University of Salford MANCHESTER
1967-2017 50 YEARS

13TH INTERNATIONAL POSTGRADUATE RESEARCH CONFERENCE 2017

CONFERENCE PROCEEDINGS

14-15 SEPTEMBER 2017

SCHOOL OF THE BUILT ENVIRONMENT

QS WORLD UNIVERSITY RANKINGS 2017 by subject
ARCHITECTURE / BUILT ENVIRONMENT
TOP 50

FOREWORD

Welcome to the 13th International Postgraduate Research Conference (IPGRC 2017) hosted by the School of the Built Environment at University of Salford, UK. This year's IPGRC is organised as part of the International Research Week 2017- 'Shaping Tomorrow's Built Environment: Construction and Design for the Modern World' and also the year we celebrate the 50th anniversary of Salford as a University, which makes this year's conference very special. This conference creates a unique opportunity for researchers from Salford and other parts of the world to share their research interests, and outputs and to network and interact within a professional and friendly environment, with high profile academics and leaders within the built environment.

This year's conference brings together participants from a number of countries including the UK, USA, Australia, New Zealand, Canada, Sri Lanka, Hong Kong, Iran, Italy, Ireland, Norway, India, Brazil, South Korea, Nigeria, Turkey, UAE, South Africa, Iraq, Ghana, Estonia, Saudi Arabia and many more. The conference received over 100 papers and posters covering the following themes:

- Business, Economics and Finance
- Property and Project Management
- ICT, Technology and Engineering
- People, Skills and Education
- Design and Urban Development
- Sustainability and Environmental Systems

Conference will provide a forum for novel discussions into the development and application of new and emerging practices to challenge current design and construction practice in the areas of people, process and technology issues. On behalf of School of the Built Environment, the conference co-chairs and organisers, we wish you an enjoyable and fruitful experience. We hope that you will obtain useful feedback to your research work, gain insight from work of others and forge connections for future.

Dr. Chaminda Pathirage
Conference Chair
Director of Postgraduate Research Studies
School of the Built Environment
University of Salford
United Kingdom

TABLE OF CONTENTS

ID 089

A PHENOMENOLOGICAL STUDY ON DECISION MAKING UNDER UNCERTAINTY IN REAL ESTATE INVESTMENTS IN SUB-SAHARAN AFRICA - A CRITICAL REVIEW OF LITERATURE

C. Nsibande and M. An

School of the Built Environment, University of Salford, Salford, M5 4WT, UK

Email: c.nsibande@edu.salford.ac.uk

Abstract: Decision making under uncertainty can be traced back to the beginning of the 20th century as defined by Von Neumann and Morgenstein in what was termed expected utility theory. Kahneman and Tversky reinvented decision making theories and introduced prospect theory. They later introduced cumulative prospect theory which has been the central theory for studies and research in decision making under uncertainty. Kahneman and Tversky introduced psychological approaches to decision making and introduced the concept of value function and weighting function. Other important scholars include Cohen who focused on the psychological aspects of decision making. Several other authors have completed research in behavioral aspects of decision making including Slovic, Nocetti, Shefrin and Statman. The purpose of this paper is to present a critical review of the literature published on decision making under uncertainty, understand the gap and knowledge, and to develop new knowledge in decision making under uncertainty for real estate investment decisions in Sub-Saharan Africa. The relevance of the literature to the doctorate research was established through the extensive discussion section of the paper.

Keywords: Biases, Decision making, Heuristics, Literature, Real estate.

1. INTRODUCTION

The aim of this paper is to review literature that is relevant to the doctorate research topic, decision making under uncertainty in real estate investments in Sub-Saharan Africa. The paper establishes from the literature that there is a gap in knowledge from the identified practice problem, hence supporting the case that the research will lead to establishment of new knowledge on the subject under investigation. The paper has sections on how the current literature and current practice relate to the subject topic. The paper concludes with showing how the research questions on the topic of real estate decisions under uncertainty for the doctorate research were developed, linking the identified practice problem to the gap in current knowledge.

Recent literature, notably Kahneman's ground breaking research on decision making under uncertainty (1979, 1992) shed light onto the possibilities of exploring the real estate investment decision using psychological and behavioural science approaches. Further work has been undertaken by Kahneman and Tversky (1992) on prospect theories with regard to decision making process for management science. Cohen (1981) has also developed theory on psychological aspects of decision making under uncertainty.

It is acknowledged that the real estate investment decision process has both an analytical (technical rationality) stage as well as a behavioural (tactical) stage. The analytical stage involves analysis of financial and economic data and is quantitative in nature. The behavioural stage fills the gaps in the analytical phase and is subjective in nature, hence

qualitative. In every investment decision, both stages are undertaken and are an integral part of the investment decision process. In cases of uncertainty, where limited information or where data is unavailable, for concisely completing the quantitative analysis, the weight on the decision process shifts towards the subjective behavioural stage. As portrayed by Blas (2013) and Jerven (2013), economic data and market information is limited on the Sub-Saharan Africa investment markets hence the importance of understanding the effects of reliance on subjective qualitative processes for investment decision making.

2. AIM OF THE RESEARCH

The aim of doctorate research is to develop a method for practice on how rational real estate investment decisions under uncertainty can be made. For the purposes of this paper, rational refers to the process followed by investment decision makers that will maximise utility (return) for the investments. The method should maximise utility or returns through a structured, consistent and thorough process in decisions making.

The research problem came about in identifying a gap in methods, having to experience discomfort in seeing decisions made at a point in time that cannot be verified until a later date. Due to uncertainty, at the time of the decision process, investment decisions are not verifiable. It is not possible to confirm if the correct decisions were made until a much later time, during investment performance appraisal. Unfortunately, investment committees and decision makers, make investment decisions under uncertainty due to the limited available information, which in most cases is inadequate to make rational decisions. In addition, in the Sub-Saharan market, there is a greater level of complexity (risk) due to uncertainty in economic and political events. Under these uncertainties, the researcher has observed investment decision makers making investment decisions and has questioned why and if these decision makers were making rational investment decisions.

From the research title, the paper focuses on the literature around how real estate investors make decisions, decision making processes by different professional investors (behaviour, style and preference), heuristics and biases, decisions under uncertainty, studies on behavioural finance in real estate investments, and how intuition and experience of investment professionals influence the decision making process?

3. LITERATURE REVIEW

3.1. Current scholarship in decision making

Expected utility theory dominated the analysis of decision making under risk for most of the early part of the 20th century. According to Keeny and Raifa (1976), expected utility was the normative model of rational choice and was widely applied in decision making analysis. According to Friedman and Savage (1948), expected utility theory was widely used as a descriptive model for economic behaviour in decision making under risk. Further, Von Neumann and Morgenstein (1944) observed that most reasonable people would wish to obey the axioms of the theory.

Kahneman, Slovic and Tversky (1982) are perhaps the leading scholars on the subject of modern decision making under uncertainty. Their book, “judgement under uncertainty – heuristics and biases” gave a good background on the subject. The book outlined five

important biases and heuristics common in decision making, namely, representation, causality and attribution, availability, covariation and control and overconfidence. The representation heuristic refers to believing in the law of small numbers. Causality and attribution heuristic refers to the popular induction that information is not necessarily informative and people make judgements without taking into consideration all the information. Availability heuristic is failure to make the correct judgement on frequency and probability. Covariation and control heuristic refers to incorrect decisions when people are faced with making a choice between data based assessment versus theory based assessment. The illusion of control refers to the fact that people interpret results as they think they should be, not necessarily correctly. Overconfidence heuristic refers to people relying more on their own experience and rationality rather than on the information and facts.

In 1979, Kahneman and Tversky introduced a concept of prospect theory, which superseded the classical theory of expected utility theory (EUT) of the 19th and 20th Centuries. Prospect theory introduced the concept of the value function and the weighing function. The value function takes into consideration the wealth of the person making the decision and introduces the concept of relativity, that people's "perceptual apparatus is attuned to the evaluation of changes rather than to the evaluation of absolute magnitudes". The weighting function is the multiple of the decision weight which are "inferred from choices between prospects", subjective and not probabilities measures that the decision maker considers to be possible outcomes in his interpretation.

Another article by Kahneman and Tversky (1992) on prospect theory introduces a newer approach to decision making under uncertainty that employs cumulative rather than separable decision weights and extends the prospect theory in several ways.

Maital (2004) summarizes nicely the salient points in Kahneman and Tversky prospect theory and rationality. He states that there are two ways that people make judgements and decisions under uncertainty, namely; mathematical and behavioural. This is the essence of the doctorate research as the researcher seeks to capture the optimum process in making real estate investment decisions under uncertainty, with focus on the behavioural aspects.

The literature review would be incomplete without citing the work of Jonathan Cohen, another leading scholar in decision making under uncertainty. His work, from 1971 to 1981, covers many different angles on the subject of decision making under risk. His work is mostly on psychological aspects of the decision maker, including the "psychology of prediction" (Cohen, 1979), "what has induction to do with causality?" (Cohen, 1980), and "intuition, induction and the middle way" (Cohen, 1982). Cohen has also published reviews of the book by Kahneman, Slovic and Tversky (1982).

Cohen (1981) identified four categories of psychological research in human rationality, namely: conditions under which people suffer from genuine cognitive illusions; circumstances in which people exhibit mathematical or scientific ignorance (intelligence or education); a fallacy whereby people are applying the relevant normative criteria of human irrationality in an appropriate way or where the normative criteria being applied are not the appropriate ones.

3.2 Investment appraisal for capital projects and real estate investments

Investment appraisal that leads to investments in real estate follows capital projects appraisal methods as developed by Sharpe (1964) capital asset pricing model for cases of risk (known probability). The practice is based on the premise of discounting the projected cash flows by a risk premium factor that is determined by the level of risk (known probability). Earlier research on utility of choices involving risk was completed by Friedman and Savage (1948). For cases of utility choices under uncertainty, elementary work has been concluded by Merton (1969). The focus of the research is on the latter case, the case of uncertainty for which the gap in practice and knowledge has been identified. The research approach is a phenomenological study that focuses on the human experience, signifying the behavioural aspects of decision making under uncertainty.

3.3. Scholars in behavioural finance and decision making

Other scholars of note to consider in decision making under uncertainty include Stracca (2004) who identified anomalies in the behavioural finance literature with a focus on those that might impact on market prices. Stracca grouped the anomalies into five distinct groups, namely: decision heuristics; emotional and visceral factors; choice bracketing; unknown preferences; and reference dependence. Stracca concluded that the "fertilization" of finance and economics with psychological ideas had a huge potential and was gaining ground. Supporting Stracca's conclusion was Thaler's prediction of the "end of behavioural finance". In his article, Thaler (1999) predicted that behavioural finance was becoming an integral part of main stream financial analysis as in future will not be treated as a separate subject.

More recent articles by Shefrin and Statman (1994) entitled "Behavioral Capital Asset Pricing Theory" and Shefrin and Statman (2000) entitled "Behavioral Portfolio Theory" also support the idea that behavioural science is relevant to financial analysis. It is a growing trend in financial analysis and several scholars are exploring the subject. The purpose of the doctoral research is to investigate this phenomenon in real estate investment decision making in Sub-Saharan Africa. The focus would be on the behavioural attributes of decision making under uncertainty, investigating the impact of heuristics and biases during the decision making process. The literature peaks on the article by Nocetti (2006) entitled "Markowitz meets Kahneman: Portfolio selection under divided attention" where Nocetti brings along the concept of scarcity of cognitive resources in play. The theory of cognitive resources focuses on the influence of the leader's intelligence and experience on his or her reaction to stress. The theory concluded that stress was the enemy of rationality. The leader's experience and intelligence can lessen the influence of stress on his (or her) actions, that is, intelligence is the main factor in low-stress situations, whilst experience counts for more during high-stress moments.

4. DISCUSSION

The scholarship discussed above is from the main researchers in behavioural finance but several other researchers have explored the field and then applied the concepts to particular aspects of decision making research. The purpose of the doctorate research is to test the theories developed by Kahneman, Tversky, Slovic, Nocetti, Shefrin and Statman, and then further apply it to the specific filed of real estate investment decision making under

uncertainty. The purpose of the doctorate research is not to reinvest the wheel but to apply and advance the concepts already developed by these scholars. The aim is to investigate if there is evidence of behavioural analysis, that is, if the behavioural theory can be identified and verified in real estate investments from which a method can be developed for investors to follow in cases of uncertainty.

Several other scholars have followed similar research, notably, Gurevich, Kliger and Levy (2009) where they have investigated "decision making under uncertainty – a field study of cumulative prospect theory. On their research they tested the prospect theory developed by Kahneman and Tversky (1979 and 1992) in the financial market, using US stock option prices. They found that in the practical results in comparison to the laboratory results, the estimated functions (value and weighting) were closer to linearity and the loss aversion was less pronounced. Brendle (2006) looked at the power utility aspects of decision makers when they selected portfolios under incomplete information. Brendle used a stochastic approach to measure the impact of incomplete information and the power utility on the selection of the optimal portfolio. Bosch-Domenech and Silvestre (2010) investigated averting risk in the face of large losses in Bernoulli versus Tversky and Kahneman. In prospect theory, the thesis is that people display risk attraction in high probability losses but in their investigation and analysis Bosch-Domenech and Silvestre found that their subjects tended to avoid fair risks ($30 to $90), high-probability (80%) real loss, vindicating Bernoulli's view that risk aversion is the dominant attitude.

Other scholars including Bailey, Kumar and Ng (2011) examined the effect of behavioural biases on the mutual fund choices of a large sample of US discount brokerage investors. They found that behaviourally biased investors typically make poor decisions about fund style and expenses resulting in poor performance. Kester, Hultink and Lauche (2009) identified three genres of portfolio management decision making, namely: formative-reactive, intuitive, and integrative. Each genre could be identified as a unique set of portfolio management practice. Kester, et al found that firms employing an integrative approach toward portfolio decision making were mostly likely to be successful in the long run compared with the others. Other scholars who applied modern statistical decision theory were Mao and Sarndal (1966) who reviewed Markowitz' portfolio selection model in light of the newer theories in decision making. Mao and Sarndal explored the subjective nature of investor's estimates regarding probability, which brings about the subject of heuristics and biases in decision making.

Another approach identified in the literature is the development of other models, building on the existing theory on prospect theory as described by Edwards (1996) in "Prospect theory: A literature review". Edwards makes example of other scholars who have successfully developed other models from prospect theory like Loomes and Sugden (1982). Other researchers have developed variant models on prospect theory include Schmidt and Zank (2009) who presented a paper that combines the loss attitude and linier utility by providing an axiomatic analysis of cumulative prospect theory in the framework for decisions under uncertainty. Schmidt and Zank (2008) also investigated risk aversion in cumulative prospect theory. Their research found strong risk aversion implies a convex weighting function for gains and a concave one for losses, bringing more light into Kahneman and Tversky (1992) cumulative prospect theory.

Other researchers like Abdellaoui, Bleichrodt and Kammoun (2013) completed experimental studies to determine if financial professionals behave according to prospect theory.

Ultimately, the purpose of the identified literature was to find gaps in current knowledge (that supports the identified problem in practice) from which the doctorate research questions were developed. The literature detected the tone and direction of arguments upon which new knowledge will be developed. Without the relevant literature, the question of new knowledge would not be answered. New knowledge builds upon existing knowledge identified in current literature.

5. CONCLUSIONS

Decision making processes have been studied for generations beginning with expected utility theory as described by Von Neumann and Morgenstein in 1944. Modern decision theories have been developed in the 1960s and 1970s by Kahneman and Tversky (1979, 1992). The work of Kahneman and Tversky is the central theory for the proposed doctorate research. Further research completed by other scholars like Shefrin and Statman (1994, 2000), Stracca (2004) supports the work of Kahnemen and Tversky and will also form the basis of the theory for the proposed doctorate research. Thaler's (1999) proposition that behavioural finance was entering an era where it will be an integral part of main stream econometrics and financial analysis is the premise for the doctorate investigation.

The objective of the doctorate research is to investigate the psychological and behavioural aspects of decision making in real estate investments, taking into account that real estate investment decisions are usually made under uncertainty.

Further, from the literature, the methodology for the doctorate research will follow the work of Bailey, Kumar and Ng (2011), Bosch-Domenech. and Silvestre (2010), Brendle (2006), Friedman and Savage (1948), and Gurevich, Kliger and Levy (2009).

From the literature discussed on this paper, it was clear that behavioural finance is an area of research that is gaining momentum. The literature also showed that it has now become a popular subject for research as it has had numerous papers published in the last fifty years. There now seem to be consensus amongst several scholars in decision making, whether be in finance, management or medicine, psychological analysis, that behavioural aspects are critical.

More so, for professionals who rely to a great extent on experience and intuition for making professional decisions, it becomes even more critical that the human and psychological aspects of the processes are scrutinized. Even more so when you consider real estate investment decisions in developing countries, in Sub-Saharan Africa to be precise, where economic and markets' information is scarce and often unreliable.

Another benefit of the literature review was presentation of methodology examples for topics in decision making. Some of the papers reviewed provided practice based research and outlined in detail the methodology for collection of data and its analysis. Other papers presented techniques and approaches for the analysis of the data in decision making experience and field studies. The methodology described in these papers was helpful in developing the methodology for the doctorate research.

The identified literature provided a good platform for developing new ideas that could be further developed into research questions and hypotheses. The literature reviewed also

supported the importance of the human and psychological aspects in investment decision making.

6. REFERENCES

Abdellaoui, M., Bleichrodt, H. and Kammoun, H., 2013, *Do financial professionals behave according to prospect theory? An experimental study*, Theory, 74, pp 411 - 429

Bailey, W., Kumar, A. and Ng, D., 2011, *Behavioural biases of mutual fund investors*, Journal of Financial Economics, Vol 102, pp 1 – 27

Blas,J., 2013, *Africa economic data: investors fear numbers fail to add up*, Financial Times, October, viewed 30 Nov, 2013. https://www.ft.com/content/9b4343ec-34eb-11e3-a13a-00144feab7de

Bosch-Domenech, A. and Silvestre, J., 2010, *Averting risk in the face of large losses: Bernoulli vs Tversky and Kahneman*, Economic letter, Vol 107, pp 180 – 182.

Brendle, S., 2006, *Portfolio selection under incomplete information*, Stochastic Processes and their Applications, 116, pp 701 – 723

Cohen, L.J., 1979, *On the psychology of prediction: Whose is the fallacy*, Cognition, Vol 7, pp 385 – 407

Cohen, L.J., 1980, *What has induction got to do with causality?* In Applications of inductive logic, ed. L.J. Cohen and M. Hesse, Oxford: Clarendon Press

Cohen, L.J., 1981, *Can human irrationality be experimentally demonstrated*? The Behavioural and Brain Sciences, Vol 4, pp 317 - 370

Cohen, L.J., 1982, *Intuition, Induction and the middle way*, Monist 65, pt 3.

Edwards, K.D., 1996, *Prospect theory: A literature review*, International Review of Financial Analysis, Vol 5, No. 1, pp 19 -38

Friedman, M and Savage, L.J., 1948, *The Utility Analysis of Choices Involving Risks*, Journal of Political Economy, Vol 56, pp 279 – 304

Gurevich, G., Kliger, D. and Levy, O., 2009, *Decision-making under uncertainty – A field study of cumulative prospect theory*, Journal of Banking and Finance, Vol 33, pp 1221 – 1229.

Jerven, M., 2013, *Poor numbers: how we are mislead by African development statistics and what to do about it.* Ithaca: Cornell University Press.

Kahneman, D and Tversky, A., 1979, *Prospect Theory: An Analysis of Decision Under Risk*, Econonetrica, Vol 47, No. 2 (March), pp 263 – 292.

Kahneman, D and Tversky, A., 1992, *Advances in Prospect Theory: Cumulative Representation of Uncertainty*, Journal of Risk and Uncertainty, Vol 5, pp 297 – 323.

Keeny, R.L. and Raiffa, H., 1971, *Decisions with Multiple Objectives: Preferences and Value Tradeoffs*, New York: Wiley

Kester, L., Hultink, E.J. and Lauche, K., 2009, *Porfolio decision-making genres: A case study*, Journal of Engineering and Technology Management, Vol 26, pp 327 - 341

Loomes, G and Sugden, R., 1982, *Regret theory, an alternative theory of rational choice under uncertainty*, The Economic Journal, 92, pp 805 -824

Maital, S., 2004, *Daniel Kahneman: on redefining rationality*, Journal of Socio-Economics, Vol 33, pp 1 -14

Mao, J.C.T. and Sarndal, E., 1966, *A decision theory approach to portfolio selection*, Management Science, Vol. 12, No. 8, Series B (April), pp 323 – 333

Merton, R. C., 1969, *Lifetime Portfolio Selection Under Uncertainty: The Continuous-time Case*, The Review of Economics and Statistics", Vol 51, No. 3, August, pp 247 - 257

Nocetti, D., 2006, *Markowitz meets Kahneman: Portfolio selection under divided attention*, Finance Research letter, Vol 3, pp 106 113.

Schmidt, U. and Zank, H., 2009, *A simple model of cumulative prospect theory*, Journal of Mathematical Economics, 45, pp 308 – 319.

Schmidt, U. and Zank, H., 2008, *Risk aversion in cumulative prospect theory*, Management Science, Vol 54, No. 1, January, pp 208 216

Sharpe, W.F., 1964, *Capital Asset Prices: A Theory of Market Equilibrum under conditions of risk*, The Journal of Finance, Vol XiX, No. 3, September, pp 425 - 442

Shefrin, H. and Statman, M., 1994, *Behavioral Capital Asset Pricing Theory*, The Journal of Financial and Quantitative Analysis, Vol 29, No3 (Sep.), pp 323 – 349.

Shefrin, H. and Statman, M., 2000, *Behavioral Portfolio Theory*, The Journal of Financial and Quantitative Analysis, Vol 35, No2 (June), pp 127 – 151.

Stracca, L., 2004, *Behavoural Finance and Asset Prices: Where do we stand?* Journal of Economic Psychology, Vol 25, pp 373 - 405

Thaler, R. H., 1999, *The End of Behavioral Finance*, Association of Investment Management and Research, Nov/Dec, pp 12 – 17
Von Neumann, J., and Morgenstein, O., 1944, *Theory of Games and Economic Behaviour*. Princeton: Princeton University Press

Generously supported by:

THINKlab

Conference Chair
Dr Chaminda Pathirage

Conference Co-Chairs
Dr Udayangani Kulatunga
Dr Yingchun Ji
Dr Rod Gameson
Dr Chika Udeaja

Organising Committee
Dr Claudia Trillo
Dr Mohammad Takhtravanchi
Dr Belqais Allali

The University of Salford
Salford, M5 4WT
t: +44 (0)161 295 5000
www.salford.ac.uk

http://conference.org.uk/
international-research-week/post-graduates

ISBN 978-1-912337-05-7