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Effect of Insurance Cost on Commercial Property Rent in Urban Ghana

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Abstract This study assessed the insurance cost impact on annual rent per square foot of retail and office properties in Ghana within the CBDs of Tamale, Bolgatanga and Wa. Using the trans-log hedonic model, the insured and uninsured comparable office and retail properties and their rental values were identified. Through T-Test, the difference between the insured and uninsured rental values was assessed and the extent of their differences was also estimated. The results indicated that in Tamale, 15.2% of the 79 retail and 27.5% of the 51 office properties identified were insured. Again, within the Bolgatanga CBD, 20.5% of the 39 retail and 53.8% of the 13 office properties were also insured while 18.8% of the 16 retail and 44.4% of the office properties identified in the Wa CBD were insured. Statistically, the ages and sizes of these properties were not significantly different. The study further revealed that the rents of the insured office and retail properties were significantly higher than those of the uninsured counterparts in all the three CBDs at a variant extents. The research provides some insight into the determinants of rents for commercial properties in Ghana. Property insurance is recommended to commercial property owners in these regions.

Keywords: *insurance, commercial property, rent, Northern Ghana, Urban*

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1. Introduction

There is enough evidence to show that in the past few decades, the process of urbanisation has accelerated mainly in countries in the Global south through natural increase and rural-urban migration [1]. It is further estimated that more than half the global population (3.5 billion in 2010) lives in towns and cities, and projections are that this figure may even exceed 6.2 billion by 2050 [2]. The fact is that not only has most of this growth taken place in cities of developing countries, they are also expected to grow by an additional 1.3 billion people by 2030, compared to 100 million in cities of the developed world [2] This rapid and large-scale concentration of people in cities presents opportunities for innovations and development such as opportunities to generate wealth; enhance quality of life and accommodate more people within a smaller footprint at lower per capita resource use [3]. On the reverse side, the situation also presents new challenges for proper urban planning, inadequate basic infrastructure commensurate with the growth process, and disproportionately generate and accumulate risk factors in the urban space. It also creates other occupational and environmental conditions which are more vulnerable to both natural and anthropogenic hazards.

A typical characteristic of the world today is the increasing scale of losses from catastrophic disasters especially in the urban areas such as earthquakes; floods and more importantly fire disasters (see ICRC, [4]). The effects of such disasters do not only manifest in the number of lives and property lost, but also the vital livelihood support systems are perpetually ruined. Predictions are that the trend of disasters, be it natural or man-made will be probably be intensified by the climatic change phenomenon [5,6,7,8,9]. The disasters are becoming unceasing threats to humanity and their valuables including landed properties [9].

In guaranteeing mutually social and economic indemnity in the urban communities after disasters have occurred, property insurance is seen to play unparalleled role in this endeavour both in developing and the developed world [10,11,12]. Insurance is a safe net for all landed properties including commercial properties (office and retail property types). Research indicates that due to limited land availability resulting from the urbanization process, most of these properties are located in hazard liable zones (see for example, [13]). As a way of recouping loses that may arise in the event of any disaster, property owners have tended to insure their properties a situation which in tend inflate the rental values. In other words, the cost of insurance is capitalized in the market value of the commercial properties. In both real estate and insurance literature, many empirical studies indicate that insurance cost affects property values [14,15].

In Ghana, the real estate market is characterised by a huge renters' component especially in the area of office and retail space. The rental market of office and retail spaces is particularly important because of cost, operation

flexibility for expansion; maintenance, and repairs among others [16]. Rental value (and in some literature rental payment or price) in Ghana, is essential to investors as their key source of income, to tenants as price or rental payments for the bundle of rights of occupation and usage, to the central or and local government as basis for property and income tax from property owners and for the insurer or insurance companies as the main source of insurance premium [17].

While the importance of rental value of commercial properties particularly office and retail property types to all stakeholders are acknowledged, the understanding of the relationship between insurance (through its cost and availability) and rental values has not attracted academic attention. To absolutely understand the relationships between insurance cost and urban commercial properties, an empirical study of this nature is desirable. This paper fills this gap by examining the insurance cost impact on rents of retail and office properties in northern Ghana. This paper is structured as follows: after the introductory section, the next section discusses conceptual issues on insurance cost impact on retail and office property rental values. Data selection and approach for this study is presented in the third section. Finally, the last section of this paper presents the results, the discussion of key findings and conclusion.

2. Framing Insurance Cost and Commercial Property Rent

There is robust literature on Real Estate economics and management literature on the determinants of rental values, rents or rental payments of both office and retail properties. It is well appreciated that rental values do vary considerably across properties. It is also worth noting as outlined by Wiley et al., [18] that rental values of both office and retail commercial property types are dependent on locational specific variables, property specific factors, and general market conditions among others. Besides, it is indicated that rental values could be affected by factors such as operating expenses and leasing terms [18].

Rental value is the price a tenant offers for the right to use a space for a specified period of time to a landlord [19]. Again, it is described as a measure of value accepted by both tenant and landlord placed on a given size of space [20]. Recently, rental value has been defined as the payment made by a tenant to a landlord for use and occupation of real estate space and is usually expressed as the amount of money involved each year or per annum [21]. Rental value also called the current market rent, according to Getlner et al., [19] refers to the level of rents being paid on typical current leases signed in the market.

Locational specific variables may include natural (dis)amenities such as local weather and climatic conditions, and man-made (dis)amenities or facilities such as hospitals, waste and hazardous chemical dumping sites among others [19,22]. These locational specific variables affect rental values as stated by Enever and Isaac [23]. For instance, traffic volume of specific sites may have impact on the rental values of retail commercial properties [19]. Previously, an example was cited that, changes in facilities such as an introduction of new road might open up communities [23]. This breeds housing, which grows with commercial properties and can increase both supply and demand of retail and office properties at different rates, which affect their rental values (*ibid*). They further stressed that a well-located offices call for higher rental values than other ill-located ones [19,23]. Geltner et al [19] for example, describes both demand and supply of rental space market as being both location and type specific, therefore real estate space markets (including retail and office space markets) are highly segmented. Space markets tend to be local rather than national, and specialized around building usage categories [19,22] hence rental values analyses need to be at the local level such as at CBD.

Property specific factors such as the class, age, building material quality and finishing material type, number of storey, size and shape among others may influence the rental value of such property [22,24]. The age of all properties including retail and office types is relatively linked to both functional and technical obsolescence, which affect rental value. High quality building materials especially quality finish material types command high prices, which are also compensated by higher rental values[22]. Number of storey influences rental value of commercial properties through the storey number, where rental value decreases from ground floor-up [24]. Size of retail and office property, which normally represents the usable floor area increases with rental values [25]. Office or retail property space size as a normal market commodity increases with quantity. In addition, the shape of office and retail property has some impact on their respective rental values. For instance, Enever and Isaac [22] echo that, the productivity of the commercial property in question that matters. They hold a simply proposition that "the more per square meter which a commercial property can earn for its occupier, the more he will be prepared to pay' in rental values" ([23] pp. 36-37).

General market conditions for retail commercial properties such as aggregate disposable income, and aggregate household wealth for instance can influence rental values [25]. An economy with relatively low aggregate disposable income will have low household wealth that can affect retail activities negatively compared to an economy with a higher aggregate disposable income with a relative high household wealth [24]. Favourable or anticipated boom market conditions normally yield higher rental values whereas, unfavourable or anticipated erratic market conditions can affect rental values badly of both retail and office properties [22]. In addition government policy can affect rental values. An office occupation employment oriented government policy can increase rental values for office properties. They explain that an increase in employment in office occupations such as finance, insurance, real estate (FIRE), business & professional services, legal services do increase demand for office space in relation to its supply, hence, increase in office rental values as supported earlier by Fanning, Grissom and Pearson [25]. This has also been emphasised that, changes in the economic structure and the business organisations for instance the long-term trend from offices to rent vis-a-vis factories called for rental value to increase [23]. They, however, stated that the recent move toward home working or working from the home could reduce demand for offices hence rental value reduction [23].

Commercial property or building is one of the largest segments of world's financial investment in which businesses and contents of individuals, corporate entities and government are housed. Consequently insurance coverage is imperative, and generally, property insurance policies cover buildings contents, machinery and other real and personal belongings as proposed by the Virginia Corporation Commission [26]. There are two main types of property insurance: the named peril insurance (that provide coverage for specific risks events such flood, fire among others) and all risk insurance that provides protection for any lost by perils not excluded by such insurance policies [26].

The availability and cost of commercial property insurance is vital to all stakeholders in the built environment as earlier indicated. To owners of commercial properties, the cost of insurance is among the big outgoings [27]. Property insurance cost forms a major outflow under both real estate investment and financial analysis [28]. It is also important to acknowledge that property insurance cost is categorized as operating expenses which, is recoverable expenses in leases. In addition, they stressed that this is achieved by pass-through leases which are also called the single, double and triple-net lease [27,28,29]. These authors explained that net lease is a type of lease whereby tenants have the obligation to pay a portion (sometime called hybrid lease) or all of the operating expenses such as maintenance, insurance, or property taxes. The definite meaning of a net lease is market-specific, which call for in-depth analysis of property operating expenses to identify who actually bears the expenses of each lease types. Double net lease and triple net lease are lease terms in which the tenant is obliged to pay for progressively more of the property's operating expenses. Normally, a triple-net lease is the one in which the tenant pays all operating expenses, taxes, and insurance. The exact expenses paid in double and triple-net leases depend on the locality and its conventions. Sometime, we have absolutely net lease which is a type of lease by which all operating expenses are borne by the tenant. Insurance cost is not owner's expenses since it is not non-recoverable expense and its brunt rest on the tenant [29], hence the rental value paid by tenants for insured commercial properties will be relatively higher than uninsured counterpart.

The above discussion supports the proposition made by Lamond et al., ([13], pp 129) "that the availability and cost of insurance will have an effect on house prices is often accepted as fact. However the mechanism for this supposed impact has not been clearly articulated and the hypothesis is far from proven in the UK market". Though, insurance cost and availability impact on property value may differ from their impact on property rental value generally and more specifically on rental values of office and retail commercial properties, it is important to discuss insurance impact on property value in literature. As indicated earlier, Lamond et al., [13] proposed devaluated in the prices of residential property by insurance. Again, Eves [29] recorded no insurance impact on the value of properties and saw insurance cost as just one of the numerous factors affecting property values, sales and negotiation. The Association of British Insurers (ABI) [30] and Clark et al [31] as cited in Lamond et al., [13] claim that always insurance comes at as a cost however, its impact on property values are nevertheless to be ascertained. In addition, there is much slimmer body of empirical studies on insurance cost impact on both retail and office property types. This current study contributes to the existing empirical studies on the impact of insurance cost and availability on rental values of urban retail and office properties. Also, this study highlights that, property insurance with all risk or named risk policies may have differing impact on rental values paid by tenants [26]. However, the mechanism of insurance impact on rental values was unexamined.

3. Research Setting and Data Collection

The study was conducted in the three regional capitals of the three northern regions of Ghana namely, Tamale, Bolgatanga and Wa which the Ghana Statistical Service (GSS) [32] describes as newly emerging urban centers in Ghana where the municipal planners, engineers, architects, and scientists are struggling to keep up with the demands of the business community. Their strategic locations, vibrant economic activities, rich culture and history, make the three selected study locations first choice destination for migrants not only from Ghana, but also from neighbouring countries such as Mali, Burkina Faso, Niger and Togo [32]. The CBDs of the three selected study locations is fraught with commercial properties that are rented out as both office space and retail outlets. At the same time, the haphazard nature of the structural arrangement at the CBDs makes them prone to disasters, both man-made and natural. This has compelled owners of commercial properties to purchase insurance policies cover for such properties. In addition, all properties within the CBDs are subject to identical economic conditions and enjoy equal (dis)amenities such as insurance cost.

The core set of questions for data collection were guided by preliminary observations of the commercial rental environment. To prevent variations in locational characteristics, property specific character and rental transaction features that can affect rental values were observed. The following assumptions were made; comparable retail and commercial office properties in terms of size, age and type within the three CBDs (as experimental block) [13]. Again, only properties with all risk insurance policies, gross lease and lease renewed between January and June 2015 were selected. Based on the stated assumptions, the face-to-face interview approach was used for the questionnaire administration. In all, 207 tenants of 207 commercial properties were covered. While the questionnaire had various sections, the most important section was the annual rent per square foot paid by tenants of both retail and office commercial properties in the CBDs selected for the study. A team of 6 trained researchers took eight months (January to August, 2015) to complete the entire data collection process.

Questionnaire survey was conducted in the three capital towns of Upper West, Upper East and Northern regions of Ghana namely Wa, Bolgatanga and Tamale respectively. The study areas were appropriate due to their peculiar common concentration of commercial properties and vibrant nature of commercial rental market.

4. Data Input

Adhering to the above listed assumptions, all the predictors of the rental value apart from the insurance status were cancelled out. Hence, to achieve the objectives of the study the following steps were followed: (1) the study identified insured and uninsured comparable office and retail properties and their rental values; (2) the study evaluated the difference between the insured and uninsured rental values; and (3) the study estimated the extent of rental value differences between the insured and uninsured properties. The purpose was to assess if differences exist. The insurance status of a retail or commercial office property turn-out to be a major predictive or decider variable of the properties' rental values. Here, the insurance cost or availability was capitalized into the rental values of the properties. Implying insured commercial properties should have different rental values from uninsured counterparts on average.

The study adopted a trans-log hedonic model of which both the rental value and its predictor variables such as property specific variables, locational specific variable, general market growth and conditions including insurance cost among others were stated in logarithms. Therefore, the rental value of a given commercial property (c) at time (t) can be stated as:

$$InR_{ct} = \sum_{j=1}^{j} \beta_j InQ_{jct} - \delta S_{ct} + C_t + \varepsilon_{ct} \qquad (1)$$

Where

InR_{Ct} = the rental value of given commercial property, c

β_j = indicator of coefficients of the elasticity of rental value with respect to the matrix of location and property specific explanatory variables Q_{jc}

S_{ct} = insurance status and cost variable at time t with coefficient $-\delta$ (0 if not insured 1 if uninsured);

ε_{it} = error term, which is distributed with mean = 0 and variance = 2; and

C_t = a generalised logarithmic market growth term

Hence the coefficient of a predictor variable in the logarithm form was expressed as elasticity. This meant that, the rental value percentage change was attributed to that predictor's one percent change. The additional inherent price of a given (dis)amenity in this study, that is the marginal cost of commercial property insurance correlates with the amount of rental value and this depends on the size of the (dis)amenity. In an illustration, a marginal change in amount of insurance cost, may affect the rental value differently at different rate dependant of amount of insurance cost change. So unavailability of insurance cost meant no insurance cost effect on the rental value and a one, ten or thirty percent change in insurance cost may yield variant effects on rental value.

As indicated, a survey was used to identify insured and uninsured comparable office and retail properties and their respective rental values. This was compared with the uninsured for both retail and office properties, and evaluated the difference between them based on T-test analysis. In addition, in estimating the extent of rental value differences between the insured and uninsured office and retail properties respectively, if differences exist, confidence interval of each property type in all the CBDs was computed with the aid of PHStat data analytical package. See Lamond et al [13] as cited by Attakora-Amaniampong et al [17].

5. Results and Discussion

The results and discussions reported in this section is based on identified insured and uninsured commercial properties selected for the study and their rental values; difference between the insured and uninsured rental values; and the extent of rental value differences between the insured and uninsured commercial properties. As indicated in Table 1, 207 properties were identified within the three selected CBDs. The mean age of both commercial properties in each CBD and their respective mean annual rent (GHS) per square foot are also reported in Table 1.

Table 1. Statistics summary of the 207 identified properties according to cities

	Tamale		Bolgatanga		Wa	
	Retail	**Office**	**Retail**	**Office**	**Retail**	**Office**
Insured	12	14	8	7	3	4
Uninsured	67	37	31	6	13	5
Total	79	51	39	13	16	9
Ave Age (Years)	15.31	12.64	15.31	12.63	15.32	12.34
Ave Annual Rent (GHS)	326.33	6372.55	315.64	7292.31	375.29	6200
Ave Space (Sq. Ft,)	77.05	173.31	76.79	174.38	77.12	163.88
Annual Rent/Sq. Ft.	4.24	36.77	4.11	41.82	4.87	37.83

To affirm that all properties included in the study were comparable in terms of age and size, six different t-tests were undertaken. Table 2 to Table 7 present the results of no statistical significant difference between the insured and uninsured in terms of the space expressed in square foot of both commercial property types within the three CBDs at a significant level of 5%. The implication of these results is that, the contacted and included retail and office property types in this study are comparable in the spheres of space size. The comparable property concept is of great importance to this study.

Table 2. T Test Results for Tamale and Bolgatanga Office Spaces

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.0	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Tamale	51	173	252.03	One Tail	5.02	0.21	62.00	0.42	1.67	no	0.03
Bolgatanga	13	174	296.76		T TEST: Unequal Variances				Alpha	0.05	
Pooled			260.69		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.07	One Tail	5.27	0.20	17.56	0.42	1.73	no	0.05

Table 3. T Test Results for Tamale and Wa Office Spaces

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance	Variance	std err	t-stat	df	p-value	t-crit	sig	effect r
Tamale	51	173	252.03	One Tail	5.79	1.46	58.00	0.08	1.67	no	0.19
Wa	9	165	282.27		T TEST: Unequal Variances				Alpha	0.05	
Pooled			256.20		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.53	One Tail	6.03	1.40	10.68	0.10	1.80	no	0.39

Table 4. T Test Results for Bolgatanga and Wa Office Spaces

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Bolgatanga	13	174	296.76	One Tail	7.40	1.28	20.00	0.11	1.72	no	0.28
Wa	9	165	282.27		T TEST: Unequal Variances				Alpha	0.05	
Pooled			290.96		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.56	One Tail	7.36	1.29	17.65	0.11	1.73	no	0.29

Table 5. T Test Results for Tamale and Bolgatanga Retail Spaces

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Tamale	79	77.05	5.02	One Tail	0.47	0.55	116.00	0.29	1.66	no	0.05
Bolgatanga	39	76.79	7.06		T TEST: Unequal Variances				Alpha	0.05	
Pooled			5.69		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.11	One Tail	0.49	0.52	65.39	0.30	1.67	no	0.06

Table 6. T Test Results for Tamale and Wa Retail Spaces

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Tamale	79	77.05	5.02	One Tail	0.62	0.12	94.00	0.45	1.66	no	0.01
Wa	17	77.12	7.37		T TEST: Unequal Variances				Alpha	0.05	
Pooled			5.42		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.03	One Tail	0.70	0.11	20.94	0.19	1.72	no	0.02

Table 7. T Test Results for Bolgatanga and Wa Office Spaces

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Bolgatanga	39	76.79	5.94	One Tail	0.82	0.41	54.00	0.34	1.67	no	0.06
Wa	17	77.12	12.96		T TEST: Unequal Variances				Alpha	0.05	
Pooled			8.02		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.12	One Tail	0.96	0.35	22.65	0.08	1.71	no	0.07

Similarly, Table 8 to Table 13 present the results of no statistical significant difference in terms of the age (in years) between the insured and uninsured of both property types within the three CBDs. The essence of these additional six T-Tests was to ascertain whether or not there are statistical significance differences with the selected insured and uninsured property types. Again, they were meant to prove that, both insured and uninsured properties are comparable, both size and age wise.

Table 8. T Test for Tamale and Bolgatanga Retail Property Ages

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Tamale	79	15.31	0.05	One Tail	0.05	0.03	116.00	0.49	1.66	no	0.00
Bolgatanga	39	15.31	0.09		T TEST: Unequal Variances				Alpha	0.05	
Pooled			0.07		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.01	One Tail	0.05	0.02	61.64	0.49	1.67	no	0.00

Table 9. T Test Tamale and Wa Retail Property Ages

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Ta male	79	15.31	0.05	One Tail	0.06	0.18	94.00	0.43	1.66	no	0.02
Wa	17	15.32	0.07		T TEST: Unequal Variances				Alpha	0.05	
Pooled			0.06		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.05	One Tail	0.07	0.16	21.76	0.44	1.72	no	0.04

Table 10. T Test for Bolgatanga and Wa Retail Property Ages

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Bolgatanga	39	15.31	0.09	One Tail	0.08	0.12	54.00	0.45	1.67	no	0.02
Wa	17	15.32	0.07		T TEST: Unequal Variances				Alpha	0.05	
Pooled			0.08		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.03	One Tail	0.08	0.12	34.48	0.45	1.69	no	0.02

Table 11. T Test for Tamale and Bolgatanga Office Property Ages

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Tamale	51	12.64	0.03	One Tail	0.05	0.30	62.00	0.38	1.67	no	0.04
Bolgatanga	13	12.62	0.01		T TEST: Unequal Variances				Alpha	0.05	
Pooled			0.02		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.09	One Tail	0.04	0.39	30.09	0.35	1.70	no	0.07

Table 12. T Test for Tamale and Wa Office Property Ages

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Tamale	51	12.64	0.03	One Tail	0.06	0.12	58.00	0.45	1.67	no	0.02
Wa	9	12.64	0.02		T TEST: Unequal Variances				Alpha	0.05	
Pooled			0.03		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.04	One Tail	0.05	0.14	12.68	0.44	1.77	no	0.04

Table 13. T Test for Bolgatanga and Wa office property ages

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Bolgatanga	13	12.62	0.01	One Tail	0.05	0.43	20.00	0.34	1.72	no	0.10
Wa	9	12.64	0.02		T TEST: Unequal Variances				Alpha	0.05	
Pooled			0.01		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			0.19	One Tail	0.05	0.41	14.16	0.35	1.76	no	0.11

To evaluate the difference between the insured and uninsured rents of both property types in the three CBDs, the average annual rent per square foot among the insured and uninsured retail and office properties in each of the CBDs were computed, see Table 14 to Table 19. These were t-tested with insured against uninsured at property type levels for all the three cities. Six different t-tests were undertaken, one for each retail and office property types. Table 14 to Table 19 present the results of t-tests of which all indicated significant differences between the insured and uninsured of both retail and office annual rents per square foot for the three contacted CBDs. From Table 14, the mean annual rent per square foot for the insured offices was GHS 47.86 which was higher than the uninsured counterpart with mean of GHS 31.98. In addition, the same table confirmed a result of significant difference between these means.

Table 14. T Test for Tamale insured and uninsured office annual rent per square foot

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Insured	14	47.86	10.40	One Tail	0.67	23.52	49.00	0.00	1.68	yes	0.96
Uninsured	37	31.98	2.54		T TEST: Unequal Variances				Alpha	0.05	
Pooled			4.63		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			7.38	One Tail	0.90	17.62	15.47	0.00	1.75	yes	0.98

Table 15. T Test for Tamale insured and uninsured retail annual rent per square foot

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Insured	12	6.87	0.51	One Tail	0.19	16.76	77.00	0.00	1.66	yes	0.89
Uninsured	67	3.73	0.33		T TEST: Unequal Variances				Alpha	0.05	
Pooled			0.36		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			5.25	One Tail	0.22	14.36	13.65	0.00	1.76	yes	0.97

Table 16. T Test for Bolgatanga insured and uninsured office annual rent per square foot

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Insured	7	49.70	2.38	One Tail	0.63	30.01	11.00	0.00	1.80	yes	0.99
Uninsured	6	30.67	0.00		T TEST: Unequal Variances				Alpha	0.05	
Pooled			1.30		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			16.70	One Tail	0.58	32.63	6.00	0.00	1.94	yes	1.00

Table 17. T Test for Bolgatanga insured and uninsured retail annual rent per square foot

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Insured	8	6.76	0.52	One Tail	0.18	18.72	37.00	0.00	1.69	yes	0.95
Uninsured	31	3.38	0.14		T TEST: Unequal Variances				Alpha	0.05	
Pooled			0.21		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			7.42	One Tail	0.26	12.90	7.98	0.00	1.86	yes	0.98

Table 18. T Test for Wa insured and uninsured office annual rent per square foot

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Insured	4	60.38	3.67	One Tail	1.75	22.27	7.00	0.00	1.89	yes	0.99
Uninsured	5	21.44	9.14		T TEST: Unequal Variances				Alpha	0.05	
Pooled			6.80		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			14.94	One Tail	1.66	23.50	6.76	0.00	1.89	yes	0.99

Table 19. T Test for Wa insured and uninsured retail annual rent per square foot

SUMMARY			Hyp Mean Diff 0		T TEST: Equal Variances				Alpha	0.05	
Groups	Count	Mean	Variance		std err	t-stat	df	p-value	t-crit	sig	effect r
Insured	3	7.21	0.00	One Tail	0.26	11.19	15.00	0.00	1.75	yes	0.94
Uninsured	14	4.32	0.19		T TEST: Unequal Variances				Alpha	0.05	
Pooled			0.17		std err	t-stat	df	p-value	t-crit	sig	effect r
Cohen d			7.12	One Tail	0.12	23.48	14.91	0.00	1.75	yes	0.99

The results reported in Table 14 to Table 19 imply that insurance cost impacted both the office and retail property types by which the insured properties have had increased in rent over their non-insured counterpart in the three contacted CBDs in the northern Ghana. The results are in line with studies of Lamond et al, [13], which held the assertion that, insurance cost affects property prices. However, as they examined the insurance and property values, this current study gauged the impact of insurance cost on the rents of retail and office properties. Again, whereas the focus of previous studies were mainly on residential properties in the developed world including Britain, US and Australia, this study concentrated particularly on office and retail properties in Ghana..

The difference between the insured annual rent per square foot and uninsured annual rent per square foot for both retail and office property types were estimated for each of the three CBDs. At a confidence level of 95%, these were achieved with the aid of a confidence interval estimator, where the variances of Tamale office, Wa office and Wa retail were equal whereas Tamale retail, Bolgatanga office and Bolgatanga retail were unequal. From Table 20, there are no significant differences in variances between the insured and uninsured annual rent per square foot for Tamale office, Wa office and Wa retail properties, however, the Tamale retail, Bolgatanga office and Bolgatanga retail properties had significant difference in variances between their insured and uninsured annual rents per square foot respectively at significant levels of 5%. This implies that in estimating the 95% confidence interval estimate of the difference between the rents for insured and the uninsured of Tamale office, Wa office and Wa retail properties, their pooled variances need to be incorporated. This is because the three have respectively equal variances.

Table 20. F Test for difference in variance of insured and uninsured annual rent

Data	Tamale Office	Tamale Retail	Bolgatanga Office	Bolgatanga Retail	Wa Office	Wa Retail
Level of significance	0.05	0.05	0.05	0.05	0.05	0.05
Large-variance sample						
Sample size	12.00	14.00	7.00	8.00	5.00	14.00
Sample variance	0.51	0.40	2.38	0.52	9.14	0.19
Small-variance sample						
Sample size	67.00	37.00	6.00	31.00	4.00	3.00
Sample variance	0.33	2.54	1.51	0.14	3.67	0.00
F test statistic	1.55	4.09	1.57	3.79	2.49	39.09
P 1 sample degree of freedom	11 .00	13.00	6.00	7.00	4.00	13.00
P 2 sample degree of freedom	66.00	36.00	5.00	30.00	3.00	2.00
Two tail test						
Upper critical value	2.19	2.29	6.98	2.75	15.10	39.42
P-value	0.27	20.00	1.01E-72	0.01	0.48	0.05
Reject the null hypothesis	No	Yes	Yes	Yes	No	No

Table 21 presents the extent of differences between the insured and uninsured retail and office properties' rents per square foot by the three CBDs. From Table 21, the annual rents per square foot of the insured Wa offices were GHS 38.96±1.33, Bolgatanga offices with GHS 19.03±1.18 and Tamale offices were GHS 15.88±1.34 higher than their uninsured counterparts' respectively. Again, the annual rents per square foot of the insured Bolgatanga retail properties had GHS 3.39±0.48; followed by those in Tamale CBD with GHS 3.14±0.62 and Wa retail properties were GHS 2.89±1.26, higher than their uninsured counterparts' respectively. This implies that, in the Tamale CBD, the annual rent per square foot of the insured office commercial properties is on average between GHS 17.22 and GHS 14.54 higher than that of the uninsured office commercial properties. In addition, the annual rent per square foot of the insured retail commercial properties is on average between GHS 3.76 and GHS 2.52 higher than that of the uninsured retail commercial properties in the Tamale CBD. Within the Bolgatanga CBD, the annual rent per square foot of the insured office commercial properties also was on average between GHS 20.21and GHS 17.85 higher than that of the uninsured office commercial properties. Again the annual rent per square foot of the insured retail commercial properties is on average between GHS 3.87and GHS 2.91 higher than that of the uninsured retail commercial properties in the Bolgatanga CBD. Likewise within the Wa CBD, the annual rent per square foot of the insured office commercial properties also is on average between GHS 40.29 and GHS 37.63 higher than that of the uninsured office commercial properties. Again the annual rent per square foot of the insured commercial retail properties was on average between GHS 4.15 and GHS 1.63 higher than that of the uninsured commercial retail properties in the Wa CBD.

Table 21. Differences between insured and uninsured annual rent per square foot

Property Type	Insured is higher than uninsured annual rent per square foot by GHS
Tamale office	15.88±1.34
Tamale retail	3.14±0.62
Bolgatanga office	19.03±1.18
Bolgatanga retail	3.39±0.48
Wa office	38.96±1.33
Wa retail	2.89±1.26

Arguably, there is a range of gains in rents from renters to landlords for insuring their properties within the selected CBDs per square foot per annum. Beside the indemnification to the landlords who insured their properties from the insurance companies when unpredicted events occur, they additionally gain annually in terms of rent to some extent. This is just a signal to all and prospective commercial property investors or landlords to patronize insurance.

Again, the insurance companies must intensify their advertisement and increase education about their products to widening insurance coverage in the contacted CBDs. Besides, policy making organs in the study areas must come out with sustainable and effective landed property insurance policies that will encourage investors and property owners to insure their properties. From all indications, that is by considering Table 1 to Table 20, there are limited property insurance coverage throughout the three CBDs. Practically, from Table 1, only 15.19% of the retail and 27% of the office properties from Tamale, 20.5% of the retail and 53.95 of the office properties in Bolgatanga and 18.75% of the retail and 44.44% of office properties in Wa were insured.

Furthermore, the rental analyses involved in this current paper are appropriate as proposed by Brueggemen and Fisher [19]; Geltner et al., [16] and Grenadier [28] that real estate space markets are highly segmented because both demand and supply are location and property type specific. Space markets analysis such as this rental analysis need to be local rather than national, and specialized around building usage categories. Hence, the current study of the three CBDs and (retail and office) property type level analyses were in line with these Real Estate Space Market authors.

6. Conclusion

Initially, this paper identified insured and uninsured comparable office and retail properties and their rental values. Again, the difference between the insured and uninsured rental values were gauged; and finally the paper estimated the extent of rental value differences between the insured and uninsured office and retail properties, this was because the differences existed within the three CBDs of the study communities. From the total properties surveyed, only a minority were insured. In addition, the statistical differences between insured and uninsured

properties of all categories in terms of both size and age within in the CBDs was insignificant. In terms of insurance coverage by property type, relatively, the office property types were more insured than the retail property counterpart. In addition, all insured properties by CBDs and types had higher annual rent per square foot than their uninsured counterparts. The extent of differences between the insured and uninsured rents is more pronounced among the office property types than the retail properties in all the CBDs.

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