

WORKING PAPER

Leon Wansleben

Inventing the amateur speculator.

New modes of inclusion in the US stock market, 1920s to 1940s



Leon Wansleben

Inventing the amateur speculator. New modes of inclusion in the US stock market, 1920s to 1940s

Workingpaper des Soziologischen Seminars 02/2013
Soziologisches Seminar der Universität Luzern
Oktober 2013

Kontakt:

Leon Wansleben
Soziologisches Seminar
Frohburgstrasse 3
Postfach 4466
Büro 3.A07
CH-6002 Luzern
leon.wansleben@unilu.ch
T +41 41 229 56 93

Copyright by the author(s)
Review: Martina Merz

ISSN gedruckt: 1663-2532; online: 1663-2540

Downloads: www.unilu.ch/sozsem

Universität Luzern
Kultur- und Sozialwissenschaftliche Fakultät
Soziologisches Seminar
Frohburgstrasse 3
Postfach 4466
CH-6002 Luzern

T +41 (0)41 229 55 53
F +41 (0)41 229 55 65

Abstract: This paper analyses the role of investment manuals in the development of amateur speculation. It is argued that a relevant group of investment manuals – especially focused on “chart analysis” - do not give recommendations for easy profit making but rather popularize specific techniques of market observation and analysis as well as specific speculative subjectivities. This group of manuals thereby contributes to the establishment of the figure of self-reliant amateur speculator. In periods of stock market crises, this figure becomes important for legitimizing continued popular participation in the markets, especially as publics start to distrust their professional financial advisors. The argument of the paper is developed historically: It focuses on changes in the market for investment manuals in the period from 1920s to the 1940s (i.e. before and after the Great Crash).

Keywords: *sociology of financial markets; stock market participation; amateur speculation; investment manuals; technical analysis; financial charts*

1. Modes of inclusion

Stock ownership and participation in financial markets has become a widely observable phenomenon. Only in the US, the investment boom of the 1990s witnessed more than 50 per cent of the population investing in financial markets (Davis 2008).¹ While financial crises have caused periodic withdrawals from the market, recent levels of participation remain much higher than in the mid 20th century: Statistics from 2012 show that about 46 per cent of US citizens own stocks directly or indirectly (Wolff 2012: 80).

Whether these rates of participation are too high or too low (given level of wealth etc.) is a complex question. Moreover, participation rates vary considerably for different strata of the population as well as for different countries. However, setting these important questions aside, one might also ask which culturally coded practices, social relations and conceptions of agency mediate non-professional stock market participation. Market participation can, for instance, be mediated by relationships of professionals with their clients.² Lay investors can delegate their investment decisions to consultants or follow advices from bankers, independent financial advisors, financial analysts, fund managers etc. (Lounsbury 2002; Wansleben 2012). Here, it should be noted that finance professionals do not just tell investors where to invest, but they also frequently motivate these investments in the first place by virtue of advertisements and recommendations (Knorr Cetina 2011). Furthermore, professionals' advices and products allow lay persons to construe market processes in terms of personal relevance and expectations; and even if expectations are disappointed, participation is often maintained because professionals can make sense of failures and can re-invoke the promises for rational financial planning (Langenohl 2012). Indeed, professionally mediated participation seems to be widespread: For instance, in the US, most investors do not hold stocks directly but through professionally managed mutual funds (Davis 2008: 21).

An additional mode of participation in financial markets consists in actively betting on financial assets on the basis of personal expectations and techniques. For instance, the phenomenon of day trading has recently received more scholarly and media attention (Preda 2009b; Preda forthcoming; Barboza 2010). It consists of speculation conducted from one's home computer. This can either be a leisure time activity or a semi-professional practice alongside retirement, unemployment or a part-time occupation. In stock ownership statistics, day traders' activities do not feature prominently. However, turnover statistics from different markets provide cues about their empirical relevance. For instance, according to the most recent figures of the Bank for International Settlements,

¹ In Germany, stock ownership doubled in the period between 1997 and 2001 from six to twelve million (Schimank 2011: 509). Today, about 14 per cent of the population own stocks directly or indirectly (DAI 2012).

² On professional-client relationships as modes of inclusion, see Stichweh (2009).

the statistical category of ‘retail investors’ generates between eight to ten per cent of the average daily volume on the \$4-trillion-dollar currency markets (King & Rime 2010: 39).³

It is difficult to empirically disentangle profession-mediated and amateur speculation. Both may share common causes. For instance, some authors argue that financialization is a general trend in Western societies (Langley 2007). Widespread financial investment is conceived as the result of disintegrating social security systems and a move towards individualized financial care, mediated and managed by the markets (Davis 2010).⁴ Sociologists observe how states promote and subsidise new pension and life insurance schemes; and financial literacy has presumably become a necessary bourgeois competence.

With the above in mind, this paper asks: How can the second mode of participation – i.e. amateur involvement in financial markets – be sociologically explained? In other words, how and why do non-professionals acquire knowledge, competences and agencies so that speculation can become their regular practice?

Taking up this question, many authors focus on media discourse as a source for speculative motivations and identities (Aitken 2007; Fraser 2005; Stäheli 2007). Books, articles, advertisements and, more recently, TV programmes and internet portals supposedly seduce yet-to-become investors and pull them into the financial sphere (Stäheli 2004). Some authors fear that, as a consequence of this process, people tend to overestimate their financial knowledge and skills, hence, causing mispricing, crises (Barber & Odean 2001); moreover, losses may result in a feeling of “helplessness” (Schimank 2011). However, as argued in this article, critiques of seductive media discourses do not just come from academia, but also from the financial sphere itself and constitute an *internal* process of differentiation.⁵ More specifically, while accepting the possibility of universal participation in stock markets, promoters of amateur techniques of speculation reject, rather than affirm seductive imaginations of easy profits or readily available professional solutions.

Here, I reconstruct this differentiation by analysing different types of products on the market for investor information, technologies and advice.⁶ I show that the group of products, which consists of manuals, software or workshops for amateurs, are marketed as explicit alternatives to the offerings of banks, insurances and the funds industry. The core element of the former products is not usually

³ In Asian countries such as China and Japan, corresponding shares of day trading in terms of overall volumes are even higher (Barboza 2010).

⁴ Langley writes that “the making of everyday investor identities and the financialization of Anglo-American capitalism are deeply bound up with neoliberal governmentality that stresses personal responsibility for individual freedom and security.” (2007: 78)

⁵ Indeed, internal differentiation or individualization of modes of inclusion within sub-systems is a general trend; see Bohn (2008: 182).

⁶ Investor clubs are also important institutions for the formation of amateur speculation; see Harrington (2009).

investment advice but instruction and/or facilitation. A most recent example are online brokerage platforms that offer low cost internet applications with which people can get access to online trading platforms, set up their trading accounts, draw on analytical tools and even use considerable leverage depending on national legislation.

2. Technical analysis as an amateur speculation technique

In this paper, I focus on products that contain instructions on how amateurs should analyse the stock market and arrive at their trading decisions. Indeed, for that purpose, many amateurs use “technical analysis.” In other words, they use chart visualizations in order to identify trends in prices and to define the entry and exit points of their trading positions. For instance, a recent poll by CitiFX Pro shows that about 90 per cent of its respondents (consisting mostly of day traders) use technical analysis at least partially (CitiFX 2010).⁷

Already in early publications between the 1920s and 1940s, different writers tried to promote technical analysis as a way to show how amateurs could succeed on the stock market.⁸ Most of these writings appeared as a reaction to the Great Crash of 1929 and the subsequent disillusionment on the part of people towards the promises of financial advisors.⁹ Instead of re-invoking these promises or trying to re-establish trust in professionals, technical analysts promoted a novel technique. The technique would be learnt through self-instruction and could be practiced with no reliance on any expert opinion. Readers should, after following the instructions, draw and interpret charts on the basis of readily available quantitative information such as prices, and volume ratios.

Hence, my paper can thus also be read as a new sociological perspective on technical analysis. According to Alex Preda (2007; 2009a), the crucial aspect of technical analysis or “chartism” is that it constituted the first version of professional investment advice. By contrast, I argue that, at least from the 1930s onwards, chartists invented amateur speculation as a distinct practice, inde-

⁷ Mayall writes: “Despite continuing disagreement about the effectiveness of TA [technical analysis, LW], its practical use has since grown enormously in popularity and exposure, especially among non-professional traders who have entered the market in unprecedented numbers in an individualized, consumerist environment which encouraged and appeared to allow them to take control of their financial futures.” (2008: 210)

⁸ Within financial economics, technical analysis is usually portrayed as an obscure belief in trend patterns: At least according to most studies in financial economics, such patterns in prices cannot and actually do not exist. Burton Malkiel, for instance, claims that “what are often called ‘persistent patterns’ in the stock market occur no more frequently than the runs of luck in the fortunes of any gambler playing a game of chance [...] Technical analysis is akin to astrology and every bit as scientific.” (2003[1973]: 148-51) Some authors, however, challenge these statements (Lo, Mamysky & Wang 2000). I here focus on the sociological significance of the technique rather than on its profitability.

⁹ “Looking forward, the great leap for technical analysis can be dated in the thirties, as a reaction to the stock market collapse. Most of the books were printed during that decade: Rhea in 1932, Schabacker in 1932, De Villiers and Taylor in 1933, Elliott in 1938.” (Mattern 2010: 12)

pendent of any expert advice.¹⁰ Admittedly, during the mid 20th century, this practice was more fiction than reality. The strong decline in stock market participation after 1930 even suggests that there was no immediate market for technical analysis manuals among the general public. However, as the cited statistics on contemporary day trading show, the pioneering semantics and techniques still had considerable, long-term effects. They can thus be interpreted as *pre-adaptive advances* (Stichweh 2006) that would become crucial for later processes of differentiation within the financial sphere.¹¹

The following sections are mainly based on a historical contextualization and a close reading of relevant investment manuals. These were written, among others, by Jesse Livermore, Charles Dow, Richard D. Wycoff, Humphrey Neill, William P. Hamilton, William D. Gann, Richard W. Schabacker, Robert D. Edwards and John Magee.¹² Relating this these writers, the paper reconstructs transformations in the period between 1920 and 1940 that concerned strategies of addressing the US public as potential or actual investors. I particularly emphasise a rupture after the Great Crash when the group of the authors just mentioned distanced themselves from the seductive tone of earlier writings to propose instead guides for self-instruction.¹³ In the fourth section, I focus on the question of *why* – among the many imaginable techniques of investment - technical analysis could successfully associate itself with a particular mode of market participation. The article concludes by reflecting on the historical material in the light of contemporary forms of amateur online investing.

3. From Promises to Techniques

Historical accounts show that during the 18th and the 19th century, boundaries between insiders such as bankers, brokers, traders etc. and outsiders of stock markets became more clear-cut and

¹⁰ Preda's (2009a) argument is that, as financial markets became institutionalized and technologized through the price-recordings of the stock ticker in the late 19th century, a certain group formed around techniques and strategies of "privileged witnessing" of ticker information, primarily by visually charting, interpreting, and forecasting price variations. According to Preda's account, this group formation was a contingent sociocultural process, based on networks among market insiders, support by academics, creation of charismatic leadership, and the development of an idiosyncratic language.

¹¹ The notion of preadaptive advances, borrowed from evolution theory, means that an invention is built into the social structure but its true impact is retarded and only unfolds at a later point in time, in accordance with other changes (Stichweh 2006).

¹² It was not very hard to identify these as canonical authors mainly because technical analysts themselves cite them as the founding figures (Lo & Hasanhodzic 2009).

¹³ Thus, in these writings, financial-economic discourses merged with pedagogical concepts: the individual should be able to master his/her everyday problems by drawing on the help of problem-specific programmes of self-instruction. I will not comment on the underlying general societal trend towards self-governance but I thank Cornelia Bohn and Andreas Langenohl for helpful comments in this direction; for a more general account see, for instance, Helmstetter (1999).

formalized (Carruthers 1996; De Gode 2005; Preda 2009a). Critical for this separation was the monopolization of legitimate trading by cartels of traders who set up the first official stock exchanges. Investments by private persons were possible but depended to a large extent on close ties to brokers who would not only arrange deals but also provide information and recommendations. During this time, insiders invented a new genre of investment literature, containing a mix of investment advice, moral guidance as well as biographical reflections: “Fiction, manuals, and biographies were part of a larger, sustained effort to convince the public that the stockbrokers belong to an honorable profession that has nothing to do with speculation or fraud” (Preda 2009a: 80). Such “insider stories” were complemented by “outsider stories”. The most prominent group of critical writers about the stock market were the *Scriblerians*, among them Alexander Pope (Nicholson 1994). This genre also flourished in the United States: Lefèvre’s (1901) *Wall Street Stories*, for instance, narrate the market according to distinct characters (such as the big financier with a well-known name on the street, his rivals, industrial barons, corporate victims of big finance etc.), whose fates personalize and moralize financial outcomes.¹⁴

Arguably, this constellation was dissolved by a new technology – the stock ticker (Preda 2006).¹⁵ The ticker enabled information about stock market transactions (prices and volumes) to be telegraphed within a short time to broker offices (Meier 2005), where it would be received electronically and printed on paper strips. Investors at different locations were thus simultaneously informed about market data and could send back telegrams to the stock exchanges with orders on intended transactions. Stäheli (2003; 2004) argues that the ticker thus brought about a new market principally accessible to everyone and kept together by a constant flow of standardized price information (see also Knorr Cetina & Preda 2007).

However, if we look at the statistics of actual stock market participation in the United States, we see that mass participation did not follow immediately. The ticker was first introduced among New York brokerages during the 1860s and 1870s¹⁶ but more widespread participation only truly emerged after the First World War – from “a few hundred thousand before World War I (about 3 per cent of U.S. households) to an estimated 8 million by 1929 (roughly a quarter of households)”

¹⁴ “Descriptions and images of capital often connect capital to the special force or elite it is often said to be synonymous with: the ‘financial interests,’ ‘Wall Street,’ the ‘financial operators,’ or some other center of authority and capacity. References abound, for example, that link finance capital with a small, unknowable elite.” (Aitken 2007: 7)

¹⁵ The ticker is a specific financial market technology that combines telegraph and printer. It was invented by Edward A. Callahan, an engineer of the American Telegraph Company, and redesigned by Thomas Edison. The ticker produced two strips of paper, which indicated all transactions on the stock exchange floor, i.e. the code of the company traded as well as price and volume of the deals. In the 1890s, the ticker could send this information to other American cities within 90 seconds and to Europe in about four minutes (Meier 2005).

¹⁶ “Ticker operators were installed on the floor of the New York Stock Exchange (NYSE) and in the brokerage offices of David Groesbeck; Work, Davis & Barton; Greenleaf, Norris & Co; and Lookwood & Co, in December 1867” (Preda 2006: 454).

(Ott 2009: 45).¹⁷ Take, as another evidence, statistics on one of the big new industrial companies: Shareholders in the Telephone Company's stocks numbered 7,535 in 1900; by 1929, this number had increased to 454,596 (Means 1930: 563).¹⁸

Possible causes for this "retarded" expansion are numerous: We can think of a slow or restricted diffusion of the stock ticker technology as one of them.¹⁹ More important perhaps are other factors, such as increases in middle class wealth or a surge in stock offerings by industrial companies after the turn of the century.²⁰ Here, I focus on yet another aspect: A new mode of addressing potential investor audiences was only introduced during the 1910s and 20s. A critical step in this development was the Federal Government's Liberty Bonds campaign during the First World War. The purpose of this campaign was to demand general public's investments in government bonds in order to finance the war. Crucially, the government also used entertainment such as Hollywood star events or poster advertisements in order to encourage potential investors. Figure 1 presents a poster from 1917: We see an advertisement that propagates financial investment as the middle class' immediate contribution to a project of national *and* personal interest; the poster's message is that those interested in shrugging off the threat of "Prussianism" and in winning the war, should become Liberty Bonds investors.

Besides the immediate success of the Liberty Bonds campaign in attracting new investor classes,²¹ it also served as a blueprint for subsequent efforts at addressing (potential) investor audiences.²² For instance, from 1921 onwards, the New York Stock Exchange pursued a similar public relations campaign in favour of broad stock ownership, using advertisements, movies, press relations etc.

¹⁷ "The number of retail investors in the U.S. stock market increased...especially after World War I and into the 1920s [...] Whereas in the past, the U.S. securities markets had largely been the preserve of the rich investor, these developments also made the middle class a new factor in its expansion even if the 'democratization' of the market fell short of some pundits' claims." (O'Sullivan 2007: 45)

¹⁸ Galbraith (1980[1954], p. 21) focuses on the expansion of "leveraged" speculation, measured in terms of broker loans taken by investors in order to increase their profit opportunities (and risks). In two years, from 1926 to 1928, the total dollar sum of these loans grew from about two and a half to almost six billion.

¹⁹ "The 1927 edition of *The Magazine of Wall Street* estimated that in the United States there were 400 tickers in 1890, 900 in 1900, and 1,200 in 1902, while another publication estimated the existence of a striking 23,000 tickers in the United States in 1905." (Lo & Hasanhodzic 2011: 70)

²⁰ On the New York Stock Exchange, in 1885 only 151 different stocks were traded while in 1930, the number was 1,273 (O'Sullivan 2007: 11). "By 1930, the U.S. stock market had become a large and widely diversified market for the stocks of industrial, utility, and railroad companies" (ibid, 4).

²¹ Roughly 30 million US citizens bought these Federal small-denomination bonds (Ott 2009: 56).

²² "Efforts to sell war bonds during World War I created a retail distribution channel to Main Street. Retail brokerages built on this precedent, and acceptance of stock ownership by those outside the wealthiest tier grew during the 1920s as the stock market number of shareholders doubled from 2.4 million in 1924 to 5 million in 1927, and doubled again to 10 million by 1930." (Davis 2008: 14)

(Ott 2009).²³ The aim of this campaign was to provide new legitimacy for stock market speculation: The middle class stock-owner was no longer portrayed as a financial soldier in the European war, but as a shareholder in America's prospering industry (Aitken 2007). The stock market was presented as an economically efficient and highly democratic institution.

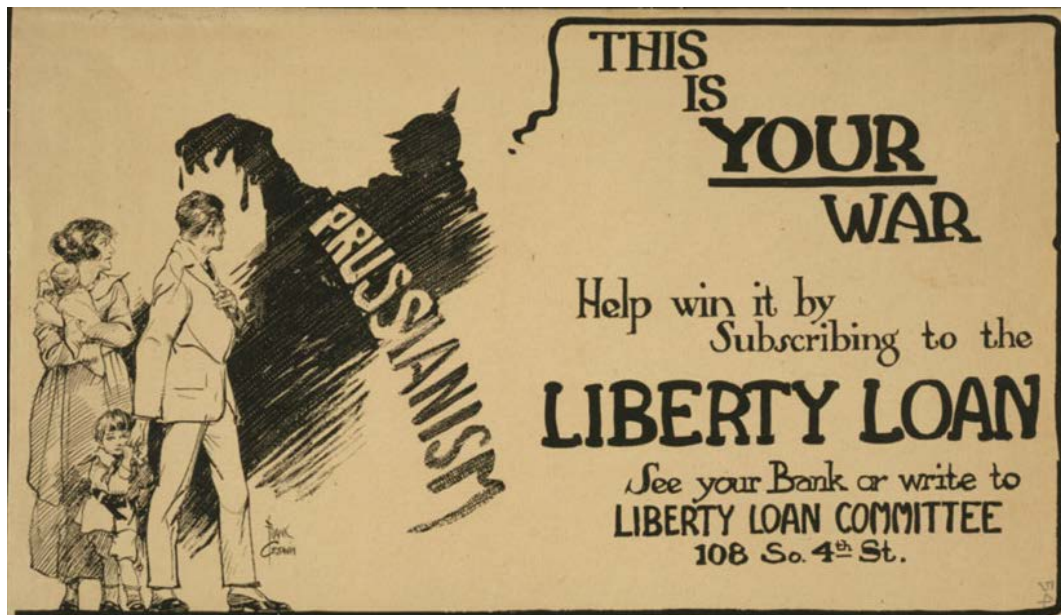


Figure 1: A poster of the Liberty Bonds Campaign, 1917; Library of Congress Online Catalogue.

In the course of the 1920s, these claims for universal participation in the stock market became widespread.²⁴ Moreover, numerous newspapers, magazines and more specialized publications featured the stock market as a topic of general interest:²⁵ “[T]he strange phenomenon of ‘public opinion’, which grew weightier yet also more elusive as mass-circulation magazines for the urban middle class proliferated, increasingly articulated the desires and anxieties of the new corporate white-collar world. It was from just those precincts that the stock market was drawing its newest

²³ Visual advertisements remained a critical element: “Visuality was, in some important ways, at the center of the new forms of commercial culture that began to impinge upon all aspects of the economy throughout the twentieth century. Of particular importance in this regard is the emergence of a rationality that begins to frame advertising, and its newly allied sciences, as a form of expertise capable of intervening deeply within the public body and all of the ‘average’ populations that constitute the body [...] The effect at this level is the mobilization of the unconscious bases of individual action: desire, memory, or sensory reaction.” (Aitken 2007: 47-48)

²⁴ John J. Raskop claimed that “Everybody Ought to Be Rich” (headline from the Ladies Home Journal) and that it would suffice to invest 15 dollars monthly for 20 years in order to gain a profit of 80,000 dollars (Galbraith, 1980[1954]: 52).

²⁵ In New York, people had among others the New York Daily Investment News, Wall Street Journal, New York Herald Tribune, New York Times, New York Sun, Magazine of Wall Street, Forbes Magazine, Annalist, Barron's, The Atlantic Monthly, The Century and Harper's at their disposal, all providing information about the stock markets.

recruits” (Fraser 2005: 222). Thus, mass media now actually *presupposed* the legitimacy of financial markets and the general public’s interest in investment matters. The central concern rather became how the public could invest its funds profitably. A whole new market was thus created for experts, brokers and others, who claimed to know how one could make a fortune (ibid, 228). As an example, McNeel Financial Services launched an advertisement campaign claiming that their customer had made 70.000 dollars after reading their publication, “Beating the Stock Market” (Galbraith 1980[1954]: 42) (see also figure 2).

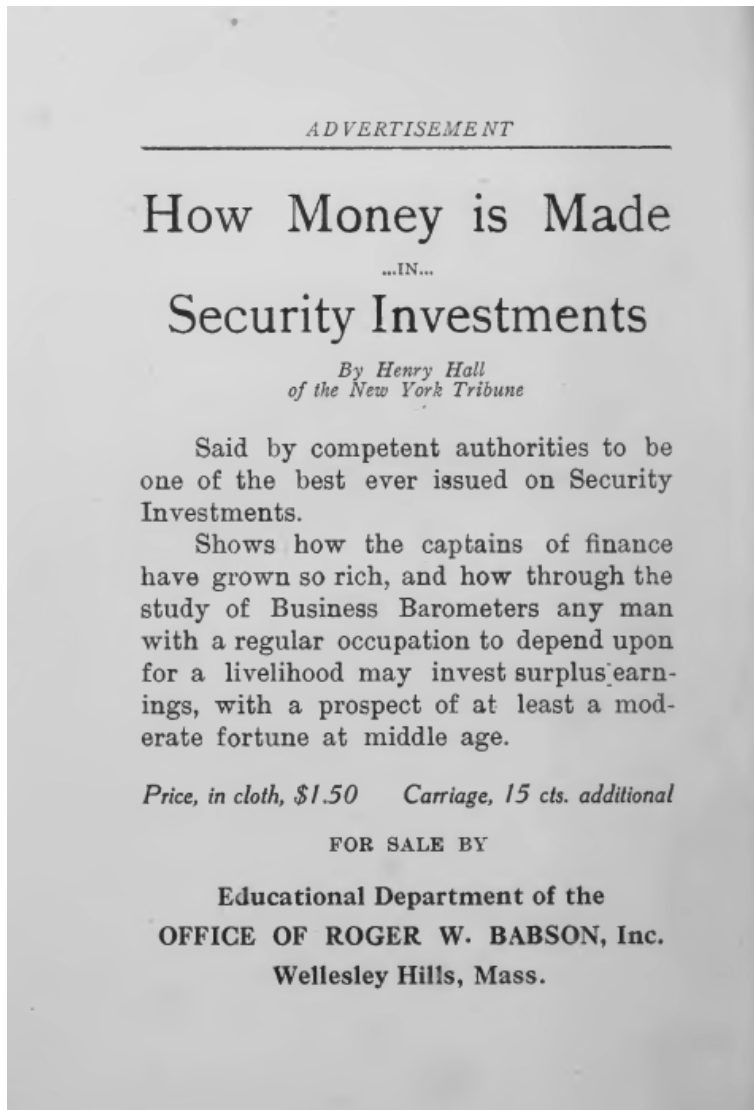


Figure 2: An advertisement for an investment guide book, printed in Babson 1909 (unnumbered page).

The Great Crash obviously constituted a rupture within this process of expansion. The idea that the public could participate in stock markets could hardly be promoted without any reservations; nobody would buy into the promise that “everybody can get rich quickly and easily”. One possible consequence of this new situation was to argue against amateur participation in financial markets, which could only end in disaster (De Goede 2005: 79-85). The other option was to continue pro-

moting broad participation in the markets but redefining the conditions under which this participation could be successful. The authors discussed here chose the latter option: They reconceived speculation as - a peculiar kind of - *work*, which could be learnt even by amateurs.²⁶ Thus, they argued that those who survived on markets were the ones who refused to rely on others and started to take their investment decisions independently. On the market for investor advice and information, the respective authors started to propose courses of self-instruction, through which the public was supposed to acquire the necessary knowledge and skills. Thus, a new genre of manuals emerged, which mainly consisted of instructions on how to observe the market and how to arrive at efficient trading decisions. The underlying rationale of this genre was that, those who would follow the instructions, had no guarantees, but increased their chances for financial success.

Many of the writings on technical analysis appeared at that time and exemplified the new approach. On the one hand, writers on technical analysis proposed the possible inclusion of all citizens into financial markets: “Anyone who will devote sufficient time to the mastery of [calculative, LW] principles can place himself in possession of the knowledge that will put him on an equal footing with the influential forces, whether they be insiders or outsiders” (De Villiers & Taylor, 2000[1933]: 47). On the other hand, this “equal footing” was no longer a result of simply following the experts’ advice. To the contrary, technical analysts recommended their readers to entirely isolate themselves from expert opinions: “Adhere to the principle of isolation. Turn a deaf ear to all gossip, rumor, inside tips, and other information“ (ibid, 33). The required competences could be learnt by anyone who would muster the necessary discipline and dedication. Lay persons were simply asked to devote “only an hour or so a day, and perhaps only a few hundred dollars” (Schabacker, 2005[1932]: XX) to speculation. No further requirements were made: No “education, that is, a college or highly specialized training [is needed]. Neither is it desirable that one be of the so-called shrewd or clever type. While a trained mind is helpful, market education is more important to the prospective successful market operator than an intensive study of higher mathematics, or an inexhaustible knowledge of the classics” (De Villiers & Taylor, 2000[1933]: 155). Technical analysis was portrayed as “a skill that can be acquired by anyone of ordinary intelligence” (Edwards & Magee 1966[1949]: 2).

4. Charting the Market

The new technique codified in the manuals primarily relied on charts and charting. For instance, Edwards and Magee, in a seminal guidebook reprinted up until today, describe technical analysis as “the science of recording, usually in graphical form, the actual history of trading (price changes,

²⁶ The famous speculator, Jesse Livermore, is cited with the following sentence: “Speculation is a business. It is neither guesswork nor a gamble. It is hard work and plenty of it.” (Hamilton 1922: 65). De Goede (2005: 114) cites Schabacker, who wrote that even on financial markets you cannot expect “something for nothing”.

volume of transactions etc.) in a certain stock or in ‘the averages’ and then deducing from that pictured history the probable future trend” (1966[1949]: 5). Economic charts, such as line graphs, had been around for quite some time before the existence of technical analysis: They were known in economic analysis from the late 18th century onwards.²⁷ Since the 19th century, graphs were also used in business cycle analysis in order to identify the periodicity of trends (Friedman 2009). Moreover, when technical analysis was developed in the US during the early 20th century, financial charts already filled the pages of newspapers and magazines such as the New York Daily Investment News, Wall Street Journal, New York Herald Tribune, New York Times, New York Sun, Magazine of Wall Street, Forbes Magazine, Annalist and Barron’s; large charts could be found on the walls of banks and broker offices.²⁸ However, in contrast to the visualizations, the purpose of “chartism” was neither to create scientific, nor public knowledge of the economy.²⁹ The new manuals and how-to guides rather associated the making and use of charts explicitly with the problem of how amateurs could become competent speculators. Thus, technical analysts referred to charts as specific tools that could facilitate market observations, reduce the uncertainty of decision-making and impose some discipline on speculators’ behaviour.

In order to understand this transformation, it is important to trace the emergence of a new understanding of the market through the advent of the stock tickers. With the introduction of the new technology, price data became not just more easily available, but also standardized. Now, official prices were recorded that newspapers could cite (e.g. in the form of closing prices) (Knorr Cetina & Preda 2007). Accordingly, market participants’ focus shifted away from the trading activity on the floor or in the streets to the readily available, reliable data. Indeed, even information provided by the stock-issuing firms (especially before the *Securities Exchange Acts* of 1934 and 1935) was conceived far less reliable and easily available than ticker data.³⁰ Despite being objective, infor-

²⁷ A famous example is Quesnay’s *Table Economique* (1767), shown in Morgan (2012: 4). However, more important still for the history of economic graphs and charts is Playfair’s *Commercial and Political Atlas* of 1786: “The first known time-series using economic data was published in Playfair’s remarkable book, *The Commercial and Political Atlas* [...] For Playfair, graphics were preferable to tables because graphics showed the shape of the data in a comparative perspective.” (Tufté 2001: 32). Latour describes these visualizations as critical elements of what he calls “centres of calculation”; see Latour (1986).

²⁸ “In the 1830s, price lists became regular parts of newspapers and price charts of stocks, commodities and interest rates came into existence (...) Their purpose then, as now, was to capture the ‘abstract entity called ‘the financial market’, ‘the stock exchange’ or ‘la bourse’ which was ‘disentangled from its anecdotal ties to the particularities of the marketplace’ - in other words to analyse the stock and not the company. Charts took a variety of forms: portable foldout charts, extra-large charts to be hung on the walls, black-and-white charts, or color charts.” (Lo & Hasanhodzic 2011: 39)

²⁹ This is the argument often found in relation to visual representations in newspapers and other mainstream media; see, for instance, Tanner (2002).

³⁰ Especially with the increase in the number of stocks traded on the exchanges and with expansion of the investing public, one could often know only very little about companies’ operations. The banker J.P Morgan therefore allegedly spoke of “undigested securities” (Hamilton, 1922: 110). Strikingly, ignorance not just concerned the new group of unknowledgeable middle class speculators: O’Sullivan notes that “in some cases

mation was not static: During the entire trading day, paper ribbons poured out of the tickers, which announced changes in prices and market activity.³¹ This stream of prices, then, became investors' central concern and source of profits.³² In his biography of Jesse Livermore, Edwin Lefèvre writes: "Those quotations did not represent prices of stocks to me, so many dollars per share. They were numbers. Of course, they meant something. They were always changing. It was really all I had to be interested in - the changes. Why did they change? I didn't know. I didn't care." (Lefèvre 2010[1923]: 2)

The central problem thus was how this data could be interpreted so that it provided cues about future price changes. Indeed, the immediate solution to this problem was quite pragmatic: Investors simply spent their entire time in brokerage offices in order to constantly read the ticker information. The ensuing technique was called "tape reading" (referring to the printed paper ribbon with price information as "the tape"). Tape reading consisted of permanently following the sequence of prices and inferring, from this synchronous observation, possible prices in the near future (the next minutes and hours). In Wycoff's words, it was "the science of determining from the tape the immediate trend of prices [...] a method of forecasting, from what is on the tape, what is likely to appear in the future" (1910: 10).

As Alex Preda (2009a) plausibly argues, first chart techniques directly emerged from tape reading. Similarly, Donald Mack, in an editorial to one of the classic works of chart analysis, argues: "[I]t probably was...when the old glass-domed ticker machines were churning out the trades as they occurred on the different exchange floors. Situated as these machines were in brokers' offices all around the country, from the start brokers and customers reading the tape and trading on the printed figures must have needed a *fuller picture* at hand of the action that had taken place and was currently happening" (De Villiers & Taylor, 2000[1933]: XVI, my emphasis).³³ Here, Mack specifically

the distributing banker [knew] no more about the issue than [did] his customer" (O'Sullivan, 2007: 43). These concerns escalated dramatically throughout the 1920s, especially as relatively new types of securities such as industrial common stocks hit the market in large numbers. By the late 1920s...'[c]onfessions of incompetence [by investment bankers] reached indecent proportions" (ibid).

³¹ Knorr Cetina and Preda relate this temporality directly to the stream of prices which poured out of the ticker: "First, the sequence provided a material and itemized market memory (...) Second, the tape was an information source; it could be scrolled through, prices at different times could be compared and inferences about market movements could be made (...) The running ticker data began to turn into a streaming epistemic system." (Knorr Cetina & Preda 2007: 124)

³² "In addition to the growth in the number of investors participating in the stock market, there was also a change in their attitudes to investments in corporate securities. In particular, they became more interested in investing for capital gains on the prices of the securities that they held as much as for the income that accrued to them from dividend payments." (O'Sullivan 2007: 46)

³³ Similarly, in 1931, Neill notes that charts are one possible way of organizing ticker tape data: "The tape records the prices at which buyers and sellers have met and agreed upon exchanges of stocks of money. This record may be printed upon sheets, or grouped for a day's business and published in the newspaper. It may be recorded upon charts." (Neill (2000[1931]: VIII).

your judgement tells you when to start and how fast to walk. That is the position of the trained Tape Reader.” (Wycoff, 1910: 117) The problem with charts therefore was that while the tape reader sensed the market in-sync with its unfolding, chart interpretation was supposedly “limited” since chart interpreters had to act “mechanically” and adhere to “rules” that mostly did not work (Wycoff, 1910: 116-122): “The proficient tape reader will doubtlessly prefer to discard all mechanical help, because they interfere with his sensing the trend.” (ibid., 125) What seemed dubious from the perspective of tape readers, then, was not the use of visualizations per se but their analytic value. Correspondingly, in early tape reading and technical analysis publications, charts had the only function of representing price history: “the same thing could be told in words, but you grasp it quicker when you see it in chart form.” (Gann 1923: 51)

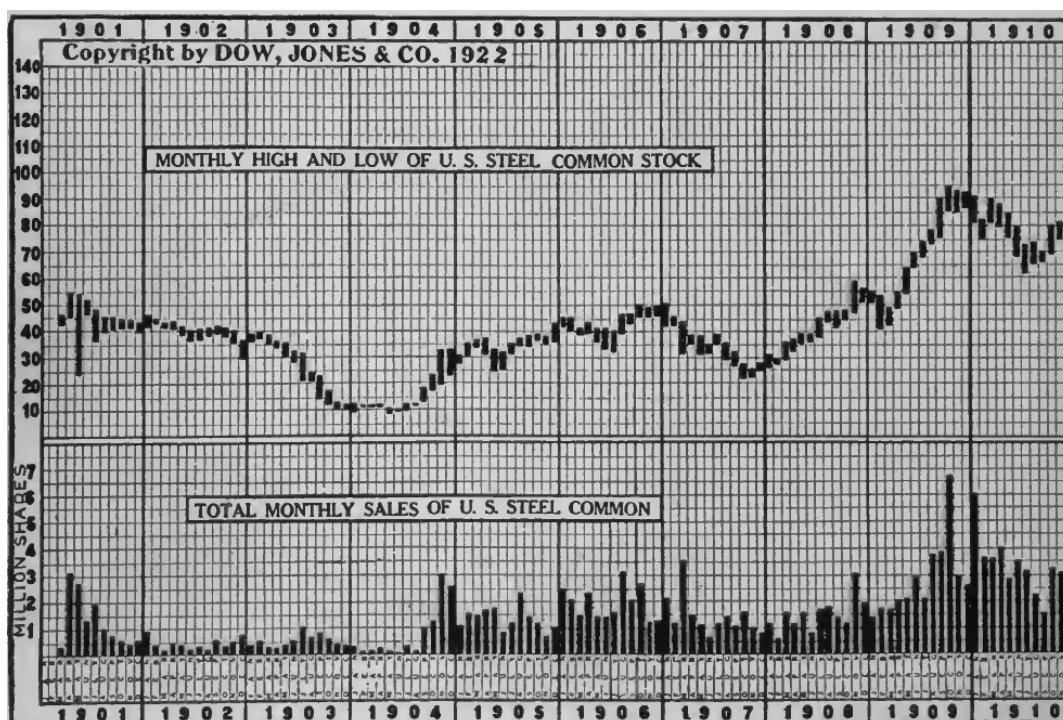


Figure 4: Stock market chart for U.S. Steel common stock, including a price and volume chart, printed in Hamilton 1922 (unnumbered page).

Thus, we can see that the history of financial charts is indeed highly related to a new understanding of price and its interpretation through the techniques of “tape reading”. However, in contrast to what Preda (2007; 2009a) suggests, one can also see that technical analysts had to argue *against* tape readers for a new understanding of charts in order to establish and popularize their technique: While tape readers argued that the ticker tape should be observed directly and synchronously, technical analysts put the charts at the centre of their recommended technique of trading.

Chartists’ first argument was practical: They observed that tape reading still depended on the presence in the boardrooms of brokerages because most people could not privately afford a ticker. With the expansion of market participation, it became increasingly implausible that a broad range of investors could follow the ticker permanently within brokerage offices: “The majority of peo-

ple...are not able to be in personal attendance to watch the trading record unfold itself in a brokerage office from 10 to 3 o'clock each day" (Schabacker 2005[1932]: 5). Moreover, after the 1929 crash, it was even seen as a disadvantage that tape readers, in view of their presence in boardrooms, remained caught in the moods and gossip of the market. Hence, one was "much more likely to benefit by divorcing [oneself] from the excitement, the conversation, the gossip, the impetuositities, and the nerve strain which emanate from the dubious vantage point of the board-room [within the broker offices, LW]" (Schabacker, 2005[1932]: 415).³⁵ The advantage of charting techniques, in comparison to tape reading was hence that it could be done at any place, at any time by any layperson and only required a simple set of affordable tools: "cross section paper (almost any kind can serve), a daily newspaper which gives full and accurate reports on stock exchange dealings, a sharp pencil and a few minutes of time" (Edwards & Magee 1966[1949]: 8).³⁶

The second argument was epistemic and concerned the question of what charts could actually depict. Tape readers had construed charts only as aids for memory and illustration.³⁷ However, for "chartists", the lines and bars on charts could reveal a distinct, invisible phenomenon: These were the different, long- (annual) mid- (monthly), and short-term (weekly) trends. The view that markets are indeed driven by distinct temporal patterns in collective behaviour was already put forward by Charles Mackay in the 1840s (Stäheli 2007) and famously advocated by Charles Dow in his *Wall Street Journal* columns (Lo & Hasanhodzic 2011: 82).³⁸ Not least because of the dramatic up- and downswings in prices, market trends became more explicitly recognized by the general public during the 1920s and 1930s.³⁹ As argued above, tape readers followed trends by being immersed in

³⁵ "The tape and boardroom gossip has caused more losses to traders and investors than most all other reasons combined." (De Villiers & Taylor 2000[1933]: 158)

³⁶ As seen on figures 4 and 5, the chart analyst should draw vertical lines ("bars") for each given time interval (day, week, month) on the paper, corresponding with each interval's price range (lowest and highest transaction prices). In the below part of the cross section paper, one additionally drew a separate chart for volumes, also indicated by vertical bars (in given units of hundreds, thousands etc.). Different scaling, such as arithmetic or semi-logarithmic, should be tested.

³⁷ This understanding was only changed slightly when charts were reconceived as cognitive tools. De Villier and Taylor argued, for instance, that charts allow "instant comparison and maximum condensation" and are therefore "vastly superior to the memory of any human being" (2000[1933]: 23) which made them, in their eyes, "better and far more reliable for judgement than can be had from tape reading" (ibid., 60). For a similar argument on visualizations, see Heintz & Huber (2001).

³⁸ "A defining element of Dow theory is the idea of a trend." (Lo & Hasanhodzic 2011: 82)

³⁹ Some authors of the time still believed that the market can be distinguished according certain investor classes: Neill (2000[1931]: 7), for instance, distinguishes between a core (floor traders, large financiers etc.), a semi-periphery (professionals) and a periphery (retail investors). These authors viewed "Insiders" or "professionals" as having a particularly large and distinct influence on prices and of exploiting the participation of the unknowledgeable public. However, many observers of the time also questioned the influence of individual groups on the ever growing market: "The market price reflects not only the differing value opinions of many orthodox security appraisers but also all the hopes and fears and guesses and moods, rational and irrational, of hundreds of potential buyers and sellers, as well as their needs and resources" (Edwards & Magee, 1966[1949]: 5). In many respects, the stock market crash of 1929 additionally contributed to contemporaries'

their dynamics.⁴⁰ “Chartists” objectified and de-temporalized trends so that they could be observed for longer stretches of time and from the viewpoint of a detached observer. The medium of this objectification and de-temporalization were charts. In fact, Schabaker argued that trends, much like certain entities in the sciences,⁴¹ could *only* be adequately observed with charts: “The habits and such changes from the accustomed action can most easily be detected, studied and interpreted through the medium of charts. In fact, it would be extremely difficult to understand and analyse them properly without recourse to a complete charted record.” (Schabacker 2005[1932]: 28) The follower of technical analysis was thus supposed to see trends “in their charted course” (Edwards & Magee 1966[1949]: 234) by recognizing the patterns of lines and bars.

However, this visual pattern recognition could only become a plausible and practical guide to stock market trading if two problems were solved: First, the authors had to provide plausible examples – if not an exhaustive list of - recurrent “pictures” (ibid., 34) or “formations” (ibid., 6), which captured the main market trends. The pioneers of technical analysis solved this problem by developing a tableau of about 25 formations of trend consolidations or reversals.⁴² Any of these formations was introduced with descriptions and visual examples. Importantly, trends were extracted from the actual market data by drawing additional lines within the charts.

awareness of a new market structure: The crash had not only shown that expectations about the state of the economy can be disrupted almost incidentally. Participants also had still, during the period preceding the crash, believed that the “organized support” of New York’s most important bankers would keep prices up; but finally, “the market had reasserted itself as an impersonal force beyond the power of any person to control” (Galbraith 1980[1954]: 111); accordingly, in 1933, De Villier and Taylor note: “In recent years, the market has more quickly responded to combined public sentiment. Millions of investors and speculators comprise that public. On occasions, their demands have taken the market completely out of the hands of the insiders.” (2000[1933]: 34)

⁴⁰ Tape readers conceived prices as ‘living’ entities: Prices’ present, observable behaviour connected to their future behaviour by way of “habits”: “Stocks have habits and characteristics which are distinct as those of human beings or animals” (Wycoff 1910, 33); “stocks are no different than human beings – they have their peculiar habits and moves.” (Gann 1923: 59)

⁴¹ “Its use brings advantages similar in practical result to the telescope, the X-ray, the electric eye and other modern devices which save so much time and energy in fundamentals and details that they make possible the transference of such energy into the more productive channels of study and research.” (Schabacker 2005[1932]: 6)

⁴² These formations are: Ascending triangle, Symmetrical triangle, Cup and Handle, Double top (“M”), Double bottom (“W”), Falling wedge (or “downward wedge”), Rising wedge (or up-turned wedge), Flag/pennant, head-and-shoulders, head-and-shoulders bottom, Price channels, Rectangle, Triple bottom, Triple top, Rounding Bottoms (bowl/saucer) and rounding tops (inverted bowl), Broadening Formation, Diamond, One Day Reversal, Scallop, The Drooping Bottom/accelerating peak, The Horn Formation, The Out-of-Line and Zigzag movement.

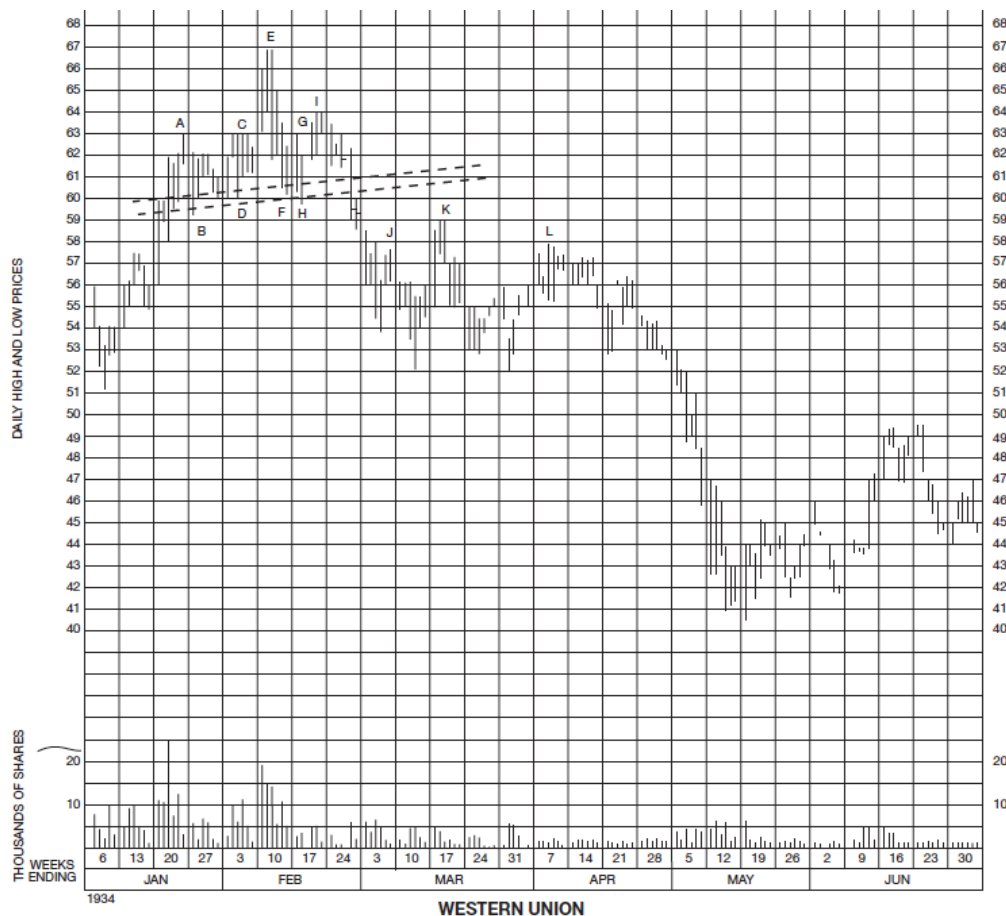


Figure 5: A bar chart, including volume. It points to a head-and-shoulder formation for January/February 1934: left shoulder: ABDC; head: E; right shoulder: FGHI; dotted line= "neckline"; Schabacker (2005[1932]: 46).

The more challenging problem, however, was in how far the identified patterns and formations were applicable to actual future market situations. Only if patterns recurred at a high regularity could speculators effectively identify entry and exit points and thus manage their stock holdings profitably. However, in accordance with the critical attitude towards making any promises for success, Schabacker, Edwards, and Magee avoided any strong claims. To the contrary, they explicitly urged the amateur *not* to trust too much in the given examples and rules of thumb: "The reader may have become dismayed at this point by our frequent recourse to such qualifying adjectives as usually, ordinarily and the like. It cannot be avoided if one wishes to present a true picture of what actually happens. No two chart patterns are precisely alike; no two market trends develop in quite the same way" (Edwards & Magee 1966[1949]: 115). Therefore, investors should not apply the exemplified patterns mechanically or regard technical analysis as an "exact science" (ibid., 116) or "sure thing" (Schabacker, 2005[1932]: 9). For reading charts requires "interpretation" (Edwards & Magee 1966[1949]: 10) and should be seen "not so much [as] a matter of 'systems' as...a matter of philosophy" (ibid., 287). Thus, the authors' idea was that their readers would test the technique for some time and thereby develop their own knowledge about, and responsibility for, its application. Losses would be incurred in the meantime, but these losses could not be attributed to imperfections

of the technique but were seen as necessary costs of acquiring trading experience: “Judgment is required, and perspective, and a constant revision to first principles. A chart, as we have said and should never forget, is not a perfect tool; it is not a robot; it does not give all answers quickly and easily and positively, in terms that anyone can read and translate it at once into certain profits.” (ibid, 277)

5. Conclusion: Some ideas for a sociology of amateur investment

During the time of their first appearance, primarily the 1930s, the recommended techniques of “chartism” were hardly recognized by the general or even the investing public. At the time, the position of the amateur speculator, who would take his/her own trading decisions and use technical analysis as a toolkit, was not fully established.

However, during later years, technical analysis would become highly relevant for amateur speculation. The most immediate driver of this expansion was the growth of the stock exchange since the second half of the 20th century. The 1980s and 1990s in particular witnessed new issues of technology stocks while a soaring market attracted more and more public attention (Thrift 2001; Piel 2003). Similar to the situation in the 1920s, this stock market boom was connected to the expansion of a second, “parasitic market” for investment information and advice. Investment banks extended their “coverage” by analysts; television and radio channels also began to provide investment information by broadcasting a never-ending stream of financial news. As speculation became a more widespread activity, there also grew a more specialized market for amateur techniques and tools. In the process, technical analysis grew significantly as one core genre on this specialized market. For instance, the manual *Technical Analysis of the Futures Markets* by John Murphy was first published in 1985 and became a bestseller in the following years. This manual as well as similar products were successful because – just as the pioneers had envisioned – they were accessible for the non-specialists and made no requirements concerning financial or economic knowledge.

Another important factor for the spread of technical analysis was that the new class of amateur traders started to use personal computers for their trading activities. Oftentimes, the visualization of market data on the new devices relied on the traditional charting techniques: Prices and volumes were presented as lines, bars or candlesticks. One trader recounts her first contact with these tools:

“I had purchased a CQG [Commodity Quote Graphics, LW] Terminal [...] That was just a black and white monitor, and I put it into my kitchen, because I was at home and I realized I spent most of my time in the kitchen, like most people do, and I felt that I could observe and watch price developments and markets. [With this device] you could do, what might seem simple to us now, real time graphics of price developments and spreads between different instruments and historical developments; you could then use, what we call the tools of technical analysis.” (Elaine Knuth, interview with author, June 2011)

Thus, with the introduction of computers, the use of technical analysis was made easier and more relevant as it could now be utilized with “live” prices (Smith 1999: 48).

Interestingly, technical analysis has survived different periods of market contraction such as the ones during the early 2000s and 2008. One possible explanation for its persistent success among lay investors is that users of technical analysis can avoid the losses incurred by other investors. However, given that different studies show technical analysis’ lack of profitability (e.g. Malkiel 2003[1973]), this explanation is not very plausible. Another argument would be that in the aftermath of crises, many forms of advice for lay investors lose their legitimacy and practical relevance. By contrast, the *culture* of amateurism thrives with its emphasis on values that become more relevant and legitimate during crises, such as: self-containment, dedication, and discipline.

6. Bibliography

- Aitken, Rob (2007). *Performing capital. Toward a cultural economy of popular and global finance*. New York: Palgrave Macmillan.
- Allen, Hellen & Taylor, Mark P. (1990). Charts, Noise and Fundamentals in the London Foreign Exchange Market. *The Economic Journal*, 100(400), 49-59.
- Barber, Brad M., & Odean, Terrance (2001). The Internet and the Investor. *Journal of Economic Perspectives* 15:41-54.
- Barboza, David (2010). Day trading still alive, outsourced to China. *New York Times*, 09.12.2010.
- Bohn, Cornelia (2008). Inklusion und Exklusion: Theorien und Befunde. Von der Ausgrenzung aus der Gemeinschaft zur inkludierenden Exklusion. *Soziale Systeme* 14:171-90.
- Carruthers, Bruce G. (1996). *City of capital: politics and markets in the English financial revolution*. Princeton, N.J.: Princeton University Press.
- CitiFX Pro (2010). *Forex Trader Survey 2010*. London: Citi Bank.
- DAI (2012). *Zahl der Aktienbesitzer geht wieder zurück*. Kurzstudie des Deutschen Aktieninstituts, Frankfurt a.M.
- De Goede, Marieke (2005). *Virtue, Fortune, and Faith. A Genealogy of Finance*. Mineapolis, London: University of Minnesota Press
- Davis, Gerald F. (2008). A new finance capitalism? Mutual funds and ownership re-concentration in the United States. *European Management Review* 5:11-21.
- Fraser, Steven (2005). *Wall Street: a cultural history*. London: Faber and Faber.
- Friedman, Walter A. (2009). The Harvard Economic Service and the Problems of Forecasting. *History of Political Economy*, 41(1), 57-88.
- Galbraith, John K. (1980[1954]). *The great crash 1929*. London: Andre Deutsch.
- Harrington, Brooke (2008). *Pop finance. investment clubs and the new investor populism*. Princeton N.J.: Princeton University Press.
- Heintz, Bettina, and Jörg Huber (2001). "Der verführerische Blick. Formen und Folgen wissenschaftlicher Visualisierungsstrategien, in B. Heintz & J. Huber (Eds.) *Mit dem Auge Denken. Strategien der Sichtbarmachung in wissenschaftlichen und virtuellen Welten*, pp. 9-37. Zürich: Voldemeer.
- Helmstetter, Rudolf (1999). Guter Rat ist (un)modern. Die Ratlosigkeit der Moderne und ihre Ratgeber. in G. von Graevenitz (Hrsg.) *Konzepte der Moderne*, pp. 284-302. Stuttgart: De Gruyter.

- Knight, Peter (2010). Reading the Market: Abstraction and Personification and the Stock Ticker in Late Nineteenth-Century American Culture. Paper presented at the *Finance in Crisis* Conference, Manchester.
- Knorr Cetina, Karin (2003). From Pipes to Scopes. *Distinktion*, 7, 7-23.
- Knorr Cetina, Karin, & Preda, Alex (2007). The Temporalization of Financial Markets: From Network to Flow. *Theory Culture Society*, 24(7-8), 116-138.
- Knorr Cetina, Karin (2011). Financial Analysis: Epistemic Profile of an Evaluative Science. in C. Camic & M. Lamont (Eds.), *Social Knowledge in the Making*, pp. 405-42, Chicago; London: University of Chicago Press.
- King, Michael R., & Rime, Dagfinn (2010) *The \$4 trillion question: what explains FX growth since the 2007 survey?* Bank for International Settlements Quarterly Review, Basel.
- Langenohl, Andreas (2012). Mathematische und professionelle Rationalität auf Finanzmärkten: Ein neuer Geist des Finanzmarktkapitalismus?" in A. Engels & L. Knoll (Eds.), *Wirtschaftliche Rationalität. Soziologische Perspektiven*, pp. 109-28. Wiesbaden: VS Verlag.
- Langley, Paul (2007). Uncertain Subjects of Anglo-American Financialization. *Cultural Critique*, 65(Winter), 67-91.
- Latour, Bruno (1986). Visualisation and Cognition: Drawing Things Together. In H. Kuklick (Ed.), *Knowledge and Society Studies in the Sociology of Culture, Past and Present*, pp. 1-40, London: Jai Press.
- Lo, Andrew W., Mamaysky, Harry & Wang, Jiang (2000.) Foundations of Technical Analysis: Computational Algorithms, Statistical Inference, and Empirical Implementation." *Journal of Finance* 55:1705-65.
- Lo, Andrew W., & Hasanhodzic, Jasmina (2009). *The Heretics of Finance: Conversations with leading practitioners of technical analysis*. New York: Bloomberg Press.
- Lo, Andrew W., & Hasanhodzic, Jasmina (2011). *The Evolution of Technical Analysis. Financial Prediction from Babylonian Tablets to Bloomberg Terminals*. Hoboken, N.J.: John Wiley & Sons.
- Lounsbury, Michael (2002). Institutional Transformation and Status Mobility. The Professionalization of the Field of Finance. *Academy of Management Journal*, 45(1), 255-266.
- Mayall, Margery (2008). From Seeing the Market to Marketing the Seeing: Technical Analysis as a Second-Order Epistemic Consumption Object. *Consumption, Markets & Culture*, 11(3), 207-224.
- Malkiel, Burton G. (2003[1973]). *A random walk down Wall Street: the time-tested strategy for successful investing*. New York; London: W. W. Norton.
- Mattern, Claude (2010). The Future of Technical Analysis. *IFTA Journal* 10:12-14.
- Means, Gardiner C. (1930). The Diffusion of Stock Ownership in the United States. *The Quarterly Journal of Economics*, 44(4), 561-600.
- Meier, Richard T. (2005). Vom Boten zum Bit: Zur Geschichte der Technologien an den Wertpapierbörsen. In C. M. Merki (Ed.), *Europas Finanzzentren. Geschichte und Bedeutung im 20. Jahrhundert*. pp. 245-293. Frankfurt a. M. u.a.: Campus.
- Morgan, Mary S (2012). *The World in the Model: How Economists Work and Think*. Cambridge: Cambridge University Press.
- Nicholson, Colin (1994). *Writing and the rise of finance: capital satires of the early eighteenth century*. Cambridge ; New York: Cambridge University Press.
- O'Sullivan, Mary (2007). The Expansion of the U.S. Stock Market, 1885-1930: Historical Facts and Theoretical Fashions. *Enterprise and Society*, 8(3), 489-542.
- Ott, Julia C. (2009). "The Free and Open People's Market": Political Ideology and Retail Brokerage at the New York Stock Exchange, 1913-1933. *The Journal of American*

History 96:44-71.

- Piel, Konstanze (2003). *Ökonomie des Nichtwissens. Aktienhype und Vertrauenskrise am Neuen Markt*. Frankfurt a. M.: Campus.
- Preda, Alex (2006). Socio-Technical Agency in Financial Markets: The Case of the Stock Ticker. *Social Studies of Science*, 36(5), 753-782.
- Preda, Alex (2007). Where do Analysts come from? The Case of Financial Chartism. in M. Callon & F. Muniesa (Eds.), *Market devices*, pp. 40-64, Malden, MA. a.o: Blackwell.
- Preda, Alex (2009a). *Framing Finance: The Boundaries of Markets and Modern Capitalism*. Chicago: The University of Chicago Press.
- Preda, Alex (2009b). Brief encounters: Calculation and the interaction order of anonymous electronic markets. *Accounting, Organizations and Society* 34, 675-93.
- Preda, Alex (forthcoming). *Life in the Markets*. Chicago: University of Chicago Press.
- Schimank, Uwe (2011). Die 'Hyperkomplexität' des Finanzmarkts und die Hilflosigkeit der Kleinanleger. *Leviathan* 39, 499-517.
- Smith, Charles W (1999). *Success and Survival on Wall Street. Understanding the Mind of the Market*. Lanham ML a.o.: Rowman & Littlefield.
- Stäheli, Urs (2003). Financial Noises: Inclusion and the Promise of Meaning. *Soziale Systeme*, 9(2), 244-256.
- Stäheli, Urs (2004). Der Takt der Börse. Inklusionseffekte von Verbreitungsmedien am Beispiel des Börsen-Tickers. *Zeitschrift für Soziologie* 33:245-62.
- Stäheli, Urs (2007). *Spektakuläre Spekulation. Das Populäre der Ökonomie*. [Spectacular Speculation. The Popular Dimension of the Economy.] Frankfurt a. M.: Suhrkamp.
- Stichweh, Rudolf (2006). Semantik und Sozialstruktur. in D. Tänzler, H. Knoblauch & H-G Soeffner (Eds.), *Neue Perspektiven der Wissenssoziologie*, Pp. 157-71. Konstanz: UVK.
- Stichweh, Rudolf (2009). Leitgesichtspunkte einer Soziologie der Inklusion und Exklusion. in R. Stichweh & P. Windolf (Eds.), *Inklusion und Exklusion: Analysen zur Sozialstruktur und sozialen Ungleichheit*, pp. 29-42. Bielefeld: VS Verlag.
- Tanner, Jakob (2002). Wirtschaftskurven. Zur Visualisierung des anonymen Marktes. In D. Gugerli & B. Orland (Eds.), *Das ganz normale Bild. Historische Beiträge zur visuellen Herstellung von Selbstverständlichkeit*, Vol. 2, pp. 129-158. Zürich: Chronos.
- Thrift, Nigel (2001). "It's the romance, not the finance, that makes the business worth pursuing": disclosing a new market culture." *Economy & Society* 30:412-32.
- Tufte, Edwin R. (2001). *The visual display of quantitative information*. 2nd edition, Cheshire, Conn.: Graphics Press.
- Wansleben, Leon (2012). Financial Analysts. in K. Knorr Cetina & A. Preda (Eds.) *Handbook of the Sociology of Finance*, pp. 250-71. Oxford: Oxford University Press.
- Wolff, Edward N. (2012). *The Asset Price Meltdown and the Wealth of the Middle Class*. Working paper, New York University.

Historical sources:

- Babson, Roger W. (1909). *Business Barometers used in the Accumulation of Money. A Text Book on Fundamental Statistics for Investors and Merchants*. Wellesley Hills: The Office of Roger W. Babson.
- De Villiers, Victor, & Taylor, Owen (2000[1933]). *The Point and Figure Method of Anticipating Stock Price Movements*. Peterfield: Harriman House Ltd.
- Edwards, Richard D., & Magee, John (1966[1949]). *Technical analysis of stock trends*. 5. edition, Springfield, MA.: Magee.
- Gann, William D. (1923). *Truth of the Stock Tape*. New York: Financial Guardian Publishing Co.
- Hamilton, William P. (1922). *The Stock Market Barometer*. New York: Harper & Brothers Publishers.

Lefèvre, Edwin (1901). *Wall Street Stories*. New York: McClure, Phillips & Co.

Lefèvre, Edwin (2010[1923]). *Reminiscences of a stock operator. With New Commentary and Insights on the Life and Times of Jesse Livermore*. Hoboken, N.J.: John Wiley & Sons.

Mattern, Claude (2010). The Future of Technical Analysis. *IFTA Journal*, 10, 12-14.

Murphy, John (1985). *Technical analysis of the futures markets*. New York, Institute of Finance.

Neill, Humphrey B. (2000[1931]). *Tape Reading and Market Tactics, Three Steps to Successful Stock Trading*. Burlington: Fraser Publishing.

Schabacker, Richard W. (2005[1932]). *Technical analysis and stock market profits : a course in forecasting*. Petersfield: Harriman House.

Wycoff, Richard D. (1910). *Studies in Tape Reading*. New York: Traders Press.