ARE THERE REGULATORY IMPLICATIONS TO 'BEHAVIORAL FINANCE'?

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Introduction

The theory of efficient financial markets, in its purest version, is the perfect example of a "laissez faire" construct. In its classic specification [Fama, 1970], it does not require any role for external regulation, for it enforces complete self-correction. Indeed, it is sensible that a market where prices respond rapidly to all relevant information, in which all risks are priced, and in which no systematic excess profits appear, is in no need of outside interventions. That is why it is the perfect example of a "laissez faire" construction.

Many years ago George Stigler wrote that "the best protection for an investor is an efficient market". In his theory of regulation, he proceeded to make a forceful argument that regulation creates obstructions and barriers to entry [Stigler, 1971]. On the face of it then, an efficient market could not only do without regulation, but regulation could interfere with efficient operation itself. It is easily ascertainable that the views of Stigler have left an indelible mark on mainstream thinking by financial economists. Most, including critics of the doctrine of market efficiency, hold a common view that harks back to the Stiglerian notion, and consider regulation more harmful than beneficial [Miller, 1991], [Shleifer, 2001], [Zingales, 2005].

In reality, market regulation has developed far and wide as capital markets have too. Not only in emerging but also in developed markets, regulators have become a feature of market life. While the era of deregulation was characterized by the widespread elimination of direct regulatory constraints on prices and quantities of certain types of financial assets, regulation did not vanish. It has remained and new regulation has developed in several directions such as the specification of prudential rules, disclosure and certification requirements, rules of market conduct and enforcement activities. Indeed, present day regulators are not just passive monitors. They are active in licensing, rule making and enforcement. As this trend is not only found in immature markets that require guidance, it cannot be explained by "infant industry" arguments. Or, in other words, it is not a feature that is expected to wither away with development. On the contrary it may grow with development [Lutz, 1996].

One way to account for the broad historical trend of expanding regulation, after deregulation, is to simply realize that markets are not perceived by policy-makers (and by market users who influence policy-makers) to be as self-disciplined as efficiency theory portrays them. Regulation seeks to correct failures that damage investors and economies. Thus, the expansion of market regulation constitutes an institutional/political critique of efficient market theory, at least as the latter is interpreted by Stigler's dictum.

Behavioral finance constitutes a strong critique of the perfect capacity of financial markets for self-correction. This critique develops within the discipline of financial economics and uses theoretical, empirical and historical argument based on market behavior. Much of the empirical material that supports it comes from the developed markets of the world. In terms of chronology and evolution this scientific critique coincides with the rise of external new regulation. In intellectual terms however, behavioral finance is not conceived as a theory of regulation, but is cast as a critique of market self-regulation. Scholars who are engaged in the behavioral perspective devote considerable intellectual energy to discovering empirical regularities that offer a better description of aggregate investor behaviors which give rise to inefficiency and create a degree of predictability of returns. Hence, a natural question arises: Are the anomalies and failures of self-correcting mechanisms which behavioral finance uncovers relevant to regulators? Could their appearance influence regulatory policy and could regulatory policy be used to limit or eliminate these failures?

It is also relevant to ask whether the manifestation of inefficiency is a permanent feature of markets or makes part of an evolutionary process; and whether within this process there is room for regulatory intervention upon the course of evolution or, on the contrary, whether it can be left exclusively to learning and adaptation by market agents [Lo, 2005].

These questions furnish background thinking for this paper. The two foremost goals of market regulation, as they are stated in regulatory mandates around the world, can be summarized as 'investor protection' and 'protection of market integrity'. These concepts

must be understood in a context of risk taking and risk pricing. In that context 'investor protection' cannot of course be understood as assurance against loss, nor can market integrity be construed as an elimination of risk from market returns. The question then is whether the precepts and the conclusions of behavioral finance can elucidate the regulatory mandate within a context of risk taking and risk pricing, and if so, whether they offer opportunities for more effective regulation.

Regulatory discourse itself is largely premised on the precept of investor rationality and the goal of market efficiency. For example, it is widely held that threats to efficient pricing come from certain types of monopolistic or fraudulent behaviors which can develop within the idiosyncratic conditions of a capital market. The monopolistic use of private information, the diffusion of misinformation, the manipulation of demand, the ability to control the supply for a financial instrument, are common cases of uncompetitive (or fraudulent) practice that are used as justification for regulatory intervention. That external regulators are mandated to combat such practices presupposes a belief that markets cannot banish them on their own, and a complementary belief that regulators can. This regulatory argument questions efficiency without questioning investor rationality. It focuses on protecting investors from manifestations of market power which distort efficient pricing.

If inefficiency is seen as arising only from monopolistic practices, a regulatory agenda can be clearly stated on a pro-competitive, anti-monopoly, anti-fraud justification. If however inefficiency is thought to arise from lapses in investor rationality, the regulatory agenda may in fact become confounded: Would regulators attempt to protect investors from their own lapses of rationality, in other words protect them against themselves? Prima facie this poses a dilemma since behavioral finance may therefore raise doubts as to the feasibility of regulation, from a perspective that is very different than the classic laisser – faire argument. This apparent dilemma warrants a careful reading of behavioral finance from a viewpoint that inquires of the scope and feasibility of market regulation. This is what I propose to take up in the following sections.

Market Efficiency and the Insights of Behavioral Finance

Behavioral finance comes to the issues of capital market operation from premises that part ways with efficient market theory. It questions efficient pricing by placing doubt on the precept of investor rationality itself. Investor rationality is a pillar of market efficiency, serving as an 'instrumental rationality': it assumes that utility-maximizing investors are informed, able to price the risks they perceive from unbiased estimates based on all available relevant information, and able to react quickly to new information. Using this precept, efficiency theory argues that asset prices will reflect available information at any given moment; will react quickly and correctly to new information releases; and will, as a result, change randomly.

This theory is one of a market with infinite ability to self-correct. If a price gets out of line compared to the true valuation based on available information, (some) investors will recognize the gap and will seek to profit by buying, selling, or short selling a security. This trading up or down of mispriced assets will allow prices to be restored to unbiased estimates of true valuation every time. The prerequisites for this condition are fairly obvious: there must be investors capable of recognizing the mispricing and they must have opportunities and resources to carry out the necessary corrective trades. The capability of recognizing the mispricing requires that at least some investors have the technical sophistication to develop, apply and maintain models of valuation which work on the basis of unbiased indicators of fundamentals, such as projected cash flows, future investment opportunities, possibilities of corporate restructuring and so on. The opportunities and resources for these investors to be able to act in the direction of price correction include access to trading facilities and capital.

A more subtle aspect of the market with an infinite ability to self – correct is an "ontological" assumption. Namely, that the forces that lead to disequilibrium are random, unsystematic and transitory. Or, in a deeper sense, only rational informed investors are willing and able to carry out purposive action. Others are perhaps misinformed, misled or simply crazy, but there is neither pattern nor purpose to their actions. The only

nonrandom, systematic and permanent factors that can promote disequilibrium in that construction are structural obstacles, e.g. barriers to trading access, barriers to information dissemination, exercise of monopoly power. Within the efficient market paradigm regulation, if it is to exist, should therefore be properly directed to the elimination of these obstacles, essentially threats to free entry and competition. And within that same paradigm, the rational informed investor is the true regulator of market self – correction, who must therefore be given as free a reign as possible in a competitive environment, by the elimination of obstacles and monopoly influences.

Behavioral finance places grave doubts on several of those precepts. The development of the behaviorist counter – argument originally emerged from empirical insight. Already in the 1970s, regularities were spotted in stock returns that contradicted the random behavior of returns predicted by efficiency theory. They were aptly termed ‘anomalies’. These were either “calendar” effects (i.e. excess returns associated with points in the calendar [Ariel, 1990], [Thaler, 1987]), or “cross-sectional” effects (i.e. excess returns systematically associated with firm size [Banz, 1981], or accounting and financial variables [Basu, 1977, 1983], [Reinganum, 1983]). The early finding of such “anomalies” sparked a huge hunt for new anomalies and hundreds of empirical articles have been published. How could these regularities persist if their specification had become widely known? Indeed, some vanished as investors, chiefly professional managers, attempted to profit from them [Schwert, 2005].

The value of the “anomalies” was mainly to acknowledge that their appearance disturbed the epistemological self-assurance of the efficient market paradigm. It was a harbinger of the notion that there were limits to the self – corrective capacity of the market. Self – correction was not instantaneous but, when and if it occurred, took time. This could be taken to have two implications. On one hand, one could argue that since empirical regularities could be eventually corrected by market action, no regulatory intervention was really necessary. On the other hand it could leave a window for intervention if it meant that large disturbances which went uncorrected for some time, and which could

potentially subvert confidence in market operation, could be attributed to faulty or incomplete policies of disclosure, supervision or trading constraints.

A more sophisticated category of doubt that pointed at the foundation of efficient markets doctrine was the empirical observation of 'excess volatility'. This is associated with the seminal work of Shiller [1981,1984,1989], which has sparked a long stream of literature. This argument finds that market prices jump around a lot more than changes in fundamentals would warrant. Efficiency theory presumes that investors respond to new information which reveals changes in fundamentals. A common sense explanation of 'excess volatility' is that investors respond to non-fundamental, even irrelevant, information and hence prices do a lot of 'aimless wandering'. This type of proposition can branch into two distinct directions. The first has to do with the fundamental makeup of an investor's psychology, as an approach that seeks an alternative description of behavior to that of 'instrumental rationality': how is the investor motivated, how are expectations formed, how are risks perceived and how are they priced? The second has to do with the content of information that is being diffused, and the capacity of investors to absorb and discriminate between relevant and irrelevant 'news'. This path does not have to necessarily assume that investors are 'irrational'. They may be operating in a context of 'bounded rationality', and act on information that is given them without being able to spend resources to distill or purify it. I focus on issues of information in a later section.

Plausible Microfoundations

The bulk of research in behavioral finance attacks directly the concept of investor rationality, as it is embedded in efficient market theory: wealth maximization with risk aversion which offers relative weightings to expected returns and risks; expectations that are formed on the basis of all relevant public information that supports unbiased estimation of long term value; independence of each investor from the choices of others. These premises are questioned widely. I choose here three essential building blocks to the behavioral critique, which can be discerned in long streams of literature. One is that investor behavior develops around a feedback mechanism [Shiller, 1990], [DeLong et. Al., 1990b], [DeBond, 1993]. As prices and returns rise (or fall), investors expect more of

the same and they end up chasing and feeding a trend. Price rises may therefore elicit excess demand rather than supply. Price falls may elicit excess supply rather than demand. This type of behavior, which is encountered in actual markets, is an outcome of expectation formation not about the 'fundamentals' underlying a security but about the next movement in its price. Clearly, it can accentuate an upward or a downward trend and turn them into spirals, positive or negative sequences of mispricing, ultimately 'manias or panics'.

A second building block is mimetic behavior. People observe others and make similar choices. Mimetic behavior may in part come from a deep and primary human need to conform; but it may also be reinforced from the use of others' behavior as a cheaply available source of information. 'Rational herding behavior' has for example been modeled as an outcome that depends on the belief that the ones who have already chosen a course of action 'know something' that the individual now facing the choice does not [Banerjee, 1992], [Bikhchandani et.al. 1992]. To the extent that mimetic behavior is motivated by a need for information, one of its foundations must necessarily be that the individual investor has no great confidence in her own ability to collect and interpret information independently, and seeks reassurance from others. In this context, not only the observation of others' behavior but also the attention to rumors and informal talk take on significance as devices that either offer new information or are used to confirm existing information [Shiller, 1991]. Again, casual empiricism suggests that when markets are in the throes of exuberance, rumors take on great significance. Whereas in calm markets rumors may fade away without much effect, in periods of exuberance they may be elevated to the status of relevant information and exercise a large effect on investor actions and valuations. If mimetic behavior is combined with feedback mechanisms it can give a powerful boost to wide market gyrations that have nothing to do with information about fundamentals but have a lot to do with mass behavior and conforming actions. Thus, it can be an important source of 'excess volatility'.

A third building block is a plausible, psychological condition that has been described in psychological/experimental evidence [Tversky and Kahneman, 2000], [Cohen and

Knetsch, 2000]. This is the condition of 'loss aversion'. Loss aversion is a concept that introduces an asymmetry, depending on whether the investor looks at a prospect of gain or at a prospect of loss. Prospects represent a frame of reference that can color one's attitudinal outlook. Looking at a prospect of gain an investor can be ebullient, imbued by optimism and ready to take risks. Looking at a prospect of loss however, she is fearful, easily overtaken by pessimism and seeking outlets towards safe havens. Such a dualistic psychological makeup can translate into variation of risk premia from low, when gains are hoped for, to high when losses are projected or feared. When this psychological feature is cumulated up to the previous two, a powerful engine that can set in motion over- and under-valuations as well as 'boom and bust' phenomena in financial markets becomes plausible.

The three building blocks – feedback mechanisms, mimesis, loss aversion – offer a micro-foundation for market anomalies of the boom-and-bust type. They do not clarify the macro-behavior of markets in a definitive way, however. What we observe in markets is the outcome of aggregated behaviors. Even if all investors are subject to biases as a result of micro-behaviors, the bias of each does not have to be identical nor correlate perfectly with the bias of every other. Thus, some degree of attenuation will inevitably take place as individual behaviors are aggregated. After all, even in markets which are in the throes of exuberance there are not only investors who buy but also those who sell. Furthermore, what if not all investors behave as the behaviorists theorize? What if there are investors who, instead of guessing the next moment's price, are interested in long term value, believe that long-term value will prevail, and seek to maximize their utilities as the rational paradigm suggests? How would they affect market and asset price behavior?

Investor sentiment and arbitrage

The aggregation of individual variations from instrumental rationality is called investor sentiment. This should be observable in overall market conditions, and be exhibited in asset prices and returns. Early theorizing of investor sentiment proposed the notion of "noise traders", of investors, that is, who trade not on differential relevant information but

for other unspecified (unsystematic, random, irrelevant, whimsical) reasons [Black, 1986], [Summers, 1986]. Class models subsequently became respectable and trendy; they have been quite widely researched in theoretical and empirical work, trying to answer the question: what equilibrium is produced by the coexistence of two classes in a market, when informed investors are pitted against noise traders? Perfect market self – correction and maintenance of fundamental values could still result from an arbitrage-free equilibrium. Informed investors could, in principle, arbitrage away the deviations from fundamental values generated by the whimsical action of noise traders. However, powerful arguments have been adduced towards the view that arbitrage itself faces severe limitations and this prevents the manifestation of an arbitrage-free equilibrium [DeLong et.al., 1990a], [Shleifer and Vishny, 1997].

One reason could be the lack of opportunity, as when short sales are not allowed, for example [Miller, 1987], [Goetzmann and Massa, 2005]. Arguably, the inability to take short positions restrains the ability to counter by arbitrage an exuberant upward sentiment. In fact, to the extent that regulatory strictures forbid or constrain short sales, they are criticized for inducing inefficiencies. Another even more serious reason that is projected in several theoretical arguments is that if sentiment is strong, arbitrage can be risky since the arbitrageurs cannot predict the time at which a return to fundamentals can be expected, and can show huge losses before that happens. Given their own dependence on outside finance and monitoring, this may prove prohibitive if it means that in the short-term they show huge losses. Finally, and building on the argument about the risks of arbitrage, in the presence of strong sentiment it becomes far more sensible for informed investors to try to ride ahead of the sentiment themselves and gain from it [Shleifer and Vishny, 1997], [DeLong et al., 1990b], [Shleifer and Summers, 1990]. This behavior harks back to Keynes in chapter 12 of the General Theory, where he states that "…It might be supposed that competition between expert professionals, possessing judgment and knowledge beyond that of an average private investor, would correct the vagaries of the ignorant individual left to himself. It happens however, that the energies and skill of the professional investor and speculator are mainly occupied otherwise. For most of these persons are, in fact, largely concerned not with making superior long-term

forecasts of the probable yield of an investment over its whole life, but with foreseeing changes in the conventional basis of valuation a short time ahead of the general public" [Keynes, 1936]. But then, if rational arbitrageurs simply try to guess the trends sentimental investors will chase, how feasible and how necessary is it to distinguish informed investors from noise traders in the Keynesian case? An outside observer would simply see everyone running away with sentiment, irrespective of motive or psychological makeup.

In analytical terms the limitation of arbitrage implies that prices and rates of return will be contaminated by sentiment. Thus, the purported failure of arbitrage creates a full theoretical transition from the efficient market theory to a theory of sentiment that allows for market boom and bust cycles but also 'momentum' in prices, i.e. protracted periods of over- and undervaluation with respect to fundamentals, with the consequent non-random time behavior of returns [DeBond and Thaler, 1985, 1987], and with persistence either in over- or in undervaluation [Barberis et.al., 1998].

An 'Ontological Reversal'

At the outset of the previous section I observed that market efficiency makes a subtle 'ontological' assumption that only informed investors are capable of purposive action. The construction of the behaviorist argument, which ends up with the theoretical triumph of investor sentiment, turns the 'ontological' assumption upside down. It is now investors with sentiment (sentimental investors from now on) who really drive markets and prices, and hence are seen as originators of purposive action. Arbitrageurs are acting to moderate or to enhance the impact of sentiment, but are not prime movers any more. The purposive action of sentimental investors however is no longer guided by unbiased estimates of fundamental values. The elements energizing it center on beliefs of profit, but these beliefs are not anchored on a well defined core structure, such as estimates of long – term value from fundamentals. The core structure of purposive action may be made up of 'prior beliefs' that are adjusted on the basis of observed price trends, it may derive from subjective hopes, fears or projections, it may be an imaginary construct of hopeful prospects and wishful thinking. This is broadly implied by authors who argue that large

financial bubbles are always underpinned by notions of ‘new eras’ of technological and economic progress that promise unlimited growth [Shiller, 1996].

The historical evidence suggests that big episodes of investor sentiment are not completely fatuous and without anchor, nor is the hope for ‘new eras’ completely without foundation; they make their appearance after an important real change has occurred, or an important new prospect has become feasible and visible, in general a development that engenders optimistic visions about asset prices [Kindleberger, 1978], [Garber, 2000]. Thus, bubbles are not to be seen as completely imaginary trips of random mass hysteria, occurrences that simply arise from random coalescences of the imagination of a multitude of investors. In a broader sense then, the appearance of bubbles is deeply connected with the process of innovation and growth, and with the perturbation of existing perceptions about the status quo and change.

This “ontological reversal” of behaviorist theory transforms the sentimental investor into a central figure in the market process. There appears a consensus among theorists that this central figure – the ‘noise trader’ of mainstream financial models – is an important provider of liquidity and buyer of financial and trading services. I suggest that this same central figure, and its potential enticement into financial asset holding and trading, is the raison d’etre for the rise of public asset markets? By public markets I mean institutional trading venues where transactions and prices are made public, access is open, assets traded satisfy a minimum standard of credibility about future promises. It is plausible that as public markets are organized expressly for the purpose of attracting liquidity and developing secondary trading, the ‘noise trader’, or her namesake - the sentimental investor - is the main target; her actual enticement is the main criterion of success of the establishment of a public market.

If we accept the precepts of behaviorist argument - feedback mechanisms, mimesis, loss-aversion – we are admitting into markets a protagonist figure who has hopes and fears, and who uses less technical and more social information to guide her actions. Chasing price trends, mimicking successful behaviors of others, running for protection when

everyone else does, choosing the same safe havens as others, seeking confirmation of hopes or fears in rumor or public commentary, are behaviors that focus on social interaction and communication rather than expert analysis of technical data.

On the contrary, the protagonist of efficient market theory is a lonesome, more private figure with occasional ability to exercise power in the market: she constantly collects and processes technical information updating her unbiased estimates, and compares these to observed prices, in order to take actions and attain profits. Prima facie, she has a strong incentive to maintain confidential her model of estimation, fearing competitive emulation by others. She also has a strong incentive to develop private discovery of information that elucidates fundamentals and gives her an edge over competitors. Thus, the rational arbitrageur, and generally the prototype of informed investor, is a self contained figure in contrast to the sentimental investor who lives on easily readable information, social interaction and communication [Shiller, 1995]. Both have selfish goals and look for profits but use very different ways to attain them.

These archetypical sketches of investor profile imply a proposition: the sentimental investor has a far stronger need for social interaction, confirmation of beliefs and reassurance than the rational arbitrageur. This nexus of fundamentally social needs is not a priori one that can be exclusively satisfied by a self-regulating market. In order to be fulfilled it requires a mix of market and non – market actions; it can engender a demand for institutional arrangements underpinning and surrounding the market, which are supplied either privately by market agents or publicly through a political process. The sentimental investor's social makeup provides fair ground for understanding markets not simply as transaction venues but as institutions in which competition, power and politics interact.

Many examples easily come to mind. The supply of dividends is private action taken by issuers to offer reassurance via income. The supply of financial disclosure can be both a result of private (voluntary) or public (mandatory) action that offers reassurance through standardized financial reporting. Protection against minority expropriation can be offered

privately through voluntary corporate governance arrangements or publicly through mandatory arrangements. Protection against fraudulent practice can be supplied privately (self – regulation, self – enforced rules of conduct)) or publicly through external monitoring, quality controls and enforcement. The sentimental investor needs not simply a market venue but also a series of institutions that facilitate entry and exit, organize market related social interaction, and normalize the flow of information about financial instruments in a readily usable form. It is not obvious from current empirical observation and history that these institutions can only be privately supplied [La Porta, et. al., 1996, 2000, 2006]. In everyday language the concept of sentimental investor parallels politically and legally established notions of 'the common man'. Many of the institutional arrangements that have been put in place in markets around the world respond to the purported needs of this 'common man' when he comes to market.

Inasmuch as the 'common man' is not an agent with power, reassurance and a sense of protection from the exercise of power by others take on paramount dimensions. We can think of reassurance as a state of mind that includes the confirmation of one's beliefs, the safety of taking conforming actions, the presumption that there is always an available route of exit. The archetypical rational arbitrageur is a self confident figure who draws reassurance from her information, her processing sophistication, and the belief that fundamentals govern values at equilibrium; the sentimental investor draws reassurance from the behavior of others as individuals, or as social groups or, further, from the intervention of public authority. Hers is social behavior par excellence.

Historically, the rise of financial markets can be seen as a development founded on the need for external finance. Within that broad development, the transition from unregulated private to regulated public markets can be seen as a process that supplies institutional arrangements to satisfy sentimental investors' demand for reassurance and a sense of security, while enticing them to financial transactions and forms of property.

In sum, the behaviorist micro – foundations are consistent with a demand for a regulatory system that provides reassurance and protections. Although, as I argued at the outset,

behaviorist argument is neither conceived nor developed in terms of regulatory discourse, its premises are much more conducive to such a discourse, compared to the premises of market efficiency. The protagonist of behaviorist theory is plausibly a figure who uses all social channels for obtaining reassurance, and this cannot but include institutions and public regulation. This is an almost self-evident proposition, as the sentimental investor is much more a 'social being' than the rational arbitrageur of efficient markets, who is literally crafted as the 'homo economicus' of neoclassical doctrine [Thaler, 2000]. As a 'social being' the sentimental investor naturally extends his activities beyond market boundaries to other social processes, including the pursuit of institutional change.

Loss Aversion has Institutional Implications

Let me come back to the three premises underlying investor sentiment in order to offer a fundamental differentiation among them. Feedback and trend chasing, mimicry and herd behavior, or rumor circulation can be conceived as aspects of behavior that could theoretically operate in a symmetric fashion, i.e. in both contexts of positive and negative sentiment. Furthermore, these activities could be understood as modes of behavior that are contained within the space defined by the market, in other words they are expressed through transactional behavior; i.e. the definition and the observation of these traits are only possible through an analysis of market transactions. Loss aversion is a different category altogether. It is intrinsically an asymmetric precept of behavior. It has different implications for a phase of a market with rising prices than for a phase of declining prices.

Loss aversion operates within a frame or, to use the old phrase of Keynes, within a 'convention that describes the state of expectation'. Depending on the frame, reassurance can be gained from various sources and actions. During a phase of rising prices, reassurance can be gained by making profits. As prices rise sentimental investors become more ebullient and gain self confidence in their investing skills to make profits. As long as price trends are maintained in the course of the buildup of a bubble, sentimental investors draw confidence from the market itself. The ultimate confirmation of their

beliefs is the market and the profits they make from it. On the other hand, at times of bursting bubbles, trend reversal and falling prices, sentimental investors become perplexed; they are unable to draw reassurance from a broken trend, they become fearful of the future recognizing that their expectations were false, and feel trapped in ambivalence about holding their positions or selling. Casual observation and common sense suggest that investors clamor for 'protection' when markets turn downwards, bubbles burst and losses accumulate. Thus the working of loss aversion can be very different in different phases. When the market, through its positive trend, provides reassurance the sentimental investor becomes a supreme believer in the free market and in his ability to gain from it. When the market, through a broken or reversed positive trend, gives rise to the prospect of loss, the sentimental investor seeks reassurance from extra-market arrangements, institutional changes, political interventions. In other words, loss aversion will power actions over different social spaces during different phases. In the phase of boom, action will be centered in market space and the demand for transactions will dominate the social atmosphere. In the phase of bust, action will shift to political space and the demand for intervention and institutional change will dominate the social atmosphere.

In fact, historical evidence from the process of creation of regulatory institutions and the emergence of regulated public markets is incontrovertible. Large institutional transformations have been occasioned by big market crises, as is the case of the Bubble Act in Britain in 1756, the creation of the US Federal Reserve in 1914, securities' regulation in the United States in the 1930s, the Sarbanes-Oxley legislation in 2002, and European Market Abuse legislation in 2003. This offers plain confirmation to the claim that demand for extra-market reassurance is very strong precisely when feedback and mimetic behaviors have led to failure, when the frame of mind switches from optimism to pessimism, and when loss aversion dominates the investor's horizon. In short, when reassurance is not available from intra-market arrangements it is sought from extra-market arrangements. This can be understood as an important temporal basis of 'demand for regulation'.

Empirical Queries and Indices of Sentiment

One of the advantages of a theory of sentiment over a theory of fundamental valuation is that the former can accommodate observed radical changes and turnarounds in asset prices whereas the latter cannot, short of radical change in (recognition or expectation of) real conditions. However, if no real change is discernible, investor sentiment can more easily explain momentum than a turnaround and its timing? A theory of price reversal, has not really been offered. It can be argued for example that eventually, in the course of a boom, informed arbitrageurs take an upper hand again and finally engineer a return to fundamentals. Or, alternatively it can be argued that sentimental investors experience increasing ambivalence as prices reach obviously imaginary levels. Any of these would mean that expanding deviations from fundamentals, or some notion of a long – term average, eventually cross a line that makes them unbearable to the existing market alignment of actors and therefore unsustainable. Can that line be conceptualized in terms of declining risks of rational arbitrageur action? Can a concept of long – term efficiency be crafted on that basis? These are still open questions in the theory of investor sentiment, as it relates to the behavior of the whole market.

Yet variation in sentiment can also be envisaged within a given market and a given time period. One promising way to capture this variation is to switch from a time series examination of a market as a whole to a cross sectional inquiry. An important and illuminating aspect of investor sentiment arises in fact from a simple question: does sentiment which characterizes the condition of a market at a certain period translate equally for all securities traded in that market, or is there differentiation? In empirical terms, is there cross-sectional variation in sentiment? Casual observation suggests a positive answer. This means that some securities are more ‘sentiment prone’ than others. What differentiates the more ‘sentiment prone’ securities should logically be an intrinsic difficulty in valuation (hence also in arbitrage operations), a scarcity of sufficient information, even a perception of unstructured uncertainty (in the original sense of Knight), which cannot easily translate into measured risk [Knight,1921], [Dow and Werlang, 1992]. This type of cross – sectional variation could lead to the formulation of a

‘sentiment coefficient’ measuring the sensitivity of an individual security’s returns to a market-wide ‘sentiment index’. Interestingly, there is recent empirical work which proceeds on this premise and puts together an empirical sentiment index for stocks [Baker and Wurgler, 2006]. This work implies that as sentiment rises, ‘speculative stocks’ rise more than others, and ‘bond like stocks’ rise less or even decline.

Inasmuch as the sentiment index furnishes an influence over stock returns which is separate and uncorrelated to the index of market returns, (or to other alternative indices) it must capture a different source of volatility. This source has to do with ‘difficulties to value’, which as was mentioned before, relate to uncertainties that are intrinsically un-measurable, or at least to missing information that corrupts the power of statistical prediction.

A cross – sectional differentiation of securities as to their proneness to sentiment lends itself to several policy questions. One relates to mandatory disclosure. For example, could a policy be devised to mandate a higher disclosure standard for these firms which are ‘difficult to value’? The feasibility of such a policy is subject to question. These will most likely be new untested firms, whose future cannot be much further elucidated through any amount of additional disclosure. Disclosure is always related to present and past data, present events and, at best, present plans for the future.

The power of disclosure is always bounded by two limits: first, it may not offer marginal benefit in terms of improvement in valuation if the substance of the uncertainty lies in deep future ambiguities. If a security represents a very large risky bet that will unravel over a long future, present disclosure may have little effect on the conditions of the bet. If comparable firms are not available, for example, present data of a new and untested firm will be very inadequate for providing estimates of future cash flows, even for those who have a high processing capacity. The second limit to disclosure is the ability of investors – sentimental ones in our case – to process complex technical data that are likely to emerge from a requirement for additional disclosure.

In any case a policy of disclosure cannot be ruled out but it should not be expected that additional or more targeted disclosure would eliminate sentiment proneness of some stocks. Any firm can be seen as a sum of values of existing assets and growth opportunities [Thomadakis, 1976, 1978], [Myers, 1974, 1977]. Generally, it seems self – evident that disclosure is more effective for valuing existing assets. On the other hand, sentiment naturally centers much more on beliefs about growth opportunities. Thus, it can be argued that additional disclosure has limits on how far it can help valuation of growth opportunities. This is of course an issue that has empirical content.

One area of regulatory policy that touches directly on 'difficult to value' securities relates to listing requirements and certifications for entry of an asset onto a trading venue. Besides mandated disclosure and due diligence about the legal status of an issuer, regulatory policy also makes use of the tool of categorization and selection of market tiers. Different market tiers have been promoted in many capital markets where listing requirements, riskiness and quality of uncertainty, in general ease of valuation with conventional means, vary across tiers. Regulators may directly mandate that a particular issue go to a specific tier, or what is more usual, may offer issuers a choice of self – selection. In this fashion, more sentiment prone securities may land into particular market tiers which are very publicly known to include firms with large valuation imponderables. In this fashion also, the manifestation of sentiment may remain contained within a particular tier and this may curtail the contagiousness of its effects. For example, the 'internet bubble' was much more a NASDAQ bubble than a NYSE bubble. The Neuemarkt in Germany could be closed down as a 'market tier' when the bubble that enveloped it burst, without contaminating too much the main German market. Essentially then the creation of market tiers, containing securities that are 'difficult to value', may act as successful mechanisms that offer insulation from the generalization of sentiment from sentiment prone securities to the general population of securities. This is cl;early an empirical proposition.

The issue of contagion and of measures to limit contagion is an important one and would be worthwhile to research further in the sense of cross-sectional contagion among

securities. Are sentiment prone securities a relatively fixed population that is determined by a priori characteristics, or do they envelop a growing circle as sentiment grows? Does sentiment spread not only across investors but also across securities?

Market Abuses

A different implication of the differentiation of securities on the basis of sentiment is this: the very securities which are more prone to sentiment would also be foremost candidates for price manipulation, for the exact same reason that makes them prone to sentiment: difficulties to value and to arbitrage. Difficulty to value implies that there is space for arbitrary intervention by some market actors, especially those tempted to misinform or to offer an overly optimistic view, difficulty to arbitrage implies that arbitrary valuation may persist.

If we revisit for a moment the Keynesian argument that rational speculators will attempt to run ahead of the sentiment, it is only a small step to argue further that some or all of them will yield to the temptation of, not just running ahead of sentiment, but of taking actions to foster and inflame the sentiment ahead of which they will then run. An eminent precursor to this assertion is Bagehot [1873]: “The good times too of high price almost always engender much fraud. All people are most credulous when they are most happy; and when much money has just been made, when some people are really making it, when most people think they are making it, there is a happy opportunity for ingenious mendacity.” Kindleberger also notes: “In a boom fortunes are made, individuals wax greedy, and swindlers come forward to exploit the greed…Greed not only creates suckers to be swindled by professionals but also pushes some of the amateurs over the line into fraud, embezzlement, defalcation, and similar misfeasance” [Kindleberger, 1978].

Manipulation can be trade – based. Several authors have argued that manipulation can pay off when market participants seek information in order to overcome difficulties to value a security [Jarrow, 1992], [Allen and Gale, 1992]. These works are cast in the context of efficient markets with monopoly power and informational asymmetry. They prove that manipulators can make a profit as long as investors (falsely) believe that the

manipulative transaction reveals new information and cannot distinguish between manipulators and informed traders. In the case of sentimental investors this type of profit can be gained a fortiori: as investors are motivated by trend chasing and feedback expectations, the probability of success of manipulative strategies would be greater if the manipulator could feed a trend and create an impression that a share has potential for future price increases. If the manipulator can instigate the manifestation of momentum in a price, it is self evident that she can profit from it.

However, an interesting problem presents itself: the manifestation of investor sentiment that makes manipulation attractive, can also confound enforcement against manipulation. If for example a manipulator reinforces a trend which is then picked up by many others, the manipulator may end up being indistinguishable from the other investors from the viewpoint of an external monitor, as the regulator. Or, if someone is seen to make large purchases early in a trend and sell at a profit a few stages later when the trend has taken hold, she can be either a manipulator or an investor who decided to chase the trend and take profits after what she thinks is a skillful strategy. One would have to base the claim of manipulation by either showing coordination between a group of investors who act in tandem to initiate a trend, or by locating repeated cycles of purchases and sales that misrepresent a security's tradability, or by locating clear cases where a price rises after a manipulator's entry and collapses back to its initial level after the manipulator's exit.

Moreover, profitable manipulation can be hard to distinguish from general profit making, when a feedback mechanism is at work. To an outside observer the manifestation of sentiment is itself a kind of coordination that comes about precisely from the combination of trend chasing and mimicry. As I read the literature on herding, I cannot but notice that mimicry is itself a coordinating device. I can in fact argue that unwittingly the actions of sentimental investors are coordinated in a boom, and effectively manipulate the market for shares that are 'sentiment prone'. Thus, the distinction that needs to be made for purposes of enforcement is between 'conscious' and 'unconscious' manipulation, and not between manipulative and fair value pricing.

More generally, effective enforcement of anti – manipulation rules would be simpler in a market where prices, in the absence of manipulation, are informationally efficient. It becomes harder in a market and in securities where sentiment drives prices. But it is precisely in those cases that risk of manipulation is higher. In conclusion then, the possibility of a vicious circle of this type could lead to market failure in the sense that sentiment increases the success rate of manipulation and manipulation can enhance sentiment. The confirmation of behaviorist conclusions implies that regulatory action against manipulation must be redefined to recognize the behavioral traits of sentimental investors on one hand, and the behavioral traits of manipulators on the other hand, and find the distinguishing features of each and of conscious manipulative strategies. In sum, one could argue that anti-manipulation policies are not as easily enforceable, in the face of 'innocent' sentiment. This discussion however must also take into account the role of information and opinion-making in financial markets. This is because a significant portion of manipulative action is based on the use of misinformation, rather than just trading behaviors.

Information, Opinions and Opinion-makers

Information about individual securities and the general conditions of a market are extremely relevant in any discussion of asset price formation and change. In all cases of 'financial news' we encounter both disclosures of economic events by issuers and production of 'opinions' or 'comment' by third parties. By 'opinion' I mean here reporting, evaluation and interpretation of current events, data, and decisions that can impact a forecast of future developments. Market efficiency theory subsumes all these activities under the heading of 'information' and assumes that this information is disseminated in a continuous, unbiased fashion. Indeed, the rational arbitrageur of efficiency theory requires just that, in order to produce and adjust her fundamental valuations.

On the contrary, it is evident that the sentimental investor who operates on the basis of social interaction and communication needs easily accessible and easily usable information. The way in which public information is packaged and presented to her is

relevant a priori, since the sentimental investor may not have a capacity for processing complex data. To such an investor therefore, the difference between 'disclosure of data' and 'opinion on value' can be very large. Her ability to process complex data from financial disclosures for example is limited. Arguably, as complexity and comprehensiveness of disclosure increase, a derived demand for 'opinion' and 'value judgment' also manifests itself among sentimental investors. In this context, information as source material must be clearly differentiated and separated from the processing and interpretation of information, i.e. 'opinion' and 'value judgment'. The huge growth of professional bodies that produce 'value judgments' (analysts, financial advisers, credit raters, auditors) and of the financial press is a momentous development in the 20th century, and can be seen as historically coterminous with the rise of public markets.

Issuer disclosure is naturally the basis for much of the information flow to market participants. Voluntary disclosure cannot easily be freed from a selection bias that encourages rapid dissemination of good news and slow dissemination, minimization of the significance, or even complete suppression of bad news. Financial economists who maintain a critical stance towards regulation in the tradition of Stigler, nevertheless admit that the imposition of mandatory disclosure rules is a legitimate regulatory objective [Zingales, 2004]. Indeed, in the practice of most capital markets, disclosure at the time of new issues, as well as periodic disclosures related to traded instruments, are regulated in terms of format, content and timing. Financial reporting and the audit of financial reports forms the backbone of mandatory disclosure policies and offers a comparable basis for judging relative values across firms or values as they evolve over time. The basic gain from mandatory disclosure is that it overcomes the strong incentives to distort the direction and the timing of issuer announcements were they to be left to voluntary choice.

There is on the other hand a constant quest for information discovery on the part of market agents and opinion – makers. Speculators and arbitrageurs seek to discover private information in order to profit from it. Whether they can equally profit from information that reinforces a trend as from information that goes against a trend, is an open question that leads straight back to the discussion on the limits of arbitrage. Thus,

even information seeking speculators and arbitrageurs may practice selectivity if in fact it proves too risky for them to utilize contrarian information.

Opinion – makers who seek information not in order to trade but to carry out professional duties are a very important conduit of market judgments. Auditors, analysts, credit raters and financial journalists are all professional agents who engage in information discovery and who subsequently make public their opinions and value judgments to the investing population. All are normally tied to the issuers from whom they obtain most of their information, in some case by explicit contracts (e.g. an audit engagement) in some cases by informal contacts and implicit understandings (e.g. analyst or journalist 'sources'). All are therefore prima facie tainted by the possibility of conflicts of interest and of threats to their professional revenues if they issue negative opinions from the information they gather from issuers. Argument has been presented that in fact these opinion-makers, including financial journalists, may reinforce trends and increase overall market volatility either because they wish to cater to issuers, or because they have a better chance of becoming popular by confirming existing perceptions of reality held by the public at large [Dyck and Zingales, 2002], [Mullainathan and Shleifer, 2003].

It is immediately obvious to the casual observer however, that whereas issuer disclosure is subject to considerable regulation in most markets, the generation and diffusion of 'opinion' based on private information remain by and large unregulated activities, with the exception of auditors. (In their case substantial regulation has now be put in place, partly as a response to the accounting scandals of the early 2000s). On one hand this is consistent with a strong democratic tradition of freedom of the press, which is a right not only of journalists but also, nowadays, is also claimed by credit raters, for example. On the other hand, the theory of market efficiency assumes tacitly the neutrality of the information disclosed and the 'opinions' offered. In other words, it assumes that "facts" are accurately described as they emerge by a neutral non-distortive process; they become available to investors in an unbiased form and unbiased timing; investors in turn draw the valuation conclusions from these facts. The theory does not require that all investors draw the same conclusions, because if so, there would be no trading; but it presumes that they

all obtain the same unadulterated and ‘true’ facts. These assumptions seem to remain strong not only as analytical precepts of efficiency theory but also in the formation of perceptions about the role and function of ‘opinion – makers’, perceptions strongly propagated by the ‘opinion – makers’ themselves.

A plausible contrary hypothesis can be proposed: those who produce opinions about the “facts” have a priori incentives to distort them. Let us take the example of financial journalists, who personify the freedom of the press function. Financial journalists, including publishers of various bulletins and newsletters, are not a priori unbiased as they are normally linked to the financial market with multiple ties of self interest. For example they may belong to organizations that are linked to listed entities or that own portfolios of securities; individual reporters or editors may have personal interests of ownership; even more they may have a strong interest in maintaining professional links to preferential sources of information, such as companies that issue shares or investment banks that underwrite new issues. They all therefore have at least a conflict of interest, and most of them have a prima facie bias in the direction of “good news”, or more generally the ‘maintenance of the convention’ which supports current valuation, to use the terminology of Keynes.

The biases introduced by ‘opinion makers’ are not without limits or balancing factors. Many ‘opinion makers’ belong to organizations that operate themselves in open markets. They are therefore subject both to market discipline via competitive rivalry and to reputational restraints, and these create pressure towards revealing ‘the truth’ [Gentzkow and Shapiro, …]. Frequently ‘the truth’ however depends very much on the lens though which it is seen. In some instances, such as the case of auditors, there are explicit regulatory requirements both in the form of well-specified, publicly known, standards that have to be followed, and in the form of monitoring of the application and enforcement of these standards. In other cases however, notably credit raters, analysts and financial journalists, there are neither public standards nor much external monitoring. Clearly, it is theoretically plausible that the bias itself is noisy, prudent or occasional.

Even so, it is impossible to simply assume it away, as efficiency theory does; this bias exists and it may impart distortions and excess volatility to the pricing process of assets.

An important issue is whether the bias imparted into investor beliefs and prices by opinion-makers is time varying, as for example during a cycle of market boom and bust. Behavioral finance has not much examined the role of opinion-makers as a potential source of distortion and excess volatility. Nevertheless, significant remarks on the role of the press are offered, for example, by Shiller [1991] who asserts that the effect is time variant, as it works to exacerbate bubbles by fanning the flames of investor 'irrational exuberance' once the train of overvaluation has started to run. Dyck and Zingales [2002] argue that journalist incentives to maintain a pro-company stance in reporting are strongest during market booms. Shleifer and Mullainathan [2002] have argued that competition may actually strengthen the tendency to 'put a spin' on stories and to confirm beliefs held by the readership, implying in the case of price booms the continuation of the trend. Kindleberger [1978] has noted a number of historical observations where the press had whipped up a sentiment that inflamed a speculative frenzy with ultimate dire consequences.

These works, albeit from very different perspectives, appear to lend credence to what casual empiricism suggests: during market booms opinion makers act to strengthen the prevailing trend, and the press does so more strongly and more visibly. There is an important difference to be noted in this respect. Several opinion makers such as auditors, analysts, or credit raters are organized in professional bodies or firms that enjoy high entry barriers due to qualification requirements and reputational capital. The financial press on the other hand is by far an easier industry to gain entry into, and during booms casual observation indicates that entry into the financial press (meaning not only papers but also electronic media) booms too. In other words, during booms there demand for opinions is heightened, and this demand finds an easier and quicker response in supply from the press, as compared to other opinion makers who may be either more regulated, less flexible because of qualification requirements, or less open to quick entry.

Manipulation, Information and Opinion

A multitude of manipulative projects in open capital markets is based on misinformation. As already noted in a previous section, several authors, going as far back as Bagehot's 19th century warnings, have noted that the sentimental investor who comes to market during price booms and frenzies of quick enrichment is much more gullible and easily misled. Booms and times of manifestation of high sentiment furnish an excellent opportunity for the diffusion of misinformation. At the extreme, misinformation may be simply a pack of lies. Fantastic projects and unreal dreams are not unknown, but over more than two centuries of incidents regulatory requirements of disclosure and due diligence have surely limited the scope of such extreme cases.

The common form of misinformation is when a real project, a real firm, a real prospect is misrepresented out of proportion, by overstating prospects, profits, cost advantages, new markets, new corporate combinations, new inventions, probabilities of success; or, when a stock is said to be ready to take off because large demand for it is about to materialize from an acquirer who thirsts for mergers, or from some other quarter seeking control. A market populated by rational arbitrageurs who are able to process and weigh complex information may not easily fall prey to manipulative misinformation. A market populated by sentimental investors who thirst for simple and easily understood information, and who pay attention to rumor as a source, may succumb to manipulative misinformation far more easily.

Among opinion makers, journalists are the ones who, by definition, have more immediate impact on the views of investors. They also may pick up rumor and propagate it more readily, since their business is to disseminate news, opinions and suggestion. The elevation of rumor to the status of a newsworthy item is the means by which misinformation can spread. Yet, the press does not publish every rumor and every possible story, nor does serious journalism lack filters to establish the validity of information to be published. Two features of reporting during booms are suggested by casual empiricism and some theory quoted above, however. The first is that rumors will be published just as rumors, relegated to gossip columns, or lines of semi-serious

commentary; so they are propagated without taking the status of news, but without being completely silenced either. If the serious press does avoid rumor propagation through filters of prudence which exclude gossip columns, for example, new entrants will gladly take up the task. Gossip letters and TV programs abound during booms. A whole huge platform of informal opinion-making is furnished by accessible internet sites.

The second feature is that during price booms (or declines), press reporters are always under pressure to provide ex post explanations why prices go up (or down) and why the current price levels are reasonable or even sustainable. In doing so they feel that they fulfill two goals: They both sail along with strong vested interests of issuers which organize around high prices and they give investors who have bought overpriced assets what they want to hear. In that context, they readily adopt or fabricate 'explanations' that accommodate observed price trends. Thereby they offer facile rationalization to make unrealistic price levels look conventional. The validity of this observation appears to be consistent with one interpretation of the feature of 'conservatism' which is used by some behavioral theorists [Barberis et.al. 1998], [Griffin and Tversky, 1992]. They attribute to this concept 'under-reaction to news', in other words a certain degree of passivity among investors, and lack of flexibility in altering their view of the status quo, until too much evidence accumulates. My proposed interpretation here is somewhat different, and I believe broader: 'Conservatism' may account for an inability to accept that a level of observed prices is unrealistic, simply because it is an "observed reality", and because investors more easily think that what is observed is conventional since others must believe the same, and therefore sustainable. Opinion – makers may play a very important role in this buildup of beliefs in a false sustainability, by certifying and rationalizing the 'causes' that explain high (or low) prices. This may induce conservatism in the sense of leading investors to believe that a phase of 'exuberance' or 'depression' is unchangeable. Is this manipulation? And if it is, does it not suggest a whole different set of possibilities for the regulation of incentives via the formulation of principles, codes of conduct, and governance arrangements for opinion makers? Can we not speculate on alternative forms of internal design of opinion makers that might alter the process of opinion formation?

In Lieu of Conclusion: Can another 'Ontological Reversal' be Contemplated?

The sentimental investor is perhaps a more realistic individual market agent who operates in open public markets, and whom behavioral theories place squarely at the center of the market process. Yet, as a social subject the sentimental investor uses opinion and certification from various opinion makers, who are themselves an integral part of the market process, and who act as private agents for profit. It could be argued that investor sentiment is a social phenomenon akin to 'public opinion'; and those who provide opinions and value judgments for the market play a strong role in shaping this 'public opinion'. It is then appropriate to ask whether in fact a second 'ontological reversal' can be theorized about who are really the purposive market agents. Are they the sentimental investors or are they the opinion-makers who drive sentiment and market conditions?

The mechanism by which public information is produced and disseminated has a strong public interest component. Some information and opinion is in fact produced by public entities. Governments themselves publish statistics but also voice opinions about market conditions and macroeconomic prospects. Private agents such as auditors, analysts, credit raters, financial journalists all produce something that affects value by becoming public knowledge. Coase [1974] was right that one should not attempt to regulate ideas. But are market opinions ideas in the Coasian sense, or are they simply elaborate judgments about future bets one way or another? It seems that the line of regulation can and must be feasibly drawn where judgments about future bets are subject to at least commonly agreed and publicly accepted standards, without this being an encroachment on the freedom of anyone's ideas.

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