Decision making and Keynesian uncertainty in financial markets: an interdisciplinary approach

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Abstract:

This interdisciplinary research examines decision-making in financial markets, regarding secondary markets and financial innovation in Europe, so as to unveil the multiple dimensions of this complexly-layered world of financial interactions. Initially, I synthesise different literatures, including Post-Keynesian economics, behavioural economics and finance, and decision-making theory, in order to shape a more complete understanding of behaviours and outcomes in financial markets. Particularly, I focus on an analysis of Keynesian uncertainty in order to show the need of economic science for interdisciplinary research, on theoretical and methodological levels, and also to highlight potential links between Post-Keynesian theory and behavioural economics.

After presenting the active role of decision-making under uncertainty into the creation of financial bubbles, as incorporated in Post-Keynesian economics, I support my argument by presenting findings obtained by a series of semi-structured interviews I conducted in 2016 in the UK, in order to investigate financial traders' beliefs, perspectives and terminology about decision-making under uncertainty in financial markets. The goal of this qualitative project is to identify market professionals' beliefs about market uncertainty and how they deal with it, to find out their knowledge about causes of the 2008 crisis and also to ask their opinion about securitisation, shadow banking and regulation weaknesses.

Keynesian uncertainty, behavioural economics and psychology

Keynesian uncertainty and expectations

Mainstream economics assumes that future outcomes of economic processes can be forecast by suitable calculations using available data from the recent past; in contrast, Post-Keynesian theory posits that economic outcomes cannot be forecast accurately from past data because they are governed by non-ergodic stochastic processes (Davidson, 2011). According to the non-ergodicity principle, representative samples of past data do not necessarily give sufficient information about the system as a whole (Davidson, 2011). Forecasting economic variables based on an analysis of past data, even if these samples are extended enough to be characterised as representative, implies a hidden assumption; that real variables, and therefore reality follows a specific probability distribution. The non-ergodicity principle rejects this assumption. In Keynesian theory, the ways in which economic agents react to uncertainty and form expectations play a key role in agents' behaviour. Specifically, it is the entrepreneurs' short-term expectations about their expected profit that dictate their decisions on production; while they also form long-term expectations about the general economic environment (Keynes, 1936, ch.12). It is fundamental uncertainty that leads the economic system to an inefficient equilibrium of underemployment. Long-term expectations depend both on the forecasts about future events and on economic agents' confidence (Keynes, 1936, p.148). In The General Theory confidence is defined as "how highly we rate our likelihood for our best forecast turning out wrong" (p.148), and it depends on agents' existing knowledge, which might be insufficient for accurately calculating mathematical expectations (p.152). Subsequently, the future is uncertain and it cannot be perfectly predicted. In this non-ergodic world individuals are incapable of optimising intertemporal rational choice, which mainstream economics describes as the standard human behaviour (Davidson, 2011). Lastly, since there is a time difference between someone's choice and the outcomes of his decision-making, then unexpected changes will take place in the meanwhile, thus future is not calculable (Davidson, 1991; Keynes, 1937).

Modelling Keynesian uncertainty and social conventions

An interpretation and extension of Keynes' ideas is Shackle's (1949) description of expectations' nature as the anticipation of an imagined future situation that individuals treat as equivalent to an actual future event, although it might not necessarily occur. This prediction has two basic characteristics; it is treated as if it is actually happening, and it depends on the degree of someone's belief that it will actually happen, or else the agent's confidence about the outcome as Keynes described it. This description of expectations develops into a focus-values conception, in which individuals make decision based on judgments about future gains and losses. Individuals' focus on future gains reveals their desirability of the expected outcome, while their focus on loss possibilities is linked with their potential surprise. There is a range of possible choices between these two marginal points, which can be mapped as a Cartesian diagram, an indifference map of uncertainty, also called gambler's indifference curves (ch.2). This analysis though misses a critical point of Keynesian uncertainty principle. When individuals shape their expectations, they do not

make choices only based on their personal beliefs, but they also get influenced by their expectations about the average opinion, also known as the beauty contest paradigm (1936, ch.13).

Keynesian fundamental or "true" uncertainty is different from risk, although in literature they are often treated as if they were the same. In mainstream economic theory, the world is governed by a stochastic process with a known and stable distribution, which is independent by individuals' actions, so this risk can be diminished by aggregations of homogeneous agents or repeated draws over time (Dymski, 1993). On the contrary, Keynesian uncertainty is distinguished from any probabilistic concept and agents' decisions play a role but people cannot be fully aware of the impact of their actions (Dymski, 1993). And lastly, systemic risk cannot be entirely eliminated because the economy has no parameters (Dymski, 1993). Hence, uncertainty cannot be quantified or modelled (Davidson, 1991).

In this unpredictable and non-ergodic world, individuals are following the pre-existing social norms in order to cope with uncertainty and be able to make choices. According to Keynesian and Institutionalist/Post-Keynesian theories, individuals are dealing this true uncertainty by following conventions, binding nominal contractual commitments and social contracts, which are learned by participating in social practice (Keynes, 1930, 1936; Davidson, 1991). People tend to trust conventional judgements rather than themselves, because they prefer to follow the better informed masses. For example, money is a contractual mean of exchanges and also a mean to store value in an uncertain world (Keynes, 1936). Therefore, fundamental uncertainty leads people to hold more liquidity as a mean of security, also known as liquidity preference, and as a result the level of effective demand falls and the economic system equilibrates with involuntary unemployment (Keynes, 1936). Institutionalist/Post-Keynesian literature emphasises the nature of economic agents as social beings in a cultural environment, rather than as individual units; cognitive processes are social and conventions should be examined through social interaction (Fernadez-Huerga, 2008; Jefferson and King, 2010).

Keynesian theory and its psychological aspects

Keynesian economic theory relies heavily on psychological insights, and it has defensible behavioural foundations on agents' behaviour and their judgments in the real and uncertain world (Pech and Milan, 2009). However, there is a debate within Post-Keynesians whether a potential engagement between Keynesian tradition, psychology and behavioural economics should take place or not.

There are several psychological insights that are fundamental in establishing the claims made by Keynesian theory, both on micro and macro level. On the macroeconomic level money plays a key role as a psychological factor in decision-making under uncertainty. Specifically, money exists only because there are contractual settlements, which can provide liquid security in an uncertain future (Keynes, 1930). The neoclassical axiom of money neutrality, according to which changes in money supply do not have an effect on real economic variables, is rejected; to the contrary, money matters in both short-run and long-

run decision-making. For example, individuals may choose to hold money for current purchases, security reasons or even for speculative opportunities (Keynes, 1930). Apart from money, in The *General Theory* numerous psychological propensities are often used, such as heuristics, animal spirits, conventions and uncertainty [Pech and Milan, 2009; Fung, 2010]. Lastly, markets' conventional valuations, the paradigm of the beauty contest in financial markets and herd behaviour is another area of common interest in Keynesian and behavioural economics.

Likewise on the individual level, decision-making is strongly influenced by psychological factors, therefore human behaviour cannot be fully explained by mathematical calculations and statistical modelling, since choices are based on the available alternatives and not on strict mathematical expectations (Keynes, 1936). Decisions are motivated by sentiments and frequently individuals act on whim or by chance, hence their behaviour cannot be modelled or predicted (Baddeley, 2013). It is also known from the psychological literature, that sentiments are necessary in the decision-making process (Baron, 2007). For example, entrepreneurs are making decisions in an uncertain world with shifting expectations. As a result, their behaviour is more likely influenced by animal spirits, heuristics and emotions rather than following rational expectations (Baddeley, 2013). Based on these psychological foundations of Keynesian theory, this research suggests that there is a theoretical background in Post-Keynesian economics that would allow for interdisciplinary research.

Should Post-Keynesians make a turn to behavioural economics?

During the last years, a debate between Post-Keynesian economists started, whether they should make a turn to behavioural economics or not. Paul Davidson claims that behavioural economics can potentially benefit from Keynesian and Post-Keynesian literature (2011). Vice versa, Jefferson and King (2010) support that Post-Keynesian literature could benefit by behavioural economics' methodological aspects in the following three ways. Firstly, behavioural economics could enhance the realism of Post-Keynesian theory by providing supporting evidence to their fundamentals (Jefferson and King, 2010). Secondly, behavioural economics could potentially enhance the Post-Keynesian microeconomic foundations (Jefferson and King, 2010). Lastly, Post-Keynesian empirical research could adopt some of the research methods usually applied by behavioural economists for micro and meso-level analysis (Jefferson and King, 2010).

The pluralism of Post-Keynesian economics allows for interdisciplinary research in different areas, not only regarding its methodological aspects but also on a theoretical level (Fung, 2010). For example, Post-Keynesian theory of finance could be developed into a "new general theory of financial behaviour" (Fung, 2006). For instance, portfolio and asset price theories could be developed by Post-Keynesian and Institutionalist theories supported by findings in behavioural finance (Fung, 2011). Furthermore, Minsky's financial instability analysis and his explanation of Ponzi schemes' role into the stages of financial bubbles have a psychological content (Dow, 2008; Galbraith, 1990). Another domain of Post-Keynesian literature that could be expanded further is consumers' behaviour, where broader approaches can be adopted from psychological literature (Earl, 2005; Lavoie 2004).

There are scholars though who raise objections because often the topics under discussion in behavioural finance literature are already criticised and rejected by Post-Keynesianism. Behavioural finance frequently focuses on individual participants' behaviour in financial markets and the reasons that lead them to behavioural deviations from efficient market model and rational expectations theory (Raines and Leathers, 2011). Another often found research topic in behavioural finance is the analysis of individuals' behaviour when they fail to rationally incorporate new information or to make consistent rational choices, under the scheme of maximising their excepted utility (Barberis and Thaler, 2002). Also, behavioural finance is often methodologically based on small-group samples in psychological experiments, a scientific weakness which has been recognised by experts as well (Kahneman and Tversky, 1979, p.82). A characteristic example is Nagel's (1995) psychological experiment, when she tried to test empirically Keynes' beauty contest paradigm (1936) by designing a group game, during which the participants' payoffs of their decisions depended on how accurate were their estimations about the average opinion. This experiment though cannot capture the professional investment environment and behaviour, described by Keynes (Fung, 2006).

In order to overcome this criticism, Post-Keynesians distinguish between old and new behavioural economics. Old behavioural economics is built on Herbert Simons' bounded rationality theory, while new era starts with the 80's revolution in behavioural finance, which was described as "not wholly different from neoclassical finance" (Shiller, 2006). Therefore, when Post-Keynesians refer to behavioural economics, they discuss the old tradition, which often incorporates the role of financial innovations and stock market speculation (Raines and Leathers, 2011).

Bounded rationality and prospect theory-challenging mainstream economics

Bounded rationality theory can be the bridge between Post-Keynesian theory and psychology, because it takes into account agents' knowledge or its absence about the environment where they belong to, and their ability to process this knowledge in order to take a decision and cope with uncertainty (Simon, 2000). Its founder, Herbert Simon, suggested that economics should built a general framework of rational decisions that would involve satisficing criteria, use of aspiration level analysis, attention mechanisms, and heuristics (Simon, 1955; 1956). Bounded rationality is the result of decision makers' time pressure and their limited cognitive hardware (Earl, 1990a); highlights individuals' constraints in their information-processing capacities, and potential limits of their rationality. Their limited cognitive capacity might rise from the uncertainty linked to the consequences that follow each alternative choice, the incomplete information about the alternatives and from the complexity in the functions being used by individuals, which discourage them from calculating the best course of action (Simon, 1972). By assuming utility maximisation, mainstream economic theory intends to predict someone's choices, but it does not take into account individual's limited cognitive capacity.

Analytically, individuals deal with their limited cognitive capacity by limiting the possible choices they have and by using rules of thumb such as conventional numerical values (Simon, 1972). Another popular process in decision-making is the use of the satisficing

criterion, when individuals stop searching for alternatives when a choice, that satisfies his aspiration level criterion, is found (Simon, 1957). The drawback of bounded rationality theory is that although it introduces imperfect information, it still assumes perfect knowledge of the distribution of the random variables. Therefore it concludes that the difficulty in decision-making is not necessarily driven by uncertainty, but by its own complexity (Simon, 1972).

The expected utility theory and risk aversion assumption of mainstream economics have also been challenged. An alternative theoretical approach of decision-making under risk is prospect theory, according to which probabilities are replaced by decision weights, changing risk preferences and ambiguity aversion (Kahneman and Tversky, 1979). In prospect theory, utilities and probabilities are calculated as changes from a reference point, which can be affected by various factors, which also explains why people give different solutions to same problem, depending on how the problem is presented to them.

Heuristics are another example of mental shortcuts, used in dealing with limited cognitive capacity and problem solving. Although they save time in decision-making, along with satisficing criteria, they can also introduce systematic errors and biases in probability judgements. For example, there are identified three heuristics related to judging under uncertainty that lead people into repeated mistakes; the availability, the representativeness and the anchoring/adjustment heuristics (Tversky and Kahneman, 1974). People tend to overvalue their memories compared to the new information they receive, which is known as the availability heuristic (Baron, 2007). The representative heuristic refers to individuals' belief that a representative event tends also to be a frequent one and lastly, the anchoring heuristic affect the quantitative estimates when an initial value is given to subjects, because they tend to adjust their following estimates in relation to the first one. This would not be a problem if individuals were not biased in favour of their present beliefs, for that reason they tend not to adjust enough (Baron, 2007). People do not assess probabilities nor predict values, as the mainstream economics suggest, but their decisions are based on simpler judgmental operations, which might lead them to systematic errors (Tversky and Kahneman, 1974).

The methodological gap

Apart from the theoretical gap between Post-Keynesian economics and behavioural studies, there is also a methodological one. Some of the qualitative tools that economists could involve into their analysis from other social sciences are the satisficing criteria, the use of aspiration level and attention mechanisms, and of heuristics (Simon, 1955). Interdisciplinary research also demands changes in scientists' education, therefore economic training should expand and involve methods of gathering data, such as observing and interviewing, analysing think-aloud protocols and extracting information from written records (Simon, 1972). Economists can also benefit from learning how to use non-numerical data, experimental data and computer simulations, methods that are already being used by psychologists (Simon, 1972). Herbert Simon (1972) suggests that economists who want to research topics on uncertainty should not be constrained by mainstream economic literature, which focuses on game theory and someone's best reaction to others' decisions.

To the contrary, they should search for the deeper processes of shaping alternative choices, equivalent to the underlying tendencies of critical realism. Political science made a shift to the so-called behavioural revolution, before the WWII, and joined other social sciences such as sociology, psychology, anthropology and history in order to build a general empirical theory on human behaviour, decision-making and social behaviour, and economic science should follow the same path (Simon, 2000).

Behavioural decision-making in financial research

Financial market psychology in non-mainstream economics

Financial market participants tend to be influenced by herd behaviour and usually they overvalue their abilities when gaining profits (Galbraith, 1990). On micro level analysis, traders prefer to believe that they are getting richer because of their own investment abilities, they become overconfident and end up overtrading and bearing a disproportionate risk level (Galbraith, 1990). During economic expansion, investors' growing tendency to reduce their expectations of risk paradoxically leads them to a higher exposure to it (Dow, 2008). In a euphoric state, investors' excitement quickly becomes mania around increasing asset values, and while assets' divergence from their real-based valuation gradually turns into anxiety, until the bubble bursts and panic expands in financial markets (Dow, 2008). On macro level, banks' behaviour in an uncertain economic environment, is based on the conventions of past experience with their customers and is also influenced by the average behaviour of other banks (Dymski, 2011). Subsequently, individual banks and the banking system as a whole tend to follow markets' same path, in order to secure their market shares and institutional reputation (Dymski, 2011). Eventually, banks' behaviour increases financial fragility and cyclical volatility, and widens the cyclical swings (Dymski, 2011).

Speculation

In Post-Keynesian economics speculators are the movement traders, not necessarily the ones that have the knowledge about the known long-term information on demand and supply conditions, but the ones who can predict better the behaviours of the rest of the investors (Earl, 1990a). They buy assets whose price is rapidly rising and they decide to sell them when they believe another asset can play this role. As a result, self-fulfilling expectations are promoted by speculators' herd-behaviour (Earl, 1990a). Additionally, speculative activity is motivated by a desire to gamble and can become a threat to genuine entrepreneurial endeavour (Keynes, 1936, p.158-61). Price instability created by speculative movements makes it difficult for investors to value financial assets based on their performances, and it can also have a negative impact on employment. In this case, the best strategy to follow, when a decision has to be made under uncertainty, is to have a list of possible future states of world, keeping in my mind that the investor can always be surprised by unanticipated events (Earl, 1990a). Decision-makers in financial markets also take into account the cost associated with hedging against them, hence, it is most likely to adjust their portfolio in favour of the most probable to occur events and stay uninsured against the rest of them (Heiner, 1983, p.576-7). Shackle (1979) suggests that the investor

might use specific mathematical or numerical probabilities, but he can also classify his choices into groups such as “practically impossible”, “unbelievable in prospect” or “perfectly possible”, although he might have not yet decided what do believe [Earl, 1990b]. This raises the infinite regress problem, which paralyses the investor and prevents him from making a decision. Uncertainty for example can be taken as a paralysing force and can lead individuals into holding greater liquidity (Shackle, 1979).

Disaster Myopia

Uncertainty and risk are often misinterpreted as identical notions, but as already discussed there is a significant distinction between them. Risk refers to the calculation of the probability of an event that might occur in the future, while uncertainty indicates our inability of perfectly foreseeing the future and any unexpected events that might occur. In other words, when individuals’ confidence in estimation is high they refer to pure risk, while when their confidence is low they refer to uncertainty (Guttentag and Herring, 1986). Disaster myopia is defined as the systematic tendency to underestimate shock probabilities, which increases as time passes since the last economic shock that took place (Guttentag and Herring, 1986); and the 2007-8 financial crisis is characterised a case of disaster myopia in housing and credit markets (Cornard and Gimet, 2011).

Disaster myopia can occur during the upturn of business cycles, when markets are driven by unrealistic optimism about asset prices and investors’ are overconfident about their trading abilities, and it is interpreted by two behavioural heuristics; the availability bias and the threshold heuristic. The availability heuristic refers to the estimation of the probability of a shock, which is based on the available information associated with the event and that individuals can bring first in their minds. The threshold heuristic rises when a probability reaches such a critically low level, which is treated as if the probability was equal to zero (Guttentag and Herring, 1986). If more market participants tend to underestimate the probability of a low frequency, but major shock and crisis, then economic system becomes more vulnerable as a whole (Guttentag and Herring, 1986).

Therefore, international and prudential banking regulation is needed, although in optimistic periods bank supervisors might also share the same disaster myopia. Additionally, the exposure to hazard is difficult to be defined and measured before a potential crisis. As a result, the necessary banking regulation might be difficult to be achieved. Current banking regulation (Basel II and III) is based on capital requirement rules and it is problematic for a variety of reasons. The off-balance sheet activities, the difference between book and market values, its inefficiency to decrease insolvency exposure, since the last one can only be recognised as sufficiently dangerous after a crisis, and lastly the difficulty to eliminate regulatory arbitrage’ benefits are some of them (Guttentag and Herring, 1986).

Behavioural finance

An overview of the studies that apply decision-making theory on financial theory can be found in Steuer and Na (2003), where 265 academic publications are categorised based on the journals, the year of publication, the country in which fieldwork took place and the methodological approaches used. Based on this extensive literature review, there is a

distinction between behavioural finance, behavioural economics and decision-making in finance. I support that decision-making in finance mostly explores financial investment decisions based on an individual-level analysis, which is what Post-Keynesian economists describe as new behavioural economics, although there are a few papers referring to banking regulation as well. Also, there is a distinction between behavioural finance and behavioural economics depending on their focus (Amin and Pirzada, 2014), while behavioural finance is a subdiscipline of behavioural economics (Glaser et al., 2004).

Behavioural finance could enrich the existing economic literature by adopting its qualitative research methods, for instance there are several experimental studies in which qualitative methodologies, such as interviews, focus groups and surveys, are applied on financial literature (Muradoglu and Harvey, 2012). A characteristic example is the consumer debt-based financial instruments and the enhanced services with behavioural finance techniques. Additionally, behavioural finance can contribute into economics by taking into account the fragile human intuition, decision-making processes and the relevant personal beliefs in order to describe how decisions are made by all kind of investors (DeBondt et al, 2010). Field based analysis shows that reliance on intuition is composed by the three following factors: the nature of the task (time, uncertainty), individual factors (experience and confidence) and lastly organisational factors (conventions and constraints, accountability and hierarchy, team dynamics and organisational culture) [Hensman and Sadler-Smith, 2011]. It is also important to understand investment market sensations and the reasons why investors do not always act on the basis of full rationality (Amin and Pirzada, 2014). For example, behavioural finance research in real estate markets shows that investors' psychology during an investment process is synthesised by cognitive behavioural psychology, emotional responses and lastly social psychology [Amin and Pirzada, 2014]. Research has shown that investors realise perpetual errors because of their overconfidence, anchoring effect and other psychological biases, and they do not always take into account all the available information, which leads them to irrational behaviour (Amin and Pirzada, 2014).

A behavioural economic explanation of financial crises

Behavioural economic theory does not focus only on individual-level analyses though. Specifically, studies conducted after the 2008 crisis argue in favour of integrating human behavioural biases into regulation, in order to make it more efficient in limiting financial vulnerability, they often reject EMH and provide better explanations about bankers' behaviour, rather than the misleading incentives approach.

Behavioural economics shed a light at the routes of the latest financial crisis, while taking into consideration the ways that human behaviour interferes to a combination of events, i.e. the irrational exuberance of lenders and borrowers driven by overconfidence, herd behaviour and framing effects (Grosse, 2012). Another fact which contributed in the 2008 financial crush was the inadequate supervision by managers in commercial and investment banking and the insufficient risk management, which resulted to excessive credit expansion (Grosse, 2012). Moreover, financial intermediaries' regulation by government agencies was inadequate. Furthermore, there were a few technical limitations of market functioning

during the panic which led to financial chaos, for example investors could not take positions on both sides of the market for a while, market prices for some instruments were not available, and investment banks could not obtain short-term funding to cover their obligations for more than 6 months (Grosse, 2012). Consequently, better risk management is needed and managers need to be held accountable for their risk behaviour, when it causes systemic risk, or else they should face pre-established penalties (Grosse, 2012).

There are four main stages of the creation of financial speculative bubbles: the stealth, awareness, mania and the blow-off stages (Vasile et al., 2012a), but financial crisis can also be analysed on the basis of behavioural, structural and cyclical factors (Vasile et al., 2012b). Starting with the behavioural factors, biases, heuristics and emotions contributed to the collapse of ethic behavioural standards in financial markets. For instance, optimism and wishful thinking, over-confidence, greed and regret, passing away responsibility and the "this time is different" syndrome are some of them (Vasile et al., 2012b). Analytically, rating agencies' behaviour and conflict of interest, corporate finance reforms and financial institutions' opacity in their reporting contributed to the development of unethical practices like predatory lending, inappropriate compensation schemes (Vasile et al., 2012b). To continue with, structural factors refer to the increasing role, complexity and opacity of financial intermediaries, securitisation and the spread of risk on a macro-economic level (Daianu and Laurian, 2008); while cyclical factors focus on the micro-economic level, such as the historical long low risk-free interest rate before 2008 [Vasile et al., 2012b].

Decision-making theory can provide supplementary explanations on human behaviour biases, not only in the case of the US financial crisis, but in a variety of cases. In the Irish banking crisis, for example, there are identified several behaviour biases (Lunn, 2013). Firstly, behaviour convergence bias refers to humans' tendency to copy similar decisions, a key aspect of a house market bubble (Lunn, 2013). Secondly, extrapolation bias of property prices led the public, research teams of banks and the independent economists to weight more their recent data compare to past asset prices (Lunn, 2013). As a result, forecasters underestimated the potential macroeconomic impact of a failure of financial markets because of the confirmation and over-optimism biases, which led to underestimation of probability of events such as the burst of the housing bubble (Lunn, 2013). The ambiguity aversion approach, time inconsistency and prospect theory are also used in explaining the causes of the Irish banking crisis, and as a result regulators should not trust the market efficiency because of traders' irrational behaviour (Lunn, 2013). Traders do not have a choice but to participate to the bubble or else they will be taken out of the market (Lunn, 2013, p.569-570), even if they know that the bubble will burst sooner or later; thus allowing the creation of mega-banks can be extremely dangerous for the economy.

Decision-making also provides suggestions for better regulation of financial markets. For example, emotion-regulation strategies during presentation of reward-conditioned stimulus could influence the traders' decision-making under risk (Martin and Delgado, 2011). Additionally, cognitive control over emotional responses can promote less risky choices. Another research emphasises the need for regulation against money laundry and how a risk-based decision-making analysis requires a probabilistic model, while the way that risk is

conceptualized is still unknown and, therefore, the risk-based approach involves a significant level of uncertainty (Ross and Hannan, 2007).

Keynesian uncertainty in financial markets- a qualitative approach

As part of this research a series of interviews were conducted in 2016, with financial traders based in the UK. 14 financial markets professionals, with average working experience of 10 years and average age of approximately 35 years, replied to a series of question about the 2008 financial crisis and its causes, as well as about rising uncertainty on the trading and examples of it. The often sufficient sample for interviews is between 10 and 15 participants because additional interviews do not emerge new beliefs, a state also known by qualitative researchers as saturation (Bruine de Bruin and Bostrom, 2013). In this section I present a part of the participants' answers, in order to show how qualitative analysis could be combined and enrich the existing literature.

On the trading floor, there is awareness of uncertainty and the inherited instability of financial markets, but often it is limited to an interpretation of business cycles. It is surprising that one of the participants referred to H. Minsky's ideas, if we consider the fact that financial traders, most often receive mainstream economic education, or even in some cases they do not have an economic background.

"Every day is uncertainty in the job I did as a trader."

"Any position you have, you face uncertainty, because by definition markets are uncertain."

"When I look the market today, I do not know when it is going to be tomorrow, I have an idea."

"The whole idea after Hyman Minsky is to have a strong regulatory and central governments to protect this force of the human nature and I think this time they fail miserably. You know Gordon Brown of the UK in his exact quote in the 2000's word 'we have put an end to boom and busted economics', and for or five years later we have the biggest bursts we've seen in the UK."

There is a distinction between the good times and the crisis, while it is suggested that particularly in good times the regulations should be more prudent. An idea which does not conflict with Minsky's famous theory that stability is destabilising. In other words, during the prosperous periods of financial markets, its inherited instability increases and leads to crises, and therefore regulatory institutions should intervene proactively.

Stereotypes actually can play the role of information vehicles and mental shortcuts, as theory suggests, when individuals try to cope with uncertainty in lending. Here is some quotes:

"They call them NINJA mortgages, no income, no job or administration. It is possible to get a mortgage like that, in the way; on the first four years or three years there is very least payments, and then it would increase and often the people could sell these mortgages. And often if you do not have a job or income then normally your education is not very strong either. You do not understand the complex nature of what you are buying."

Securitisation process is identified as a source of uncertainty, because of the nature of the tool and of the distance it creates between individuals or/and institutions of the two sides of a deal. The spread of the risk lead to opaqueness on processes:

"What securitisation meant was that relationship became segmented, so I might issue/originate the mortgage and someone might split and someone end might sell the mortgage. And by the end, it is not clear to whom you are owing money. And securitisation I think basically reduced the linkage between the owner of the debt and the borrower. And in particular it became unclear, the wrong incentives changed place"

Financial modelling is seen as a source of financial crises:

"I think the practice is always need to be more careful about applying the mathematical new instruments, and whatever the new instrument created often overreliance on mathematics can cause issues. So the crash of 1987 was caused by overreliance on a series of portfolio protection and not a good understanding of price option."

"Subprime crisis were very much driven by a poor assumption on how to model securitised instruments and the Gaussian Copula formula, and the assumption of correlations."

When the final price of a financial product loses connection with its initial value, i.e. when there is distance between the underlying assets of a security and the price of it, then the uncertainty about its validity and its "true" price increases. In other words, when the financial tools become too complex, individuals need alternatives in order to understand them. Then the individual ends up over-relying on mathematics to cope with this uncertainty. But the problem occurs from the fact that the trader uses a model that can only take into account risk, to deal with a problem of uncertainty in the first place.

"When you have something that is derived formulated, if something loses connection with the underlying assets then then you rely on mathematics. And sometimes the modelling and the understanding of the mathematics are not clear"

With the following example, the participant describes a case of uncertainty in the real world. The impossibility of foreseeing, but also the inability of realising that a physical event that might occur in the long-run.

"Let's say we are going to build a house, and the overall strength of the house depends on how windy it is going to be, and we are looking in 10 years the worth of dangers. We are probably going to miss that every 30 or 40 years there is a hurricane. And that's why in rural places, people built houses without taking into consideration an earthquake. Because when they built they do not have memory of an earthquake. They do not have an adequate model of risk and these people work with observation, and the same happens with financial instruments. The 1987 issue of portfolio insurance and the 2008 credit crisis, for example created these mathematical house but they didn't realise there could be earthquakes."

Traders often use past information and personal experience to cope with the future uncertainty, they tend to believe that their experience is the way to avoid repeating the same mistakes, but individuals do not realise that actually new mistakes can take place.

"I think after the lesson of our age, we are now better equipped to understand how the securitised instruments"

There are multiple reasons that might drive uncertainty in the short-run:

"When pricing a stock, there is uncertainty because I have to make a price that I think not only encourage the clients to trade but the price should also cover my risk.

There are different levels or steps of uncertainty. There is something unknown when you rely on other professionals' decisions, e.g. that could be your client's decision, but also on the bigger scale there is market uncertainty."

Another source of uncertainty is the time gap between making a decision and the outcome of it. In the following example, the participant describes a case when unforeseen circumstances occurred, while he was working on a trade. In the meantime the context had changed though, and he had no effect on it.

"Another example is I had a position in a stock which extracted because I sort a company which was in the process of a takeover, and the price was below the takeover price. So I bought the stock and I sorted, and then the takeover was complete, there is always uncertainty. What happened while was that I was pricing, it was the perceived uncertainty in the market versus my view on the uncertainty."

Another way of interpreting uncertainty is by defining it as unknown risks. In the interviews I conducted I asked for the participants' opinion both about uncertainty and unknown risks.

One of the interpretations received about the known and calculable risks is the following:

"A whole bunch of micro and macroeconomics factors, constantly changing within a certain framework of, let's say an expected distribution, those can be known risks."

A known risk is limited by an expected distribution, as opposed to the unknown ones. While the distinction between the known and the unknown is described as:

An unknown risk in 2001, was 9/11. Every risk is known, if you make a list long enough, you will eventually put on the terrorist attack. At that point that was an unknown risk, that why the markets reacted so highly. There was no one back then thinking that was going to happen.

The abovementioned example, agrees with the bounded rationality theory; according to which individuals have some information about the future and the parameters that might influence it, but their choices and actions are limited by their environment. In the case of financial trading that can be interpreted as the fact that a trader needs to think, evaluate and react fast, or else she/he will be out of business.

Uncertainty has also a more important role in financial markets, because of the very liquid values determined in it, on a daily basis, as opposed to the real economy and entrepreneurship.

An example of something that is certain is, I have a shoe shop and somebody wants to buy a shoe; the certainty is that I know the price, I have the sale, and I have the item. The uncertain is that when I am going to buy a stock today, I do not know what is going to happen tomorrow.

Response to uncertainty:

Market professionals have developed different personal and social conventions to cope with uncertainty. It could be described as a mix of expectations, insights, statistic and experts'

opinions. The confidence is built based on the available information, and its quality. What the standard theory does not tell us is that this confidence often is influenced by the success of the model being used. That being said, a trader trusts its tools for as long as they work, and they beat the market. But in an open and changing financial world, the underlying assumption might not hold anymore, unexpectedly. This explains the collapse of the confidence when uncertainty occurs.

"Q: How would you respond in uncertainty?

A: It is a strange blend we have in finance of expectations, statistics, insights and expertise. If where the market is going to be tomorrow is uncertain, then how can you say anything? Well the one thing I can have a look at is, I can tell you, a range with a level of confidence based on statistics.

We are in finance, whether we like it or not, it is a combination of science, experience and guess what."

Yet the reliance of mathematics and statistics varies among different financial institutions and investors.

"Some people might rely more on the statistics and will have very large models, the quantitative funds that would make a much sharper prediction based on statistics. Other people, such as George Soros, used purely views and little bit of statistics, it is very much their own feel for the markets, their instinct and experience."

While in the meantime, financial regulation has the role of a safety net, both for financial markets and for the real economy.

"The less regulation there the more place for speculative behaviour, and speculative behaviour without control. And the more we see that, it follows greater levels of subsequent volatility and subsequent market disruption. So if it going to be greater disruption, and greater volatility it is clearly that this mean more of uncertainty."

Conclusions

This research is an analysis of the psychological insights of Keynesian uncertainty literature, in order to show the need of economic science for interdisciplinary research, both on theoretical and methodological levels, and also to highlight potential links between Post-Keynesian theory and behavioural economics. While, mainstream economics fails to incorporate human behaviour into its analysis, my intention is to show the advantages of engaging behavioural research into explaining the active role of decision-making under uncertainty on the trading floor, as opposed to the rational-agent based models of mainstream financial literature.

The weakness of the mainstream theory is that it relies on unrealistic assumptions about human behaviour in a real world environment, and consequently about trading behaviour as well. Traders are individuals with reasoning before making a decision, but not necessarily with the best reasons (Lewis, 1989). Stock markets are grossly inefficient in valuing everything, and in such an environment the most successful businessman is the best risk taker and the one who handles risk better than the rest of the risk-taking world (Lewis,

1989, p.220-221). Under these conditions, there is room for qualitative exploration of the existing risks norms.

This analysis starts by classifying the psychological aspects in Keynesian theory and continues with the views for and against an interdisciplinary research between Post-Keynesian and behavioural economics. So far, the most recent research in the areas of behavioural economics and behavioural finance could be described as mainstream. The theoretical foundations though, also known as old behavioural economics, remain an area that could be enriched by the realism of Post Keynesian economics, but also provide useful tools for the non-mainstream economists. For example, psychological theories, such as the disaster myopia hypothesis, are often used in interpreting the creation of financial bubbles driven by herd behaviour and behavioural biases. Similarly, bounded rationality theory challenges the rational agent theory, which suggests that any individual in the exactly same position –ceteris paribus- would make the same judgment, by incorporating into the analysis the impact of the environment on individuals' decisions.

Based on the findings derived from a series of interviews, I conducted in 2016 with financial traders based in the UK[1], I suggest that Keynesian uncertainty does not have one unique definition, quite often even the same individual would give different interpretation of it. Therefore the debate around the nature of fundamental uncertainty is expected to exist, but new questions are raised in relation to the financial models being used. If financial traders are aware of the limited usefulness of their models, why do they rely so heavily on them? According to the interview findings, because it is their way to cope with uncertainty. Hence, the inherited instability of the system continues to develop through these financial practices, even though they are suspected of enhancing the probability of a financial Ponzi scheme and they are characterised as problematic in both mainstream and non-mainstream economic literature, because it is traders' best answer in this vicious cycle of dealing with an uncertain future. The level of the reliance on these methods might differ among professionals, as it often depends on their working experience, age, gender, and of course their confidence. But overall we could say that financial markets are destined to be driven by quantitative schemes that operate in a world of uncertainty, while they take into account only the parameter of risk. As the reflexivity axiom suggests, economic theory and economic models are implicated in creating and altering the economy they are supposed to describe (Lockwood, 2015).

[1] In this initial draft of my paper I present only a part of these findings

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