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**The Psychology of Financial Markets:
Keynes, Minsky and Emotional Finance***

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Abstract

This paper is concerned with drawing on both psychology and economics in order to amplify the psychological content of Minsky's account of the behaviour which leads up to financial turmoil, and market responses to it. In exploring recent developments in behavioural finance, which explicitly apply psychology to economics, we find that a crucial element is given inadequate attention: the motivation for action under uncertainty. Yet earlier traditions in economic thought (notably the Scottish Enlightenment thought) incorporated the role of psychological motivation under uncertainty. We see this emerging again in Keynes's analysis of financial behaviour, and again in Minsky's financial instability hypothesis. We explore the methodological features of their economic analysis which allow this crucial psychological input to be present, focusing in particular on the role and meaning of rationality. We also draw out their use of psychology by considering the new field of emotional finance.

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Introduction

Hyman Minsky's financial instability hypothesis has provided an influential explanation for the current phase of systemic instability, tying it into a cyclical pattern of asset valuation (Whalen 2007). For Minsky, boom periods result from a growing tendency to reduce expectation of risk and to expect an increasing appreciation of asset values, with consequent growth in credit and thus exposure to risk. This tendency increases the fragility of the financial system and thus its potential for reversals, as expectations are confounded and defaults increase. A key element of the process is that illiquidity problems, though knock-on effects on asset valuation, can create insolvency problems. The boom period is categorised as one of 'euphoria', which has a key role in the absence of the necessary conditions for objective quantitative risk assessment. While uncertainty diminishes with the general confidence in low risk during the boom period, the reversal increases uncertainty about future asset values, encouraging a rise in liquidity preference which continues as expectations become more firmly held of asset price deflation.

The concept of euphoria, and indeed of uncertainty in the absence of objective quantifiable risk, are redolent of psychology rather than rational economic man. Indeed the expression 'the psychology of the market' is often used in this context, and notably by Minsky's (1975) mentor Keynes. While Keynes explicitly discussed psychology in a variety of ways as an integral part of his economic analysis, Minsky did not actively explore it. Indeed, as Chick (2001: 40) has pointed out, Minsky's theory demonstrated the structural nature of cycles in contrast to Keynes's 'ad hoc appeals to a collapse in expectations'. It is the financial fragility which builds up in the euphoric phase which accounts for the reversal not any particular event (anything which breaks through the euphoria will do). For all Minsky explicitly adopted Keynes's theory of expectations under uncertainty, he appeared to distance himself further from psychological exploration by referring, for example, to 'the irrational fact of uncertainty' (Minsky 1982: 118).

Indeed there was a long period of increased disciplinary separateness (Hausman 1992), whereby economics was understood to be concerned with rationality and psychology with irrationality. But in recent years there has been an increasing focus on the scope for combining economics and psychology, from a variety of perspectives, particularly with reference to financial behaviour. The purpose of this paper is to consider the available ideas on economics and psychology in order to flesh out, in the spirit of Minsky, the psychological content of his theory.

We start by considering the recent emergence of importing psychology into economics in the 'new' behavioural finance literature, as a way of understanding how psychology can be used in economics, tying the discussion into some different approaches within psychology itself. We find that psychology is introduced as a 'separable' additive element, which does not affect the fundamental structure of theory. Further psychology enters theory in terms of either preferences or cognition, treated separately. But the 'old' behavioural economics, which focused on cognition issues, proposed a different approach to theorising, employing a broader notion of rationality (see Sent 2004 for a discussion of the distinction between the 'new' and 'old' behavioural finance). We discuss this approach to cognitive problems along

with some of the subsequent thinking in neuroscience which raises questions about separability between issues of cognition and emotion. Indeed historically psychology evolved alongside economics in the eighteenth century within moral philosophy, allowing for more integration between the economic and the psychological, not least because of the integrated treatment of cognition and emotion. In the third section, we trace this approach to economics and psychology to Keynes, whose theories were a primary inspiration for Minsky. In the fourth section we consider some new work in the area of emotional finance with its emphasis on uncertainty as the crucial factor. This indicates how the Keynes/Minsky account of financial markets might be developed further.

Financial instability is a complex phenomenon, best explained as Minsky has done as a structural phenomenon which is natural to market economies. The intention here is not to argue that psychology alone can explain cycles. Within Minsky's structural framework, other important factors particular to context, such as institutional arrangements (both within public sector institutions and within banks), are an integral part of any account. The purpose here is to focus on the nature and role of the psychological element in cycles.

'New' Behavioural Finance

Identifying the psychological content of economics is not straightforward, in that the field of psychology itself has its own history and range of approaches. Indeed how we understand this context also depends fundamentally on the approach to economics within which we consider psychology (see Dow forthcoming). We start with the traditional efficient market theory explanation for financial instability as a jumping-off point for the contributions of the new behavioural economics; this is the area of combining economics and psychology which perhaps currently has the highest profile.

In order to explain financial instability in efficient markets where behaviour is rational in the standard axiomatic sense requires the importation of some market imperfection. This imperfection could take the form of imperfect information, or more logistical factors which limit the efficiency of market arbitrage. Once the market has deviated from equilibrium, rational behaviour can initially amplify the deviation, although rational behaviour then reverses the process, the whole process constituting a 'rational bubble'.

Given the traditional demarcation between economics and psychology, psychology can enter into the financial instability explanation in the form of a deviation from equilibrium caused by an element of irrationality in the market. Thus for example the amplification of the deviation could be explained by herding behaviour (an irrational overemphasis on past trends). Yet efforts have been made to explain such behaviour as being rational given the extent of available information (Bikhchandani and Sharma 2001).

Alternatively, some heterogeneous agent models segment the market into rational players (primarily the professionals) and irrational players who allow sentiment to influence their choices (Baker & Wurgler 2007). Eventually the rational players drive the market back to equilibrium. Other heterogeneous agent models allow for disagreement in interpretation of

market trends, but imperfect updating of inferences as to others' beliefs. These latter explanations have psychological content: sentiment/irrationality and cognitive limitations.

Irrational behaviour on the part of the representative agent too can explain financial instability. This kind of psychological input has tended in the past to be treated as exogenous (economics not being concerned with irrationality). But Kahneman and Tversky (1974, 1979) in particular have sought to explore further into the nature and content of this psychological input. The benchmark for them too is rational economic man, but their work has used experimental evidence to challenge the realism of the rationality assumptions in economics, since the outcomes were not those predicted by standard decision theory. Rational choice theory explains choice as the outcome of optimising with respect to some objective function, subject to constraints, which generally yields an unambiguous best outcome. However, Kahneman and Tversky (1974, 1979) demonstrated that the choices actually made in experiments depended crucially on how the agent frames the choice problem (a matter of cognition) and preferences (a matter of sentiment or emotion, as in loss aversion for example). The scope for different framings arises from cognitive limitations, which are addressed in practice by the adoption of heuristics. This is potentially of tremendous significance. From a psychological perspective, accepting different framings, there is no longer one best solution. For economists to model choice, there needs to be a model of framing. From an economics perspective, however, there is still the best rational choice, and any framing other than in terms of classical logic is deemed irrational.

Kahneman and Tversky's work has sparked off a large literature in behavioural theory, which addresses actual behaviour as it appears from experimental evidence. However, this interest in behavioural economics builds on behavioural psychology. This approach to psychology does not inquire into the actual causal processes behind behaviour, but rather seeks stable predictable relationships, which can be modelled, between stimulus and response. Behavioural psychology thus takes a 'black box' instrumentalist approach.

While a large gap remains between the pure, deductivist, theoretical literature and the inductivist applied literature drawing on experimental evidence, the goal is to combine the two, by achieving a much more complex specification of rational choice which takes on board the psychological elements taken to lie behind the experimental results. As Hong and Stein (2007: 126) put it:

The enduring appeal of classical asset-pricing theory over the last several decades owes much to its success in forging a consensus around a foundational modelling platform. This platform consists of a core set of assumptions that have been widely-accepted by researchers working in the field as reasonable first-order descriptions of investor behaviour, and that – just as importantly – lend themselves to elegant, powerful, and tractable theorizing.

If behavioural finance is ever to approach the stature of classical asset pricing, it will have to move beyond a large collection of empirical facts and competing one-off models, and ultimately reach a similar sort of consensus.

We can summarise the psychological input to behavioural finance in a stylised way as follows, where D = decision, U = utility/preferences, S is the state, or context, within which the decision is taken and which constrains the decision, and f is the functional form of the decision-making process: $D = f(U|S)$.

Psychology enters first in the functional form, f . Rather than an optimising structure, decision-making may follow a satisficing structure with its own decision rules (such as Maslow's hierarchy of needs). This is explained by human cognitional limitations as well as the nature of the subject matter. Cognition also enters into the perception of context, S ; agents may apply their own particular frame to the situation, events may have triggered particular emotions, and social norms may enter into both the interpretation of the choice situation and the forming of expectations.

Psychology enters secondly in the preferences. The utility function may include arguments based on emotion or sentiment (e_1, e_2, e_3, \dots), such as loss aversion, as well as the conventional arguments, such as income and leisure: y and l : $U = U(e_1, e_2, e_3, \dots; y, l)$, where y and l are the conventional arguments, income and leisure.

The core framework therefore remains outcome-oriented rational optimising behaviour. As Kahneman (2003: 1469) put it, 'theories in behavioural economics have generally retained the basic architecture of the rational model, adding assumptions about cognitive limitations designed to account for specific anomalies'. Indeed Altman (2004) argues that Kahneman and Tversky focus on deviations from predictions of rationality models as error or irrationality. Their verbal discussion is broader ranging than what is modelled; see also Shiller's 2005 work on irrational exuberance. But the formal modelling of behavioural economics imposes restrictions on what can be incorporated. The modelling of heuristics (and framing) poses particular problems. As de Grauwe (2007, quoted by Goodhart 2008: 7) notes, 'The challenge when we try to model heuristics will be to introduce discipline in the selection of rules so as to avoid that "anything is possible"'. Further, while psychological factors can be incorporated as preferences, there is no obvious way of explaining the large changes in behaviour associated with financial instability. This would appear to require some exploration of psychological motivation, ie a theory of the mind.

'Old' Behavioural Finance and Neuroscience

Long before the emergence of behavioural finance, Herbert Simon (1955) was exploring the significance for economic behaviour of cognitive limitations. Rather than focusing just on outcomes, Simon was concerned to inquire into mental processes. Indeed Simon (1986) argued that the economic concept of rationality focused on choices, whereas in the other social sciences rationality was a matter of processes. He argued that the subject matter is such that we cannot have perfect information; indeed knowledge is generally inevitably held with uncertainty. This argument (shared by Keynes and Minsky, as we shall see below) did not attract the attention of mainstream economics. What did attract attention was his other argument that, in addition, our human cognitive capacities are limited. Both limitations in

general rule out optimising behaviour. The informational and computing demands, eg for a complete indifference mapping of preferences over all possible choices, including all contingencies, are beyond human capabilities. Instead, we employ heuristics to guide decision-making. This was rational in a broader sense than the term is used in the rationality axioms. Further, Simon's approach emphasises induction over deduction, as the way in which economic agents build their knowledge and adopt heuristics, but also as the way in which the economist should build theory. Indeed Simon took a strong stand against deductivist reasoning and therefore formal equilibrium models (Sent 2004: 747).

One decision-making strategy is to follow others, which is efficient in many circumstances, but which also can have disastrous consequences in others. For example Earl, Peng and Potts (2007) have used Simon's heuristics approach to analyse financial instability in terms of herd behaviour which can precipitate a crisis. The emphasis is on diversity of investment strategies rather than diversity of information. Drawing on Dopfer and Potts's (2008) analysis of rules as meso trajectories, they explore decision-rule cascades in speculative markets. Strategies are developed creatively (requiring its own analysis, drawing on Kelly 1955), but then these strategies cascade down through expert levels to households, and lose detail in the process. Thus a sophisticated strategy for buying real estate may degenerate into a simple 'buy-real-estate' rule for households regardless of capacity to finance the necessary mortgage loan. As the heuristic degenerates, speculative buying builds strength and the seeds of instability are sown.

Simon's work provided encouragement for the move within psychology from behavioural psychology to the development of neuroscience, which explored the source of behaviour in the structure of the brain, opening up new possibilities for explaining apparent deviations from the predictions of the conventional rational optimising agent model. As Camerer et al (2005: 54) put it, 'there is no theoretical basis in finance for why attitudes towards risk would vary over time. Maybe neuroscience can supply one'.

First, adding to Kahneman and Tversky's argument about different possible framings, neuroscience demonstrated that behaviour depends on the specific part of the brain triggered by an event, adding further to the conclusion that there was scope for a variety of outcomes (Martins 2008). Indeed it would be difficult in these terms to contemplate a unitary set of preferences, even for the individual (far less the representative agent). Second, behaviour is in general dominated by affect (or emotion) rather than rational calculation. Affect is generally unconscious, as opposed to feelings which are in general conscious; a common form of affect is the unconscious desire for system.

The most important consideration in human decision-making and action is not how to optimise cost/benefit ratios, but how to maintain an emotional state in the person performing the action that is as stable as possible and free of contradiction within itself (Gerhard 2003: 2).

Indeed it is argued that emotion is necessary for decision-making, citing evidence from individuals whose emotional capacity is limited (Gigerenzer and Selton 2001: 207). Yet behaviour can be understood as the outcome of a struggle between different mental processes, such as reason and emotion.

There have been attempts within this literature to model decision-making taking account of emotion (ie incorporating emotion into a model of rational choice). This is particularly the case in the artificial intelligence literature (see eg Marvin Minsky, 2006). But the scope for these attempts to succeed has been challenged by Gigerenzer (2000, 2007), who argues that the evidence suggests rather that decision-making is based primarily on biological evolved heuristics, and gut feelings, rather than calculative rationality. While this decision-making is rational in a broader sense than calculative rationality, it seriously undermines the meaningfulness of the idea in the economics literature that rational behaviour (in the narrow sense) could drive out the irrational (see further Gigerenzer et al 1989, Gigerenzer and Selten 2001). In particular it challenges the Kahneman and Tversky approach with its separation between calculative rationality and other (apparently irrational) bases for action. But this literature is continuing to evolve. There is now a growing literature in psychology on emotion theory, where there are competing strands of thought, eg as to whether it is reason which generates emotion (as in fear as a selfpreservation strategy) or whether emotion such as fear is rationalised afterwards as a mechanism for self-preservation. An argument which is influential in some quarters is put forward by Damasio (1994), that emotion is an integral element in decision-making; evidence on people who have lost the use of the emotional part of their brains find decision-making extremely difficult.

The question remains as to what instigates activity in the brain, and thus behaviour: whether it is always the result of an exogenous stimulus to given mental states. (There is a parallel with the theory of financial instability being caused by exogenous events, or, as in Minsky, by structural changes rather than the events as such.) Indeed there is a strand of thought in psychology which questions the validity of separating emotion and reason (something which is evident to a limited extent in Camerer et al.'s 2005 survey article). For example, individuals are depicted as generally ambivalent rather than single-goal directed (Berezin 2005). What is clear from the neuroscience literature is that deductive protocols themselves cannot stimulate action, particularly the kind of change in behaviour patterns evident under financial instability; behaviour itself requires inductive reasoning. As Klein and d'Esposito (2007) argue, there is a profound incompatibility between deductive reasoning and the inductive reasoning needed to address ill-defined, complex strategic situations. Indeed Camerer et al. (2005) argue that the rational protocols of rational choice models, as explored in neuroscience, have a better chance of illuminating animal behaviour than the behaviour of humans who are capable of deliberating about emotion and the consequences of emotional acts.

At issue is the presence or not of dualism, ie the propensity to structure thought around all-encompassing, mutually-exclusive categories with fixed meaning, which is characteristic of closed systems (Dow 1990). The duals at issue here are rationality/irrationality and reason/emotion, as well as (probabilistic) certainty/ignorance.

If these duals do not adequately represent the psychological reality of decision-making, because of the nature both of the mind and of the environment, deductive calculation cannot explain behaviour. It may then be that the standard finance approach, being deductivist, cannot provide a satisfactory explanation for behaviour. We have seen that the standard theory imports psychology in separable form, into the preferences of agents, and their capacity to optimise. Further, behavioural economics represents decisionmaking within a goal-oriented framework, where the preferences can be understood as having emotional content. But changing emotional states not only change behaviour but may also make it difficult to represent the behaviour as addressed to goals, rather than, say, instincts, in a clearly-defined way. It may also be an insuperable problem to incorporate heterogeneous emotional states.

Bruni and Sugden (2007) trace the emphasis of economics on rationality back to Pareto, rather than the combination of economics with psychology, focusing on the pleasure/pain principle, as pursued by Edgeworth and Jevons. But we can trace the combination of economics with psychology much further back. Some of these issues explored above were addressed in the early days of the evolution of modern economics, as well as modern psychology, in the writings of key figures in the Scottish Enlightenment, notably Hume and Smith. Some of these ideas resurfaced (with further influence from Freud) in Keynes's writings. In both cases the significance of psychology followed from thie epistemology. We now proceed to explore these ideas in order to inform our modern thinking on psychology and economics.

An integrated approach to psychology and economics

Modern psychology may be said to have stemmed from one of the same roots as modern economics: the Scottish Enlightenment. We find many of the features of the mind which are now being demonstrated by neuroscience. What is now referred to as 'psychological' was Adam Smith's (1795) explanation for the motivation for science and the spread of ideas. Scientists are motivated by the urge to set the mind at rest when it comes across disturbing instances which seem not to be explained by current theory; they also have a disposition to find particular pleasure in solving such puzzles. This urge was subconscious; as Foucault (1972) argues, this period saw the emergence of the unconscious mind. The real world was too complex to generate certain knowledge; knowledge was therefore built up provisionally through induction and the development of provisional principles through reason, on the foundation of sentiment. Further, ideas are spread by means of persuasion, in the absence of access to truth. Theories are more persuasive which are pleasing to the mind; they are simple, connect with something which is already thought to be known, and derive from first principles. Indeed the psychological factor of aesthetic sense was a central aspect of Smith's theory of knowledge (Comim 2006).

Central to Smith's work was the view that knowledge is the product of the mind (a view shared and developed later by Marshall and Hayek; see Loasby, forthcoming). Indeed the modern theory of mind found its origins in this period in the debates around common sense philosophy, which posited that the mind adds to the observations of the senses. The mind was the locus of ideas as well as the registering of experience, and reason. Reason was a

faculty which only came into play after the sentiments established motivation, and also the grounding of belief (for example in the existence of reality) which underpinned observation. As Hume (1739-40: 413) put it, ‘reason alone can never be a motive to any action of the will; ... it can never oppose passion in the direction of the will’.

Sentiment could also constrain action. Thus the impartial spectator, understood through imagination, was the locus for moral sense which, along with self-command, constrained self-interest (Montes 2004). This interpretation is in marked contrast to Ashraf et al (2005) who have interpreted the impartial spectator as imposing reason on irrational sentiment (consistent with our account of behavioural economics above). Yet the first interpretation accords well with the neuroscience analysis of deliberation limiting affect. Reason could also be applied perversely in that human beings are capable of self-deception. In the case of Smith’s (1759: 181) poor man’s son, for example, increased economic activity is the fortunate side-effect (as if arranged by the Invisible Hand) of an unreasonable expectation that riches will bring happiness.

Psychology then referred to the sentiments rather than reason, but the two were intertwined, eg in the process of persuasion, or of the development of moral sense. While sentiments would be different, and manifested in different ways, in different contexts, there was a belief in the commonality in human nature, allowing general statements, eg as to what is more persuasive in one theory than another. This interdependence of sentiment and reason followed from an epistemology which emphasised the limits to human knowledge.

It is not surprising, given the similarities between Keynes’s epistemology and the epistemology of the Scottish Enlightenment, that psychology could enter similarly into his approach to economics. For Keynes too, psychology provided the subconscious motivation for behaviour. Thus, drawing on Freud, Keynes argued that economic activity in a market economy is driven by the urge for financial accumulation. Like Smith, he saw this urge as involving self-deception, operating against individuals’ best interests (Winslow 1995). This view of money as a good sought in itself, rather than as a veil, is also supported by the modern literature in neuroscience.

In the *Treatise on Probability*, Keynes (1921) explored how we establish reasonable grounds for belief as the basis for action. Given the limited scope for certain (or certain-equivalent) knowledge, most knowledge is held with uncertainty. In the absence of the ability to establish knowledge with reason alone, then, we use what direct knowledge we have, along with indirect (theoretical) knowledge, conventional knowledge, and expert advice. But, as he explained with respect to the valuation of assets and the investment decision, this knowledge is never enough to justify action. Rather it must be supplemented by instinct, and a psychological urge to action (‘animal spirits’). As he argued in the *General Theory*, action in the form of investment could never be justified by rational calculation, since all knowledge with respect to the future was subject to fundamental uncertainty. ‘A large proportion of our positive activities depend on spontaneous optimism rather than a mathematical expectation, whether moral or hedonistic or economics’ (Keynes 1936: 161).

In times of low confidence in expectations, however, there is no urge for action, and liquidity preference is high.

These two factors, the psychological expectation of yield on capital assets and the psychological attitude to liquidity, are two of the three ‘ultimate psychological factors’ which underpinned his macroeconomic theory (the third being the marginal propensity to consume) (ibid.: 246-7). Further, Keynes (1937) later suggested some heuristics to guide expectations formation, and thus behaviour, under uncertainty: assume the present to be a guide to the future, assume current prices to be a correct valuation of assets, and adopt conventional judgements (conforming to the majority or average). These heuristics embody an emotional trust which may well be proved to be disastrously wrong.

Keynes’s realisation that emotion and reason play interdependent parts is most explicit in his essay on ‘My Early Beliefs’ (Keynes 1972). His understanding of rationality is made clear by comparing chapters 11 and 12 of the *General Theory*, as accounts of the investment decision. Under uncertainty it would never be rational, in the standard economic sense, to invest; a rational calculation could not be made. The investment decision requires the emotional urge to act in spite of uncertainty; this is potentially reasonable behaviour, not irrational behaviour. But of course in euphoric conditions, the urge to act may not be reasonable in retrospect, when asset prices fail to meet expectations.

Keynes put great emphasis on the ‘psychology of the market’ as determining opinion about the valuation of assets, and the confidence held in that valuation. While Keynes has been criticised (eg Pixley 2004) as offering too individualistic an account of psychology, his theory of expectations emphasised the social dimension, in his ‘beauty contest’ example where individual expectations focus on the expectation of market expectations, or in his emphasis more generally on social convention (Davis 1994). Goodhart (2008) similarly criticises Shackle’s related ideas about expectations under uncertainty, in the context of financial market instability, as being unduly individualistic. We will explore the application of social, rather than individual, psychology to financial instability in the following section, as an approach which seems consistent with Minsky’s structural approach..

Minsky (1976) was clearly inspired by Keynes. Indeed Chick (2001: 36) describes him as ‘perhaps the earliest of the retrievers of Keynes’s *Treatise on Probability*’. Minsky’s epistemology, and thus methodology, were thus heavily influenced by Keynes. Thus, while he used formal representations as partial arguments, Minsky explicitly chose not to present his theory as a general formal model; the emphasis was on structural change and evolution (Foley 2001). Thus Minsky developed Keynes’s ideas further, providing a systemic account of financial instability. His interest in Schumpeter is revived in Leathers and Raines’s (2004) analysis of financial cycles fuelled by financial innovation. In what follows, we explore the field of emotional finance which likewise focuses on innovation as providing the psychological drive for financial instability.

Emotional Finance

Within the modern finance literature there is renewed attention to the notion of the psychology of the market as the primary force behind financial instability, where emotion or sentiment is integrated with reason. The first field we will consider is emotional finance, associated with the work of Tuckett and Taffler (2008) which draws on Freud, and focuses on the role of novelty as an emotional spur. We will then consider a study by Pixley (2004) entitled *Emotions in Finance* which takes a more social psychology approach.

Freudian psychoanalysis sought a rational (in the broad sense) explanation for apparently irrational behaviour, emphasising the scope for beliefs, intents, desires, and knowledge to be unconscious as well as conscious. He focused on biologically-induced emotions as physical and mental internal states (see further Wollheim 1999). The implication was that behaviour was the outcome of reason, however defective might be the content of the reasoning (Simon 1986: 5209), but that reasoning could be unconscious. While Freud began from neuroscience, his later methods verged on the literary, weaving narratives around a small number of cases. While the content of much of his theory and methods have now been discredited in some circles, there seems to be a revival of interest in his more general approach, as we shall see below in the discussion of emotional finance.

According to Tuckett and Taffler's interpretation of Freud's psychoanalysis, behaviour is driven by emotion and unconscious phantasy, and (in tune with both Adam Smith and the neuroscience literature) the subconscious search for a settled mind and the avoidance of anxiety. The starting-point is uncertainty and the sense of emotional conflict that creates. The argument is then developed that decisions made under uncertainty must be ambivalent, in particular between phantasy and reality-based thinking. Phantasy, or unrealistic wishes, corresponds to the wishful thinking Smith identified with the poor man's son. Financial instability can then be analysed as a sequence whereby the tension between reality-based thought and phantasy is resolved as phantasy takes over.

Bubbles start with some novelty which causes excitement. Not only is the excitement of a euphoric state a response to a novel stimulus, but, as Scitovsky (1981) argues, we may actively crave novel stimuli. And yet the excitement itself alters judgement (Kaish 1986; see further Earl 1990 chapter 12). Tuckett and Taffler (2008) use the dot com bubble as an example, although we could consider structured debt instruments as the novelty which arose in the run-up to the current crisis (Chick 2008). Bubbles then follow an emotional sequence: patchy excitement turns into growing excitement and in turn manic/euphoric excitement. There is normally some conflict between emotion (wishful thinking) and normal asset valuation (reality-based cognition). This conflict increases as asset valuation diverges more and more from a reality-based valuation, causing anxiety. Market players avoid this anxiety by increasingly ignoring reality as the euphoria builds up. Indeed the market tends to be dominated by those who are willing to act, ie those who resolve the tension by privileging phantasy; those who continue to retain reality-based thinking will drop out of the market as the euphoria is perceived to be excessive.

It is only when reality breaks through in some form that phantasy is challenged and the bubble bursts, and panic ensues. But the continuing dominance of wishful thinking is evident in the prevalence of blame rather than guilt when bubble bursts; guilt would require acknowledgement that there had been a major departure from reality-based thinking.

This analysis treats emotion or sentiment as integral to market behaviour, given rein by uncertainty compounded by the tensions in attitudes to asset valuation. It therefore has the potential to flesh out a Minskian account of the psychology of the market. The notion of reality-based thought may be taken to imply some notion of objective valuation as a benchmark. For Minsky, as for Keynes, asset valuation is not an objective process, since it is conducted under uncertainty. Nevertheless, if we consider Keynes's notion of weight of argument, we can consider degrees of uncertainty, or conversely degrees of confidence, with respect to expectations, on the basis of experience, or evidence. Realitybased thinking therefore draws more on evidence than wishful thinking, which involves self-deception.

Tuckett and Taffler share with all the other approaches which aim to integrate emotion and reason a reliance on the inductive method, drawing evidence from surveying market players, while employing provisional theoretical principles which Freud had previously drawn from case study evidence. Just like Simon, Keynes and Minsky, they make no attempt to model behaviour in any deterministic way. If knowledge is held with uncertainty, the switch from euphoric market behaviour to panic becomes a potential as the bubble gains force and the structure of the financial system becomes more fragile, but the nature and timing of the events which provoke the onset of panic cannot be predicted. This 'potential' corresponds to the critical realist notion of 'tendency' as an underlying causal force which may or may not be in operation at any time (Lawson 1997).

Interviewing key players is also the approach of Pixley (2004), but the provisional principles on which she draws are those of Keynes and Minsky. The emotions on which Pixley focuses are trust and distrust, where these are understood in social terms, ie trust and distrust in institutions. Starting with a Keynesian analysis of uncertainty, she explains the importance of the institutions of money and banking which help us cope with uncertainty. On the other hand these institutions rely on our confidence and trust – if that is challenged (when there is a bank run for example), then panic ensues and trust is destroyed. Like Minsky, the source of this challenge is not events as such, but the financial structure which has built up over the boom period. Her interviews add valuable, up-to-date evidence in support of the Minsky approach, but with an explicit focus on emotions as integral to decision-making under uncertainty. Further, her approach to uncertainty and to emotion is itself consistent with Minsky's structural approach, being understood at the level of social structures and institutions rather than isolated individuals.

Conclusion

We have seen in this discussion that the key to drawing on psychology in economics lies in epistemology. If, as in the benchmark mainstream model knowledge is held with certainty, or certainty-equivalence, or with clearly-specified imperfections, there is only room for risk,

not uncertainty. Without uncertainty, psychology does not enter into knowledge. Further, if behaviour is expressed as being goal-oriented, on the basis of this certain knowledge, then rational behaviour can be clearly specified, and anything else is by definition irrational. The verbal behavioural economics literature suggests a much richer notion of psychology in relation to cognition and emotion, but the methodological requirements of the optimising modelling approach impose severe limitations on what can be incorporated. The notion of rationality is constrained by the framework.

But if we depart from the formal requirements of models of optimisation subject to constraints, then a richer notion of psychology, and an integration of cognitive and emotional factors, are possible. Rationality, or reasonableness, inevitably combines reason with emotion. In particular, if knowledge (including the knowledge of economists) is seen as being in general held with uncertainty, then psychological factors are necessary to underpin knowledge, and indeed all activity. Rather than being separable in the form of preferences or information imperfections of some sort, psychology becomes integrated with reason and experience in the building up of knowledge as the basis for action.

There is a growing literature on which to draw, in finance, in economics and in psychology, and a growing body of evidence from a variety of sources. And this includes a fruitful set of ideas and experimental evidence in behavioural finance. But it is only when uncertainty is foundational to theory, rather than an imperfection relative to a perfect benchmark, and when behaviour is understood as more complex than optimising with respect to given psychological goals, that these ideas can actually bear fruit. It is only by paying attention to Minsky's uncertainty-based epistemology, and his corresponding methodology, that we will be able to take advantage of what psychology has to offer economics in aiming to understand financial instability.

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