



ASSET MANAGEMENT

Théories et croyances, séances 5 et 6

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Asset Management, Théories & Croyances

1. Introduction à l'asset management (1 séance)
2. Alpha and beta : the very short alphabet of AM (1 séance)
3. Factor investing : from risk premia to multi-premia portfolios (1 séance ½)
4. Gestion obligataire et Factor investing in bonds (1/2 séance)
5. Behavioral Finance and Technical Analysis (2 séances)
6. The quantitative challenge : how to avoid overfitting, ML implementation (1 séance)
7. Stock selection and security analysis ((1 séance))

Revue de la notion de risque et de ses origines

Les origines du Risque

- Etymologie: « se risquer » en français apparaît en 1577
 - Kinounos : le feu / la vaillance: littéralement aller au-devant du feu (danger)
 - Resecare: couper / racourcir (parcours maritime à « optimiser »)
 - Rizk: ce que l'homme acquiert sur terre (providence) mais aussi ce qu'il mérite par ses actions (récompense / vs infortune = punition de Dieu)
- Histoire
 - Sociétés archaïques (Homère): prendre un risque, c'est une certaine éthique de l'audace, mais tout est écrit: on s'en remet à Dieu
 - Rupture avec Pascal: « Le silence de ces espaces infinis m'effraie » ou l'engloutissement de l'homme dans un univers sans dieu. Dieu ne fait pas (plus) réponse. Ce monde-là n'est pas forcément organisé: il est hasardeux et échappe à une volonté divine. Le non-sens apparaît et revêt la perception du risque.
Controverse sur le tremblement de terre de Lisbonne en 1755 oppose Voltaire (qui y voit un châtiment divin) et Rousseau qui analyse une erreur d'urbanisme

Un monde absurde et une liberté totale, c'est-à-dire une responsabilité absolue

- Un monde absurde:
 - On ne choisit pas de vivre
 - Notre action sur terre est dérisoire
 - Nous allons tous mourir!

Nous sommes dans un monde absurde, livré au chaos à l'absurde.
- L'existentialisme suppose à la fois une liberté totale et une responsabilité absolue, presque terrifiante, sans faux-semblant (cf pensée freudienne)

Cette angoisse de l'absurde mène à la révolte (Camus) mais nous pouvons / devons la retourner pour en faire un projet, un moteur et donner du sens à la vie. Ethique de l'audace dans la prise de décision, mais dans un monde de l'absurde.
==> Nous sommes orphelins du sens et condamnés à prendre du risque afin de créer du sens et de pouvoir vivre passionnément
- Paradoxalement, parce que Dieu a déserté la société, la recherche de sens est impérative
 - La société consumériste et d'accumulation a été une solution
 - Toutes les tentatives alternatives essaient d'apporter une vision spirituelle et humaniste.
 - Principe d'un projet qui dépasse l'individu (projet national ou global comme l'écologie par exemple).

Prise de risque et performance

- Le risque, ce n'est pas le danger: le danger est subi, le risque se prend en pleine responsabilité, il est assumé et doit se comprendre comme une balance entre des dangers potentiels, il y a des opportunités, des fortunes possibles. Balance entre prudence (apathie) et témérité
- La prise de risque renvoie à la créativité et à l'audace de l'entrepreneur, chère à Schumpeter et aussi à celles des marchands, les premiers à prendre du risque pour mieux profiter des opportunités
- Les outils qui permettent de mieux analyser et de maîtriser le risque doivent aussi offrir une plus grande réussite (analogie avec les premières armes du cueilleur – chasseur : les flèches lui permettaient à la fois de mieux se défendre face au gibier et en même temps d'être plus efficace)
- Analogie avec le jeu: (René Girard): la prise de risque peut se voir sous différents angles
 - Alea
 - Compétition
 - Vertigo
 - Masque / déguisement

En fonction de l'angle choisi, le résultat a tout lieu d'être différent

L'émergence de FOMO (Fear Of Missing Out)

- La société exige le principe de précaution pour éviter tout danger à la communauté. C'est le zéro risque collectif (toujours très relatif et rarement apprécié avant que l'évènement ne se réalise).
Ce qui est vrai au niveau collectif n'est pas forcément vérifié au niveau individuel.
- La prise de risque de certains implique, en creux, l'absence de risque des autres (cf. compagnies d'assurance) qui préfèrent la tranquillité à l'audace.
- Mais l'absence de prise de risque suggère un coût significatif, elle est le terreau de frustrations futures, d'une vie terne et étroite, sans compensation de la peine d'exister (cf. théorie de l'absurde)
- La fréquentation du risque serait-elle la condition pour éprouver du plaisir, pour ré-apprécier son énergie vitale et le sel de la vie? La société actuelle est le reflet de cette vision: les winners sont ceux qui savent prendre des risques (et parviennent ensuite à réussir) et les losers sont ceux qui ne tentent rien (et échouent fatidiquement). Le héros moderne prend des risques permanents, c'est un entrepreneur dans l'âme...
- FOMO naît de ce paradoxe: le risque est de ne pas en prendre
C'est le pari de Pascal revisité avec comme dilemme, la prise de risque

Introduction to Behavioral Finance

History and definition

Main behavioral bias and possible implication in Finance

Crowds

Why crowds are manipulated at extremes (Gustave Lebon)

And why crowds can be right most part of the time

Introduction to Technical Analysis

History and definition

Psychological explanations

Main schools of TA

EMH and market anomalies

- Investors who believe in the random walk theory feel that it is **impossible to outperform the market without taking on additional risk**, and that a **long-term buy-and-hold strategy is the best**
- In his book, **Malkiel preaches that both technical analysis and fundamental analysis are largely a waste of time** and are still unproven in outperforming the markets.
- In short, random walk says that **stocks take a random and unpredictable path**. The chance of a stock's future price going up is the same as it going down. A follower of random walk believes it is impossible to outperform the market without assuming additional risk.
- However, there are numerous **stock market anomalies** that seem to contradict the EMH. Theoretically though, once an anomaly is discovered, investors attempting to profit by exploiting the inefficiency should result its disappearance. In fact, numerous anomalies that have been documented via back-testing have subsequently disappeared or proven to be impossible to exploit because of transactions costs.
- The **paradox of efficient markets** is that if every investor believed a market was efficient, then the market would not be efficient because no one would analyze securities. In effect, efficient markets depend on market participants who believe the market is inefficient and trade securities in an attempt to outperform the market.
- Active managers argue that less efficient markets provide the opportunity for outperformance by skillful managers. However, a **majority of active managers in a given market will underperform** the benchmark in the long run. For those who outperform it is important to appreciate if it comes from **Skill or luck?**
- Additionally, **The lack of consistent performance persistence among active managers supports the EMH**.

Behavioral finance or how to differentiate skill from luck

- Behavioral Finance **describes how investors actually behave, rather than how they should behave**, which is the case of CAPM theory.
- Serious issues with behavioral finance:
 - For instance, The fact of knowing we are involved in an experiment causes us to behave differently (Schrôdinger)
 - Or the opportunities due to specific behavior can evaporate quickly when they are implemented (windfall gain)



Behavioral Finance: theoretical answers to EMH theory

BF observes that:

- 1- Individual / professional investors have investment bias
- 2- Therefore a lot / majority of decisions aren't (at least totally) rational
- 3- RWT is wrong because the assumptions are wrong: the concept of rationality suggests the lack of emotion, while emotions often drives our decisions (cf. dependancy of social environment, codes...)
- BF observes a lot of bias in the investor behaviors
- TA can be considered as the empiric side of BF trying to take benefit from all the bias by using specific patterns or rules.

Behavioral finance theories (1)

Researcher Name	Year	Theory/ Concept/ Model
Herbert Simon	1955	Models of bounded rationality
Festinger, Riecken and Schachter	1956	Theory of cognitive dissonance
Tversky and Kahneman	1973,1974	Introduced heuristic biases: availability, representativeness, anchoring and adjustment
Kahneman and Tversky	1979	The prospect theory, introduced loss aversion bias
Tversky and Kahneman	1981	Introduced Framing Bias
Richard Thaler	1985	Introduced mental accounting bias
De Bondt and Thaler	1985	Theory of overreaction in stock markets.
Barberis, Shleifer and Vishny	1998	Investor sentiment model for underreaction and overreaction of stock prices.
Meir Statman	1999	Behavioral asset pricing theory and behavioral portfolio theory
Andrei Shleifer	2000	Linkage of behavioral finance with Efficient market Hypothesis to find that stock markets are inefficient.
Barberis, Huang and Santos	2001	Incorporation of prospect theory in asset prices.
Grinblatt and Keloharju	2001	Role of behavioral factors in determining trading behavior.
Hubert Fromlet	2001	Importance of behavioral finance. Emphasis on departure from ' <i>homo economicus</i> ' or traditional paradigm to more realistic paradigm.
Barberis and Thaler	2003	Survey of Behavioral Finance
Coval and Shumway	2006	Effect of behavioral biases on stock prices. The price reversal for biased investors is quicker than unbiased investors

Behavioral finance theories (2)

Bias Name	Author	Findings
Representativeness	Tversky and Kahneman (1974)	Tendency of individuals to estimate the likelihood of an event by comparing it to a previous incident that already exists in their minds.
	Kumar (2001)	Past price trend is representative of the future price trend as investors tend to buy stocks with recent positive abnormal returns.
	Kaestner (2005)	Investors extrapolate the recent earnings surprise and hence overreact to subsequent earnings surprise.
Availability	Tversky and Kahneman (1973, 1974)	It is the ease with which relevant issues come to mind. It creates a selection bias in decision making.
	Kliger and Kudryavtsev (2010)	Stock price reaction to recommendation revisions (up or down) is stronger when accompanied by index returns in the same direction.
Anchoring	Tversky and Kahneman (1974)	Tendency of people to estimate an unknown value with the help of an initial value or "anchor".
	Campbell and Sharpe (2009)	Expert forecasts releases are biased (anchored) towards previous months releases.
Overconfidence	Odean (1998a)	Investors' tendency to overestimate the precision of their knowledge about the value of a security.
	Daniel, Hirshleifer and Subrahmanyam (1998)	Overconfidence of investors leads to negative serial correlation in prices (price reversals).
	Barber and Odean (2000)	Overconfidence increases trading activity in investors that in turn depletes their wealth due to higher trading costs.
	Gervais and Odean (2001)	Past successes in trades makes investors overconfident and leads to high trading volume in future periods.
Optimism (Pessimism)	Heifetz and Spiegel (2001)	Investors' tendency to overestimate (underestimate) the expected mean returns of the risky asset.
	Toshino and Suto (2004)	Optimistic investors selectively incorporate only good news in their decision making process.
	Shefrin and Statman (2011)	Excessive optimism creates speculative bubbles in financial markets.
	Hoffman and Post (2011)	Identify the drivers of optimism and pessimism that are return expectations, return tolerance and risk perceptions.

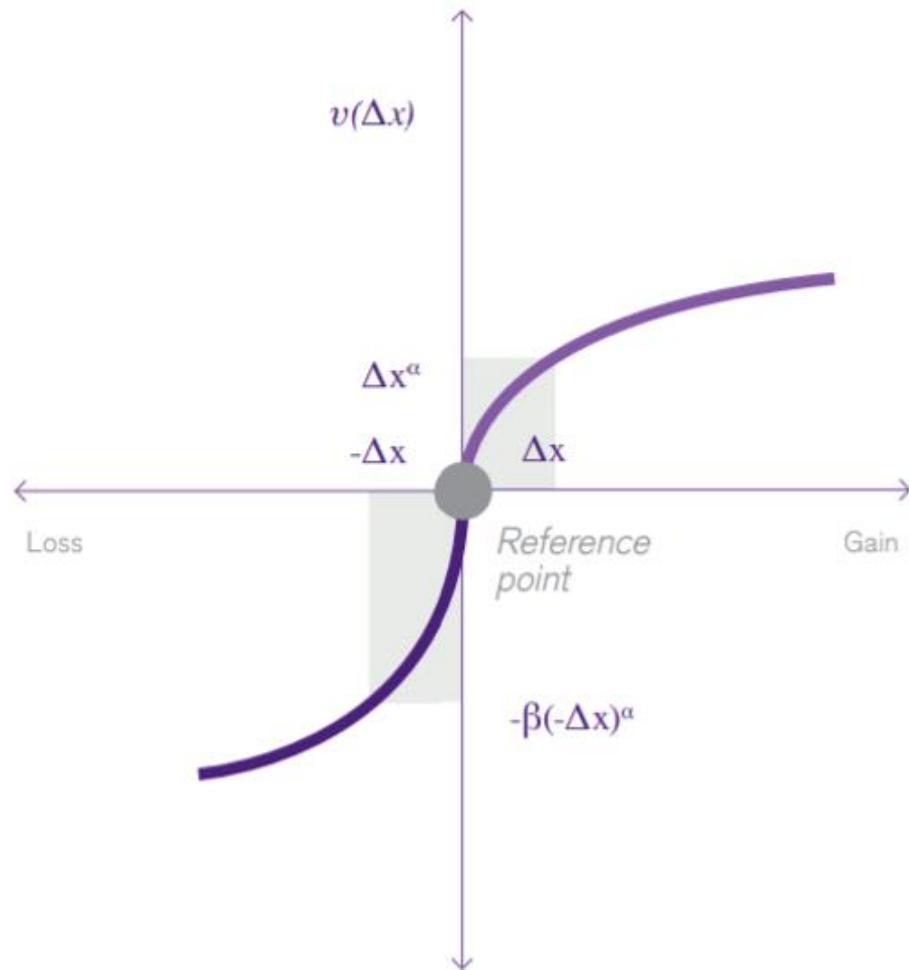
Behavioral finance theories (3)

Bias Name	Author	Findings
Loss aversion	Kahneman and Tversky (1979)	Loss brings regret and people try to avoid losses in order to avoid subsequent regret.
	Coval and Shumway (2003)	Analyzed loss aversion in intra-day trading. A loss in the morning leads to higher risk taking behavior of market makers in the afternoon.
	Berkelaar and Kouwenberg (2008)	Investors with heterogeneous loss aversion become gradually less risk averse when they experience gains, pushing the security prices up.
	Hwang and Satchell (2010)	Level of loss aversion changes depending on market conditions. Investors become more loss averse in bull markets than bear markets.
Narrow Framing	Shefrin (2000)	Tendency of investors to treat repeated risks as if they were a one-shot deal.
	Barberis and Huang (2005)	People evaluate a new gamble in isolation, separated from their other risks, even if it is just one of many that determine their overall wealth risk.
	Liu and Wang (2010)	Investors could easily become susceptible to narrow framing when trading in the complex derivatives market. Factors like professionalism, sophistication and experience can reduce this bias to a certain extent.
Mental accounting	Thaler (1999)	Investors make mental accounts of their wealth which have an impact on stock selection decisions
	Barberis and Huang (2001)	Comparison between stock accounting by investors to portfolio accounting. Change in investors mental system of accounting affects asset prices.

Behavioral finance theories (4)

Bias Name	Author	Findings
Disposition Effect	Shefrin and Statman (1985)	Tendency of investors to sell winning stocks early and holding on to losing stocks
	Odean (1998b)	Using the ratio of proportion of gains realized (PGR) to proportion of loss realized (PLR) show that investors are prone to the disposition effect.
	Grinblatt and Keloharju (2001)	Evidence of the disposition effect in Finnish stock market.
	Shumway and Wu (2006)	The disposition effect drives momentum in Shanghai stock exchange.
	Alok Kumar (2009)	In order to avoid regret investors continue to hold on to loss making stocks in the hope of future gains
Herding behavior	Lakonishok <i>et al.</i> (1991)	Developed a model which measures herding by studying a subset of market participants over time.
	Scharfstein and Stein (1990)	Examined herding in money managers. Reputational concerns and ‘sharing-the-blame’ effect, were some of the factors that could drive managers to herd
	Christie and Huang (1995)	Investigated the presence of herding using cross-sectional standard deviation (CSSD). Analyzed that herding exists in periods of market extremes.
Status quo Bias	Samuelson and Zeckhauser (1988)	Individuals tend to disproportionately stick to their status quo, i.e. maintaining one's current or previous decision.
	Brown and Kagel (2009)	Status quo prevails in an environment in which there are very low costs of identifying better performing stocks.
	Jianbiao	Identified factors affecting the status quo bias as framing, investors' emotion and information structure.

Utility fonction of the prospect theory



Myopic Loss Aversion

- Most investors fear losses more than they enjoy profits.
- There is an inclination to look at market and performances too often which can lead to emotional and bad decisions.
- It's always better to control a portfolio with a long term view

JUST A NORMAL DAY AT THE NATION'S MOST IMPORTANT FINANCIAL INSTITUTION...



WHAT ARE COGNITIVE BIASES?

- There are well over 100 cognitive biases, an umbrella term that refers to types of errors in thinking that occur when we're processing and interpreting information. Think of them as mental shortcuts that help us make sense of the world and reach decisions quickly. If we had to consider every possible option and outcome when making a decision, we would likely be overwhelmed. Because of the amount of information we're exposed to, it's necessary to rely on **mental shortcuts that allow us to act quickly** (see « bottom line » & « big picture » thinking)
- Because of the complexity of the markets and our nonstop access to data, investors tend to rely on cognitive biases more than they should to make important decisions, like when to buy and sell and how to manage risk. **Confirmation bias**, which is our tendency to **ignore information that challenges or contradicts our views** and opinions, is exhibited repeatedly in the investment world. Anchoring, where we continue to use information we've used to make past decisions despite the existence and availability of new and relevant data, is another.

WHAT ARE EMOTIONAL BIASES?

- As its name suggests, **emotional biases stem from emotional factors, like impulse or intuition**, which distort cognition and decision-making. The effects of emotional biases can be similar to cognitive biases and can even be considered as a subcategory of those biases. The differentiator, however, is that the cause lies in our fears and/or desires, rather than our reasoning.
- Like cognitive biases, investors are prone to use emotional biases to make important investment decisions. **Loss aversion**, for example, which is our tendency to feel the pain of loss more profoundly than the joy of an equivalent gain, can lead investors to **hold on to losing assets longer than they should to avoid the pain** of seeing a loss materialized, which only exacerbates losses more. And, the **status quo bias** can prevent investors from making changes that may be beneficial. For instance, studies show that many investors don't make changes to their retirement savings allocations over time – which can result in a portfolio that's riskier than it should be given their proximity to retirement.

OVERCOMING OUR BIASES

- Recognizing that we all rely on biases to make decisions is the first step to overcoming them – or, at least trying. While it's nearly impossible for us to be completely unbiased in our investment decisions, we can lessen the impact by identifying the cognitive and emotional biases we're more apt to fall back on, and actively working to outsmart our brains and temper our emotions to achieve better outcomes

Cognitive Biases (1)

Confirmation Bias

- People tend to look for, and notice, evidence that confirms their existing beliefs, ignoring other information that challenges or contradicts their views. This happens as human beings tend to avoid what is technically called “cognitive dissonance” – the mental discomfort that occurs when new information conflicts with our beliefs or perceptions.
- In the investment world, confirmation bias is exhibited repeatedly. As a result, investors ignore negative information about certain assets, which could be a warning sign that can help prevent losses. Investors may also ignore information that supports differing points of view, which can make them miss out on attractive opportunities.

Anchoring Bias

- Anchoring is the tendency to rely too heavily on the first piece of information we learn, which can have a serious impact on the decisions we make. Once that first piece of information, or “anchor,” is set, our brain makes adjustments based on that anchor.
- Investors may stick too closely to their original estimates when new information becomes available. For example, if an investor estimates next year’s earnings for a company to be \$2 per share and the company experiences difficulties during the year, the investor may not adjust their original estimate to account for these challenges because they’re anchored by their original estimate.

Cognitive Biases (2)

Narrative Bias

- The narrative bias refers to our tendency to interpret information as being part of a larger story or pattern, regardless of whether the facts actually support the full narrative.
- Investors are likely to abandon evidence in favor of a good story about a specific stock or strategy. For example, the most admired stocks have the greatest stories, but they also tend to have the highest prices. While stories can be compelling, it's important to consider the whole picture before making an investment decision.
- Framing is when someone makes a decision because of the way information is presented to them, rather than based just on the facts. In other words, if someone sees the same facts presented in a different way, they are likely to come to a different conclusion about the information..

Home Bias

- Statistics show that most investors tend to buy stocks from companies in their home country. These stocks seem more trustworthy, and investors grew up with these company names and are often mentioned frequently in the local media.

Hindsight Bias

- Statistics Hindsight bias is the theory that when people predict a correct outcome, they wrongly believe that they "knew it all along".
- We all have an explanation after the facts...

Emotional Biases (1)

Overconfidence Bias

- This bias occurs when people overestimate their own abilities, believing that they are smarter or more informed than they really are. People showing overconfidence may mistakenly equate information quantity with quality, feeling more confident if they have substantial amounts of information, even if its quality is poor.
- Overconfident investors tend to underestimate the risks or overestimate the expected returns of an investment. They also tend to trade excessively – quick to sell an asset that has disappointed them, only to buy a new security that they feel overconfident about. And they do it repeatedly.
- Self-serving cognitive bias is the propensity to attribute positive outcomes to skill and negative outcomes to luck. In other words, we attribute the cause of something to whatever is in our own best interest. Skill vs bad luck.

Herding bias

- Herd mentality is when investors blindly copy and follow what other famous investors are doing. When they do this, they are being influenced by emotion, rather than by independent analysis.
- They prefer to trust others that being self-confident enough and follow their own belief. It leads to lack of responsibility.

Emotional Biases (2)

Status Quo Biases

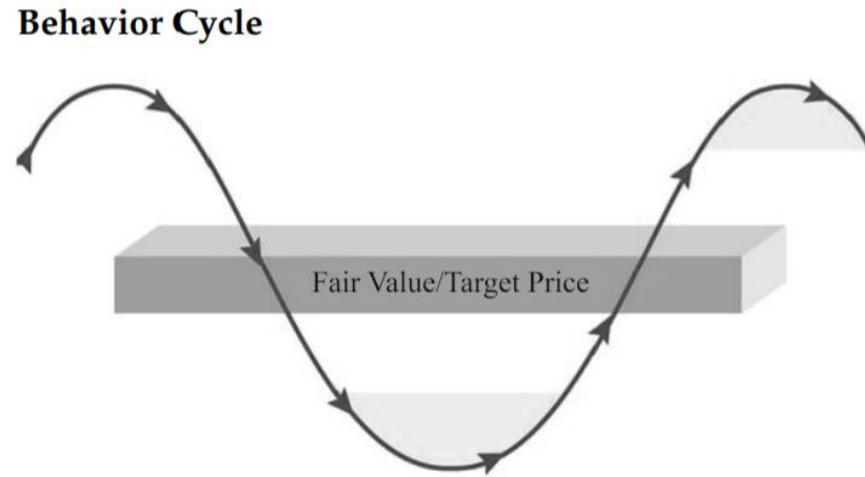
- Status quo bias is an emotional bias in which people respond to new circumstances by doing nothing instead of making appropriate adaptations. People are generally more comfortable keeping things as they are. This bias might prevent an investor from looking for opportunities where change may be beneficial.
- Investors unwilling to change or adapt to new information may end up with portfolios that are inappropriate given their circumstances, perhaps making an old investment no longer suitable as markets shift.

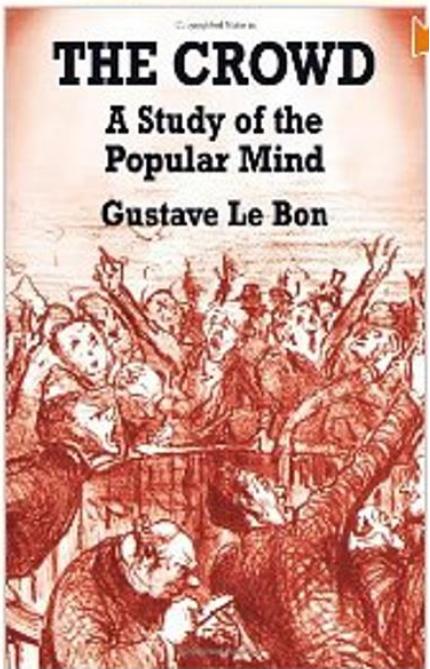
Endowment Effect

- The endowment effect makes investors give holdings that they own a disproportionate value simply because they already own them. If the endowment bias didn't exist, the price that people would be willing to buy would equal the price at which they would be willing to sell – something that rarely happens.
- Investors may hold on to losing or inappropriate assets, instead of selling them, because they are assigning them a disproportionate value. This focus also makes investors miss out on other, perhaps better, opportunities.

Behavioral cycle

- Pricing is not just income statement, balance sheet, and company information; the price is also based on the decision process of investors.
- Therefore, stock prices are also a function of investor's cognitive biases, decision errors, and affect (feelings) about companies.
- These biases are the key to long term and consistent alpha generation because they cause stocks to follow the behavioral cycle :
 - when the economics of a firm are weak, investors overextrapolate and push price below fair price.
 - As economics improve, investor's enthusiasm pushes prices above fair value.





A NEW YORK TIMES BUSINESS BESTSELLER

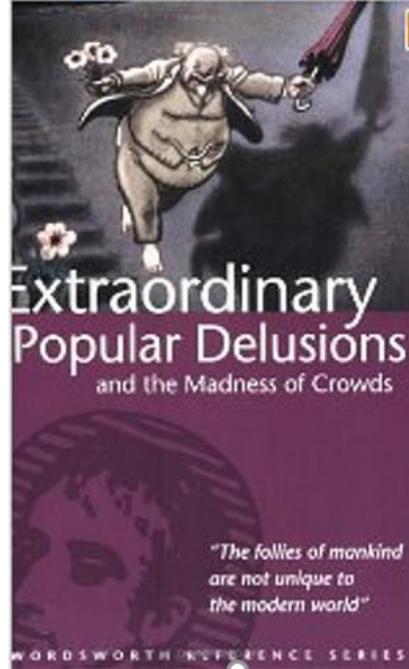
"As entertaining and thought-provoking as *The Tipping Point* by Malcolm Gladwell. . . . *The Wisdom of Crowds* ranges far and wide."

—*The Boston Globe*

THE WISDOM OF CROWDS

JAMES
SUROWIECKI

WITH A NEW AFTERWORD BY THE AUTHOR



*"The follies of mankind
are not unique to
the modern world"*

WORDSWORTH REFERENCE SERIES

Crowds psychology

How individual psychology is linked to crowd psychology

- **A crowd shows two types of behaviour:**
 - A crowd dominated by a leader
 - Revolutionary crowd: overthrowing the established order
- **An individual is never alone: he belongs to a community:** He follows the informations from his own networks (investor community, medias, websites...). Even unconsciously, he obeys to specific rules and logics... and potentially to certain hidden leaders...
- In a quite environment people keep a big part of objectivity and free will. However, once volatility / emotion goes higher, he is in danger and can lose his objectivity and can more easily follow new modes and be influenced by what crowds do
 - Bullish mode: new schemes – this time is different – exhuberence...
 - End of mode: Individuals are taken by surprise... Irrational reactions and fear
 - Very often, the membership to a crowd (even unconsciously) implies the loss of points of reference and the blindly acceptation of new ideas ...
- **Loss of personality**, impressed by new concepts and not by reasoning... Improbability doesn't exist for crowds... Emotions lead the crowds...
- Feeling of impunity principles of responsibility vanish. Individuals can accept situation opposed to their own interest. Being part of the move seems more important than anything else.

La fragilité de la mémoire et des connaissances affaiblit l'esprit critique et entraîne la confusion, mère de toutes les manipulations

- Théorème de Pythagore
- Perception d'un film, d'un livre ou de n'importe quelle oeuvre
- Convictions sur un évènement public ou ce qu'a pu dire tel ou tel
- Valeur des témoignages et détails de l'histoire



Tout le monde fait des erreurs !

The Reinhart-Rogoff error – or how not to Excel at economics

<https://theconversation.com/the-reinhart-rogoff-error-or-how-not-to-excel-at-economics-13646>

Reinhart and Rogoff's work showed average real economic growth slows (a 0.1% decline) when a country's debt rises to more than 90% of gross domestic product (GDP) – and this 90% figure was employed repeatedly in political arguments over high-profile austerity measures.

- The most serious error was that, in their Excel spreadsheet, Reinhart and Rogoff had not selected the entire row when averaging growth figures: they omitted data from Australia, Austria, Belgium, Canada and Denmark.
- When that error was corrected, the “0.1% decline” data became a 2.2% average increase in economic growth.

How mimicry works?

- Our knowledge is often very loose and can be useless
- **Conformity**; it's often difficult to defend its own view (especially when they are fragile) in front of a leader or a public which is against you ... People needs to join a group and to stick to it. Especially when the leader has a lot of charisma.
- Mimicry keys are:
 - **fragility of ideas and beliefs**,
 - **conformity** and the imperious need for comfort to join a group –not to be or to feel different from the others... and then need to show ones membership through an active participation for the group. A new converted member is often a very good proselyte.

Freudian theory

- Regression of the individual in the crowd : their **conscious personality fades giving way to primitive instincts**. Becoming a member of a crowd serves to unlock the unconscious mind.
 - This occurs because the super-ego, or moral center of consciousness, is displaced by the larger crowd, to be replaced by a charismatic crowd leader.
 - simplistic emotions are widespread, and complex emotions are rarer. In a crowd, the overall shared emotional experience reverts to the least common denominator leading to primitive levels of emotional expression.
- The crowd is driven by a **collective unconscious, common to all its members, influenced by archaic figures** (fascination for primordial father and other authority...)
- This organizational structure is that of the "primal horde"—pre-civilized society— Moscovici expanded on this idea, discussing how dictators such as Mao Zedong and Joseph Stalin have used mass psychology to place themselves in this "horde leader" position.

Crowds are able to do the worst things

- Charles Mackay, Scottish journalist, published “Extraordinary Popular Delusions and the Madness of Crowds” in 1841 : an endlessly entertaining chronicle of mass manias and collective follies.
- For Mackay, crowds were never wise. They were never even reasonable. Collective judgments were doomed to be extreme.
 - "Men think in herds, and they go mad in herds, while they only recover their senses slowly, and one by one."
- A lot of brilliant intellectuals have the same conclusions
 - In the popular imagination, groups tend to make people either dumb or crazy, or both. The speculator Bernard Baruch said: "Anyone taken as an individual is tolerably sensible and reasonable—as a member of a crowd, he at once becomes a blockhead."
 - Henry David Thoreau :"The mass never comes up to the standard of its best member, but on the contrary degrades itself to a level with the lowest.
 - Friedrich Nietzsche: "Madness is the exception in individuals but the rule in groups"

The wisdom of crowds (1)

Francis Galton, english scientist, discovered that crowds could be smarter than pundits:

- " Experiments left me with little faith in the intelligence of the average person"
- "The stupidity and wrong-headedness of many men and women being so great as to be scarcely credible."
- 1906: Plymouth fair –Ox weighting contest... Galton was interested in figuring out what the "average voter" was capable of because he wanted to prove that the average voter was capable of very little. Galton borrowed the tickets and analyzed them with a series of statistical tests.
- Galton arranged the guesses in order from highest to lowest and graphed to observe a bell curve! Then, he calculated the mean representing the collective wisdom of the Plymouth crowd.
- If the crowd were a single person, that was how much it would have guessed the ox weighed. After all, mix a few very smart people with some mediocre people and a lot of dumb people, and it seems likely you'd end up with a dumb answer.
- The crowd had guessed that the ox would weigh 1,197 pounds versus a real weigh of 1,198 pounds.

The wisdom of crowds (2)

- Under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them.
- Groups do not need to be dominated by exceptionally intelligent people in order to be smart. Even if most of the people within a group are not especially well-informed or rational, it can still reach a collectively wise decision.
- We generally have less information than we'd like. We have limited foresight into the future and we often let emotion affect our judgment.
- Yet despite all these limitations, when our imperfect judgments are aggregated in the right way, our collective intelligence is often excellent: This intelligence or "the wisdom of crowds" is at work in the world in many different guises (democracy or financial markets for instance)

How to reconcile wisdom of crowds and madness of crowds?

- Very likely, crowds follow various types of behavior according to the environment
- In a peaceful situation, crowds is supposed to behave in the Galton's way: each individual brings its emotion, its knowledge, its understanding of the situation and the aggregation of all these individuals feelings lead to a rather smart result with a good equilibrium. Democracy can be strengthened through this approach.
- However, in extreme situations, when people are frustrated and angry, nothing good can emerge from a crowd. Resentment is too strong and crowds tend to forget its ability to think independantly, following a leader and moving towards irresponsability and disorder
- In a market, most part of the time, the crowd is right (follow the trend) but at the extreme, greed and fear are the main driver of market moves. It comes with the level of volatility which is a good measure of market emotion.

Emotion is everywhere...

Is Beauty Skin Deep?

Posted: 27 Feb 2021 • Last revised: 3 Apr 2021

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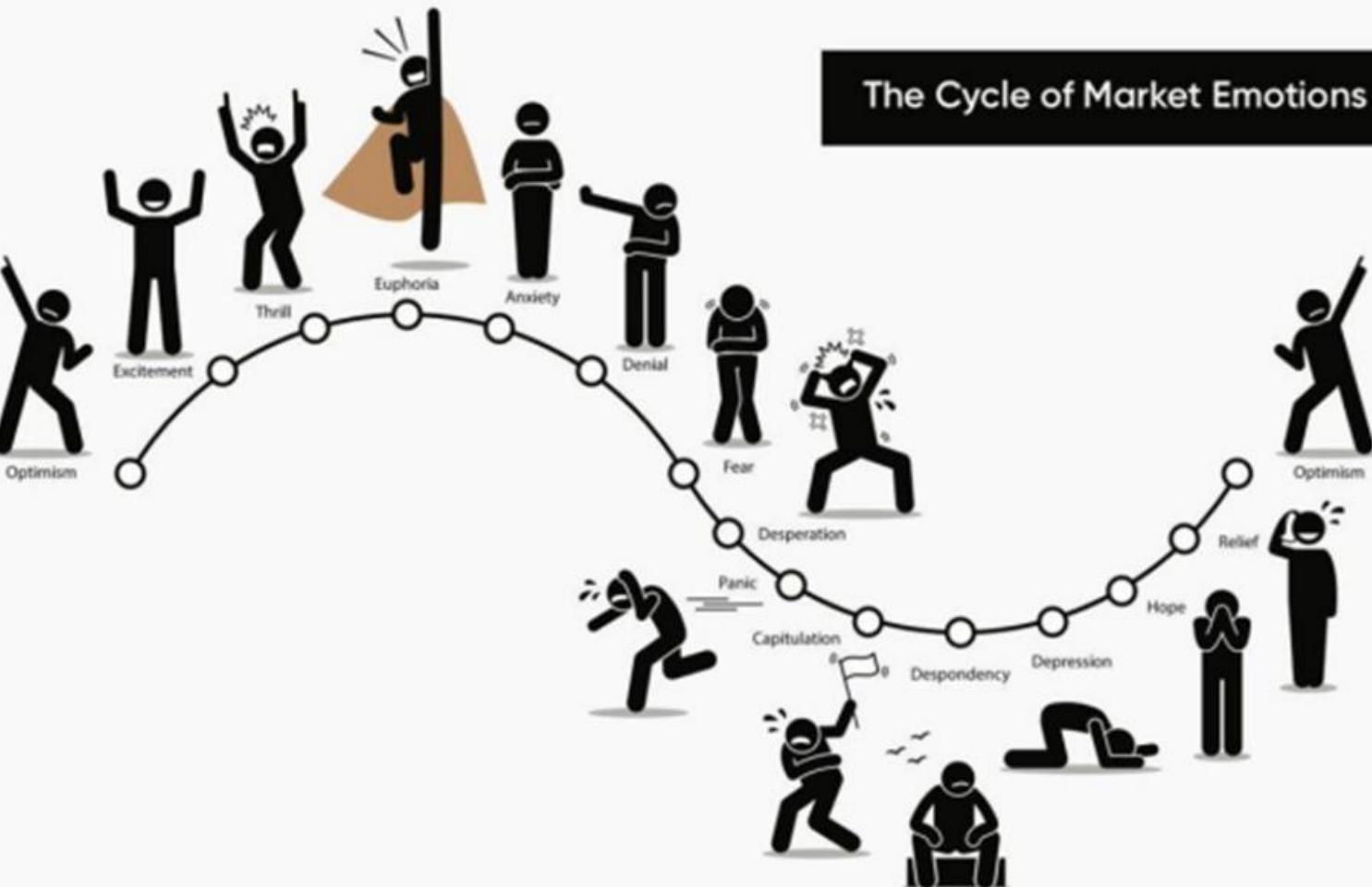
University of Rhode Island

Date Written: June 30, 2020

Abstract

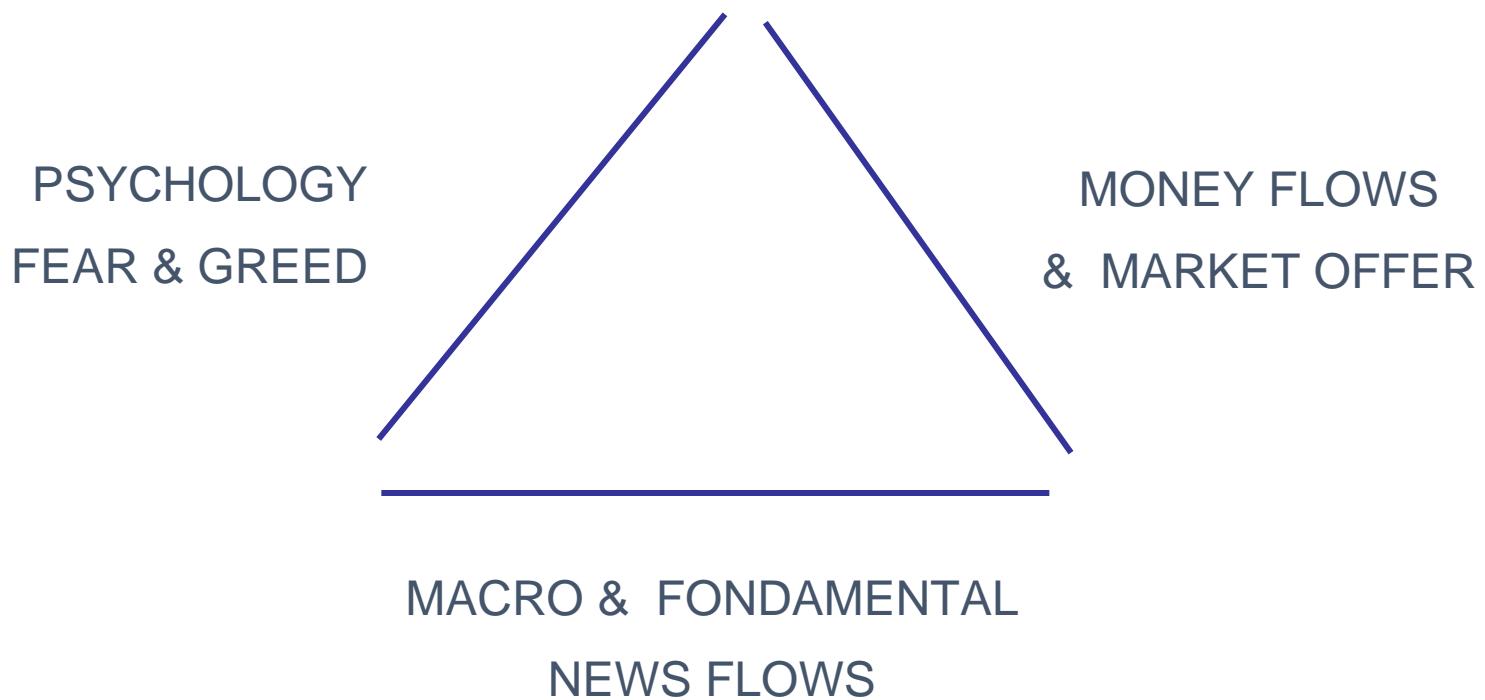
In this paper, we investigate if the perceived attractiveness of mutual fund managers influences mutual fund flows. We hand collect professional photographs of mutual fund managers and use machine learning algorithms to develop two objective proxies of attractiveness. We find that, even after controlling for fund characteristics, performance measures and manager characteristics, mutual funds managed by ‘attractive’ managers receive higher fund flows. Our results are robust to matched sample analysis, Heckman two-stage selection, alternate model specifications as well as use of an alternate proxy. We also find that the attractiveness bias is predominantly witnessed within retail investors. We further find that manager attractiveness does not entail superior fund performance. Our results thereby suggest that mutual fund investors exhibit a bias for seemingly attractive mutual fund managers.

The Cycle of Market Emotions



Source: Compounding Quality

Market Triptic



Markets Leaders

- Macro & fundamental analysis should give the main trend
 - **Economic figures, politics, major economic trend**
- Flows (supply & demand)
 - **Collecting and understanding datas from both sides...**
- Psychology, what psychology?
 - Human behavior: fear & greed, imitation
 - **Keynes Parabol** on markets
 - TA: a good way to appreciate and understand market psychology.
- Technical Analysis :
 - To appreciate the strength and the quality of the trends in place
 - To build market expectation & appreciate market risk
 - To understand market psychology
- **TA is the study of market activity to expect the next direction of market prices**
- **TA only deals with market action**

2012

TECHNICAL
ANALYSIS
IS ALWAY RIGHT



UNTIL IT'S WRONG

U.S.
POSTAGE
45

ZAZZLE.COM



Introduction to Technical Analysis

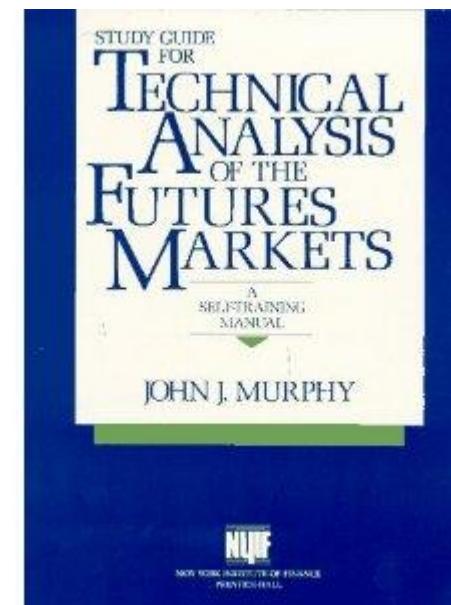
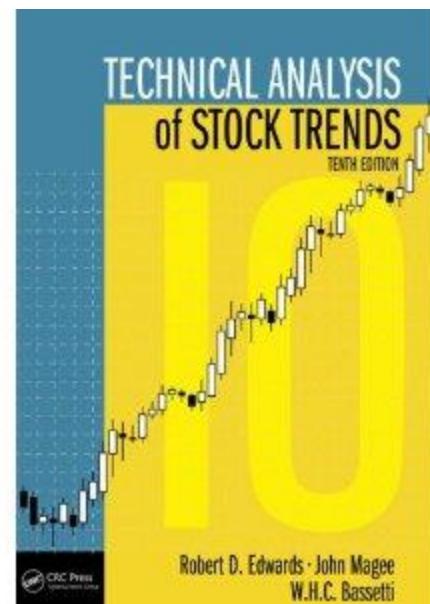
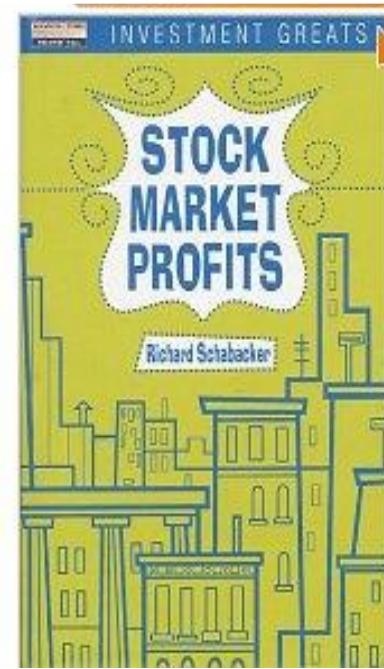
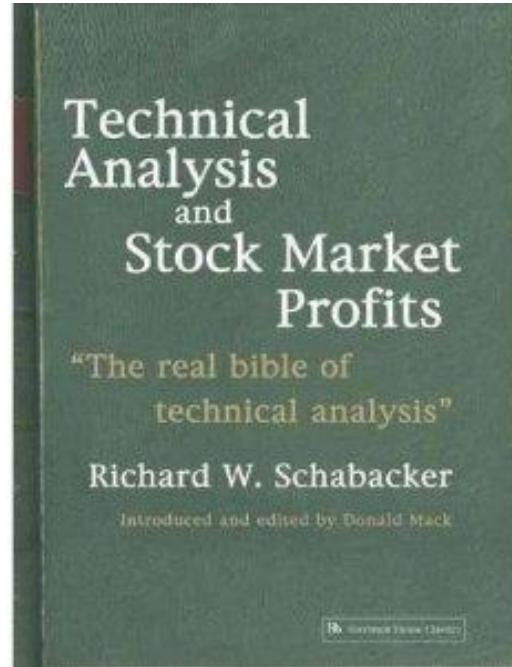
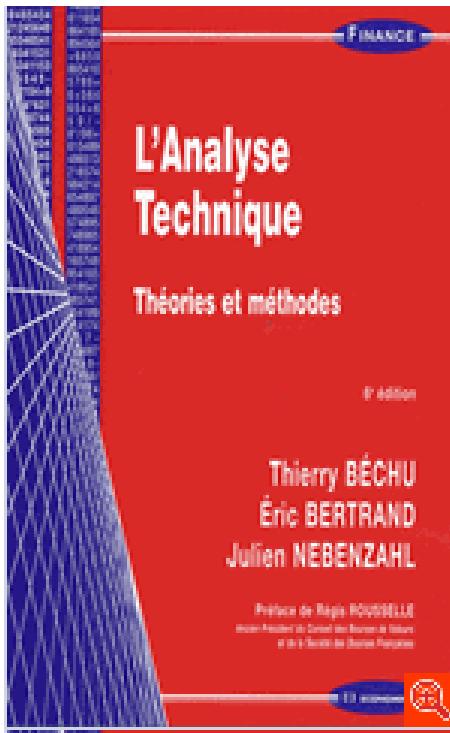
Introduction

Charts & patterns: type of charts, gaps, volumes, support & resistance, trends, patterns

Technical Analysis: filters & moving averages, Bollinger bands, technical oscillators

Market indicators, contrary opinion, inter-market analysis, cycles

TA & trading: systematic approach, turtles story, principles of risk & money management, discretionary trading.



A short story of TA

- TA principles have been designed before modern theory of finance (CAPM, RWT, B&S...) and without any connection with economic theory.
- TA philosophy is possible as soon as prices are registered and markets are seriously organized (from XV^e century).
- Before any fundamental analysis, merchants created TA
- Japan is the starting point of TA
 - In Japan, merchants collected prices and drew charts (lines, candles...).
 - The **oldest book is written in 1755 by Sokyū Homma** « The fountain of gold – The three monkey of record of money » and two other books.
 - He defines both **market principles and trading principles**. He is the first to mention the importance of **volume**, of the **number 3**, and of the **psychology** (even mentioning contrary opinion rules).
 - He is considered as the father of the candlesticks patterns
- The occidental TA appears at the extreme end of the XIX^e century – without any knowledge of Japanese knowledge.

A short story of occidental TA

Charles Dow (1851-1902) is often considered as the father of TA...Even if he is more a market theorist than a technician. He published many articles and developed major market principles.

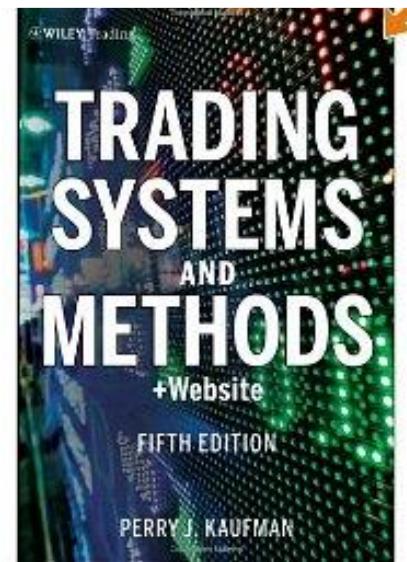
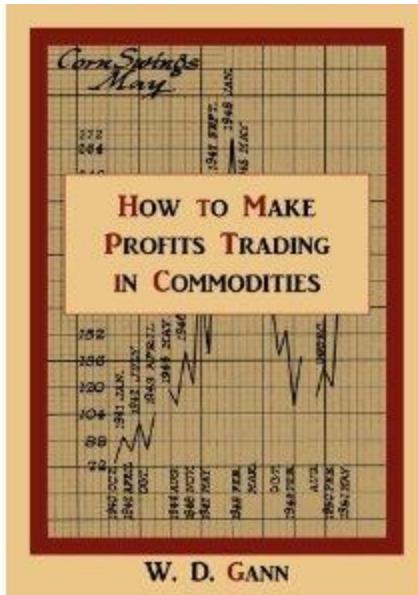
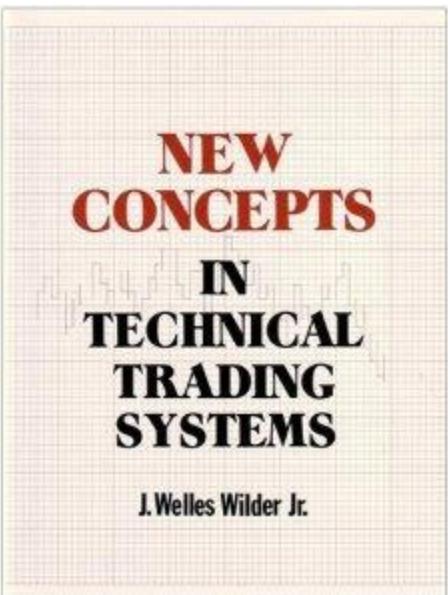
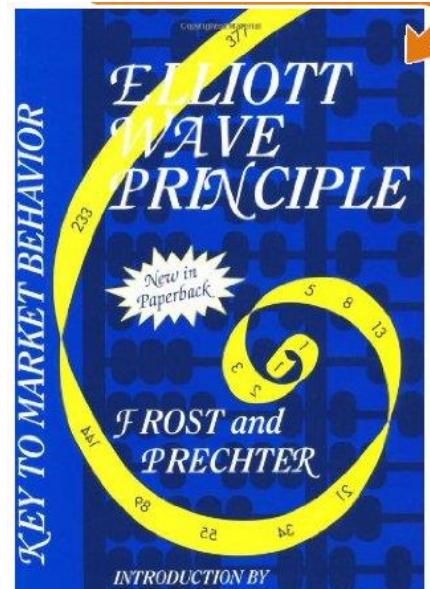
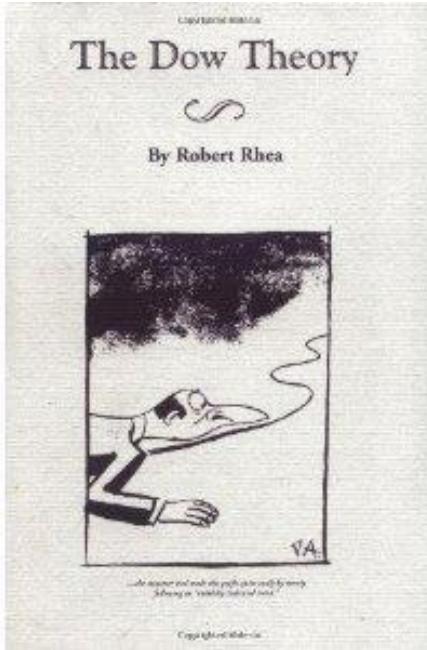
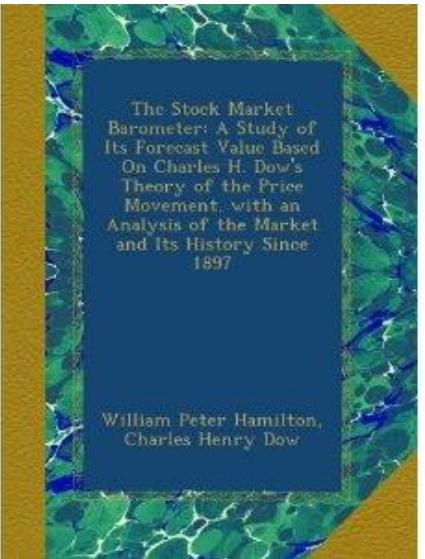
- His theory of prices interpretation will be later formalised by **Hamilton** (in the Wall Street Journal) and Robert Rhea (« The Dow Theory » 1932).

Richard Schabacker, probably the true father of TA. The principles of Chartism and chart patterns are developed at the end of the XIXe but are pioneered as « charts analysis principles » in the XXe by Schabacker (« Stock Market Theory and Practice » 1930 and « Technical Analysis and Stock Market Profits: A course of forecasting » -1932).

Edwards & Magee published the Bible « Technical Analysis of Stock Trends » in 1948.

Elliott (1871-1848) & Gann (1878-1955) proposed determinist approaches (golden ratio and influence of geometry and time).

- In the 70's some analyst proposed links between TA and economic cycles
 - In the 70's, emergence of the TA based on indicators and filters (mathematical approach). **James Wilder** (1978) – **Perry Kaufman**
 - For almost 20 years, TA is considered as a human science by Behavioral Finance.
-
- After being treated with contempt by academic finance, we observe a growing interest from academic research and interesting studies partly validate the assumptions of TA.



TA PRINCIPLES

- Market discounts everything: all the information is in the price

In that sense, price shows what investors do, not what they say or think...

- Prices follow trends

It's possible to use them to make money...

The trend prevails over the state and the standard: action is key

- Principle of repetition in history:

Patterns exist which can be used to make money

it's naturally reminiscent of cycles concept.

☒ TA is unique in its ability to combine prices, trends and repetition of patterns and to mix prices and time;

☒ Its apparent simplicity helped TA to get very popular and massively used. However it didn't help its credibility (often denigrated by academics or 'serious' people...).

Technical Analysis main assumptions

The field of technical analysis is based on three assumptions:

1. The market discounts everything. (which is roughly the same starting point than random walk theory...)
2. Price moves in trends.
3. History tends to repeat itself.

1. The Market Discounts Everything

A major criticism of technical analysis is that it only considers price movement, ignoring the fundamental factors of the company. However, technical analysis assumes that, at any given time, a stock's price reflects everything that has or could affect the company - including fundamental factors. Technical analysts believe that the company's fundamentals, along with broader economic factors and market psychology, are all priced into the stock, removing the need to actually consider these factors separately. This only leaves the analysis of price movement, which technical theory views as a product of the supply and demand for a particular stock in the market.

2. Price Moves in Trends

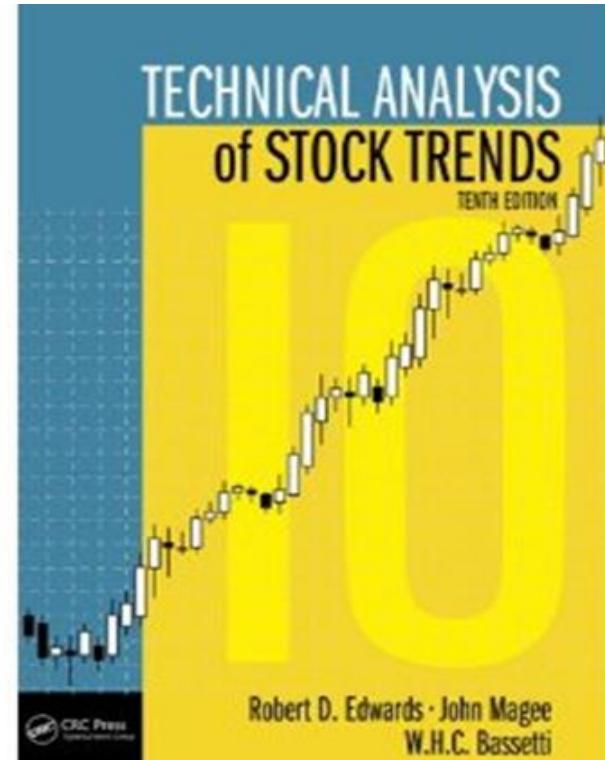
In technical analysis, price movements are believed to follow trends. This means that after a trend has been established, the future price movement is more likely to be in the same direction as the trend than to be against it. Most technical trading strategies are based on this assumption.

3. History Tends To Repeat Itself

Another important idea in technical analysis is that history tends to repeat itself, mainly in terms of price movement. The repetitive nature of price movements is attributed to market psychology; in other words, market participants tend to provide a consistent reaction to similar market stimuli over time. Technical analysis uses chart patterns to analyze market movements and understand trends. Although many of these charts have been used for more than 100 years, they are still believed to be relevant because they illustrate patterns in price movements that often repeat themselves.

John Magee's three principles:

- 1- Stock prices tend to move in trends
- 2- Volume goes with the trends and
- 3- A trend, once established, tends to continue in force



DOW Theory

1- Market discounts everything: All the information is in the price

2- There are three types of trend

- Primary (years)
- Secondary (months)
- Minor (days)

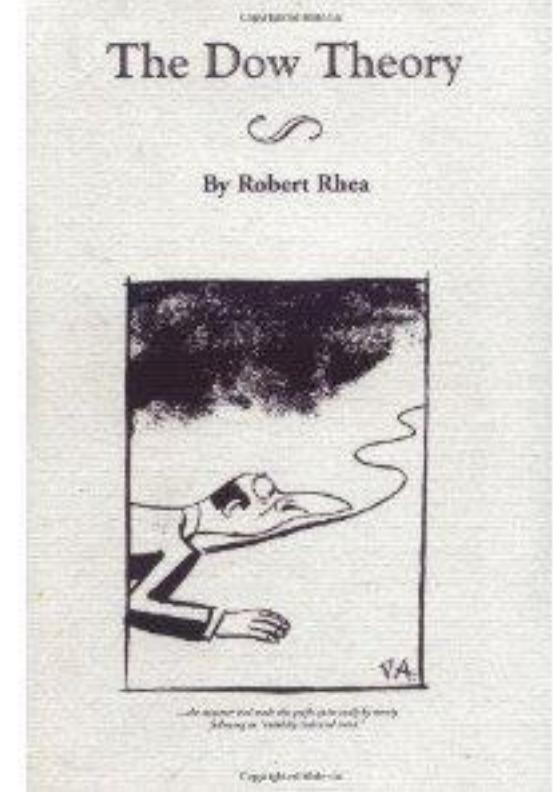
3- Principle of accumulation – distribution (cycle)

asymmetric information & « Buy the rumour, sell the news »

4- Principle of confirmation between indexes (DOW Industrial & Transport & Utilities...)

5- Volume validates the trend

6- A trend is defined by prices variations (higher highs & higher lows). Trends remain as long as they aren't invalidated



DOW Theory & advices

1- Market discounts everything: all the information is in the price
Price is enough

2- There are three types of trend
One have to specify the primary & secondary trend

3- Principle of accumulation – distribution (cycle)
To understand where we stand in trend cycle

4- Principle of confirmation between indexes
To check other markets / indexes

5- Volume validates the trend
To check volumes

6- Trends remain as long as they aren't invalidated
Keep invested as long as no reversal occurs

How psychology plays a major role

- **Speculation and imitation**
 - Imitation : A rational behaviour for individuals
Either my neighbour knows more than me which motivates imitation or he is as ignorant as me, and my situation is unchanged
 - People needs to be reassured
 - What other people do or think is meaningful (cf Keynes beauty contest)
- **Imitation is key to explain bubbles**
 - Mimetic behaviour in Dow theory (accumulation / distribution)
 - Tautology
 - Autorealisation risk in panics (feedback effect in the real life).
- **Psychology is paramount to understand individual behaviour**
 - « Greed and fear »
 - Individuals are looking for comfort at any price, even if not rational
 - ... and avoid responsibilities
- **Understanding the psychology of crowds**
 - Gustave Lebon – the crowd
 - Extraordinary popular delusions and the madness of crowds (McKay)

Past performance influences future performance

- If a returns distribution is random, then returns are independant = meaning if $t-1$ is positive, the probability to have $t>0$ is 50%.
- Moreover, this condition should be also confirmed in the situations with market biais (up or down trend – we can use a moving average as an approximation)
- We observe that, on short term, returns are obviously random, on MT or LT there are biais. Prices are statistically dependant. It justifies the existance of trends: the momentum of the previous period influences the momentum of the next période (CQFD).

		S&P 500	Dollar index
	# >0	53,0%	50,0%
j>0 si j-1 >0		51,2%	46,3%
j>0 si j-1 >0 & MM up		56,2%	54,2%
j<0 si j-1 <0		45,6%	46,2%
j<0 si j-1 <0 & MM down		44,8%	58,7%
	# >0	56,2%	49,6%
w>0 si w-1 >0		55,0%	48,9%
w>0 si w-1 >0 & MM up		61,0%	57,3%
w<0 si w-1 <0		43,7%	51,1%
w<0 si w-1 <0 & MM down		46,0%	63,0%
	# >0	59,3%	49,7%
m>0 si m-1 >0		60,0%	51,5%
m>0 si m-1 >0 & MM up		62,4%	61,2%
m<0 si m-1 <0		43,0%	56,0%
m<0 si m-1<0 & MM down		34,2%	62,5%

daily from 1980 to 2007
 Weekly & mthly from 1930 to 2007

from 1990 to 2007

« Volatility is the ennemy of thinking »

- The very short term is not efficient: To be ST focused prevent to think to the ‘big picture’ and is therefore rarely rewarding.
- Short term affects investors and can lead to wrong decisions (emotions)
- Volatility is there to kill weak hands for the strong hands benefit

scale	probability of success 15% return with a 10% volatility
1 year	93%
1 quarter	77%
1 month	67%
1 day	54%
1 hour	51,30%
1 minute	50,17%
1 second	50,02%

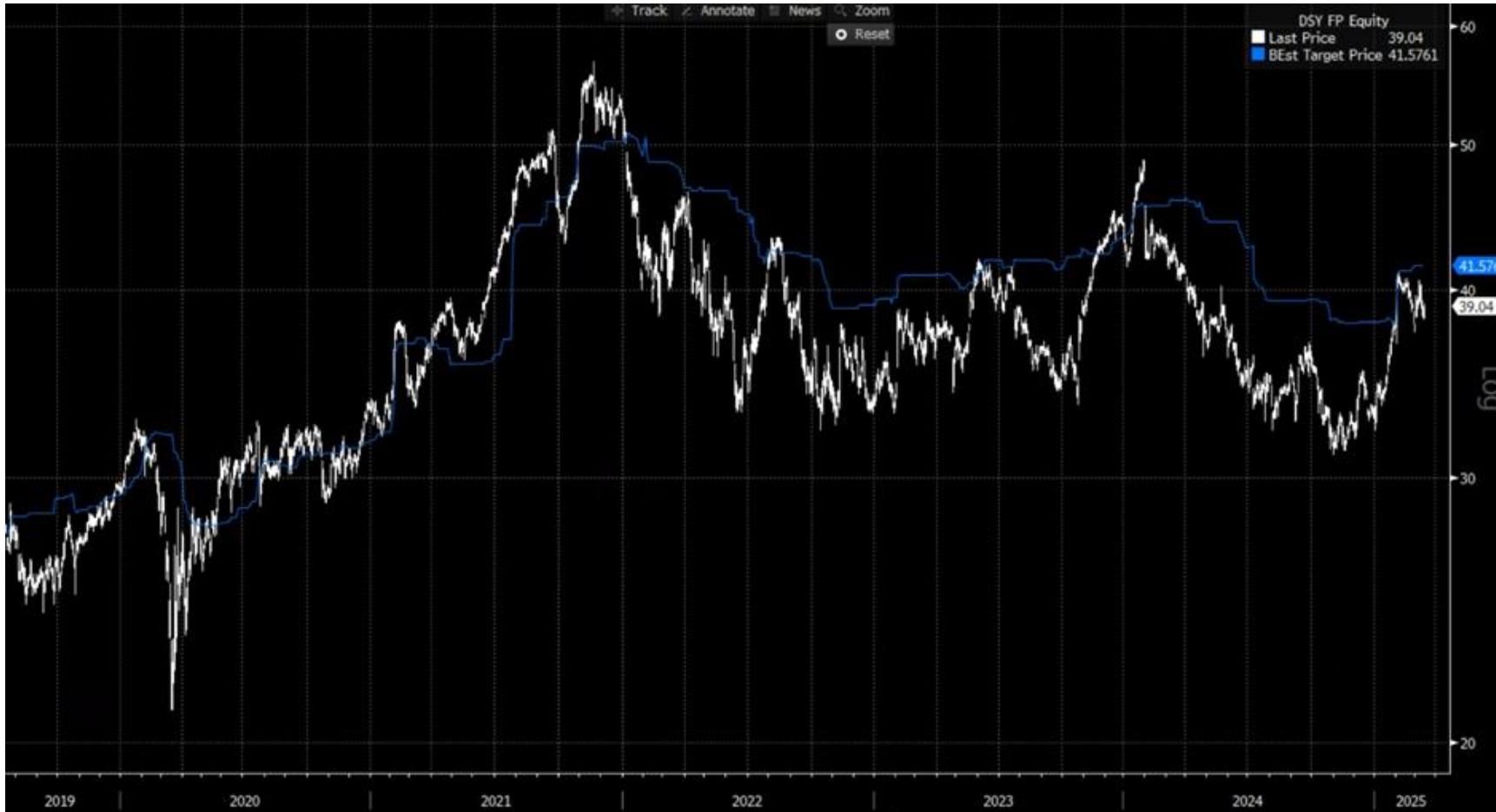
INTEREST OF TECHNICAL ANALYSIS

- Information expectation
- Takes the rational into account
- psychology (excess, bubbles, panics...)
- Universality of methods and accessibility
- Timing
- Subjectivity of the method (polymorphism of charts)
- Orthogonality with academic thinking (cartesian vs pragmatic approach)
- Numerous examples of false signals – some patterns are weak but popular

TA & FONDAMENTAL

- Weaknesses of fundamental (late, unability to consider irrationality, quality and cost of information...)
- Strength of fundamental : primary trend, value oriented (avoid mistakes due to volatility)
- To combine both is rewarding

Don't believe financial analysts !
Consensus target price is (often / always) late



Pernod Ricard – consensus target price & moving average

Analysts consensus follows LT MA with a positive bias

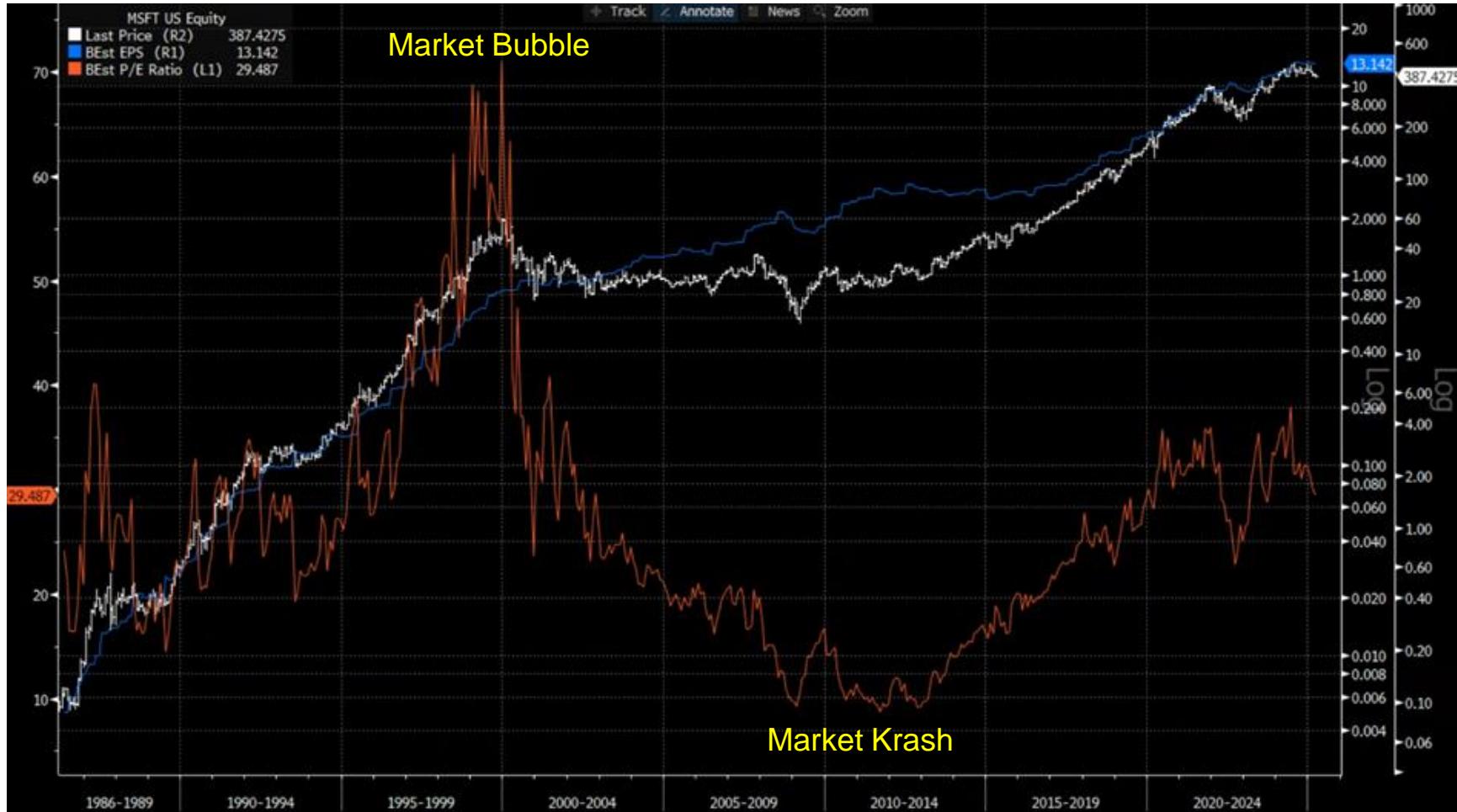


ADP - Long term EPS & Prices + valuation

valuation reflects market psychology



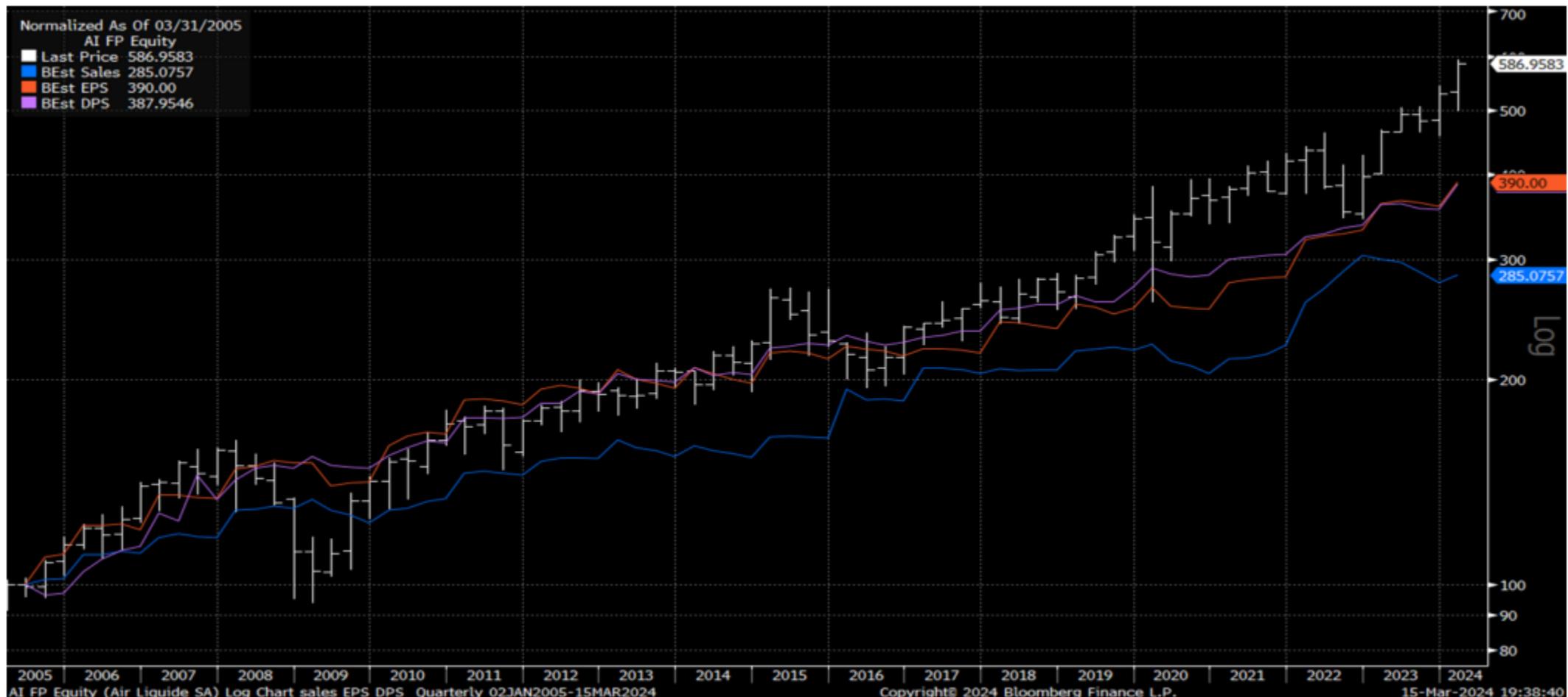
Microsoft - Long term EPS & Prices



L'Air Liquide : the perfect behavior



When prices are perfectly aligned to fundamentals
No market exhuberence is always better

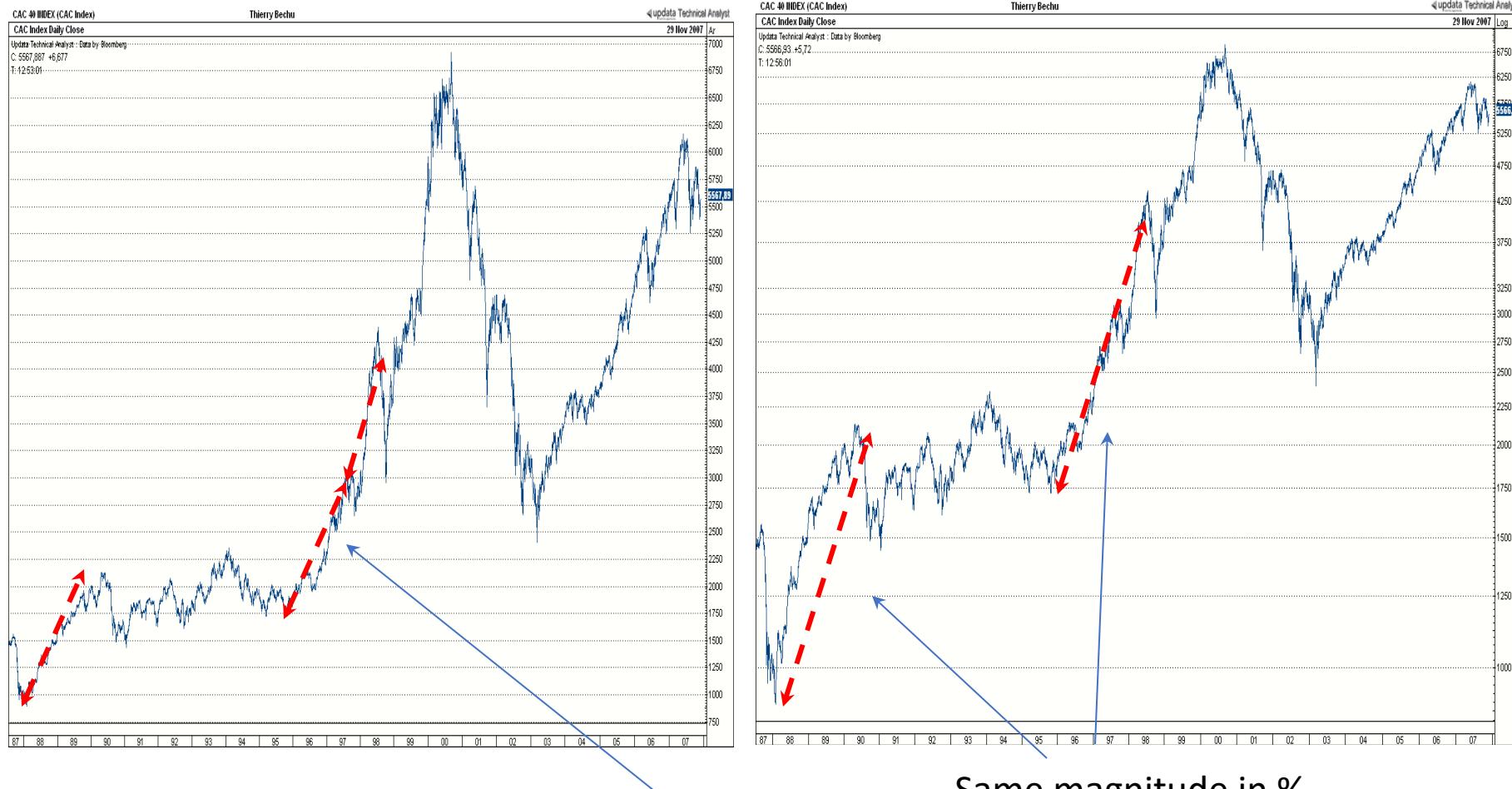


Chartism

The different ways to chart prices

- Line chart
 - Arithmetic scale
 - Logarithmic scale
 - Line chart with volumes and open interest
- Bar chart
 - 4 pieces of information (open, high, low, close)
 - + gaps over-night
- Candlesticks (1600s – 1991 « Japanese candlestick charting techniques » by Steve Nison)
 - Yin & Yang principles & intraday momentum perception
 - Body & shadows
- Points et figures
 - Construction principles: Boxes (X & O), Box size, Box reversal
 - No volume / no time
 - Filters useless periods – it only charts the significant moves
- Alternative charting methods
 - Market Profile
 - Equivolume charts & equivolume candlesticks
 - volume & price areas
 - Price-volumes charts
 - Ichimokus

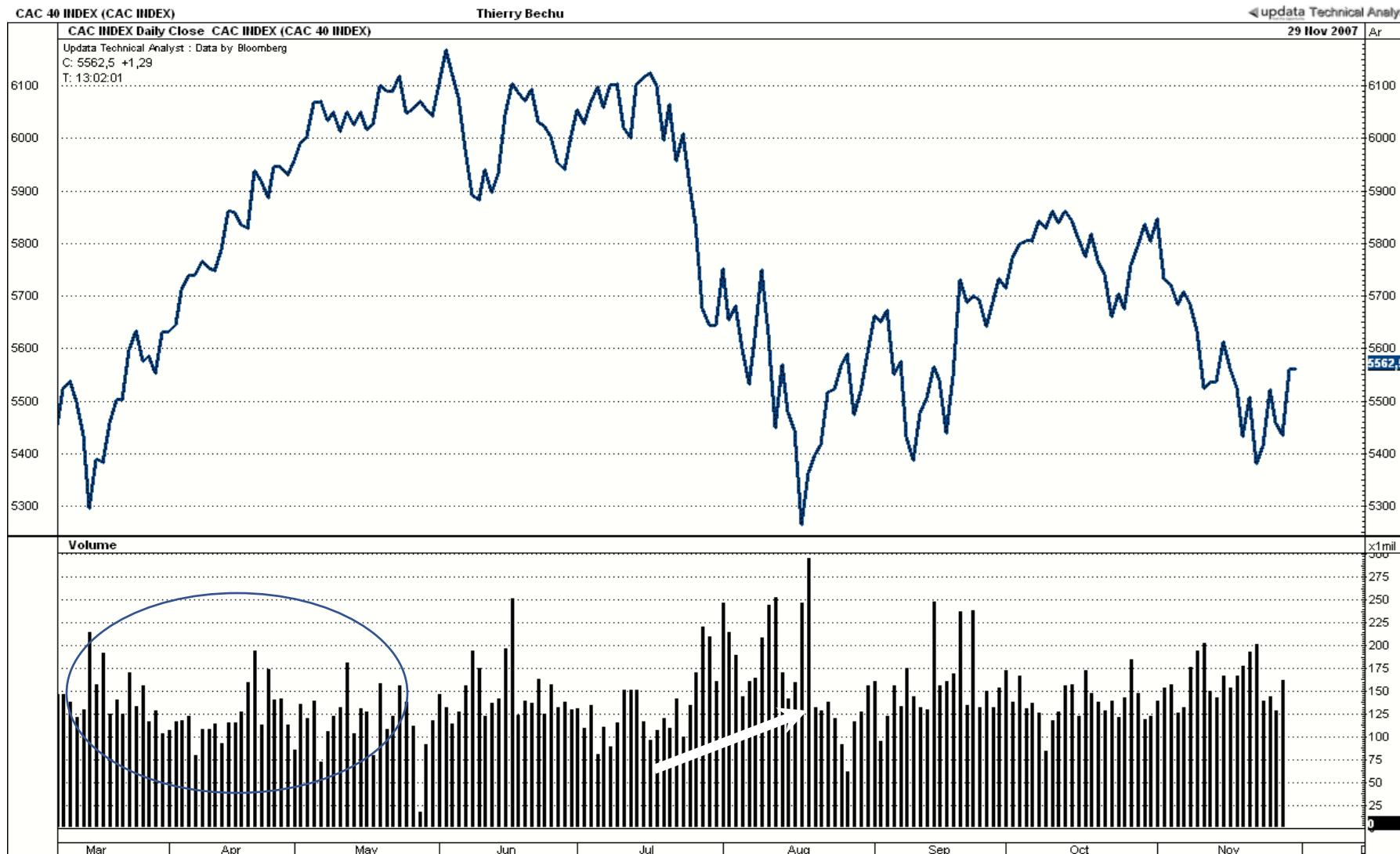
Arithmetic scale vs logarithmic scale



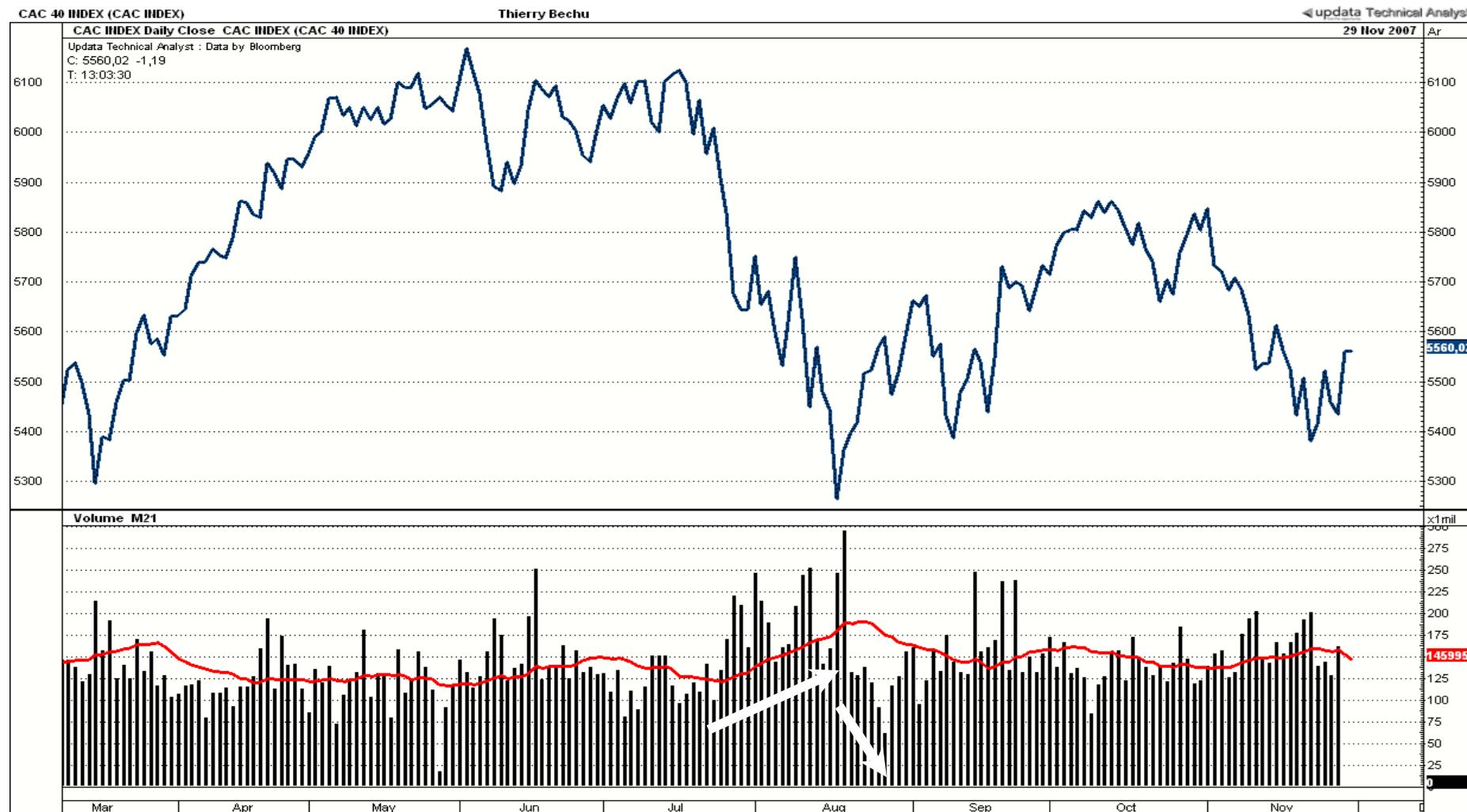
Apple in arithmetic vs logarithmic scales



Line chart with bar volumes



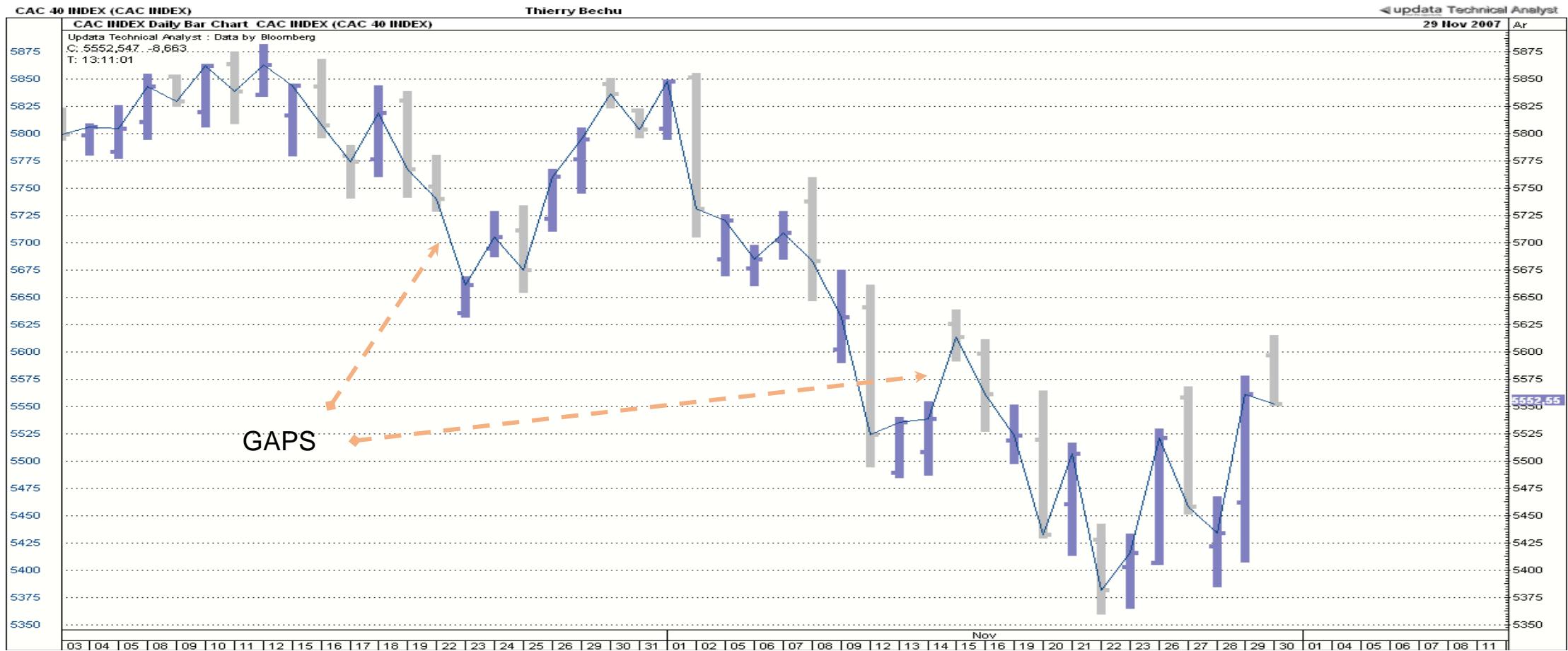
Line chart with bar volumes + moving average on volumes



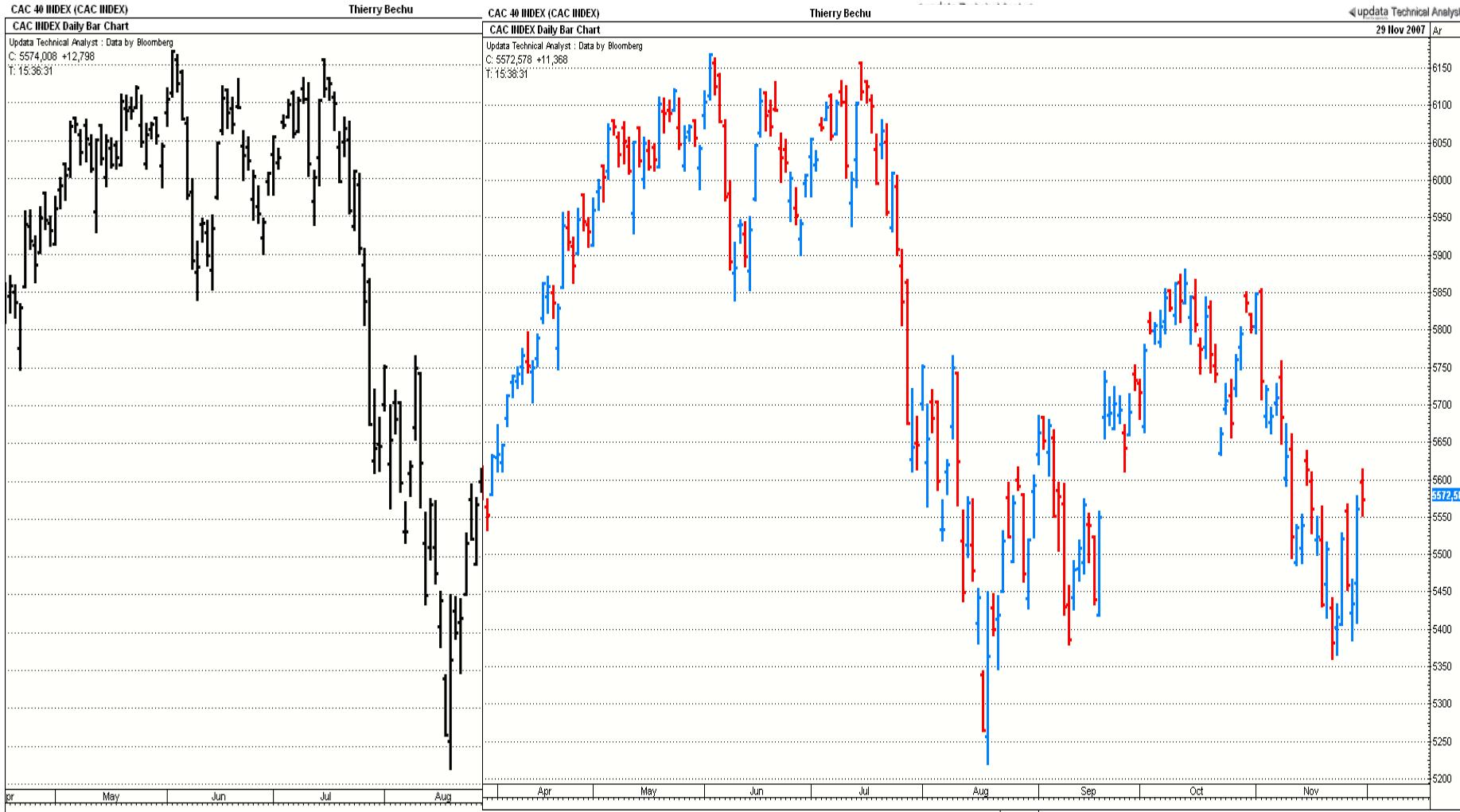
Line chart vs Bar chart



Line chart with bar volumes



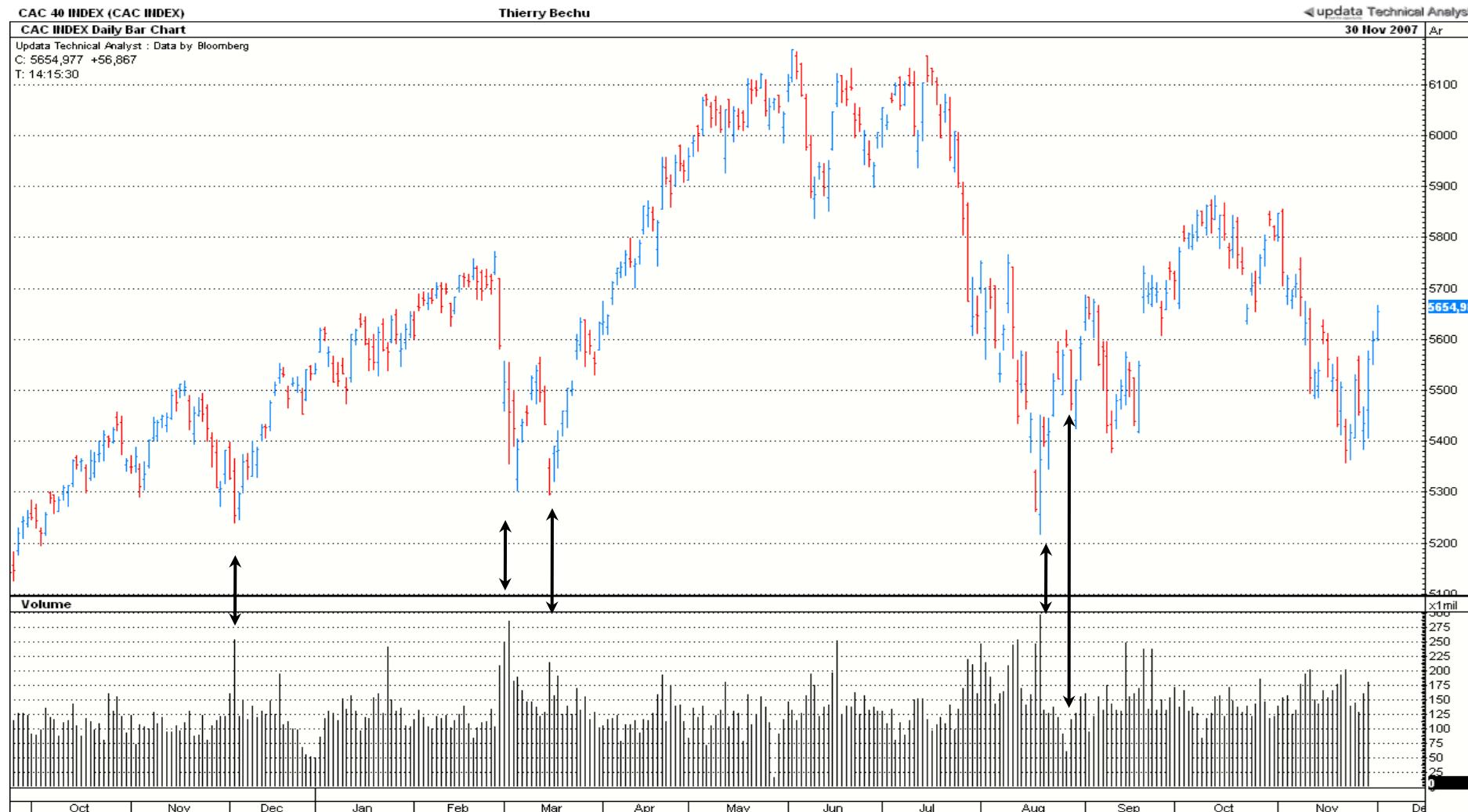
Black bar chart vs coloured bar chart



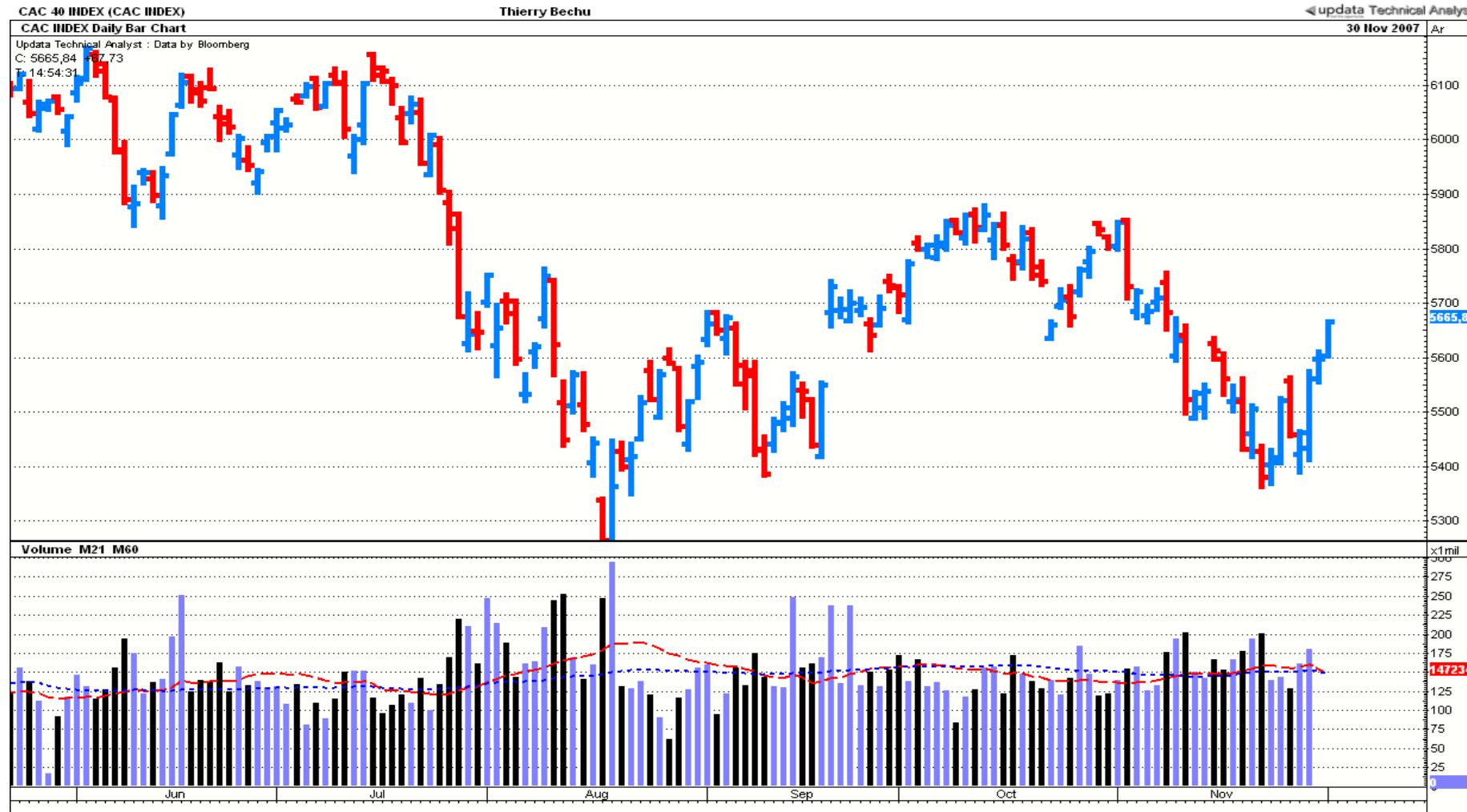
VOLUMES

- Charting the volumes
 - Bar chart
 - Moving average smoothing
- Key principles
 - Volume validates the trend
 - Price-volumeDivergence
 - Validation of breakouts & patterns
 - Extreme volumes & reversal days : contrarian picture
- Asymmetric behaviour of volumes during bear trend
 - Asymmetric behaviour of investors in bull vs bear markets
 - Secondary corrections / retracements
 - Major corrective moves : often short in time = positions cleaning

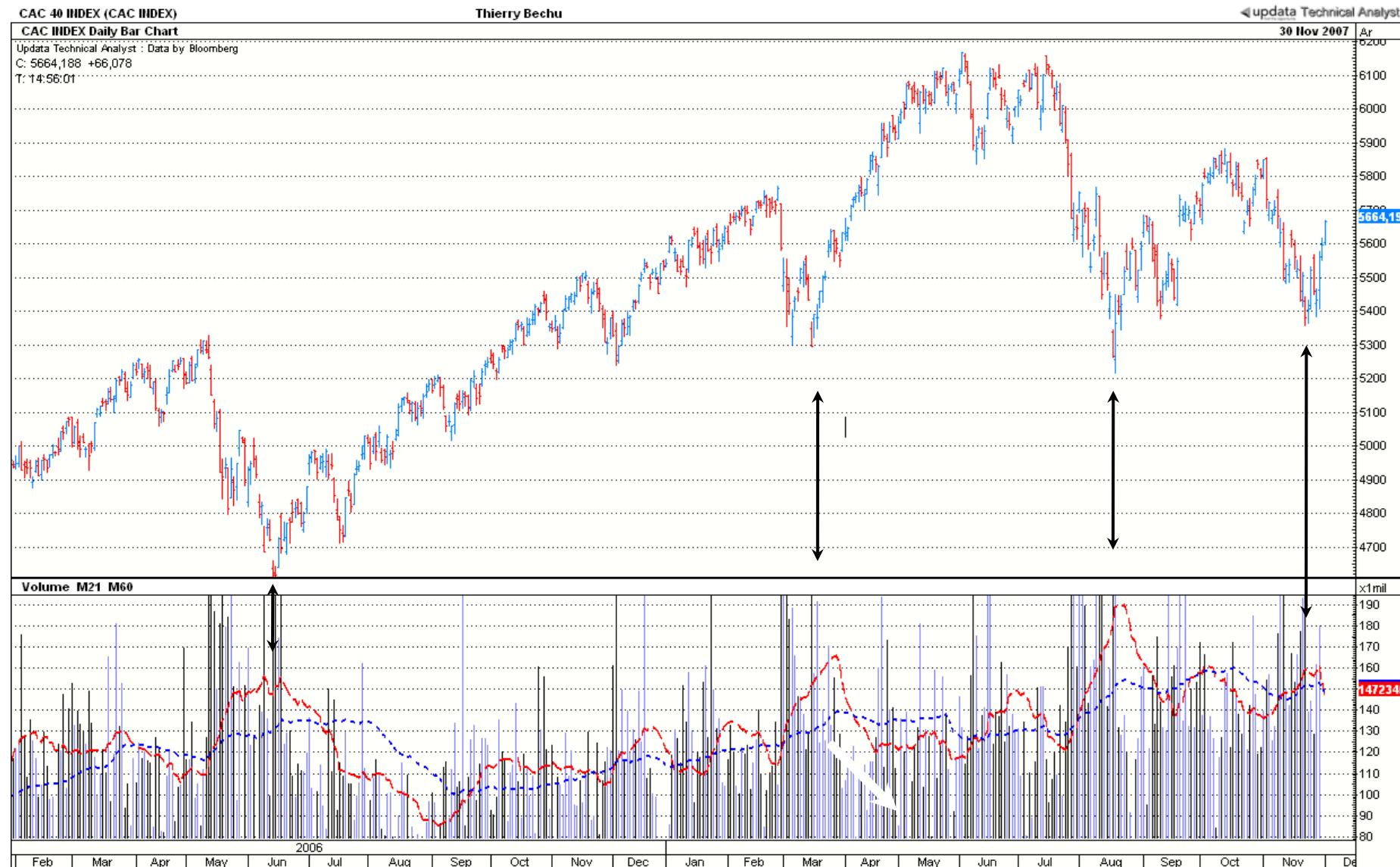
The usual way to chart the volumes



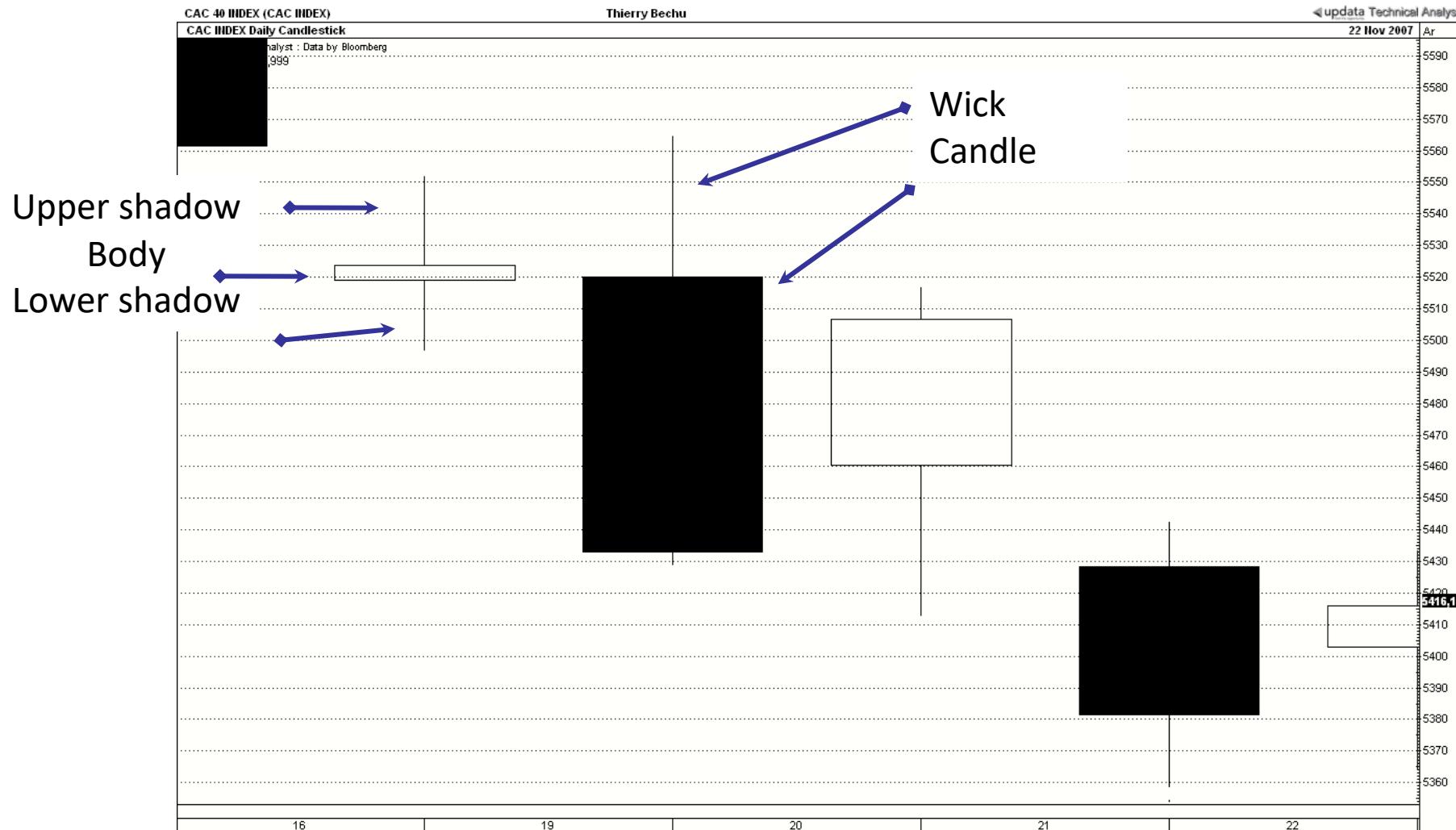
Volumes (up & down) & moving averages



Volumes (up & down) with moving averages



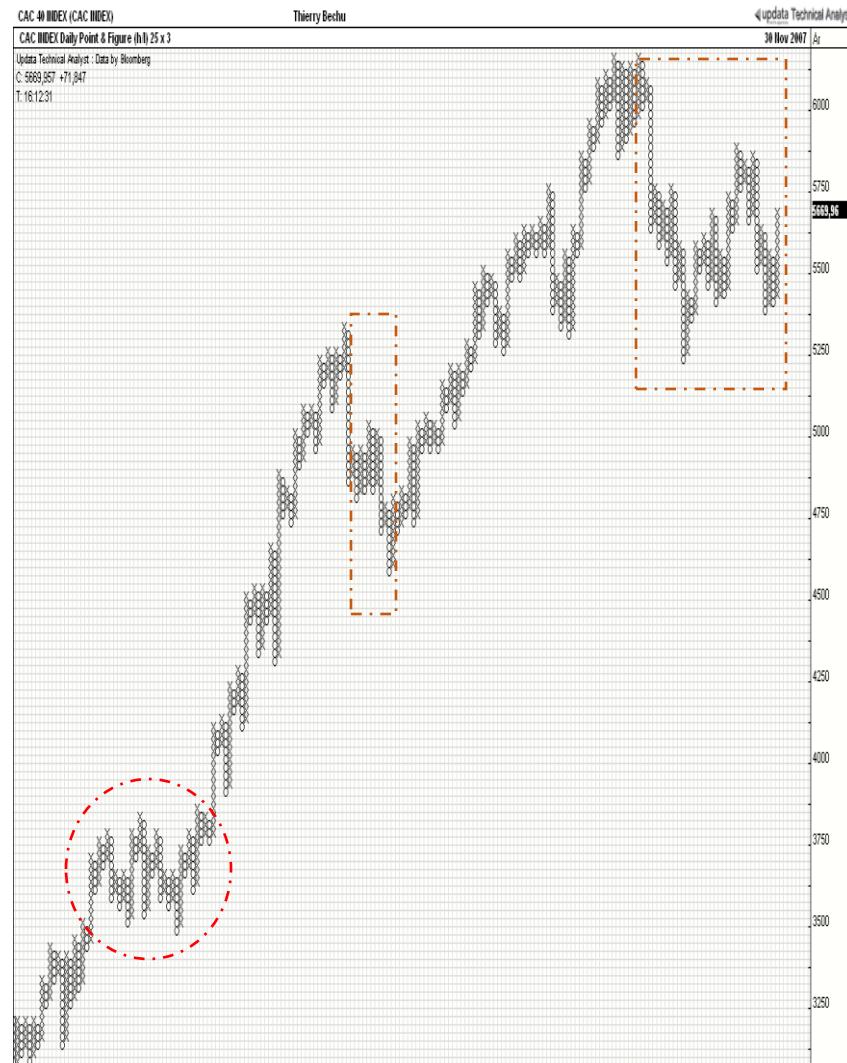
Japanese candlesticks



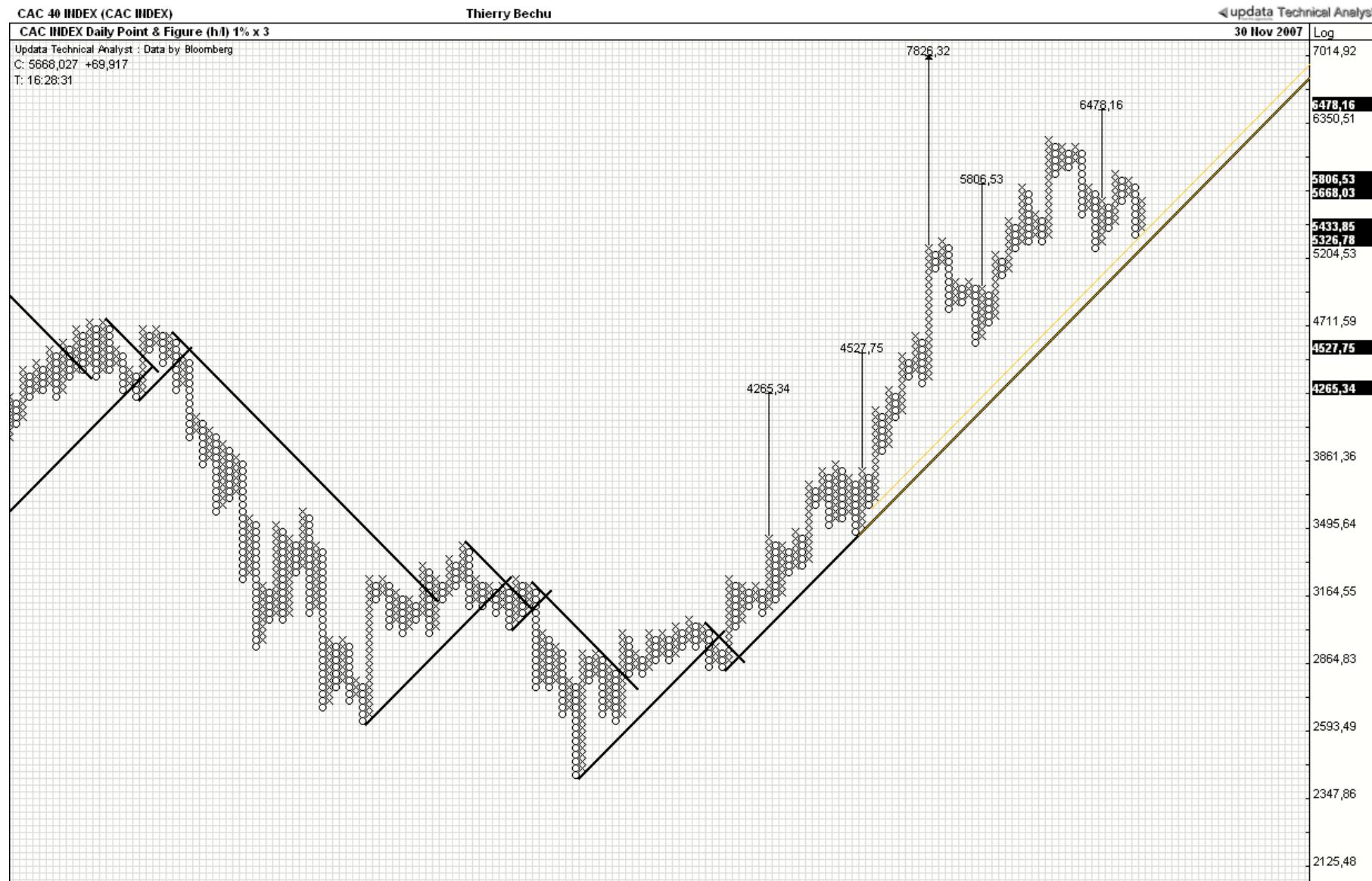
Candlesticks



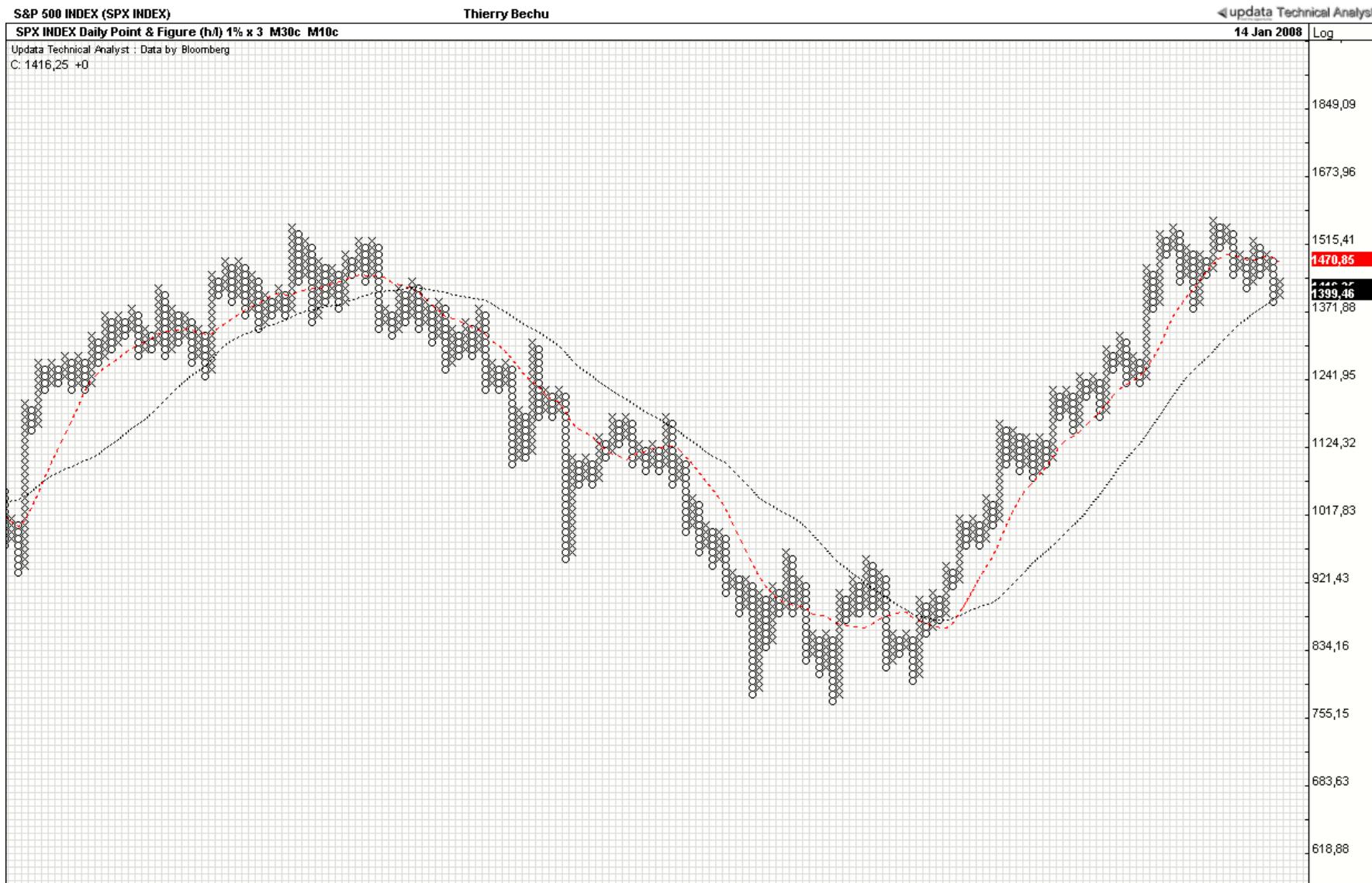
Points & Figures vs bar charts



Points & Figures – 45° angle



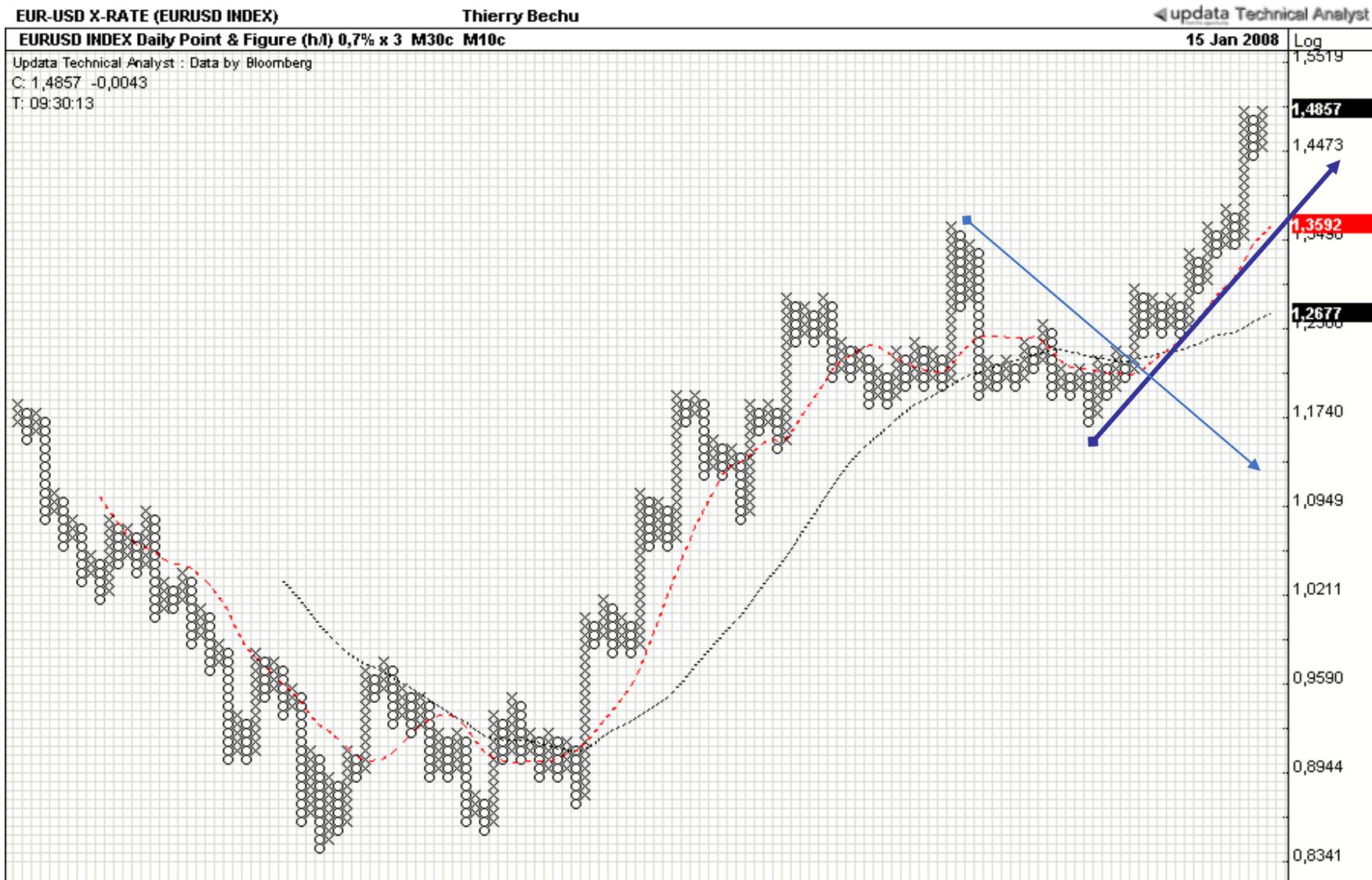
Points & Figures – moving averages



Points & Figures – moving averages



Points & Figures – moving averages



Market profile (cf book)

CAC 40 INDEX (CAC IIINDEX)		Thierry Bechu	◀ updata Technical Analy
Daily CBOT Market Profile ®: Period 30min pi 2		30 Nov 2007	Ar
Updata_Technical Analyst : Data by Bloomberg		EFGJ	5636,0005
C 5677,39795 +79,28809		DEFGJ	5634,0005
T 16:37:31		DEF	5632,0005
		D	5630,0005
		D	5628,0005
		D	5626,0005
		D	5624,0005
		D	5622,0005
		D	5620,0005
90 (43,48%)	E	CD	5618,0005
	E	CD	5616,0005
	DE	CD	5614,0005
	DE	CD	5612,0005
	CDE	CD	5610,0005
	CDE	CD	5608,0005
	CDE	CD	5606,0005
	CDE	CD	5604,0005
	CDE	CD	5602,0005
	CDEF	CD	5600,0005
	CDFT	CD	5598,0005
	CDFT	54 (37,5%)	5596,0005
	CDFPT		5594,0005
	CDFGNPT		5592,0005
	CDFGNPT		5590,0005
	DFGHNPST		5588,0005
	DFGHNPOSTV		5586,0005
	FGHLNPORSTV		5584,0005
	FGHILNPQRST		5582,0005
118 (64,84%)	FGHIJLNQQRST		5580,0005
S	FGHIJLMNPQRS		5578,0005
S	FGHIJLMNPQRS		5576,0005
S	FGHIJLMNPQRS		5574,0005
S	FGHIJLMNPQRS		5572,0005
ST	FGHIJLMNPQRS		5570,0005
ST	GHIJKLMNQR		5568,0005
ST	GHIJKLMNQR		5566,0005
STV	IJKLMOR		5564,0005
STV	IJKLM		5562,0005
ST	IJKL		5560,0005
ST	IJKL		5558,0005
ST	IJKL		5556,0005
ST	IK		5554,0005
RST	K		5552,0005
R			5550,0005
R			5548,0005
R			5546,0005
R			5544,0005
R			5542,0005
R			5540,0005
105 (50,72%)			Nov 5538,0005

SUPPORTS & RESISTANCES : key principles

- Psychology can explain the existence of S & R : principles of memory and regret
- Breakout of S & R : specific information (can be seen as a match between bull & bear)
- How to select the key S & R
- How to rank S& R
- Calculation of S & R in terra incognita
 - Retracement
 - Extension
- Traps:
 - There are a lot of false break
 - Is it possible to avoid them?
 - Theory of traps: how to take benefit from false signals

Supports & Résistances



Supports & Résistances – long term



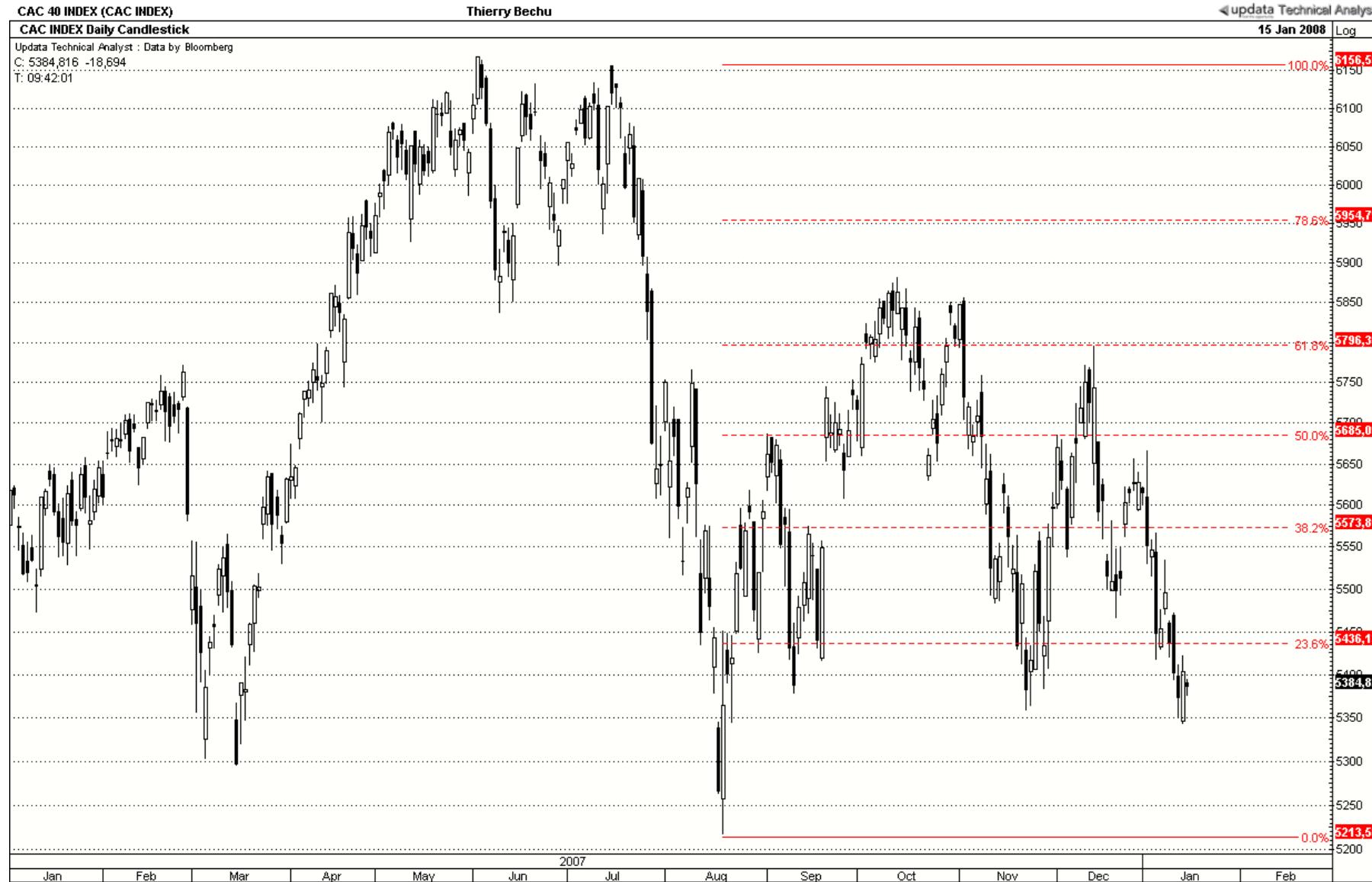
Retracement ratios

- **Tubbs' Law of Proportion :** *The market tends to move **one half, two thirds and three fourths** of previous moves. First in relation to the next preceding move which was made. Then with relation to the move preceding that, which was made, it might go on indefinitely to the highest and the lowest at which price that stock or aggregate has ever sold.*
- ⓘ see Gann (1/8 retracements) and Fibonacci (38%, 50% and 62%) retracement levels.

Fibonacci Retracements = 23% - 38% - 50% - 62% - 76%



Fibonacci Retracements = 23% - 38% - 50% - 62% - 76%



Fibonacci Retracements = 23% - 38% - 50% - 62% - 76%



The Tubbs' swing rule

- Newton / Babson : "For every action there is an equal and opposite reaction."
- when a market crosses a previous top, expect that market to move upwards as far above the previous top as it had retraced below it.



Fibonacci Extensions = 138% - 162% - 200% (balance effect)



Fibonacci Extensions = 138% - 162% - 200% (balance effect)



The theory of trends

- General principle
 - Definition : higher highs and higher lows = uptrend
- How to draw a trend and to select the good ones
 - At least 2 successive lows / highs : the third one confirms the trend
 - The strength of the trend is dependant of the number of hit points
 - However, the probability to keep a trend with more than 4 – 5 -6 points is increasingly lower
 - Possibility to use a previous high to draw a support trendline
- Parallel principle: possibility to draw a parallel with only one extreme point
 - Channels and intermediate lines
- Breakout of trendlines
 - Implication and targets
 - Breakouts and trend reversals

Trends: support lines and parallel



Trends: support lines and parrallels



Trends: support lines and parrallels



Trends: support lines and parrallels



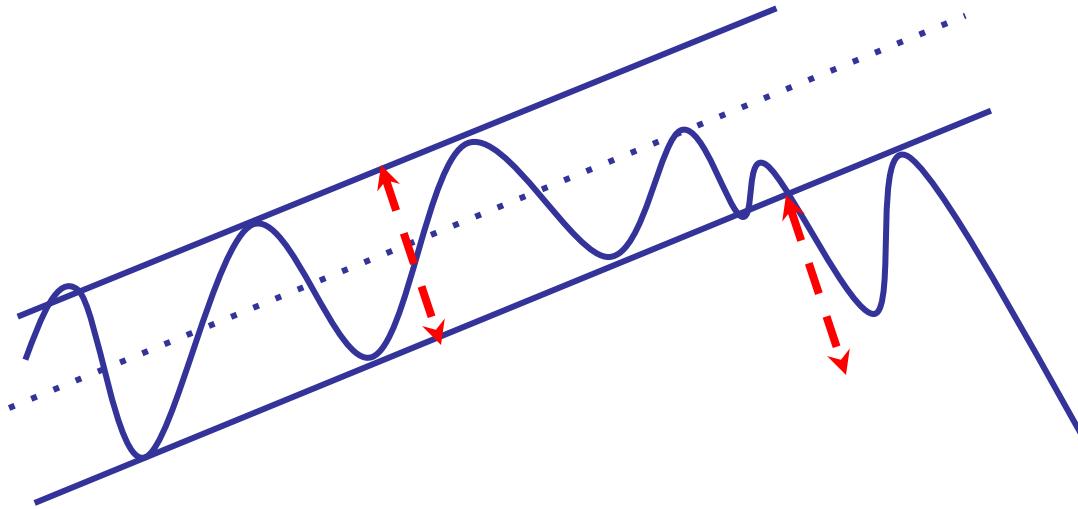
Trends: support lines and parallel



Trends: support lines and parallel and the concept of channel



TREND CONFIGURATIONS

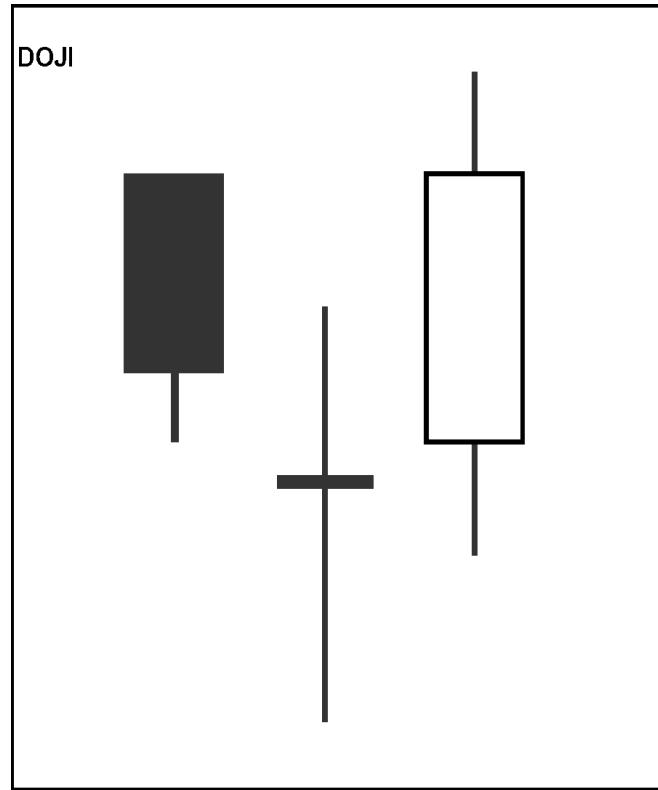


Construction, dtes // et intermédiaires, rupture, pull-back & objectif,
Cas des réintégrations

CANDLESTICKS

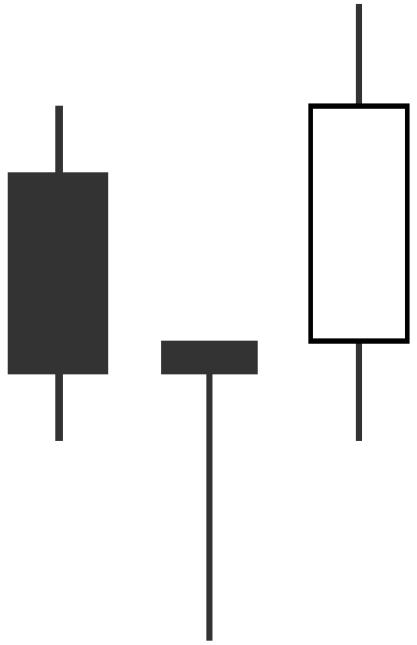
- Major patterns
 - Yin (black day) & yang (white)
 - Doji
 - Evening star / morning star
 - Hammer / shooting stars
 - Engulfing pattern
 - Dark cloud cover / piercing pattern
 - Harami & three methods
- Helpfull to confirm breakouts and pullbackset des pull-backs

Doji

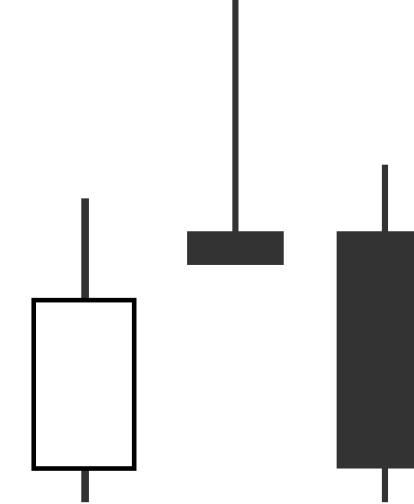


Hammer & Shooting Star

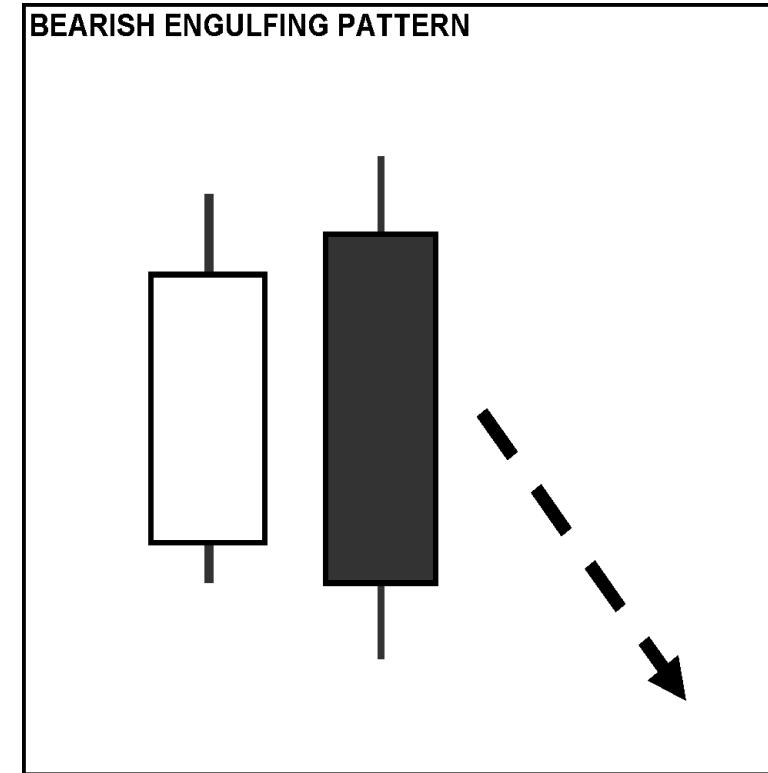
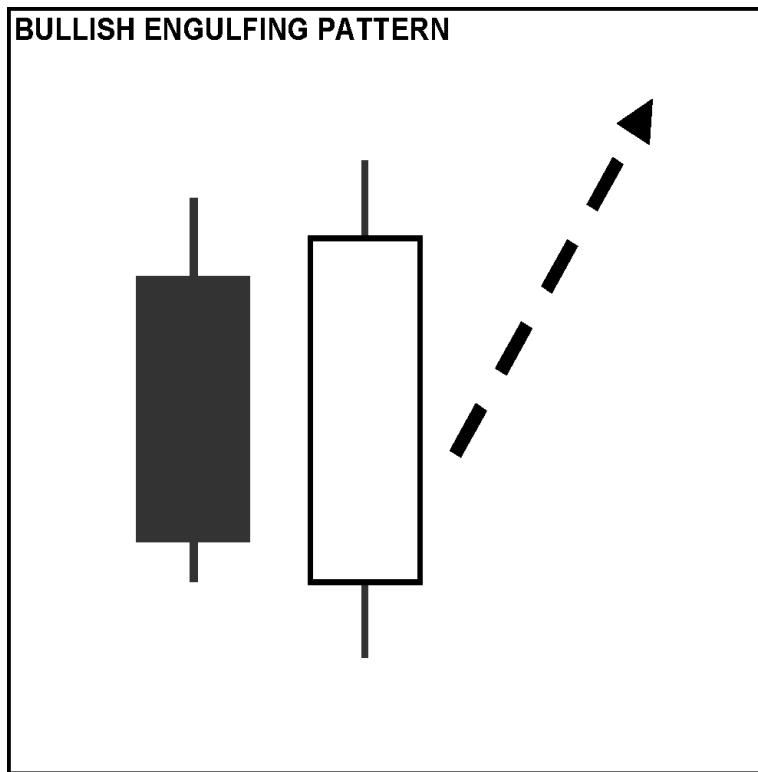
MARTEAU



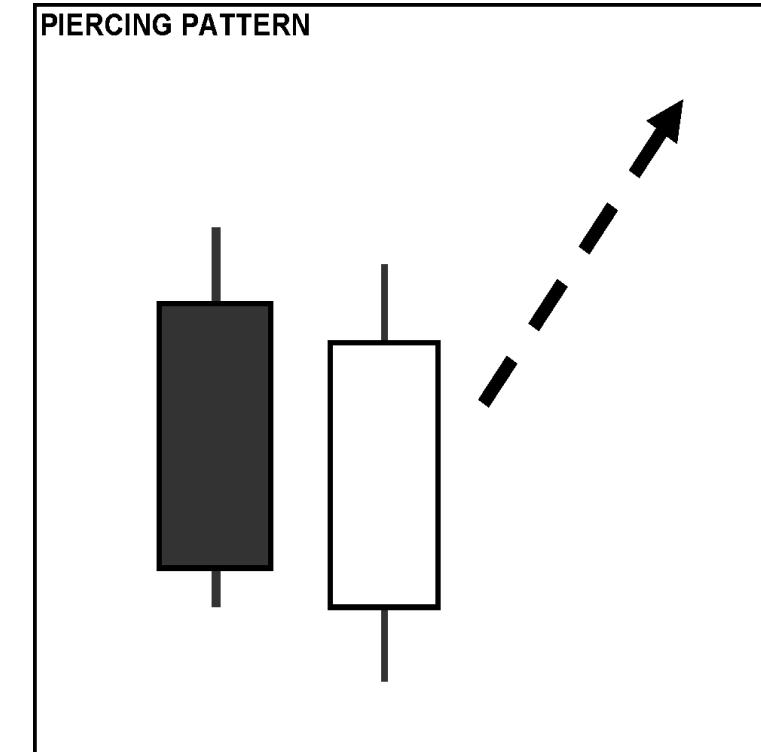
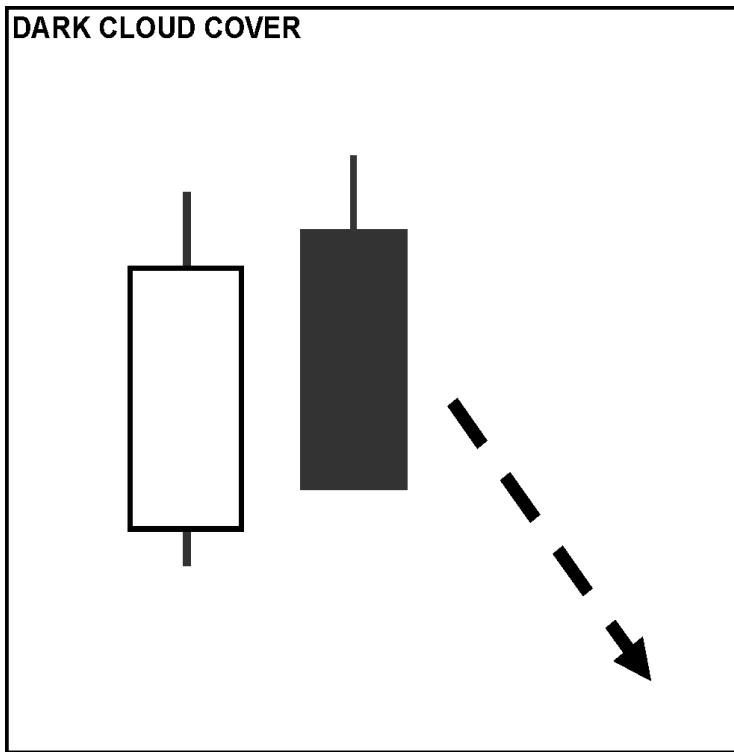
SHOOTING STAR



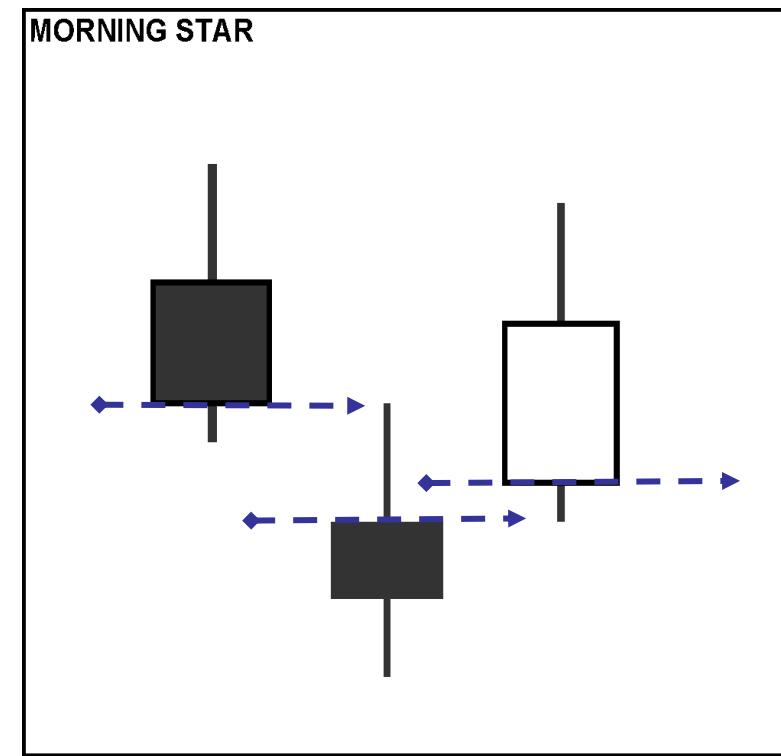
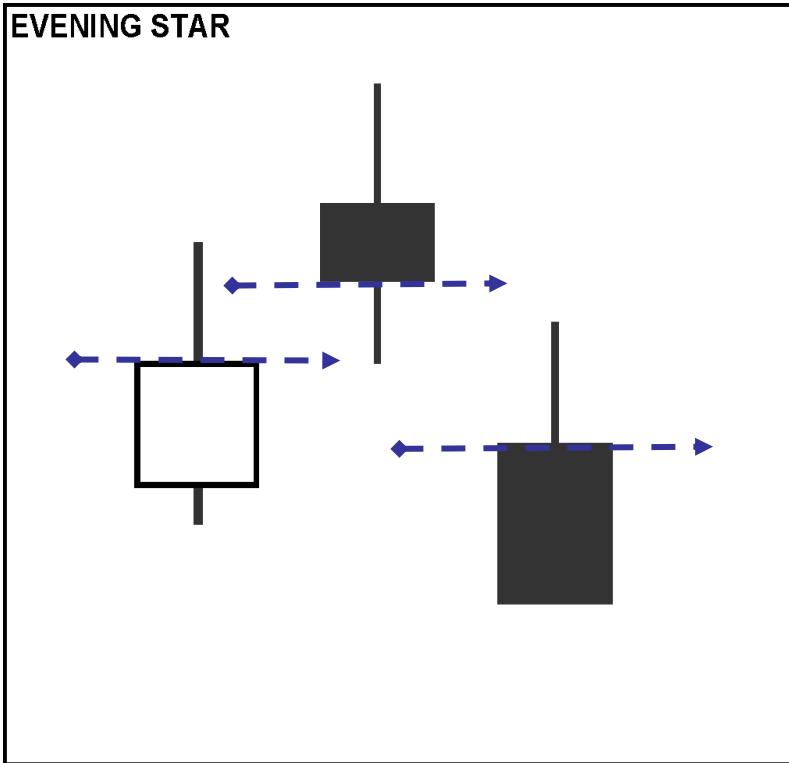
Bullish & Bearish Engulfing Pattern



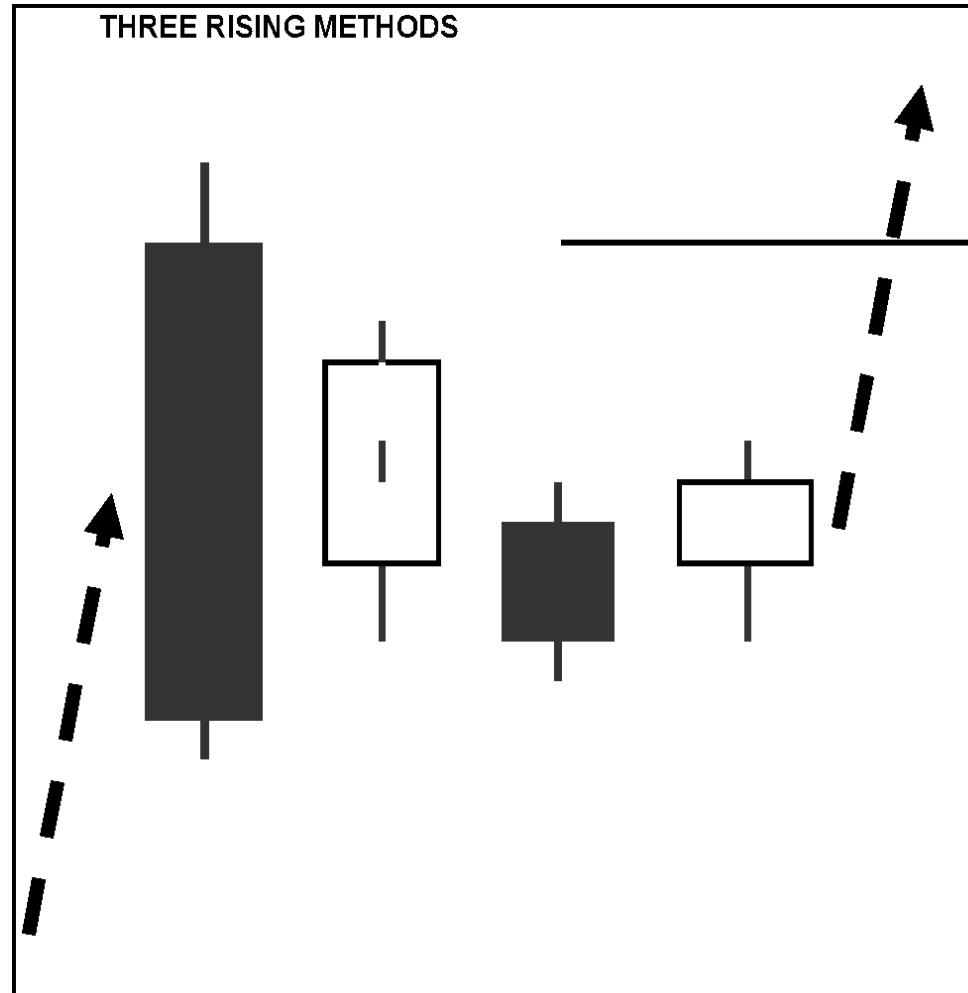
Dark Cloud Cover & Piercing Pattern



Evening & Morning Star



Three Rising Methods



Candlesticks in motion



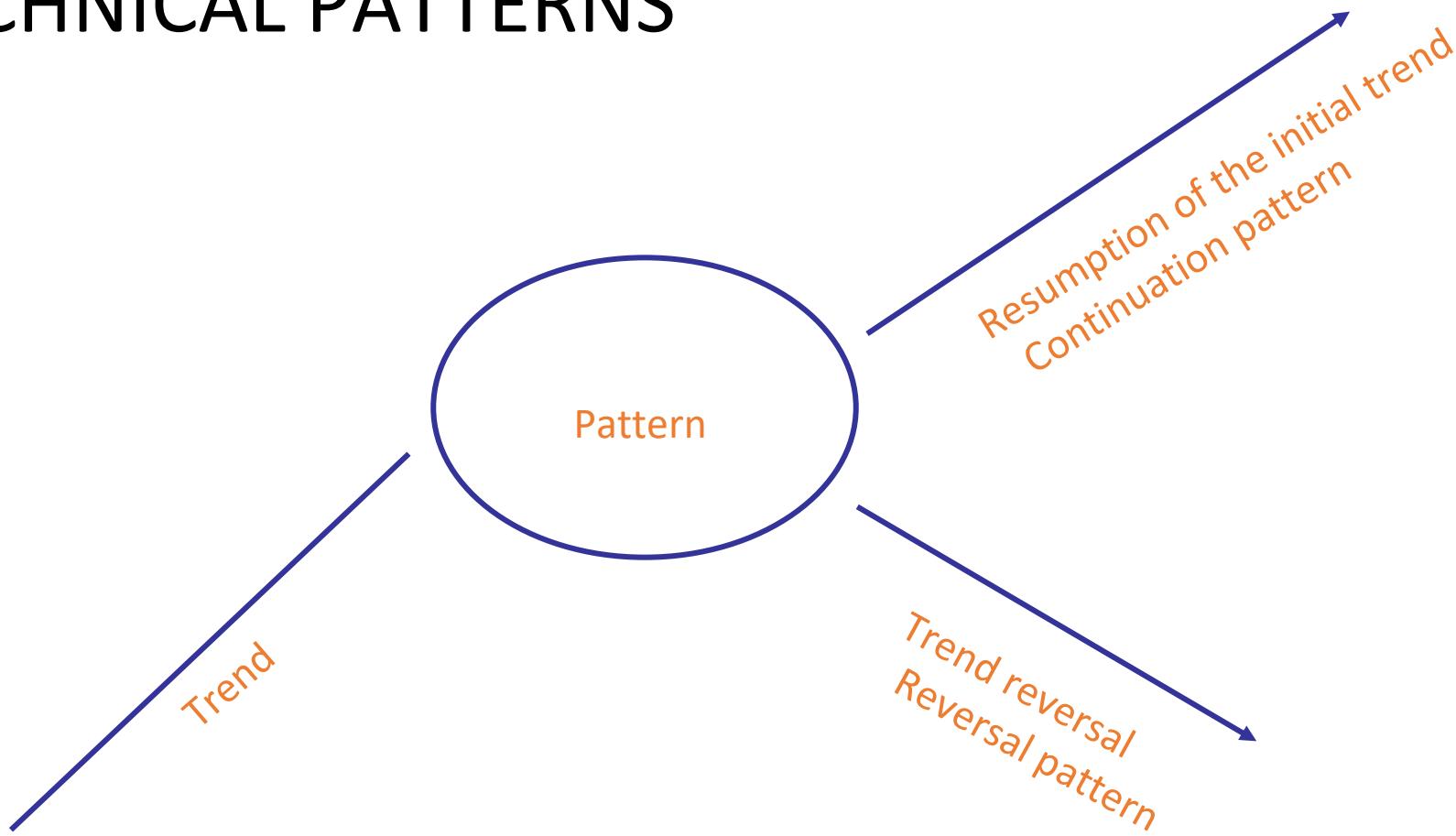
Candlesticks in motion



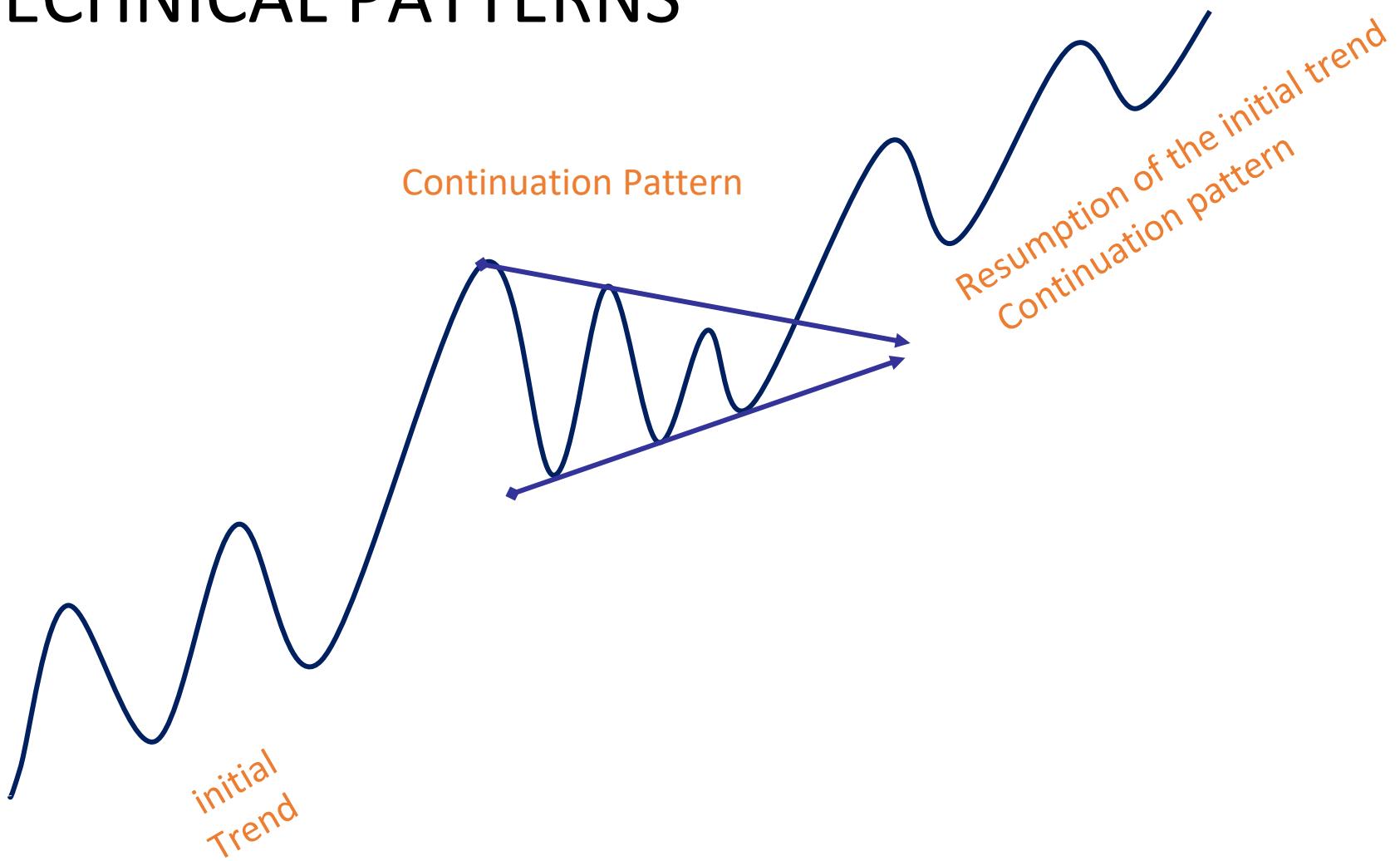
Candlesticks in motion



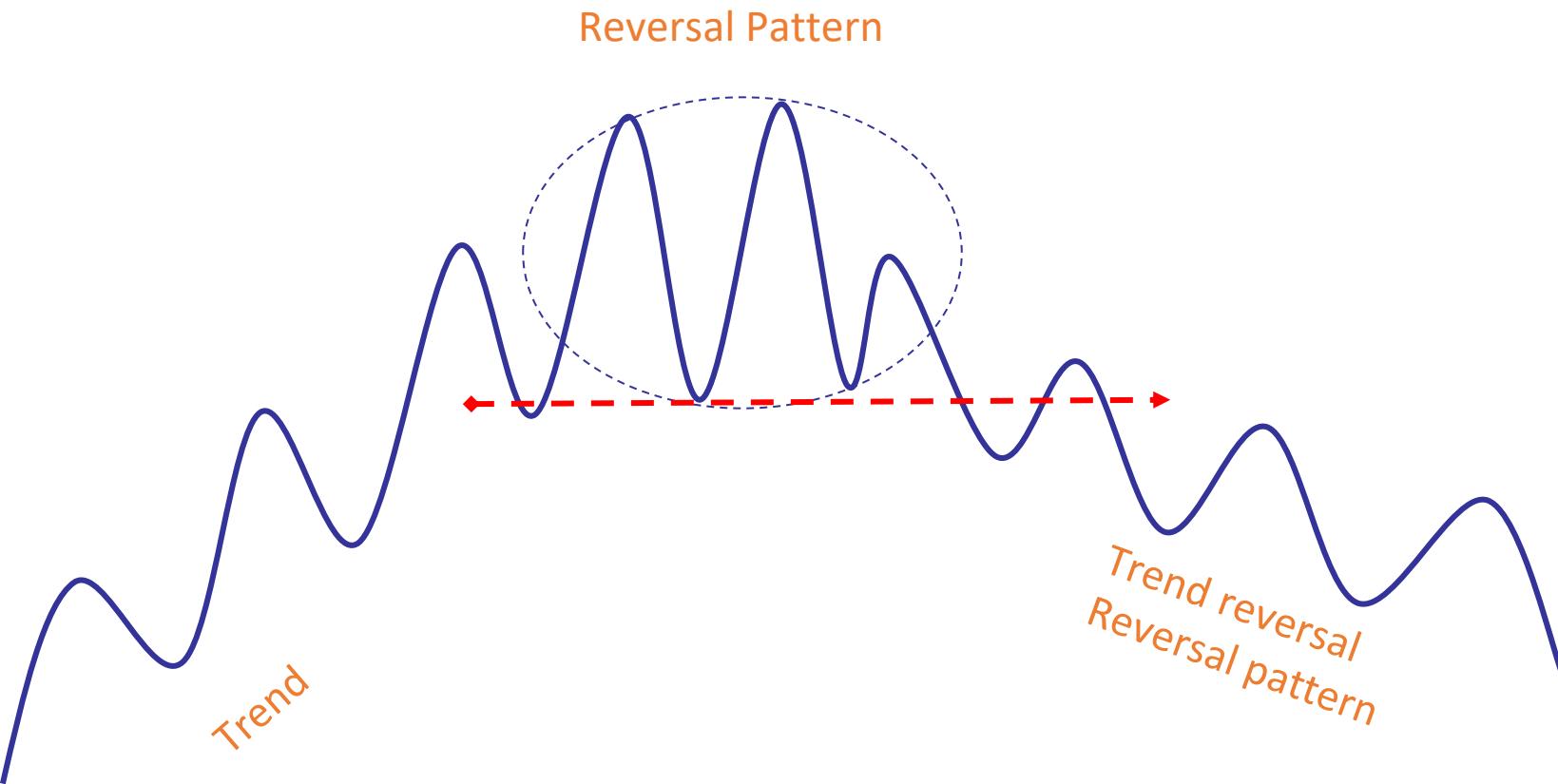
THE TECHNICAL PATTERNS



THE TECHNICAL PATTERNS



THE TECHNICAL PATTERNS



CONTINUATION PATTERNS

Triangles

- Symetric triangles
 - pattern
 - Volumes
 - Breakout : direction, validation, timing
 - Target : calculation & maximum efficacy
 - False signals
- Ascending & descending triangles
- Brodening formations
- Diamonds
- Wedges: reversal & continuation
- Flags & pennants

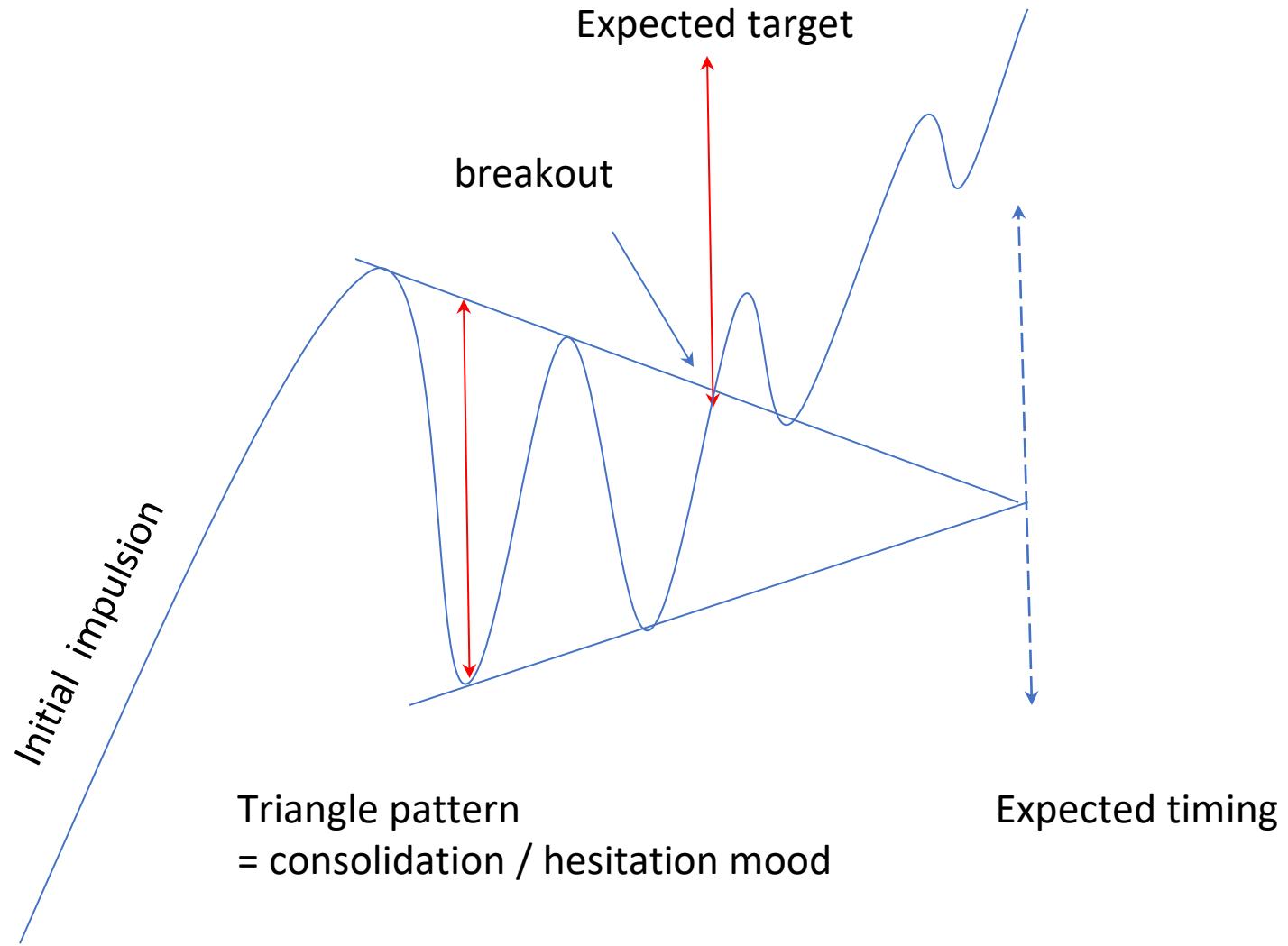
REVERSAL PATTERNS

- Rectangles
- Head & shoulders
 - pattern
 - Volumes
 - Breakout : direction, validation, timing Pull-back
 - Targets: calculation & duration
 - False signals
 - Continuation H & S
- Double tops & triple-tops
- Rounding formation
- V top & key reversal
- Gaps formations & gaps theory

Continuation Channel – construction & target



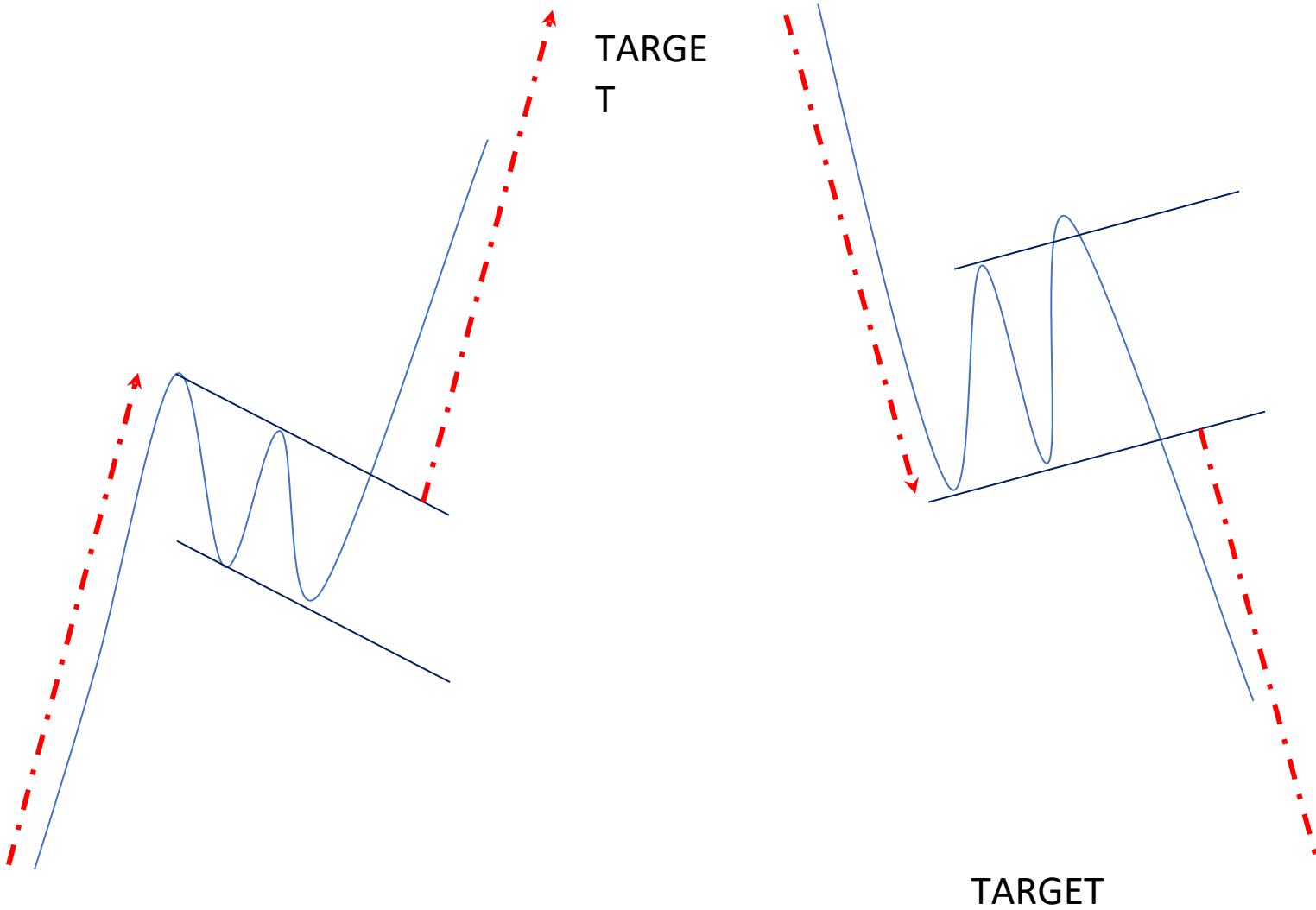
Symetric Triangle



Symetric Triangle



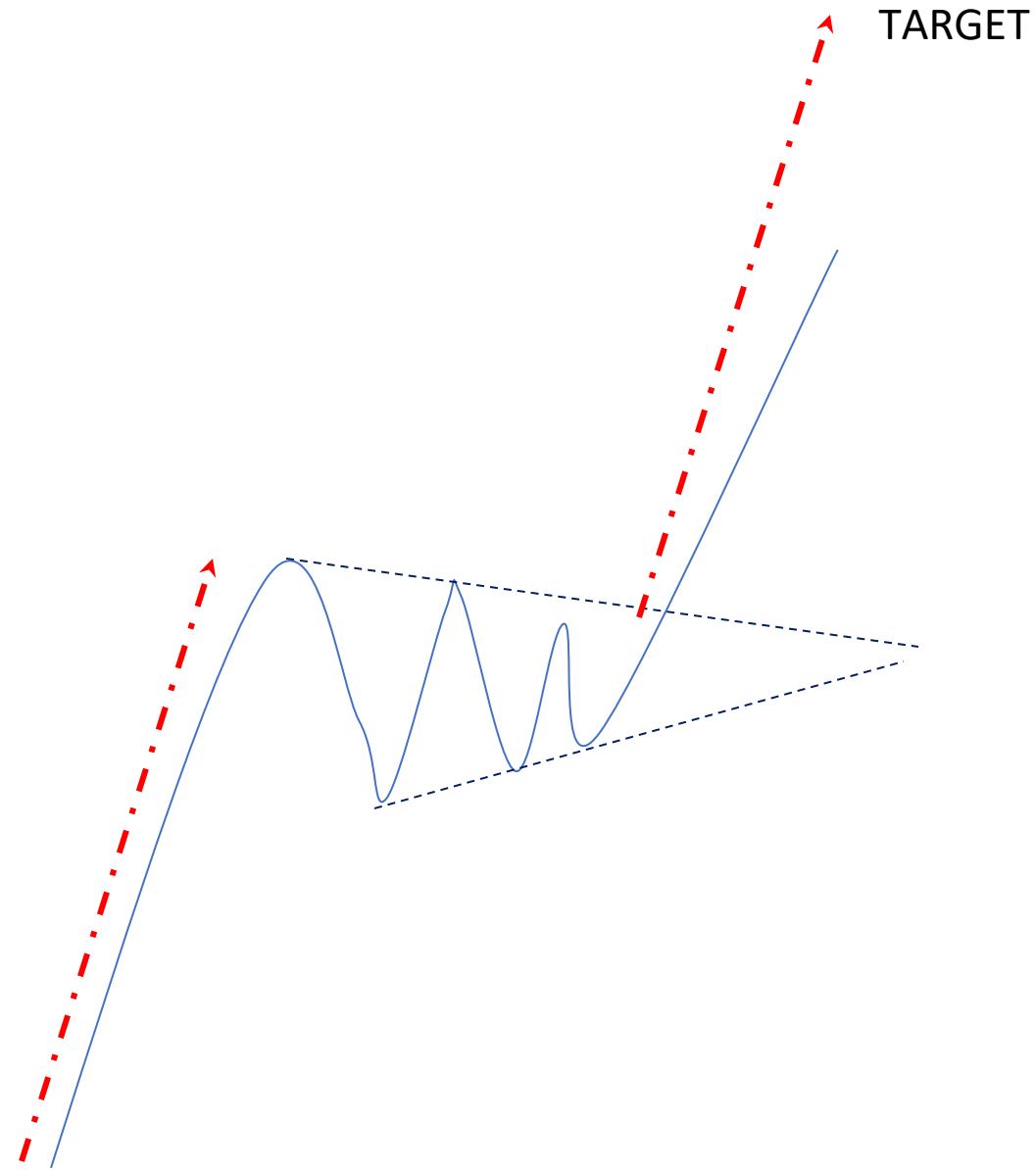
Bull and Bear Flags



Bear Flag



Pennant



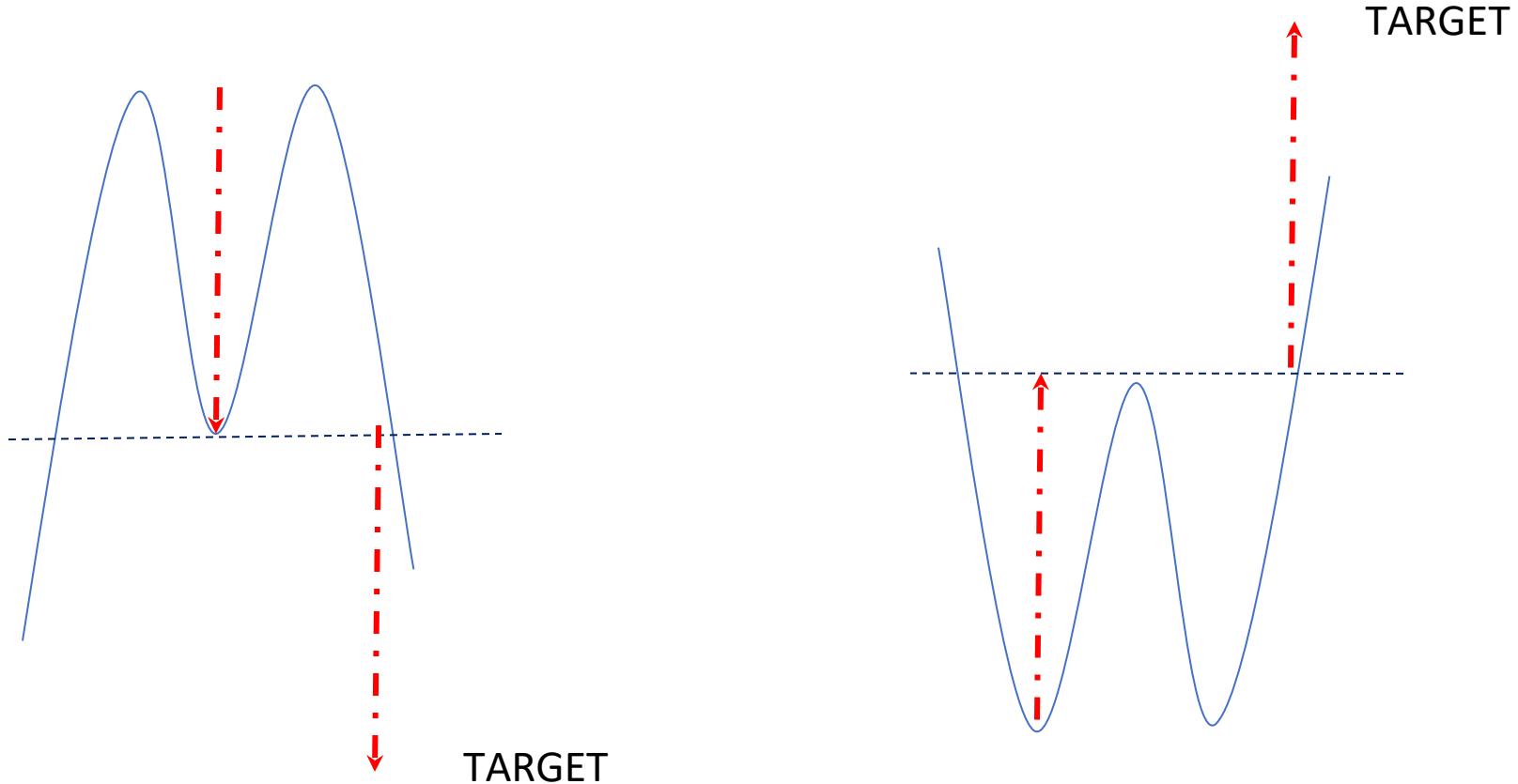
Bear pennant & wedge



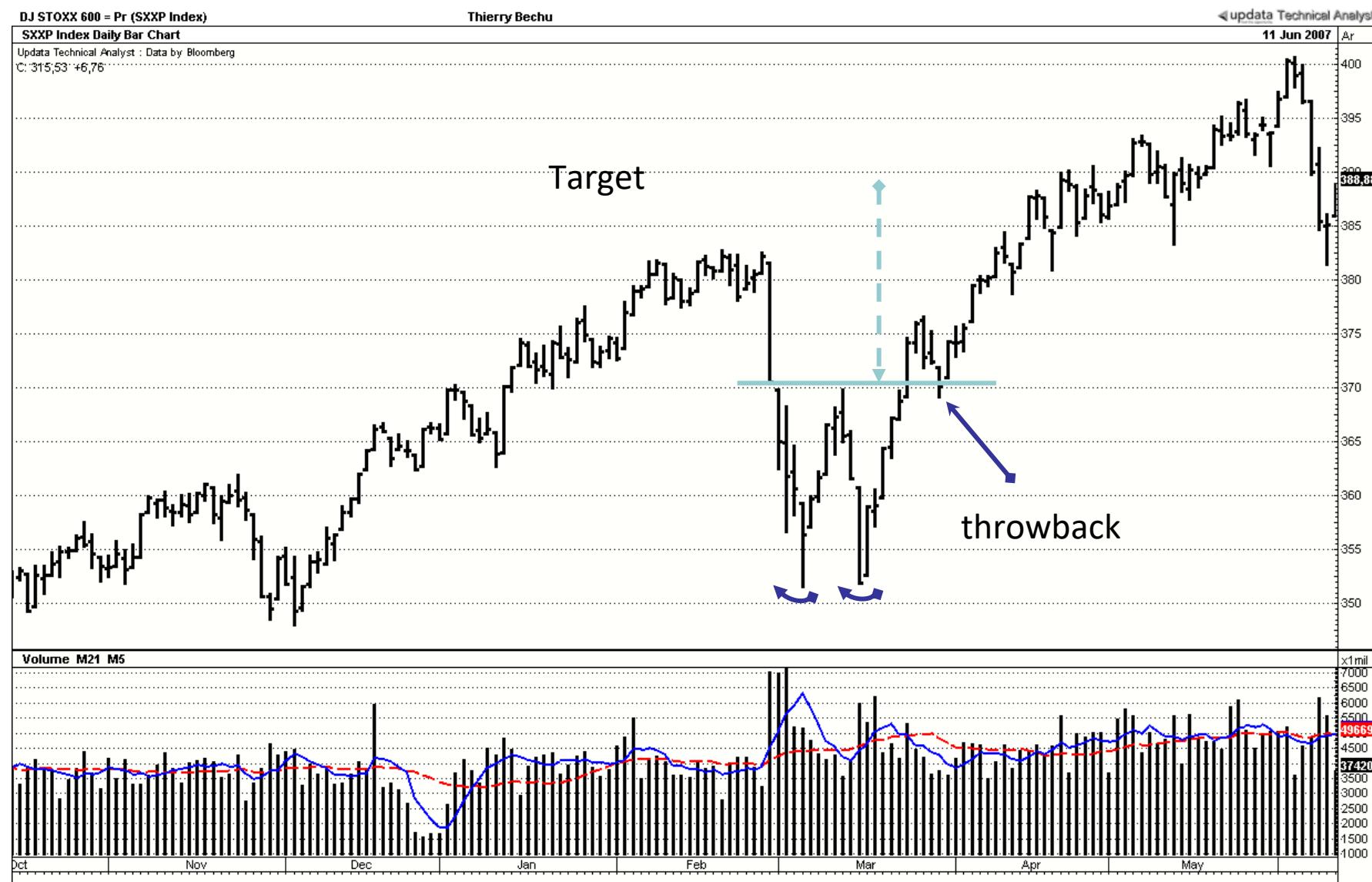
Bull pennant



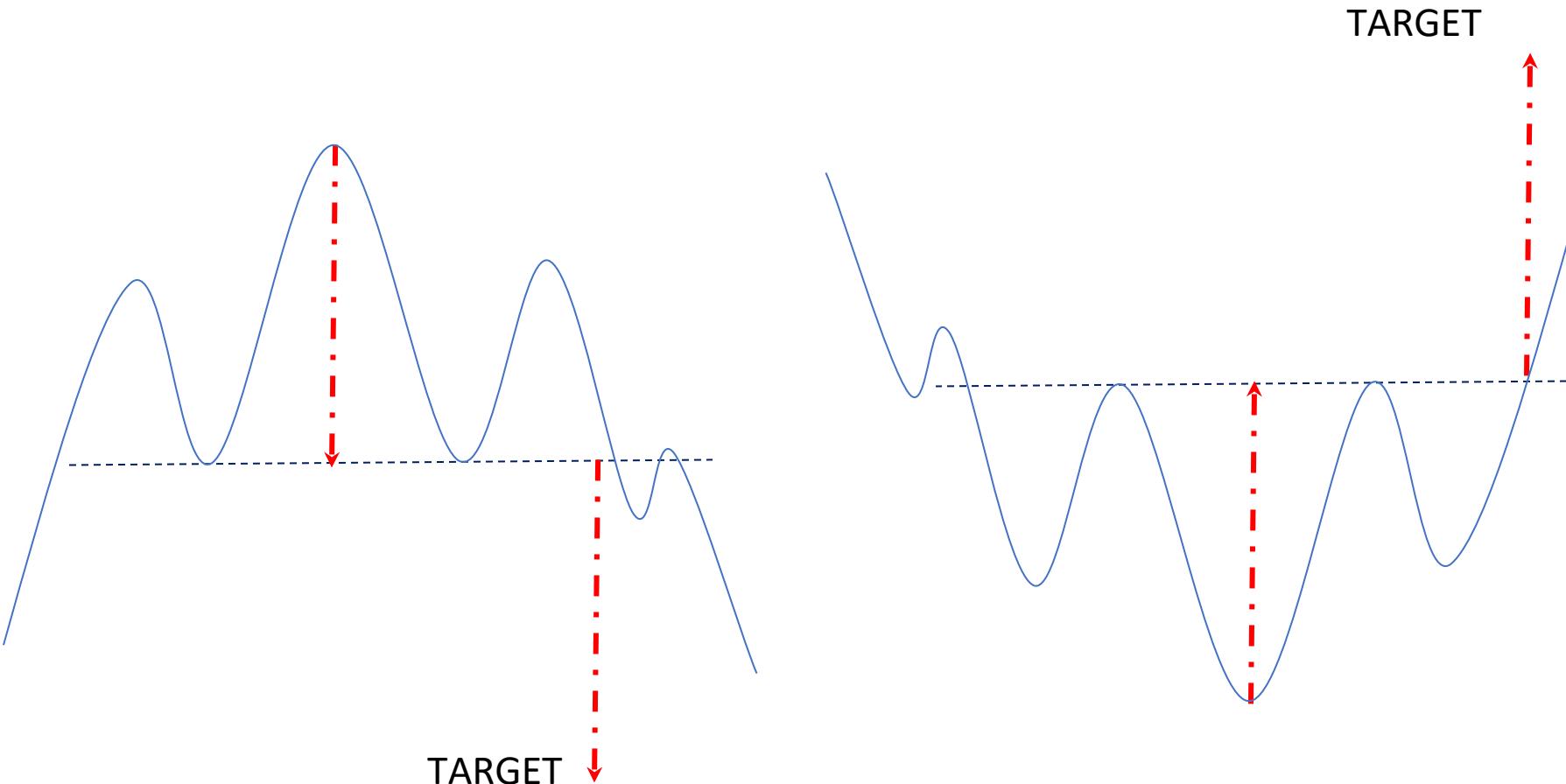
Double Tops & Double Bottoms



Double bottom with throwback



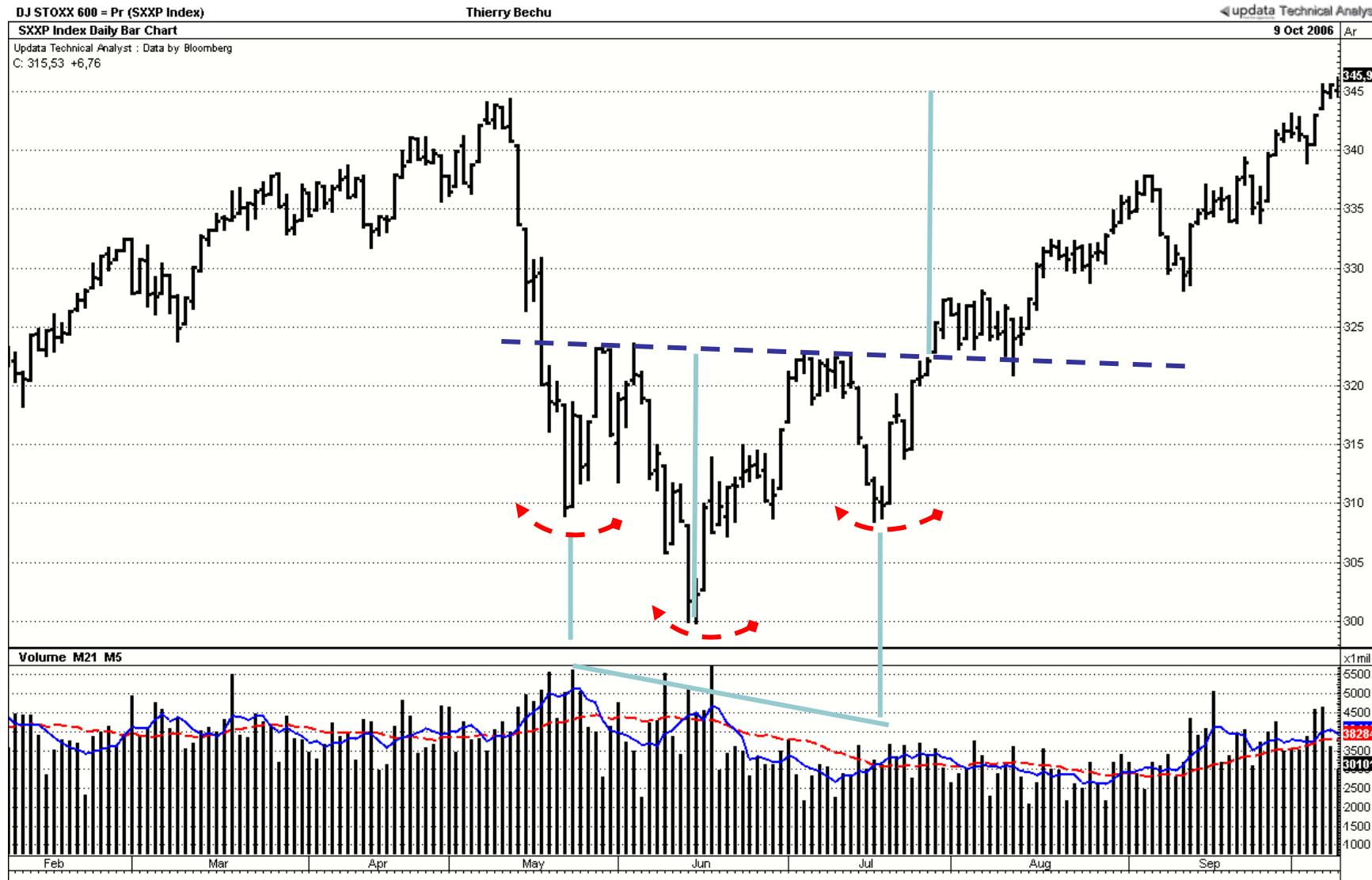
Head & Shoulders and Reverse H&Sh



Head & Shoulder (Reversal pattern)



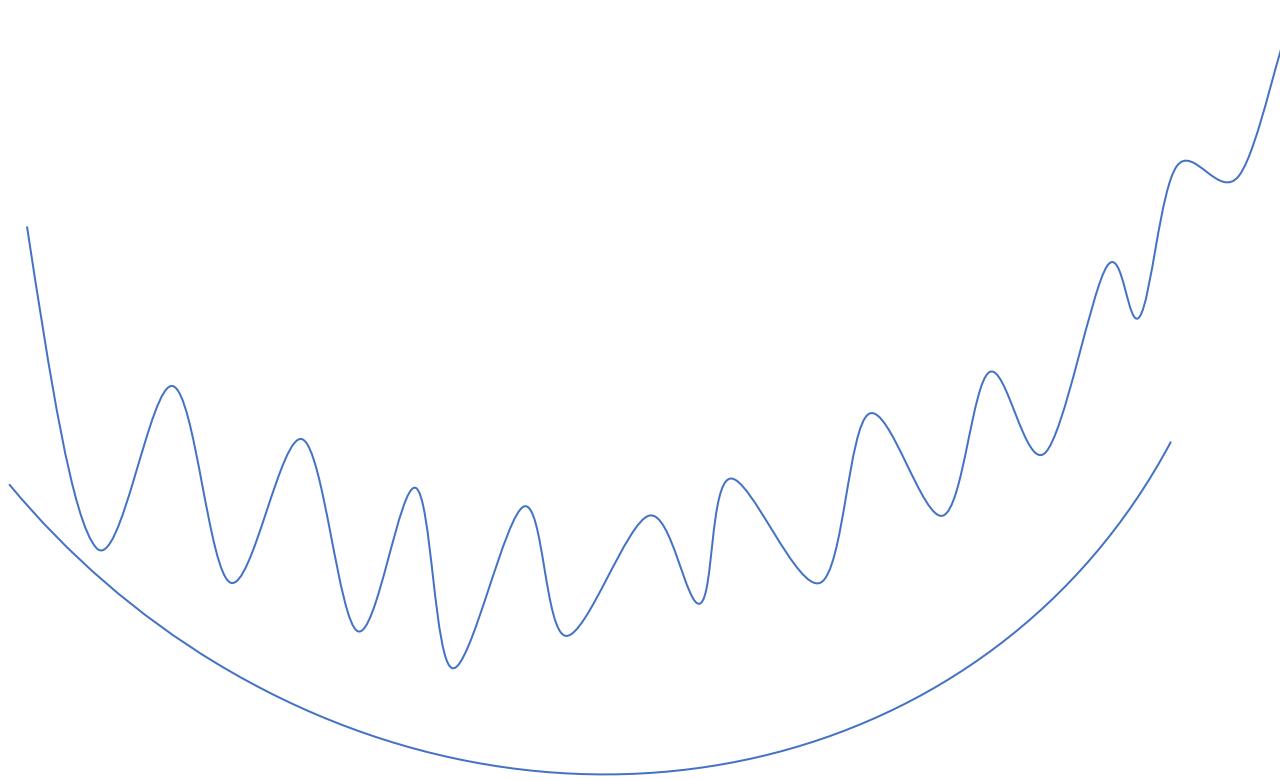
Inverse Head & Shoulder (reversal pattern)



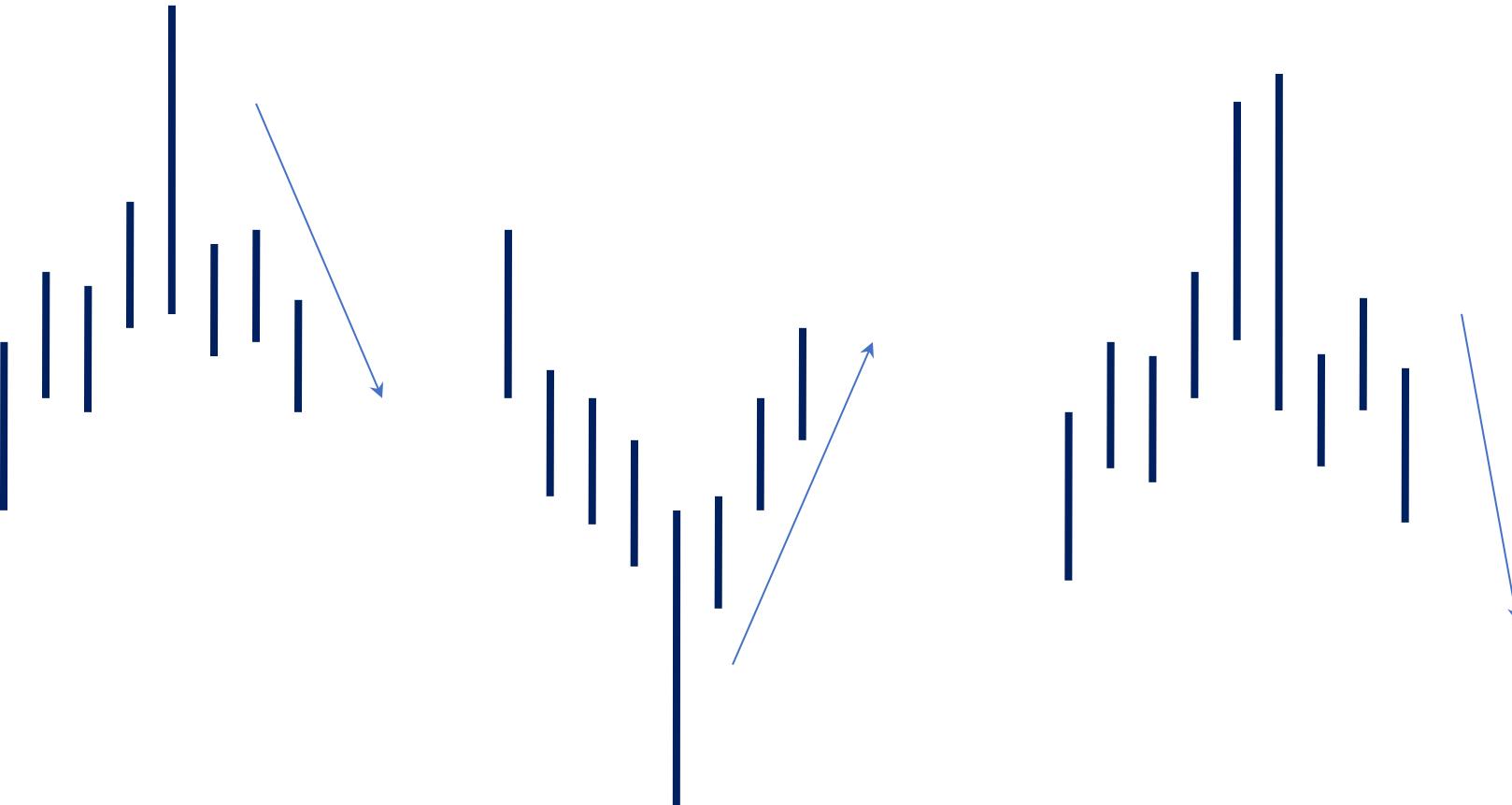
Inverse Head & Shoulder (continuation pattern)



Saucers



Spikes & two-days reversal



TECHNICAL ANALYSIS

Lesson 3 / 4

Technical Analysis & Market analysis

Filters: moving averages and bands

Price oscillators: RSI, Macd, Momentum, Stochastics, DMI...

Volume based indicators

Contrary opinion and Market breadth analysis

Cycles

Filters, moving averages, enveloppes and other methods based on MA

- Filters principles
 - Mathematical Filters
 - Price filters (variation filter, Point & Figures)
- Moving Averages
 - MA simple / exponential / arithmetical...
 - Signals with one MA
 - Signals with 2 or 3 MA
 - How to select the parameters? Is there an optimal parameter?
- Bands principles
 - Simple bands
 - Keltner Bands
 - Bollinger Bands
- Ichimoku: exemple of a complex system based on lagged moving averages

Variation filter



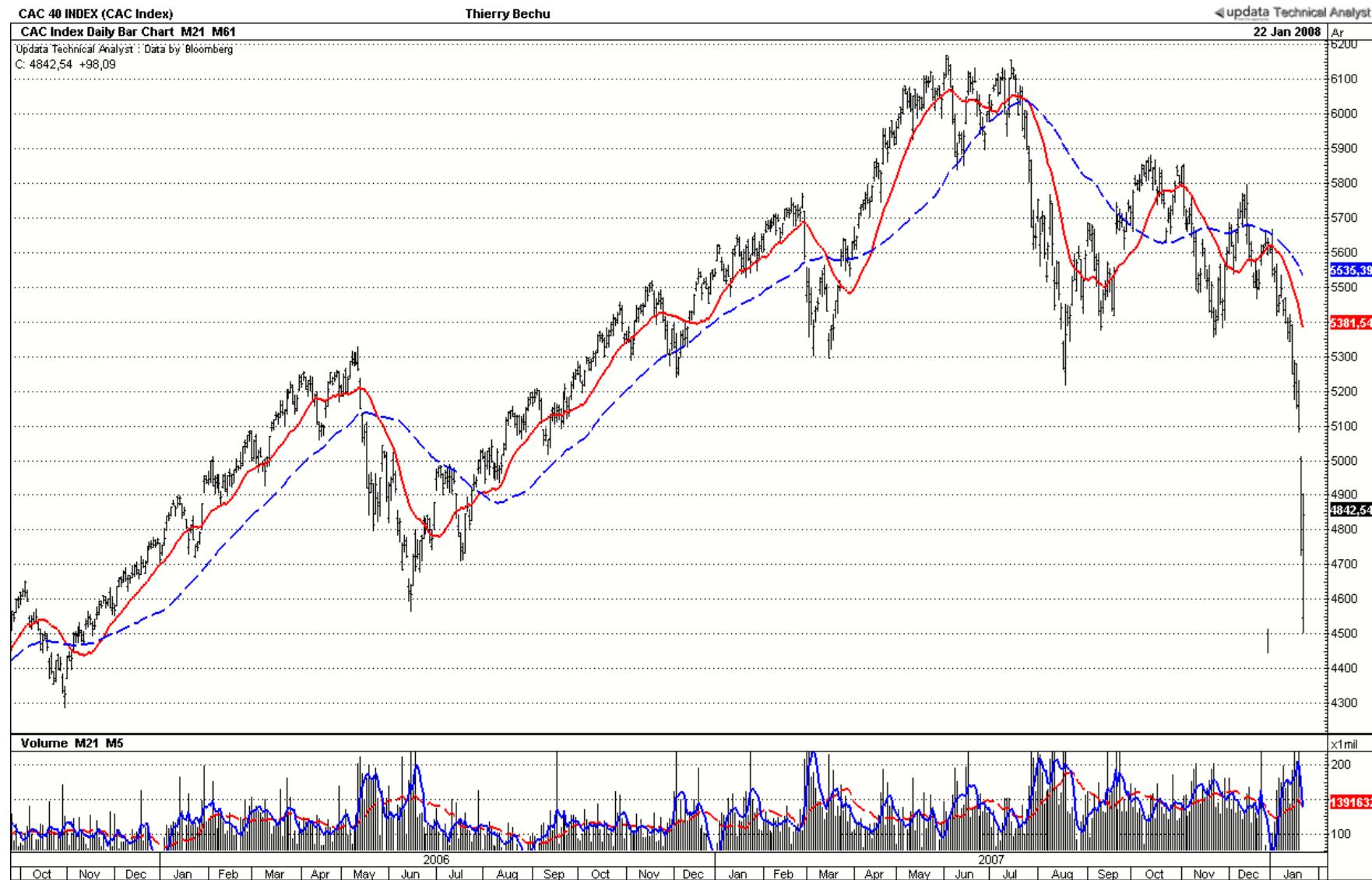
Variation filter



Moving average



Using two moving averages



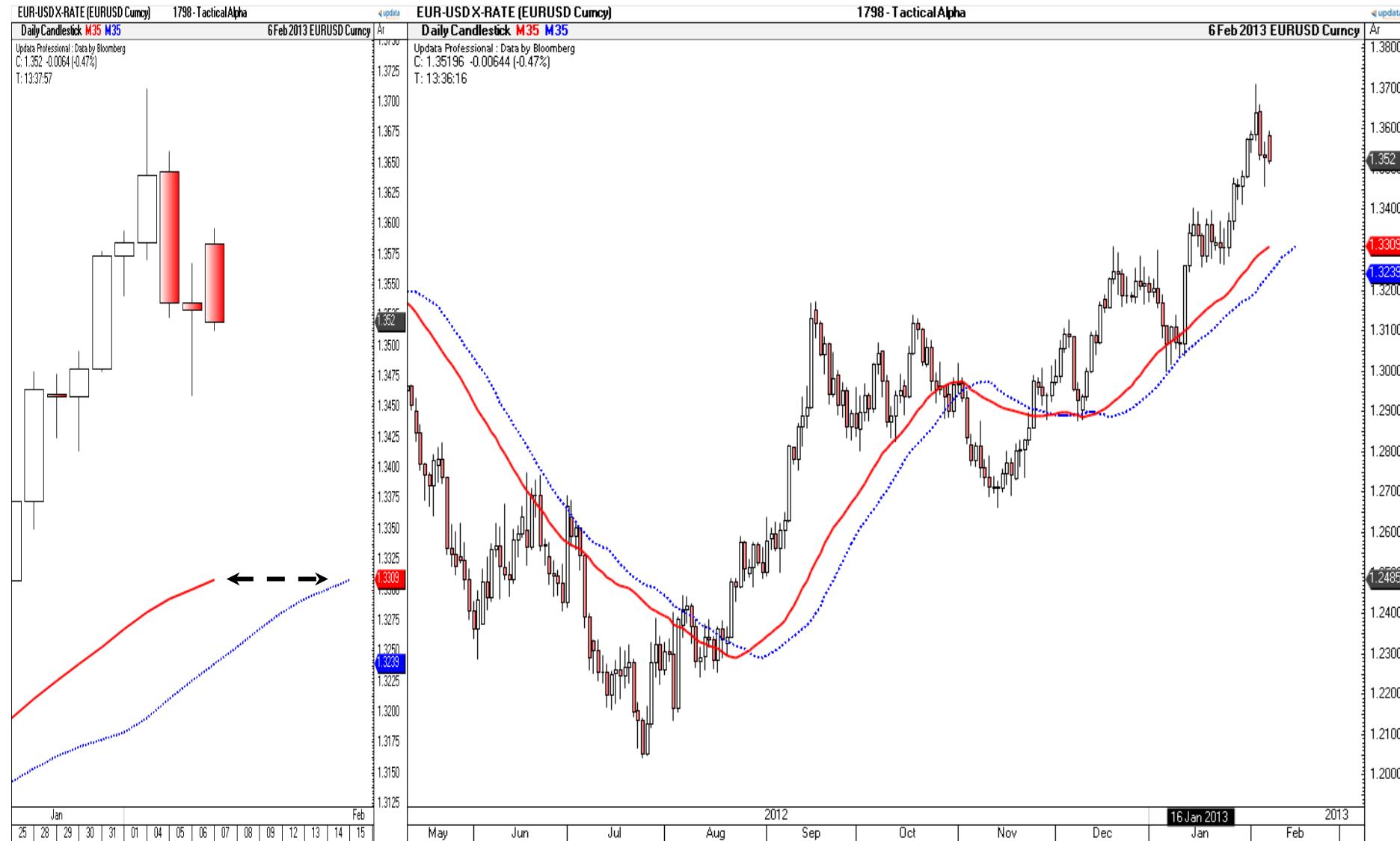
Three moving averages



Simple, Exponential, weighted Moving Averages



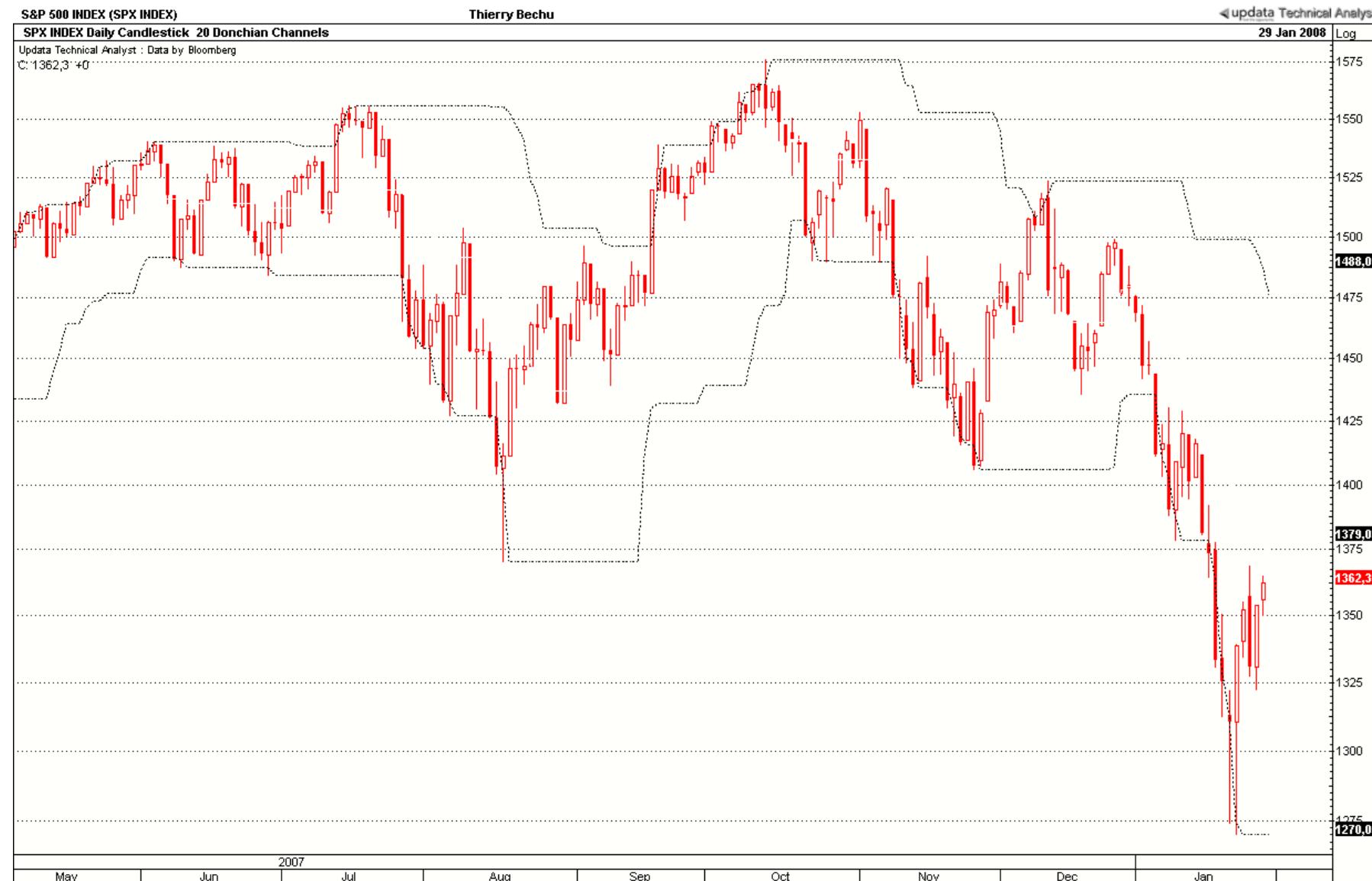
Lagged Moving Average



% enveloppes (Basic concept)



Dunchian channel (Min – max 20 days rolling)



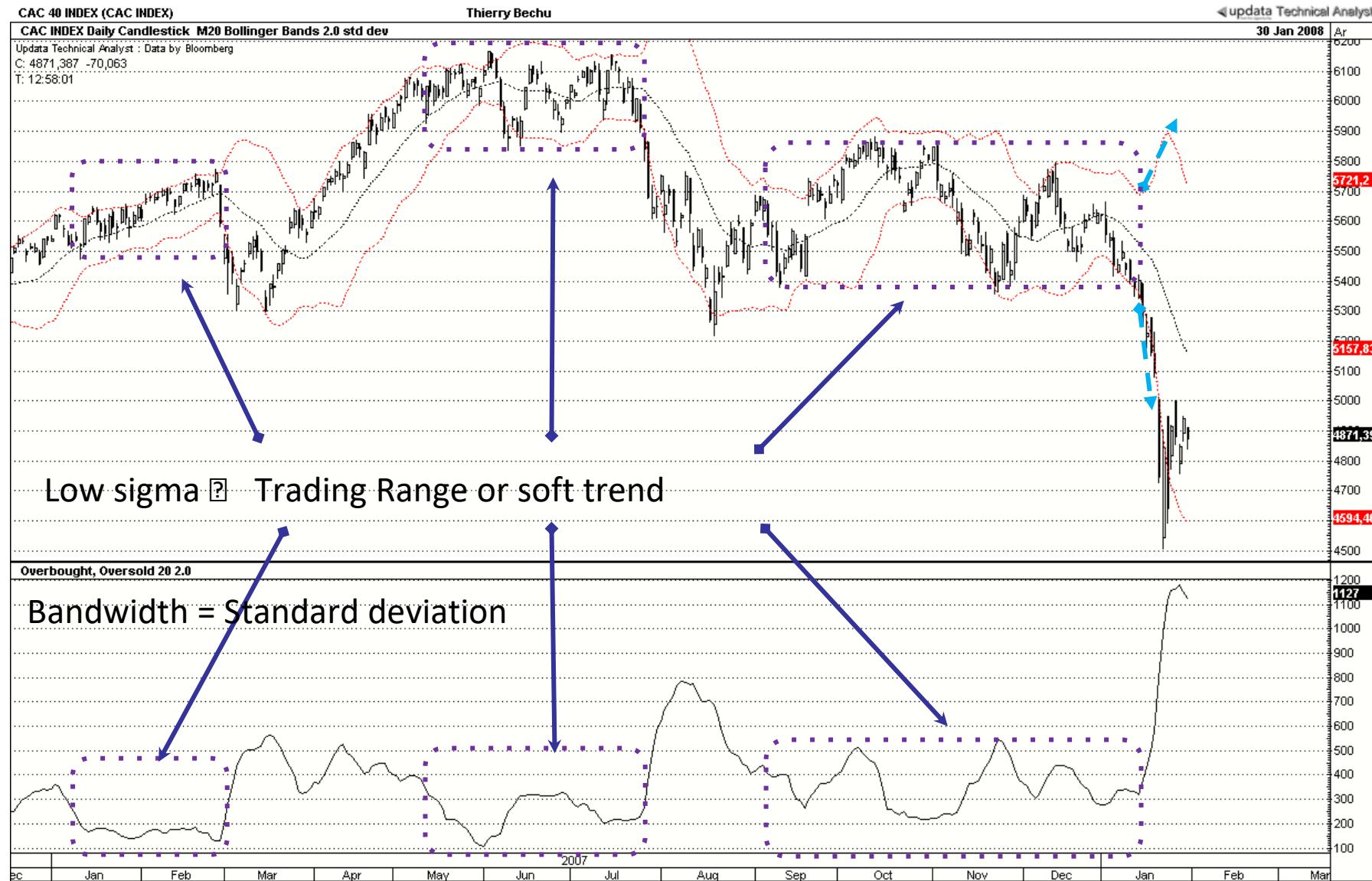
Bollinger Bands



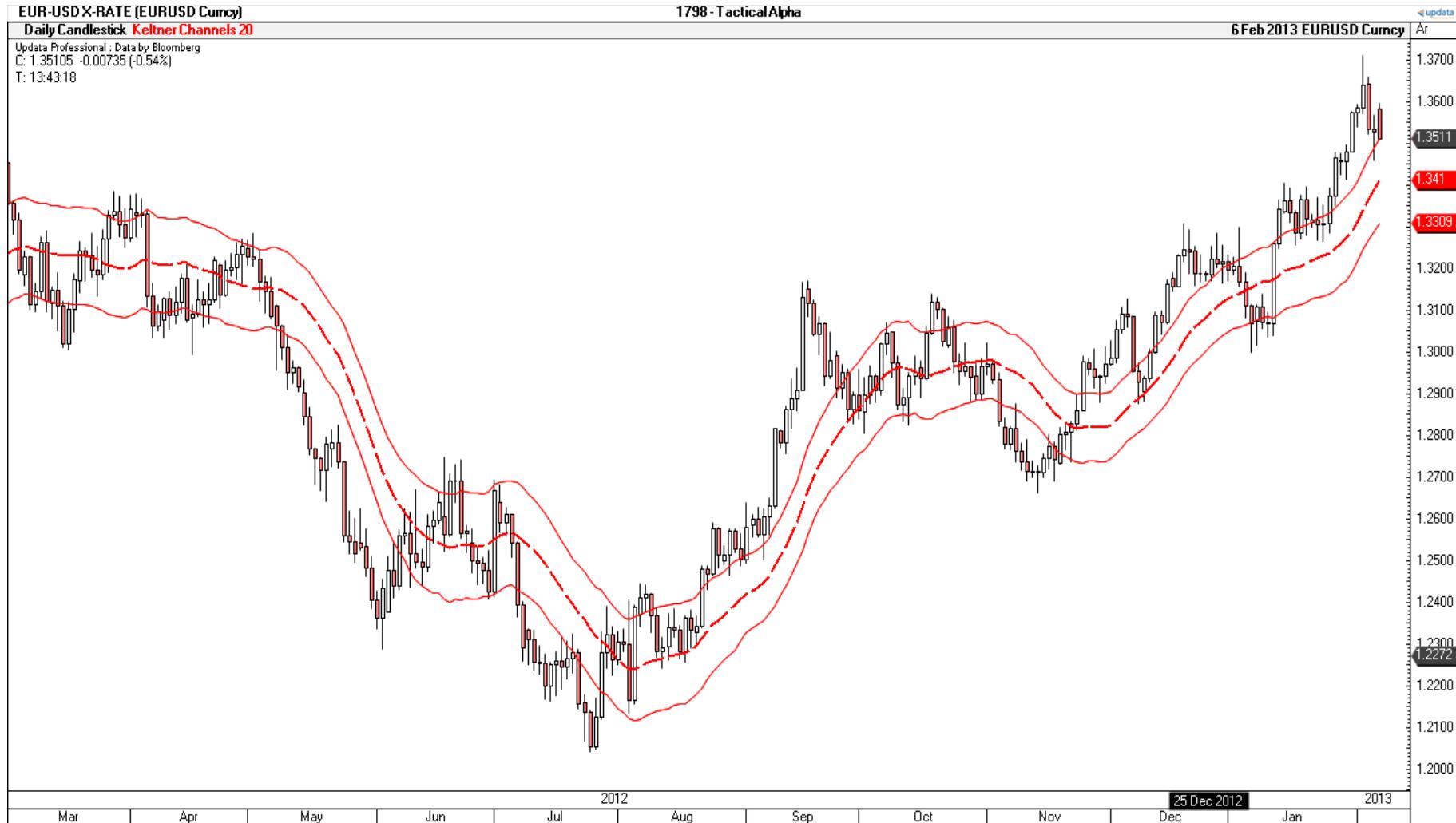
Bollinger Bands



Bollinger Bands & sigma oscillator



KELTNER BANDS



Keltner Bands & Bollinger Bands: The squeeze effect

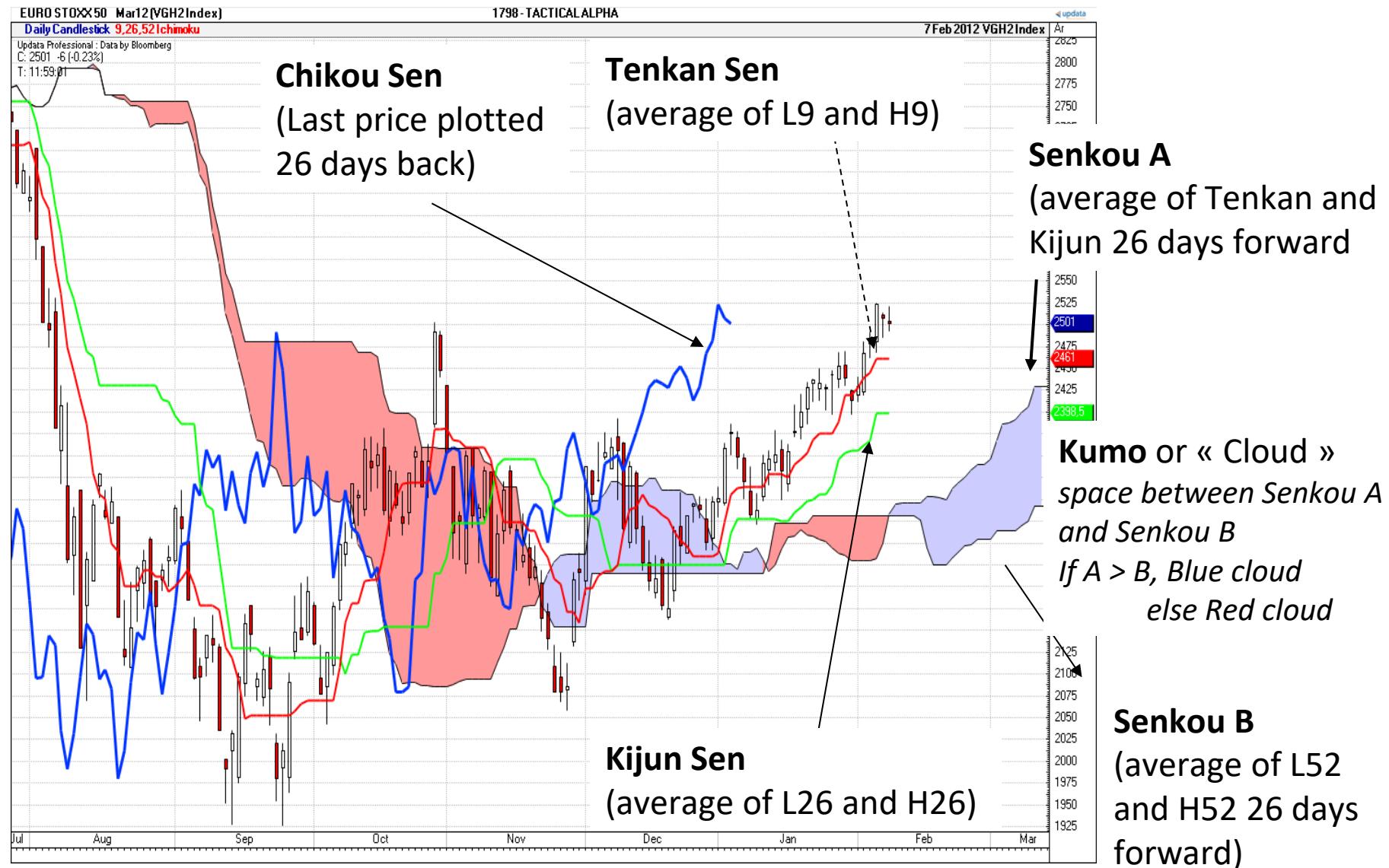


Ouverture de mâchoire sur le S&P



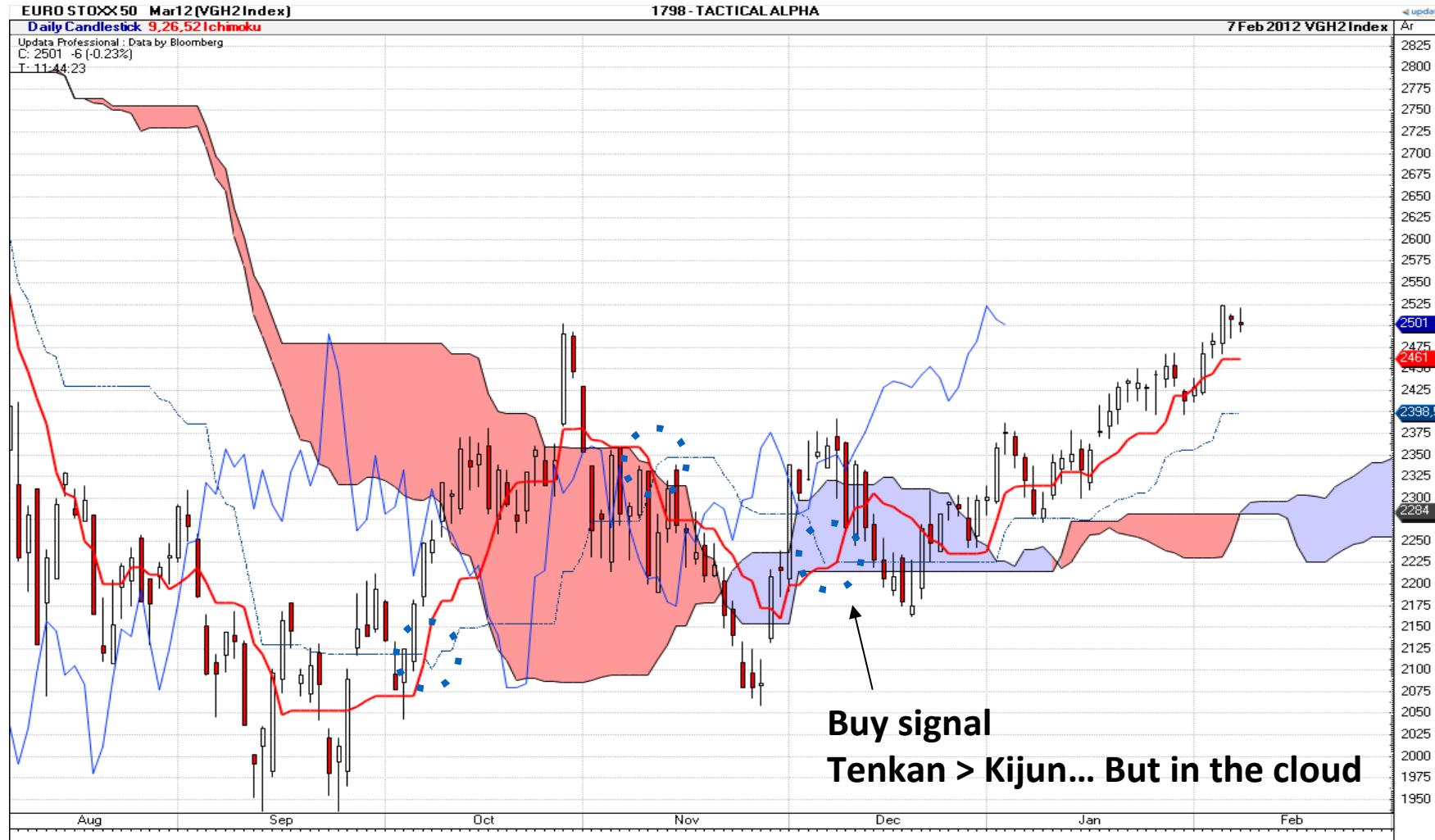


ICHIMOKU Kinko Hyo (« Curve equilibrium at first glance »)

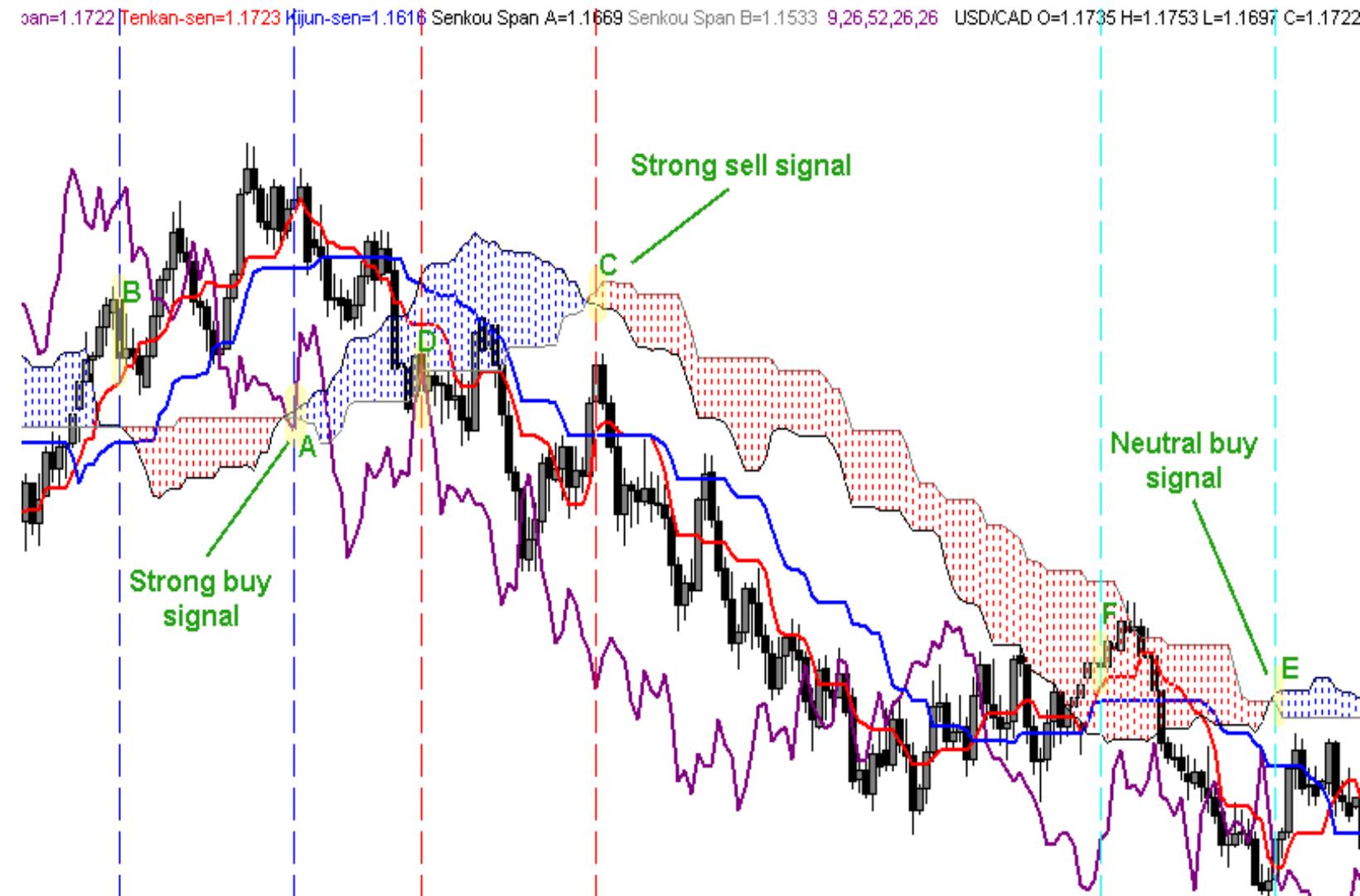


ICHIMOKU Kinko Hyo (« Curve equilibrium at first glance »)

PARIS IX Dauphine – MASTER 203

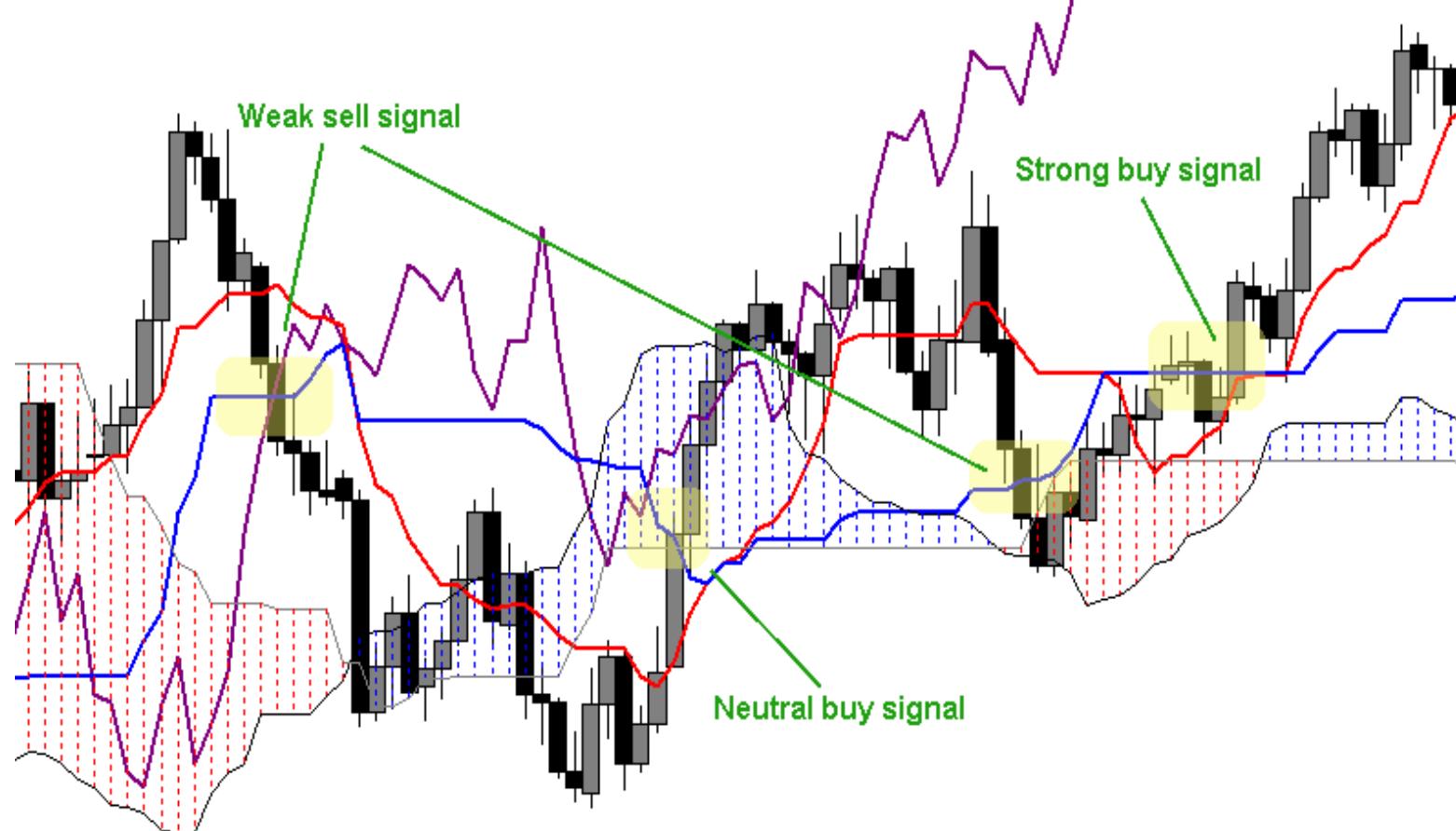


Senkou span cross



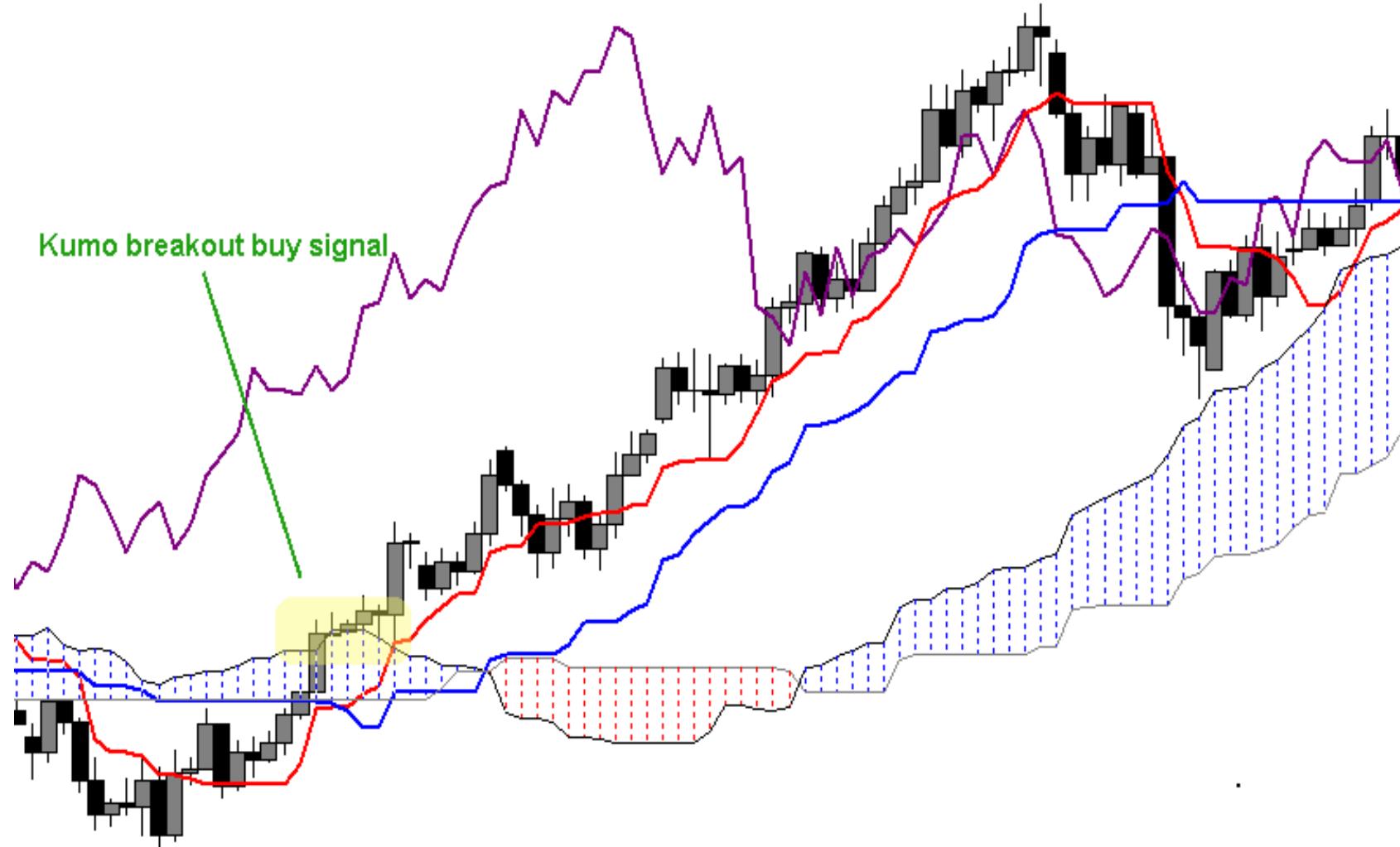
Kijun Sen Cross

oan=1.2463 tenkan-sen=1.2384 Kijun-sen=1.2255 Senkou Span A=1.2319 Senkou Span B=1.2229 9,26,52,26,26 USD/CHF O=1.2485 H=1.2498 L=1.2418 C=1.2463

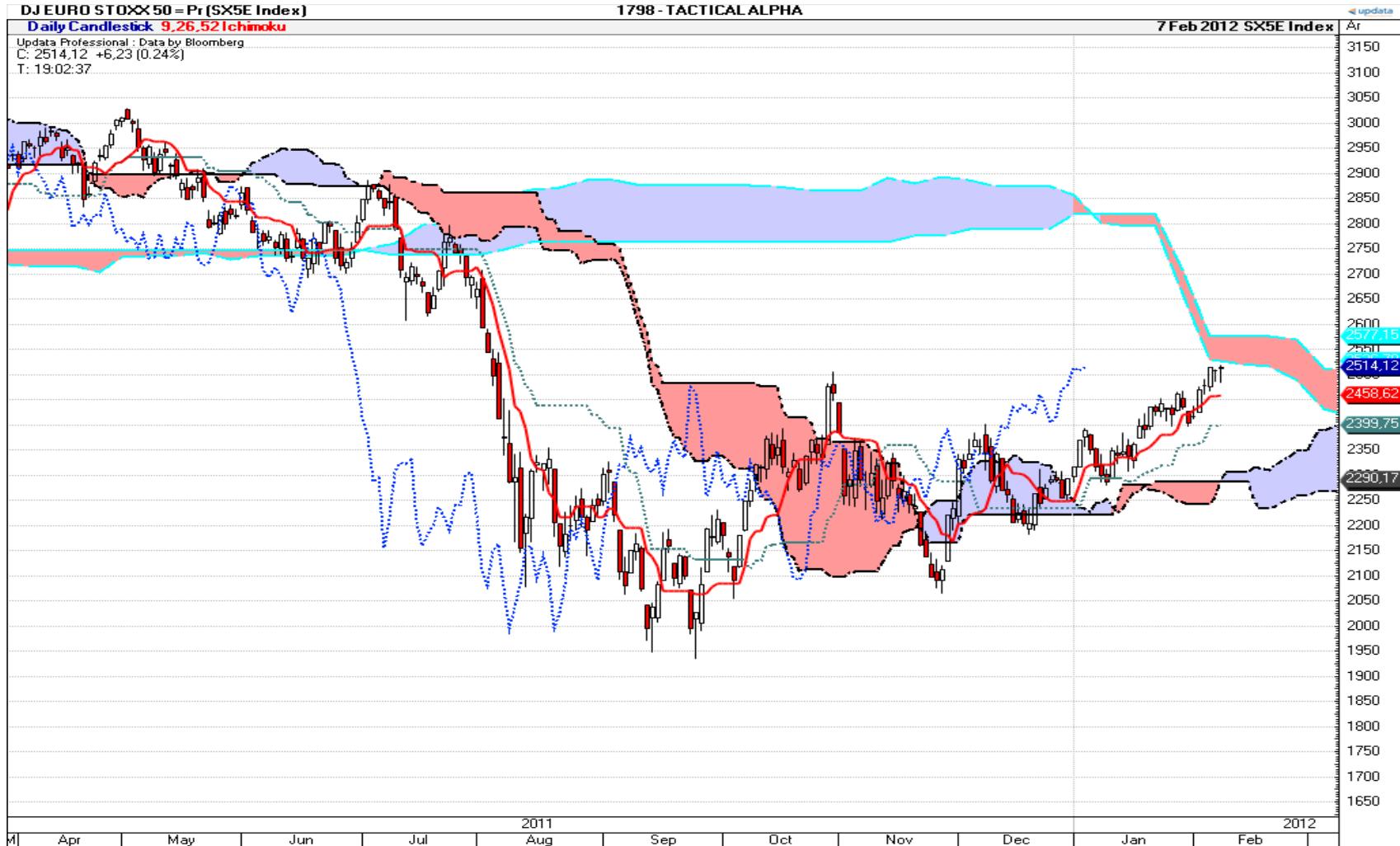


Kumo Breakout

pan=0.7897 Tenkan-sen=0.7832 Kijun-sen=0.7869 Senkou Span A=0.7850 Senkou Span B=0.7795 9,26,52,26,26 AUD/USD O=0.7892 H=0.7905 L=0.7861 C=0.7897



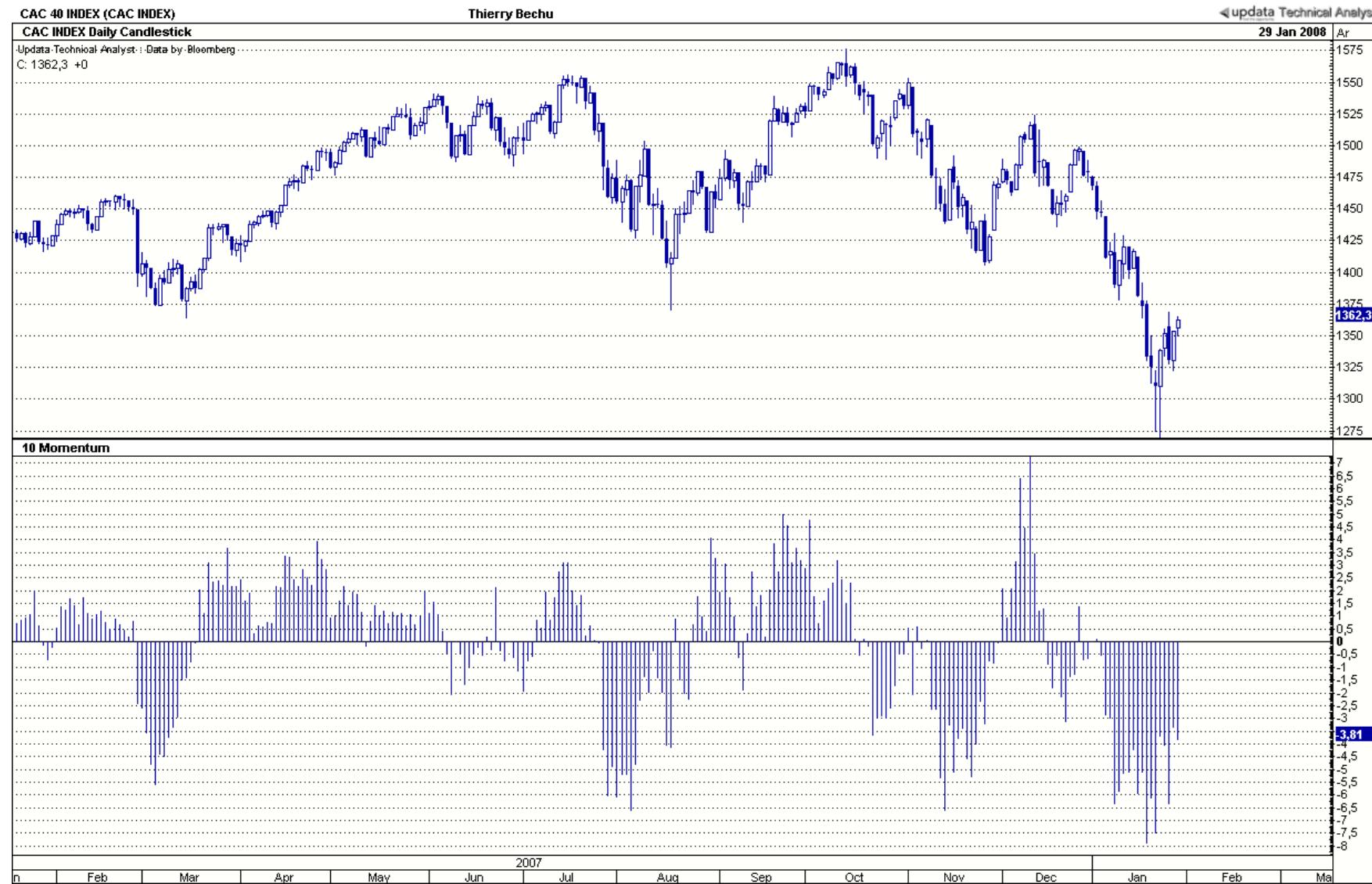
Ichimoku daily and weekly



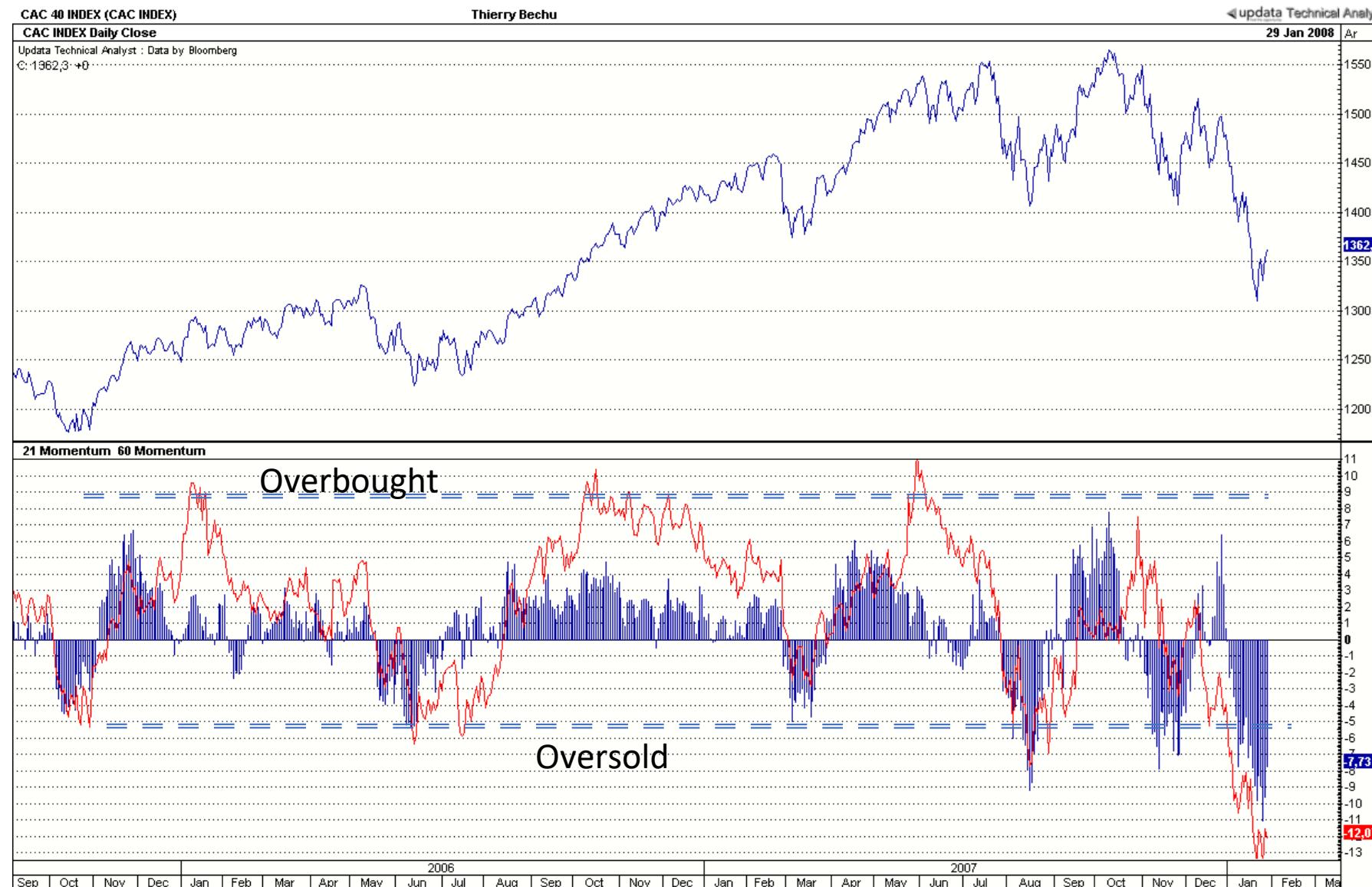
TECHNICAL OSCILLATORS

- Main Principles
 - Construction, principles and main signals :
 - Overbought / Oversold
 - Cross signals (MA or level)
 - divergence principle
- Main oscillators
 - Basic oscillators
 - Momentum, ROC, MA oscillators, MACD...
 - More sophisticated oscillators:
 - RSI, Stochastics...
 - Trend indicators
 - Directional Movement Index and ADX

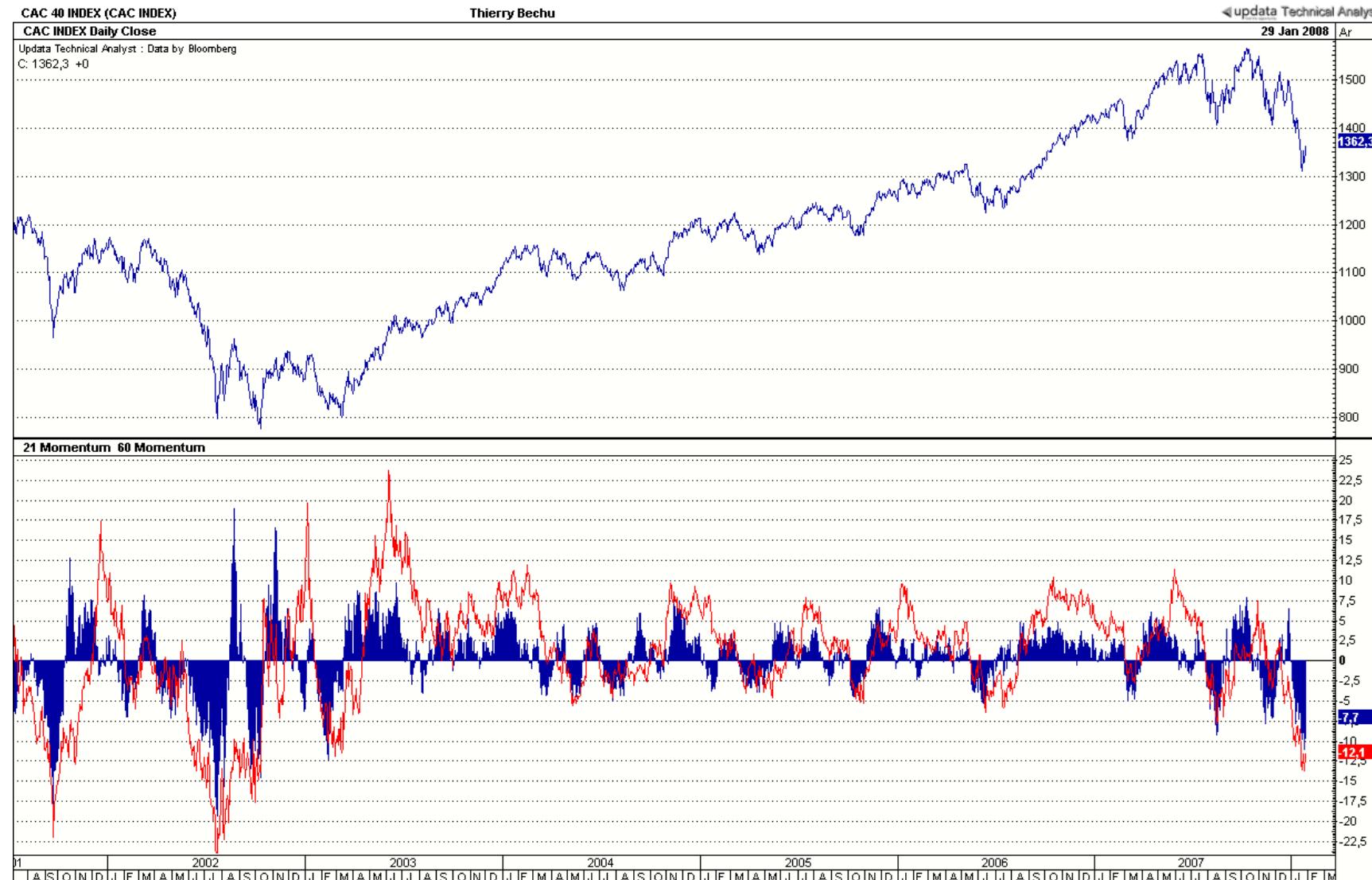
Momentum / rate of change



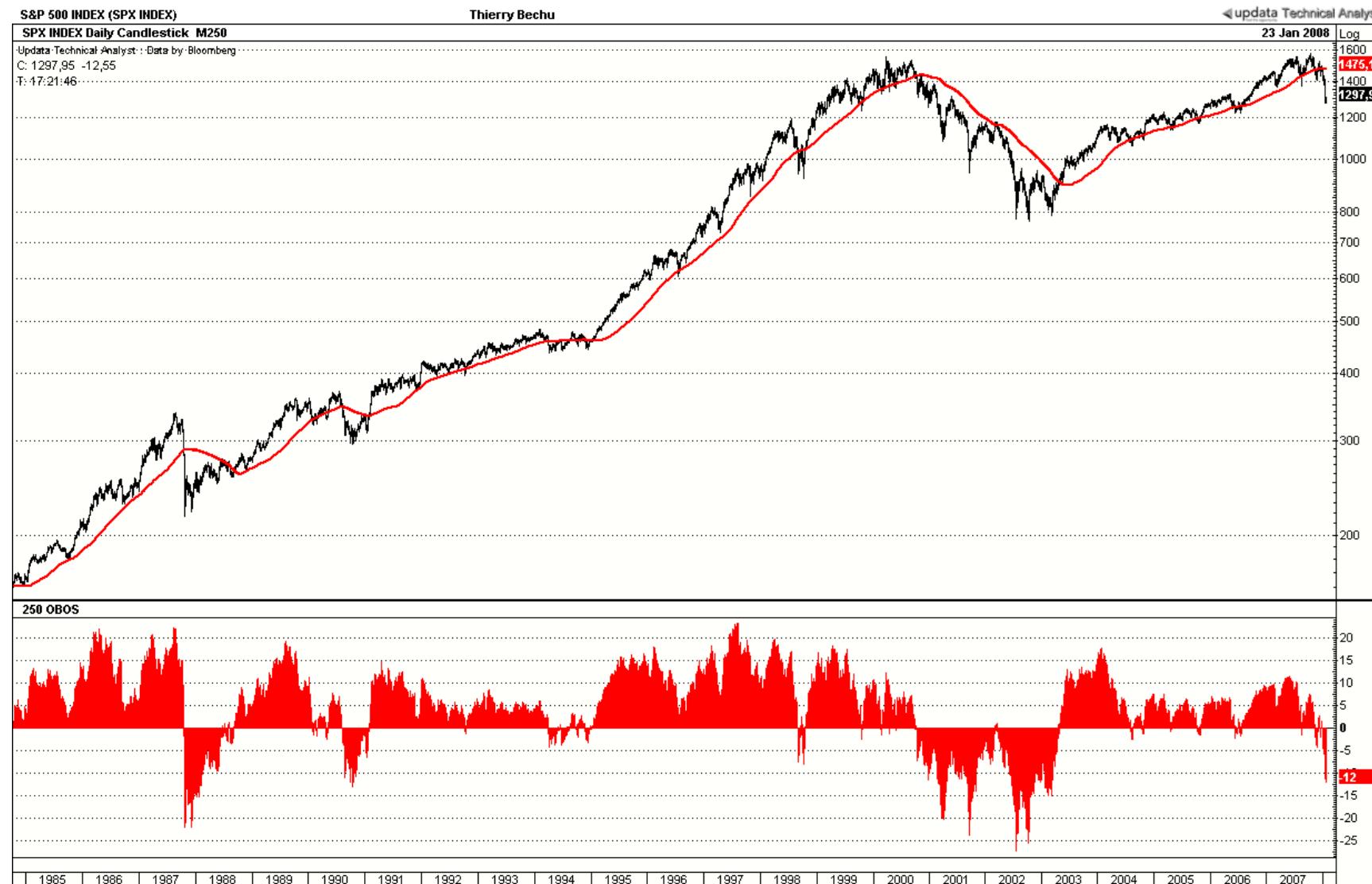
Momentum / rate of change (21 days and 60 days)



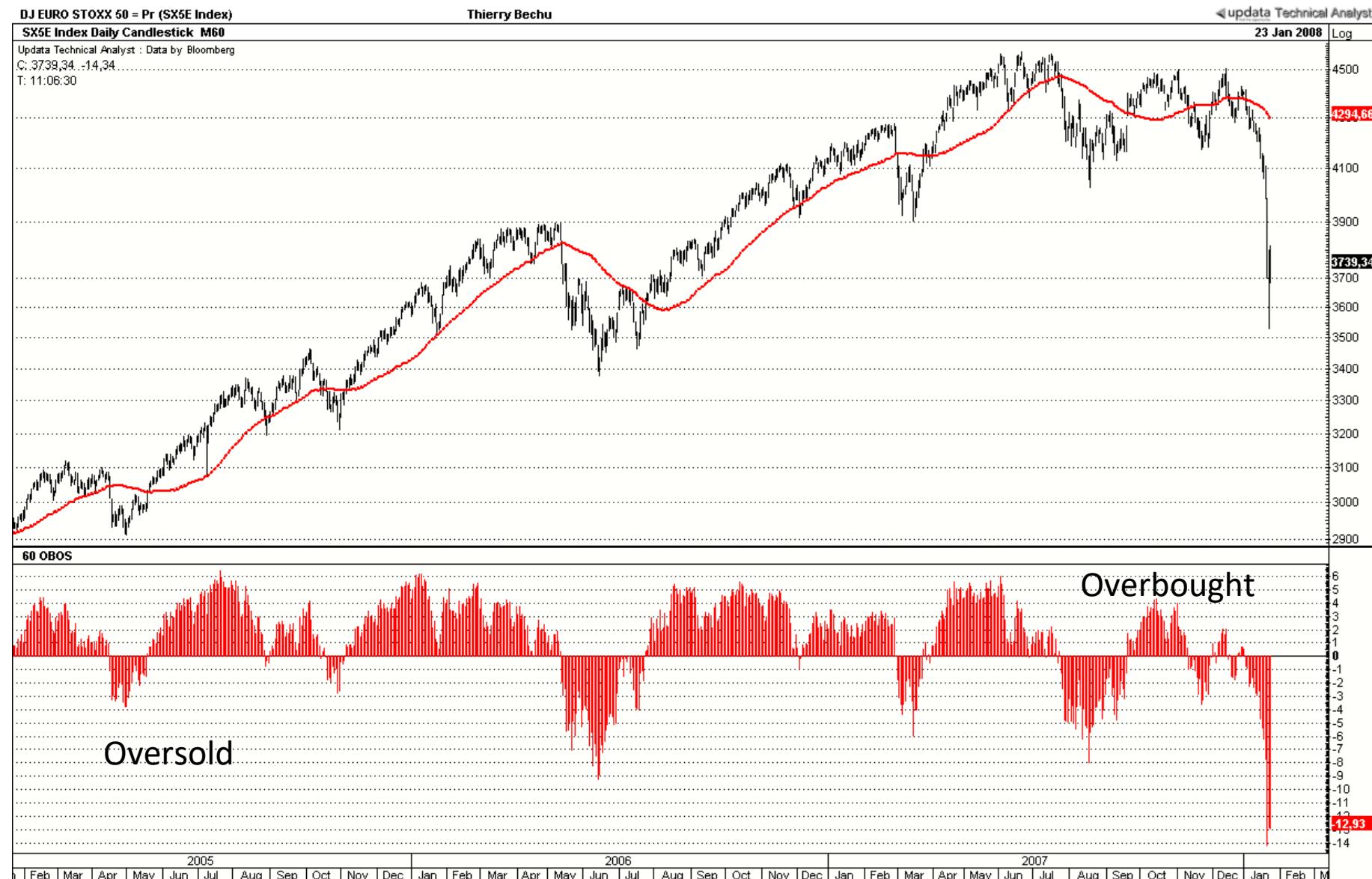
Momentum / rate of change (21 days and 60 days)



Moving average & moving average oscillator



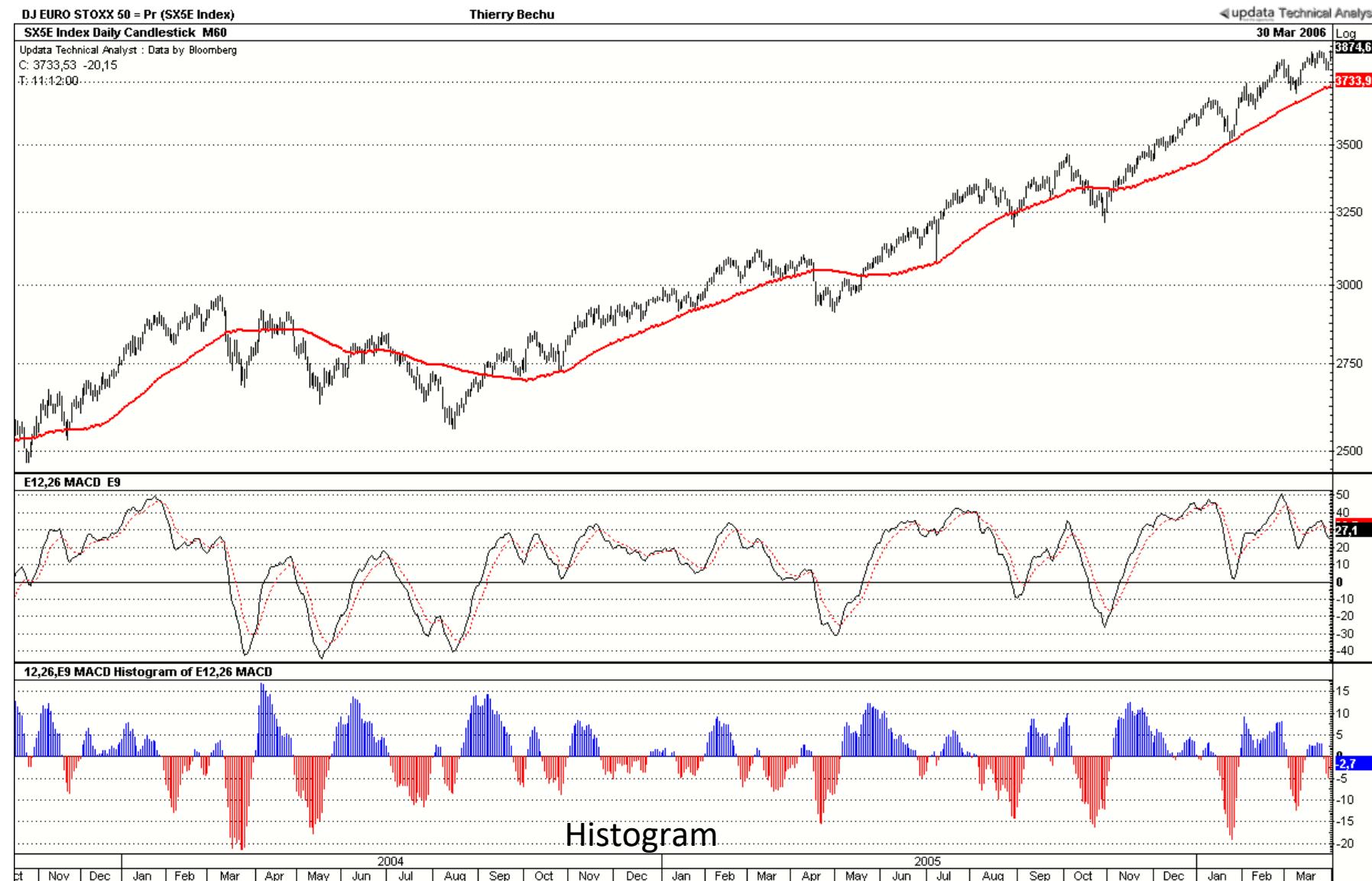
Moving average & moving average oscillator



Moving Average Convergence Divergence (macd)



Macd + histogram



Relative strength index (RSI)

$$RSI = 100 - \frac{100}{1 + RS}$$

RS = Average of x days' up closes / Average of x days' down closes



Relative strength index (RSI) – very long term – 50 level as bullish signal + trend signals



Definitions : RSI & Stochastics

Technical momentum indicator that compares the magnitude of recent gains to recent losses in an attempt to determine overbought and oversold conditions of an asset.

It is calculated using the following formula:

- Relative Strength Index

$$\begin{aligned} \text{RSI} &= 100 - \frac{100}{1 + \text{RS}} \\ \text{RS} &= \text{Average of } \overline{x \text{ days}^t \text{ up closes}} / \text{Average of } x \text{ days' down closes} \end{aligned}$$

- Stochastic and slow stochastic

$$\%K = 100[(C - L14)/(H14 - L14)]$$

C = the most recent closing price

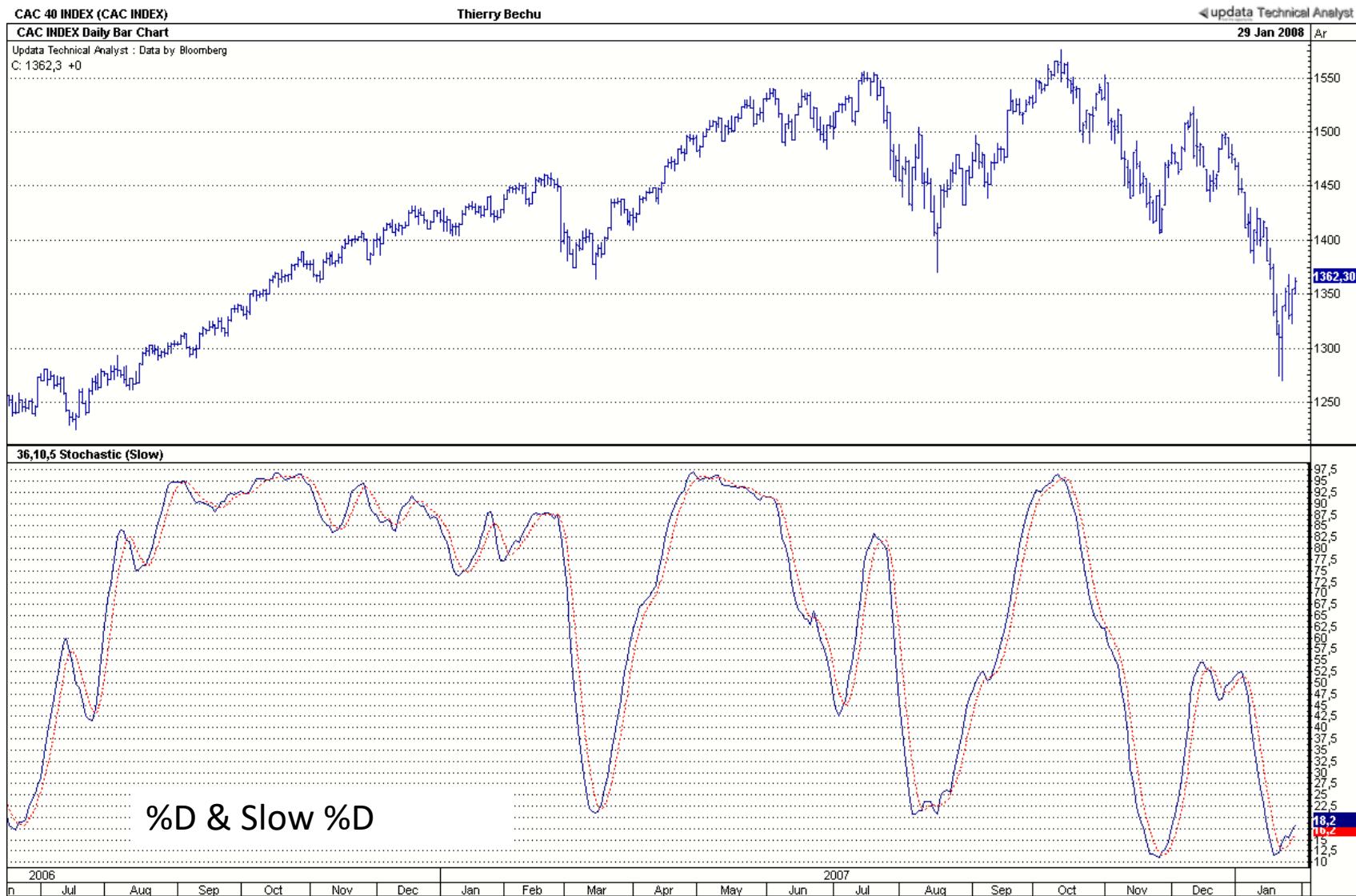
L14 = the low of the 14 previous trading sessions

H14 = the highest price traded during the same 14-day period.

%D = 3 (or more)-period moving average of %K

Slow %D = moving average of %D (plot only the %D & slow %D)

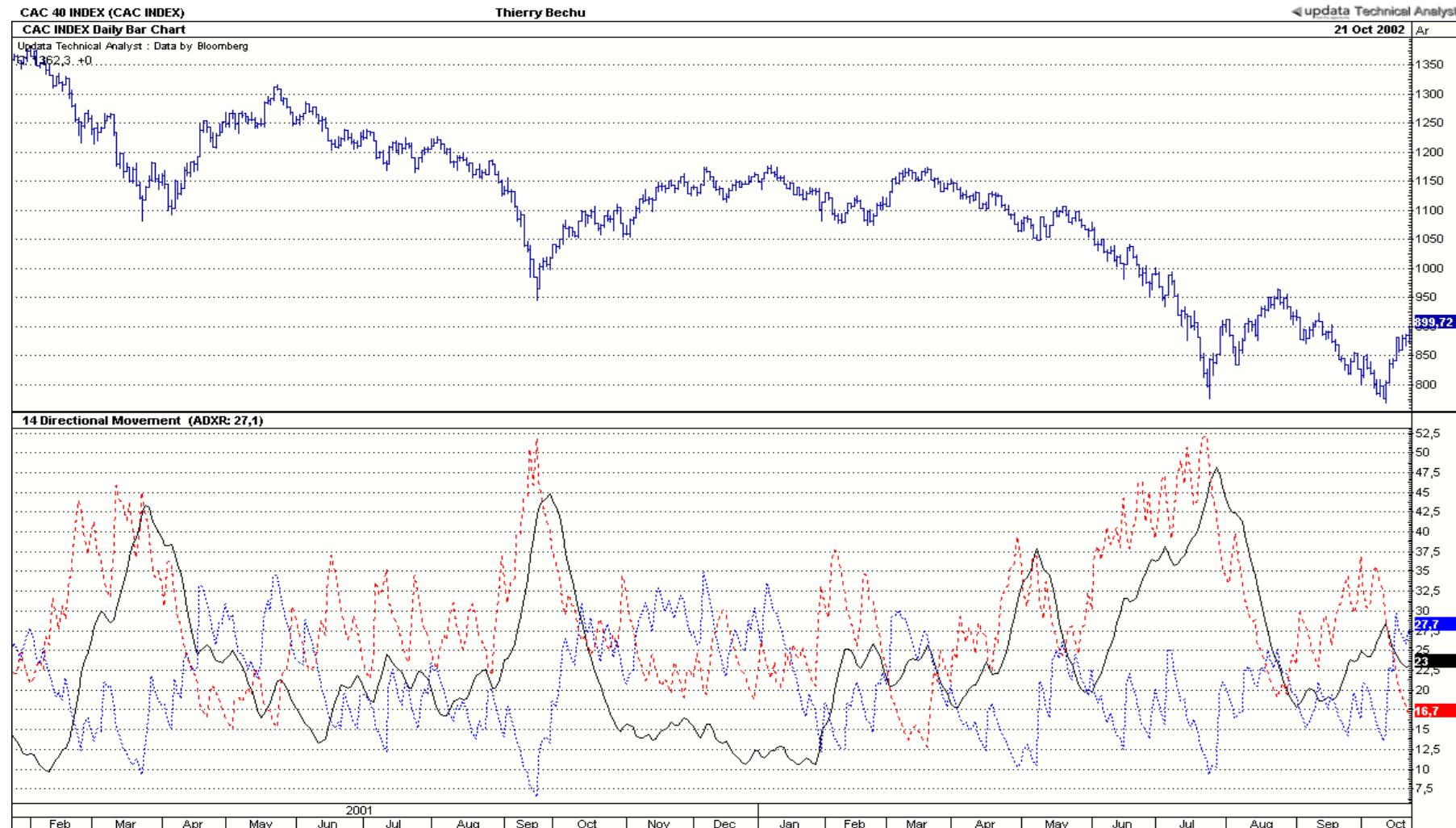
Stochastics (slow % d / %d / %k)



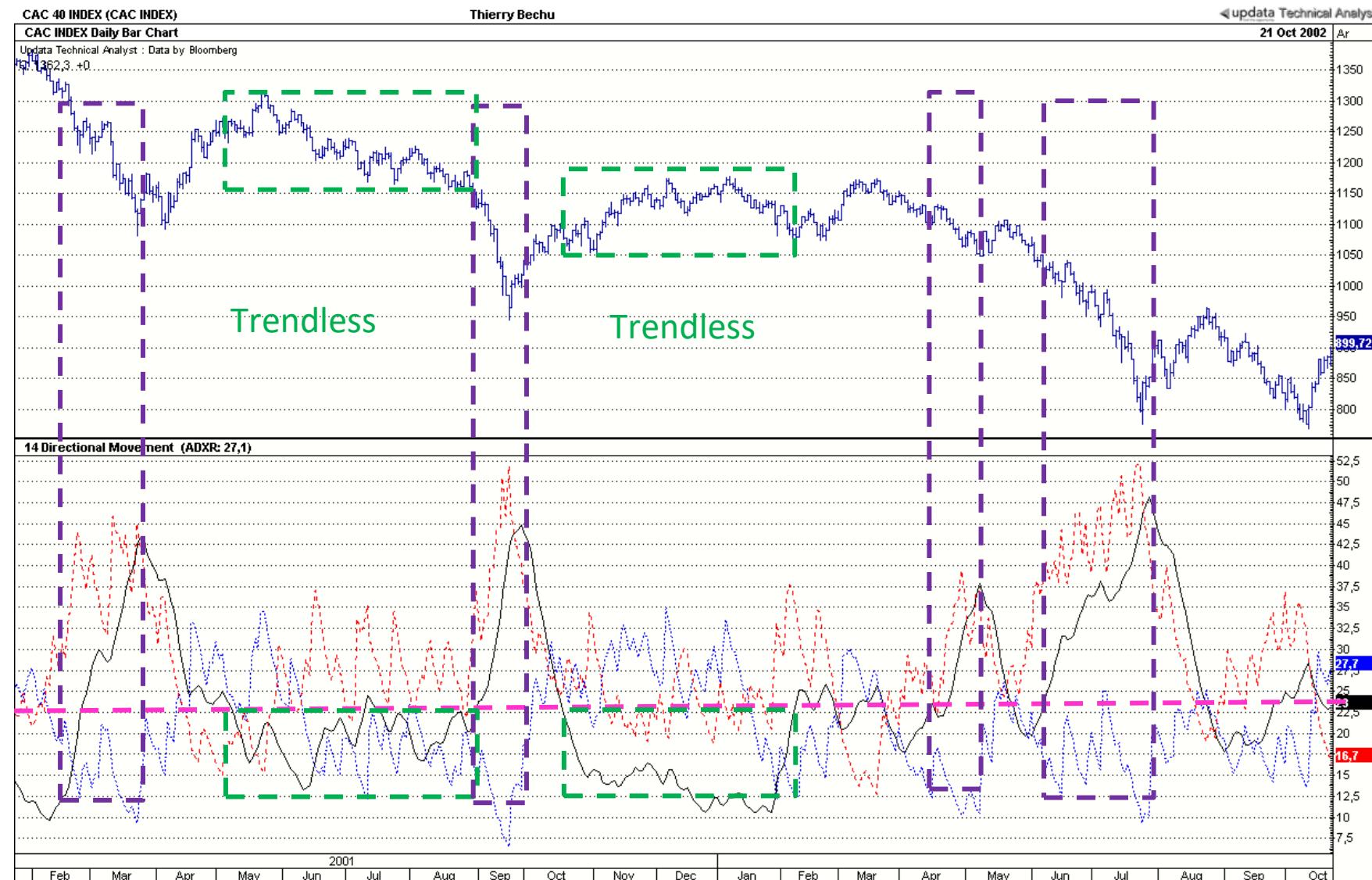
Stochastics



Directional Movement Index (DMI)



Directional Movement Index (DMI)



Contrary Opinion & Market Breadth Indicators

- Intermarket Principle (extrapolation of Dow Theory)
 - Relative Strength (One stock vs the index or vs an other stock)
- Volume based indicators
 - On Balance Volume
 - Up & Down Volumes
 - Volume Strength Index
- Market breadth indicators and Intermarket analysis
 - The principle of Contrary Opinion and the use of consensus indicators
 - Consensus Indicators (Bull-Bear ratios)
 - Market Breadth Indicators
 - Advance Decline Line and Mc Clellan indicator
 - Put-call ratios
 - Volatility Index
 - New Highs / New Lows; % stocks above 200 days MA;
 - ARMS Index or TRIN indicator