



**Approaches to Improving Valuation Decision Making: A
Review of the Literature**

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Approaches to Improving Valuation Decision Making: A Review of the Literature

Abstract

Purpose – The complexity of property valuation, coupled with valuers' cognitive limitations make some degree of error inevitable in valuations. However, given the crucial role that valuations play in the efficient functioning of the economy, there is need for continuous improvement in the reliability of reported values by enhancing the quality of the decision-making process. The purpose of this paper is to review previous research on valuation decision making, with particular interest in examining the approaches to improving the quality of valuation decisions and identifying potential areas for further research.

Design/methodology/approach – The paper adopts a narrative approach to review 42 research articles that were obtained from Scopus and Web of Science databases and through author citation searches.

Findings – Our findings show that existing literature is skewed towards examining the use of technology in the form of decision support systems with limited research attention on non-technological (i.e., behavioural) approaches to improving the quality of valuation decisions. We summarise the non-technological approaches and note that much of the discussions on these approaches often appear as recommendations arising from other studies rather than original investigations in their own rights.

Research Implications – We conclude that studies investigating the effectiveness of the non-technological approaches to improving valuation decision making are lacking, providing various avenues for further research.

Originality/Value – This paper presents the first attempt to provide a comprehensive overview of non-technological approaches to improving the quality of valuation decisions.

Keywords Property valuation, decision making, improving valuation, behavioural valuation, valuer behaviour

1. Introduction

The valuation profession is central to the efficient functioning of a country's economy, society and the environment (Wilkinson et al., 2017). It plays a crucial role in supporting individuals and businesses in establishing market values of properties for a variety of financial decisions such as acquisition, disposal and investment performance evaluation (Baum et al., 2000; Gilbertson & Preston, 2005; Levy & Schuck, 2005). People rarely make vital decisions regarding their properties without seeking value opinion of such properties from a competent valuer (Chen & Yu, 2009). Thus, the provision of inaccurate valuation estimates can adversely impact the users of valuations and the economy at large (Baffour-Awuah & Gyambi-Yeboah, 2017; Jiang et al., 2013) because of the strong linkage between the real estate sector and the wider economy as established in the literature (Chiang et al., 2015). Moreover, following periods of economic downturns, reliable valuations play a major role in restoring normalcy and public trust to the property market (Coester, 2015).

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3 In most valuation engagements, valuers are required to estimate the property's market value,
4 which is expected to be arrived at by going through a rational, analytical decision-making
5 process (i.e., the normative valuation process) (Amidu & Boyd, 2018; Whipple, 1991). This
6 process typically comprises instructions, bases of value, methods of valuation, and reporting
7 of the estimated value (Crosby, 2000a). Levy and Schuck (1999) describe the normative
8 valuation process as a signal processing system in which the valuer filters and interprets
9 property and market information to produce a property's estimated value. However, valuation
10 is a relatively complex activity due to the heterogeneous nature of properties, the infrequency
11 of trading, the challenges in accessing transaction data, and the substantial amount of private
12 information (Levy, 2005; Wyatt, 1997). The complexity of valuations is further complicated
13 by the need for valuers to apply rules and procedures, as well as exercise professional judgment
14 and reasoning in non-routine, dynamic situations (Amidu & Boyd, 2018; Klamer et al., 2017,
15 2018). Additionally, the general decision making process of valuers is subject to several
16 external constraints that restrict the decision space within which valuers can operate (Amidu,
17 2011) and internal constraints such as cognitive limitations of human information processing
18 (Newell & Simon, 1972). As a result, Diaz (1990a) and Diaz et al. (2002) argue that effective
19 valuation decision making may necessitate a departure from the preferred normative model to
20 a more efficient, heuristic-driven approach, which may result in sub-optimal or biased
21 valuation decisions (Diaz, 1999).

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23 Although a significant amount of behavioural valuation research has been devoted to
24 establishing the existence, and the possible causes of bias in valuation, there has been
25 surprisingly little attention on how these biases can be mitigated and how valuation decisions
26 can be improved (Abidoye et al., 2021; Lausberg & Dust, 2017). Previous studies in this regard
27 have largely focused on the use of decision support tools as an approach to reducing valuation
28 bias and improving valuation quality (e.g., Abidoye & Chan, 2017; Evans et al., 2019;
29 Lausberg & Dust, 2017; Tidwell & Gallimore, 2014). However, many researchers have argued
30 that if valuation decisions are to be improved, there is need to address the potential impact of
31 non-technological, behavioural issues such as the roles of professional bodies, valuers
32 knowledge, experience and ethical conduct, as well as issues relating valuation education and
33 professional development (Abidoye et al., 2021; Ali, et al., 2020; Amidu, 2011; Amidu et al.,
34 2019a; Baffour-Awuah et al., 2017; Cheloti & Mooya, 2021, 2023; Baum, 2000; Crosby et al.,
35 2018; Havard, 2001). Yet, investigations into these non-technological issues appear to be
36 deficient in the literature.

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38 By adopting a narrative approach, this paper reviews existing valuation literature to examine
39 the approaches for improving valuation decision making and highlight areas for future research.
40 We note that this is an area that has not been dealt with in past reviews of the valuation
41 literature. Previous reviews papers have focused on studies that investigated the valuation
42 procedure, bias in valuation or the application of decision support tools in valuations (e.g.,
43 Abidoye & Chan, 2017; Adilieme et al., 2023; Amidu, 2011; Binoy et al, 2022; Diaz, 1999;
44 Diaz & Hansz, 2002; Geerts et al, 2023; Klamer et al., 2017; Mohammad et al., 2018; Yiu et
45 al., 2006). While some of these studies have superficially addressed the non-technological
46 approaches to improving valuation quality, none has provided a comprehensive review of the
47 issues. The present study, therefore, bridges this gap in the literature, thereby enhancing our
48 understanding of how valuation decisions might be improved. The paper also introduces an
49 organising framework for valuation decision making research, provides an overview of extant
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literature in the major research areas and identifies future research needs. In the next section, we describe how we identified the studies included in this review.

2. Methods

The approach used in this paper is that of a narrative review, which entails reviewing literature on a subject area (Grant & Booth, 2009) and providing a quick summary of previous research (Green et al., 2006). Our choice of narrative approach was driven by the lack of adequate empirical evidence on the principal issue being investigated, that is, the non-technological approaches to improving valuation decision making. Because these issues are mostly embedded in studies that seek to understand or evaluate valuation decisions, they are not easily identifiable through titles and keywords search. Thus, our search strategy involves identifying studies in the broad behavioural valuation domain, which were then reviewed to identify the measures that have been proposed in the literature as approaches to improving valuation quality. Although the narrative review approach has been criticised for lack of rigour (Byrne, 2016), employing the methodologies of systematic reviews can help to improve its quality by using effective bibliographic research strategy to reduce articles selection bias (Ferrari, 2015). Consequently, we adopted the framework developed by Page et al. (2021) to identify and select the papers reviewed in this study (see Figure 1).

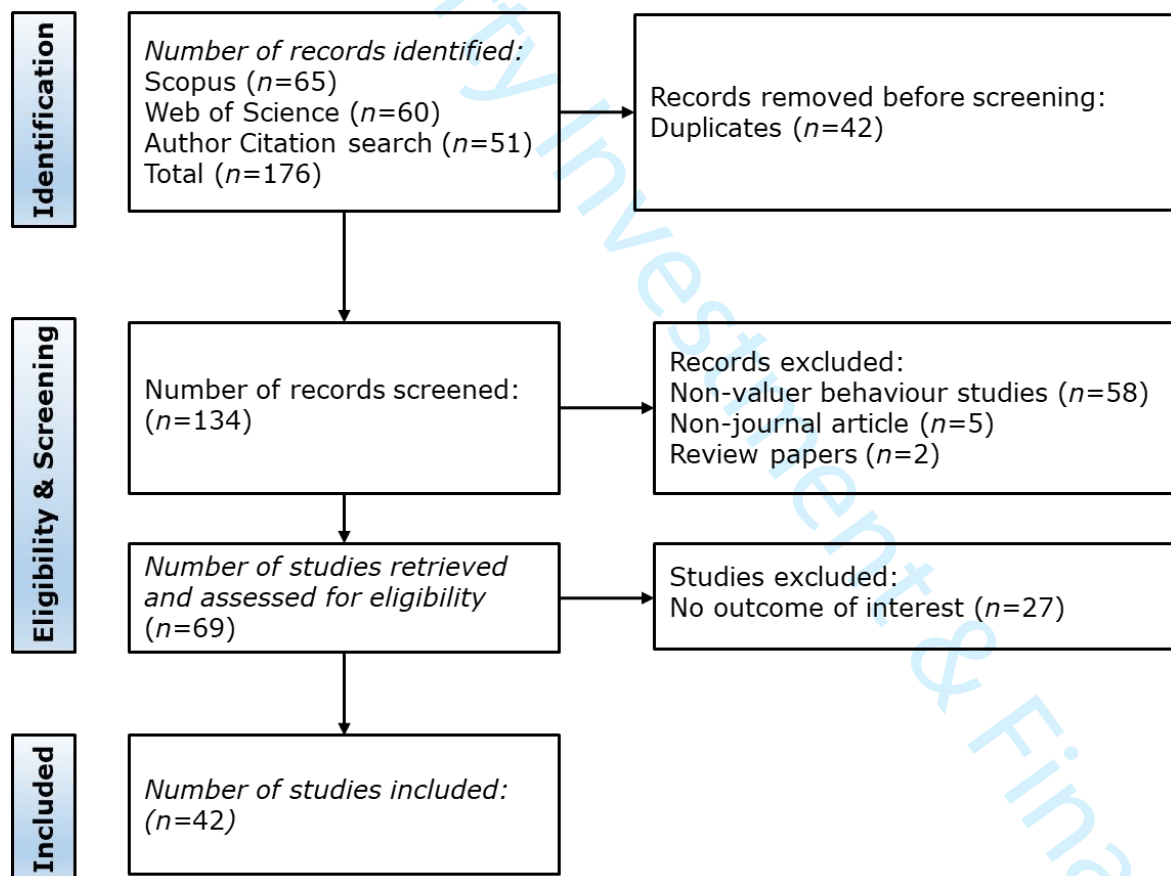


Figure 1: Flow diagram of the literature selection process

Documents for this review were identified from two major databases; Scopus and Web of Science, which are widely used for assembling review materials in property research. The following Boolean search protocol was utilised in the database search: ("property valuation" OR "real estate valuation" OR "property appraisal" OR "real estate appraisal") AND

("behaviour" OR "behavior"). This resulted in an initial dataset of 125 papers from Scopus (n=65) and Web of Science (n=60). However, to ensure that all relevant papers were included, consistent with the snowball technique utilised by Klamer et al. (2017) and Bolomope et al. (2020), we used author citation search to gather additional relevant papers for the review. Accordingly, at the end of the entire search process, a total of 176 potentially suitable studies were identified. These studies were then screened using a number of exclusion criteria as outline in Figure 1. After screening for duplicates (n=42), non-valuer behaviour studies (n=58), non-journal articles (n=5) and literature review papers (n=2), we were left with 69 behavioural valuation studies, which we retrieved and assessed for eligibility. These 69 papers were published between 1990 and 2023 (as shown in Figure 2), providing a reasonable reflection of the evolution of behavioural valuation research over the years. The top countries of publications (based on authors' affiliations) are presented in Figure 3.

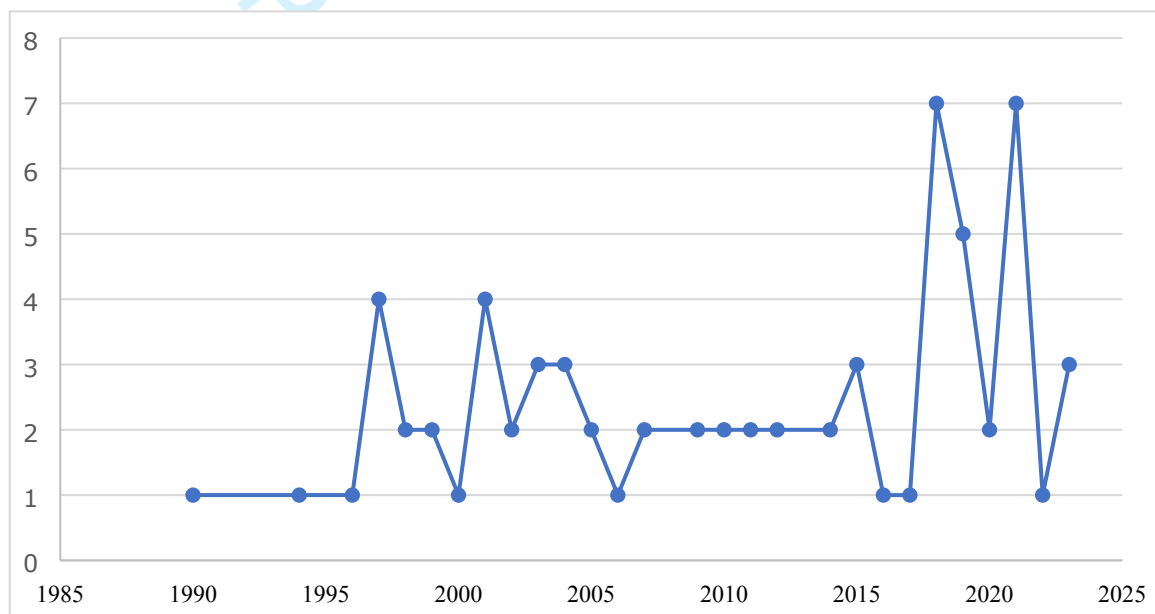


Figure 2: Number of publications per year

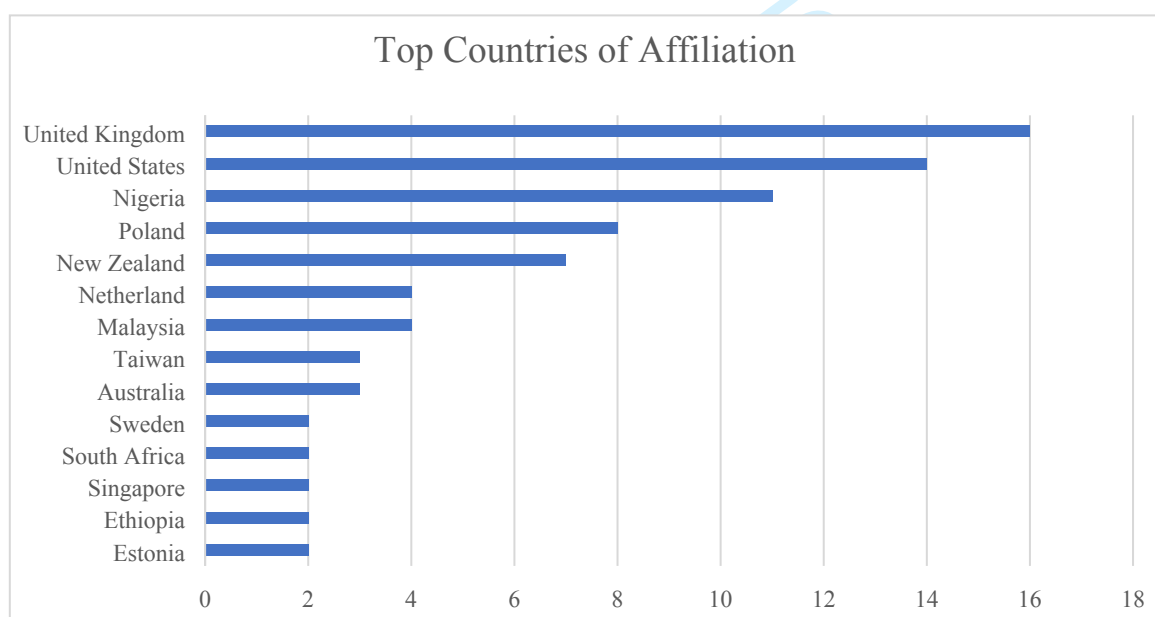


Figure 3: Top Countries of Publications

The last round of screening (i.e., assessment for eligibility) resulted in a final dataset of 42 relevant empirical papers that were included in the review. These 42 papers, published between 1997 and 2023 offered some recommendation on how to improve the quality of valuation decisions as will be discussed in Section 3.3.

3. Results

3.1 An organising framework for valuation decision making research

The property discipline including property valuation inherently deals with human behaviour. The overall purpose of research in valuation decision making is to provide useful advice on how the quality of valuation decisions can be improved (Diaz, 1999). To provide such advice, there is need to first evaluate the quality of valuation decisions. However, a precondition for such evaluation is to understand how valuers actually make decisions. This is consistent with the contention by Vlek (1984, p. 6) that “*once we know how they do it, we might advise them on how to improve on it*”. A comprehensive understanding of the decision-making behaviour of valuers has implication for valuation education, valuers’ development and professional autonomy (Amidu et al., 2019b). Therefore, as with other disciplines of professional services that involve the use of subjective human judgment such as auditing (Ashton, 1982; Trotman, 1998), it can be argued that the three major reasons why researchers undertake research in valuation decision making is to understand, evaluate and ultimately, to improve valuation decisions. Thus, analogous to the approach adopted by Wang and Noe (2010), we developed an organising framework for valuation decision making research (Figure 4).

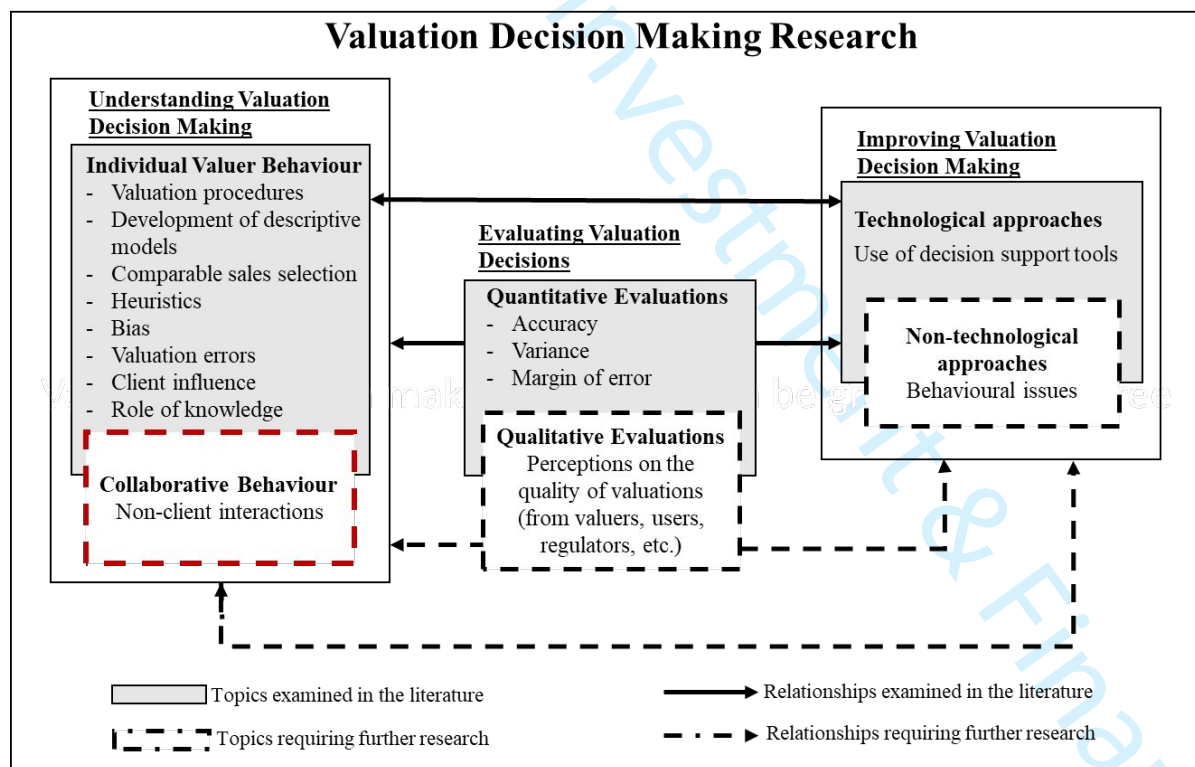


Figure 4: A Framework of Valuation Decision Making Research

Source: Authors

The framework shows the three major areas of emphasis of valuation decision making research. It also highlights the key issues that have been researched within each area of emphasis, the relationship between the areas, and some of the areas requiring further research. Accordingly,

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3 in the framework, the research issues listed in the shaded boxes are those that have been
4 substantially examined in the literature, while those in the dotted boxes are the ones that have
5 not been given adequate attention and hence, need further research. One key area that requires
6 more in-depth investigation, which is the focus of this paper is on the application of non-
7 technological (i.e., behavioural) approaches to improving valuation decision making. It should
8 be noted, however, that we are not suggesting that the other areas of emphasis are fully
9 saturated (i.e., we are not ruling out further research gaps in those areas). Only that our focus
10 in this paper is in the area of improving valuation decisions. Thus, we proceed, in the next two
11 sections, by providing overviews of research in understanding and evaluating valuation
12 decision making respectively. The key findings from the literature review on improving
13 valuation decision making are then discussed in the subsequent section. The final section
14 highlights the implications of the research and provides directions for future studies.
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19 3.1.1 Understanding valuation decision making

20 Prompted by concerns that expert valuers may not be investing the required cognitive effort
21 when solving valuation problems (such as following the normative valuation process that
22 requires a step-by-step approach) (Amidu, 2011), research on understanding valuation decision
23 making is centred on investigating valuers' actual decision making behaviour with the aim of
24 addressing the primary question of: how do valuers make decision? The major motivation for
25 these studies lies in the need for a clear understanding of decision making processes as a
26 prerequisite for improving valuation decisions (Diaz, 1990). Accordingly, the key focus of this
27 stream of research has been on explaining factors that could influence the valuation decision
28 making process and they include: valuation procedures (e.g., Adair, et al., 1996a; Diaz et al.,
29 2002, 2004; Diaz, 1990a; Havard, 2001; Lin & Chang, 2012), valuers' actual decision making
30 and comparable sales selection strategies (e.g., Amidu, et al., 2019b; Diaz, 1990b; Gallimore
31 & Wolverton, 1997), bias in valuation (e.g., Diaz & Hansz, 1997, 2001; Diaz & Wolverton,
32 1998), and client influence and pressure (e.g., Amidu & Aluko, 2007a, 2007b; Amidu et al.,
33 2008; Crosby et al., 2018; Kinnard et al., 1997; Levy & Schuck, 1999, 2005; Nwuba et al.,
34 2015; Worzola et al., 1998).
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41 In sum, these studies, which fall under the broad theme of behavioural valuation research, have
42 shown that valuers significantly deviate from the normative models that they are trained to use
43 when carrying out valuations. Such deviation is triggered by valuers use of heuristics both in
44 their search for efficiency (Diaz, 2002) and in coping with inefficient market and limited
45 information availability (Adair, et al., 1996a). This is because the property valuation process is
46 undertaken in a property market that deviates from the theoretical model of market efficiency
47 in which stakeholders are assumed to possess perfect information (Wyman et al., 2011), which
48 is congruent to the notion of rationality. In reality, the property market is often characterised
49 by "*high informational search cost, limited information, heterogeneous properties and*
50 *relatively few transactions*" (Tidwell & Gallimore, 2014, p. 45). Consequently, the body of
51 research on judgment bias provides a deeper explanation into the likely factors that are
52 responsible for valuers' deviation from the normative process. These studies demonstrate that
53 valuers are not only prone to intrapersonal bias that is caused by the use of heuristics, but also
54 interpersonal bias arising from pressures from clients that commission the valuations (for a
55 detailed review of these two forms of biases, see Klamer et al., 2017). Despite this recognition
56 of the influence of human behaviour in the valuation decision making process, the bulk of
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2 studies that attempt to evaluate the quality of valuation decisions are premised on this
3 assumption of a rational economic man as discussed in the next section.
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6 *3.1.2 Evaluating valuation decision making*

7 As earlier stated, another major reason for which research in valuation decision making is
8 undertaken relates to the need to evaluate valuation decisions. Research into this area predates
9 those seeking actual understanding of valuer behaviour and have thus, perceived property
10 valuers as rational decision makers whose quality of decisions can be assessed based on how
11 such decisions correspond to the correct outcome, that is, actual market prices. Although
12 findings from this stream of research have been mixed, varying across time periods and level
13 of market maturity, a considerable amount of these studies suggest that valuations may not be
14 accurate due to the existence of random and systematic errors in the value estimates (Boyd &
15 Irons, 2002; Levy & Schuck, 2005). Specifically, research attention in this area has focused on
16 scrutinizing valuation decisions to determine their levels of (in)accuracy or variation. Whereas
17 valuation accuracy measures the difference between the value estimate produced by a valuer
18 and the eventual sales price, valuation variance measures the difference between the value
19 estimates produced by different valuers for the same property, typically using the same set of
20 information (Boyd & Irons, 2002; Crosby, 2000b). Generally, a valuation that is outside a
21 margin of $\pm 10\%$ is believed to have exhibited a high degree of inaccuracy or variance
22 (Hutchison et al., 1996; Crosby et al., 1998). The summary of findings from this body of
23 research is that property valuations are indeed susceptible to different degrees of errors that
24 result in inaccuracies and variations (e.g., Adair et al., 1996b; Babawale & Ajayi, 2011;
25 Baffour-Awuah & Gyamfi-Yeboah, 2017; Brown, 1992; Brown et al., 1998; Crosby et al.,
26 1998; Diaz & Hansz, 2001).
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34 Many decision researchers have however faulted the use of the outcome approach as a yardstick
35 to assess the quality of decisions, arguing instead that decisions should be evaluated in terms
36 of the processes followed to arrive at such decisions because it is often difficult to determine
37 what a correct outcome is. In addition, most outcomes only occur long after the decisions are
38 made (Dolan, 1999). These two sentiments have also been recognised in the valuation
39 literature. Firstly, in the absence of actual sales, there is no “correct valuation” that can be used
40 as a benchmark to determine the extent to which valuations are accurate (Amidu & Boyd,
41 2018). Secondly, even if actual sales are available to be used as proxies for comparison, there
42 is often a lag between the date of valuation and the date that the actual sales occur (Crosby,
43 2000b), raising concerns over possible changes that might have occurred in the market during
44 the lag period, thereby impacting the comparability (Parker, 1999). Moreover, as earlier
45 highlighted, the assumption of a perfect market is more of a mirage than a reality as the property
46 market is characterised by information ambiguity and high level of illiquidity.
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52 Given these major shortcomings of the outcome-based rationality approach, academics and
53 practitioners have questioned its appropriateness in evaluating valuation decisions (Amidu &
54 Boyd, 2018). Moreover, although the margin of error of $\pm 10\%$ is widely acceptable by the
55 parties to valuation instructions (Bretten & Wyatt, 2001), others have cautioned against the use
56 of the principle in determining the cases of valuation negligence as it lacks empirical basis and
57 does not examine the process that the valuer follows (Asnakew & Amogne, 2021; Crosby et
58 al., 1998). Nevertheless, the body of research produced in this area not only provides valuable
59 insights, but also highlights the need for a more thorough understanding of the valuation
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decision making process. It also signals the need for a departure from the use of accuracy as the key measure for evaluating valuation decisions to other more critical, process-based approaches (Asnakew & Amogne, 2021). In addition, these studies have underscored the need for a more extensive exploration of how valuation decisions can be improved. The next section discusses current research on improving valuation decisions.

3.1.3 *Improving valuation decision making*

Although research into understanding and evaluating valuation decision making has been on for decades, studies investigating how valuation decisions can be improved are somewhat limited (Abidoeye et al., 2021; Lausberg & Dust, 2017). Based on the review of valuation literature undertaken and reported in this paper, we identify two broad approaches to improving valuation decision making that have been the subject of discussion, which we label here as technological and non-technological approaches. The technological approach mainly deals with the application of different forms of decision support tools in the valuation process with the hope of reducing bias and improving the quality of valuation decisions. On the other hand, the non-technological approaches focus on identifying the behavioural issues that need to be addressed for valuers to be able to make higher quality valuation decisions. Ali et al. (2020) argue that it is essential to identify and devise potential countermeasures to address psychological and behavioural issues in property valuation. The present study shows that current research trend in valuation research appears to be skewed towards the technological approach while the non-technological approaches hardly appear as the actual topic of research despite the recognition of the influence of human behaviour in the valuation decision making process. Although the focus of this study is on the non-technological approaches, an attempt is made, in the following section, to provide a brief overview of the technological approach to improving valuation decisions.

3.2 *Technological approach to improving valuation decision making*

This approach employs technology mainly in the form of Decision Support Systems (DSS) in the decision making process. A DSS has been defined as “*a system that improves and supports decision-making capabilities of an individual or group*” (Glumac & Des Rosiers, 2018, p. 3). The decision making literature shows that DSS are useful tools for overcoming cognitive limitations, reducing heuristic behaviours and biases, and improving overall decision making process. This is because the systems are based on a balance between human judgment and computerised information processing (Zarate, 2013). This approach, which uses technology that is external to the decision maker, has the potential to reduce both search and processing cost thereby reducing overreliance on the use of heuristics (Conlisk, 1996), albeit if used effectively (Tidwell & Gallimore, 2014).

In property valuation, DSS have been operationalised and applied in different forms. Such phrases as Automated Valuation Models (AVMs), Hedonic Price Modelling (HPM), Artificial Neural Networks (ANN), and Computer Assisted Mass Appraisal (CAMA), among others have become common place in both valuation research and practice. Consequently, the use of decision tools and their potential for debiasing and improving valuation decisions have received significant research attention within the valuation literature (e.g., Abidoeye & Chan, 2017, 2018; Lam et al., 2009; Lausberg & Dust, 2017; Mak & Liu, 2007; Tidwell & Gallimore, 2014; Evans et al., 2019). Lausberg & Dust (2017) assert that the use of the right decision aids

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3 is crucial in improving manual valuations. Tidwell & Gallimore (2014) and Evans et al. (2019)
4 also point to the usefulness of DSS in reducing heuristics behaviour and appraisal bias. This is
5 because by using DSS, decision makers will be required to use less cognitive efforts, and thus,
6 less reliance on cognitive simplifications. In support of this, Abidoye et al. (2019) note that the
7 use of technology-based valuation methods has been found to be helpful in reducing disparities
8 between valuation opinions and actual sales prices. In other words, DSS can help improve
9 valuation accuracy.
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13 Despite the usefulness of DSS in debiasing and improving decision making, they are not
14 without their limitations. Several risks associated with the use of DSS in decision making have
15 been highlighted. For instance, Salles (2015) notes that there is the risk of inaccuracies of the
16 results produced by the system due to errors from data input or data processing. There also
17 exists the risk of losing diversity due to vicious circle of feedback. Explaining this in the context
18 of consumer behaviour, Salles (2015) argues that models will favour products that record the
19 highest number of purchases at the detriment of those that may be more suitable to satisfy the
20 actual (rather than the inferred) needs of the consumer. Thus, in the context of property
21 valuation, DSS could potentially under- or over-value some property attributes in relation to
22 others due to the nature of the data that is entered into the system.
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27 Furthermore, the robustness of most valuation decision support tools depends on the
28 availability of data that is sufficient to develop a model. This has made the utilization of these
29 tools, especially those that do not require much human intervention post-initiation (such as
30 AVMs), somewhat limited to the residential sub-market where the products are relatively
31 homogeneous, more frequently traded, and their transaction records are now becoming
32 increasingly publicly available, when compared to the commercial sub-market. Thus, in an
33 insight paper of the Royal Institution of Chartered Surveyors (RICS), Scheurwater (2017, p.24)
34 argues that there seems to be agreement that “AVMs are most (if not exclusively) suitable for
35 residential property... because for an AVM to be reliable and consistent, the volume of
36 comparable transactions needs to be reasonably high, with the differences between properties
37 identified through straightforward attributes (such as number of bedrooms or floor space).”
38 Commercial properties, however, are highly heterogeneous and sometimes specialised in
39 nature, their market is thin, there is the risk of omitted variables and errors often occur in the
40 measurement of dataset (Kummerow, 2003; Scheurwater, 2017). These limitations of DSS
41 suggest that they may not be the best approach to improving valuation decision making,
42 especially from the commercial property point of view. We thus argue that research must
43 continue to explore other approaches through which valuation decisions can be improved.
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50 **3.3 Non-technological approaches**

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52 As highlighted earlier, the influence of human behaviour in valuation decision making is well
53 established in the property literature. Thus, researchers have consistently recommended
54 measures through which the negative impact of these human behaviours can be ameliorated. It
55 is noteworthy that most of these measures appear as recommendations arising from studies in
56 the other areas of emphasis rather than being the actual focus of research. Moreover, the
57 recommendations are often centred around the valuer, while largely neglecting the roles of the
58 valuation environment and other stakeholders that valuers interact with in the valuation process
59 (Adilieme et al., 2023; Cheloti & Mooya, 2023). This is not surprising as the valuer is believed
60 to play a much larger role in the valuation process (Chen & Yu, 2009). Bretten and Wyatt

(2001) contend that most of the factors that cause valuation variance are related to the valuer's behavioural characteristics. In other domains such as auditing, recommendations for improving audit quality have also focused on the auditor (e.g., Robertson, 2010; Adams et al., 2021). What follows is a synthesis of the key measures recommended in the valuation literature.

3.3.1 Periodic review of valuation standards

Several researchers have advocated the need for regular reviews of professional standards as a way of improving valuation decisions through the provision of new guidelines that will address the shortcomings of previous standards (Babawale & Omirin, 2012; Cheloti & Mooya 2023; Nwuba et al., 2015; Smolen and Hambleton, 1997). Others have argued for establishment of standards where they do not already exist (Asres, 2023; Asnakew & Amogne, 2021; Mwasumbi, 2014). Following periods of economic downturns, criticism is often raised about the quality of valuations produced by valuers. In response to such criticism, and the need for the property profession to continuously uphold standards that are relevant to a dynamic world, to maintain public trust and meet clients' needs (Peto, 2010), professional valuation associations such as the RICS have consistently taken steps to address the issue of valuation failures (Amidu et al., 2021; Crosby et al., 2018). Such steps include, for instance, the Mallinson Report (Mallinson, 1994), the Carsberg Report (Carsberg, 2002), the harmonisation of standards at international level (Crosby, 2000b; Crosby et al., 2018) and updating valuation standards on a regular basis, the most recent being the RICS Red Book 2022 (RICS, 2022). While these strides are commendable, the revision of standards alone has often not yielded the much desired results (Almond et al., 1997) as they failed to address some the behavioural roles of valuers. Rather, such revisions have been described as mere products of commercial needs (Daly et al., 2003).

3.3.2 Improving valuers' conduct

As highlighted by Chelotti and Mooya (2021), research has attributed the existence of many valuation problems to ethical misconduct of valuers in both developed and developing countries. Evidence suggests that unethical valuers are more prone to succumbing to influence that can undermine the quality of their valuations. Influence in valuation refers to a situation in which valuers are pressurised to do things that breach their code of ethics (Appraisal Institute of Canada, 2010 as cited in Nwuba et al., 2015). Consequently, several studies, especially those emanating from less developed markets in Africa have often cited the need for improving valuers ethical conduct as a means of enhancing the quality of valuation decisions (Baffour-Awuah et al., 2016; Cheloti & Mooya, 2023; Iroham et al., 2012; Nwuba et al., 2015). These studies recommend that improving valuers' conduct can be achieved through continuing professional development (CPD) programmes (Babawale & Omirin, 2012; Iroham et al., 2012), other practical on-the-job and off-the-job trainings (Chelotti & Mooya, 2021), exposure to international best practices (Babawale & Omirin, 2012), better remuneration (Lee et al., 2020), and rewards mechanisms both for valuers that demonstrate excellence (Wolverton & Gallimore, 1999) and those that resist client pressure (Iroham et al., 2012) among others.

3.3.3 Enforcing disciplinary measures

Another approach that has been often recommended by researchers is the strict enforcement of valuers' code of ethics (Achu et al., 2015; Kucharska-Stasiak et al., 2018). This can be achieved by implementing appropriate penalties on valuers (and valuation firms) that violate ethical standards (Ayuthaya & Swierczek, 2014; Layne, 2002) or succumb to client influence

(Wolverton & Gallimore, 1999). Such penalties may include “*formal caution, note of warning, suspension of certification, and certificate withdrawal*” (Ayuthaya & Swierczek, 2014, p. 43). It is noted, however, that although professional bodies such as the RICS have sanctions for erring members, they are more concerned about encouraging and promoting good practices rather than enforcing the disciplinary actions (French, 2011). Moreover, in countries where institutions are weak and indiscipline and corruption are endemic, enforcing disciplinary measures may not deter professionals from engaging in unethical conducts (Akadakpo & Izedonmi, 2013). For instance, evidence from Nigeria suggests that disciplinary actions are inadequate to deter valuers from succumbing to client influence (Nwuba et al., 2015). In fact, even in some developed economies such as Taiwan, “*valuers do not think that rules and regulations would help to deter client pressure*” (Chen & Yu, 2009, p. 40). Therefore, as an alternative, Małkowska et al. (2021) argue that improved ethical conduct can be achieved by adopting measures that will increase valuers’ job satisfaction.

3.3.4 Improving access to information

Property valuation has been described as a function of information (Gallimore, 1996). The availability of readily accessible, adequate, and reliable information is central to the quality of valuations (Peto, 1997). Thus, Brown (1992) argues that the use of better information set results in better valuations. Property markets globally can be classified into four types based on their level of transparency: highly transparent, transparent, semi-transparent, and low transparency (French, 2023). In the absence of centrally available databases, which is typical of less transparent (less developed) markets, valuers resort to using non-systematic approaches to gather market information, which can trigger incomplete information search and consequently result in higher inaccuracy of value estimates (Augustyniak et al., 2018; Tidwell & Gallimore, 2014). Furthermore, lack of transparent market information provides clients with the opportunity to influence valuations by taking advantage of subjectivities in the market (Chen & Yu, 2009). To address this issue, some researchers have argued for a more transparent property market with higher level of disclosure (Chen & Yu, 2009; Levy & Schuck, 2005). Others have raised awareness on the need for an improved access to relevant market data through the establishment of central databanks (Augustyniak et al., 2018) especially in developing markets where such is non-existent (Abidoye et al., 2021; Asres, 2023; Babawale & Omirin, 2012; Baffour-Awuah et al., 2017; Cheloti & Mooya, 2023). One way through which this can be achieved is by a coordinated pooling of information from both public and private sectors (Cheloti & Mooya, 2023; Layne, 2002). However, concerns about the reliability of data from these sources must be considered during the gathering process. This is because uncertainties in market-related or property-specific information can influence the quality of valuation decisions (French & Gabrielli, 2004, 2005). Although there has been improvement in the availability of market data globally (Hemphill et al., 2014), our review shows that existing studies especially those emanating from developing countries have not critically examined progress made in harnessing data and making it readily available to valuers in reliable form. More importantly, how this might have improved the quality of valuation decisions requires further research.

3.3.5 Changes to valuation education

Previous studies have raised concerns over the ability of valuation curriculums to meet actual industry needs in both developed and developing countries (Crosby, 2000a; Małkowska et al., 2019; Mooya, 2015). One explanation is due to the lack of practical experience (Blake &

Susilawati, 2009). However, another plausible reason for this is the non-inclusion of topics related to the influence of human behaviour on valuations in the curriculums of most property programmes. Experimental audit studies show that knowledge of behaviouralism can mitigate heuristics and judgment bias (Henrizi et al., 2021; Wilson et al., 1996). Valuation researchers have thus recommended the integration of aspects of human behaviour and decision making in valuation education (Amidu, 2011; Cheloti & Mooya, 2023; Havard, 2001; Klamer et al, 2021; Małkowska et al., 2019; Palm & Anderson, 2021). It is believed that by so doing, there will be increased awareness of the potential biasing impact of human behaviour on the outcome of valuations (Havard, 2001). Such awareness will, in turn, result in reduced judgment errors that are often made by valuers when making valuation decisions, thereby increasing the quality of valuation decisions. Another change to valuation curriculum suggested is the inclusion of legal elements to equip valuers with “*procedural knowledge of evaluating and questioning the correctness of valuations as well as the ability to defend them*” (Małkowska et al., 2019, p. 18).

3.3.6 Specialisation and valuing in familiar locations

Empirical studies have shown that valuers are more susceptible to anchor on certain cues and reference points when undertaking valuations in unfamiliar locations (e.g., Diaz, 1997; Diaz & Hansz, 1997; Hansz, 2004; Gallimore & Wolverson, 1997; Yiu et al., 2006). Evidence also suggests that unfamiliar valuation tasks require a higher level of cognitive effort (Halvitigala et al., 2011). Although valuers are expected to increase their search for comparable sales when working in unfamiliar markets, research evidence shows that they do not. This behaviour is consistent with the need for cognitive efficiency which may be at the detriment of the quality of valuation output (Diaz et al., 2004). Researchers have thus cautioned individual valuers and valuation firms against valuing properties in markets that they are not familiar with (Diaz & Hansz 1997; Havard, 2001). Others have advocated for specialisation in specific geographic areas (Amidu, 2011) or asset types (Małkowska et al., 2019). It is argued that by so doing, valuers would be able to improve the quality of the services that they provide. This will also ensure compliance with the IVS as valuers would only engage in valuation in places that they have adequate knowledge of the local market (IVSC, 2022).

3.3.7 Knowledge and experiential learning

Researchers have highlighted the importance of acquiring domain-specific knowledge to equip valuers with what is required to produce high quality valuations (e.g., Amidu & Boyd, 2018; Amidu et al., 2019b; Wilkinson et al., 2018). The accuracy of valuations is influenced by, among other things, the personal knowledge and experience of the valuer (Hager & Lord, 1985). Unknowledgeable and inexperienced valuers are more likely to produce inaccurate valuations (Babawale & Omirin, 2012). Amidu and Boyd (2018) and Scott and Gronow (1990) reported that the knowledge valuers gained from several years of practice is important in informing subsequent valuation decisions particularly in terms of understanding how best to deal with valuation problems and make the right valuation decisions. Additionally, as valuers gain more local knowledge and experience, they are more likely able to resist client pressure which is another major source of bias in valuation (Chen & Yu, 2009). Nevertheless, valuers should not solely rely on their experiences as the best tool for mitigating biases, overcoming cognitive limitations, and improving their decisions. This is because at best, repeated experience may not be a reliable teacher (Bratvold et al., 2002) because it can repeatedly be inexact and has the potential to mislead the decision maker (Larrick, 2004) due largely to the role of intuition in the decision making process. The implication of this is that experienced and

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2 inexperienced valuers alike need to strive for better ways of overcoming these flaws and
3 improving their decisions.
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5 6 3.3.8 Collaboration

7 Collaboration has been widely acknowledged as a useful approach to improving the quality of
8 decisions in different domains. Some researchers have also proposed the use of collaborative
9 approach as a means of improving valuation decisions (e.g., Amidu, 2011; Amidu & Boyd,
10 2018). It is noteworthy that aside studies that examined valuer-client interactions, research
11 investigating how valuers collaborate among themselves and with other stakeholders when
12 making valuation decisions are deficient. It is in view of this gap in knowledge that Havard
13 (2005) suggested that valuers' interactions within the valuation process be properly scrutinised
14 and modelled. This gap in knowledge has not been properly addressed in the valuation literature
15 (Liman et al., 2024). Existing descriptive valuation studies have largely focused on individual
16 valuer behaviour, while the behaviour of valuers in a collaborative context has remained largely
17 undescribed.
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22 3.3.9 Other recommendations

23 Other measures that require proactive role of regulators have also been proposed. For instance,
24 Kinnard et al. (1997), Liao et al. (2018) and Clayton et al. (2001) suggest valuer rotation (as
25 obtainable in audit) as a means of preventing valuation bias. Similarly, professional bodies and
26 regulatory agencies should consider introducing valuation commissioning systems (Amidu &
27 Aluko, 2007a; Amidu et al., 2008; Liao et al., 2018). Such systems, which are aimed at
28 separating valuers from the clients are already in existence in countries like New Zealand (for
29 residential valuations). Others emphasised on the need to increase public enlightenment on the
30 importance of objective valuations (Achu et al., 2015; Amidu & Aluko, 2007a; Amidu et al.,
31 2008) as well as the recognition of the fairness of valuers (Lee et al., 2020). The latter can be
32 achieved by ensuring a transparent valuation commissioning process (Liao et al., 2018).
33 Finally, it is recommended that valuers should be aware of and be prepared to react to the
34 different ways through which clients may exert their influence (Klamer et al., 2019; Levy &
35 Schuck, 1999). These measures are expected to reduce bias in valuation and improve valuers'
36 judgment and decision making.
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43 4. Research implications and future research direction

44 This study has contributed to the valuation literature in two major ways. First, the study
45 introduces an organising framework of valuation decision making research. Second, the study
46 synthesises current knowledge on the approaches to improving valuation decision making with
47 particular focus on the non-technological approaches. The importance of accurate valuations
48 to businesses and the economy at large cannot be overemphasised. The valuation literature
49 shows that valuation decision making is indeed a complex and ill-defined human activity and
50 valuers often deviate from the normative models when carrying out valuations. This is because
51 in making valuation decisions, valuers, like their counterparts in other areas of complex
52 decision making use simplifying heuristics which may sometimes be helpful in increasing
53 efficiency but could also lead to judgment bias. Another major source of bias in valuation is
54 feedback and pressures from clients through their principal-agent relationships with valuers.
55 Studies in this area have revealed that valuers are indeed susceptible to these influences. A
56 major implication of the resulting intrapersonal and interpersonal biases, as shown in the
57 existing literature is that they adversely affect the quality of valuation decisions. In other words,
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they often lead to sub-optimal valuation decisions. This, therefore, underscores the need to continue to explore ways through which these biases could be subdued, and consequently, the quality of valuation decisions improved.

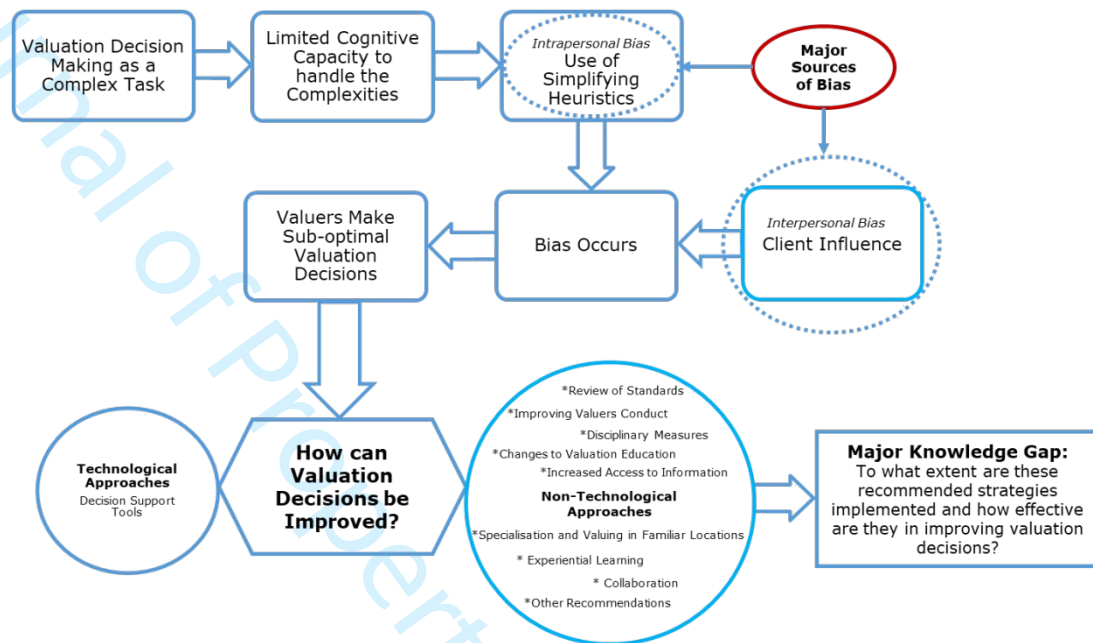


Figure 5: Summary of the research findings

Source: Authors

The literature has shown that there is surprisingly limited research on how valuation decisions can be improved. We note, however, that although there appears to be an increasing research interest in this area in recent time, much empirical studies have focused on the use of decision support tools as a way of improving valuation decisions. We argue that research addressing the non-technological, behavioural considerations as means of improving valuation decision making has not received adequate attention. These (behavioural) issues generally appear as recommendations arising from other studies rather than original investigations in their own rights. Furthermore, whereas there are three major causes of valuation problem; person, task and environment (Amidu, 2011), it has been observed that much of the proposed solutions have focused on the valuer with little attention on the valuation environment/market-related problems (Cheloti & Mooya, 2021, 2023), the roles of other stakeholders such as the clients that exert both structural and economic powers (Adilieme et al., 2023), the roles of valuation firms and the structure of the valuation task. Moreover, studies investigating the effectiveness of the recommended approaches are lacking. We contend, in the light of the foregoing, that if the much desired improvement in valuation decision making is to be achieved, there must be increased, deliberate and sustained research into these non-technological, behavioural issues bordering around the valuer, the valuation environment, the valuation task, the client and other stakeholders. Drawing from the findings of this review and empirical research in other domains such as auditing, we identify promising avenues for future research. We hope that outcomes from the suggested future studies will generate valuable insights that can guide relevant stakeholders in adopting an integrated, more proactive approach to improving the quality of valuation decisions.

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3 One very important area that future research should focus attention on is the extent to which
4 the recommendations described in this paper have been implemented in practice, and their
5 effectiveness in improving the quality of valuations decisions. For instance, while there has
6 been continuous changes to valuation professional standards with their attendant
7 internationalisation (Bellman & Lind, 2019; Crosby et al., 2018), there is need for more
8 research on how this and other changes related to valuation regulations have impacted the
9 quality of valuations in real terms. Similarly, there is a need to investigate the extent to which
10 valuation professional associations enforce existing disciplinary measures and how the level of
11 enforcement correlates with improvement in valuation quality. In auditing, for instance,
12 research by Boone et al. (2015) found no evidence to suggest that the quality of audit opinion
13 provided by one of the Big 4 audit firms changed as a result of a disciplinary measure
14 constituted against the firm by the Public Company Accounting Oversight Board. In the aspect
15 of data, whereas there has been improvement in the availability of market data globally
16 (Hemphill et al., 2014), future research should investigate progress made in developing
17 countries in the area of creating central databanks viz-a-viz improvement in the quality of
18 valuations.
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24 Furthermore, this review has highlighted the biasing effect of location unfamiliarity as event
25 in previous research, with some researchers recommending specialisation and discouraging
26 valuers from undertaking valuations in unfamiliar locations. However, how valuers can
27 effectively achieve this without substantial loss of income in an increasingly competitive
28 market is worth investigating. Research also shows that overreliance on experience can lead to
29 biased valuation decisions. Future studies should thus investigate how best valuers can use their
30 experience to improve the quality of their decisions while avoiding its biasing effect. One
31 solution that is worth exploring further is the integration of both rational and intuitive thinking
32 in the decision making process as exemplified by Amidu et al. (2019b).
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37 Another area with a lot of potential for future research is in understanding the role of
38 collaboration in the valuation process. Research in other domains suggest that collaboration
39 has now become a veritable tool for making better quality decisions (Kugler et al., 2012). This
40 is because compared to individuals, collaborative groups have the capacity to generate
41 information and knowledge that are more complete (Robbins et al., 2009). Similarly, Perry and
42 Moffat (2004) argue that collaboration can result in an increase in the quantity and quality of
43 information that can be relied upon by decision makers. However, this phenomenon of
44 collaboration has not been properly examined in property valuation, thereby providing
45 opportunity for further research (Liman et al., 2024). Forthcoming studies by the authors
46 examine, inter alia, how collaboration among valuers, as well as between valuers and other
47 stakeholders (aside clients, which has been widely researched) contributes to the quality of
48 valuation decisions. Still on collaboration, since technology is not replacing human valuers in
49 the commercial property space, at least in the short to medium term, there is need for more
50 research into the complementary roles of humans and technology (i.e., valuer-technology
51 collaboration) in the valuation decision making process, rather than focusing only on
52 developing models that seek to replace the role of the human valuer.
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58 Finally, more research is needed in the areas of valuer rotation, valuation commissioning
59 systems, and awareness of the importance of objective valuations and other factors that can
60 potentially mitigate against achieving high quality valuations. Empirical auditing research

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3 shows that mandatory auditor rotation can improve audit quality under certain conditions (e.g.,
4 Bowlin et al., 2015; Cameran et al., 2016; Krishnan, 2007; Nagy, 2005). Specifically, the
5 implementation of audit partner (or audit firm) rotation can reduce the level of familiarity
6 between auditors and their clients, thereby enhancing the independence of the auditors (Firth
7 et al., 2012). It will be worthwhile to empirically examine how this plays out in a property
8 valuation context.

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11 In conclusion, this review has underscored the persistence of valuation problems across both
12 developed and developing countries. However, it is apparent that certain issues are more
13 prevalent in developing countries, where markets are less mature and institutional and
14 regulatory frameworks are often weak or non-existent. These disparities suggest that a one-
15 size-fits-all solution may not be viable across different markets. Whereas several solutions have
16 been proposed in previous studies, most of them have remained largely theoretical or as Daly
17 et al. (2003) put it, they are mere products of commercial needs. Research investigating the
18 extent to which these solutions have been implemented and their level of effectiveness is
19 significantly lacking and should, therefore, be subject of future research efforts. An important
20 implication of this review for professional practice is that effectively addressing valuation
21 problems and improving the quality of valuation decisions will require a holistic approach that
22 is not only centred on the valuer, but also considers the valuation environment (e.g., availability
23 of information, market maturity, transparency, uncertainty, etc.) and other stakeholders (e.g.,
24 the client, regulators, and the public).

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Approaches to Improving Valuation Decision Making: A Review of the Literature

Response to Reviewers' Comments

Reviewer 1:

1. **Reviewer's comment:** This is an interesting paper which reviews the literature non-technological approaches to improving the quality of valuation decisions. The paper is well written and structured and will be a good resource for both the academic community and those in practice wishing a review of the various issues surrounding valuation decision making.

Authors' response: Thank you very much!

2. **Reviewer's comment:** My one concern is that the review of the literature lacks a geographical and institutional context. The impacts associated with certain issues are likely to be different across markets where there is a difference in market maturity and a distinctive institutional structure and response. For example, in 2024 access to comparable data is less of an issue in the UK given the presence of the CoStar database, compared say with data availability in the less developed markets of eastern Europe and Africa. The authors will be reflecting their experience in different markets and I think this needs to be acknowledged. Moreover are the issues different where the presence of the RICS or Appraisal Institute is less strong? This institutional context will impact the approaches to improving the quality of valuation decisions.

Authors' response: Thank you for pointing this out, and we agree that this is an important consideration. However, in the absence of empirical studies investigating the effectiveness of these recommended measures for improving valuation decisions, it is difficult to provide a robust discussion around differences in market maturity and institutional structures. It is in this regard that we have advocated for research into the extent to which these recommended measures have been implemented and their effectiveness in improving valuation decisions. We believe that such studies will provide a basis for evidence-based reflections around differences in market maturity and institutional structures across different markets.

Nevertheless, we draw the reviewer's attention to different sections of the original manuscript where we highlighted some differences that exist across markets. For example, we mentioned in section:

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- 3.3.3 Enforcing disciplinary measures (Page 11): *“Moreover, in countries where indiscipline and corruption are endemic, enforcing disciplinary measures may not deter professionals from engaging in unethical conducts (Akadakpo & Izedonmi, 2013). For instance, evidence from Nigeria suggests that disciplinary actions are inadequate to deter valuers from succumbing to client influence (Nwuba et al., 2015).”*
 - 3.3.4 Improving access to information (Page 11): *“In the absence of centrally available databases, which is typical of less transparent markets, valuers resort to using non-systematic approaches to gather market information, which can trigger incomplete information search and consequently result in higher inaccuracy of value estimates (Augustyniak et al., 2018; Tidwell & Gallimore, 2014). Furthermore, lack of transparent market information provides clients with the opportunity to influence valuations by taking advantage of subjectivities in the market (Chen & Yu, 2009). To address this issue, some researchers have argued for a more transparent property market with higher level of disclosure (Chen & Yu, 2009; Levy & Schuck, 2005). Others have raised awareness on the need for an improved access to relevant market data through the establishment of central databanks (Augustyniak et al., 2018) especially in developing markets where such is non-existent.”*
 - 3.3.2 Improving valuers’ conduct (Page 10): *“Consequently, several studies, especially those emanating from less developed markets in Africa have often cited the need for improving valuers ethical conduct as a means of enhancing the quality of valuation decisions”*

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These notwithstanding, we have added the following in the concluding paragraph of Section 4 - *Research implications and future research direction* (Page 16) to once again highlight this important issue:

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“In conclusion, this review has underscored the persistence of valuation problems across both developed and developing countries. However, it is apparent that certain issues are more prevalent in developing countries, where markets are less mature and institutional and regulatory frameworks are often weak or non-existent. These disparities suggest that a one-size-fits-all solution may not be viable across different markets.”

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3. **Reviewer’s comment:** Is it worth putting in a table highlighting which markets were investigated in the 42 research articles?

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Authors’ response: We have included a graph (instead of a table) to show the top countries where the studies emanate from (Figure 3 on Page 4).

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Reviewer 2:

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1. **Reviewer’s comment:** This paper presents an interesting and somewhat comprehensive review of literature on valuation decision-making and the approaches

to improving valuation decisions. A wide range of literature is included in the analysis.

Authors' response: Thank you very much!

2. **Reviewer's comment:** Section 2 Methods/Fig 1: what is the timeframe for the total number of papers (n=176) and the reduced number (n=42) and do these papers reflect an evolution of valuation thought over this timeframe? This would be useful for the reader.

Authors' response: We have included the timeframe for the papers. We have also noted that these papers provide a reasonable reflection of the evolution of behavioural valuation research over the years. The following paragraphs were added in the revised paper, together with Figures 2 and 3 (Pages 4-5):

“After screening for duplicates (n=42), non-valuer behaviour studies (n=58), non-journal articles (n=5) and literature review papers (n=2), we were left with 69 behavioural valuation studies, which we retrieved and assessed for eligibility. These 69 papers were published between 1990 and 2023 (as shown in Figure 2), providing a reasonable reflection of the evolution of behavioural valuation research over the years. The top countries of publications (based on authors' affiliations) are presented in Figure 3.

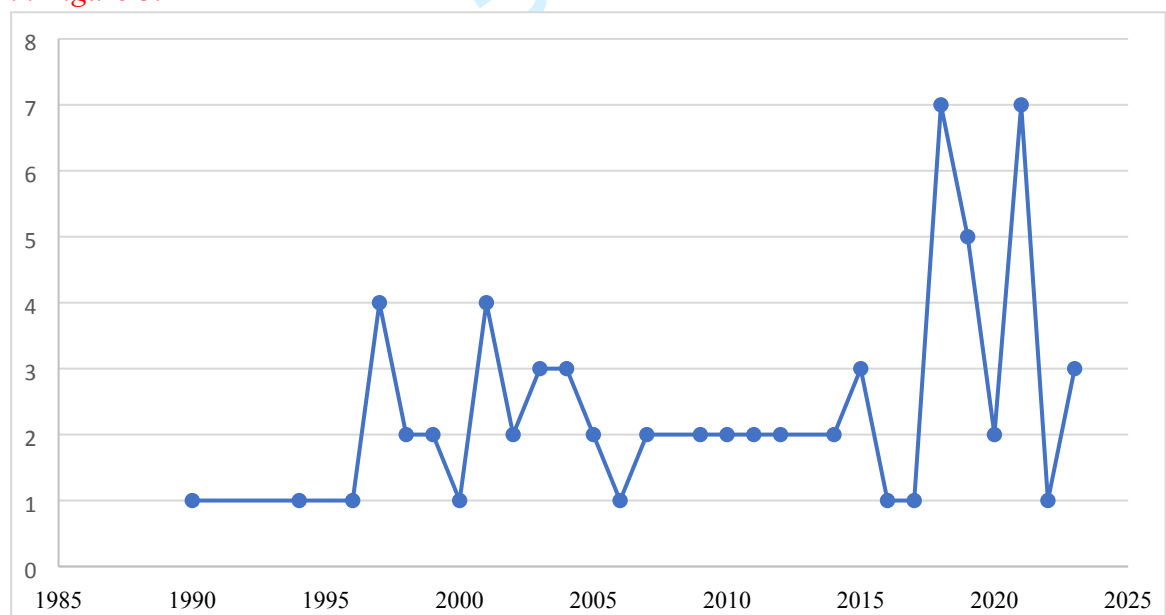


Figure 2: Number of publications per year

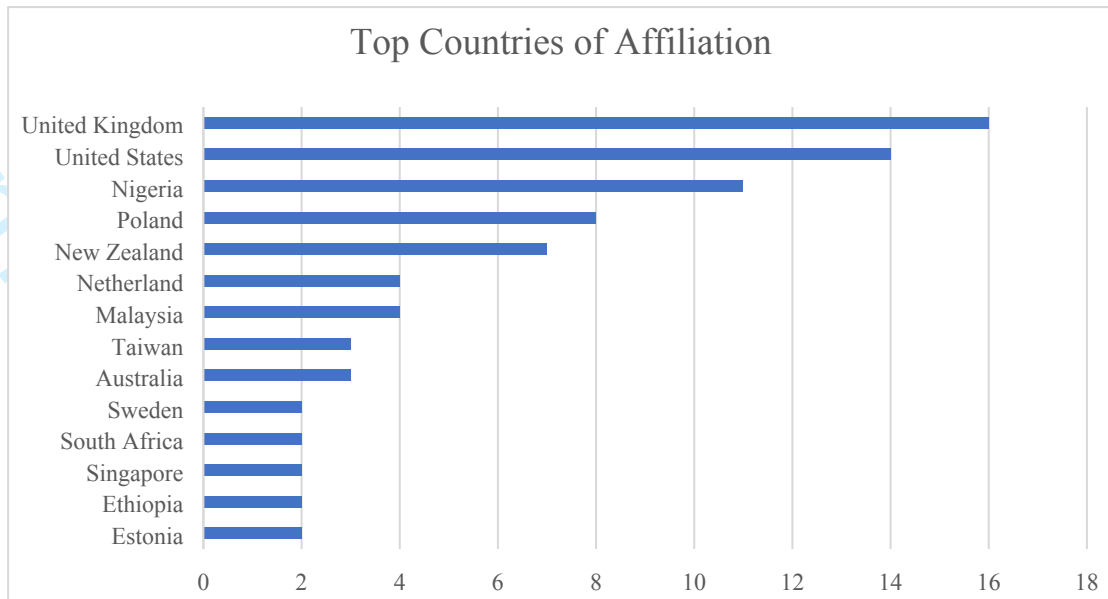


Figure 3: Top Countries of Publications

The last round of screening (i.e., assessment for eligibility) resulted in a final dataset of 42 relevant empirical papers that were included in the review. These 42 papers, published between 1997 and 2023 offered some recommendation on how to improve the quality of valuation decisions as will be discussed in Section 3.3.”

- 3. Reviewer’s comment:** In Fig 2 the relationships requiring further research flow from Collaborative Behaviour (column 1) to Non-technological approaches (column 3) but not vice-versa. Why is this a one-way flow unlike Qualitative Evaluations (column 2) which flows both ways.

Authors’ response: The figure has been updated, such that the relationship flows both ways. (Note: This is now Figure 4 on page 5 of the revised paper)

- 4. Reviewer’s comment:** It is not clear how this analysis is taking forward the findings of earlier studies especially in relation to specific issues and relationships requiring further research as outlined in Fig 2. The recommendations and conclusions are quite general in nature and would benefit from more specific examples demonstrating how valuation decision-making can be improved.

Authors’ response: Thank you for pointing this out. We have addressed this in section 4 (pages 14-16). We draw on findings from studies in other disciplines (such as auditing, which has many parallels with valuation) to provide more specific examples. See below:

Page 15: *“In auditing, research by Boone et al. (2015) found no evidence to suggest that the quality of audit opinion provided by one of the Big 4 audit firms changed as a*

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3 *result of a disciplinary measure constituted against the firm by the Public Company*
4 *Accounting Oversight Board.”*
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7 *Page 15: Research in other domains suggest that collaboration has now become a*
8 *veritable tool for making better quality decisions (Kugler et al., 2012). This is because*
9 *compared to individuals, collaborative groups have the capacity to generate*
10 *information and knowledge that are more complete (Robbins et al., 2009). Similarly,*
11 *Perry and Moffat (2004) argue that collaboration can result in an increase in the*
12 *quantity and quality of information that can be relied upon by decision makers.*
13 *However, this phenomenon of collaboration has not been properly examined in*
14 *property valuation, thereby providing opportunity for further research (Liman et al.,*
15 *2024).*
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21 *Page 15 -16: In auditing, for instance, empirical research shows that mandatory*
22 *auditor rotation can improve audit quality under certain conditions (e.g., Bowlin et*
23 *al., 2015; Cameran et al., 2016; Krishnan, 2007; Nagy, 2005). Specifically, the*
24 *implementation of audit partner (or audit firm) rotation can reduce the level of*
25 *familiarity between auditors and their clients, thereby enhancing the independence of*
26 *the auditors (Firth et al., 2012). It will be worthwhile to empirically examine how this*
27 *plays out in a property valuation context.”*
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32 **Please note, new references have been updated in the reference list (see tracked-**
33 **changes).**
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