Perspectives in Business Culture

Renato Di Lorenzo

Basic Technical Analysis of Financial Markets

A Modern Approach

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to Annie

Preface

Those who practice correctly technical analysis—after having studied it seriously and having had the patience to understand it fully—having established its effectiveness cannot but be surprised at how many investors lose regularly on the markets.

Usually this happens because most of them do not analyze things as they are (i.e., as they appear from the graphs of the price and, maybe, the volumes) but as they *should be*, paying attention to economists, TV commentators, magazines, blogs, and all the folklore—often with a personal interest in what they are saying—that revolves around this colorful world.

The classic books on Technical Analysis—on the other hand, it must be admitted—are now hopelessly aged.

The analysis techniques have changed, people have learned, they have evolved: what was hard to do years ago, today with the free tools available on the Internet have become quite simple, and this has also relentlessly emphasized that a number of classical teachings have revealed to be pure fantasy, or that they are too simple to be really useful.

A more efficient technical analysis is needed, then, one that is not satisfied with protocols that just *seem* to be fine, but which requires that they *are* fine, verifying it through simulations on the PC, serious statistical counts, and so on.

Those above are the reasons for the exclusion from this book of popular chapters, even fascinating ones, such as the Elliot Wave theory or the Gann Fans, because those recipes are not well statistically verifiable.

Good reading, then, and my usual good luck!

Renato Di Lorenzo

Acknowledgments

The author thanks Stefano Caroti Ghelli for his help. Many graphs are constructed by use of the site www.ProRealTime.it; the author thinks it is one of the best sites for technical analysis on the Internet. Special thanks to Gabriele Bonetti and Marina Forlizzi.

Warnings

The worksheets and the codes used in this book will be sent free of charge to those who will request them from the author (e-mail: renato.dilorenzo1@gmail.com) accompanying the request with any proof of purchase of this book.

Disclaimer

It should be noted that markets can go up or down and, to our knowledge, there is no perfect technique for investing and trading. So we cannot be deemed responsible for any losses arising from the advices and tools provided here.

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Part I

Part I

Chapter 1
Graphical Representation

1.1 Zig-Zag

The simplest graph is the so-called *zig-zag*, obtained by joining with a segment the prices (usually the closures) of the securities or contracts recorded at fixed intervals of time (1 day, 5 min etc.) (Fig. 1.1).

The main effort made by the trader when he reads a zig-zag graph consists in trying to understand what the underlying trend is, i.e., in trying to separate the random oscillations (that may be called *the noise*) from the underlying regular trend to which they are superimposed. We will see along all this book that this is **the** problem of technical analysis, and of investing in general.

It often happens to read that small changes in price that happen from one bar to the other can be filtered out because they are not significant.

If you draw a real graph[1] that uses this protocol[2] applied in a manner so naive, we see that this kind of operation is substantially detrimental rather than beneficial.

In the graph in Fig. 1.2, the closures of the FTSE MIB index of the Italian bourse are reported, as well as the same closures, but without the changes[3] in price of less than 0.5 %.

As one can see, the net effect is that of having a graph more readable but delayed, which is exactly what we do not need because our problem is almost always to be timely. *Timing is all*, as they say.

One might think that the delay effect is reduced by using a filter with a threshold much lower, for example not taking into account variations inferior to only 0.1 %, but it is not so (Fig. 1.3).

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[1] See the worksheet *Filtered graph*.

[2] A *protocol* is a set of rules or concepts to be followed for a particular purpose, such as a medical treatment to cure a disease.

[3] From the closure of the current bar to the closure of the previous bar. The *adjusted close* (AC) is the closure adjusted for stock splits, dividends etc.

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Fig. 1.1 The Nasdaq. *Source* Yahoo

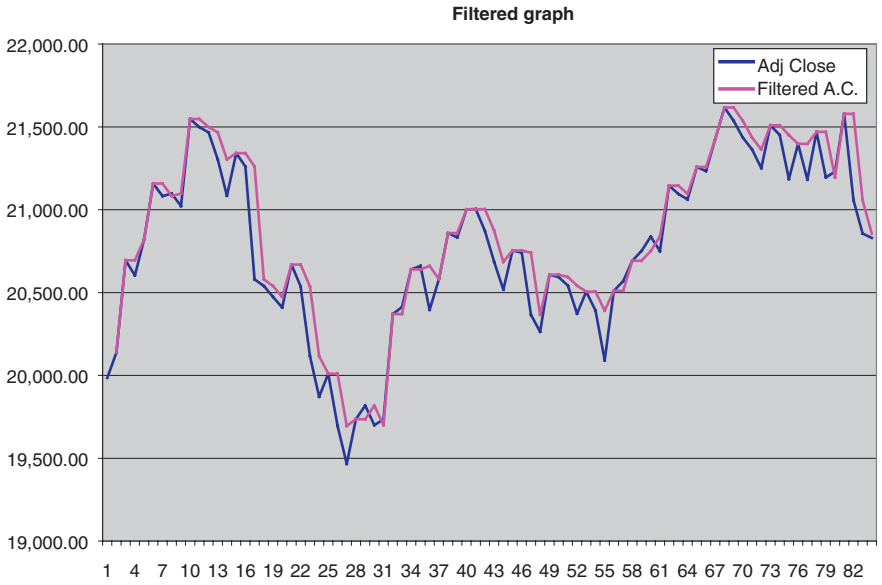

Fig. 1.2 Filtered graph

The delay persists, and the graph maintains a zig-zag behavior which is very annoying.

One might also think that the variations to be filtered out are not those from the closure of a bar to the closure of the previous one, but those from the closure of a bar to the closure (for example) of 5 bars before… but also in this case the result is disappointing (Fig. 1.4).

As can be seen, in some areas of high volatility (where there is a trend) there is no filtering at all, while in some areas of low volatility (i.e., substantially during sideways movements) there is a filtering action but there also appears a sound delay.

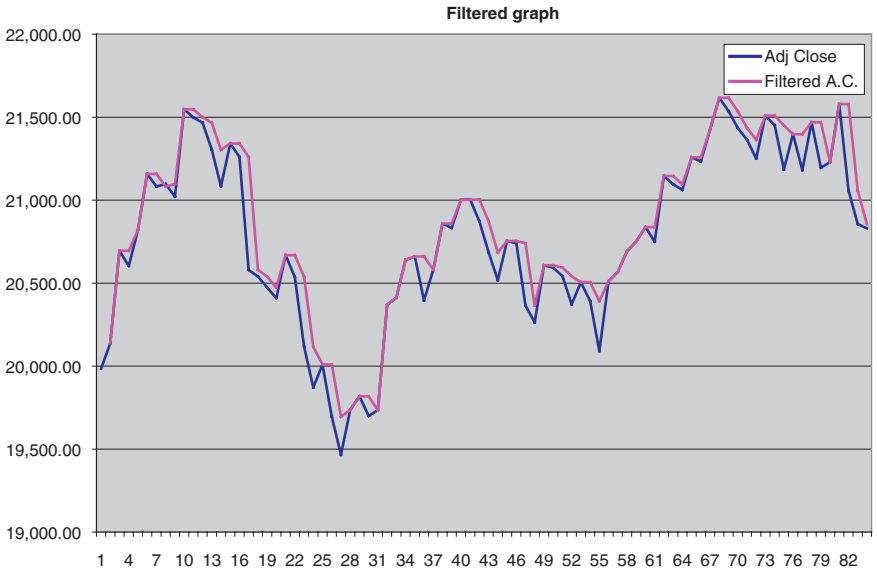

Fig. 1.3 Filtered graph

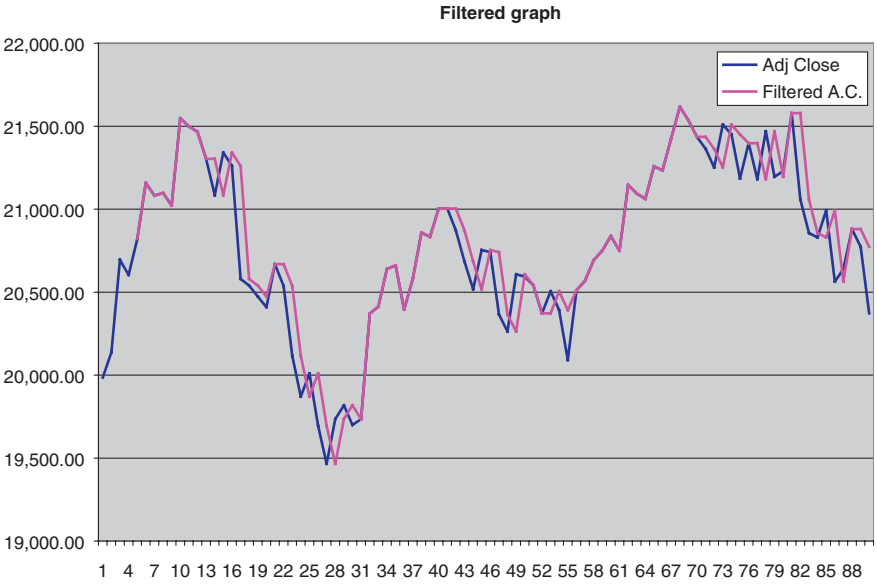

Fig. 1.4 Filtered graph

This is not the way to go, then.

A type of filter that is very basic but that has the advantage of being immediately interpreted, consists in coloring in a different way the segments of the zig-zag graph with closures upward and those with closures downward.

Here is an example (Fig. 1.5).[4]

Obviously, changing the time span—namely the period of time elapsing from one observation to the other—and changing it from daily (an observation per day) to weekly (one observation per week, of course the same day of the week and at the same hour every time) one gets the same glance but the uptrends and downtrends are decoded by the eye in a more efficient way (Fig. 1.6).

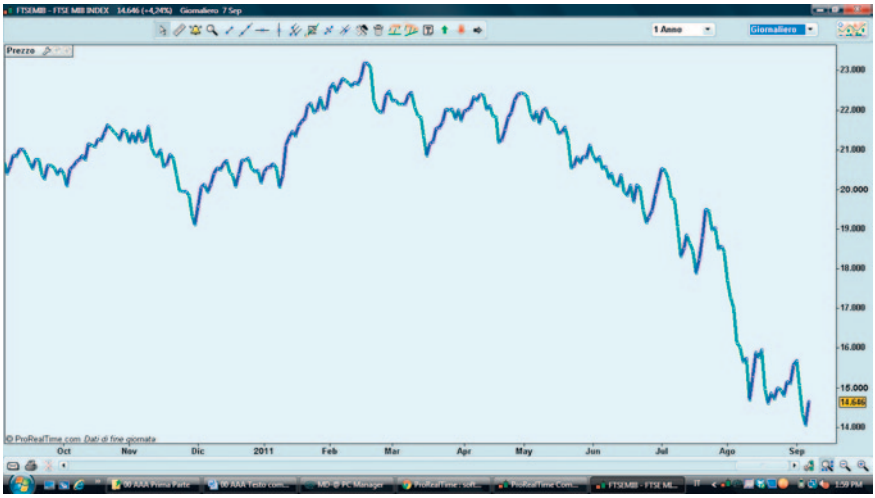

Fig. 1.5 Ftse Mib. ProRealTime platform

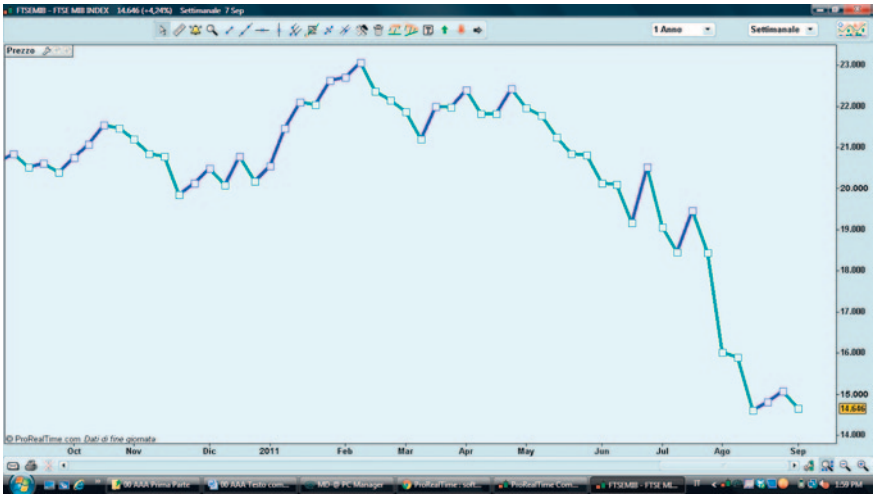

Fig. 1.6 Ftse Mib. ProRealTime platform

[4] The printed page will show the different segments in different shades of gray.

Fig. 1.7 Ftse Mib. ProRealTime platform

The protocol just described, i.e., moving from a daily to a weekly chart, is definitely a way to filter the signal, because it eliminates the more hysterical fluctuations that occur from day to day.

An even greater filtering effect is achieved by using a monthly chart, that is, one that reports only one observation each month (the same day of the month at the same time, of course) (Fig. 1.7).

However, it should be noted that, by switching to a monthly sampling—for example with observations recorded on the last Friday of the month at close—to be able to add a point to the graph one needs each month to wait for that day and hour, and then one will suffer a blackout every month of at least 15 days on average, which is definitely too much for any form of trading you want to use unless position trading.[5]

1.2 Bar Charts

The standard format with which the financial data are presented is shown in Table 1.1.[6]

The graphs seen so far, as mentioned, are said to be of a zig-zag type and the reason is obvious as they show just one of the four available values, normally the adjusted closure.

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[5] In *position trading* one buys a security and keeps it for a long time, but he has opened such a position for reasons that normally have nothing to do with technical analysis. See also: Di Lorenzo R., *How to make money by fast trading*, Springer-Verlag, 2012.

[6] They can be downloaded from various sites on the Internet, typically Yahoo. The daily data are normally free.

Table 1.1 Standard form of financial data

Date (m/d/y)	Open	High	Low	Close	Volume	Adj close
1/3/2011	65.88	65.88	65.11	65.22	9472800	64.29
1/4/2011	65.02	65.19	63.81	63.87	13970200	62.95
1/5/2011	63.79	63.95	62.86	63.49	17189500	62.58
1/6/2011	63.62	63.66	62.83	63.03	10856200	62.13
1/7/2011	62.78	63	62.56	62.92	8296400	62.02
1/10/2011	62.7	63.2	62.56	63.06	7452300	62.16
1/11/2011	63.34	63.42	62.67	62.69	7752000	61.79
1/12/2011	63.21	63.36	62.7	63.04	7111600	62.14
1/13/2011	63.25	63.86	63.13	63.4	8973800	62.49
1/14/2011	63.37	63.37	62.98	63.13	6315700	62.23
1/18/2011	63.21	63.74	63.17	63.48	8172000	62.57
1/19/2011	63.68	63.92	63.19	63.42	9163400	62.51
1/20/2011	63.62	63.88	62.75	62.93	10290000	62.03
1/21/2011	63.18	63.2	62.72	62.77	8354100	61.87
1/24/2011	62.87	63.27	62.68	63.25	7531400	62.34

Fig. 1.8 EUR/USD. ProRealTime platform

On the contrary, both the bar chart and the candlestick chart exploit all the four values: Open, High, Low, and Close in a way now well-known almost by anyone (Fig. 1.8).

In the bar chart, the opening is indicated by a tooth facing left and the closure from a tooth facing to the right, while the vertical bar goes from the maximum to the minimum quotes achieved during the session.

The vertical bar is usually colored red (or white, if the background allows) if the session has been downward (i.e. close < open) and green (or black) if the session has been upward (close > open).

Fig. 1.9 EUR/USD. ProRealTime platform

It is obvious that the amount of information transmitted by these two types of charts, compared to a zig-zag chart, is much greater.

1.3 Candles

In the *Japanese Candlesticks* chart, the information used are the same as in the bar chart, only made more evident by the conformation of the drawing (see Fig. 1.9).

The two thinner parts facing upward and downward (the rovings, so to say) are called *shadows* and mark the maximum and the minimum quotes reached during the course of the session, while the thickest part (the candle itself, or *body*) goes from opening to closing. The colors used are the same as for the bar graph.

The length of the bar or candle is variable: daily if the session is a day, or 15 min, or an hour, or 1 month… what you want.

1.4 Candlevolume

The *Candlevolume graph* is a normal candlestick chart, but to it an information that we have not used—the volume[7]—is added in some way.

I remind that the standard form of representation of the volumes consists of a histogram added in the lower window of the chart, like in Fig. 1.10.

[7] The volume is the number of Securities exchanged during the session.

Fig. 1.10 Mediaset. *Source* Yahoo

Fig. 1.11 Unicredit. ProRealTime platform

How then can we add the volumes directly on the price chart rather than in a separate window?

There is no other option than to incorporate them into the candle by varying its width.

Each candle body, therefore, will present a width proportional to the volumes exchanged during the session (Fig. 1.11).

The meaning of the volumes in terms of trading is very controversial, and we will deal with it for a long time. In any case, no doubt that there are situations in which whether or not there has been an increase in the number of trades is important, typically, as we shall see, the breakout from a figure (e.g., a triangle or a head and shoulders…). In this case, the graph Candlevolume provides this information in an immediate way. Apart from these cases, however, not always (for example) a long candle—i.e., one with a very long body, index of a market that desires to move in one direction or another—associated with high[8] volumes is necessarily an effective signal.

1.5 Equivolume

The graph *Equivolume* is very similar to the *Candlevolume*, but it takes into account only the maximum, minimum, and the volume of the session: open and close are not reported. Then one draws simple rectangles, or *boxes*, instead of candles. The height of the box represents the so-called *range*, equal to the difference between the maximum and the minimum quotes reached during the session, and it has to do with a measure of volatility. In the absence of an indication of the fact that the session has been upward or downward (because one lacks the open and close information), it makes up for coloring the edges of the boxes: green (or clear) for the sessions on the upside and red (or black) for the downward sessions (Fig. 1.12).

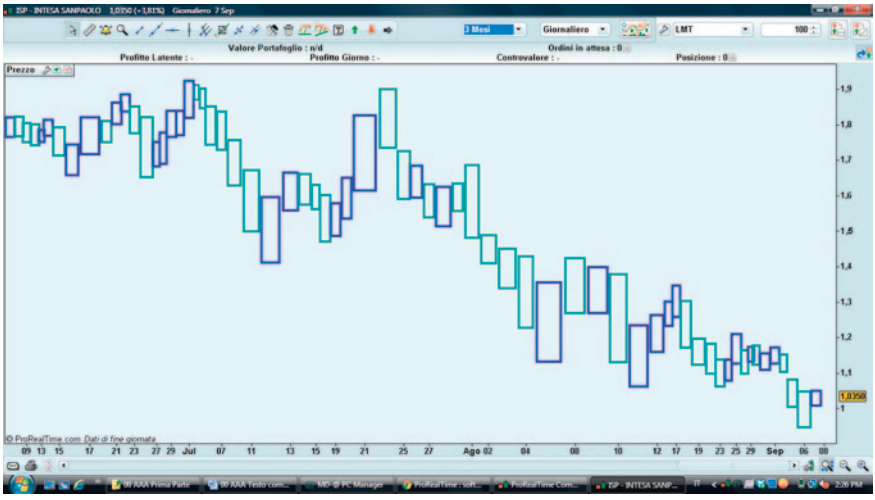

Fig. 1.12 Intesa. ProRealTime platform

[8] It is therefore a candle long and wide at the same time.

Introduced by Richard W. Arms in 1967, in this type of graph the width of a box represents a percentage, precisely, the volume traded in the course of that candle—or session or bar—divided by the total volume traded on that security in the course of the session. According to Arms, the shape of each box tells a story: namely, boxes short and broad—that represent high volumes without substantial price changes—tend to occur in the turning points, i.e., when a lateral movement or trend in a certain direction (for instance upward) is becoming a trend in the opposite direction (e.g., downward), while tall and narrow boxes (which show a great variation of prices on low volumes) tend to occur in long-lasting trends. Here is an example from his bibliography (Fig. 1.13).

Arms seems then to suggest that a breakout (i.e., the outburst from an area of support or resistance—see below) to be valid—i.e., to be the start of a powerful movement—should be represented by boxes high and wide that he called *power bars* or *power boxes*.

In general:

- power boxes that are very wide and at least as high, indicate a strong momentum in the market (bullish or bearish);
- the *narrow boxes*, instead, are high and narrow and occur especially in the phases of continuation of the trend;
- the *square boxes* are… square boxes and indicate a great indecision in the market;
- the *oversquare boxes* are wider than high, and represent a lack of direction in the market.

It is quite obvious that, both in the Equivolume and in the Candlevolume graphs, the time axis is deformed: dilated at high volumes and compressed at low

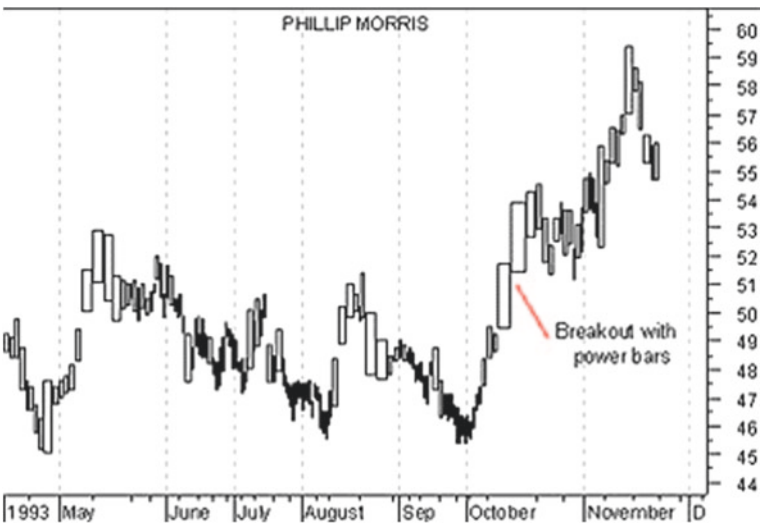

Fig. 1.13 Philip Morris. *Source* armsinsider.com

volumes, but this is usually neither a handicap nor a particular advantage: only it appears more or less useless on these two graphs to plot lines of resistance and support (see below) precisely because of the deformation of the time axis.

1.6 Point and Figure

Another representation of the price chart is the *Point and Figure*. Also in this representation the time axis is deformed, so that there is no more compliance with the axis of the true time. However in the *Point and Figure* graph, support and resistance straight lines (see below) are nevertheless drawn because this is a representation with a high filtration capacity and then these lines retain their ordinary meaning.

It is a graphical analysis method invented in the late 1800s. It is reported that Charles Dow in person talked of it in a number of his Wall Street Journal in 1901, calling it *Book Method*. Apparently, the name *Point and Figure* seems to have been coined in 1933 by a certain Victor de Villiers.

Here is the general aspect of this representation (Fig. 1.14).

The downward movements are identified by a column composed of circles O, while the upside movements are identified by a column of crosses ×.

Price changes (upward or downward) below a certain amount (the threshold is called *box size*) are removed. The standard dimensions of the box size, more or less accepted in practice, are shown in Table 1.2 in relation to the price range of the security.

Fig. 1.14 Coca Cola (KO). ProRealTime platform

Table 1.2 Box size

Price from	To	Box size	Average (%)
0	0.25	0.0625	25.0
0.25	1	0.125	10.0
1	5	0.25	4.2
5	20	0.5	2.0
20	100	1	0.8
100	200	2	0.7
200	1,000	4	0.3
1,000	10,000	20	0.2
10,000	100,000	200	0.2
100,000	∞	2,000	

Fig. 1.15 Generali. ProRealTime platform

A more modern way to determine the dimension of the box size is to equal it to the average true range (ATR). In the Appendix, there is the explanation of what the ATR is and how to calculate it, if necessary using a standard platform as ProRealTime.

Following the instructions in the Appendix, the *Generali* shares at the time of writing have a value of the ATR, and then of the box size, of 0.4918, while the price is 13.26. Using the conventional table reported above, the box size should be 0.5, not very different from the value calculated via the ATR.

However, in Fig. 1.15 the ATR is shown in the bottom window, which shows that the coincidence between the two values that we found in this case is just a coincidence.

Ultimately, in this case all the variations in the price of less than about 2 % should be skipped. If one can calculate the ATR, this is a more accurate and