

Candlesticks and Noise

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Introduction

Candlestick charting was invented by the Japanese in the 1600's and used for rice futures trading.

In the 1700's a Japanese man called Homma also disclosed that there was a strong link between supply and demand and that the prices were also strongly influenced by the emotions of the traders, meaning that there could be a vast difference between the value and the price for commodities!

As my professional background is in telecommunication engineering, interpreting Candlestick charts was rather easy. To me, Candlesticks are nothing more than an end-of-day (EOD) sample of the days trading, with added noise to show the outline of the periods' trading extremities by time and value (and volume to boot).

The added noise are the High, Low, Open, Close and Volume values> Millions of people have poured over these candlestick charts in attempts to predict the future. An example is given below:



The picture above is a typical Candlestick plot (as seen in MetaStock) where the main body contains the Open and Close limits and the whiskers show the extensions to High and Low prices of that period. If the box outline is Green then the Close is higher than the Open, and the box is Red if the Close is lower than the Open!

The hollow and full boxes add to confusion, but basically when the boxes are full this means the trend continued between Close and Open. It doesn't need much more explanation other than the Blue spikes below that are the traded daily volume – you get the relative trading picture!

Defining the Daily Period

Let's step back a bit and have a look from a distance. The Stock Market opens at nominally 10 am and closes at 4 pm, and therefore stays open for 6 hours of the 24-hour day! In the other 18 hours, people panic on whether to buy, sell or do nothing (hold)!

This situation means that most of the activity will be at opening and most panicking people will have rushed to place their buying and selling positions before opening.

After 30 minutes or so the market settles down to normal trading, and at the end of the day there is another minor stampede with minor stocks and nervous traders to finalise sales or get in or out of the market before closing.

For Day Traders, these people cannot stand leaving the money in the market overnight, so they almost inevitably pull out later in the afternoon – causing the market to drop. For Week Traders, they inevitably pull out of the market on Friday, again causing the market to drop in this period.

The vast majority of mums and dads, they get the price information a day later then make a value judgement on that and place their orders accordingly through their Brokers or on-line Brokers like E*Trade or ComSec.

Of course there is another rule for the Financial Institutions (strange that, one rule for us and another for them)! The "Black" traders – the Financial Institutions, have rules to themselves, and transfer massive amounts of securities as Off Market Trades, and their times start about 9.30 am and close about 4.30 pm.

Financial Institutions have extended hours, and the volume amounts of their trades are not disclosed. All you see is a "u" in the volume field when looking at the trading "Depth of Field" data. More on that later! This explains why security prices of large corporations "jump" overnight for no apparent reason.

I have yet to see a 'level playing field' in business, and if anyone hints that they are making changes to create this fictitious creation, then you know that they are blatantly lying or are incredibly inept – or both!

So, the sampling rate is 24 hours – or one working day; weekends and public holidays simply do not count, and the price can vary a percent or more in a day.

Stocks are Securities

Some years ago the Australian Stock Exchange (ASX) coined the name "Securities" for all forms of financial "instruments" being traded on the ASX. This terminology is quite quaint in its own way because if anything is not secure in price it is a "security"!

Quaint also that the ASX did not change its' name to the "Australian Securities Exchange, so that what it facilitates the trades for would actually align.

Depth of Trade Explained

The depth of trade is the number of buyers and sellers lined up to make trades, depending on the instant value of the security. As traders buy into a security, the number of available securities at that price runs out on the selling (higher) side so the price climbs as the trades are transferred. As traders unload securities, the depth of trade on the buying (lower) side runs out and the price falls.

There is a lot of emotion involved here. People make trades in a hurry, put up Buy prices or Sell much too quickly. Consequently force the price to unnecessarily fluctuate and this makes the “Noise” that I was alluding to in an earlier document.

The bigger the depth of trade the far less a security will fluctuate in price, and consequently the more predictable the relative prices will be over time.

The large majority of securities have a rather small depth of field, meaning that if something is going on with a public company (i.e. that has securities in the stock market) then people will buy in or sell out of that business on a rumour or well before the change becomes public knowledge. The latter is what is called “inside trading”.

Blue Chip Securities Explained

The term “Blue Chips” comes from the Casino, where the highest value chips apparently are blue. For many people, the stock market can be like a Casino as they will be fleeced for several reasons, the most notable one is that they do not read the lie of the land and buy into stocks that have a general negative trend, as opposed to those that use a bit of technical know how and put into those major companies that have a positive trend (or increasing value with time)!

Typically the “Blue Chip” stocks don’t change value much with time because the volume of trades is relatively large and the depth of trades is usually quite deep.

Just because a major company has shares on the stock market and they are highly traded is no reason to consider that companies shares as “Blue Chip”.

Never believe Stock Brokers telling you what companies are “Blue Chip” as Stock Brokers are interested in you making the trade and them getting a commission for your trade.

There is nothing easier for Stock Brokers to trade in that securities that have a high turnover – for Stock Brokers – those stocks are “Blue Chip”. This is where Stock Brokers make their easy money – facilitating the trade of high turnover securities.

More on Candlesticks

The advantage of Candlesticks is that the colours generally point in the direction of the trending trades, and that makes it very easy to look at a full screen chart and weigh up the forests and fires (greens and reds) and with a bit of practice it only takes a second or two to consider further investigation or not.

The problem with Candlesticks is that they carry four pieces of raw data (Open, High, Low, Close) in them but that raw data also included derived data (Going Up, Going Down, Peaked Out, Bottomed Out) and then there is Volume – usually done as a Bar chart to show the relative trading intensity.

Engineering logic would tell me to take a weighted average of the trade prices of the day and plot that (maybe along with the high and low of the day)!

This is too much data for one sampling time, spaced out too far and because of that, these situations all combine to make the market more volatile than it needs to be. In any case very few mathematical techniques have been utilise more than one value from these types of samples!

The beauty of Trading Bars and Candlesticks is that these tools effectively show the trade movements per timeslot. Unfortunately when there is no trade, most graphing application packages don't show a null bar at the last price, and this can upset the flow of mathematically generated graphing tools, but most people that use these technical trading tools don't have a knowledge of electronic engineering and in particular Information Theory.

There have been a swathe of publications about reading Candlestick charts, and most of these are unfit for human intelligence for a few simple reasons, and the base reason is that candlesticks are nothing more than a quantification of a period of trading.

Faster Candlesticks

If you want to see more into it then don't look at the bottom of the teacup for life's directions as it is not there and the same goes for EOD candlesticks. If you want to see more then get the data into shorter interval timeslots – so that the candlesticks are minimised and in most cases prices only are shown, and that way the guesswork is removed – and the swathe of misleading articles.

You simply cannot read into a few adjacent candlesticks and know the future when in fact, you should have already taken action!

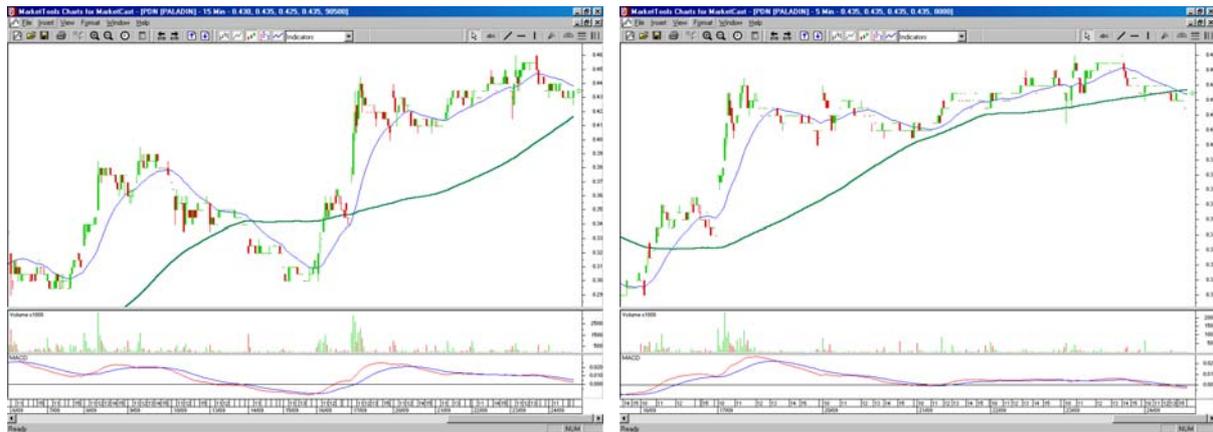
This is covered in far greater detail in some later chapters – but to whet your appetite, here are four graphs that should start to give you some long asked for answers.

These charts are from “MarketTools Charts” which is a very nifty charting package that works on EOD and live data – the best from both worlds.



The above left hand side graph is a “Weekly” chart, and it is saying that the volume is now falling, as the price seems to have maximised – so from a weekly perspective it is probably time to get out and move on.

Now that is not obvious on the daily chart (shown on the right hand side, but this one does show that the price seems to be flattening out. These charts are usually available with EOD data. Now lets look a bit closer!



These two charts show intra-day data. The left hand side one is in 15-minute timeslots and the right hand one is in 5-minute timeslots. It is like zooming in – but beware that most charting packages only have timeslots if trades in those timeslots exist – so the picture can be time-distorted. There is a heck of a lot to be said about these and other charts – but not now!

Drawing your Own Conclusions

Fundamental data has its use, but like most investigations, the data is already very second hand by the time it is made public, whereas Technical data can be almost real time, but it needs some powerful interpretation before sense can be made of it.

For centuries most people have relied on Fundamental data, but the world is moving faster and we now have the tools to analyse technical data, and we also have a wealth of mathematic tools to assist with the analysis – and the computing power!

The maths behind power measurement, the use of decibels, and logarithms, the use of probability and charting all combine eloquently with computing to provide us with the tools to formulate programs and analytic equations to filter out the technical noise from the vital signals.

The chapter may have appeared off-course but it is a foundation for a platform of closely associated mathematics that will be utilised in the upcoming chapters.

The only use of news reports and other fundamental data sources is that it will support what we already can see from technical trading. A bit like, “I told you so”!

Candlesticks and Sampling

Candlesticks and Bar Graphs are interesting because they tell you the general trend of a security, and the mere fact that they show more than one price at any particular timeslot should be powerful evidence that that the sampling rate is much too slow but the visual image shows colours and that seems to be even more powerful evidence that the stock may be moving price with time!

Now here is the dilemma: The longer the candlesticks and/or their whiskers/wicks, the more obvious that the candlesticks are under-sampling.

We are now about to move into the realm of digital mathematics.

Sampling is a “feature” of digital equipment - as opposed to their cousin analogue equipment.

The prime difference between a digital and analogue electronic equipment is that with analogue equipment the time is continuous where in a digital filter, the time is “clocked” into discrete time samples, so the output is a clocked series of discrete levels and not a continually changing waveform.

If the clocking is fast enough and the differences in the samples are small enough, then digital equipment has the effect of appearing to be moving continuously. It is common practice to include an analogue filter of some sort on the output of all digital equipment to minimise the abrupt steps into a virtually continuous analogue flow.

With candlestick charts, there is a lot of visual information in candlestick colours, shapes and whisker lengths and this is because of the time span over which the time clocked candles are generated.

Depending on the timeframe for the candle, the security prices can change significantly and the four types of samples that are taken (price at: Opening, Close, the Maximum and the Minimum combine to make each candle's visual pattern.

If while generating these candlesticks, if the price varies significantly during each clocking cycle, then it should be obvious that the clocking rate is comparatively slow and this is called 'under-sampling'.

With highly cyclic functions this can result in alias sub-modulation products which can give misleading results in technical trading - but more on that later.

Our Radios, and TVs use this feature to (in an analogue sense by utilising an auxiliary oscillator to modulate the incoming radio waves and produce a constant band range Intermediate frequency that radically simplifies the tuning process to only one button/knob).

This is the structure of a common super(sonic) heterodyne (commonly called a superhet) receiver, developed by Edwin Armstrong¹ way back in the early 1910s!

There are volumes that have been written about candlesticks and candlestick charting, and I do not intend to cover old material, so let's face it, we are not going to get rid of a system that is visually appealing, and has been proven to be effective for some centuries, so at this stage we had better work with it and be more aware of their limitations!

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¹ <http://www.radio-electronics.com/info/receivers/superhet/superhet.php>