

## Influence of electricity availability on the intention to invest in residential real estate in Akure Nigeria: Mediating roles of perceived behavioral control and attitude

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**CHRONICLE**

**ABSTRACT**

*Article history:*

Received: January 2, 2022

Received in revised format: June 18, 2022

Accepted: August 10, 2022

Available online:

August 12, 2022

*Keywords:*

*Residential real estate*

*Theory of Planned Behavior*

*Attitude*

*Perceived behavior control*

*Intention*

*Electricity availability*

*Variance-based Structural Equation Model*

Globally, factors influencing the residential real estate market are of great importance. This study examines the influence of theory of planned behavior constructs as well as introduces uninterrupted electricity supply as electricity availability construct in place of the locational attributes on intention to invest in residential real estate. In addition to the mediation effects of attitude and perceived behavioral control on the relationships between electricity availability and intention to invest in real estate property. The data for this study were obtained from the residents of government-reserved areas in Akure, Ondo State, Nigeria. Based on random sampling techniques, a total of 132 questionnaires were useful for this study. The results established the indirect-only mediation and the no-effect non-mediation for both paths via attitude and perceived behavioral control respectively. Among other results, the study concluded that attitude is a reliable antecedent of behavioral intention in making a decision to invest in residential real estate in the study area.

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### 1. Introduction

Globally, business environments are characterized with uncertainties and sustaining competitive advantage is the only yardstick for survival (Kadhim et al., 2018). This makes information that can help provide marginal gain in real estate business very essential. In an increasing uncertainty, the decision to commit scarce resources (such as money) into residential assets is one of the important steps in human existence as both the emotional and social perspective are attached. As well as bearing in mind that the means to satisfy the unlimited wants are scarce, which justify the need for guidance in taking real estate investment decisions. The investment may be achieved in two ways; first, an individual may decide to go through the rigor supervising this from the scratch to completion of the building. Secondly, the person may opt for the outright purchase of an already completed building due to unavailability of time to go through the hassle of erecting a new one. Elenwo and Akujuru (2018) defined real estate as a wide terminology that entails natural land and man-made on land. While real property includes the interests, benefits and rights that culminates in the ownership of land and real estate. Igbinosa (2011) further stated that real estate has several categories, which includes residential, commercial, industrial, agricultural and special purpose. In particular, this study placed more emphasis on residential real estate, a property type used for single or multi-family apartments in urban, suburban and rural areas (Nunarong & Punnakitikashem, 2018).

Nowadays, prospective residential property owners, a single-family home or multi-family apartments for an individual or investor respectively, face a number of challenges in their initial planning phase that affect the behavioral intention to invest. One of such is the choice of location, which Rachmawati et al. (2019) considered as the most important factor. Mariadas et al., (2019) opined that a locational factor represented by certain criteria, can make the investment functional and significant.

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ISSN 2816-8151 (Online) - ISSN 2816-8143 (Print)

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doi: 10.5267/j.jfs.2022.8.001

This study has identified the availability of electricity in a location as an advantage for functional homes. Nigeria is known for her incessant supply of electricity (Adepoju et al., 2018; Adepoju, 2020) and in particular, Akure in Ondo state is not an exception (Babalola et al., 2019). Because of this peculiarity as well as the importance of the construct being novel contributes to the originality of this study, thereby filling the gap in the existing literature relating to the investment behavior intention in real estate.

Several theories exist to predict the behavioral intention of human beings towards investment in real estate. Notably among them are the Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB). Fishbein and Ajzen (1975) and Ajzen (1991) respectively had earlier developed the two theories. The TRA proved the influence of attitude on intentions, which mediates its relationship with behaviors. TRA is known to generally consist of three constructs namely: behavior, intention, attitude and subjective norm. Nevertheless, this study relies on the TPB constructs as it notably includes the perceived behavior control, which is an extension of the TRA as a predictor of behavior construct. Some of the authors who had included TPB in their works include but not limited to Liu et al. (2013), Al-Nahdi et al. (2015), Guyer and Fabrigar (2015), Martinez and Lewis (2016), Lai (2017), and Reyhanloo et al. (2018). This study focused more on the TPB constructs, as there are dearth of studies on the inclusion of availability of electricity construct.

In line with TRA, Lai (2017) posits that attitude is the construct to determine behavioral intention of a person. The author further defined attitude as the evaluation of an object based on the perspective of an individual's belief about the object and thereby leading to the behavior experienced. The second factor in TRA is the subjective norms, which is the way a person perceives his or her relations attitude to certain behavior. This therefore motivates an individual to behave in the same way. In addition to TRA, the theory of planned behavior only added the third variable, which is the perceived behavior control (PBC). This factor is believed to predict the behavioral intention of a person's attitude toward a behavior such as in the decision to invest in residential property.

Reyhanloo et al. (2018) emphasized the importance of TPB in the study of intention to invest. They reinforce that behavior is determined by an intention to perform the behavior. Their study also reported the three antecedent determinants as attitude, subjective norm (perceived social pressure) and perceived behavioral control of performing the behavior. Guyer and Fabrigar (2015) discussed the previous studies emphasizing association between attitude and behavior as well as others challenging such propositions. Further, their work in the quest to clarify the relationship venture into the roles played by other constructs. The exemplary theory of reasoned action played a prominent role in suggesting that the relationship between attitude and behavior is not a direct one. It is believed that the most proximal determinant of a behavior is the intention. Behavioral intention is regarded as the amount of pressure an individual is willing to exert in order to achieve a stated behavior. This is with the knowledge that intention encompasses all the motivation factors that can affect a stated behavior. Based on TRA, the study conceptualized behavior as an intention that falls under the volitional control of an individual. So, the determination of behavioral intention of a person is critical to the predictive power of the person's behavior. However, over the years there have been propositions that whether the inclusion of an additional factor would fully explain the variations in behavioral intention. The TPB introduced the PBC construct, which is a reflection of a person's belief regarding the difficulty of performing a stated behavior. The study of Martinez and Lewis (2016) refers to PBC as the confidence displayed by an individual to perform the said behavior. Their work defined attitude as a function of the perceived desirability and likelihood of expected outcomes. Whilst, perceived norms, the second predictor of behavioral intention, as perceptions of what people think one should do and what others are doing (Fishbein, 2000). The first reason is referring to the subjective norm and the latter part defines the descriptive norm (that is what others typically do). Another study conducted in Saudi Arabia on the factors affecting the purchasing behavior in real estate opined that the TPB is used to understand the relationship of intentions to performing a behavior (Al-Nahdi et al., 2015).

This group also confirmed that intention is influenced by attitude, subjective norms and control over the behavior. They also cited that TPB had earlier been used to forecast human behavior and factors influencing consumers to purchase their residential units (AL-Nahdi, 2014; Thanaraju et al., 2019). Leone et al. (1999) also reported three models of attitude-behavior relationships that include TRA, TPB and the theory of self-regulation (TSR; Bagozzi, 1992). The work reiterated that TPB is a non-volitional factor aspect of TPB, which is missing in the TRA. The study concluded that the TRA model has an omitted important variable such as self-efficacy-based variables or motivational factors as desire. But opined that the TRA was able to predict behaviors under total volitional control, however, under less stringent circumstances predicted intention poorly. Nevertheless, TPB and TSR models showed better relationships with intention under incomplete volitional control. They further suggested that motivation-based variables and self-efficacy deserve important roles more in theories about attitude and behavior relationships.

The paper is inspired to include this extrinsic motivation variable into the theoretical perspective of TPB constructs and examine its impact directly and indirectly on the intention to invest in residential real estate in Akure, Nigeria. Therefore, the paper presents the following hypotheses:

**H<sub>1</sub>:** *There is a significantly positive effect of the availability of electricity on the intention to invest in residential property in Akure.*

**H<sub>2</sub>:** There is a significantly positive effect of availability of electricity on perceived behavioral control to invest in residential property in Akure.

**H<sub>3</sub>:** *There is a significantly positive effect of availability of electricity on the attitude to invest in residential property in Akure.*

**H<sub>4</sub>:** *There is a significantly positive effect of perceived behavioral control on intention to invest in residential property in Akure.*

**H<sub>5</sub>:** *There is a significantly positive effect of attitude on intention to invest in residential property in Akure.*

**H<sub>6</sub>:** *Perceived behavioral control mediates the positive relationship between availability of electricity and intention to invest in residential property in the study area.*

**H<sub>7</sub>:** *Attitude mediates the positive relationship between availability of electricity and intention to invest in residential property in the study area.*

The rest of the paper is organized as follows: the next section deals with the methodology, thereafter results and the study finally draw on the conclusions and implications from the obtained results.

## 2. Methodology

The study followed the cross-sectional survey design. The study area is the Government Reserved Areas in Akure, Ondo State, South West, Nigeria. The sample of this research was based on random sampling of the respondents and the study was able to retrieve 148 questionnaires from each household, out of which only 132 were useful after preliminary data cleaning that include missing data and unengaged responses. Data were collected with the aid of a structured questionnaire. Both dependent and independent variables were composite or latent variables measured with a 9-point Likert scale. The objective involves the use of variance-based structural equation modeling of constructs of electricity availability (ELECT), attitude (ATTD), perceived behavioral control (PBC) and the intention (INTENT) to invest in residential property (Table 1). Therefore, this analysis employs the SmartPLS version 3 to execute the measurement model and the structural model according to the procedure recorded in Hair et al. (2019).

## 3. Results and Discussion

The result on the demographic characteristics shows that the male respondents dominate the composition by a difference of 28 representing 21.2% greater than the female respondents. It also shows that 87 (66%) of the respondents have a minimum of bachelor's degrees and 67 of the 132 are monthly earners. The results further show that 78 of the respondents are above the age of 30 years and only 65 of them responded that they earn above ₦100, 000 every month. It is also revealed that 54 of the respondents have been living the GRA for more than five years as at the time of survey. In the quest to do justice to the hypotheses, the study has applied the principle of partial least squares to provide information on the constructed relationships. The approach involves the measurement model evaluation of the outer model and the inner model for the structural paths. The two sequences were conducted to help guarantee that manifests from each of the constructs are valid and reliable before the study can draw any meaningful conclusions on the relationships.

### 3.1 Measurement Model

In this study, ELECT, PBC, ATTD, and INTENT are operationalized reflectively. First, the procedure for reflective measurement involves internal consistency reliability, convergent validity, and discriminant validity. The internal consistency of the constructs was evaluated using Cronbach's alpha and composite reliability approach, as proposed by (Hair et al., 2017; Hair et al., 2019a). Both Cronbach's alpha and composite reliability have a threshold of 0.7 with higher values indicating a higher level of reliability (Herath & Rao, 2009). Nevertheless, it is possible to get suitable reliability for values between 0.60 as well as 0.70, though one other validity coefficient needs to be adequate (Hair et al., 2017). Table 2 shows that Cronbach's alpha values range from 0.809 to 0.887, and composite reliability also ranges from 0.853 to 0.917. The results show that reflective constructs have no issues of reliability as they surpass the recommended threshold of 0.7 for both tests (Hair et al., 2019b). Table 2 also reveals the outcomes of the average variance extracted as an indication of the convergent validity; the values range from 0.578 to 0.801, which are above the recommended value of 0.5 (Hair et al., 2017; Bagozzi & Yi, 1988).

Furthermore, the discriminant validity of the constructs is examined based on their cross-loadings, Fornell-Larcker criterion, and the assessment of the correlations HTMT. The outcome of the cross-loadings expected that in the assessment, the outer loading of an indicator (Fig. 3) needs to be more significant on its latent variable in comparison with its cross-loadings on the other constructs.

**Table 1**

Compositions of the composite variables

Availability of electricity	
a1	I would consider availability of national grid lines to supply electricity uninterrupted when making a decision to invest in residential real estate
a2	I would consider availability of constant supply of electricity when making a decision to invest in residential real estate
a3	I would consider electricity supply of almost 24 hours per day when making a decision to invest in residential real estate
a4	I would consider proximity to BEDC station which guaranty constant electricity supply when making a decision to invest in residential real estate
a5	I would consider transformer in the area is shared with highly important people which makes electricity supply uninterrupted when making a decision to invest in residential real estate
a6	I would consider no breakdown of transformers which guaranty supply of electricity when making a decision to invest in residential real estate
Attitude	
d1	I would consider buying as a beneficial decision when making a decision to invest in residential real estate
d2	I would consider buying as a good idea when making a decision to invest in residential real estate
d3	I would consider buying as a wise decision when making a decision to invest in residential real estate
d4	I would consider buying as an admired decision when making a decision to invest in residential real estate
Perceived behavioral control	
g1	I have completed control over buying/purchasing when making a decision to invest in residential real estate
g2	I have enough skills and knowledge about housing property when making a decision to invest in residential real estate
g3	I have enough money when making a decision to invest in residential real estate
g4	I have enough time to make a decision when making a decision to invest in residential real estate
g5	I have enough opportunity (access to market) in making a decision when making a decision to invest in residential real estate
Behavioral intention	
e1	I will continue to invest in residential real estate
e2	I intend to invest in residential real estate in the future
e3	I plan to invest in residential real estate
e4	I will always try to invest in residential real estate
e5	I want to invest in residential real estate

Furthermore, the discriminant validity of the constructs examined based on their cross-loadings, Fornell-Larcker criterion, and the assessment of the correlations HTMT. The outcome of the cross-loadings expected that in the assessment, the outer loading of an indicator (Fig.1) needs to be more significant on its latent variable in comparison with its cross-loadings on the other constructs.

**Table 2**

Reliability and Validity of Constructs

	Cronbach's Alpha	rho A	Composite Reliability	Average Variance Extracted (AVE)
attd	0.917	0.921	0.941	0.801
elect	0.853	0.855	0.891	0.578
intent	0.905	0.909	0.930	0.727
psc	0.882	0.884	0.914	0.680

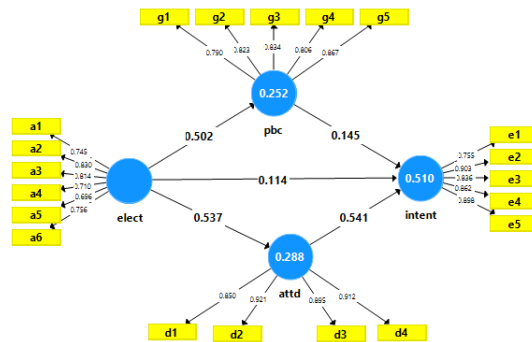
**Fig. 1.** Measurement model showing outer loadings and weights (PLS-Algorithm)

Table 3 demonstrates that the outer loading of each indicator is higher on its respective construct when compared with its cross-loadings on another construct with no less than a difference of 0.10 suggested by Gafen and Straub (2005). Another technique concerned the Fornell-Larcker criterion, which proposed that every construct's AVE need to be compared to the squared inter-construct correlation of that same particular construct and any other reflectively measured constructs within the structural model (Hair et al., 2017). Furthermore, the shared variance for all of the model constructs should not be bigger when compared to their AVEs. Table 4 shows that this recommendation on Fornell-Larcker criterion has been achieved. The study went further to assess the HTMT in light of the limitation of the AVE technique (Hair et al., 2017). It is recommended that a value above 0.90 displays a lack of discriminant validity (Henseler et al., 2015). Moreover, the confidence interval of the HTMT should not include the value 1. Table 5 shows that the HTMT criterion has been satisfied with the study PLS model.

**Table 3**  
Cross-Loadings

	attd	elect	intent	pbc
a1	0.398	0.745	0.317	0.413
a2	0.412	0.830	0.419	0.436
a3	0.467	0.814	0.342	0.372
a4	0.354	0.710	0.382	0.408
a5	0.411	0.696	0.438	0.316
a6	0.403	0.756	0.257	0.331
d1	0.850	0.460	0.548	0.559
d2	0.921	0.466	0.662	0.550
d3	0.895	0.522	0.584	0.575
d4	0.912	0.475	0.686	0.609
e1	0.528	0.410	0.755	0.508
e2	0.647	0.454	0.903	0.535
e3	0.585	0.380	0.836	0.431
e4	0.588	0.366	0.862	0.418
e5	0.609	0.419	0.898	0.444
g1	0.534	0.501	0.433	0.790
g2	0.436	0.371	0.436	0.823
g3	0.521	0.341	0.417	0.834
g4	0.579	0.404	0.494	0.806
g5	0.556	0.430	0.474	0.867

**Table 4**  
Fornell-Larcker criterion

	attd	elect	intent	pbc
attd	0.895			
elect	0.537	0.76		
intent	0.695	0.477	0.853	
pbc	0.641	0.502	0.549	0.824

**Table 5**  
HTMT

	attd	elect	intent	pbc
attd				
elect	0.608			
intent	0.760	0.539		
pbc	0.709	0.571	0.612	

All of the manifest items have satisfied the conditions of measurement model analysis and the study has no cause to remove any item due to its adequate reliability, convergent validity and discriminant validity. The next stage of analysis in variance-based structural equation modeling involves the assessment of the structural model and the hypotheses testing.

### 3.2 Assessment of structural model

The study employed the technique of structural model, which examines the collinearity, the coefficient of determination ( $R^2$ ), path coefficients ( $\beta$ ) and the effect size ( $f^2$ ). The linear values of the variance inflation factor (VIF) were examined for collinearity issues. The results of VIF showed that ELECT was 1.493, PBC was 1.802 and ATTD was 1.895. The study found all the VIF values to be below the threshold of 5 (Tehseen et al., 2019). Hence, collinearity among the exogenous latent variables does not exist and causes no issue in the structural model. Therefore, the analysis can proceed to evaluate the report of the results.

After the study has satisfied the VIF values, the bootstrapping was conducted with 1000 resamples using PLS 3.2.8 to obtain the standard path coefficients, standard errors and t-values to examine the significance of the hypothesized relationships (Hair et al., 2017). The mediating effects of attitude and perceived behavioral control were also assessed according to the procedure stated in Hair et al. (2017). This procedure includes the direct and indirect effects of the exogenous constructs on the endogenous variable. Table 6 and Figure 2 provide information on the direct path coefficients for availability of electricity (ELECT) in the area and illustrate a positive and non-significant relationship with intention (INTENT) ( $\beta = 0.114$ ,  $t = 1.310$ ). The second and third hypotheses indicate positive and significant effects of ELECT on PBC ( $\beta = 0.502$ ,  $t = 6.445$ ) and on attitude (ATTD) towards investment in residential real estate ( $\beta = 0.537$ ,  $t = 7.085$ ). For the fourth hypothesis findings show the positive and significant effect of PBC on the intention to invest in residential real estate at 10 percent significance

level ( $\beta = 0.145$ ,  $t = 1.657$ ). The relationship between ATTD and intention to invest formed the fifth hypothesis and the result shows a positive and significant relationship ( $\beta = 0.541$ ,  $t = 5.923$ ). Nevertheless, the mediation between ELECT, PBC and INTENT to invest illustrate a positive and non-significant effect ( $\beta = 0.073$ ,  $t = 1.551$ ). Whereas, the mediation path of ELECT, ATTD and INTENT is positive and significant ( $\beta = 0.291$ ,  $t = 4.956$ ). Therefore, *H1* was not supported but *H2*, *H3*, *H5* were supported at 1 percent significance level. But, *H4* was supported at 10 percent significance level. The results also supported the mediation effect between ELECT on INTENT via ATTD of people making a decision to invest in residential real estate. However, the mediation effect via the PBC was not supported.

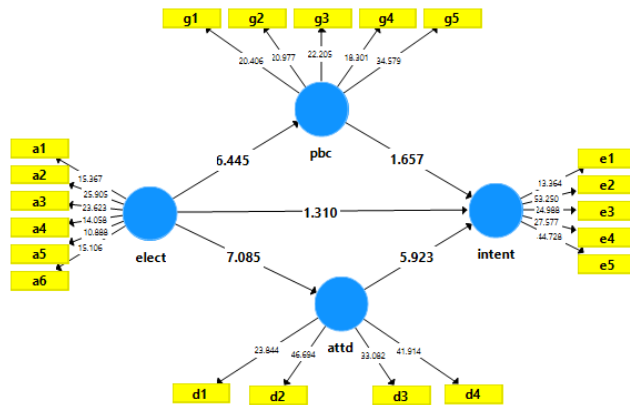
The coefficient of determination ( $R^2$ ) was 0.510 for the intention to invest,  $R^2$  of 0.252 and 0.288 for PBC and ATTD to invest, respectively. The work of Cohen as reported in Tehseen et al. (2019) suggested that  $R^2$  values of 0.02, 0.13, and 0.26 should be considered as weak, moderate, and substantial respectively. Thus,  $R^2$  values of the endogenous constructs were found between moderate to substantial because they were more than 0.13. The result of  $R^2$  suggests ELECT, ATTD and PBC explained 51 per cent of the variance in the intention to invest in the real estate.

Next, the paper examined the effect size ( $f^2$ ). Also, Tehseen et al. (2019) reported Cohen's effect size of 0.02, 0.15, and 0.35 as small, medium, and large effects of the exogenous constructs respectively. According to the guidelines of Cohen (1988), Table 7 shows that ELECT does not have any effect on INTENT. However, PBC has a small effect on the intention to invest, whereas a medium size effect was exerted by attitude towards investment.

**Table 6**  
Hypothesis Testing in Structural Model

Hypothesis	$\beta$ values	SD	t-statistics	p values	Decision	Mediation
<i>H1</i> : ELECT→INETENT	0.114	0.087	1.310	0.190	Not supported	
<i>H2</i> : ELECT→PBC	0.502	0.078	6.445	0.000	Supported	
<i>H3</i> : ELECT→ATTD	0.537	0.076	7.085	0.000	Supported	
<i>H4</i> : PBC→INETENT	0.145	0.087	1.657	0.098	Supported	
<i>H5</i> : ATTD→INETENT	0.541	0.091	5.923	0.000	Supported	
<i>H6</i> : ELECT→PBC→INETENT	0.073	0.047	1.551	0.121	Not supported	No
<i>H7</i> : ELECT→ATTD→INETENT	0.291	0.059	4.956	0.000	Supported	Yes

Notes: Critical t-values: \*1.65 (significance level = 10 per cent); \*\*1.96 (significance level = 5 per cent); and \*\*\*2.57 (significance level = 1 per cent).



**Fig. 2.** Bootstrapping showing the t-statistics

**Table 7**  
Effect size ( $f^2$ )

Exogenous Construct	$f^2$ on INTENT
ELECT	0.018
PBC	0.024
ATTD	0.316

#### 4. Discussion of results and Contributions

Since the relationship between the direct path of ELECT and INTENT is positive and non-significant, hypothesis *H1* is rejected. This finding contradicts the earlier studies of Saw and Tan (2014) and Hei and Dastane (2017). These studies had obtained positive and significant relationships between the constructs of location attributes and intention of investors or consumers to make purchasing decisions. From Hei and Dastane (2017), this present study has inferred a close proximity in the definitions of extrinsic attributes of locational factor and electricity availability construct used in this study. The possible explanation for this non-significant relationship result obtained could be that electricity supply in Nigeria has not been reliable overtime. So investors do not have to consider it for the feasibility planning phase. Another related perspective might be because it is an extrinsic motivational factor, hence, it will require additional finance to upturn the situation should that become imperative in the study area. However, the relationship may be significant in a place where electricity supply is required for commercial real estate. Surprising the outcomes of second and third hypotheses that were the new assumed relationships in this study showed a positive and significant effect. These mean that an uninterrupted supply of electricity

perceived in a location may control the behavior of investor or consumer as well as change their attitude to consider making favorable decisions to invest in residential real estate property. Similarly, the positive influence of attitude on the intention to invest in residential property has been established again in this study. This gave credence to the study conducted by Al-Nahdi et al. (2015), Martinez and Lewis (2016), and Reyhanloo et al. (2018). This is an indication that respondents in this study have found a perceived usefulness of the residential property, which could lead to attitude change towards investment. Furthermore, the impact of perceived behavioral control on intention to invest was positive and non-significant at 5 percent level. This confirmed the earlier assertion made by Kamariah et al. (2008) and Al-Nahdi et al. (2015). However, when the significant level is relaxed, say at 10 percent level, the PBC becomes significant in this study. Other studies that have revealed positive and significant relationships between PBC and INTENT are Liu et al. (2013) and Martinez and Lewis (2016). The mediation effects present both significant and non-significant results in this study. First, the positive correlation as well as the significant results in *H3* and *H5* contributed toward the mediation interaction between the ELECT and INTENT (*H7*) ( $\beta = 0.291$ ,  $t = 4.956$ ). According to Hair et al. (2017), this observed mediation effect result is known as the indirect-only mediation because the indirect effect is significant but not the direct effect. Conversely, the positive correlation as well as the significant result of *H2* and fairly significant result of *H4* also contribute toward the lack of mediation interaction between the ELECT construct and INTENT via PBC (*H6*) ( $\beta = 0.073$ ,  $t = 1.551$ ). This study has established a lack of mediation effect in the relationship between ELECT and INTENT via PBC. In this case, the study reports a no-effect non-mediation, which is an observation that neither the direct nor the indirect effects are significant (Hair et al., 2017). This study has contributed in several ways. First, it contributes to the existing literature by developing and testing a new empirical model (an extension of TPB) that incorporates the availability of electricity in a location, a construct that is a subset of the extrinsic attributes of a locational factor. The study shows that ELECT construct has no significant relationship with the intention to invest in residential property in the study area. In addition, findings provide support for the mediation effect of attitude on the relationship between ELECT and INTENT in the study area. Though, the study mediation's result of PBC on the relationship between ELECT and INTENT was not supported. Lastly, this study has established that between the constructs of the theory of planned behavior examined, attitude is found to exert more influence on the intention to invest in residential real estate property than the perceived behavioral control.

The study must be viewed in the light of a number of limitations. First, this study is confined to a single city in the state and secondly, a sample of 132 respondents is relatively small. There is evidence suggesting that access to population in pursuit of obtaining data is a challenge in developing country contexts. The study is also limited to the exploration of the effect of two constructs out of three on the TPB. Moreover, the study tested the validity of the developed model in the context of residential real estate property investment. The validity of the empirical model developed in this study should be tested across different locations and states. Knowing fully well that the empirical testing of the developed model could provide some useful insight into how these variables affect different locations as investors and individuals would be able to gauge the factors that matter most before making a decision to invest in residential real estate.

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