Causes of Valuation Inaccuracy in Mortgage Lending in Ethiopia

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Abstract

This study aims to add to the scarce empirical literature on mortgage valuation by ranking the variables that make inaccurate mortgage valuations. Given the central role, valuation plays in lending, high valuation inaccuracy leads to major market distortions in real estate with potentially harmful financial system repercussions. Thus, this study is envisioned to investigate the causes of valuation inaccuracy for mortgage purpose in commercial banks in Ethiopia. To achieve this objective, the study employed a convergent parallel mixed design. Data were collected from valuers through questionnaires and interviews using purposive, snowball, and convenience sampling techniques. To investigate the impact of the factors on valuation inaccuracy, an ordinal regression model was used. The study revealed that inappropriate valuation methods, the inadequacy of the market data, and property market imperfection were the most significant predictors. However, there are moderately significant causes which include the characteristics of the property market, valuation regulatory framework, and absence of the valuation standard. Client pressure, ethics, and competence of valuers were insignificant predictors. This paper recommends that the government should establish a government agency that is independent and in charge of valuation regulation, developing legal frameworks, and intervening in the property market. Based on the framework valuers should use an appropriate valuation method. Moreover, there should be an establishment of central databases that valuers relied on.

Keywords: Valuation, inaccuracy, mortgage, banks, Ethiopia

☉1.0 INTRODUCTION

The effective operation of the real estate market in particular, and the economy in general, depends on accurate property valuation (Abidoye et al., 2021). Using property valuations individuals, private organizations, and governmental bodies make several decisions, including those involving the purchase and sale of real estate, the underwriting of mortgages, expropriation, the level of property performance, tax matters, business accounts, and the reinstatement of insurance (Isaac, 2002). The whole systems of the real estate market, and consequently the overall financial system of economies, depend greatly on mortgage valuation (Mangioni, 2012). Therefore, its accuracy is critical to provide solid foundations on which to base decisions for mortgagors and mortgagees (Effiong, 2015; Oduyemi et al., 2016). Given that credit is frequently granted based on the value of the property, it provides a guarantee for mortgagors to get financing while in the event of a loan default, it lowers the risk for mortgagees (Asres et al., 2020). Thus, valuers should provide reliable and accurate valuations to benefit both the mortgagee and the mortgagor. However, it is challenging to make a precise prediction using implicit data obtained from a flawed market. As a result, valuation should lie in the acceptable reasonable range from the true value of properties (Crosby, 2000; Millington, 1985). In developed real estate markets such as the one in the UK, case law develops the allowable error, primarily through precedents made in valuation negligence cases. According to the benchmark margin of error established in Singer and Friedlander vs John D Wood & Co 1977 - a case in UK where the judge determined that a margin of error between 10% and 15% was acceptable, it appears that a level of accuracy of between 10 and 15 percent is most commonly anticipated when it comes to court judgments.

In Ethiopia, there is no legal framework for valuation. The valuation is also not self-regulatory (Asres et al., 2020). Due to this, valuation standards that address ethical and competency problems, such as the basis of valuation, the purpose of the valuation, and the valuer's competency assessments, are lacking (Asres, 2019). Even banks do not adopt other valuation standards from other countries/regions; rather the valuation is undertaken based on institutional interest in a non-standard way. For instance, a research work by Asnakew and Amogne (2021) found that courts at different levels in the Amhara region employ different valuation methods for judgment execution. Another study by Asres et al. (2020) revealed that commercial banks in Ethiopia applied mortgage valuation depending on the individual banks' interest. In the Ethiopian valuation system, engineers are responsible for the real property valuation assignments for different purposes of valuation. This is because on the one hand engineers are assumed as the most qualified experts for property valuation

by most institutions, on the other hand, there was no valuation education in the country. It was very recently that valuation education is started in a few universities. Normally values might be worth different from the original valuation due to market distortions and negligent valuation (Źróbek et al., 2013). In Ethiopia, there are no private valuation firms and there is no registration of valuers as well. Moreover, there are no professional or regulatory bodies for the valuation. Without a framework for valuation, lack of private valuation companies, and absence of qualified valuation specialists, the possibility of inaccurate opinions of value estimates may be more than the conventional and has significant consequences. As a result, learning about the various mortgage valuation practices would be a logical place to start developing a framework and standard for property valuation in Ethiopia, where mortgage valuation inaccuracy is one and most important.

Several factors may be responsible for valuation inaccuracy from the beginning of the valuation process through the determination of the final value (Gambo & Anyakora, 2013). Empirical findings in the literature revealed various causes for valuation inaccuracy. However, in Ethiopia, there is a scarce empirical study to trace the level of valuation inaccuracy and its causes in mortgage lending. Even a recent study by Asnakew and Amogne (2021) on causes of valuation inaccuracy was for judgment execution by courts. Besides, courts or any other institutions do not document the acceptable level of inaccuracy so far. Policy-makers and other stakeholders may be unable to comprehend the nature of the problem and recommend effective solutions due to a lack of empirical evidence regarding mortgage valuation inaccuracy. In addition, the absence of adequate empirical evidence makes it difficult to select the causal variables in the Ethiopian context. Thus, in this study nine variables that are supposed to cause valuation inaccuracy in the Ethiopian property market context were selected. These variables are the characteristics of the property market, imperfection of the property market, market data inadequacy, valuers' competency, client pressure, absence of regulatory framework, inappropriate valuation method, absence of valuation standard, and ethics of valuers. Therefore, this paper endeavored to add to the body of knowledge by exploring the causes of valuation inaccuracy in mortgage lending. To achieve this objective, a convergent parallel mixed design was used. The study was based on primary data from valuers working in Ethiopian commercial banks. Valuers were selected based on convenience, snowball, and purposive sampling. Descriptive and inferential statistics were employed to analyze the data.

The rest of the paper is organized into five parts. The next section is dedicated to the literature review followed by the methodological approach the study adopts. The fourth section delivers the finding of the study which describes the data analysis of the findings. The fifth section is devoted to the discussion of the findings. The final section presents a summary of the study and puts forward the implications of this study.

2.0 LITERATURE REVIEW

2.1 Overview of Valuation Accuracy

Terms like valuation bias, errors, and variation are frequently used in valuation accuracy empirical research. Valuation bias is a general term that indicates under or over-valuation concerning the target (Yiu et al., 2006b). It refers to the circumstances where valuations are continuously and persistently overestimated or underestimated (Hutchison, 1996). On the other side, valuation error describes the discrepancy between a valuation estimate and the ensuing real selling price. It should be emphasized that systematic valuation errors that are either higher or lower than actual selling prices result in valuation bias. When valuation errors fluctuate randomly around the true value (as represented by price), they may cancel out, leaving no sign of a bias in the valuation (Addae-Dapaah, 2001). Valuation accuracy explains how the estimated value is close to the actual market price (Waldy, 1997; Yiu et al., 2006b), where the market price is considered the basis for valuation (Gambo & Anyakora, 2013; Mooya, 2016). Yet, because valuation is a representation of expert opinion, all valuations are inherently uncertain to some degree. As a result, valuers may arrive at different value judgments while evaluating the same property, which is both acceptable and right (Baum et al., 2000). While there is some uncertainty in every value estimate, it must be kept within a reliable range (Mallinson, 1994). Hence, valuation inaccuracy occurs when estimations are regularly below or above the sale price, but valuation variance occurs when value estimates are consistently above or below one another (Yiu et al., 2006b).

Valuation bias has a proclaimed effect on valuation accuracy (Klamer et al., 2017). Studies on valuation bias can be seen from two perspectives i.e., appraisal smoothing and behavioral appraisal (Yiu et al., 2006a). Appraisal smoothing is the ratio of the standard deviation of true portfolio property values to the standard deviation of appraised portfolio property values (Geltner, 1989b). It can occur at both aggregate (index, portfolio, or macro) and disaggregate (individual property or micro) levels. The former is brought on by temporal aggregation bias and the seasonality of reappraisals, whilst the latter is brought on by the assessment process and the conduct of the appraisers (Hansz, 2004). Offered lack of confidence and valuation timing as two possible explanations of the phenomenon of appraisal smoothing (Geltner, 1989a). The cause of valuation smoothing has been identified as valuers' influence from prior value estimates (Clayton et al., 2001; Diaz & Wolverton, 1998; Geltner, 1993; Hansz, 2004; Quan & Quigley, 1991). Unlike these studies, Diaz (1997) found that valuers' past value judgments did not influence them. On the other hand, Diaz and Hansz (1997) discovered that because of market ambiguity, experts in new marketplaces were influenced by anonymous expert judgments. To minimize valuation lag bias, Clayton et al. (2001) suggested commercial property managers rotate valuers, not assigning the same property to the same valuation company for a revaluation until after many years have elapsed.

Property valuation in mortgage lending should be accurate to offer trustworthy foundations for decision-making by mortgagors and mortgagees (Effiong, 2015). However, because of the real estate market imperfections, valuation accuracy in the strict sense is theoretical, suggesting that valuation should lie in the reasonable range concerning the properties' actual values (Millington, 1985). Indeed, there is consensus within the academics and professional communities about the inevitability of valuation inaccuracy. Yet, there is disagreement on the appropriate margin of error. In any event, valuers are expected to offer estimates that fall within a range of a hypothetical correct value, beyond which the estimate becomes dubious (Crosby, 2000). This idea holds that it is acceptable to assess how much a valuation deviates from the actual value of a property when determining whether a valuer used appropriate expertise and diligence in performing the

appraisal (Crosby et al., 1998). Case laws provide a standard, largely based on the precedents created in valuation negligence cases. Instead of referencing any scientific studies or standards established by the professional body, this benchmark has been accepted by the courts and the profession over time through a process of consensus (Havard, 2001). The margin of error principle used by UK courts, according to research by Crosby et al. (1998), is fundamentally faulty and lacks an empirical foundation.

The first valuation accuracy study appeared in the 1980s as a result of various occurrences involving the privatization of companies. During that time, privatized companies were sold for prices that were far higher than their value (Crosby et al., 1997). Hager and Lord (1985) performed a small survey of ten valuers who had been asked to value two properties in the UK. When compared to the benchmark of 5% they used, the range of valuations in one case was 10.6% and in the other, 18.5%, indicating a low degree of accuracy (Waldy, 1997). Using a sample of 29 properties, Brown (1986) conducted another early study on valuation accuracy and discovered a strong correlation between valuation and price, indicating that 99% of the valuations could be explained by the sale price, demonstrating the attainment of very high valuation accuracy. According to Brown et al. (1998), valuers can provide their opinion of value within the arbitrary range between 5% to 10% of market price. Parker (1998) reviewed quantitative and qualitative literature in Australia and concluded that there was a significant amount of valuation inaccuracy. Cole et al. (1986) in the US market compared the valuation of commercial property with the actual sales price and found a mean absolute inaccuracy of 7.6%. A study by Kain and Quigley (1972) in the residential property market compared the owner's valuation with that of the valuation of professional valuers, discovering a median discrepancy of 2%. A similar conclusion was relayed by Robins and West (1977) as they compared the estimated value of professional designated valuers with non-professional designated appraisers, finding more precise valuations of professional designated appraisers. The international association of assessing officers has been developing standards for ratio studies. This standard is used to evaluate the valuation accuracy for property tax purpose (IAAO, 2013). According to the report, the level of valuation for all major classes of property (including residential, commercial/industrial, and unoccupied land) should be within 10% of the statutorily required level of assessment.

Despite this, recent research from the UK and the USA revealed that a 5% to 10% range of valuation inaccuracy is considered acceptable. In Australia, the accepted level of error is between 10% and 15% even though judges have permitted up to 20% in response to valuers' expert evidence (Skitmore et al., 2007). Similar research works have also been done in Africa most of them coming from Nigeria (Komu, 2018). For instance, an effort by Nnamdi and Chukwudi (2018) in Nigeria has shown that the general perception and expectation of valuers is that margin of error should not exceed 10%. However, a study by Aliyu (2017) revealed that practically the margin of error for residential property was 16-20% in Nigeria. Another study by Ogunba and Ajayi (1998) also found a margin of error of 33.43% to 36.47% in the Lagos Metropolis. A similar study in Lagos by Ajibola (2010) got a 24.82% to 51.54% margin of error. According to a research work conducted by Gambo and Anyakora (2013), the margin of valuation error could range from 5% and to 15% depending on how the property in question is complicated. Another study by Babawale (2013) in Nigeria confirmed, the level of accuracy for a mortgage, sales, share pricing, compensation, merger, and balance sheet had 10% while for insurance purposes it was 20% indicating a high level of inaccuracy.

In developed market economies, the accuracy of valuation depends on the valuer's capacity to analyze price trends in the market for the assets that need to be valued. Yet, this has not generally been the case in underdeveloped nations (Komu, 2018). This is a result of the majority of these nations lacking the centralized property data bank required for accurately estimating property values (Abidoye & Chan, 2018). In situations where a real estate sales database is missing, valuers typically collect transactional data from various sources including newspapers, real estate agents, and online databases (Chau & Chin, 2003). This can affect the quality of valuation accuracy. Because of this, the governments of these nations have taken an effort to outline the skills necessary as well as to provide recommendations on valuation methods, including the usage of value rates that must be prescribed, reporting practices, and certification (Komu, 2018). This suggests that valuations in developed markets, where information is easy to come by, can be more accurate, but valuations in emerging markets, where information is more difficult to come by, can be more uncertain (FAO, 2017). This was supported by a comparative study conducted in Nigeria and the UK by Effiong (2015) confirmed this by indicating the existence of a high level of valuation inaccuracy in Nigeria as compared to the UK.

Inaccurate valuation might take the form of either an overvaluation or an undervaluation (Mallinson & French, 2000). Overvaluation increases credit risk, exposes mortgagees to financial loss, and prompts them to lower the value of forced sales to obtain additional loss insurance (Gwin & Maxam, 2002). Undervaluation, on the other hand, makes it harder for borrowers to obtain suitable loans, overprotects mortgagees' money at the expense of borrowers' demands, and compels borrowers to change mortgagees' policies (Oyedeji & Sodiya, 2016). The potential consequences of failing to address valuation inaccuracy are generally severe, including harm to the activity of both the local real estate market and property records, a decline in the valuer's credibility, and a reduction in the significance of valuations (Parker, 1998). Also, it tends to erode investors' trust in how the real estate market functions, which is harmful to the market's ability to grow healthily. Furthermore, it might cause investors and portfolio managers to make poor choices, which might cost real estate investors and financial institutions a significant financial loss (Babawale & Ajayi, 2011).

2.2 Causes of Valuation Inaccuracy

The valuation process may be inaccurate from the beginning until the final value is determined for a variety of reasons. (Gambo & Anyakora, 2013). An earlier study by Gallimore (1996) discovered that an individual valuer's professional judgment is a significant determinant of valuation. According to Millington (1985), factors of valuation inaccuracy include the fundamental characteristics of the property as an asset class, the volatility of the real estate market, the lack of a centralized record of sales, the nature of buildings, and the confidentiality of information. Gambo and Anyakora (2013) note that valuation methodology, valuation standards, and processes are significant determinants of inaccuracy in mortgage valuation in Asia. In a study conducted in the UK, Havard (2001) identified the following factors as causes of valuation inaccuracy: the valuer's experience, survey errors, knowledge of valuers, selection, interpretation, and use of comparable evidence, inadequate depth of investigation, procedural errors, valuation method, and client pressure or

influence. The primary contributing factor to inaccurate valuations in the UK according to Baum et al. (2000) is the influence of valuers and clients.

According to Adegoke (2016), the reasons for valuation inaccuracy in the Nigerian market include valuers' skill, judgment, and experience, relevant data, valuation methods, client pressure, valuation assumptions, type of property, the integrity of valuers, the nature of the commercial property market and the efficacy of the regulatory framework. Another study on factors influencing valuation inaccuracy in the Nigerian residential market by Aliyu (2017) discovered that the key determinants of mortgage valuation inaccuracy are valuation methodology, the lack of data, client pressure, an effective regulatory framework, the absence of national valuation standards, skill, experience, and valuers' judgment. A study by Ayedun et al. (2012) found a lack of market data, valuation approach, lack of regulation, lack of standards, professional negligence, the unpredictability of the real estate market, client influence, and lack of experience among valuers in Nigeria.

The lack of standards, incomplete understanding of the real estate market, incomplete market data, a lack of regulatory framework, inadequate training of valuers, methods, and bases for valuation used, client influence, incorrect cost per square meter assumptions, and a lack of professional experience were all identified as contributing factors to inaccurate mortgage valuations in Effiong's (2015) comparative study conducted in Nigeria and the UK. Ekenta and Iroham (2014) and Nwuba et al. (2015) argued that valuation inaccuracy is a result of a lack of adequate information about the subject property, client influence, neglect of valuation guidelines by valuers, knowledge, and experience of valuers. A study by Ajibola (2010) revealed lack of market data, the use of obsolete valuation techniques, and client influence are the source of valuation inaccuracy in Nigeria. Another study by Oduyemi et al. (2016) showed that valuation methodology, the problem of relevant data, client pressure, the effectiveness of regulatory framework, lack of valuation standard, university curriculum, the integrity of the valuer, state of the property market, types of property, skill, experience, and judgment of valuer, valuation assumptions are an important determinant for valuation inaccuracy in the Nigerian property market.

According to Babawale (2013), the main causes of inaccuracy include an ineffective regulatory framework, the volume of valuation jobs valuers take on, a lack of market data, a lack of understanding of a market and poor data analysis, client influence, poor knowledge of valuation theory and skill, inappropriate methodology, poor academic background for valuers, ethics of valuation firms, and behavior of valuers. The sales comparison (market) approach, the investment (or income) approach, and the cost approach are the three basic valuation approaches that are acknowledged in the valuation literature (IVSC, 2021; TEGoVA, 2020). Theoretically, the three approaches can support or indicate market value. The cost approach, however, is often seen as being inappropriate for a mortgage because it is unable to capture the fundamentals of investment uncertainty for mortgages (Aluko, 2007; Aro-Gordon, 2015). Yet, it frequently gets used when there are not any comparable property deals on the market or when it is challenging to get a specific income stream for the subject property (IVSC, 2021). As a result, the cost approach is mostly employed to verify that the value calculated using another valuation approach is appropriate (Aluko, 2007; IVSC, 2021). This is because the cost approach is based on the understanding that the estimated value of the property is naturally reflected in the cost of producing the property (Miller & Geltner, 2005).

Commercial banks in Ethiopia are doing mortgage valuation without valuation frameworks. Furthermore, a national independent agency that provides a clear policy for mortgage valuation is absent. Therefore, banks undertake mortgage valuation depending on administrative practices that often change quickly and without public notice (Asres et al., 2020). Without a definite legislative framework and a regulatory body for valuations, the possibility of inaccurate opinions of value estimates may be more than the conventional and has significant consequences. Even the causes of inaccuracy are not known. Even though a recent contribution by Asnakew and Amogne (2021) found that the lack of market data, the use of inappropriate valuation methods, a lack of valuation standards, the use of outdated data, the bases adopted, the ethics of the valuer, and biases are the causes of valuation inaccuracy, it is for judgment execution by courts. Since the valuation in Ethiopia is not standardized, some of the variables that significantly affect inaccuracy for judgment execution may not be significant for mortgage valuation cases and there is no other empirical finding to trace. This absence of adequate empirical evidence makes it difficult to compare the results of this study and select the causal variables. Thus, this study selected potential variables supposed to cause valuation inaccuracy in the Ethiopian property market. The selected variables were also significant in valuation inaccuracy in the literature. The factors that have been chosen are client pressure, the valuer's ethics, the inadequacy of the valuation methodology, market data inadequacy, the imperfection of the property market, the absence of a valuation standard, the competence of the valuer, the absence of the valuation regulatory framework, and the characteristics of the property market.

2.3 Literature Gap

The reviewed literature shows that there are several variables responsible for valuation inaccuracy which depends on the real estate market context of nations and the purpose of valuation. Countries have different but related property market contexts. Thus, the variables which significantly affect valuation inaccuracy in one case may be less significant in another. The Ethiopian property market literature is scant about property valuation and the determinants of its inaccuracy. Very little is known about mortgage valuation inaccuracy. Although mortgage valuation is critical in the banking business, it is unexpected that there are no well-known empirical studies on mortgage valuation inaccuracy. Lack of empirical evidence on mortgage valuation accuracy and the determinants may prevent government decision-makers and other stakeholders from comprehending the nature of the issue and prescribing suitable treatments. As a result, this study aimed to advance knowledge by exploring significant variables that affect mortgage valuation inaccuracy.

Table 1 Summary of previous research regarding the causes of valuation inaccuracy

S/N	Author/s	Determinant Factors
1	Asnakew and Amogne (2021)	Market data inadequacy, use of inappropriate valuation methods, use of outdated data, lack of valuation standard, bases adopted and biases, and violation of ethical conduct
2	Abidoye et al. (2021)	Experience of valuers, the selection, interpretation, and use of comparable evidence in property valuation exercise, and the complexity of the subject property in terms of design, age, material specification, and state of repairs
3	Abidoye and Chan (2018)	Valuation methods
4	Aliyu et al. (2018)	Data inadequacy, the imperfection of the property market, and clients' pressure
5	Aliyu (2017)	Valuation method, market data inadequacy, client pressure, regulatory framework, absence of valuation standards, skill, experience, and judgment of valuers, ethics of valuers, characteristics of the property market, valuation assumptions, and familiarity with the property market.
6	Adegoke (2016); Gallimore (1996)	Valuers' skill, judgment, and experience, the problem of relevant data, valuation methods, client pressure, valuation assumptions, characteristics of the property market, the integrity of individual valuer, nature of the property market, the effectiveness of the regulatory framework
7	Oduyemi et al. (2016)	Valuation method, the problem of relevant data, client pressure, the effectiveness of regulatory framework, lack of valuation standard, university curriculum, errors, the integrity of the individual surveyor, state of the property market, types of property, skill, experience, and judgment of valuer, valuation assumptions
8	Effiong (2015)	Lack of standards, market data inadequacy, lack of regulatory framework, methods of valuation adopted, client's influence, inadequate training of valuers, imperfect knowledge of the property market, characteristics of the property, and experience of valuers
9	Ekenta and Iroham (2014); Nwuba et al. (2015)	Market data inadequacy, clients' influence, ethics of valuers', valuers' knowledge and experience
10	Ayuthaya and Swierczek (2014)	Valuation standards, valuation method, and competence of valuers
11	Babawale (2013)	Ineffectiveness of the regulatory framework, experience, and skill of valuers, the paucity of market data, the skill of valuers, clients' influence, obsolete knowledge of valuation theory, inappropriate valuation method, and poor academic background of valuers
12	Ayedun et al. (2012)	Market data inadequacy, use of outdated valuation methods, lack of valuation regulation, lack of valuation standard, ethics of valuers, imperfection of the property market, client influence, and lack of experience on the part of the valuers
13	Ajibola (2010)	Market data inadequacy, use of outdated valuation methods, and clients' influence
14	Havard (2001)	Experience of the valuers, market data inadequacy, the difference of opinion between valuers, errors in the survey, insufficient depth of investigation, errors in a procedure, client pressure, and the valuation method
15	Baum et al. (2000)	Experience of valuers and clients' influence
16	Millington (1985)	Characteristics of property, the imperfect nature of the property market, lack of database, building characteristics, and confidentiality of information

⭘**3.0 METHODOLOGY**

3.1 Research Design

In this study, a convergent parallel mixed design was used. In this design, the researcher gathers quantitative and qualitative data simultaneously, analyzes them, and then compares the findings to see if they support or contradict one another. (Creswell, 2014). This design is important to develop a complete understanding of mortgage valuation inaccuracy caused by converging quantitative and qualitative data and comparing the two databases (Creswell, 2014). Quantitative data were utilized to generalize a population, while qualitative data were gathered to acquire a thorough knowledge of valuation inaccuracy and its causes.
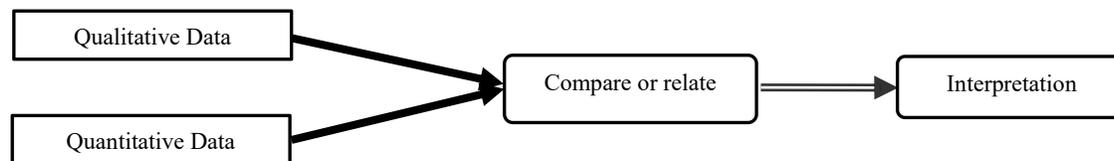
Figure 1 Convergent parallel mixed research design
(Source: Creswell, 2014, p. 270)

The study used primary and secondary data sources in order to achieve its goals. Structured questionnaires and structured and semi-structured interviews were used to collect primary data. while secondary information was gathered from books, journals, and other published sources (reports, proclamations, regulations, directives, standards, and legislations).

3.2 Sample Size and Sampling Techniques

The target population of the study was all 17 banks in Ethiopia that provide mortgage credit to households and firms along with other banking services at the time of data collection in 2020. All commercial banks in Ethiopia have head offices in Addis Ababa city where most valuers are working at head offices. Thus, the data collection was held in Addis Ababa. According to the information from each

commercial bank's head office, at the time of data collection, 241 valuers were working in banks across the country. From the total valuers, using a 95% confidence level, and 5% confidence interval, 150 sample valuers were selected using Yamane's (1967) formula (refer to Figure 2). All commercial banks in Ethiopia employed engineers for the valuation of properties at the head office. In addition, some banks employed additional engineers at a few district offices in large cities, but the number of valuers in district offices is small. In branch offices, when there is a demand for valuation, the branch manager requests valuers from head offices. Convenience and snowball sampling methods were used to choose the respondent valuers.

　　　Due to the absence of a valid sample frame, these sampling techniques were used, i.e. it was impossible to obtain a sampling frame for valuers. This is due to valuers not being accessible in a single document and not being accessible at the office. Thus, valuers were selected by going to their office in person. From those presented in the office, questions were given by asking about their willingness. Sometimes, the valuation department heads of banks forwarded questions to those valuers who are appropriate for answering questions. Therefore, the chosen sample techniques were the most practical and appropriate ways to obtain the necessary data for the investigation (Hair et al., 2011). On the other hand, using the purposive sampling technique, four skilled key informant valuers were chosen from four banks (Commercial Bank of Ethiopia, Awash Bank, Abay Bank, and Dashen Bank).

$$n = \frac{N}{1 + N(e)2}$$

Figure 2 Yamane's (1967) formula

where 'n' is the sample size, 'N' is the population size, and 'e' is the level of precision.

3.3 Model Selection

An ordinal logistic regression model was employed to find significant variables that affect valuation inaccuracy using the SPSS package. The ordinal regression models were built using nine explanatory variables that have been supposed to influence mortgage valuation inaccuracy in the Ethiopian market context (see Figure 3). The outcome variable valuation inaccuracy and all of the independent variables are measured on an ordered, categorical, and five-point Likert scale items which consist of 'strongly agree', 'agree', 'neural', 'disagree, and 'strongly disagree'.
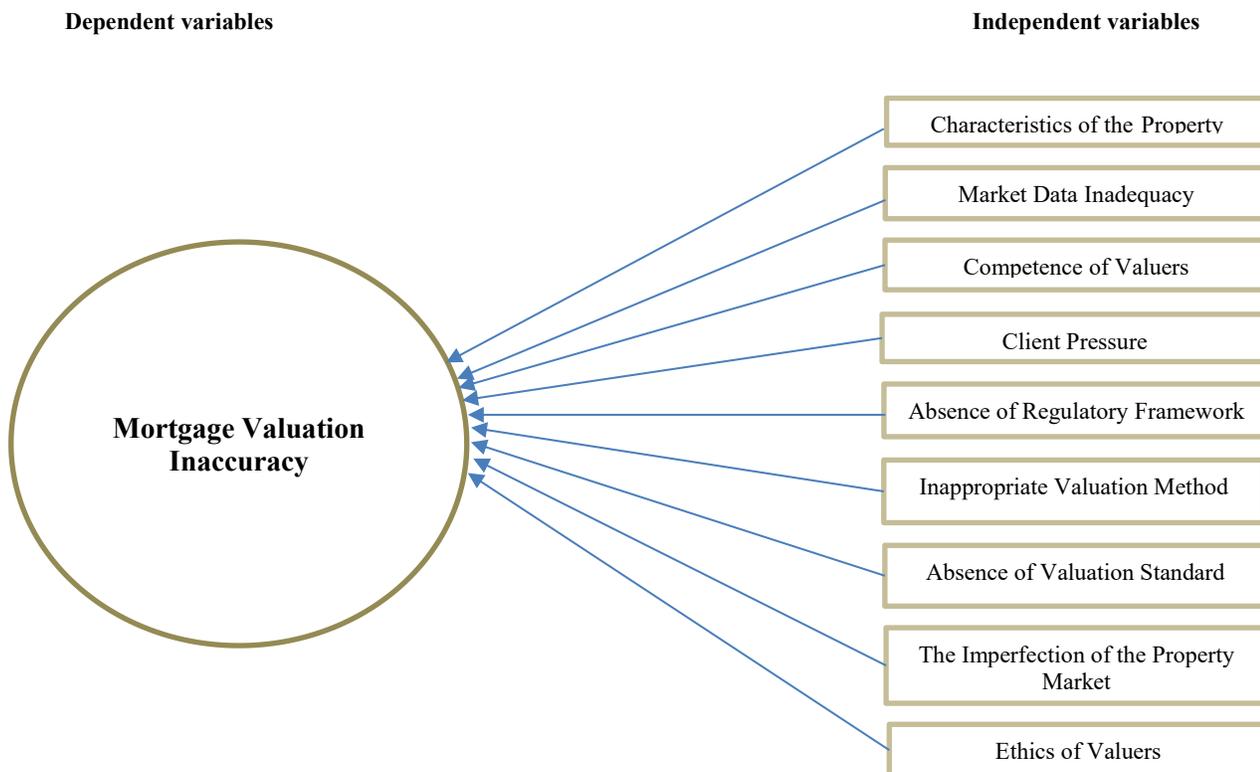
Dependent variables　　　　　　　　　　　　　　　**Independent variables**

Figure 3 The model for valuation inaccuracy

The ordinal logistic regression model is expressed as,

$$Y = Ln\left(\frac{F}{1-F}\right) = \beta 0 + \beta 1 X1 + \beta 2 X2 + \beta 3 X3 + \beta 4 x4 + \beta 5 X5 + \beta 6 X6 + \beta 7 X7 + \beta 8 X8 + \beta 9 x9 + E$$

where Y=Valuation inaccuracy,

X_1=Characteristics of the property,
X_2=Market data inadequacy,
X_3=Competence of valuers,
X_4=Client pressure,
X_5=Absence of regulatory framework,
X_6=Inappropriate valuation method,
X_7=Absence of valuation standard,
X_8=Imperfection of the property market,
X_9=Ethics of valuers, and
E=Error term

3.3.1 Ordinal Logistic Regression Model Assumptions

To validate this model, four assumptions must be met. They are: (1) dependent variables should be measured at the ordinal level; (2) the treatment of independent variables must be either continuous or categorical; (3) no multicollinearity; (4) each independent variable has an identical effect at each cumulative split of the ordinal dependent variable. The collected data satisfies these assumptions using the SPSS package.

There are five widely used link functions in the ordinal regression model, which alter the cumulative probabilities and enable model estimation (Smith et al., 2019). According to Norušis (2011), the distribution of the response variable should be taken into consideration while selecting the link function. She recommends using the Cauchit link function for distributions with many extreme values, the logit link function for outcomes with a latent, underlying normal distribution, the negative log-log and complementary log-log link functions for positively and negatively skewed outcomes, respectively, and the logit link function for outcomes with a uniformly distributed ordinal outcome (see Table 2).

Table 2 The link function and its typical application
(Source: Norušis, 2011)

Function	Form	Typical application
Logit	$Log\left(\frac{X}{1-X}\right)$	Evenly distributed categories
Probit	$F^{-1}(X)$	The variable is normally distributed
Complementary log-log	Log (-log(1-x))	Higher categories are more likely
Negative log-log	-log (-log(x))	Lower categories are more likely
Cauchit (inverse Cauchy)	tan (π(x-0.5))	The variable has many extreme values

The histogram in Figure 4 shows the distribution of opinions of valuers towards the existence of valuation inaccuracy. Most of the cases are in the upper categories with negatively skewed outcomes. Thus, the complementary log-log link function is chosen since it concentrates on the higher outcome categories.
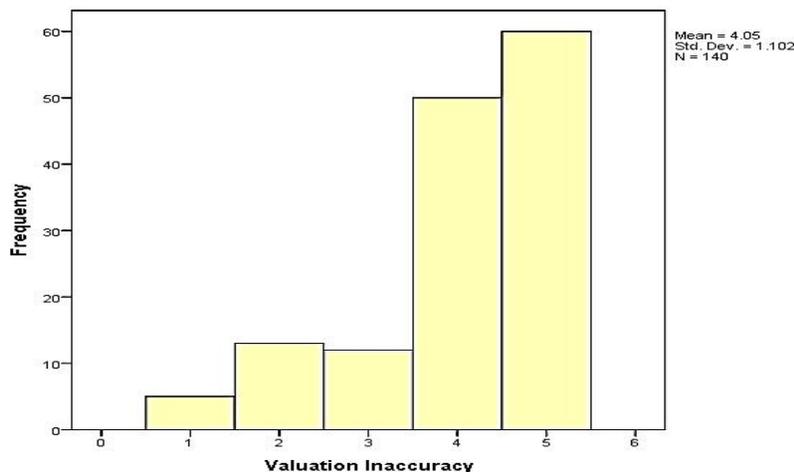

Figure 4 Responses of valuers about mortgage valuation inaccuracy

○4.0 FINDINGS

This section deals with the empirical findings on the causes of inaccurate valuation in mortgage lending in Ethiopia. The result presents a range of responses, views, and perceptions about the causes of valuation inaccuracy. 140 valuers out of a total of 150 sample respondents correctly filled out and returned the questionnaire, making it valid for data analysis. This makes the response rate stands at 93 percent. Using Cronbach's alpha coefficient test, the validity and reliability of the research's findings were confirmed. As a result, Cronbach's alpha values for all the variables revealed that they were all statistically significant at 0.780, indicating that the items are internally consistent (see Taber, 2018).

4.1 General Characteristics of the Respondents

Table 3 presents the age composition of respondents. By and large, 46% are between 31 and 40 years, 43% are between 20 and 30 years and 9% are between 41 and 50 years and the remaining 2% are above 50 years. Work experience has a positive effect on job performance. In connection to this, most valuers had experience in other organizations before they are hired as a valuer. Accordingly, 63% have less than 5 years of work experience. However, 13% of the respondent valuers have no practical work experience in other organizations; rather they are employed in commercial banks for the first time (see Tables 4 and 5). The key informant valuers also confirmed that banks request some years of work experience to hire engineers as a valuer. The key informant from the commercial bank of Ethiopia described the issue in the following way, "*...most commonly his bank in all districts hires fresh university graduates and provides on-job training by senior staff while sometimes 2 to 5 years of practical work experience in the engineering field is required*". This shows that there is no fixed rule in employing valuers instead based on the seasonal demands of the banks. Property valuers having less experience and being young may increase the probability of client pressure as suggested by Małkowska et al. (2019).

Table 3 Age composition of the respondents
(Source: Field survey)

Age (in years)	Frequency	Percentage
31-40	64	46
41-50	12	9
>50	3	2

Table 4 Work experience of respondents as a valuer
(Source: Field survey)

Experience (in years)	Frequency	Percentage
1-2	46	33
3-5	55	39
6-10	28	20
>10	11	8

Table 5 Work experience of respondents
(Source: Field survey)

Experience (in years)	Frequency	Percentage
No experience at all	18	13
1-2	36	26
3-5	52	37
6-10	22	15
>10	12	9

Next, Table 6 presents the educational background of the respondents, of which 79% are BSc degree holders, 19% are MSc degree holders and 2% are PhD holders. Of the respondent valuers, 83% are civil engineers, 16% are construction engineers and others are architects, which constitute less than 2%. This shows that banks hired predominantly BSc civil engineers (see Table 7). The level of degree valuers has may be acceptable and adequate for undertaking property valuation but the relevancy of the qualification is questionable. The primary reason for considering engineers as the appropriate to estimate mortgaged properties is that banks assume engineers as the most qualified to value them as confirmed by key informant valuers. Concerning this, some banks including Abay Bank, have named the team responsible for the valuation engineering department/team.

Table 6 Educational background of the respondents
(Source: Field survey)

Background	Frequency	Percentage
BA/BSc	111	79
MSc/MA	27	19
PhD	2	2

Table 7 Qualification of valuers
(Source: Field survey)

Qualification	Frequency	Percentage
Civil Engineering	116	83
Construction Engineering	23	16
Architecture	1	1

4.2 Ordinal Logistic Regression Model

4.2.1 Model Fitting Information

To forecast the relationship between the independent factors and the ordinal outcome (valuation inaccuracy), an ordinal logistic regression model was utilized. The model entails several decisions. Before analyzing the effect of each predictor on the outcome variable, first, it is logical to see whether the model improves our ability to predict the outcome. To achieve this, the final model and the baseline are compared. The model fitting information in Table 8 gives the -2 log-likelihood (-2LL) values for the baseline (354.557) and the final model (97.601). The statistically significant chi-square statistic ($p < 0.05$) indicates that the final model gives a significant improvement over the baseline intercept-only model. This tells us that the model gives better predictions than if we just guessed based on the marginal probabilities for the outcome categories.

Table 8 Model fitting information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept only	354.557			
Final	97.601	256.955	9	0.000

*Link function: Complementary log-log

4.2.2 The Goodness-of-Fit

Table 9 contains Pearson's Chi-square statistic for the model and another Chi-square statistic based on deviance. These statistics are intended to test whether the observed data are inconsistent with the fitted model. According to the goodness of fit statistical result, we failed to reject the null hypothesis ($p > 0.05$). Then, we conclude that the data and the model predictions are similar and that the model fits very well.

Table 9 Goodness of fit

	Chi-Square	df	Sig.
Pearson	370.964	503	1.000
Deviance	248.729	503	1.000

*Link function: Complementary log-log

4.2.3 Pseudo R-Square

To compare the LL of the estimated model and the LL of the null model, pseudo-R^2 is used (Mbachu et al., 2012). Several pseudo-R^2 values have been proposed using this model which include Cox and Snell (1989), Cragg and Uhler (1970), Maddala (1983), Nagelkerke (1991), McFadden (1974), and Tjur (2009). However, Cox and Snell, Nagelkerke, and McFadden are most commonly applied. The result from these statistics shows that the independent variables explain about 84%, 91%, and 71.6% of the variations of the dependent variable respectively if we consider Cox and Snell, Nagelkerke, and McFadden statistics respectively. These measures revealed that the fitting model is good (see Table 10).

Table 10 Pseudo R-Square

Cox and Snell	0.840
Nagelkerke	0.911
McFadden	0.716

*Link function: Complementary log-log

4.3 Ordinal Logistic Regression Model Estimation Result

Table 11 summarizes the parameter estimates for each predictor's impact on the outcome variable. The sign of the coefficients for covariates can provide a significant understanding of the impacts of the model's predictors. When a coefficient is positive, it means that there is a direct correlation between the predictors and the outcomes, and vice versa. An increasing value of a predictor with a positive coefficient corresponds to a larger likelihood of falling into one of the categories with "higher" cumulative outcomes.

$$Y = Ln\left(\frac{F}{1-F}\right) = 0.364 + 0.132X1 + 0.694X2 + 0.103X3 + 0.015x4 + 0.142X5 + 0.720X6 + 0.070X7 + 0.610X8 + 0.157x9 + E$$

where Y=Valuation inaccuracy,
X_1=Characteristics of the property,
X_2=Market data inadequacy,
X_3=Competence of valuers,
X_4=Client pressure,
X_5=Absence of regulatory framework,
X_6=Inappropriate valuation method,
X_7=Absence of valuation standard,
X_8=Imperfection of the property market,
X_9=Ethics of valuers, and
E=Error term

The result revealed that client pressure, the competence of the valuers, and the ethics of valuers have no significant effect on mortgage valuation inaccuracy at the 5% α level, which means we failed to reject the null hypothesis which states that the predictor does not influence the outcome variable significantly. This is not to say that those factors have no impact, just that their impact on valuation inaccuracy is less significant. On the other hand, imperfection of the property market, inappropriate valuation method, market data inadequacy, nature of the property market, absence of regulatory framework, and absence of valuation standard are statistically significant at 5% α level, which in this case reject the null hypothesis, which states that the predictors do not influence the outcome variable.

Table 11 Parameter estimates

Variables	Regression coefficients	Std. Error	df	p-value
Ethics of valuers	0.157	0.105	1	0.135
Characteristics of the property market	0.132	0.117	1	0.000
Market data inadequacy	0.694	0.143	1	0.000
Competence of valuer	0.103	0.110	1	0.350
Client Pressure	0.015	0.118	1	0.899
Absence of valuation regulatory framework	0.142	0.143	1	0.000
Absence of valuation standard	0.070	0.134	1	0.000
Imperfection of the property market	0.610	0.152	1	0.000
Inappropriate valuation method	0.724	0.140	1	0.000

*Link function: Complementary log-log

❍5.0 DISCUSSION

The survey result revealed that the order of importance of the causal variables is to some extent different from the literature. For instance, imperfection of the property market is among the less significant variables causing valuation inaccuracy. On the other hand, client pressure is the most significant variable in many empirical studies. However, this study discovered that client pressure is the least important factor while imperfection of the property market is among the most significant factors causing mortgage valuation inaccuracy. This is because of the difference in the property market context and the difference in valuation practices among countries. The detailed discussion on the effects of each predictor to the outcome variable is explained in the following paragraphs.

5.1 Significant Predictors (β >0.5, P<0.05)

5.1.1 Inappropriate Valuation Method (β=0.724)

When the probability of valuation method inappropriateness increases by 1%, the possibility of mortgage valuation inaccuracy increases by 72.4%. For valuation to be reliable and appropriate, valuation methodology is important (Baum & Crosby, 1988). The use of the three conventional valuation methodologies depends on the selection of the proper basis of value, the assumptions behind the basis of value, the

state of the market, the objectives of the valuation, and the availability of trustworthy information (Aro-Gordon, 2015; IVSC, 2021). Nonetheless, independent of the nature and type of properties, commercial banks in Ethiopia primarily use the cost approaches of valuation (Asres et al., 2020).

Key informant valuers also described that they carry out mortgage valuation using the cost approach without taking the type and character of properties into account. One valuer from the Dashen Bank commented as follows, "*Our valuation manual states that either one of the typical approaches can be used to value the collateral depending on the nature of the property and the information we get. However, as far as I am in this position, other methods of valuation have not been used*". Normally cost approach fails to accurately reflect a mortgaged property's marketability. Contrarily, this method is generally applied to assets where there is no evidence of comparable properties, sales, or rental transactions but there is information on current building cost rates. However, commercial banks persist with the cost approach even though there is a possibility of getting income and expense data. Moreover, renting is the primary method of housing tenancy in Ethiopian cities (Goodfellow, 2015). This suggests that there is a chance to obtain pertinent information from the rental market in order to perform an accurate estimate. Furthermore, the sources of depreciation from functional and economic obsolescence are not taken into account when using the cost approach, valuers failed to use any accepted methods for estimating the value of land/cite and valuers failed to take into account the sources of data that are readily available for building and cite estimation (Asres et al., 2020). The outcome is that the value obtained in this way does not provide an accurate value.

This contradicts the suggestion by Aluko (2007), which states that the market and income approaches are appropriate for mortgage valuation. In cases where other approaches are appropriate, the value obtained using; the cost approach is far from the correct value. In this regard, Baffour-Awuah and Gyamfi-Yeboah (2017) explained that when an unsuitable valuation approach is applied, there may be a high level of valuation inaccuracy. This enables valuers to apply the income approach. Thus, the inappropriateness of the valuation method is the most significant cause of valuation inaccuracy is logical. The result is also similar to prior studies which include Asnakew and Amogne (2021), Abidoye and Chan (2018), Aliyu (2017), Adegoke (2016), Effiong (2015), Ayuthaya and Swierczek (2014), Babawale (2013), Ajibola (2010) and Havard (2001).

5.1.2 Market Data Inadequacy (β =0.694)

When the probability of market data inadequacy increases by 1%, the possibility of valuation inaccuracy is increased by 69.4%. The market's information affects a property's value (Kucharska-Stasiak, 2013). In this regard, the property market in Ethiopia is sedentary and it is difficult to get adequate information about the property to be valued. Regarding this, a report by the Ministry of Urban Development and Housing of Ethiopia indicates that the property market in Ethiopia is not well developed, and reliable, complete, and up-to-date information is currently absent (MoUDH, 2019). In addition, in Ethiopia, there is no centralized and organized property data that valuers relied on. Even valuers do not use the available published building cost rates and unit price of land from municipalities and the Central Statistical Authority.

Additionally, as the lease price of vacant land is determined by competitive auction sales as per article 7 sub-article 2 of the lease proclamation, the current lease price can be considered a reasonable value (FDRE, 2011). However, banks do not consider it as a rational value of vacant land. The practice shows that valuers in banks do not consider even the existing important information for the valuation assignment. One of the key informants discloses how the valuers of banks denied the importance of data by saying, "*In the valuation of properties, we do not worry about whether we get relevant data or not, rather we measure plot size, area, and other property characteristics to get building estimate and land value, to determine the value of the properties using the cost approach*". He added that it is the guideline prepared by his bank that restricts the valuers not to apply other approaches of valuation. To him, it is obvious that there is a data shortage, but for some properties, particularly commercial properties, there is a possibility of getting appropriate data. In such cases, appropriate valuation method could have been employed. Therefore, these practices are a good justification for the market data inadequacy as an important predictor for valuation inaccuracy. Regarding prior research, the present finding is in agreement with Asnakew and Amogne (2021), Aliyu et al. (2018), Aliyu (2017), Adegoke (2016), Effiong (2015), Nwuba et al. (2015), Babawale (2013), Ajibola (2010), Ayedun et al. (2012), Millington (1985) and Havard (2001).

5.1.3 The Imperfection of the Property Market (β=0.610)

As the probability of property market imperfection is increased by 1% the possibility of valuation inaccuracy is increased by 61%. The property market in Ethiopia is typically imperfect and this has given a rise in valuation inaccuracy. Real estate has little or no transaction-based pricing, in contrast to stocks and bonds, which are measured in terms of investment performance using actual transaction prices that are publicly available. As a result, valuations must be used to approximate actual selling prices when determining how well real estate investments perform (Ayedun et al., 2012). The value of mortgage loans is not explained by market price, according to key informants, because of the extensive role that brokers play in the real estate market. This indicates that in the Ethiopian mortgage valuation context, the selling price is not a good proxy of mortgage lending value. This insight makes it evident that one of the key predictors of valuation inaccuracy is the imperfection of the real estate market. Prior empirical findings including Ayedun et al. (2012), Aliyu et al. (2018), and Millington (1985) support the current outcome.

5.2 Moderately Significant Predictors (β <0.5, P<0.05)

5.2.1 Absence of Valuation Regulatory Framework (β=0.142)

If the possibility of undertaking valuation without a legal framework increases by 1%, the probability of valuation inaccuracy will increase by 14.2%. Commonly, countries may have either a clear legal framework for valuation or the valuation is self-regulating (EMF, 2009). Without a valuation regulatory framework or professional associations, the existence of valuation inaccuracy is high. This is because, without a regulatory framework, valuers may value properties depending on their needs or clients' interests. In Ethiopia, the valuation profession is not self-regulated and there is no valuation regulatory framework. The National Bank of Ethiopia (NBE), which has the authority to provide licenses, monitor, and control the activities of commercial banks, does not have a clearly defined policy regarding mortgage valuation. It just exhorts banks to develop valuation policies without providing any standards or procedures (NBE, 2010). Key informants confirmed that their banks have been undertaking the valuation without a legal framework and the profession is not self-regulated. They rather relied on their guideline that is not disclosed to the public or even to the client. As a result, valuers undertake the valuation without a theoretical foundation based on the banks' needs. Consequently, it is evident that the lack of a regulatory framework affects the outcome of the valuation. This result conforms with Aliyu (2017), Adegoke (2016), Effiong (2015), Babawale (2013), and Ayedun et al. (2012).

5.2.2 Characteristics of the Property Market (β=0.132)

If the probability of knowing the property market is increased by 1%, the possibility of inaccuracy is increased by 13.2%. The real property market in Ethiopia is opaque (Jones Lang LaSalle, 2022). Thus, acquiring adequate information about the market is difficult. Thus, it is convincing that it affects the value. Prior studies including Aliyu (2017), Adegoke (2016), Effiong (2015), and Ayedun et al. (2012) also support this result.

5.2.3 Absence of Valuation Standard (β=0.070)

If the possibility of not using the valuation standard is increased by 1%, the probability of valuation inaccuracy will increase by 7%. Valuation for different purposes is carried out, using the national valuation standard if any, or using the IVS and using valuation standards improves valuation accuracy (TEGoVA, 2020). In Ethiopia let alone the detailed rule-based standards, the principled approach to valuation is absent (Asres et al., 2020). Four of the key informants argue that their banks do not follow valuation standards, rather banks relied on the valuation guideline prepared by the banks themselves. It indicates that the valuation in Ethiopia is undertaken without valuation standards. Therefore, the result supports this argument, and empirical studies including Asnakew and Amogne (2021), Aliyu (2017), Adegoke (2016), Effiong (2015), and Ayuthaya and Swierczek (2014) conform with this result.

5.3 Non-Significant Predictors (P>0.05)

5.3.1 Client Pressure

Despite client pressure being the most significant variable in earlier empirical findings in the literature, in this study its effects is minimal. According to the response from key informants, all banks use internal valuers for all valuation assignments. Since internal valuers are supposed to work to the advantage of their bank, the possibility of client pressure may be minimal in this case (Baffour-Awuah & Gyamfi-Yeboah, 2017). The existence of the valuation maker-checker system adopted in commercial banks may also minimize the level of client influence since the valuation done by the valuation maker is checked by the valuation checker (Asres et al., 2020).

5.3.2 Competence of Valuers

The competence of valuers is one of the significant variables that affect valuation inaccuracy in most prior studies. However, this is not the case in mortgage valuation practice in Ethiopia. This is because valuers in commercial banks in Ethiopia do not have discretion in selecting the appropriate methods of valuation and other relevant rates, they rather only have the decision to choose the cost rates and unit price rates of land from the range of rates listed in the manual (Asres et al., 2020). One key informant valuer explained the issue in the following way. "*The mortgage valuation in commercial banks including his bank is exclusively relied on the valuation guideline of banks. Thus, valuers do not have discretion in selecting the appropriate approaches of valuation and other relevant rates. They only have the decision to choose the cost rates of buildings and unit price rates of land from the range of rates listed in the valuation guideline*". Thus, the competence of the valuer may not significantly affect the inaccuracy. This indicates that valuers do not have the professional liberty to use their competence.

5.3.3 Ethics of the Valuer

This result contradicts prior studies. According to key informants, valuers are permanent employees of the banks (internal valuers); they are supposed to work to the advantage of their bank. Due to this, valuers could base their valuation views on their clients' expectations. Moreover, banks in Ethiopia assigned different roles to valuers, i.e. some valuers are valuation makers and others are valuation checkers. The primary valuation must be completed by the valuation maker, and verification must be done by the valuation checker. This system may also minimize the level of client influence since the valuation done by the valuation maker is checked by the valuation checker. This

system may force valuers to be based on the principles. In other prior studies, such a system may not exist and thus ethics may be a significant predictor.

⭕6.0 CONCLUSION

The study revealed that inappropriate valuation methods, market data inadequacy, and imperfection of the property market are the most significant predictors that influence mortgage valuation inaccuracy. However, there are also other less significant predictors which include the absence of a valuation regulatory framework, characteristics of the property market, and the absence of valuation standard. Other variables which include the competence of the valuer, client pressure, and ethics of valuers are not significant in influencing valuation inaccuracy.

To improve the context of mortgage valuation inaccuracy, this paper suggests that the government should establish an independent valuation regulatory institution responsible for regulating mortgage valuation activities and property market intervention. To build trust in mortgage valuation, the legal framework should focus on developing and implementing professional codes of conduct and ethics. More focus should be on best practices and practical applications of valuation methods, procedures, reporting of valuation, and competence of valuers. In addition, valuers should apply an appropriate valuation method based on the type and nature of properties depending on the prepared framework. Furthermore, the government should improve valuation precision by establishing a central property database system that collects data on all transactions and allows the usage of the standard valuation method. Moreover, a central property database with information on previous transactions should be maintained.

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