. (1967), "The random walk theory: an empirical test", *Financial Analyst Journal*, Vol. 23, pp. 87-92.

Vasiliou, D., Eriotis, N. and Papathanasiou, S. (2008), "Incorporating technical analysis into behavioral finance: a field experiment in the large capitalization firms of the Athens Stock Exchange", *International Research Journal of Finance and Economics*, Vol. 14, pp. 100-112.

Wong, W., Manzur, M. and Chew, B. (2003), "How rewarding is technical analysis? Evidence from Singapore Stock Market", *Applied Financial Economics*, Vol. 13 No. 7, pp. 543-551.

Further reading

Kirkpatrick, C. and Dahlquist, J. (2006), *Technical Analysis: The Complete Resource for Financial Market Technicians*, FT Press, Upper Saddle River, NJ.

Corresponding author

Michael R. Melton can be contacted at: mmelton@rwu.edu

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgroupublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com