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A comparative study of rental value of residential properties at border communities of Lagos and Ogun States, Nigeria

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Abstract. This study delves into the pattern and level of development of two adjacent border communities of Lagos and Ogun States, Nigeria to compare the effect on rental values of residential properties in the two communities. The study attempted to find out if there are significant differences as well as definite relationship between the values. Questionnaires were distributed to two groups of respondents which are 84 estate surveying and valuation firms in Ikeja, Lagos and 152 residential property owners/residents in the two communities. Data were analysed with statistical tools such as tables, percentages and mean. Student's t-test statistics was used to ascertain the difference in rental values while Pearson coefficient of correlation was used to establish the degree of relationship. The importance of factors influencing rental values was determined using the relative importance index. Analysis were presented in percentages, tables and charts and then discussed. Result showed that there are significant statistical differences in rents of the two communities despite the proximity. It was further observed that neighbourhood density and level of infrastructure development play vital roles in the gaps observed in rental values. However, the Pearson correlation coefficient revealed that there is a relatively strong positive correlation between rental values of properties in the two communities. The research therefore concluded that for property market on the Ado-Odo/Ota side of the emerging Lagos megacity to attain its full potential, there is the need for major urban renewal, investment in physical and economic infrastructure via partnership with private sectors and property owner in the communities.

Key words: comparative, border, communities, megacity, rental value, property, infrastructure

1. Introduction

According to [1], development is a step by step alteration in the manner of existence, advent and perpetuation of perfect state of affairs in a fiscal or commercial, ethnic, and communal setting. Development refers to an inherent growth in all aspects of a city that leads to progress. The process of making a municipality advance to modern standards through facilities improvement, construction of new buildings and interrelated access routes can be referred to as urban development in that community. [2] noted that people go to border communities in order to build their own houses since housing in city centers are scarce due to excess demand. The author further observed that the problems of overcrowded city centers can be a re-direction to people to live in the outlying regions. This scenario of urban infrastructural development causing population spread is what automatically pushes some of the city's population outside of the urban areas to its fringes or border communities. The

neighbouring communities then takes up a smaller and unplanned replica of where the first development started, also having an effect on further neighbouring communities. Most times, this continues and leads to an unplanned and unhealthy growth and development of fringes or border communities. For instance, [3] averred that the growth of Nigeria's urban population in both absolute and relative terms has been accompanied by the expansion of existing built-up areas and the emergence of new and identifiably 'urban' settlements. [4] also opined that a community's inherent ability to progress is affected by its remoteness or closeness to a major urban center.

[4] observed that while a major percentage of the world's populace work in urban areas, the population of those living at remote areas is ironically dense. In Nigeria, the population has increased over the years causing what is known as urban expansion and this is to an extent that one can no longer tell when a land is 'urban' or 'rural' [3]. The population of urban centres in Nigeria often leads to an urban sprawl into its border communities. There have been a number of cases of urban sprawl in Nigeria. In Akure, people have been seen to migrate into the sub urban areas because of their need for a larger space [5]. Also, [4] observed that the Ota community is one of the major border communities that have been affected in social structure by its closeness to Lagos State. [3] also observed a similar case in Makurdi where the movement of state capital triggered a kind of migration which led to a sudden rise of economic developments and thereafter causing a spread to surrounding communities. The continued influx of people from city centres to fringe communities often leads to increased demand for urban infrastructure and ultimately, increased investment in the provision of these infrastructures, particularly housing related infrastructures. Even though the population growth and expansion may be unexpected and unplanned for, the value of landed properties in the boundary communities are directly affected by the level of urban development in the community as increase in demand is directly proportional to increase in value [6, 7].

The population of Lagos State was about 17 million according to the National population commission [8]. According to [4], the city of Lagos has grown in terms of population and space. According to [9], Lagos State has been growing and continued to grow until it slopped over into its border state, Ogun State. As a result of this, Lagos State government decided to start the Lagos Mega city project covering the whole of Lagos state and four local governments in Ogun State, at the border of Lagos State. These include: Ado-Odo/Ota, Ifo, Obafemi-Owode and Sagamu [9]. As stated by [4], the way in which Lagos and Ota relate has caused an inflow of people from Lagos to live in Ado-Odo/Ota environs prominent of which is the Ota community. The consequence of this spill of Lagos population into the adjoining communities has upgraded their status to fit into the emerging Lagos megacity. This was what prompted this research albeit to investigate how far this has translated to in terms of physical development and increase in property values in the border community of Ota, Ogun State.

2. Literature review

2.1. Urban land development
Land is regarded as urban when it has certain infrastructural developments, have reached a level of economic development and contain a high population of people in that area [3]. Urban land development according to [10] is a form of urbanization which occurred due to rural-urban migration that causes intensification in provision of development standards. In the same study, urban expansion was interpreted to mean a large part of urban land development. [11] opined that increased village-city movement leads to urbanization. [3] on the other hand observed that urbanization is not just the dynamics of demographics in a city but also the rate of change of a rural land to urban and this is seen to be happening in many urban fringes as new municipalities emerge at a faster rate. However, it was also revealed in the study, that the internal demographics of a city were more of a determinant than rural-urban migration in the structure of urban lands. The authors further found that the manner in which urban lands in the country were structured and developed depends on prevalent political and economic situations in the country. The ability of the government to control urban expansion as well as urban growth was also found out as a factor that affects urban land development. The lack of control results in spontaneous patterns of growth around urban fringes while proper control of land resources and its allocation reduces unnecessary expansion. In spite of the various benefits of urban land development such as: physical beauty, a lot of challenges still exist such as security, vulnerability

of low income earners as well as poor living conditions as a result of inadequate resources for the growing population [3, 16].

2.2. Urban infrastructure development
The rate at which the use of land is altered has been a determining factor in the rate of urban land development. These changes often happen on popular intersection nodes where it is predicted that more people are likely to move into [3]. As urban growth occurs paving way for a larger urban system, the government and other private sector stakeholders provide urban infrastructures to keep the system running. According to [7], infrastructures are those devices whether in material form or in form of services that makes a community work as it should. Some of these services include: effective accessibility routes, water supply, electricity, refuse disposals, gating, schools and hospitals. There should be no underestimation of the role infrastructures play in the development of urban lands. In fact, the level of improved infrastructures in a community speaks largely about the level of urban development in that area. [12] showed that the level of improvement of facilities topped the rank in deciding accommodation prices in Magodo. Also, the availability of facilities in a municipality can attract real estate investment in development of residential buildings in that location [13]. However, [11] expressed displeasure in the provision of just one facility and noted that it is not enough, as there is need for the interaction of various infrastructures so as to facilitate development. [7] advised that facilities should be invested upon so as to promote economic development. Furthermore, the need for infrastructures was recorded in the study by describing a process whereby the addition to population in a city creates the need for enlargement of space to accommodate the addition. This leads to the expansion of urban areas and arouses the location of commercial and industrial establishments at strategic places as well as other land uses to satisfy various needs of the growing population of residents (consumers). Infrastructures are therefore provided so that the residents can fully function in the new areas.

2.3. Urban population growth
Urban growth and urbanization is often juggled and interchanged in sentences to mean the same. However they are different, in that while urbanization refers to a process in which part of a city becomes physically and aesthetically built up, urban growth is the specific number of people that have been added to those who live in city centers [3]. The population of a city center is very important to its development and is usually a measure of how far that city has gone in terms of its urbanization. There might be no addition to population if there is no development in the urban system of the city, while in other cases, urban land development is caused by the addition to population in that area. Demographics is very necessary to be studied when researching on the development of urban lands, as it helps in projections and to make for better plans in that urban area [14]. Although population could lead to a certain level of development, rapid population growth could lead to imbalance in the urbanized area as the community may be unable to meet up with the demands from growing demographics. A very important relationship between population and the rate of urban development of lands was described by [15] where it was seen that fully populated communities usually lead to excessive crowding and increased the usage per unit person of a facility. Urban growth is the rate of increase in the demographics of a modern city center [16]. Urban population growth definitely necessitates urban infrastructure development while urban infrastructure development by default induces population growth. [17] identified four important participants in the provision of urban infrastructures namely: the government, formal private sector, informal private sector, and the residents of the affected community. [1] opined that sustainable urban development requires a wide involvement and agreement of stakeholders so as to foster a development that is effectual and lawfully established.

2.4. Urbanization process in border communities
Border communities are settlements located at the fringes of a state or city whose location directly adjoins another territory or jurisdiction. The inherent growth of a city in all of its areas leads to population addition and the increase in number of people per house in the community. This forms the very bases of urban sprawl. Although urban growth leads to urban sprawl, the two terms are different. [5] noted the latter as an unwilled figure of the former. While [18] sees it as a prolonged urban growth without a proper scheme. [11] revealed that urban land development comes about as a result of the rise in movement of people from villages to main city centers causing a population spread to the city's boundaries, but then added that this situation makes the limits of such city to snap. This causes

population spill to forms another city node in need of development. Such small municipalities were predominantly associated with the use of land for farming purposes and other minor agricultural related uses, however the increase in population creates a need for modernized development. [19] studied the pattern and process of urbanization in South Africa and realized that a process of decentralization has been occurring. This is the movement of individuals or households who live in a city centre to the outskirts of that city and it forms another node for urban city growth. [19] further posited that a time comes when the rapid development of outlying cities close to urban centers become more than those farther away from the urban centers. It was then asserted in the study that border communities and outskirt cities of metropolitan areas have the ability and tends to grow as the urban city expands itself. According to [20], land and property value in peri-urban areas increase with increase in the influx of people into the neighbourhoods. At the same time, these communities often suffer various environmental problems, infrastructural deficit and diverse security challenges.

3. Research methods

Exploratory survey approach involving the use of structured questionnaire was employed in this study. Study population comprise the owners and residents of residential properties in Alimosho and Ado-Odo/Ota local government areas of Lagos and Ogun State respectively. Reliable data from which the theoretical population size can be obtained was not available, hence, two border communities were identified, one from each local governments. These communities are Joke Ayo community in Alimosho and Akeja community in Ado-Odo/Ota. To establish the sample size, a radius of 1km was measured on either side of the Sebe River Bridge, the boundary between the two communities. A total of 63 houses were counted within the 1km radius in Akeja community and 89 houses within the 1km radius of Joke-Ayo community. Thus the sample size of survey population in this study is 152 houses. The second category of respondents is the eighty-four estate surveying and valuation firms in Ikeja, Lagos. Sample sizes for the target population are the owners/adult resident of the identified houses and estate surveyors and valuers in the capacity of manager or partner in the firm. Thus, there are 152 house owners/adult residents and 84 estate surveyors and valuers. Structured questionnaire was administered to the two set of respondents. The effect of each factor on property values was measured on a five point likert scale such as nil(1), low(2), moderate(3), high(4) and very high(5). Mean and range values were used to determine point estimates of rental values as well as the change in rental values. Karl Pearson product moment coefficient of correlation was used to establish the relationship between rental values in the two localities. Findings were also presented in tables, charts and then discussed.

4. Data analysis and presentation

4.1 Questionnaire administration and rate of response
One Questionnaire each was administered to estate surveying and valuation firms in Ikeja. However, fifty-four (54) were retrieved, constituting 64.3% rate of response. It is noteworthy that this percentage of respondents claimed good knowledge of property market along Lagos-Ogun border communities either by virtue of having carried out property transactions there before or currently managing properties in the areas.

Table 1: Analysis of response

Questionnaires	Joke-Ayo (Lagos)	Akeja (Ogun)	Estate Firms	Total
No. Administered	89	63	84	236
No. Retrieved	64	51	54	169
Response rate (%)	71.9	80.9	64.3	71.6%

Also, a total of 152 questionnaires were administered to adult residents/house owners of the selected border communities with 115 duly completed and returned thereby constituting 75.7%. The response rates were deemed sufficient to undertake subsequent analysis. The pattern of questionnaire administration and retrieval rate is presented in Table 1.

4.2 Survey of residential property in border communities

Table 2: Types of residential property found in the communities

Property Type	Property Description	Joke-Ayo (Lagos)		Akeja (Ogun)	
		No.	percentage	No.	Percentage
Type 1	Tenement building	3	4.7%	18	35.3%
Type 2	Self-contained	2	3.1%	3	5.9%
Type 3	Block of 2 bedroom flats	9	14.1%	6	11.8%
Type 4	Block of 3 bedroom flat	17	26.6%	11	21.6%
Type 5	2 bedroom bungalow	3	4.7%	2	3.9%
Type 6	3 bedroom bungalow	15	23.4%	7	13.7%
Type 7	Semi-detached building	5	7.8%	2	3.9%
Type 8	Fully Detached building	10	15.6%	2	3.9%
Total		64	100	51	100

Table 2 presents the types of residential properties in the border communities. The Table showed a predominance of tenement in Akeja communities having 35.3% of the number of houses captured compared to blocks of 3 bedroom flat and 3 bedroom bungalow that have 26.6% and 23.4% of the number of houses in the Joke-Ayo community. The survey also revealed fewer numbers of prototype of modern design in Akeja compared to Joke-Ayo neighbourhood.

Table 3: Average rental value of residential properties in Joke-Ayo and Akeja communities
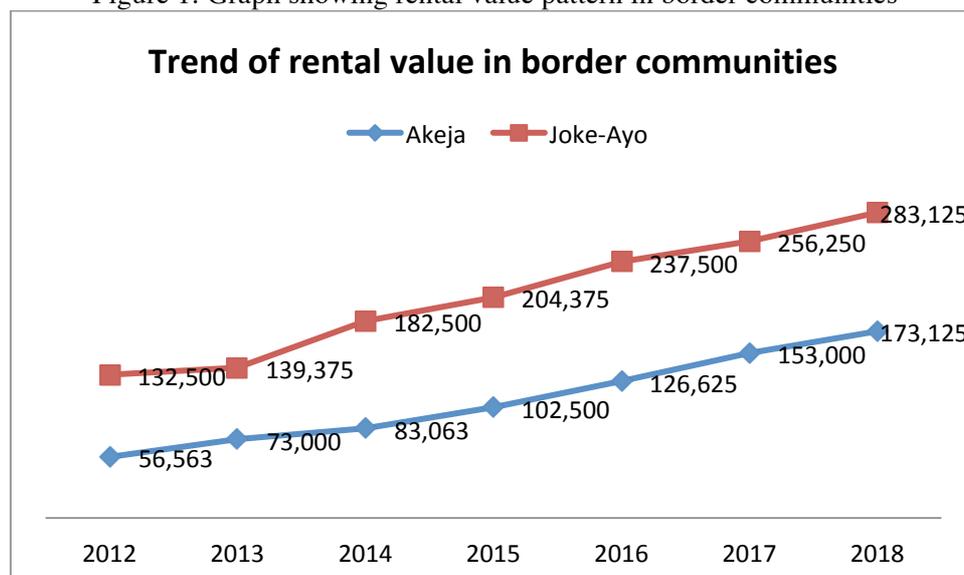
Property Type	2012		2013		2014		2015		2016	
	Joke-Ayo	Akeja	Joke-Ayo	Akeja	Joke-Ayo	Akeja	Joke-Ayo	Akeja	Joke-Ayo	Akeja
Type 1	25,000	7,500	25,000	9,000	30,000	12,000	45,000	15,000	50,000	18,000
Type 2	65,000	15,000	70,000	20,000	90,000	22,500	120,000	25,000	120,000	35,000
Type 3	110,000	45,000	120,000	50,000	150,000	60,000	160,000	90,000	180,000	120,000
Type 4	150,000	60,000	160,000	75,000	180,000	90,000	200,000	100,000	240,000	120,000
Type 5	160,000	70,000	180,000	90,000	220,000	100,000	250,000	120,000	280,000	130,000
Type 6	170,000	75,000	180,000	100,000	250,000	110,000	280,000	140,000	320,000	170,000
Type 7	180,000	90,000	180,000	120,000	260,000	120,000	280,000	150,000	350,000	180,000
Type 8	200,000	90,000	200,000	120,000	280,000	150,000	300,000	180,000	360,000	240,000

Property Type	2017		2018	
	Joke-Ayo	Akeja	Joke-Ayo	Akeja
Type 1	60,000	24,000	75,000	30,000
Type 2	150,000	50,000	150,000	75,000
Type 3	200,000	130,000	240,000	150,000
Type 4	250,000	150,000	280,000	160,000
Type 5	280,000	150,000	320,000	180,000
Type 6	350,000	200,000	350,000	220,000
Type 7	360,000	240,000	400,000	250,000
Type 8	400,000	280,000	450,000	320,000

Presented in Table 3 is the average rental value of different types of property in border communities of Joke-Ayo and Akeja as indicated by the estate surveyors and valuers. The figures represent point estimates of range of values submitted by the valuers for each property type between 2012 and 2018. It was observed that average rental values increase in both communities during the period covered although neither the rate of growth nor the relationship between the values was immediately clear from the Table.

Arising from Table 3, the mean rental value of all types of residential properties in the two communities were determined for each year. The result plotted on a line graph to see the trend and relationship of rental values between the two communities. This is shown in Figure 1.

Figure 1: Graph showing rental value pattern in border communities

Relationship in the rental values between the two communities

The change in rental value of each type of residential property between 2012 and 2018 was calculated for each of the two communities. The change was obtained using the mathematical expression:

$$(R_1 - R_0)/ R_0 \qquad\qquad\qquad \text{------------(1)}$$

Where R_1 represents rental value in 2018 and R_0 represents rental value in 2012. The result is presented in Table 4.

Table 4: Change in rental value

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8
Joke-Ayo (X)	2.00	1.31	1.18	0.87	1.00	1.06	1.22	1.25
Akeja (Y)	3.00	4.00	2.33	1.67	1.57	1.93	1.78	2.56

In order to find out if there is significant difference between the rental values of residential properties in the two communities, a null and alternative hypothesis was set.

Null Hypothesis H_0: There is no significant difference between rental values of residential properties at border communities of Lagos and Ogun States.

Alternative Hypothesis H_1: There is significant difference between rental values of residential properties at border communities of Lagos and Ogun States.

The decision rule is that if the calculated t is less than the tabulated t, then the null hypothesis is accepted, otherwise, the null hypothesis is rejected and alternative hypothesis affirmed.

Given a margin of error (α) of 0.05, the value of the calculated t against the tabulated t for a two-tailed t-test is calculated as follows:

T-test statistics formula is given as; $t = \dfrac{\overline{X_1} - \overline{X_2}}{\sqrt{(S_1^2)/N + (S_2^2)/N}}$ -----------------(2)

As derived from Table 4, N = 8, $\overline{X_1}$ = 2.36, $\overline{X_2}$ = 1.24,   Var X_A = 0.6802,   Var X_i = 0.1162

Formula for variance $(\overline{X}) = \sum\{(X - X)^2\}/N - 1$

$$t\text{-cal} = \frac{2.36 - 1.24}{\sqrt{(0.6802/8) - (0.1162/8)}} \qquad = \frac{1.12}{\sqrt{(0.0850 + 0.0145)}}$$

$$1.12/0.3154 = 3.5511$$

Thus the value of calculated t, (t-cal) = 3.5511

With the margin of error of 0.05 and n = 8, df = n – 1 = 7; the value of tabulated t in a two-tailed table is 2.365

Hence t-cal = 3.5511 and t-tab = 2.365

Since the t-cal is greater than the t-tab, i.e. 3.5511 > 2.365,

It implies that the null hypothesis which states "that there is no significance difference between the rental values of residential properties at border communities of Lagos and Ogun States" is rejected. Consequently, the alternative hypothesis which states that "there is significance difference between rental values of residential property values at border communities of Lagos and Ogun States" is accepted.

Furthermore, to establish the relationship between rental value of residential properties in the two communities, Karl Pearson Product Moment coefficient of Correlation was used. The correlation coefficient is given by the mathematical equation:

Coefficient of correlation (r) = $\dfrac{n\sum XY - \sum X \sum Y}{\sqrt{[n\sum X^2 - (\sum X)^2]\,(n\sum Y^2 - (\sum y)^2]}}$ ----------- (3)

Where: n is the number of property types, x and y are independent variables representing the rental values of residential properties in the two communities. Based on the information in Table 4, the values of each parameters in the Karl Pearson coefficient of correlation are as derived:

n = 8; $\sum X$ = 9.89; $\sum Y$ = 18.84; $\sum X^2$ = 13.04;

$\sum Y^2$ = 49.14; $(\sum X)^2$ = 97.81; $(\sum Y)^2$ = 354.95; $\sum XY$ = 24.43

$$\frac{8(24.43) - (9.89)(18.84)}{\sqrt{[8(13.04) - (9.89)^2]\,[(8(49.14) - (18.84)^2]}}$$

$$= \frac{195.44 - 186.33}{\sqrt{(104.32 - 97.81)(393.12 - 354.95)}}$$

$$\frac{9.11}{\sqrt{248.49}} \qquad = \qquad \frac{9.11}{15.37} \qquad = 0.5780$$

Karl Pearson Coefficient of Correlation (r) = 0.5780

The correlation coefficient of +0.5780 shows that there is a relatively strong positive correlation between rental values of residential properties between the two border communities covered in this study. The coefficient of correlation shows that the rental values move in the same direction albeit at a significantly different magnitudes.

4.3. *Factors influencing rental values in border communities*

Respondents from the real estate surveying and valuation firms were requested to indicate the level of impact that factors influencing property value have on rental values of residential properties in the border communities. The responses were tallied against a 5-point Likert scale ranging from very high impact (5), high impact (4), moderate impact (3), low impact (2) to no impact (1). Analysis were extracted and presented in Table 5

Table 5: Factors influencing property value

Factor	Joke-Ayo		Akeja	
	RII	Rank	RII	Rank
Population density	3.891	4	4.312	1
Infrastructure development	4.512	2	2.918	4
Housing quality	4.512	2	3.212	3
Administrative division	3.891	6	2.183	7
Structural factors	4.733	1	2.702	5
Locational factors	4.132	5	3.691	2
Neighbourhood factors	4.306	3	2.433	6
Economic developments	4.141	4	2.918	4

Table 5 showed that the respondents' have different opinion as regards the impact of factors identified have on rental value of residential properties in the two communities. As shown, structural factors, level of infrastructure development, housing quality as well as locational and neighbourhood factors have high impact on residential property values in the neighbourhood in Joke-Ayo communities. On the other hand, population density, locational factor, housing quality are factors that have moderate impact on rental value of residential properties in Akeja communities.

5. Findings and discussion
Arising from the various analysis, it was observed that Joke-Ayo communities has more development density i.e. neighbourhood density compared to Akeja community. This is attributed to the significant difference in the number of houses found within the 1km radius of each community whereby, there are 63 houses as against the 89 houses within the 1km radius of each of the two communities. This shows that Joke-Ayo is more of a relatively sub-urban precinct witnessing rapid urban fringe transformation. Moreover, Table 2 shows the characteristic of properties found in the two communities. Whilst Joke-Ayo neighbourhood has more buildings of modern and good quality design, Akeja neighbourhood has higher number of tenement buildings typical of older neighbourhoods development pattern. Figure 1 reveals that the mean rental value of residential properties in the two communities increase between 2012 and 2018. This implies that the border communities witnessed similar growth pattern in the value of rental properties over the six year period. While the figure showed the pattern, Karl Pearson coefficient of correlation shows the direction and strength of relationship between the changes in the value of rents between the two communities. The coefficient of correlation clearly showed that there is a relatively strong positive correlation between rental values of residential properties in the two border communities albeit at a significantly different magnitudes. Finally, Despite the closeness of the two border communities, the significant differences in rental value across the types of residential properties found within the two communities corroborate the results in Table 5 where the study found that different set of factors have very high influence on rental values in Joke-Ayo community compared to another set of factors that affect similar properties in Akeja community. The finding inherently indicates that population spill from Lagos into the border communities is an important factor contributing to the trend of rental value of residential properties in Akeja community of Ado-Odo/Ota local government of Ogun State.

6. Conclusion
The study compared rental values of residential properties at border communities of Lagos and Ogun states. The significant differential in rental values as well as the pattern of rental growth revealed stark differences in the level of infrastructure development, neighbourhood density, housing quality, administrative jurisdiction and level of economic development in the two communities. This notwithstanding, the relatively strong positive correlation of rental values between the border communities is an indication of the enormous potentials of property market of the Ogun communities that border Lagos State. It is therefore suggested that Ogun state government should invest in the

development of socio-economic infrastructure, renewal programmes of Ota border communities. Recommendations from this study would facilitate the achievement of goals #9 and #10 of the United Nations sustainable development agenda. The goals aimed at building resilient infrastructure, promote inclusive and sustainable industrialization, foster innovation and reduce inequalities among urban dwellers.

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